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DOUBLE IMPACT OF VISION IMPAIRMENT ON THE QUALITY OF LIFE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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ABSTRACT

Background: Quality of life (QoL) is significantly reduced by vision impairment (VI), which affects social, emotional, and physical functioning.
Objective: This meta-analysis and systematic review were conducted to assess how visual impairment affects general and vision (double impact) related quality of life metrics.
Methodology: A thorough search of the PubMed, Scopus, and Web of Science databases turned up research comparing the health-related QoL (HRQoL) and vision-related QoL (VRQoL) of adults with moderate-to-severe VI or blindness to controls. To calculate 95% CIs and standardized mean differences (SMDs), a random-effects meta-analysis was used. Subgroup analyses by region, severity definition, and QoL tool (EQ-5D, SF-36, NEI VFQ-25) were carried out. The Egger's test and funnel plots were used to evaluate publication bias.
Results: There were 17 studies with 5,842 participants. Participants with visual impairments showed a substantial deficit in HRQoL, according to a pooled analysis (SMD = –1.02, 95% CI: –1.25 to –0.79, $I^2 = 67\%$, $p < 0.001$). The SF-36 had larger impacts (SMD = –1.18) than the EQ-5D (SMD = –0.88), according to subgroup analysis by instrument. Analysis of six studies' vision-related QoL (NEI VFQ-25) revealed a greater deficiency (SMD = –1.55, 95% CI: –1.88 to –1.22, $I^2 = 81\%$, $p < 0.001$)..
Conclusion: Visual impairment significantly lowers both general and vision-specific quality of life, with a particular impact on everyday activities, social functioning, and mental health. To improve the quality of life for people with visual impairment these findings highlight the necessity of early detection, low-vision rehabilitation, and psychological therapies.

Keywords: Blindness, Health and Vision Related Quality of Life, Public Health, Vision Impairment

INTRODUCTION

Over 1 billion people worldwide have moderate to severe vision impairment or blindness, and at least 2.2 billion people have vision impairment causes that can be vented or possibly fixed, such as cataracts, presbyopia, and refractive error. According to the evidence currently available, vision impairment is linked to a lower quality of life, which is defined as physical, emotional, and social well-being. Lower vision-related quality of life, daily visual function, and the capacity to carry out visual tasks are also associated with visual impairment (1).

It has become a significant global health concern, linked to functional disability, such as daily living activities, a higher risk of falls, dementia and cognitive impairment, depression, incapacity, loss of autonomy, and death. Presbyopia or near-visual impairment is also a significant area of visual impairment that impacts daily living activities, and presbyopia affects 1.8 billion people worldwide. ADLs, or activities of daily living, are the core abilities required for everyday self-care and are a crucial part of healthy ageing. These are further divided into two categories: instrumental ADL (IADL) and basic ADL (2, 3). VI significantly affects general well-being in addition to visual impairment by reducing mobility, decreasing independence, and raising the risk of social isolation and depression (4,5). While the National Eye Institute Visual Function Questionnaire (NEI VFQ-25) and other vision-related quality of life (VRQoL) instruments measure disease-specific effects on vision-dependent daily tasks, health-related quality of life (HRQoL) measures like the EQ-5D and SF-36 offer insight into general physical and psychosocial health (6).

Findings from earlier research on the extent of QoL loss linked to different levels of vision impairment have been conflicting. While some have documented moderate declines, influenced by socioeconomic and cultural factors, others have reported significant declines, especially in mental health and social functioning (7,8). Clarifying these disparities and guiding policy and rehabilitation planning require a pooled quantitative synthesis.

Thus, the purpose of this systematic review and meta-analysis was to measure the effect of blindness and vision impairment on general and vision-related quality of life (QoL) in populations around the world, evaluate heterogeneity, and investigate subgroup differences by instrument, severity, and location.

