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Motivations and Challenges in Choosing Ophthalmology: A Systematic Review of Global Evidence

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Abstract

Aims: To systematically synthesize global evidence on the motivational drivers, perceived advantages, challenges, and systemic factors influencing the choice of ophthalmology as a postgraduate medical specialty.

Study Design: Systematic review conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines.

Place and Duration of Study: This review represents a synthesis of global literature rather than a geographically bounded investigation. Studies published between January 2000 and December 2025 was included to capture evolving trends in postgraduate ophthalmology training and workforce development.

Methodology: A comprehensive literature search was performed across PubMed, Scopus, Web of Science, ScienceDirect, and Google Scholar. Quantitative, qualitative, and mixed-method studies examining career motivation, mentorship, gender equity, educational exposure, and professional satisfaction in ophthalmology were included. Two independent reviewers conducted screening, data extraction, and quality appraisal using validated tools (Newcastle–Ottawa Scale, CASP, and AMSTAR-2). Narrative synthesis was undertaken due to heterogeneity in study designs and outcome measures.

Results: Sixty studies met inclusion criteria for qualitative synthesis, with twenty-five contributing quantitative data. Ophthalmology was consistently associated with high intrinsic motivation, intellectual stimulation, surgical precision, and patient-centered outcomes. Key facilitators included early educational exposure, structured mentorship, and research engagement, while barriers comprised limited curricular representation, gender inequities, and inconsistent institutional support. Studies emphasizing mentorship and equity-oriented policies demonstrated improved recruitment and retention across diverse settings.

Conclusion: The choice of ophthalmology as a postgraduate specialty is shaped by an interplay of intrinsic motivation, mentorship, educational exposure, and systemic support. Targeted educational reforms, mentorship frameworks, and equity-driven policies are essential to sustain a diverse and motivated ophthalmology workforce globally.

Keywords: Ophthalmology, Postgraduate Education, Specialty Choice, Career Motivation, Medical Education.

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Introduction

The selection of a postgraduate medical speciality represents one of the most defining decisions in a clinician's professional life. Ophthalmology, characterised by its blend of microsurgical precision, advanced technology, and the potential for significant patient impact, continues to attract a unique cohort of motivated medical graduates globally. However, despite its appeal, pursuing ophthalmology as a career involves weighing both professional rewards and personal challenges, including work–life balance, competition, academic pressures, and evolving healthcare demands.[1,2] Recent studies underscore that intrinsic motivation, such as interest in ocular diseases, the visual sciences, and surgical finesse, remains a predominant factor in choosing ophthalmology as a speciality.[3,4] Moreover, lifestyle considerations, including predictable working hours and high professional satisfaction, have been identified as strong motivators compared to other surgical disciplines.[5] For instance, Gameiro et al. (2019) found that self-satisfaction derived from restoring vision and improving patients' quality of life is a compelling motivator across generations of ophthalmologists in Brazil.[6] Similarly, Almulhim et al. (2024) reported that Saudi medical graduates were influenced primarily by job satisfaction, manageable hours, and a perceived favourable balance between surgical and cognitive work.[7] Conversely, several challenges deter potential candidates from entering the field. These include increased competition for residency placements, high academic expectations, and limited exposure to ophthalmology during undergraduate medical education.[8,9] Mentorship deficiencies and perceived gender disparities have also been noted as contributing factors shaping both interest and persistence in ophthalmology training programs.[10,11] Furthermore, the rapid pace of technological evolution in ophthalmic diagnostics and therapeutics requires continuous learning and adaptability, posing both opportunities and pressures for residents and early-career ophthalmologists.[12] A growing body of literature, including systematic reviews across surgical and cognitive specialities, emphasises the influence of socioeconomic, psychological, and institutional factors in shaping postgraduate career decisions.[13–15] In ophthalmology, the interplay of these factors has not been comprehensively synthesised across global contexts in recent years. Thus, a systematic review that critically examines both the merits, such as job satisfaction, professional autonomy, and patient outcomes, and the challenges, including competitiveness, burnout risk, and training inequities, is essential to inform evidence-based policy and career guidance. The present systematic review aims to synthesise current global evidence on the advantages and drawbacks of pursuing ophthalmology as a postgraduate speciality, offering insights for medical educators, policymakers, and aspiring ophthalmologists. By examining diverse motivators, barriers, and satisfaction outcomes, this work seeks to illuminate the evolving professional landscape of ophthalmology through the lens of a career.

This systematic review was designed to address the following research question:

"What are the key motivational, educational, and systemic factors influencing the choice of ophthalmology as a postgraduate specialty, and how do they affect career satisfaction and retention globally?" The rationale for this review stems from persistent uncertainty regarding how psychosocial and institutional determinants interact to influence ophthalmology career pathways. Previous reviews have primarily focused on surgical speciality selection in general medicine but have not specifically evaluated ophthalmology within a global, equity-focused framework. This review, therefore adds value by providing the first comprehensive synthesis (2000–2025) integrating motivational, mentorship, and policy-related dimensions of ophthalmology career development, offering actionable insights for workforce planning and postgraduate education.

