

AWARENESS AND KNOWLEDGE OF SCLERAL LENS PRACTICE AMONG OPTOMETRISTS IN BIHAR

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Abstract

Background: Scleral lenses are specialty gas-permeable contact lenses that vault the cornea and rest on the sclera, creating a fluid reservoir that can improve optical quality and protect the ocular surface. Safe fitting requires technical knowledge, practical training and access to diagnostic resources. Regional evidence from Bihar is limited.

Objective: To assess awareness, item-level theoretical knowledge, reported practice patterns and perceived barriers related to scleral lens practice among optometrists in Bihar.

Materials and Methods: A descriptive cross-sectional online survey was conducted among qualified optometrists practicing in Bihar using a non-probability convenience sampling approach. A literature-informed 35-item questionnaire covering demographics, awareness, item-level theoretical knowledge, reported practice, complications and barriers was validated by six scleral lens practitioners using content-validity indices. Knowledge was analyzed through selected theoretical indicators and an open-ended utility item rather than as a single clinical-competency score. Data from 88 complete eligible responses were analyzed descriptively. Exploratory association analyses used Fisher's exact test or chi-square testing with effect sizes where appropriate.

Results: Among 88 respondents, 62.5% were aged 20-30 years, 70.5% were male, 60.2% held a Bachelor of Optometry degree, 68.2% had less than 5 years of practice and 63.6% worked in hospital-based settings. Overall, 75 respondents (85.2%) reported at least some awareness of scleral lenses and 47 (53.4%) reported full awareness. In the open-ended utility item, 42.0% demonstrated correct knowledge, 33.0% partial knowledge and 25.0% minimal knowledge. Selected technical knowledge was stronger: 77.3% correctly identified the purpose of central vault, and 73.9% identified high-Dk gas-permeable materials and all key design parameters. However, 44.3% had never

fitted scleral lenses and only 10.2% reported regular fitting. The most common single barrier was lack of formal training (31.8%). Exploratory analyses did not show significant associations between experience and full awareness or between qualification and utility knowledge.

Conclusion: Surveyed optometrists in Bihar demonstrated partial but non-uniform awareness and selected areas of theoretical knowledge, while routine clinical fitting remained uncommon. The findings indicate a knowledge-to-practice gap and support structured hands-on training, mentorship, improved trial lens access and stronger referral pathways.

Keywords: Scleral lens; contact lens practice; optometry; Bihar; knowledge; awareness; clinical training; cross-sectional survey.

1. Introduction

Scleral lenses are large-diameter gas-permeable contact lenses designed to vault the cornea and limbus while bearing on the conjunctival tissue overlying the sclera. The post-lens fluid reservoir can neutralize irregular anterior corneal optics and provide continuous ocular surface protection, making scleral lenses useful in both visual rehabilitation and therapeutic management (van der Worp et al.2014), (Barnett et al. 2021). Contemporary evidence-based guidance describes their role in corneal irregularity, keratoconus, post-surgical ectasia, ocular surface disease and selected refractive indications when conventional modalities are inadequate (van der Worp et al.2014), (Barnett et al. 2021).

The modern resurgence of scleral lenses has been enabled by high-oxygen-permeability materials, improved manufacturing reproducibility and better anterior segment imaging. They have moved from a highly specialized rescue modality to an increasingly important part of specialty contact lens practice (van der Worp et al.2014), (Schornack 2015). Clinical benefits include improved comfort, visual acuity and ocular surface protection, particularly in patients who cannot tolerate corneal rigid gas-permeable lenses or who require a protected hydrated ocular surface (Barnett et al. 2021), (Schornack et al. 2014).

Despite these advantages, scleral lens practice is technically demanding. Safe fitting requires understanding of sagittal depth, lens diameter, central and limbal clearance, landing zone alignment, tear exchange, oxygen transmissibility and follow-up assessment. Excessive vault, lens thickness, poor landing-zone alignment or inadequate monitoring may contribute to corneal edema, conjunctival prolapse, blanching, midday

fogging, handling difficulty or dropout (Michaud et al.2012), (Walker et al.2016). Therefore, awareness alone is insufficient; practitioners must also develop procedural competence and access to trial sets, imaging, slit-lamp evaluation and mentorship.