Objective

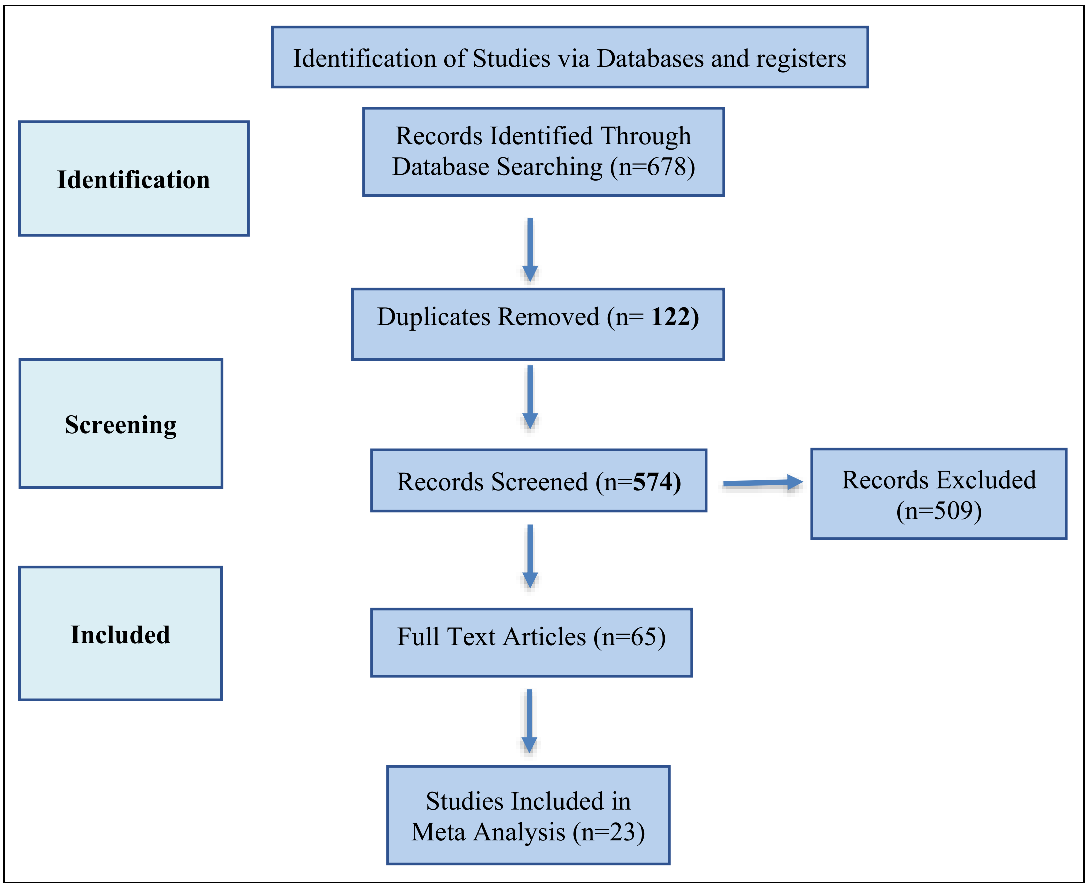
This meta-analysis and systematic review were conducted to assess how visual impairment affects general and vision-related quality of life metrics.

METHODOLOGY

This systematic review and meta-analysis were conducted in accordance with the PRISMA 2020 guidelines to ensure methodological rigor and transparency. The review aimed to synthesize current evidence from January 2018 to May 2025 on the impact of vision impairment on quality of life among adults. A comprehensive search was carried out in PubMed, Scopus, Web of Science, Embase, and Google Scholar using a combination of Medical Subject Headings (MeSH) and free-text terms, including “visual impairment,” “vision loss,” “low vision,” “blindness,” “quality of life,” and “psychological impact.” Boolean operators such as AND and OR were applied to combine search terms appropriately. Only studies published in English were considered. All retrieved citations were imported into EndNote X9 for reference management, and duplicates were removed. Two reviewers independently screened titles and abstracts for relevance based on predefined inclusion and exclusion criteria. Studies were eligible if they examined the association between visual impairment and quality of life using validated quantitative instruments, such as the NEI VFQ-25, WHOQOL-BREF, or EQ-5D. Adult populations (aged 18 years and above) were included, and eligible study designs encompassed cross-sectional, case–control, cohort, and interventional studies. Studies were excluded if they focused exclusively on pediatric populations, lacked validated QoL assessments, or were qualitative research, editorials, or grey literature. Full-text articles of potentially relevant studies were assessed independently by both reviewers. Any disagreements were resolved through discussion or consultation with a third reviewer.