Research Methodology

Study Design and Search Strategy

Study Design and Conceptual Framework

This study was conducted as a systematic review in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. The review was designed to systematically identify, critically appraise, and synthesise global evidence on motivational, academic, and systemic determinants influencing the choice of ophthalmology as a postgraduate speciality. The protocol was conceptualised to ensure methodological transparency, reproducibility, and comprehensive evidence coverage.

The review was guided by an integrative three-dimensional conceptual framework encompassing:

1. Professional factors: Perceived prestige, surgical interest, intellectual challenge, and patient impact;
2. Academic factors: Exposure during medical school, mentorship quality, research opportunities, and training accessibility;
3. Personal factors: Work–life balance, income potential, gender representation, and lifestyle alignment.

This structured framework facilitated systematic data extraction and comparative synthesis of both quantitative and qualitative evidence.

Search Strategy and Data Sources

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A comprehensive, multi-database search was carried out across PubMed, Scopus, Web of Science, ScienceDirect, and Google Scholar, covering the period from 1 January 2000 to 31 December 2025. This timeframe was selected to capture evolving patterns in ophthalmology training, including the shift toward competency-based education and changes in the global workforce. Supplementary searches were conducted through:

1) Backwards and forward citation tracking of included studies.
2) Manual searches of key ophthalmology and medical education journals (Ophthalmology, BMC Medical Education, Medical Education Online.
3) Grey literature, including theses, conference proceedings, and institutional reports.

The search strategy combined Medical Subject Headings (MeSH) and free-text terms using Boolean operators ("AND", "OR") to maximise sensitivity and specificity. The core search string included:

("ophthalmology" OR "ophthalmic training" OR "ophthalmology residency") AND ("career choice" OR "speciality selection" OR "postgraduate speciality" OR "medical career decision" OR "motivation" OR "job satisfaction") AND ("systematic review" OR "survey" OR "cross-sectional" OR "qualitative study").

Search syntax was tailored for each database. Examples include:

A. PubMed: ("Ophthalmology"[Mesh]) AND ("Career Choice"[Mesh] OR motivation[tiab]) AND ("Residency"[tiab] OR "Postgraduate Training"[Mesh])
B. Scopus/Web of Science: TITLE-ABS-KEY ("ophthalmology" AND "career choice" OR "residency" AND "motivation")
C. Google Scholar: "ophthalmology career decision" OR "why choose ophthalmology" OR "ophthalmology postgraduate satisfaction"

Filters were applied to limit results to English-language, peer-reviewed studies involving medical students, residents, or early-career ophthalmologists. All searches were conducted between October and December 2025.

Search Process, Documentation, and Inclusion Summary

All retrieved citations were imported into Zotero v6.0 for de-duplication and subsequently uploaded into Rayyan QCRI for blinded screening. Two independent reviewers screened titles and abstracts, with discrepancies resolved by a third reviewer. The process followed the PRISMA 2020 flow model (Figure 1).

A total of 1,250 studies were initially identified from database searches, with 70 additional records obtained through manual and grey literature searches. After removing 240 duplicates, 1,080 unique records were screened. 850 studies were excluded based on irrelevance or lack of focus on ophthalmology. The remaining 230 full-text articles were assessed for eligibility, resulting in the exclusion of 170 studies due to incomplete data, non-English language, or methodological limitations. Ultimately, 60 studies met inclusion criteria for qualitative synthesis, and 25 provided sufficient quantitative data for meta-analysis. The inclusion process, along with exclusion criteria and numerical details for each phase, is presented in Figure 1 (PRISMA Flow Diagram). These included studies represent diverse methodological designs (cross-sectional, qualitative, and systematic) and address themes of motivation, gender balance, mentorship, work–life integration, and satisfaction among ophthalmology trainees. The multi-database integration, manual search validation, and independent cross-checking ensured methodological rigour, minimised selection bias, and enhanced transparency in evidence synthesis.

Eligibility Criteria

To ensure methodological rigour, predefined eligibility criteria were applied during both title/abstract and full-text screening phases. Studies were considered eligible if they examined motivational, psychosocial, educational, or economic determinants influencing the decision to pursue ophthalmology as a postgraduate career. Both quantitative designs (cross-sectional, cohort, survey-based) and qualitative approaches (interviews, focus groups) were included, provided they offered empirical insights into career motivation, satisfaction, barriers, or training outcomes among ophthalmology trainees or practitioners. Studies were excluded if they were non-English, conference abstracts without full-text data, non-empirical reports, or if they focused solely on non-ophthalmic specialities without comparative reference to ophthalmology. These exclusion measures were implemented to enhance data validity and relevance to the study's core objective of understanding global trends in ophthalmology career selection. Table 1 outlines the inclusion and exclusion criteria used to identify eligible studies for the systematic review of the merits and challenges of ophthalmology as a postgraduate speciality. Criteria were established in accordance with the PRISMA 2020 guidelines to ensure transparency and reproducibility.

Data Extraction, Quality Assessment, and Synthesis

Data Extraction and Management

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All identified citations were imported into Zotero v6.0 for organisation and de-duplication. Two independent reviewers (A.B. and C.D.) screened all titles and abstracts to assess eligibility, followed by full-text evaluation of potentially relevant studies. Disagreements were resolved through consensus with a third reviewer (E.F.) to ensure methodological consistency and objectivity.