International surveys show that scleral lens use is expanding but that prescribing patterns, fitting approaches and management practices vary across settings (Harthan, Nau, et al.2018), (Schornack et al.2023). Education-focused SCOPE studies further indicate that optometric curricula and graduating students' fitting exposure are variable, with many students perceiving limited hands-on experience before independent practice (Harthan, Schornack, et al.2021), (Harthan, Fogt, et al.2023). These findings are particularly relevant for regions where specialty contact lens teaching, case exposure and equipment access may be uneven.

Evidence from Nigeria demonstrates a similar implementation problem: most optometrists had heard of scleral lenses, but relatively few fitted them, with availability, cost and patient-related barriers limiting practice (Billo & Shuaibu 2024). For India, state-level evidence may be useful for targeted educational planning because service delivery and training opportunities can differ across regions. In Bihar, a densely populated Indian state with growing eye-care services, there is little published evidence describing optometrists' awareness, knowledge or adoption of scleral lens fitting. This regional evidence gap limits the ability of educators, professional associations and eye-care institutions to design targeted training initiatives. The present study therefore assessed awareness and theoretical knowledge of scleral lens practice among optometrists in Bihar, with additional exploratory evaluation of reported practice patterns and perceived barriers.

2. Materials and Methods

2.1. Questionnaire development

The data-collection instrument was a closed-ended, structured questionnaire that was created following a review of the literature on scleral lens awareness, clinical features, diagnostic considerations and professional training gaps. The data collection tool was a structured 35 item questionnaire developed after review of scleral literature and practice relevant domains. The questionnaire was organized into six broad sections: practitioner demographics and contact lens practice profile; awareness of scleral lenses; theoretical knowledge of indications, design and fitting parameters; reported clinical practice and assessment methods: complications and patient management; and information sources, training needs and perceived barriers. Response formats were

yes/no items, multiple-choice items, multiple-response items, Likert-type items and few open-ended questions. The estimated time for completion was 10-15 minutes.

Face and content validation were performed by six expert scleral lens practitioners who have experience in scleral contact lens practice. Experts evaluated each item for relevance, simplicity and clarity using a four-point rating scale. Item-level CVI values ranged from 0.83 to 1.00, with an overall S-CVI/Ave of 0.99 and S-CVI/UA of 0.94, indicating excellent content validity. The expert panel's feedback was utilized to make some changes in the questionnaire prior to its circulation.

2.2 Study design

This was a descriptive cross-sectional, questionnaire-based survey of optometrists practicing in Bihar, India. A cross-sectional design was suitable for the purpose of describing the distribution of knowledge, awareness and self-reported clinical practice at a specific time point.

2.3. Study Setting and Sample Size

Data were gathered from November 2024 to January 2025, and the survey remained open for approximately 4–6 weeks. The questionnaire was administered as an online survey using a non-probability convenience sampling and was distributed electronically through WhatsApp, email and LinkedIn. These platforms were selected because the target population was geographically dispersed across Bihar and optometrists were practicing in different clinical and academic settings. Participation was voluntary. The survey introduction described the purpose of the study, confidentiality of responses and the electronic consent procedure before participants proceeded to the questionnaire.

2.4. Participants and eligibility criteria

The inclusion criteria for the participants were optometrists qualified with a minimum of Bachelor of Optometry or above in Bihar. All optometrists in hospital, private clinic, corporate, academic, research, optical or other practice settings were eligible. Students in the undergraduate course of optometry and optometrists outside Bihar were excluded. Demographic variables included years of clinical experience, which was not used as an exclusion threshold in the analyzed data set and included the category of less than one year.

