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Integrating eye care in low-income and middle-income settings: a scoping review

Ling Lee ,[1,2,3] Elise Moo ,[1] Tiffany Angelopoulos,[1] Sarity Dodson,[1] Aryati Yashadhana [1,4,5]

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[1]International Programs Division, The Fred Hollows Foundation Melbourne, Carlton, Victoria, Australia
[2]School of Optometry and Vision Science, University of New South Wales, Sydney, New South Wales, Australia
[3]Department of Paediatrics, The University of Melbourne, Melbourne, Victoria, Australia
[4]Centre for Primary Health Care and Equity, University of New South Wales, Sydney, New South Wales, Australia
[5]School of Population Health, University of New South Wales, Sydney, New South Wales, Australia

Correspondence to
Dr Ling Lee;
ling.lee1@unsw.edu.au

ABSTRACT

Objectives Integrated people-centred eye care has been recommended as a strategic framework for reducing global vision impairment and blindness. The extent to which eye care has integrated with other services has not been widely reported. We aimed to investigate approaches to integrating eye care service delivery with other systems in low resource settings, and identify factors associated with integration.

Design Rapid scoping review based on Cochrane Rapid Review and Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines.

Data sources MEDLINE, Embase, Web of Science, Scopus and Cochrane Library databases were searched in September 2021.

Eligibility criteria Papers with interventions involving eye care or preventative eye care integrated into other health systems, peer-reviewed in English, conducted in low-income or middle-income countries, and published between January 2011 and September 2021 were included.

Data extraction and synthesis Two independent reviewers screened, quality appraised and coded included papers. A deductive–inductive iterative analysis approach was used with a focus on integrating service delivery.

Results The search identified 3889 potential papers, of which 24 were included. Twenty papers incorporated more than one intervention type (promotion, prevention and/or treatment), but none included rehabilitation. Most articles involved human resources development yet rarely appeared to be people-centred. The level of integration was associated with building relationships and enhancing service coordination. Integrating human resources was challenged by the need for ongoing support and worker retention. In primary care settings, workers were often already at full capacity, had competing priorities, varying capabilities and limited motivation. Additional barriers included inadequate referral and information systems, poor supply chain management and procurement practices and finite financing.

Conclusion Integrating eye care into low resource health systems is a challenging task, compounded by resource limitations, competing priorities and ongoing support needs. This review highlighted a need for people-centred approaches to future interventions, and further investigation into integrating vision rehabilitation services.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This review's search strategy provided a comprehensive evidence overview of integrating eye care service delivery within and beyond the healthcare sector.
⇒ Synthesis of results enabled in-depth understanding of common barriers and facilitators for integrated and people-centred eye care across diverse contexts and intervention designs.
⇒ Relevant information from non-English publications, grey literature articles, reports and theses might have been missed.
⇒ Due to the heterogeneity of papers included, the extent to which eye care interventions can be effectively integrated into healthcare cannot be discerned.
⇒ Eye care integration studies that focused on critical health system functions beyond service delivery were not explored in depth.

INTRODUCTION

Vision impairment and blindness are significant public health concerns, particularly in low-income and middle-income countries which experience approximately 90% of the global burden.[1] In 2020, an estimated 1.1 billion people will have some form of vision loss, most of which is preventable or avoidable. A predicted surge in vision loss is expected over coming decades due to a growing and ageing global population.[2] Eye care services are expected to be overseen, regulated and funded, and in some countries provided by national and subnational governments. However, in many low-resource settings, external not-for-profit and private stakeholders provide additional support for eye care services, which can discourage national ownership and efforts to integrate eye care within broader national health systems, plans and policies.[3] Without significant changes to the way eye care is delivered, the unmet needs will impact sustainable development outcomes, including poverty, education, economic inequality and health and well-being.[4] This is particularly important in low-income and middle-income settings where availability and access to eye care are already challenged.[5]

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Multiple strategies that consider the complexities of different settings are required to address eye care access. The WHO's World Report on Vision recommends that member states make eye care an integral part of Universal Health Coverage through 'Integrated people-centred eye care (IPEC)', where services centre people across the life course and are coordinated across different levels and services to promote a full spectrum of care.[5] The IPEC approach aligns global efforts to improve eye care service provision and access with the WHO's framework on Integrated People-Centred Health Services and health systems strengthening pillars.[6 7] At the 73rd World Health Assembly in 2020, member states adopted a resolution indicating their commitment to the recommendations and the implementation of the IPEC framework.[8]

