

Appendix A: Summary of Included Studies

Study ID	Region	Country	Sample Size	Study Duration	Study Design	Population Characteristics	Barriers Studied	Barrier Category	Key Findings	Quality Score (Newcastle-Ottawa Scale)
Vashist et al. ¹ (2022)	Nationwide (All regions)	India	251,949	2015-2019	Population-based cross-sectional survey (RAAB-based)	Adults aged ≥50 years; both sexes; urban and rural; 31 districts	Barriers to cataract surgery and spectacle use	Economic, Awareness, Accessibility, Personal/Fear	1.99% blindness; major cause: cataract; key barriers: cost, unawareness, lack of perceived need	8/9
Seidu et al. ² (2021)	West Africa	Ghana, Gambia, Togo	39,108	2017–2020	Secondary data analysis (MICS)	General population, incl. children and adults	Vision difficulties self-reported	Sociodemographic (age, wealth, education)	Age, poor socioeconomic status strongly linked to vision difficulties	7/9
Correia et al. ³ (2017)	Southeast Asia	Timor-Leste	3,468	2016–2017	Population-based cross-sectional survey	Adults ≥50 years; rural & urban	Cataract surgery barriers	Accessibility, Economic	Cataract was leading cause; barriers: cost, access	7/9
Oye and Kuper. ⁴ (2007)	Central Africa	Cameroon (Limbe)	2,126	2005–2006	RAAB-style population-based survey	Urban population, adults ≥40 years	Not directly stated	NA	Cataract & refractive error major causes; limited eye care access	7/9
Ahmad et al. ⁵ (2015)	South Asia	Pakistan	5,000	2010–2013	Cross-sectional Survey	Marine fishing communities in Karachi	Self-perceived barriers to eye care	Socioeconomic, Cultural	Major barriers: cost, lack of awareness, traditional beliefs, gender roles.	7/9
Anderson-Loftin et al. ⁶ (2002)	Southern USA	USA	103	Not reported	Qualitative (Focus Groups)	Rural African Americans with diabetes	Cultural beliefs around diet & health education	Cultural, Communication	Highlighted importance of culturally competent education; barriers included mistrust and relevance.	7/9
Atta et al. ⁷ (2022)	North America	USA	564	2019–2020	Cross-sectional Survey	Individuals attending free vision screening	Demographic & economic characteristics as barriers	Structural, Economic	Key barriers: insurance status, transportation, language, income.	8/9
Briesen et al. ⁸ (2014)	East Africa	Kenya, Tanzania	1,437	2009–2011	Cross-sectional Study	Adults in rural communities with visual impairment	Health-related quality of life barriers	Psychosocial/Functional	Large variations in implementation; need for standardized vision screening policies globally.	7/9
Crewe et al. ⁹ (2011)	Oceania	Australia	95	2005–2009	Cross-sectional Study	Individuals with severe visual impairment	Quality of life and independence limitations	Psychosocial/Functional	Those with severe vision loss reported significantly lower quality of life scores.	8/9
Burton MJ et al. ¹⁰ (2021)	Global	Multiple countries	Not applicable (commission synthesis)	Data synthesized up to 2020	Global Commission / Evidence synthesis	Global population across income settings	Global burden, causes, and inequalities in vision impairment	Structural, Economic, Health-system	Vision impairment affects hundreds of millions globally; ~90% occur in low- and middle-income countries. Leading causes include uncorrected refractive error and cataract, with disparities linked to socioeconomic status, gender, and access to care.	8/9
Elam and Lee. ¹¹ (2014)	North America	USA	5 Focus Groups	2012	Qualitative (Focus Groups)	High-risk underserved adults with systemic health risks	Awareness, access, cultural beliefs	Psychosocial/Structural	Identified distrust, lack of knowledge, and transport issues as key barriers to eye care.	9/9
Frick KD. ¹² (2007)	North America	USA	77511	2005–2007	Economic Analysis	National population estimates	Productivity loss, healthcare cost	Economic	Estimated annual economic burden of vision loss in the US to exceed \$35 billion.	8/9
Garg et al. ¹³ (2014)	Asia	India	Not specified	Not specified	Descriptive	Eye care workforce and training	Workforce limitations	Structural	Emphasizes the need for multidisciplinary eye care training and	7/9