2.5. Data Management and Quality Assurance (QA)

Only complete responses were kept for the final analysis. To reduce duplicate responses, only one response per email address was allowed as per the study protocol; email restriction was used only for duplicate control and was not retained in the analysis

dataset. No names, contact numbers or direct personal identifiers were collected for analysis. The data was exported to Microsoft Excel for preliminary organization and checking, and analysed in an aggregate form to maintain respondent confidentiality.

2.6. Statistical analysis

Data were analyzed using Jamovi version 2.6. Categorical variables were summarized using counts and percentages. Because the analyzed variables were nominal or ordinal categorical survey responses, Exploratory association analyses were performed only where they were theoretically meaningful and statistically interpretable. Sparse categories were collapsed before testing to reduce instability from small expected cell counts. Full awareness of scleral lenses was compared between respondents and postgraduate respondents using chi-square testing, with Cramer's V reported as an effect size. Statistical significance was set at $p < 0.05$. All association results were interpreted cautiously because of the convenience sample and exploratory design.

2.7. Ethical considerations

Participation was voluntary and electronic informed consent was obtained before survey completion. Participants were informed about the study purpose, voluntary nature of participation and confidentiality of responses. No names, contact numbers or direct personal identifiers were collected for analysis. The study was conducted in accordance with the tenets of the Declaration of Helsinki.

3. Results

3.1. Respondent characteristics

A total of 88 complete eligible responses were analyzed. The baseline demographic and professional characteristics of the surveyed optometrists are presented in Table 1. Most respondents were aged 20-30 years (62.5%), male (70.5%) and Bachelor of Optometry qualified (60.2%). Most had less than 5 years of professional practice (68.2%), practiced in urban areas (54.5%) and worked in hospital-based settings (63.6%).

Contact lens activity was modest in the sample. Most respondents reported seeing 1-5 contact lens patients per week (61.4%), while 25.0% reported no weekly contact lens patients. Soft contact lenses were the dominant modality (71.6%). Only 6.8% identified scleral lenses as the main type of contact lens patient encountered, indicating limited routine exposure to specialty lens practice.

Table 1. Demographic and Professional Characteristics of Respondents

Domain	Category	Frequency (n)	Percentage (%)
Age group	20-30 years	55	62.5
	31-40 years	24	27.3
	41-50 years	8	9.1
	Above 50 years	1	1.1
Gender	Male	62	70.5
	Female	26	29.5
Highest qualification	Bachelor in Optometry	53	60.2
	Masters in Optometry	34	38.6
	PhD in Optometry	1	1.1
Years of practice	<5 years	60	68.2
	5-10 years	16	18.2
	11-15 years	8	9.1
	>15 years	4	4.5
Practice location	Rural	22	25.0
	Semi-urban	18	20.5
	Urban	48	54.5
Practice setting	Hospital-based practice	56	63.6
	Private clinic	22	25.0
	Optical outlet	5	5.7
	Multispecialty hospital	3	3.4
	Academic institution	1	1.1

Domain	Category	Frequency (n)	Percentage (%)
	NGO/outreach setting	1	1.1
Contact lens patients/week	None	22	25.0
	1-5	54	61.4
	6-10	5	5.7
	More than 10	7	8.0
Main contact lens type	Soft lens	63	71.6
	RGP	7	8.0
	Orthokeratology	7	8.0
	Scleral	6	6.8
	Prosthetic	5	5.7

RGP = rigid gas-permeable; NGO = non-governmental organization.

3.2. Awareness and theoretical knowledge of scleral lenses

Awareness and selected knowledge indicators are summarized in Table 2. Any level of awareness was reported by 85.2% of respondents when somewhat aware, partially aware and fully aware categories were combined. Full awareness of scleral lenses was reported by 53.4%, while 29.5% were somewhat aware, 2.3% partially aware and 14.8% not aware. The most commonly recognized indication was keratoconus (71.6%), followed by irregular corneas (11.4%) and ocular surface disease (8.0%); other reported indications are shown in Table 2.