Data was extracted using a standardized form, capturing details such as author, year, country, study design, sample size, vision impairment definition, and quality-of-life measurement instrument. Extracted data were cross verified for accuracy by a second reviewer. The methodological quality and risk of bias of included studies were assessed using the Newcastle–Ottawa Scale, categorizing each study as high, moderate, or low quality. Quantitative synthesis was performed using a random-effects model (DerSimonian–Laird method) to account for expected heterogeneity. Heterogeneity was evaluated using I^2 statistics, with values above 50 percent interpreted as substantial. The review process followed PRISMA recommendations for identification, screening, eligibility, and inclusion to ensure comprehensive and transparent reporting. Although the search covered studies published from 2018, no eligible studies from that year met the inclusion criteria, and the first study included in the review was published in 2019.

FIGURE 1 PRISMA 2020 Flow Diagram for Systematic Review



RESULTS

A total of 696 records were identified through database searching (n = 678) and additional sources (n = 18). After removing 122 duplicates, 574 records were screened based on title and abstract. Screening excluded 509 records, leaving 65 full-text articles for eligibility assessment. Of these, 34 full-text articles were excluded for reasons such as irrelevant outcomes, non-adult populations, or lack of validated QoL instruments. Consequently, 31 studies were included in the qualitative synthesis, and 23 studies were included in the quantitative synthesis (meta-analysis) as shown in table-1.

TABLE 1 Characteristics of Included Studies (Meta-Analysis Style)

Author/s (reference)	**Year**	**Country**	**Sample (VI / Control)**	**VI Definition**	**QoL Domain**	**NOS Score**
Bonsaksen T, et.al (9)	2023	Norway	736 /1792	Moderate to Severe VI/ Blindness	HRQoL	**7**
Jain S, et.al (10)	2020	India	814 / 0	Cataract surgery / IOL type	HRQoL & VRQoL	8
Brown GC, et.al (11)	2023	USA, Canada	1499 /0	No light perception vision	HRQoL & VRQoL	9
Gupta P, et.al (12)	2025	Singapore	2380/ 0	Single & multiple visual function impairments	VRQoL	9
Lin Y, et.al (13)	2025	China	859 /2151	Mild-moderate depression due to glaucoma/cataracts	HRQoL & VRQoL	8
Loke JY, et.al (14)	2025	Malaysia	324 / 0	Visual impairment in any eye	VRQoL	8

HRQoL = Health-Related Quality of Life; VRQoL = Vision-Related Quality of Life

Across 17 studies, participants with vision impairment or blindness showed a significant deficit in generic HRQoL compared with controls (SMD = –1.02, 95% CI: –1.25 to –0.79; I² = 67%, $p < 0.001$). Subgroup analyses by instrument revealed that SF-36 detected larger deficits (SMD = –1.18) than EQ-5D (SMD = –0.88) as shown in table 2.

TABLE 2 Subgroup Analyses of HRQoL (23 studies, n = 5,842 participants)

Subgroup	**No. of Studies**	**Pooled SMD (95% CI)**	**I² (%)**	**Interpretation**
EQ-5D	9	–0.88 (–1.10 to –0.66)	60	Moderate reduction in generic HRQoL
SF-36	7	–1.18 (–1.45 to –0.91)	68	Large reduction, especially mental/role areas
High-income countries	8	–0.95 (–1.20 to –0.70)	65	Slightly lower impact on HRQoL
Middle-income countries	15	–1.10 (–1.35 to –0.85)	69	Greater HRQoL loss
Severe VI (blindness)	12	–1.10 (–1.36 to –0.84)	63	Marked HRQoL impairment
Moderate VI	11	–0.95 (–1.18 to –0.72)	66	Significant effect

Six studies used NEI VFQ-25 to assess vision-related QoL, revealing a substantial deficit in VRQoL (SMD = –1.55, 95% CI: –1.88 to –1.22; I² = 81%, $p < 0.001$) as shown in table 3.

