

SYSTEMATIC REVIEW

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Prevalence and management of cataracts among older adults in Sub-Saharan Africa: a scoping review

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Abstract

Introduction Cataract is a leading cause of visual impairment and blindness, mainly affecting older adults in sub-Saharan Africa (SSA). This scoping review aims to map evidence on the prevalence, contextual factors, and management strategies for cataracts among older adults in SSA.

Method Four central databases (PubMed, Scopus, Medline, and Google Scholar) were searched, yielding 383 records. Additional searches produced eight records. After screening and applying inclusion criteria, 26 full-text articles were eligible for further review. Finally, seven full-text records were included in the thematic analysis and synthesis.

Results Cataract prevalence among older adults in SSA ranged from 13.5–62.5% across different countries. Surgery remains the primary management strategy, but cataract surgical coverage varies widely (12.1–96%). Significant barriers to effective management include lack of awareness, limited access to healthcare, economic constraints, gender disparities, and cultural misconceptions about cataract surgery.

Conclusion There is a significant burden of cataracts among older adults in SSA, with considerable variations in prevalence and surgical coverage across the region. Comprehensive strategies addressing awareness, accessibility, affordability, and cultural factors are needed to improve cataract management and reduce visual impairment in SSA.

Keywords: Prevalence, Management, Cataract, Older Adults, Sub-Saharan Africa, Scoping Review

Introduction

A cataract is the clouding of the eye's lens, which initially prevents clear vision and eventually progresses to blindness if left untreated [11]. Cataracts affect older adults worldwide, but their impact is often more severe in low- and middle-income countries due to limited access to eye care and surgical services [3]. It is estimated that cataract is the most common cause of blindness in Sub-Saharan Africa (SSA) [19, 25].

Eye care services in SSA are woefully inadequate due to several factors, including inadequate healthcare infrastructure, a severe shortage of trained eye care professionals and high levels of poverty [6, 8, 14]. The region has one of the lowest ratios of ophthalmologists

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per capita, with many countries reporting less than one ophthalmologist per million people [9]. This shortage limits the availability of timely and effective cataract surgeries, leading to prolonged visual impairment and blindness. Additionally, the rural-urban divide in healthcare access further compounds these issues, leaving rural populations particularly vulnerable.

Management of cataracts involves surgical removal of the lens and replacement with an intraocular lens [5]. Despite cataract surgery being one of the most cost-effective health interventions globally [24] and several advances in surgical techniques which can effectively restore vision, the prevalence of cataracts in SSA continues to rise. This is also exacerbated by socio-economic and infrastructural challenges [7].

Resource constraints and systemic issues often limit the effectiveness of strategies to reduce the prevalence of cataracts. While cataract surgery is highly effective, its utilisation remains low due to the scarcity of surgical facilities and trained personnel [20]. Health education initiatives to raise awareness and promote early detection are crucial, yet educational and logistical barriers often restrict their impact. Community-based programs, such as mobile eye clinics, play a vital role in reaching underserved populations but face challenges related to sustainability and resource availability [23, 26]. Addressing these limitations requires strategic investments in healthcare infrastructure, workforce development, and innovative approaches to delivering eye care services. Socioeconomic factors and logistic challenges, such as long distances to healthcare facilities and the high surgery cost, may deter many from seeking treatment [6, 14]. These barriers show a great need for comprehensive strategies to improve the uptake of cataract surgery, thus reducing the prevalence of visual impairment in SSA.

With cataracts being a public health issue of importance in SSA, this scoping review aims to map the current evidence on the prevalence and management of cataracts in sub-Saharan Africa. By identifying gaps in the literature, assessing the effectiveness of existing interventions, and providing recommendations for future research and policy development, this review seeks to provide helpful information that can help improve eye care for people in the region. Besides, this evidence synthesis will support the efforts of SSA in attaining the Sustainable Development Goal on Health, which is to reduce the burden of cataract-related blindness and improve the quality of life for individuals in this vulnerable region.