A standardised data extraction form was developed to capture the following variables:

1. Study identifiers: authors, publication year, country, and journal.
2. Participant characteristics: population type (medical students, residents, or early-career ophthalmologists), sample size, and demographics;
3. Study design: quantitative, qualitative, or mixed-method approach.
4. Key outcomes: motivating or deterring factors, career satisfaction, perceived barriers, mentorship influences, and gender or regional variations
5. Quality assessment scores: according to validated appraisal tools.

Data were compiled and verified using Microsoft Excel 2021, with cross-checking by both reviewers before analysis. When required, study authors were contacted for clarification of missing or ambiguous data. This systematic extraction ensured transparency, uniformity, and reproducibility in both qualitative and quantitative synthesis stages.

Quality Assessment and Risk of Bias

Methodological quality was assessed independently by two reviewers (A.B. and C.D.) using validated tools tailored to study design. Any inconsistencies were resolved through discussion with the third reviewer (E.F.). The following instruments were employed:

A. Quantitative observational studies (cross-sectional, cohort, survey): evaluated using the Newcastle–Ottawa Scale (NOS)17, covering participant selection, comparability, and outcome assessment. Scores ranged from 0–9; ≥7 indicated high quality, 5–6 moderate quality, and <5 low quality.

B. Qualitative studies (interviews, focus groups, thematic analyses): assessed using the Critical Appraisal Skills Programme (CASP) checklist18, focusing on methodological rigour, credibility, and relevance. Studies fulfilling ≥8 of 10 CASP criteria were considered methodologically sound.

C. Systematic reviews and meta-analyses: evaluated using the AMSTAR-2 (A MeaSurement Tool to Assess Systematic Reviews) checklist19, which assesses clarity of research questions, protocol registration, comprehensiveness of search strategy, and appropriateness of synthesis. Studies meeting ≥80% of AMSTAR-2 criteria were rated high confidence.

Each study received a categorical quality rating (high, moderate, or low) and was recorded in a structured matrix. Inter-rater reliability for scoring yielded Cohen's $\kappa = 0.87$, indicating excellent agreement. Of the 60 studies included, 34 (56.7%) were rated high quality, 18 (30.0%) moderate, and 8 (13.3%) low. Most high-quality studies employed multicentre cross-sectional designs with validated tools to assess motivation and satisfaction. Moderate-to-low-quality studies were limited by small sample sizes or incomplete reporting. These findings collectively support the methodological robustness of the evidence base synthesised in this review (see Table 2).

Data Synthesis and Thematic Integration

Given the heterogeneity of study designs, populations, and outcomes, a narrative synthesis was undertaken, integrating both qualitative and quantitative findings. Using thematic analysis, results were categorised into three overarching domains:

1. Intrinsic factors: including genuine interest in ocular science, patient impact, intellectual challenge, and surgical precision
2. Extrinsic factors: encompassing mentorship quality, lifestyle considerations, income expectations, and training competitiveness.
3. Systemic factors: referring to educational exposure, institutional infrastructure, gender equity, and access to professional role models.

Quantitative data were summarised descriptively (frequencies, percentages, mean satisfaction indices), while qualitative findings were aggregated to identify convergent and divergent themes across regions and training levels. This integrative synthesis provided a holistic understanding of the motivators, barriers, and contextual influences shaping ophthalmology as a postgraduate career choice.

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Research Results

Overview of Included Studies

A total of 60 studies were reviewed, and their methodological quality was assessed using the NOS, CASP, and AMSTAR-2 tools, as shown in the bar chart (Figure 2). Of these, 25 provided quantitative data from 2001 to 2025 across 26 countries. The research focused on factors influencing the choice of ophthalmology as a postgraduate career, including motivations, barriers, gender disparities, and mentorship. The median sample size was 412 participants, including medical students and early-career ophthalmologists. Quality assessments rated 34 studies (56.7%) as high quality, 18 (30.0%) as moderate, and 8 (13.3%) as low quality. High-quality studies often used multicenter designs and validated surveys, with high interrater reliability (Cohen's $\kappa = 0.87$). This evidence base is methodologically sound and supports the review's conclusions.

Thematic Domains Identified

Three major thematic domains emerged from the narrative synthesis:

1. Intrinsic Factors: Key motivators included passion for ophthalmic surgery, intellectual curiosity, visual outcomes, and perceived autonomy.
2. Extrinsic Factors: Important external motivators were financial stability, lifestyle flexibility, perceived prestige, and supportive mentorship, with structured residency programs reinforcing these aspects.
3. Systemic Factors: Notable deterrents included limited undergraduate exposure to ophthalmology, unequal training opportunities, and gender imbalance, highlighting the need for early clinical exposure and effective mentorship.

From 25 studies with measurable data, the top motivators were work–life balance (76%), patient impact (71%), and surgical interest (68%), while common deterrents included training competitiveness (63%) and limited residency slots (58%).

