

# The Invisible Cost of Being a Women: A Systematic Review of the Experiences of Women in Ophthalmology from Training to Practice

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## Introduction

Despite equalising rates of acceptance to, and matriculation from, medical schools among men and women in high-income countries (HIC), major disparities in the proportion of women within surgical residency programs and practice persist.<sup>1</sup> The gender gap within surgical specialties including neurosurgery, orthopaedics, and urology is well-reported, with commonalities in barriers cited across the board.<sup>2,3</sup> Negative experiences such as micro- and macro-aggressions starting in preclinical years and extending throughout practice. The following are often cited as key contributors to this gender gap.<sup>4</sup>

Paucity of mentorship

Poor leadership representation

Work-life balance

Although many of these findings can be applied to surgery broadly, there are unique experiences for women in various surgical subspecialties. There are several studies exploring the experiences of women in ophthalmology, however, there is yet to be a systematic review to consolidate this information, assess the quality of existing data, and identify future directions in the area. By understanding the landscape of women in ophthalmology, we hope to glean insights into gender-based issues across training and practice that require further attention and action.

## Objectives

This study's **purpose** is to characterise the experiences of women in ophthalmology in high-income countries. The following were the **main outcomes**:

1. Prevalence of women in ophthalmology over time and across career stages in HIC.
2. Issues and barriers for women in ophthalmology within HIC
3. Interventions to address identified barriers facing women in ophthalmology

## Methods

**Design:** Systematic Review

**Search:** All English-language studies relating to women in ophthalmology, with no limitations on date

**Databases:** PubMed, MEDLINE, Embase

**Quality Assessment Tool:** Scale modified from the Oxford Centre for Evidence-based Medicine.

Inclusion Criteria	Exclusion Criteria
1. Articles available in English	1. Articles reporting personal experiences
2. Articles reporting on women's experiences in ophthalmology in HIC, as defined by the World Bank	2. Articles that are historical perspectives, editorials, opinion pieces, letters, textbook chapters, and news pieces
3. Articles reporting on the prevalence of women in ophthalmology in HIC	3. Articles addressing other surgical specialties without ophthalmology-specific results
4. Articles discussing interventions to address issues faced by women in ophthalmology in HIC	4. Articles reporting women's outcomes of ophthalmic procedures or conditions