Methods

This scoping review was conducted following the six-stage framework by Arksey and O'Malley. The framework was adopted because it helps assess the literature, examine what has been done, and identify the gaps in knowledge that need attention. Arksey and O'Malley suggest that the following stages should be followed in conducting a scoping review: (1) identifying and stating the research questions; (2) identifying relevant studies; (3) study selection; (4) data collection; (5) data summary and synthesis of results; and (6) consultation.

In the first stage, we identified and formulated the research questions to guide this scoping review: (1) What is the prevalence of cataracts among older adults in sub-Saharan Africa (SSA)? (2) What are the current management strategies for cataracts in SSA? and (3) What are the barriers to effective management and treatment of cataracts among older adults in SSA?

Four central databases (PubMed, Scopus, Medline, and Google Scholar) were searched for literature. Medical Subject Heading (MeSH) terms were utilised for the PubMed search and refined for search in other databases. The search strategy is presented in Table 1, with exclusion and inclusion criteria. The keywords in Table 1 were moved to the MeSH. A planned search strategy in PubMed is presented in Table 2.

These MeSH terms were adapted to fit other databases (Scopus, Medline, Google Scholar). The authors scrutinised the records obtained, and the Rayyan AI online software was used to remove duplicates. The WHO Library, Google and institutional repositories of universities in SSA were searched for additional records. Furthermore, reference lists of eligible records were checked for relevant articles.

To conduct this review accurately and consistently, the following authors (PM and EA) extracted the data independently. Also, a chartered librarian at the Sam Jonah Library was consulted for records search and data management support. Whenever there were discrepancies during data charting, we resolved them in regular meetings with all the authors. JOS and PYAA supervised and reviewed the data charting process to ensure everything was on track. Additionally, we received expert guidance from ASPQ (a consultant ophthalmologist), who served as an independent reviewer. For our analysis, we used both thematic and content analysis methods.

Results

The search conducted in the four central databases produced 383 records. An additional five records were identified through a search conducted on Google. After removing duplicates (278) using the Rayyan online AI,

Table 1 Search strategy for articles on the prevalence and management of cataracts among older adults in SSA

Search Strategy Item	Search Strategy
Databases	PubMed, Scopus, Medline, Google Scholar
Language Filter	English Language
Time Filter	2000–2023
Spatial Filter	"sub-Saharan Africa", OR "Angola" OR "Benin" OR "Botswana" OR "Burkina Faso" OR "Burundi", OR "Cape Verde" OR "Cameroon", OR "Central African Republic" OR "Chad" OR "Comoros" OR "Congo" OR "DR Congo" OR "Cote d'Ivoire" OR "Equatorial Guinea" OR "Eritrea" OR "Eswatini" OR "Ethiopia" OR "Gabon" OR "Gambia" OR "Ghana" OR "Guinea" OR "Guinea Bissau" OR "Kenya" OR "Lesotho" OR "Liberia" OR "Madagascar" OR "Malawi" OR "Mali" OR "Mauritania" OR "Mauritius" OR "Mozambique" OR "Namibia" OR "Niger" OR "Nigeria" OR "Rwanda" OR "Sao Tome & Principe" OR "Senegal" OR "Seychelles" OR "Sierra Leone" OR "Somalia" OR "South Africa" OR "South Sudan" OR "Sudan" OR "Tanzania" OR "Togo" OR "Uganda" OR "Zambia" OR "Zimbabwe."
Keywords	1. "Cataract" OR "Lens Opacity" 2. "Prevalence" OR "Incidence" OR "Epidemiology" 3. "Management" OR "Treatment" OR "Intervention" OR "Surgery" OR "Medication" 4. "Older adults" OR "Elderly" OR "Aged" OR "Senior"
Inclusion Criteria	The paper should be: 1. Peer-reviewed or grey literature 2. Published from 2000 and later 3. Conducted in sub-Saharan African countries 4. Published in the English language 5. Conducted on adults aged 50 years and above 6. The prevalence and management strategies for cataracts.
Exclusion Criteria	The paper should be: 1. Conducted on people under 50 years 2. Conducted in countries outside sub-Saharan Africa 3. Published online before the year 2000 4. A report, review, abstract, minutes, commentary, letter to editors, preprint, literature reviews 5. Outside the variables of interest