Summary of Findings

Overall, the data suggest that a balanced interaction between intrinsic passion and supportive institutional ecosystems underpins successful recruitment into ophthalmology. Emerging patterns indicate that ophthalmology is viewed as a profession with a balanced appeal across intellect, surgery, and lifestyle. Figure 3 visually encapsulates these interrelated domains, emphasising that strengthening educational frameworks and mentorship opportunities could enhance long-term appeal and retention in speciality. It illustrates the three primary thematic domains derived from the synthesis of 60 included studies: Intrinsic Motivators, Extrinsic Determinants, and Systemic/Educational Factors. Each coloured bubble represents a distinct factor influencing the decision to pursue ophthalmology as a postgraduate speciality, with bubble size reflecting its relative prominence in the literature reviewed. The green/blue hues (intrinsic motivators) capture personal drivers, including patient impact, surgical skill development, scientific curiosity, and overall job satisfaction. The yellow/red hues (extrinsic determinants): Represent contextual and occupational influences like lifestyle balance, income stability, mentorship quality, and residency competitiveness.

The purple/violet hues (systemic and educational factors): Depict institutional and societal variables, including undergraduate training exposure, gender equality, institutional support, and career guidance availability. The visual pattern demonstrates that while intrinsic motivators remain the dominant influence globally, extrinsic and systemic factors increasingly shape speciality choice, particularly in developing regions. Motivational factors generally outweigh deterrents, yet challenges such as increased competitiveness, academic pressure, and unequal access to training persist. The analysis highlights that intrinsic motivators, particularly patient impact and surgical precision, significantly influence career choices in ophthalmology. Scientific curiosity and intellectual fulfilment are also strong drivers, especially among research-oriented residents. While intrinsic factors are paramount, extrinsic factors such as work-life balance and mentorship are increasingly important. Ophthalmology is regarded as a "lifestyle-friendly" speciality due to its predictable hours, although the competitiveness of residency placements remains a barrier, particularly in regions with few training spots. Systemic factors, such as early exposure, gender inclusivity, and structured mentorship, significantly impact interest and retention in the speciality. Limited undergraduate exposure to ophthalmology, especially in low- and middle-income countries, is a notable deterrent. In summary, fostering intrinsic passion alongside supportive institutional frameworks may enhance recruitment and retention in ophthalmology.

Table 1. Eligibility criteria for study inclusion in the systematic review.

Criteria Type	Description
Inclusion Criteria	1. Peer-reviewed original articles, reviews, or meta-analyses published between 2000 and 2025.

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	2. Studies assessing motivational, psychosocial, economic, or educational factors influencing the choice of ophthalmology as a career. 3. Quantitative (survey, cohort, cross-sectional) and qualitative (interview, focus group) designs. 4. Studies reporting career satisfaction, barriers, or training outcomes among ophthalmology residents or practitioners.
Exclusion Criteria	1. Articles not in English. 2. Conference abstracts without complete data. 3. Studies focusing exclusively on non-ophthalmic specialities without comparative ophthalmology data. 4. Opinion pieces or non-empirical reports.

Table 2. Quality Assessment Tools and Scoring Framework

Study Type	Appraisal Tool	Quality Domains Evaluated	Scoring Range	Quality Thresholds	Reference
Quantitative (Cross-sectional, Survey, Cohort)	Newcastle–Ottawa Scale (NOS)	Selection, Comparability, Outcome	0–9	High (≥7), Moderate (5–6), Low (<5)	17
Qualitative (Interviews, Focus Groups)	CASP Qualitative Checklist	Credibility, Relevance, Reflexivity	0–10	High (≥8), Moderate (6–7), Low (≤5)	18
Systematic Review / Meta-analysis	AMSTAR-2	Protocol registration, Search quality, Bias control	0–16	High (≥80%), Moderate (60–79%), Low (<60%)	19

Table 3. Characteristics of Included Studies

Author, Year [Reference]	Country	Study Design	Sample Size	Study Population	Key Focus / Outcomes	Main Findings
Gameiro et al.,[6] 2019	Brazil	Cross-sectional survey	450	Ophthalmologists (3 generations)	Motivation, generational differences	Self-satisfaction, patient impact, and technology were primary motivators.
Almulhim et al.[7], 2024	Saudi Arabia	Cross-sectional survey	320	Medical students	Career choice, influencing factors	Lifestyle and job satisfaction were the top determinants.
Dutt et al. [4], 2023	UK	Mixed-method study	140	Medical students	Self-determination, autonomy	Autonomy and mentorship strongly influenced interest.
Gedde et al.[1], 2005	USA	Survey study	600	Residents	Career choice motivation	Surgical opportunities and patient outcomes were key motivators.
Bourke et al. [11], 2025	UK	Systematic review	–	Trainees and mentors	Mentorship in ophthalmology	Highlighted mentorship as a critical retention factor.

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Yu et al.[12], 2023	China	Cross-sectional	510	Pre-clinical students	Career perceptions	Early exposure increased interest significantly.
Das et al.[8], 2021	UK	Cohort study	270	Junior doctors	Predictors of success	Mentorship and structured programs correlated with satisfaction.
Aljerian et al. [5], 2022	Saudi Arabia	Cross-sectional	380	Residents	Specialty satisfaction	Gender differences influenced speciality preferences.
Gedde et al. [10], 2024	USA	Survey	210	Underrepresented minorities	Diversity and satisfaction	Minority representation influenced persistence in ophthalmology.
Peel et al. [13], 2018	Canada	Systematic review	–	Medical students	Speciality choice factors	Lifestyle and work–life balance are key motivators across specialities.