In the open-ended utility item, 42.0% demonstrated correct knowledge, 33.0% partial knowledge and 25.0% minimal knowledge. Correct responses were interpreted as those linking scleral lenses to clinically appropriate uses such as keratoconus or irregular-cornea visual rehabilitation and/or ocular surface protection, whereas partial responses reflected incomplete clinical explanation. Technical knowledge was stronger for selected fitting concepts: 77.3% correctly identified that central vault avoids corneal contact, 73.9% identified high-Dk gas-permeable materials, and 73.9% selected all key

design parameters. These findings were interpreted as item-level theoretical indicators rather than proof of full clinical competence. Figure 1 contrasts awareness with reported fitting practice, and Figure 2 displays selected knowledge indicators.

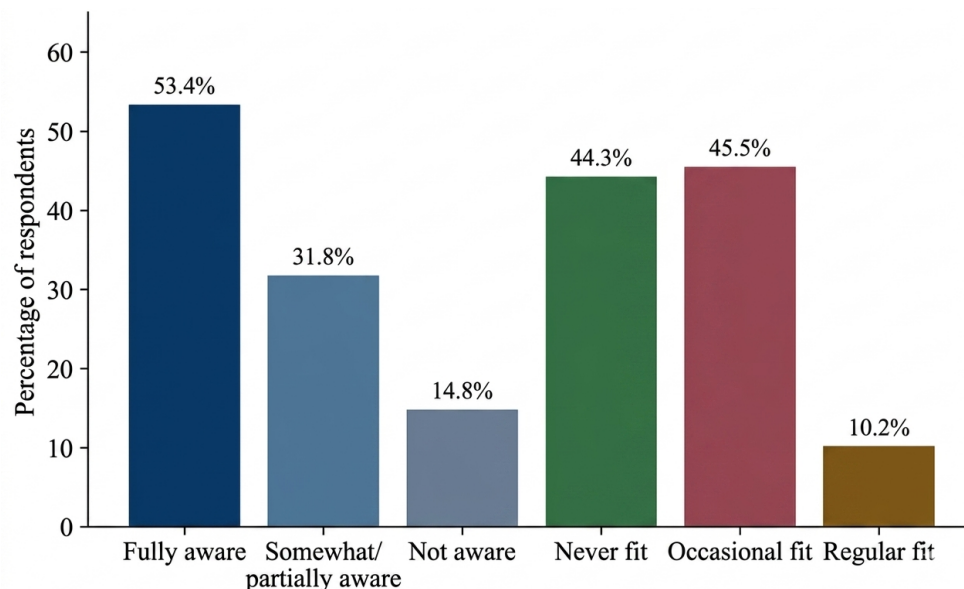


Figure 1. Awareness of scleral lenses and reported fitting practice.

Table 2. Awareness and theoretical knowledge indicators

Variable	Most relevant response	Frequency (n)	Percentage (%)
Awareness of scleral lens definition	Yes, fully aware	47	53.4
	Somewhat aware	26	29.5
	Partially aware	2	2.3
	Not aware	13	14.8
Recognized indication	Keratoconus	63	71.6
	Irregular corneas	10	11.4
	Ocular surface disease	7	8.0
	Post-surgical corneal ectasia	3	3.4
	Dry eye	2	2.3

Variable	Most relevant response	Frequency (n)	Percentage (%)
	Uncomplicated refractive error	2	2.3
	Irregular astigmatism	1	1.1
Open-ended scleral lens utility	Correct knowledge	37	42.0
	Partial knowledge	29	33.0
	Minimal knowledge	22	25.0
Typical diameter	15-22 mm	51	58.0
Lens material	High-Dk gas-permeable material	65	73.9
Design parameters	Sagittal depth, diameter and landing-zone profile	65	73.9
Central vault purpose	Avoid corneal contact	68	77.3
Equipment	Corneal topography, AS-OCT and corneal profile assessment	65	73.9
Important trial lens parameter	Sagittal height	36	40.9

AS-OCT = anterior segment optical coherence tomography; Dk = oxygen permeability.