						institutions			team approaches in resource-limited areas.	
Gower et al. ¹⁴ (2013)	North America	USA	865	2011–2012	Cross-sectional Survey	Low-income urban residents referred from vision screening	Missed appointments, transport, understanding	Structural/Psychosocial	39% did not attend follow-up due to transport, time constraints, or lack of clarity on referral.	8/9
Horwood et al. ¹⁵ (2021)	Europe	UK	10,000	2015–2018	Cost-effectiveness Study	School-entry children aged 4–5	Costs, screening model efficiency	Economic/Systemic	Orthoptic-led screening more effective and cost-saving compared to primary school nurse model.	7/9
Kovai et al. ¹⁶ (2012)	Asia	India	520	Not specified	Cross-sectional Study	Patients attending rural vision centers	Satisfaction, service quality	Psychosocial/Service-related	Patients reported high satisfaction; suggested improvements in wait time and affordability.	8/9
Lee et al. ¹⁷ (2013)	Asia-Pacific	Timor-Leste	500	2005–2010	Comparative Study	Adults aged 40+ using eye services	Changing access and affordability	Structural/Economic	Significant reduction in reported barriers over five years due to community-based programs.	8/9
Li et al. ¹⁸ (2011)	Asia	China	14,000	2008–2009	Population-Based Study	Adults aged ≥50 in rural northern China	Prevalence and causes of VI	Structural/Medical	High prevalence of uncorrected refractive error and cataract in older rural populations.	7/9
Marmamula et al. ¹⁹ (2014)	Asia	India	~7,800	2011–2012	Cross-sectional (RAVI)	Adults aged ≥40 in Andhra Pradesh	Uptake of services, awareness, cost	Structural/Economic	Main barriers: lack of perceived need, cost, and distance to eye care centers.	8/9
Patil et al. ²⁰ (2020)	Asia	India	830 individuals	2020	Cross-sectional	Rural population of Dhule, Maharashtra	Surgical access, awareness, affordability	Economic/Social/Medical	Low cataract surgical coverage; common barriers include cost and lack of awareness.	8/9
Prathiba & Rema. ²¹ (2011)	Asia	India	3000	~2010	Narrative Review	Rural & underserved populations	Physical inaccessibility, lack of specialists	Geographic/Structural	Teleophthalmology shown to improve access in remote areas.	7/9
Sabherwal S. ²² (2020)	Asia	India	1,200	2020	Mixed Methods	Women across urban and rural eye care centers	Gender disparities, socio-cultural norms	Social/Cultural	Notable gender gaps in access to secondary/tertiary eye care, especially in rural areas.	8/9
Sengo et al. ²³ (2022)	Africa	Mozambique	1,062	2022	Community-based Study	Suburban residents in Nampula	Lack of information, cost, service availability	Structural/Economic/Social	Over 60% unaware of eye services; affordability was a key factor.	8/9
Frazier & Kleinstein. ²⁴ (2009)	North America	USA	5,000	2009	Literature Review	General population	Access inequality, lack of insurance	Economic/Systemic	Insurance coverage critical to utilization; access disparity prevalent in minorities.	7/9
Keeffe et al. ²⁵ (2019)	Global	Multiple	195	2019	Epidemiological Report	Global population	Causes of VI, access to treatment	Medical/Structural	Cataract and refractive error top causes; access remains inequitable in LMICs.	8/9
Zhabina & Efimov. ²⁶ (2020)	Europe	Russia	3,500	2020	Cross-sectional survey	General population	Prevalence, social impact	Social/Medical	Visual impairment and blindness have significant medical and social implications.	8/9
Silva et al. ²⁷ (2015)	Latin America	7 countries	14,279	2015	Multinational RAAB survey	Adults aged 50+	Avoidable blindness, inequality	Social/Structural	Cataract most common cause; large inequalities in surgical coverage.	8/9
Zaback et al. ²⁸ (2020)	North America	United States	28	Not specified	Cross-sectional Qualitative	Adults who experienced vision loss and became blind	Access before and after vision loss; availability; awareness	Healthcare system & personal	Significant gaps in care continuity; vision loss altered health-seeking behavior; post-blindness barriers persist	8/9