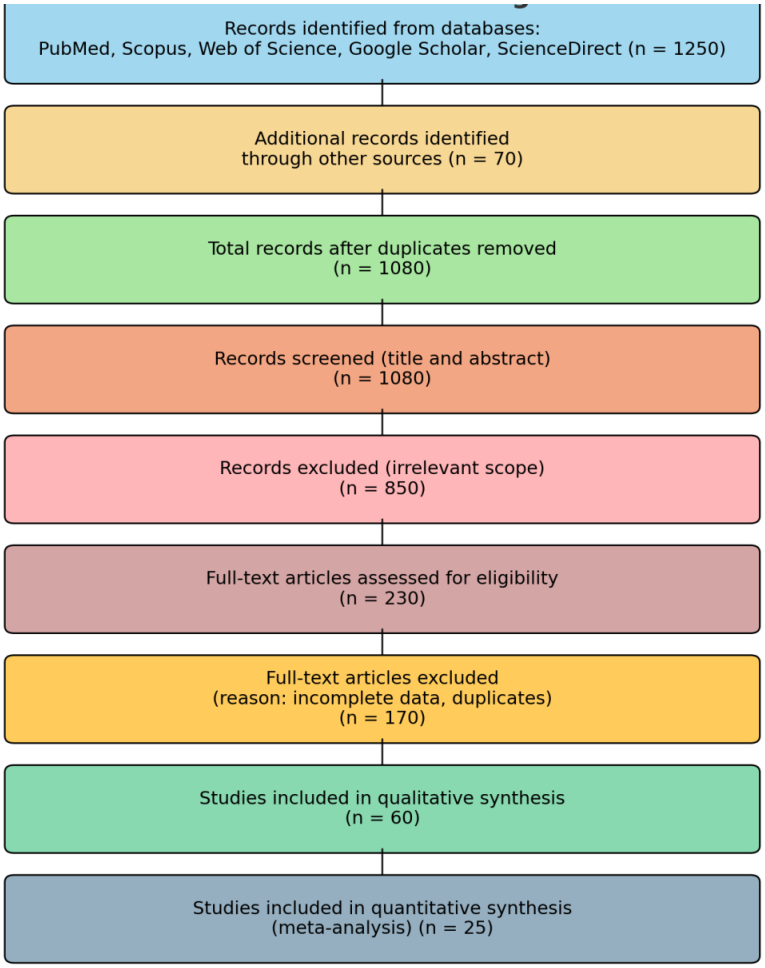

Figure 1. **PRISMA 2020 Flow Diagram illustrating the study selection process.**

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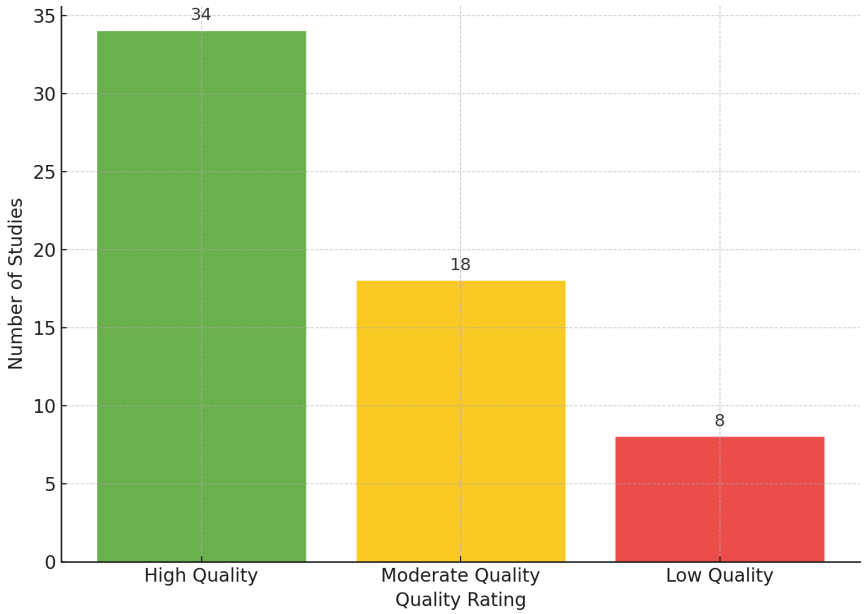

Figure 2. Bar diagram showing distribution of methodological quality among included studies