Table 2 Search strategy in PubMed

Search (#)	Search terms
1	"Cataract"[MeSH Terms] OR "Lens Opacity" OR "Cloudy Lens"
2	"Older adults"[MeSH Terms] OR "Elderly" OR "Aged" OR "Senior"
3	"sub-Saharan Africa"[MeSH terms] OR "Angola" OR "Benin" OR "Botswana" OR "Burkina Faso" OR "Burundi" OR "Cape Verde" OR "Cameroon" OR "Central African Republic" OR "Chad" OR "Comoros" OR "Congo" OR "DR Congo" OR "Cote d'Ivoire" OR "Equatorial Guinea" OR "Eritrea" OR "Eswatini" OR "Ethiopia" OR "Gabon" OR "Gambia" OR "Ghana" OR "Guinea" OR "Guinea Bissau" OR "Kenya" OR "Lesotho" OR "Liberia" OR "Madagascar" OR "Malawi" OR "Mali" OR "Mauritania" OR "Mauritius" OR "Mozambique" OR "Namibia" OR "Niger" OR "Nigeria" OR "Rwanda" OR "Sao Tome & Principe" OR "Senegal" OR "Seychelles" OR "Sierra Leone" OR "Somalia" OR "South Africa" OR "South Sudan" OR "Sudan" OR "Tanzania" OR "Togo" OR "Uganda" OR "Zambia" OR "Zimbabwe"
4	#1 AND #2 AND #3
5	"Prevalence"[MeSH Terms] OR "Incidence" OR "Epidemiology" OR "Rate"
6	"Management"[MeSH Terms] OR "Treatment" OR "Intervention" OR "Surgery" OR "Medication"
6	#5 AND #6 Limits: 01/01/2000 to 07/07/2024, English language

110 records were available for screening. In addition, three papers were retrieved through consultation and reference checking. Eighty-nine records were excluded because these records did not meet the inclusion criteria.

A total of 26 full-text were eligible for further screening. Finally, seven full-text records were included in the thematic analysis and synthesis (see Fig. 1 for details on the screening process in the PRISMA flow diagram).