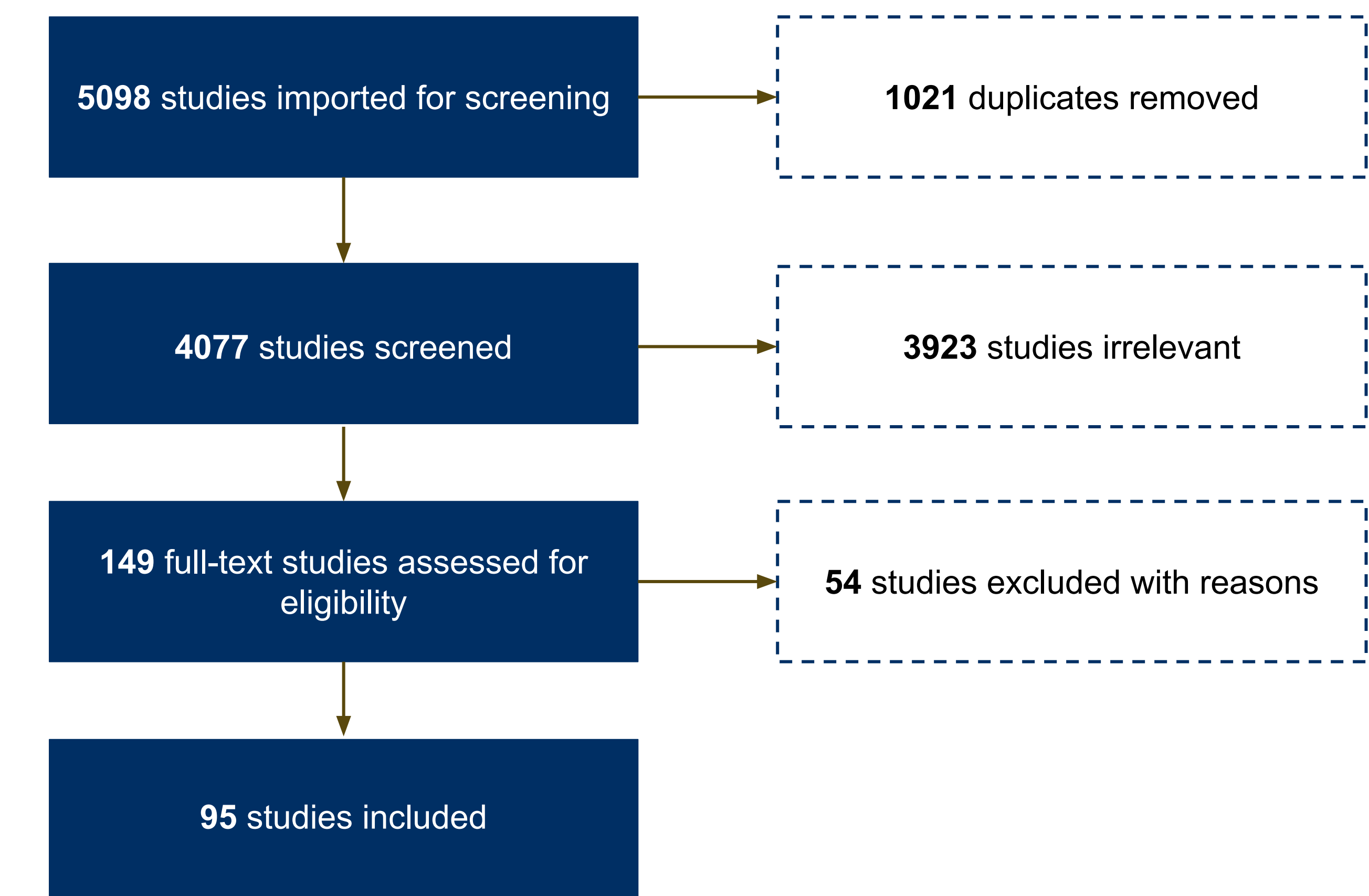
## Results

Stage	Results
Medical School	<p><b>Mentorship</b></p> <ul style="list-style-type: none"> <li>• Lack of same-gender role models often cited as a reason not to pursue ophthalmology (US, 2018)<sup>5</sup></li> <li>• Women medical students are advised by their surgical mentors that ophthalmology is among the <b>top 5 specialties receptive to women</b>. However, <b>20.22%</b> of women mentors tell trainees it is <b>only</b> receptive to men (US, 2020)<sup>6</sup></li> </ul> <p><b>Reference Letters</b></p> <ul style="list-style-type: none"> <li>• Letters for men and women <b>differ systematically</b> in wording and content (adjusted for grades, USMLE scores, and extracurricular activities) (US, 2019)<sup>7</sup> <ul style="list-style-type: none"> <li>◦ Letters written for <b>men</b> were determined to be <b>more "authentic"</b> with true stories characterized by complexity and positivity.</li> <li>◦ Letters for women <b>emphasize work ethic</b> over their ability or talent</li> </ul> </li> </ul>
Training	<p><b>Recruitment Patterns</b></p> <ul style="list-style-type: none"> <li>• Departments with women residency program directors had a <b>greater recruitment</b> of women residents (US, 2022)<sup>8</sup></li> </ul> <p><b>Surgical Training</b></p> <ul style="list-style-type: none"> <li>• Women were <b>less likely</b> to have access to a wet lab than men (UK, 2005)<sup>9</sup></li> <li>• Resident logbook data found <b>lower cataract cases</b> among women residents, with a gap as large as 21.5% lower at 18 months and 41.7% lower at 4 years (this trend extends to all surgical volumes) (US, Aus/NZ, 2021)<sup>10,11</sup></li> </ul> <p><b>Evaluations</b></p> <ul style="list-style-type: none"> <li>• Women residents had marginally <b>higher evaluations</b> than men, but were more likely to receive <b>lower evaluations</b> from men faculty (US, 2020)<sup>12</sup></li> </ul> <p><b>Fellowships</b></p> <ul style="list-style-type: none"> <li>• Women pursued fellowship training at similar rates to men, but were <b>less likely</b> to undertake fellowships in more <b>lucrative subspecialties</b> (Canada, 2016)<sup>13</sup></li> </ul>
Practice	<p><b>Practice Patterns</b></p> <ul style="list-style-type: none"> <li>• Women ophthalmologists tended to more frequently serve <b>women, younger patients, and ethnically diverse populations</b> (US, 2021)<sup>14</sup></li> <li>• Women ophthalmologists work <b>fewer hours</b> and have <b>lower clinic and surgical volumes</b> compared to their men counterparts (Global, 2021)<sup>15</sup></li> <li>• There were <b>no gender differences</b> in the number of surgeries among <b>recently graduated</b> ophthalmologists (Global, 2021)<sup>15</sup></li> <li>• Compared to women, men were more likely to be married or in a stable relationship, and more likely to have children, and sooner in their careers (Aus/NZ, 2007)<sup>16</sup></li> </ul> <p><b>Mentorship</b></p> <ul style="list-style-type: none"> <li>• Practicing ophthalmologists reported having <b>greater difficulty</b> in finding <b>women mentors</b> than resident ophthalmologists (Canada, 2021)<sup>17</sup></li> </ul> <p><b>Income</b></p> <ul style="list-style-type: none"> <li>• Women ophthalmologists <b>earn less</b> than men (adjusting for clinical activity, practice characteristics, and provider characteristics) (Global, 2021)<sup>18</sup> <ul style="list-style-type: none"> <li>◦ Compared to other surgical specialties, ophthalmology had the <b>third greatest hourly difference</b> in earnings between men and women (\$54.06 USD/hour), behind orthopedic surgery and cardiothoracic surgery (US, 2019)<sup>19</sup></li> </ul> </li> </ul> <p><b>Publications</b></p> <ul style="list-style-type: none"> <li>• There is a significant association between the gender of first and last authors (Global, 2019)<sup>20</sup></li> <li>• Women ophthalmologists had significantly <b>lower</b> median h-indices, but <b>similar</b> median m-quotients (Global, 2021)<sup>21</sup></li> <li>• When controlling for publication experience, women with 31 to 40 years publication experience demonstrated scholarly impact <b>equivalent to or exceeding</b> that of their men counterparts (US, 2014)<sup>22</sup></li> </ul> <p><b>Leadership</b></p> <ul style="list-style-type: none"> <li>• Women are <b>underrepresented</b> across all leadership positions (Global, 2022)<sup>8</sup> <ul style="list-style-type: none"> <li>◦ From 1983 through 2007, 415 individuals held the position of chair at the 127 institutions, 11 of which were women (2.7%) (US, 2009)<sup>23</sup></li> <li>◦ Of 20 journals, 95.8% of editors in chief were men (Global, 2020)<sup>24</sup></li> <li>◦ There has been an increase in the proportion of women editorial board members, with an increase from 3.3% in 1969 to 18.8% in 2009 (among 3 top journals) (Global, 2012)<sup>25</sup></li> <li>◦ General conferences had a higher proportion of women compared to the expected rates for paper and non-paper presentations and subspecialties tended to have lower rates of female presenters (US, 2020)<sup>26</sup></li> </ul> </li> </ul> <p><b>Career Satisfaction</b></p> <ul style="list-style-type: none"> <li>• There are no significant differences reported in overall career satisfaction and compared with other surgical specialties, women ophthalmologists reported <b>greater satisfaction in work-life balance</b> (Global, 2007)<sup>16</sup></li> </ul>