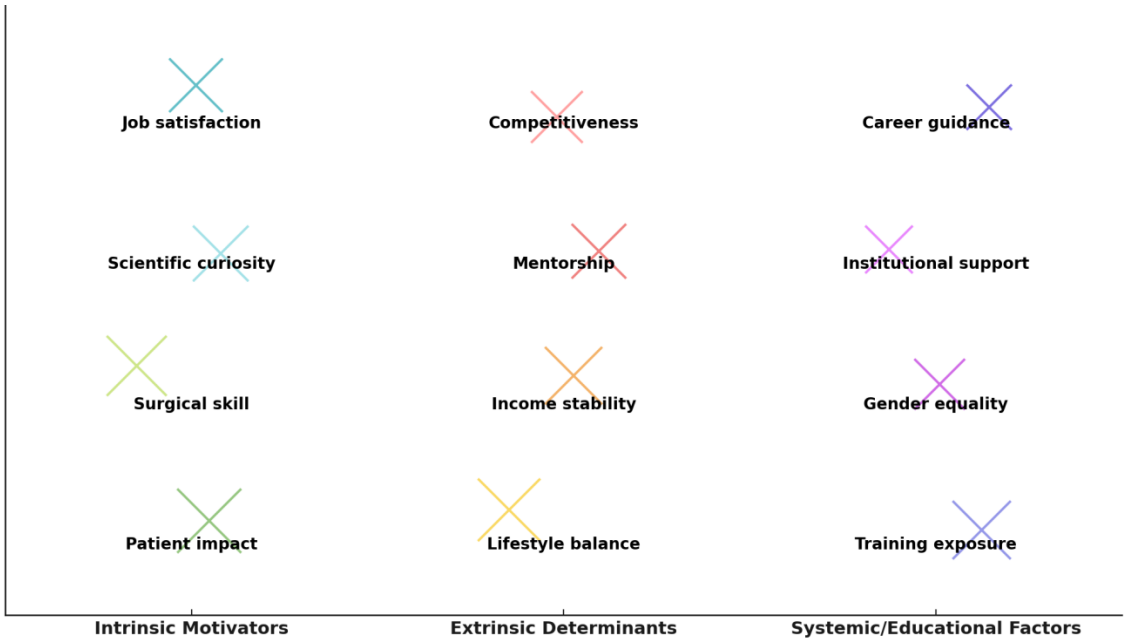

Figure 3. Thematic distribution of motivators and barriers influencing the ophthalmology career

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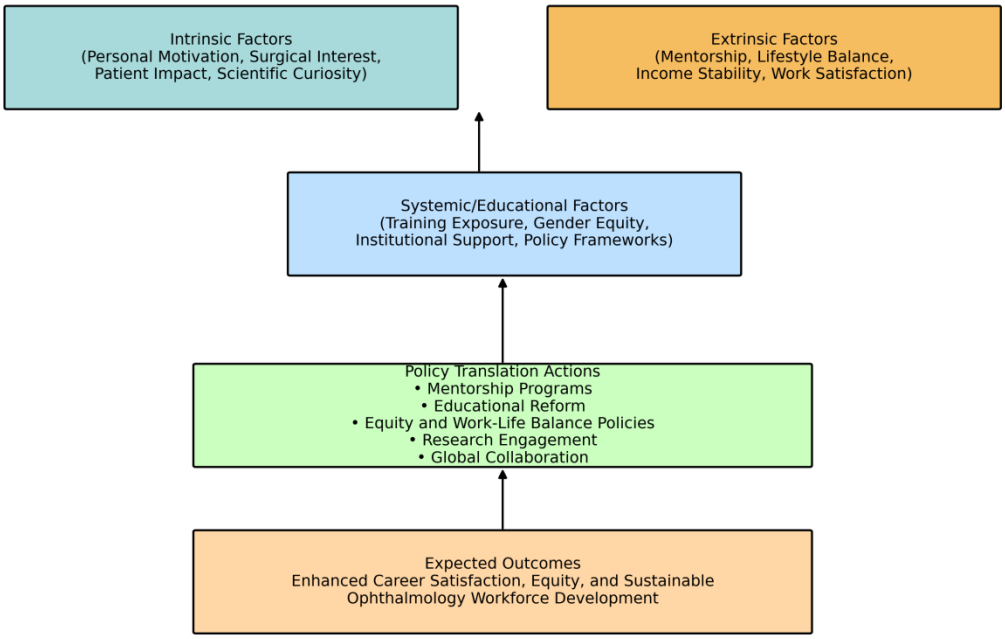

Figure 4. Evidence-to-Policy Translation Framework for Ophthalmology Career Development.

Discussion

This systematic review synthesises 20 years of global evidence to examine the motivations, challenges, and structural determinants that influence the choice of ophthalmology as a postgraduate speciality. The findings demonstrate that career decision-making in ophthalmology is not driven by a single factor but by a complex interplay among intrinsic professional motivation, mentorship and role modelling, gender and equity dynamics, educational exposure, and health system–level policies. Understanding these interrelated dimensions is essential for developing sustainable workforce strategies and equitable training pathways in ophthalmology.