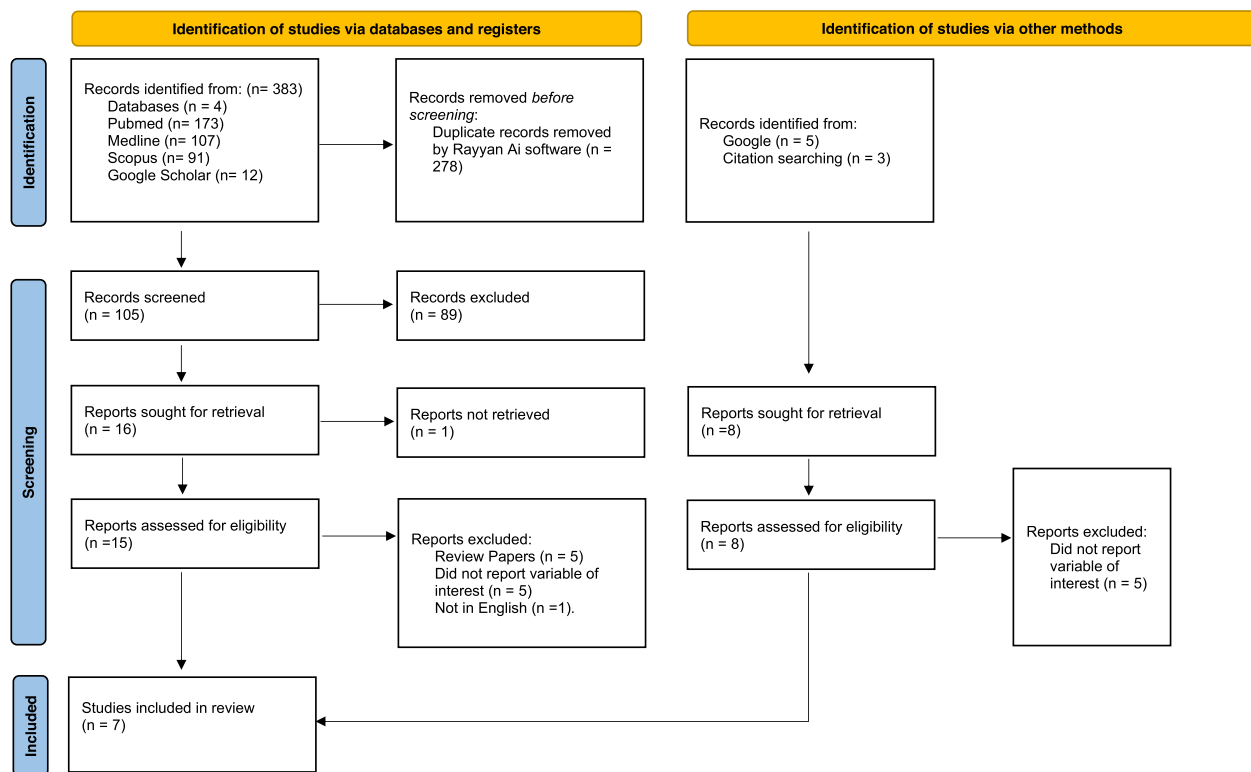


Fig. 1 PRISMA flow diagram of search results and record the screening process

Characteristics of reviewed studies

Most (6) of the reviewed studies used cross-sectional study design. The designs of the studies are shown in Table 3. Furthermore, 50% of the included studies were conducted in only one SSA country, Nigeria (3). Most of the included studies were published online between 2010 and 2023. See details of the characteristics of the reviewed studies in Figures 2 and 3.

Prevalence of cataracts among older adults in sub-saharan africa (SSA)

The reviewed studies reported cataract prevalence between 13.5% [17] and 62.5% [1]. Prevalence of cataract, as reported by the studies was 54.1% in Uganda [18], 44.5% in Eritrea [17], 47.8% in Mali [17], 31.6% in The Gambia [17], 19.4% in Tanzania [17], 13.5% in Rwanda [17], 20.8% in Kenya [17], 44% in South Africa [7], 62.5% in Ghana [1], 3.9% [2].

Current management strategies for cataracts in SSA

Five studies mentioned surgery as the mainstay for cataract management [1, 7, 15, 17, 21]. Three studies reported cataract surgical coverage. Of these three, two studies reported low cataract surgical coverage: 12.1% [15], 28.2% for persons with VA < 6/60 [21], and the other study reported a high cataract surgical coverage rate

with 96% of people needing surgery at VA < 3/60 having received it [7].

One study reported the number of surgeries needed per million persons to address cataract-related visual impairment in various countries: 2200 in Tanzania, 1800 in Rwanda, 2600 in Kenya, 4500 in Mali, 2900 in The Gambia, 4100 in Eritrea [17]. In the study conducted in Ghana, the overall cataract surgical uptake among older adults was 48.9%, with slightly higher rates among men (49.1%) compared to women (48%) [1]. Also, one study mentions the importance of health education, intersectoral collaboration, and evidence-based policies to reduce cataract prevalence [2].

Barriers to effective management and treatment of cataracts among older adults in SSA

The effective management and treatment of cataracts in Sub-Saharan Africa (SSA) face several significant barriers. Lack of awareness is a common issue, as many individuals, particularly in rural areas, are not informed about cataracts or the available treatment options [2, 7, 15]. Limited access to healthcare is another critical barrier, with scarce healthcare facilities and services, especially in lower-middle-income countries [2, 15]. This is compounded by the concentration of surgical services in