Women in ophthalmology are **3 x** more likely to experience **discrimination** and up to **6 x** more likely to experience **sexual harassment** (Global, 2021)<sup>27</sup>

- This harassment tends to be both **more frequent** and **more severe** for women compared to men, with one study reporting 3 cases of attempted rape and 1 case of rape
- While patients are the most common source of harassment, harassment from colleagues and supervisors is not uncommon.
- Most victims report **significant impact** on their professional lives, with some ophthalmologists even changing jobs or careers
- **42%** witnessed sexual harassment as bystanders and **33%** of these people took **no action**
- A 75-minute interactive workshop on responding to patient-initiated verbal sexual harassment resulted in 86.3% feeling mostly or completely prepared to respond to remarks about their age, marital status, appearance, attractiveness, specific body part, and sexual or inappropriate jokes (US, 2020)<sup>28</sup>

Across all stages



Prisma Flowchart

## Conclusions

To the best of our knowledge, this is the **largest systematic review** on the experiences of women in ophthalmology to date. Although women are entering ophthalmology at increasing rates, we find that **gender disparities persist** across all domains. With this, it is important to ensure women are supported throughout their training and careers.

1. **Institutional Strategies:** The impact of women in leadership positions and women mentorship are frequently cited as crucial mitigating factors to gender disparities. Gender disparities in ophthalmology must be met with evidence-based interventions embedded into institutions.
2. **Individual Strategies:** Each individual is encouraged to evaluate their implicit bias and how it may impact their perceptions and actions. Interventions including bystander training and billing and leadership workshops should be explored.

We found that much of the literature was focused on publications and leadership. **More research is required** in other domains, including recruitment patterns, surgical training volumes, and sexual harassment.

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Table 1 - Key Results from Included Studies

The country and year from which the data was represented is denoted in brackets. "Global" with the publication date of the most recent study is indicated when there were several studies corroborating the same finding. Contact the authors for additional citations.