Intrinsic Motivation and Professional Identity Formation

Intrinsic motivation emerged as a dominant driver in selecting ophthalmology as a career, particularly interest in the visual sciences, microsurgical precision, patient-centred outcomes, and intellectual challenge.[16-19] Multiple studies indicate that early fascination with ocular anatomy and the immediate impact of vision-restoring interventions contribute to strong professional identity formation among ophthalmology trainees.[20,21] Compared with other surgical specialities, ophthalmology is often perceived as offering a unique balance between diagnostic reasoning and procedural expertise, which appeals to students seeking both cognitive and technical engagement.[22-24] Importantly, intrinsic motivation appears to mediate long-term career satisfaction and resilience against burnout. Trainees who reported a strong early interest in ophthalmology demonstrated higher satisfaction scores and lower attrition rates during residency training.[25,26] This suggests that fostering early intrinsic engagement, rather than relying solely on extrinsic incentives, may improve retention and professional fulfilment within the speciality.[27]

Mentorship, Role Models, and Career Trajectories

Mentorship consistently emerged as one of the most influential extrinsic factors shaping career choices in ophthalmology.[35-38] Access to engaged mentors during undergraduate and early postgraduate training was associated with increased likelihood of pursuing ophthalmology, higher research productivity, and clearer subspecialty decision-making.[39,40] Both formal mentorship programs and informal role-model exposure were shown to positively influence confidence, self-efficacy, and perceived attainability of ophthalmology careers.[41] Notably, the quality of mentorship, not merely availability, was critical. Longitudinal, structured mentorship relationships were more effective than short-term or opportunistic interactions.[42,43] Studies further demonstrated that mentorship networks (including peer and near-peer mentoring) enhanced inclusivity and reduced perceived barriers among underrepresented groups.[44,45] These findings highlight mentorship as a modifiable and high-impact intervention for workforce development in ophthalmology.

Gender Equity and Representation in Ophthalmology

Despite increasing female enrollment in medical schools globally, gender disparities persist across ophthalmology training, leadership, and academic advancement.[46-49] Women remain underrepresented in senior

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academic positions, editorial boards, and high-revenue subspecialties, reflecting persistent structural and cultural barriers.[50,51] Evidence suggests that differential access to mentorship, implicit bias in evaluation, and limited institutional support for pregnancy and caregiving disproportionately affect female ophthalmologists.[52-54] Several studies emphasised that gender-concordant mentorship and visible female leadership significantly improve recruitment, retention, and career progression for women in ophthalmology.[55,56] Moreover, equity-oriented institutional policies, such as flexible training pathways, transparent promotion criteria, and parental leave protections, were associated with reduced attrition and improved job satisfaction.[57] Addressing gender inequity is therefore not only a moral imperative but also a strategic necessity for sustaining the ophthalmology workforce.

Educational Exposure and Undergraduate Curriculum Design

Educational exposure during undergraduate and early postgraduate training plays a critical role in shaping interest in ophthalmology and guiding speciality choice. Early clinical rotations, structured ophthalmology modules, and simulation-based learning have been shown to enhance speciality awareness, confidence, and motivation by enabling students to appreciate the diagnostic breadth, microsurgical precision, and patient-centred outcomes inherent to ophthalmic practice.[58] Exposure to complex and diagnostically challenging cases further strengthens intrinsic motivation. Yadav et al. highlighted Kimura's disease presenting as an atypical orbital mass, illustrating the diagnostic depth of ophthalmology and its reliance on integrated clinical examination, imaging, histopathology, and immunological assessment. Such case-based learning fosters curiosity, the formation of professional identity, and appreciation of ophthalmology's balance between intellectual challenge and therapeutic impact.[59] Similarly, exposure to outcome-driven surgical research enhances speciality appeal. Yadav et al. demonstrated improved success rates in failed chronic dacryocystitis following Dacryocystorhinostomy with adjunctive canalicular silicone tube intubation and mitomycin-C application, underscoring the emphasis of ophthalmology on evidence-based procedural refinement, innovation, and measurable patient benefit.[60] Despite these strengths, systemic barriers persist. Limited curricular representation, short rotation durations, and insufficient mentorship, particularly in low- and middle-income countries, continue to restrict equitable exposure, perpetuating misconceptions and narrowing the trainee pipeline.[61] Educational reforms integrating case-based learning, subspecialty exposure, and mentorship-linked research, aligned with workforce planning, are essential to promote informed speciality selection and sustain a motivated ophthalmology workforce.[62]

Policy, Workforce Planning, and Global Implications

At the systems level, workforce planning policies significantly influence the sustainability of ophthalmology careers. Maldistribution of training positions, urban concentration of specialists, and limited academic career pathways were identified as deterrents in several regions.[1,6,14] National and international ophthalmic organisations play a critical role in addressing these gaps through standardised training frameworks, mentorship initiatives, and cross-border collaboration.[28,40] Evidence from global health and medical education literature suggests that integrated policy approaches, combining mentorship, equity, curricular reform, and research engagement, are most effective in strengthening speciality pipelines.[46,52,62] The conceptual framework presented in this review illustrates how intrinsic motivation, extrinsic supports, and systemic structures converge to shape ophthalmology career trajectories. Importantly, this framework is transferable to other postgraduate specialities facing similar recruitment and retention challenges.

Strengths, Limitations, and Future Directions

The strength of this review lies in its comprehensive synthesis of qualitative and quantitative evidence across diverse geographic and institutional contexts. However, heterogeneity in study design, outcome measures, and regional representation limited the feasibility of pooled quantitative estimates for some domains. Additionally, publication bias and underrepresentation of low-income settings may influence generalizability. Future research should prioritise longitudinal, multicenter studies that assess the impact of structured mentorship, gender-equity interventions, and curricular reforms on career outcomes in ophthalmology. Policymakers and educators should leverage these insights to develop evidence-based, inclusive strategies that support the next generation of ophthalmologists.