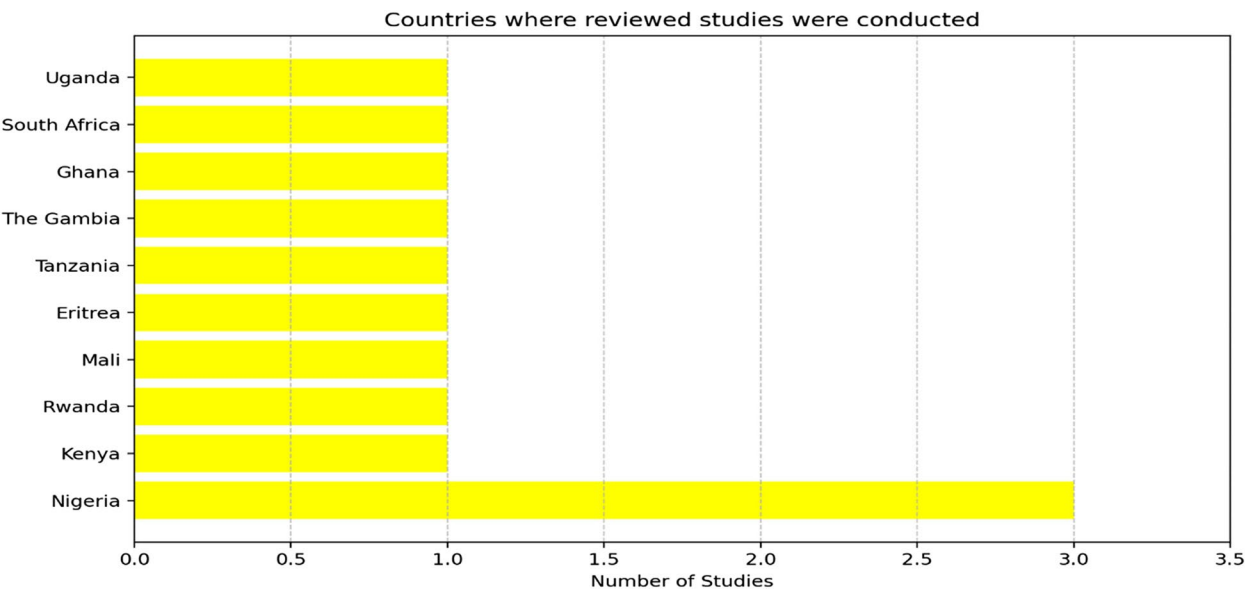


Fig. 2 Countries where reviewed studies were conducted in SSA

state capitals, making it difficult for individuals in remote areas to access these services [21]. Economic constraints are a pervasive issue, as the high cost of cataract surgery prevents many from seeking timely medical intervention [1, 2, 7, 15, 21]. Financial limitation is another factor that leads to lower cataract surgical coverage among the poorest populations [7].

Gender Disparities also play a role, with more females suffering from cataracts but being less likely to undergo surgery compared to males [21]. This disparity is not well understood but highlights the need for targeted interventions. Fear and Misconceptions about cataract surgery,

including fear of complications and the belief that cataracts need to mature before being treated, further deter individuals from seeking surgery [1, 15].

Discussion

This scoping review reveals a significant prevalence of cataracts among older adults in Sub-Saharan Africa (SSA), ranging from 3.9–62.5% across different countries. Surgery remains the primary management strategy, but cataract surgical coverage varies widely, from 12.1–96%. The number of surgeries needed per million population ranges from 1800 in Rwanda to 4500 in Mali.