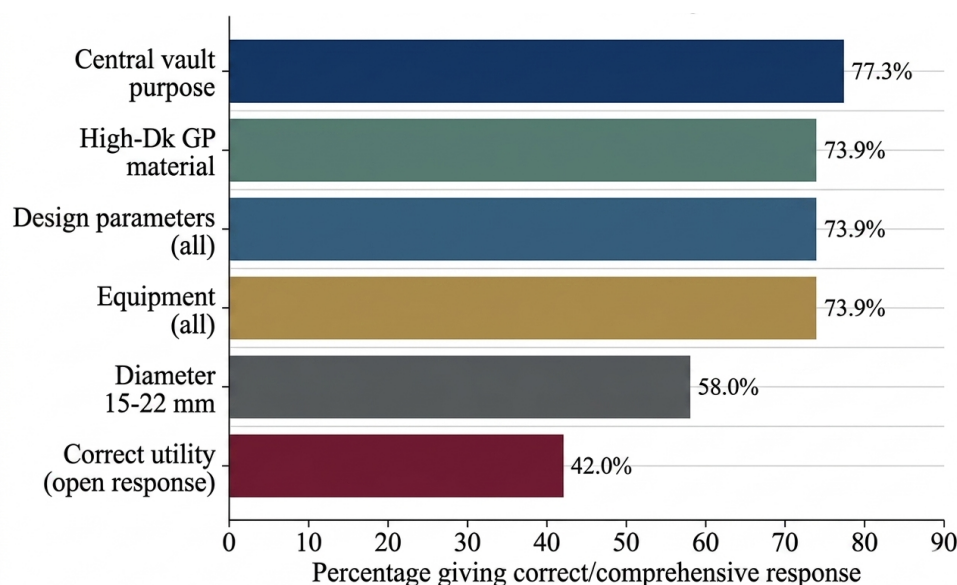


Figure 2. Selected scleral lens knowledge indicators.

3.3.Exploratory practice patterns, complications and perceived barriers

Practice-related results are summarized in Table 3. Despite non-uniform awareness and selected areas of theoretical knowledge, routine clinical fitting was uncommon. A total of 44.3% had never fitted scleral lenses, 45.5% fitted them occasionally and only 10.2% reported regular fitting. For vault assessment, 51.7% reported using both fluorescein with cobalt blue illumination and AS-OCT; this item had one missing response and was analysed with $n = 87$.

Midday fogging was the most commonly reported complication or fitting issue (42.0%), followed by corneal edema (12.5%), hypoxia-related changes (11.4%) and conjunctival prolapse (6.8%). Nearly half of respondents reported counselling patients at every visit (48.9%).

The most common single barrier was lack of training or formal training (31.8%). Importantly, 23.9% selected the 'all' category, indicating that many respondents perceived multiple barriers simultaneously rather than a single isolated constraint. Adoption limitations specific to Bihar were dominated by lack of awareness among patients or practitioners (37.5%), lack of trained professionals or training (21.6%) and high cost or affordability concerns (15.9%). The reported barriers are illustrated in Figure 3.

Table 3. Selected practice patterns, complications, information sources and barriers

Domain	Response	Frequency (n)	Percentage (%)
Scleral lens fitting practice	No, never	39	44.3
	Yes, occasionally	40	45.5
	Yes, regularly	9	10.2
Fitting requirements	All listed requirements	56	63.6
Vault assessment method	Both fluorescein/cobalt blue and AS-OCT	45/87	51.7
Landing-zone assessment	Both blanching assessment and slit-lamp inspection	60	68.2
Comfort factor	Central vault, edge lift and haptic alignment	57	64.8
Scleral asymmetry assessment	Always	37	42.0
Management of blanching	No knowledge	29	33.0
	Lens modification	26	29.5
Chair time perception	Agree or strongly agree that fitting is time-consuming	63	71.6
Common complication	Midday fogging	37	42.0
Patient counselling	Every visit	43	48.9
Barriers	Lack of training/formal training	28	31.8
	All barriers selected	21	23.9
	High patient cost	10	11.4