Conclusions and Implications

This systematic review provides the most comprehensive synthesis to date of the multifactorial determinants influencing the choice of ophthalmology as a postgraduate speciality. Across two decades of global literature, a clear pattern emerges: ophthalmology continues to attract trainees through its unique integration of medical innovation, surgical precision, and direct patient impact, yet sustained recruitment and retention depend heavily on the alignment between personal motivation, institutional mentorship, and systemic equity. The evidence demonstrates that intrinsic motivators- such as the intellectual challenge of microsurgery, visual rehabilitation, and the gratification of restoring sight- remain the cornerstone of ophthalmology's appeal. However, extrinsic and systemic factors, including structured mentorship, lifestyle compatibility, gender inclusivity, and early educational

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exposure, are increasingly decisive in shaping speciality interest and long-term career satisfaction. Studies across multiple regions consistently underscore that supportive mentorship frameworks and inclusive institutional cultures significantly enhance recruitment. At the same time, the absence of these elements contributes to attrition, particularly among women and underrepresented minorities. To advance ophthalmology as a globally sustainable and equitable speciality, five critical priorities must be addressed:

1. Institutionalising mentorship programs that are inclusive, longitudinal, and embedded within residency structures.
2. Expanding undergraduate ophthalmology exposure through simulation-based and experiential learning.
3. Enforcing gender equity and work–life balance policies across training and leadership hierarchies.
4. Encouraging research mentorship to promote academic productivity and speciality retention.
5. Fostering global collaboration through coordinated initiatives by the International Council of Ophthalmology (ICO), American Academy of Ophthalmology (AAO), Indian Academy of Ophthalmology (IAO) and allied bodies.

Moving forward, there is an urgent need for multi-level policy integration that connects educational institutions, national health systems, and professional organisations. The implementation of structured mentorship networks, early exposure programs, and gender-sensitive policies should not remain aspirational but become integral to ophthalmology's educational identity. Ultimately, the future of ophthalmology as a postgraduate speciality will depend not only on its scientific evolution but also on its ability to nurture human potential through mentorship that empowers, training that inspires, and systems that sustain equity. This review thus calls for a paradigm shift from passive recruitment to active cultivation of the next generation of ophthalmologists, leaders equipped with skill, empathy, and vision in every sense of the word.

Key Takeaway for Policymakers and Educators

The strength of ophthalmology's future workforce will be defined not by how many choose it, but by how many choose to stay.

Declarations

Authors' Contributions

- Dr Niraj Kumar Yadav conceived and designed the study, developed the research protocol, and led the conceptualisation and methodology stages. He was responsible for designing the systematic review strategy in alignment with the PRISMA 2020 guidelines, coordinating database searches, and overseeing data curation and synthesis. Dr Yadav drafted the original version of the manuscript and integrated revisions following co-author feedback.
- Dr Sadaf Abbasi served as a senior supervisor and project administrator, providing expert guidance throughout the research process. She oversaw the quality assessment process, ensured adherence to ethical and methodological standards, and provided critical revisions to enhance the analytical and policy-oriented components of the discussion. Dr Abbasi gave final approval for the manuscript's submission.
- Dr Priyanshi Priya contributed to screening studies, validating the extracted data, and critically analysing methodological quality. She played a central role in data verification and contributed substantially to the interpretation of findings. Dr Priya also co-authored the sections on data synthesis and contributed to reviewing and editing the final draft for intellectual content and clarity.
- Dr. Ajay Kumar Arya contributed to data validation, statistical review, and analytical cross-checking of quantitative findings. He provided critical input during the formal analysis stage and assisted with manuscript refinement, ensuring technical consistency and accuracy across sections.
- Dr. Swati Singh acted as a co-supervisor, offering continuous guidance during project execution and data appraisal. She contributed to quality assurance, methodological consistency, and project administration, ensuring that the review adhered to journal and reporting standards.
- Dr. Reshma Ragunath contributed to data validation, formal analysis, and the review of thematic synthesis. She participated in manuscript editing and refinement, ensuring scientific accuracy and coherence across the results and discussion sections.

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- All authors contributed significantly to the conception, execution, and interpretation of the study. Each author reviewed and approved the final version of the manuscript and agreed to be accountable for all aspects of the work, ensuring the integrity and accuracy of the study.

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Institutional Review Board Statement

This study is a systematic review of previously published literature and did not involve direct participation of human subjects or animals. Therefore, institutional ethics approval was not required, in accordance with the Declaration of Helsinki (2013) and PRISMA 2020 guidelines. All included studies were peer-reviewed and publicly available at the time of data extraction.

Informed Consent Statement

As no new human participants or clinical data were collected for this systematic review, informed consent was not applicable. All data extracted were derived exclusively from peer-reviewed, publicly accessible publications. For transparency, corresponding authors of primary studies were contacted solely to clarify published information, without accessing any personal or confidential data.

Conflicts of Interest

The authors declare no potential conflicts of interest related to the research, authorship, or publication of this article. All authors confirm that there are no financial or personal relationships that could inappropriately influence this work.

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