Eye care integration is one of the critical components to the reform agenda set out by the WHO,[5] and relies on organisational arrangements and formal relationships to develop, organise and deliver care in ways that minimise service fragmentation and improve continuity.[9 10] Integration efforts are commonly described as vertical or horizontal.[11] Horizontal integration involves arrangements across services or organisations providing a similar level of care, while vertical approaches involve connections across different levels of the health system (eg, from community-level to tertiary-level or quaternary-level care). Integrating services has been suggested to enable access to eye care and improve cost-effectiveness.[12] Yet, how eye care services have attempted to integrate has not been widely reported, particularly in low-income and middle-income countries. Additionally, there is a need to build understanding on the contextual factors that could influence the integration of eye care into other areas of care or services.

As eye health interventions often occur in healthcare systems that are complex and context-specific, we aimed to conduct a scoping review to describe what and how eye care service delivery has integrated with health and other systems in low-income and middle-income countries. Additional objectives included identifying barriers and facilitators associated with eye care integration.

METHODS

The search strategy followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Scoping Reviews and Cochrane Rapid Reviews guidelines.[13 14] The review was registered in OSF Registries (https://osf.io/6nyjh). The following databases were searched for studies published between January 2011 and September 2021: MEDLINE (OVID), Embase (OVID), Web of Science, Scopus and Cochrane Library. Search terms included three concepts: (1) eye care and its services, (2) intervention and (3) integration (online supplemental table 1). To contain the search and screening, the concept of people-centredness was excluded from the search. The database search results were combined into a single library in EndNote (Clarivate Analytics, USA) where duplicates were removed. The library was imported into Covidence (Veritas Health Information, Australia) software for title/abstract and full-text screening.

As per Atun *et al*,[15] we defined integration as the 'extent, pattern and rate of adoption and eventual assimilation of health interventions into each of the critical health system functions, which include inter alia: (i) stewardship and governance, (ii) financing, (iii) planning, (iv) service delivery, (v) monitoring and evaluation and (vi) demand generation'. For this review, we focused on integration in service delivery and its corresponding elements (table 1).

Study selection

Studies were included in the review if they involved implementing an intervention focused on integrating eye care or preventative eye care with other health systems (eg, non-eye care settings or between levels of care), and conducted in low-income and middle-income countries as defined by the World Bank.[16] Studies were excluded if they were published more than 10 years ago, published in a language other than English, and not peer-reviewed empirical research.

As per Cochrane rapid review guidelines and after duplicates excluded, at least 20% of titles and abstracts (400) retrieved were dual screened by two independent reviewers. The remaining were assessed by one reviewer and excluded papers scanned by a second reviewer to address risk of selection bias. Where it was unclear whether the selection criteria were met, studies were included for full-text review. Five full-texts were reviewed by two independent reviewers and once consensus reached, a single reviewer assessed the remaining papers (72). Disagreements at screening and full-text review stage were discussed and resolved with a third reviewer.

Quality appraisal

Quality appraisal of the included papers was completed with the QualSyst tool.[17] Quality appraisal was conducted by one reviewer and verified by a second reviewer. As there was a lack of homogeneity of reported outcomes, risk of bias across studies was not conducted.

Data extraction, analysis and synthesis

Papers were classified by categorical variables including country of study, study design, intervention type, study population and life course stage(s) targeted, which were used to extract descriptive statistics.

A combination of deductive and inductive analysis was performed on each paper identified for inclusion in the final synthesis, whereby any references (qualitative or quantitative) to healthcare integration with a focus on service delivery were coded using NVivo software (QSR International V.12, 2018).

Atun's framework on integration (table 2)[11] with a specific focus on service delivery was used for deductive analysis. The conceptual framework facilitates analysis for evaluative and formative studies on integration structured by critical health system functions. Results are presented

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Table 1 Framework on healthcare integration[11]