Neyhouser et al. ²⁹ (2018)	Southeast Asia	Cambodia	98	2015	Cross-sectional Qualitative	Male and female adults in underserved rural communities	Gender norms, affordability, mobility, provider attitudes	Socio-cultural & economic	Women faced greater barriers in accessing eye care; societal roles and cost were major obstacles	7/9
Owusu-Afriyie et al. ³⁰ (2024)	Sub-Saharan Africa	Papua New Guinea	865	2023–2024	Cross-sectional survey	Residents from rural and urban communities	Cost, awareness, fear, availability of services	Economic, psychological, healthcare system	Financial constraints and low awareness were key barriers; rural populations reported more difficulties accessing services.	8/9
Koomson et al. ³¹ (2019)	Sub-Saharan Africa	Ghana	170	2017-2018	Community-based cross-sectional study	Rural residents in Upper Denkyira West District	Unavailability of services, lack of awareness, distance	Healthcare system, geographical, awareness	Grossly inadequate utilization of ophthalmic services mainly due to unavailability; rural dwellers resorted to harmful eye care practices.	8/9
Merepa et al. ³² (2017)	Sub-Saharan Africa	Ghana	350	2012-2016	Descriptive cross-sectional study	Residents in Upper East Region	Distance, cost, lack of awareness, cultural beliefs	Geographical, economic, cultural	Distance to facilities and cost were major barriers; cultural beliefs also influenced utilization.	7/9
Nirmalan et al. ³³ (2003)	South Asia	India	15265	1999-2001	Population-based cross-sectional study	Adults aged 50 years and older	Gender disparities in cataract surgery uptake	Gender, healthcare system	Females were less likely to undergo cataract surgery despite higher burden; literacy was a major predictor.	8/9
Ravilla et al. ³⁴ (2016)	South Asia	India	7518	2011- 2015	Population-based study	Adults aged ≥60 years	Use of biomass fuels, exposure to smoke	Environmental, gender	Biomass fuel use associated with increased risk of cataract in women; no significant association in men.	7/9
Sharts-Hopko et al. ³⁵ (2010)	North America	United States	18	2009	Qualitative study	Women with visual impairment	Healthcare experiences, accessibility issues	Healthcare system, gender	Women with visual impairment faced multiple challenges in healthcare settings; need for tailored services.	8/9
Brunes & Heir. ³⁶ (2018)	Europe	Norway	736	2017	Cross-sectional interview-based study	Adults with visual impairment	Sexual assault, psychological impact	Social, psychological	Individuals with visual impairment had higher prevalence of sexual assaults; associated with lower self-efficacy and life satisfaction.	8/9
Frempong & Van Staden. ³⁷ (2024)	Sub-Saharan Africa	Ghana	1140	2018	Descriptive cross-sectional survey	Urban residents in Kumasi Metropolis	Distance, cost, time constraints, self-medication	Geographical, economic, behavioral	Eye care services are accessible but underutilized; barriers include distance, cost, and time away from work/school.	7/9
Ormsby et al. ³⁸ (2012)	Southeast Asia	Cambodia	600	2011	Cross-sectional survey	Residents of Takeo Province	Lack of knowledge, negative attitudes	Awareness, cultural	Limited knowledge and negative attitudes significantly hindered access to eye-care services.	8/9
Thompson et al. ³⁹ (2015)	Sub-Saharan Africa	Mozambique	1087	2013-2014	Mixed-methods study	General population	Cost, lack of awareness, cultural beliefs	Economic, awareness, cultural	Financial constraints and cultural beliefs were major barriers to utilizing refractive services.	8/9
Okoye et al. ⁴⁰ (2018)	Sub-Saharan Africa	Nigeria	28	2018	Qualitative study	Residents of Anambra State	Cost, transportation, lack of information	Economic, geographical, awareness	High cost, transportation issues, and lack of information were significant barriers to accessing eye care services.	8/9
Olusanya et al. ⁴¹ (2016)	Sub-Saharan Africa	Nigeria	643	2014-2015	Cross-sectional survey	Rural adult population in South-Western Nigeria	Distance to facilities, lack of education, age	Geographical, educational, demographic	Proximity to eye care facilities and higher education levels were associated with increased utilization of services.	7/9
Dandona et al. ⁴² (2000)	South Asia	India	2522	1999	Population-based cross-sectional study	Urban population in Hyderabad, Andhra Pradesh	Lack of awareness, cost, accessibility	Awareness, economic, geographical	A significant portion of the urban population did not utilize eye care services due to lack of awareness and financial constraints.	7/9

Varadaraj et al. ⁴³ (2019)	North America	USA	190,000	2008–2016	Cross-sectional (NHIS data)	US adults surveyed in NHIS	Cost of eyeglasses, lack of insurance	Economic, policy	Affordability and lack of insurance coverage were significant barriers to eye care use and eyeglasses access, especially among low-income groups.	8/9
Lu et al. ⁴⁴ (2010)	North America	USA	10,000	2007-2009	Cross-sectional (survey data)	Working-age adults in rural and urban KY	Lack of insurance coverage	Economic, policy	Rural residents had higher uninsured rates and more inconsistent insurance coverage, affecting their access to care including eye care.	8/9
Tumin et al. ⁴⁵ (2018)	North America	USA (Ohio)	37,140	2016-2017	Cross-sectional study	Adults across income brackets	Local income inequality, personal SES, unmet needs	Economic, structural inequality	Local income inequality was strongly associated with unmet healthcare needs, including vision care, especially in lower SES populations.	8/9

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