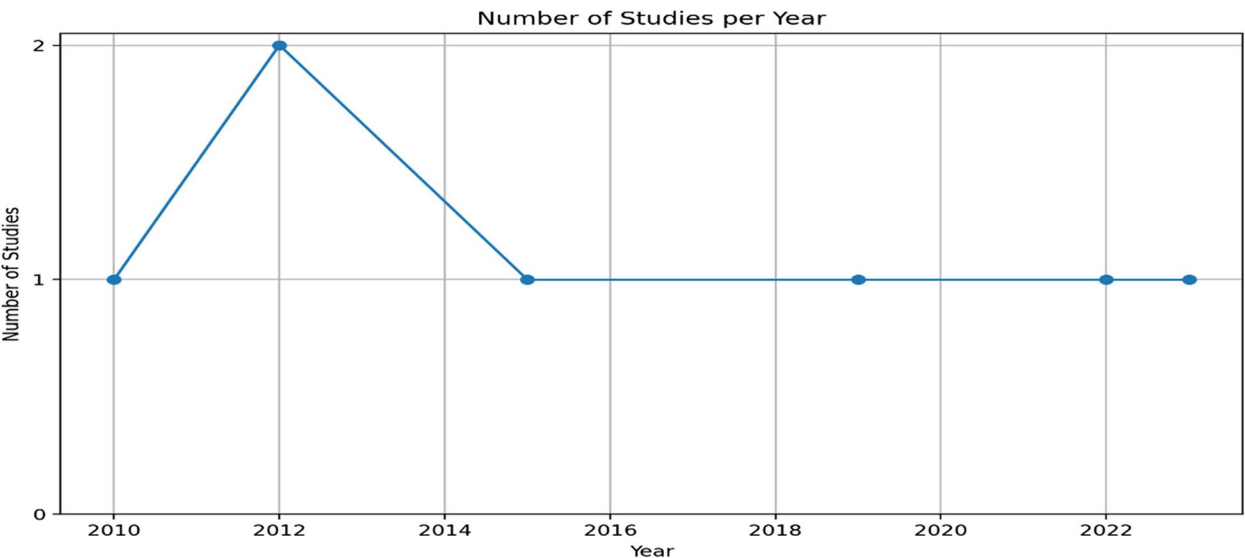


Fig. 3 The year-reviewed studies were published online

Table 3 Design of reviewed studies in sub-Saharan Africa

Author/Year	Country	Aim	Study design	Sample size	Sampling strategy	Summary findings
Makinde et al., 2023	Nigeria	To determine the awareness, prevalence and burden of cataracts among adults in Ido/Osi LGA, a rural community of Ekiti State	Cross-sectional study	361	Multi-stage sampling	Most of the respondents had a good awareness of cataracts, and the prevalence of cataracts in this study was 3.9%
[7]	South Africa	To estimate the prevalence and causes of blindness and visual impairment in Cape Town, SA and to explore socio-economic and demographic predictors of vision loss in this setting	Cross-sectional study	2750	Cluster sampling	The prevalence of blindness among people 50 years old in Cape Town was lower than expected, and the contribution of posterior segment diseases was higher than previously reported in South Africa and Sub-Saharan Africa.
[21]	Nigeria	To generate data on blindness and visual impairment for planning and monitoring a comprehensive eye care programme in Katsina state of Nigeria	Cross-sectional study	3120	Multi-stage cluster random sampling	Cataract was a principal cause of blindness (70%). Katsina has a high burden of avoidable blindness, affecting more women.
[15]	Nigeria	To estimate the burden of blindness and VI due to cataracts in Egbedore Local Government Area of Osun State, Nigeria	Cross-sectional study	1183	Cluster sampling	Over 600 operable cataracts exist in Nigeria. The age- and sex-adjusted prevalence of bilateral cataract-related blindness (visual acuity (VA) < 3/60) in people of 50 years and older was 2.0% (95% confidence interval (CI): 1.6–2.4%). The Cataract Surgical Coverage (CSC) (persons) was 12.1% and Couching Coverage (persons) was 11.8%. The age- and sex-adjusted prevalence of bilateral operable cataract (VA < 6/60) in people of 50 years and older was 2.7% (95% CI: 2.3–3.1%).
[1]	Ghana	To describe cataract surgical uptake among older adults in Ghana				231 older adults reported having been diagnosed with cataracts in one or both eyes within the last five years, and 48.9% of them reported having cataract surgery.
[17]	Kenya, Tanzania, Rwanda, Kenya, Mali, Gambia, Eritrea	To estimate the incidence of vision-reducing cataracts in sub-Saharan Africa and use these data to calculate cataract surgical rates (CSR) needed to eliminate blindness and visual impairment due to cataracts.				
[18]	Uganda	To determine the prevalence and risk factors for VI among the elderly at Mulago National Referral Hospital eye clinic in Uganda	Cross-sectional study	346	Purposive sampling	Cataract was the leading cause of blindness 54.1%, followed by refractive error (21.6%), glaucoma (11.7%), and corneal opacities (5.4%).