Critical health system function	Elements of integration
Service delivery	Human resources: Training or upskilling non-eye care workers (including supervisors) to improve the delivery of eye care in health or other systems.
	Shared infrastructure and structural integration with other services: Sharing physical and organisational structures and facilities with the provision of eye care.
	Referral systems: Establishing referral systems for vertical integration of eye care.
	Guidelines and care pathways: Incorporating eye care guidelines and protocols with non-eye care specific services.
	Procurement and supply-chain management: Incorporating eye care resource procurement and supply management (such as medicines, spectacles and equipment) with other services to ensure supply.
Stewardship and governance	Accountability function: Feedback systems to enable accountability of health systems including eye care. Reporting: Incorporating eye care indicators with other health reporting. Performance management: Incorporating eye care skills or supervision into the assessment of worker performance.
Financing	Pooling of funds: Combining eye care funds and resources with health and other systems; or pooling service delivery funds for future care. Provider payment methods: Incorporating eye care into public health fund or private insurance schemes to pay providers.
Planning	Needs assessment: Including eye care needs within a facilities' needs assessment. Priority setting: Including eye care in priority setting when planning health services. Resource allocation: Allocating resources to eye care among the wider health system.
Monitoring and evaluation	Information technology infrastructure: Infrastructure that enables eye care indicators to be collected, monitored and evaluated. Data collection and analysis: Including eye care indicators in monitoring and evaluation of broader healthcare.
Demand generation	Financial incentives: Incorporating eye care into public health fund or private insurance schemes to improve patient uptake. Population interventions: Eye care promotion and education in health or other systems to encourage the population to drive demand.

according to the service delivery elements of integration, that are observed across included papers: human resources, guidelines and care pathways, referral systems, shared infrastructure and structural elements (combined) and procurement and supply chain (combined). Inductive coding enabled identification of contextual factors impacting integration of eye care into other areas of care or services.

Patient and public involvement

There was no patient or public involvement in this study.

RESULTS

The database search identified 3889 potential papers. After removal of duplicates 1941 titles and abstracts were screened. Of these, 77 full-text publications were retrieved for consideration. A total of 53 papers were excluded after performing the full-text review, leaving 24 papers for inclusion (figure 1). The diverse intervention approaches of the included papers are outlined in table 2, online supplemental table 2.

The 24 included papers described studies across 12 countries in 7 regions, 16 were from sub-Saharan Africa, 5 from South Asia, 2 from South-East Asia, East Asia and Oceania and 1 from Latin America and Caribbean. All papers, excluding one, implemented interventions that targeted more than one life course stage. Table 3 presents the service delivery and integration elements that were incorporated within the studies and across the life course stages based on the studies' targeted populations.

Some papers integrated other critical health system functions into their intervention, including 11 incorporating demand generation, 8 in monitoring and evaluation, 8 in stewardship and governance, 6 in planning and 2 in financing.

Of the 24 included papers, 20 incorporated more than one intervention type. Sixteen included prevention, 20 included promotion and 17 included treatment in their interventions. However, no intervention included rehabilitation.

Human resources

Interventions to support integrating human resources were observed across multiple contexts, including training non-eye care providers in the promotion, detection or treatment of basic eye care in primary care or

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Table 2 Characteristics of included studies

First author (reference)	Year	Country	Methodology	Service delivery – integration elements	Other integrated health system functions	Key outputs/outcomes
Abebe[35]	2019	Ethiopia	Cross-sectional	HR, GCP	DG	Proportion of implementation and associated factors
Ajay[28]	2016	India	Mixed methods	HR, GCP, PSM, SI	DG, ME, PL	Patient attendance; number of known and new cases of hypertension and diabetes; mean change in blood pressure and fasting plasma glucose
Amritanand[40]	2018	India	Observational	GCP, PSM	Nil	Proportion of correct referrals
Bechange[18]	2021	Pakistan	Qualitative	HR, SI	Nil	Experiences of teachers and eye care providers
Bechange[30]	2021	Pakistan	Qualitative	HR, GCP, SI	DG	Experiences of patients and health workers
Carnell[19]	2014	Ethiopia	Quasi-experimental	HR, SI	DG, FI, ME, PL, SG	Vaccination coverage; vitamin A supplementation coverage
Jimenez Carrillo[37]	2020	El Salvador	Case study	HR, GCP, PSM, RS	DG, ME, PL, SG	Experiences of patients and health workers
Habtamu[26]	2011	Ethiopia	Qualitative	HR, SI	PL	Experiences of eye care providers
Jacoby[25]	2016	South Africa	Retrospective	HR, GCP, SI	Nil	Number of referrals, detection, management and treatment outcomes
Johari[38]	2020	Malaysia	Qualitative	HR, GCP, SI	DG, ME	Experiences of patients
Jolley[20]	2017	Tanzania	Qualitative	HR, PSM, SI	ME, SG	Experiences of eye care providers
Kalua[32]	2014	Kenya, Malawi and Tanzania	RCT	HR	ME, SG	Availability of eye care equipment; knowledge and eye care skills
Lall[29]	2020	India	Mixed methods	HR, GCP, SI	ME	Patient attendance; mean change in blood pressure and fasting plasma glucose
Lebina[39]	2019	South Africa	Cross-sectional mixed methods	HR, GCP, SI	Nil	Implementation fidelity
Lilian[21]	2018	South Africa	Cross-sectional	HR, GCP, PSM, SI	Nil	Availability of eye care equipment; knowledge and eye care skills
Mafwiri[22]	2014	Tanzania	Historical comparison	HR, GCP, RS	DG, SG	Knowledge and eye care skills
Mafwiri[23]	2016	Tanzania	Mixed methods	HR, GCP	DG	Knowledge and eye care skills; experiences of eye care providers
Malik[34]	2020	Tanzania	Pre-post	HR, GCP	DG	Knowledge and eye care skills
Okwen[33]	2014	Tanzania	Quasi-experimental	HR	SG	Knowledge and eye care skills
Pente[27]	2021	Sierra Leone	Qualitative	HR, GCP	DG, ME, PL, SG	Experiences of eye care providers
Rono[31]	2018	Kenya	Cluster-RCT	HR, RS	Nil	Patient referral attendance
Shantha[36]	2021	Sierra Leone	Descriptive	HR, SI	PL, SG	Implementation lessons learnt
Yip[24]	2018	Rwanda	Mixed methods	HR, GCP, PSM, SI	DG, FI	Experiences of eye care stakeholders; availability of eye care equipment; implementation fidelity
Zeng[41]	2020	China	Cluster-RCT	RS, SI	Nil	Patient referral attendance