Domain	Response	Frequency (n)	Percentage (%)
	Limited access to trial lens sets	8	9.1
Information source	Conferences/workshops	43	48.9
	Peer-reviewed journals	26	29.5
Training resources needed	Hands-on training/workshops	26	29.5
	Mentorship/expert guidance	12	13.6
Adoption limitations in Bihar	Lack of awareness among patients/practitioners	33	37.5
	Lack of trained professionals/training	19	21.6
	High cost/affordability	14	15.9
	Limited referrals/professional network	10	11.4

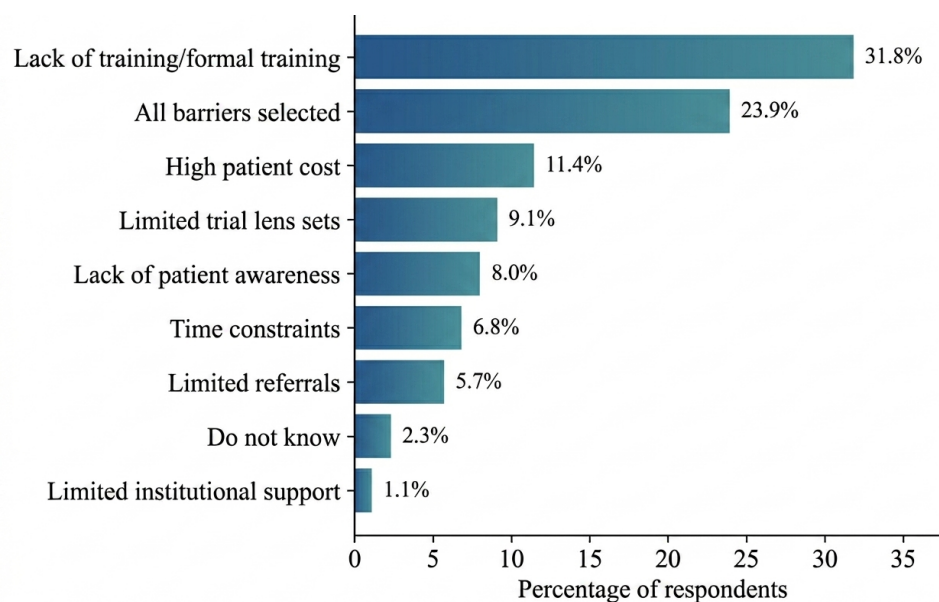


Figure 3. Reported barriers to scleral lens practice.

3.4. Exploratory association analyses

Exploratory association results are shown in Table 4. To reduce sparse-cell instability, years of practice were collapsed into less than 5 years and 5 or more years, and awareness was dichotomized into full awareness versus less-than-full awareness. Full awareness was not significantly associated with practice experience (Fisher's exact $p = 0.654$; $\phi = 0.05$).

Academic qualification was collapsed into Bachelor of Optometry versus postgraduate qualification because only one respondent reported a PhD in Optometry. Knowledge of scleral lens utility was not significantly associated with qualification (chi-square = 4.60, degrees of freedom = 2, $p = 0.100$; Cramer's $V = 0.23$). These findings should be interpreted as exploratory because the study used convenience sampling and was not powered for inferential subgroup testing.

Table 4. Exploratory association analyses

Relationship examined	Test	Result	Effect size	Interpretation
Years of practice (<5 vs ≥ 5 years) and full awareness of scleral lens definition	Fisher's exact test	$p = 0.654$	$\phi = 0.05$	No statistically significant association
Highest qualification (Bachelor vs postgraduate) and knowledge of scleral lens utility	Chi-square test	chi-square = 4.60; degrees of freedom = 2; $p = 0.100$	Cramer's $V = 0.23$	No statistically significant association

4. Discussion

This cross-sectional survey provides preliminary state-level evidence on awareness and theoretical knowledge of scleral lens practice among surveyed optometrists in Bihar, with exploratory reporting of practice patterns and perceived barriers. The principal finding is not a complete absence of awareness, but an incomplete translation of awareness and selected technical knowledge into routine clinical practice. Slightly more than half of respondents reported full awareness of scleral lenses, and several fitting-related knowledge items were answered correctly by more than 70% of

respondents. However, only 10.2% reported regular scleral lens fitting, while 44.3% had never fitted scleral lenses.