Significant barriers to effective management include lack of awareness (especially in rural areas), limited access to healthcare facilities and services, economic constraints due to the high cost of surgery, gender disparities with females being more affected but less likely to undergo surgery, and fear and misconceptions about cataract surgery. Key themes emerging from the review include the need for health education and awareness campaigns, improving accessibility to surgical services, addressing financial barriers to treatment, the necessity for intersectoral collaboration, and addressing regional differences in surgical uptake and accessibility. The findings highlight the importance of comprehensive strategies that address awareness, accessibility, affordability, and cultural factors, as well as the potential for tailored interventions to address regional disparities and gender-specific approaches to improve surgical uptake among females in SSA.

Prevalence of cataracts among older adults in sub-saharan africa (SSA)

The prevalence of cataracts among older adults in sub-Saharan Africa (SSA) shows considerable variability, ranging from 3.9–62.5% across different countries and studies [1, 17]. This wide range reflects the factors influencing cataract development and detection in the region. Studies reported diverse prevalence rates: 54.1% in Uganda, 44.5% in Eritrea, 47.8% in Mali, 31.6% in The Gambia, 19.4% in Tanzania, 13.5% in Rwanda, 20.8% in Kenya, 44% in South Africa, 62.5% in Ghana, and 3.9% in Nigeria. These variations may be attributed to several key factors. Firstly, methodological differences among studies, including variations in sampling techniques and diagnostic criteria, could significantly impact reported prevalence rates. The predominant use of cross-sectional study designs (6 out of 7 studies) may capture different stages of cataract progression across populations, potentially skewing results. Secondly, disparities in healthcare access and socio-economic conditions across SSA countries may influence cataract development and detection rates [10]. The studies span from 2010 to 2023, and temporal changes in healthcare practices and environmental conditions during this period could affect prevalence rates. It is crucial to interpret these findings cautiously, considering the limitations of available data and the multi-faceted nature of cataract prevalence in SSA.

Current management strategies for cataracts in SSA

Current management strategies for Sub-Saharan Africa (SSA) cataracts primarily revolve around surgical intervention [4]. However, cataract surgical coverage varies significantly across the region, ranging from low rates of 12.1% and 28.2% for persons with visual acuity < 6/60

in some areas to a high of 96% for those with visual acuity < 3/60 in others [7, 15, 21]. The number of surgeries needed per million persons differs widely among countries, from 1800 in Rwanda to 4500 in Mali. In Ghana, overall cataract surgical uptake among older adults was 48.9%, with a slight gender disparity favouring men [1]. Beyond surgery, the importance of health education, intersectoral collaboration, and evidence-based policies in reducing cataract prevalence was emphasised, though specific implementation details were not provided [2]. The wide variation in surgical coverage and needs across different countries suggests significant disparities in access to and utilisation of surgical services [7, 15, 21]. While surgery remains the core management strategy, there is a clear recognition of the need for a more comprehensive approach to cataract management in SSA, addressing regional disparities and implementing complementary strategies to enhance overall eye care in the region [10]. These complementary strategies include community outreach programs, training of non-physician surgeons, telemedicine, and public awareness campaigns. Looking at successful approaches from other parts of the world that have increased surgical coverage, we find strategies such as task-shifting, public-private partnerships, cross-subsidisation models, integration of cataract services into primary health care, and national cataract surgery programs. Adapting these strategies to the SSA context could significantly improve cataract management and overall eye care in the region [13, 22].