DG, demand generation; FI, financing; GCP, guidelines and care pathways; HR, human resources; ME, monitoring and evaluation; PL, planning; PSM, procurement and supply-chain management; RCT, randomised controlled trial; RS, referral systems; SG, stewardship and governance; SI, shared infrastructure and structural integration with other services.

school-based settings,[18–24] retinopathy of prematurity screenings,[25] or ophthalmic surgeries,[26 27] managing non-communicable diseases (NCDs)[28 29] and incorporating immunisation into child healthcare.[30 31] Upskilling district eye coordinators visiting primary healthcare settings in 'enhanced' supervisory methods were also tested.[32 33]

Training resulted in mixed responses and outcomes. For primary eye care workers in Tanzania, training was well

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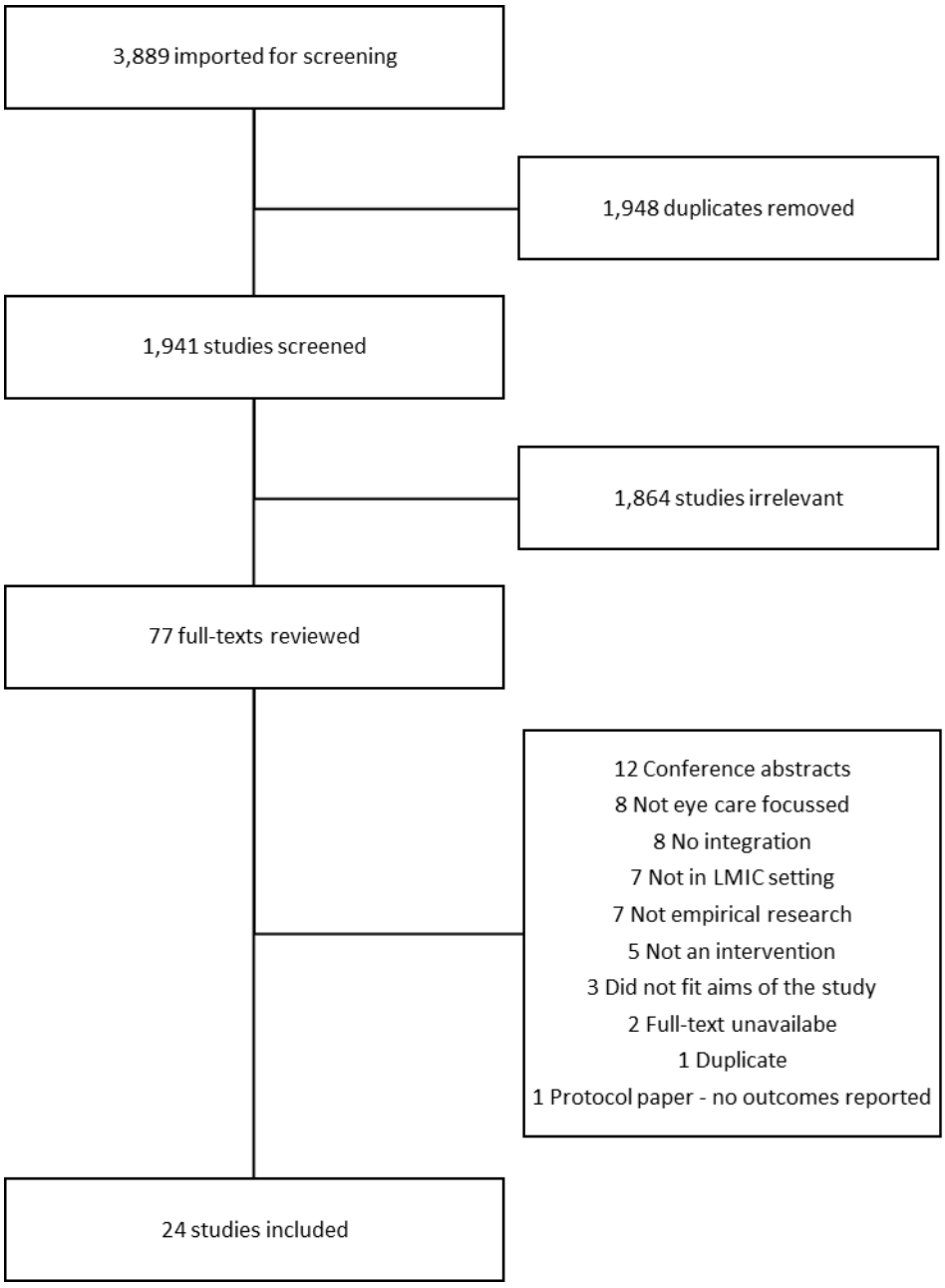