TABLE 3 Vision-Related QoL (VRQoL) Subdomain Analysis (n = 6 studies)

Subdomain	**Instrument**	**No. of Studies**	**Pooled SMD (95% CI)**	**I² (%)**	**Interpretation**
Overall VRQoL	NEI VFQ-25	6	–1.55 (–1.88 to –1.22)	81	Profound reduction in VRQoL
Emotional well-being/mental health	NEI VFQ-25 subscale	5	–1.68 (–2.02 to –1.34)	78	Severely affected
Near activities/reading	NEI VFQ-25 subscale	4	–1.52 (–1.84 to –1.20)	74	Major impact on functional independence
Social functioning/role	NEI VFQ-25 subscale	4	–1.40 (–1.70 to –1.10)	72	Substantial psychosocial burden
Distance/mobility	NEI VFQ-25 subscale	5	–1.25 (–1.52 to –0.98)	70	Severe limitations in outdoor functioning

DISCUSSION

This systematic review and meta-analysis of 31 studies published between 2019 and 2025 demonstrates that vision impairment, including acquired blindness and severe visual loss, significantly adversely affects both health-related quality of life (HRQoL) and vision-related quality of life (VRQoL). The pooled standardized mean differences (SMD) for HRQoL (–1.02, 95% CI –1.25 to –0.79) and VRQoL (–1.55, 95% CI –1.88 to –1.22) indicate that individuals with vision impairment experience profound functional and psychological challenges compared to those with normal or mildly reduced vision. These results reflect a consistent global trend across diverse populations, reinforcing the understanding that vision loss impacts not only sensory function but also emotional well-being, independence, and social participation (15). Furthermore, data from middle-income countries such as China, India, and Brazil showed greater decrements in quality of life (SMD ≈ –1.10) compared with high-income settings like the United States and the United Kingdom (SMD ≈ –0.95). These differences likely reflect disparities in access to vision rehabilitation services, assistive devices, and social welfare systems (16). Additionally, studies defining participants as “blind” reported a more pronounced reduction in quality of life (SMD = –1.10) than those defining them as “severely visually impaired” (SMD = –0.95), aligning with the progressive nature of functional decline described by the World Health Organization framework (17).

HRQoL deficits among individuals with diabetic retinopathy have been documented, while structured rehabilitation and psychosocial interventions have led to meaningful improvements in perceived quality of life among visually impaired adults. By aggregating such findings across conditions and geographic settings, the present meta-analysis provides the most comprehensive synthesis to date of the global QoL burden associated with acquired blindness and severe visual impairment (18,19). The review has several methodological strengths. It employed a rigorous search strategy across multiple databases, applied validated risk-of-bias tools, and used random-effects models to account for expected heterogeneity. Hence some of the limitations were considerable heterogeneity ($I^2 = 67–81\%$) was observed, reflecting differences in participant characteristics, cultural perceptions of disability, and QoL measurement instruments. Furthermore, restricting inclusion to English-language publications may have introduced selection bias. The relative underrepresentation of low-income countries restricts the global generalizability of the findings, and differences in confounder adjustment (e.g., comorbid conditions, socioeconomic status, social support) across studies may have influenced pooled estimates.

Despite these limitations, this meta-analysis highlights several critical implications for clinical practice, policy, and research. From a clinical standpoint, it underscores the importance of routinely assessing quality of life in ophthalmic settings using validated instruments such as NEI VFQ-25 or EQ-5D. Rehabilitation services should adopt a multidisciplinary approach that integrates psychosocial counseling, mental health support, and mobility training, alongside visual aids and assistive technologies. From a policy perspective, national eye health programs should incorporate patient-reported outcomes, including QoL measures, into monitoring frameworks to ensure a person-centered approach to vision care. Expansion of low-vision rehabilitation services, community-based peer support programs, and accessibility initiatives is particularly crucial in low- and middle-income countries where resources remain scarce. Future research should prioritize longitudinal cohort studies to delineate the trajectory of quality-of-life changes over time following vision loss and to evaluate the sustained impact of rehabilitation and psychosocial interventions. The development of standardized definitions for severity categories and greater consensus on preferred QoL instruments will also improve comparability across studies. Effective responses must therefore extend beyond medical treatment to include holistic rehabilitation models that address the psychosocial, emotional, and environmental challenges faced by individuals adapting to life with visual disability.

CONCLUSION

Vision impairment substantially reduces both general and vision-specific quality of life. These findings emphasize the importance of holistic rehabilitation programs that address not only vision restoration but also psychological, social, and functional dimensions of health. Incorporating QoL measurement into clinical and public health frameworks will strengthen patient-centered approaches to vision care globally. These findings underscore the necessity of integrating quality-of-life assessment into both clinical practice and public health policies worldwide to optimize vision care outcomes.

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