The pattern suggests that awareness and selected theoretical knowledge are necessary but insufficient for clinical adoption. Scleral lens fitting requires procedural competence, case-based judgement and access to appropriate fitting resources. Recognition of technical concepts in a questionnaire may reflect theoretical exposure rather than procedural mastery. A practitioner may correctly identify high-Dk materials, central vault or design parameters, yet still lack confidence, equipment, trial lens sets or supervision to fit lenses independently. This distinction is important because questionnaire-based knowledge should not be interpreted as equivalent to clinical competence. If this gap persists, appropriate referral and management of conditions such as keratoconus and ocular surface disease may be delayed in settings with limited specialty lens services.

Compared with the Nigerian cross-sectional survey by Billo and Shuaibu, where 94.1% of optometrists reported awareness of scleral contact lenses but only 14.3% fitted them in practice, the Bihar findings show a different but related implementation gap (Billo & Shuaibu 2024). In the present study, full awareness was lower at 53.4%, although any awareness reached 85.2% when somewhat and partially aware respondents were included. Fitting definitions also differed: 55.7% of the Bihar respondents reported at least occasional scleral lens fitting, but only 10.2% reported regular fitting. Therefore, the Bihar problem should not be described simply as absence of exposure; rather, the results suggest limited depth of knowledge, limited routine adoption and insufficient practical confidence.

Within the Indian context, the present study provides Bihar-specific evidence rather than a national prevalence estimate. Crucially, the low frequency of routine scleral lens fitting observed in this cohort (10.2%) aligns with broader national trends documented across India. For instance, (Saifi 2026) conducted a multi-state survey evaluating specialized optometric practices across five Indian states—including a subset from Bihar—and reported that while contact lens services are widely practiced (69.5%), specialized scleral contact lens fittings comprise only 24.0% of these specialty services overall (Saifi, 2026). This national backdrop confirms that specialty rigid gas-permeable and scleral modalities remain significantly underutilized compared to conventional soft contact lenses, which dominated at 71.6% in our sample and historically exceed 85% to 90% in global optometric audits. The dominance of urban and hospital-based respondents, the low proportion of regular scleral lens fitting and

the high demand for hands-on workshops indicate that access to training and equipment is likely uneven across practice settings. The finding that conferences and workshops were the most common information source suggests reliance on continuing professional education, while the request for hands-on training and mentorship indicates that theoretical exposure alone may not be enough for adoption in routine Indian optometric practice.

The study also aligns with education-focused SCOPE literature, which emphasizes variability in scleral lens curricula and student experience with fitting (Harthan, Schornack, et al.2021), (Harthan, Fogt, et al.2023). In academic settings internationally, graduating optometry students frequently showcase strong theoretical parameter knowledge yet experience a parallel clinical confidence deficit. In a SCOPE survey of graduating optometry students, a massive 62% reported fitting fewer than 10 scleral lenses during their entire institutional training, establishing a low baseline of practical mastery globally (Harthan, Fogt, et al.2023). This baseline provides context for why 44.3% of our Bihar respondents have never attempted a clinical fit despite demonstrating high structural knowledge (e.g., 77.3% identifying central vault purpose). In the present survey, conferences and workshops were the most common source of information, and hands-on workshops were the most frequently requested training resource. This pattern implies that formal education and routine clinical exposure may not be providing adequate applied experience for all practitioners. Structured training should therefore move beyond didactic lectures and include diagnostic lens selection, slit-lamp evaluation of clearance and haptic alignment, management of midday fogging and blanching, patient handling education and supervised follow-up. Furthermore, international prescription and management consensus highlights that the learning curve for independent scleral lens practice is steep; less experienced fitters require significantly more follow-up visits (a mean of 4.2 visits) to complete a single patient's fit compared to established practitioners (Harthan, Fogt, et al.2023). This elevated chair time requirement perfectly mirrors the perception of 71.6% of our respondents who agreed that fitting is highly time-consuming, indicating that clinical efficiency remains a principal systemic barrier.