Barriers to effective management and treatment of cataracts among older adults in SSA

The management and treatment of cataracts among older adults in Sub-Saharan Africa (SSA) face several barriers, revealing significant challenges in eye care accessibility and utilisation. A primary obstacle is the pervasive lack of awareness, particularly pronounced in rural areas, which impedes early detection and timely [2]. This knowledge gap is compounded by limited access to healthcare services, especially in lower-middle-income countries and remote regions where surgical facilities are scarce and often concentrated in urban centres [2, 15]. Economic constraints emerge as a formidable barrier, with the prohibitive cost of cataract surgery placing treatment out of reach for many, disproportionately affecting unemployed individuals and those from lower socio-economic strata [12]. This financial hurdle contributes to notably lower cataract surgical coverage among the poorest populations [16]. Gender disparities add another layer of complexity, with studies indicating that while females are more affected by cataracts, they are less likely to undergo surgery compared to their male counterparts [10]. This gender gap, though not fully understood, highlights the

need for targeted interventions addressing gender-specific barriers. Cultural factors also play a role, with fear and misconceptions about cataract surgery, including concerns about complications and beliefs about cataract maturation, further deterring individuals from seeking surgery [16].

Policy implications

The findings of this scoping review have significant policy implications for addressing cataract-related visual impairment among older adults in Sub-Saharan Africa. Policymakers should prioritise the development of comprehensive eye care strategies that integrate cataract management into broader health systems. This includes allocating resources to expand and decentralise surgical services, particularly in rural and underserved areas. Policies should focus on reducing financial barriers to cataract surgery, potentially through subsidised or free services for vulnerable populations. Cross-subsidisation models and public-private partnerships can be combined to create a sustainable system where higher-income patients and private clinics contribute to subsidising cataract surgeries for lower-income individuals. At the same time, participating businesses receive tax incentives or other benefits from the government. Additionally, there is a need for policies that promote health education and awareness campaigns to address misconceptions and encourage early detection and treatment. Gender-sensitive policies should be implemented to address the disparity in surgical uptake between men and women. Also, it is essential to integrate technology-driven solutions such as telemedicine, telerefraction, and AI-assisted diagnostics, which can enhance the efficiency and reach of eye care services. Incorporating these technologies into the workforce strategy will help bridge gaps in accessibility and optimise the use of available human resources. Lastly, policies supporting research and data collection on cataract prevalence and management outcomes are essential for evidence-based decision-making and resource allocation in eye care services across Sub-Saharan Africa. These policy recommendations align with SDG 3 (Good Health and Well-being), mainly targeting 3.8 to achieve universal health coverage and contribute to the broader goals of reducing health inequalities and improving the quality of life for older adults in the region.

Limitations

This scoping review has a few limitations. The reliance on only English-language publications may have excluded relevant studies published in other languages, potentially limiting the comprehensiveness of the findings. The

variability in study designs, sample sizes, and diagnostic criteria across the included studies makes direct comparisons challenging.

Conclusion

This scoping review reveals a significant burden of cataracts among older adults in Sub-Saharan Africa, with prevalence rates varying widely across countries. While surgical intervention remains the primary management strategy, numerous socio-economic, cultural, and infrastructural barriers hinder its implementation and accessibility. The review highlights critical challenges, including limited awareness, inadequate healthcare access, economic constraints, and gender disparities in treatment uptake. These findings underscore the urgent need for comprehensive, multi-faceted approaches to improve cataract management in the region. Future efforts should focus on enhancing surgical capacity, implementing targeted educational programs, addressing economic barriers, and developing culturally sensitive interventions. Concerted action involving intersectoral collaboration and evidence-based policies is essential to reduce the prevalence of cataract-related visual impairment and improve eye health outcomes for older adults across Sub-Saharan Africa.

Authors' contributions

J.O.S. and P.Y.A.A. conceptualized review. E.K.A. and P.M. analysed and wrote the initial draft. J.O.S., P.Y.A.A. and A.S.P.Q. reviewed the analyzed the data. A.S.P.Q. reviewed the final draft. J.O.S. and P.Y.A.A. supervised the work. All authors read through the final script.

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Declarations

Ethics approval and consent to participate

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Consent for publication

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Competing interests

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