The barrier profile has direct educational and service-delivery implications. Lack of formal training was the most common single barrier, but nearly one-quarter of respondents selected all listed barriers, highlighting that implementation is not constrained by one factor alone. Cost, trial lens access, patient awareness, chair time and referral networks all interact with training. Therefore, increasing adoption may

require a coordinated model involving optometry colleges, hospitals, manufacturers, professional associations and ophthalmology referral networks. Regarding complications, midday fogging was the preeminent challenge cited by our cohort (42.0%). This is strongly corroborated by global literature, which identifies midday fogging as the single most frequent post-lens tear film disruption, occurring in up to 20% to 40% of established scleral lens wearers due to the accumulation of lipids and inflammatory leukocytes beneath the lens reservoir (von Elm et al.2007).

The association analyses did not show statistically significant relationships between experience and awareness or between qualification and open-ended knowledge. These findings should not be interpreted to mean that experience and qualification have no role in scleral lens competence. Rather, within this convenience sample, awareness and open-ended utility knowledge were distributed across early-career and more experienced practitioners and across undergraduate and postgraduate groups. This supports the practical need for continuing professional development across all career stages.

Theoretical responses should therefore be interpreted as item-level knowledge indicators rather than a complete measure of clinical competence. For service development in Bihar, training programs should prioritize supervised fitting, interpretation of corneal topography and AS-OCT findings, trial lens selection, complication management, patient counselling and referral coordination. These findings should be interpreted with caution because the study design and sampling approach have limitations, which are described below.

5. Limitations

This study has several limitations. First, a non-probability convenience sample was used because a complete sampling frame of practicing optometrists in Bihar was not available. As a result, the findings should be interpreted as preliminary evidence from surveyed optometrists rather than as population-level prevalence estimates for all optometrists in Bihar.

Second, the sample was predominantly young, male, urban and hospital-based, which may underrepresent practitioners from rural, optical-outlet, outreach or low-resource settings. Because the questionnaire link was circulated through open professional networks, a denominator-based response rate could not be calculated.

Third, all practice and knowledge responses were self-reported and may be affected by recall bias, social-desirability bias and over- or under-estimation of clinical competence.

The questionnaire assessed theoretical understanding and reported practice; it did not directly observe fitting skill or patient outcomes.

Fourth, the open-ended scleral lens utility item was coded using a predefined rubric, but inter-rater reliability was not calculated. In addition, the study did not create a composite knowledge score; therefore, knowledge results should be interpreted as item-level indicators rather than as a single validated knowledge level.

Finally, some response categories, particularly the 'all' category for barriers, limit precise separation of individual barriers. The cross-sectional design can identify reported patterns and perceived constraints, but it cannot establish causal determinants of scleral lens adoption.

6. Conclusion

Surveyed optometrists in Bihar demonstrated partial, non-uniform awareness and selected areas of theoretical knowledge regarding scleral lenses. However, theoretical knowledge did not consistently translate into routine clinical fitting, as only 10.2% reported regular practice and 44.3% had never fitted scleral lenses. The major barriers were lack of formal training, cost, limited trial lens access, patient awareness, referral limitations and infrastructure constraints. These findings support structured hands-on workshops, mentorship, improved trial lens resources and stronger interdisciplinary referral pathways in Bihar.

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Funding Statement

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Conflict of Interest Statement

The author declares no conflict of interest.

Ethics Statement

Ethical approval was obtained from the Institutional Ethics Committee of GD Goenka University, Gurugram, India. Electronic informed consent was obtained from all participants before survey completion. Participation was voluntary, and responses were analyzed anonymously.

Data Availability Statement

The anonymized survey data underlying this manuscript are available from the corresponding author upon reasonable academic request, subject to institutional approval.

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