Figure 1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow chart of systematic review process and sampling. LMIC, low-income and middle-income country.

received,[22 34] however, having mixed cadres with varying literacy levels at the same training left some clinical officers disappointed by the level of information provided.[22] Teachers in Pakistan felt the duration of vision screening training was too short, where only half of the intended time allocated was provided, due to poor planning and transport issues for trainers to attend schools.[18] Consequently, shortened training may have led to confusion among teachers around correct use of visual acuity charts.

Attitudes towards eye care did not significantly improve with nurses in South Africa after primary eye care training.[21] This differed in Tanzania where reproductive child health staff who received eye care training improved in attitudes that resulted in training others in eye care.[22 23] With capacity development, Kenyan teachers could effectively refer children requiring further eye care using smartphone technology,[31] yet teachers in Pakistan struggled to complete referral forms.[18] Post implementation, trainees also requested refresher training to maintain newly acquired skills.[27 30 35]

Though additional trained workers were available to provide eye care in Pakistan,[30] Ethiopia,[26] Tanzania,[20 22 23] Sierra Leone[36] and Rwanda,[24] the lack of education materials, short-lived diagnostic and treatment consumables for eye injuries and infections or surgeries were a key hinderance to service provision. Providing educational sessions to nursing staff and meetings discussing case studies enabled better retinopathy of prematurity care

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Table 3 Distribution of articles by service delivery element according to life course stage

Service delivery: elements of integration	Life course stage (no. of articles)						
	Before birth (n=0)	Infancy (0–12 months) (n=14)	Childhood (>1–9 years) (n=18)	Adolescence (10–17 years) (n=14)	Young adulthood (18–40 years) (n=12)	Middle-age (41–64 years) (n=15)	Older age (>65 years) (n=15)
Guidelines and care pathways (n=15)	0	10	9	7	8	11	11
Human resources (n=22)	0	13	16	13	11	14	14
Procurement and supply-chain management (n=6)	0	4	4	3	4	5	5
Referral systems (n=4)	0	1	3	1	0	1	1
Shared infrastructure and structural integration with other services (n=15)	0	8	10	8	8	10	10

of infants in South African paediatric tertiary hospitals,[25] and providing interpreters to facilitate counselling and consent for Ebola virus survivors requiring diagnostic testing and cataract surgery improved patient care.[36]

Limited senior support or supervision were reported challenges in settings where eye care workforces were increased.[18 20 23 26 35] This included either lack of relevant personnel or introduction of supervisory processes that did not pertain to eye care. Furthermore, interventions that introduced enhanced supervision in integrated eye care services conducted in Tanzania, Kenya and Malawi, were faced with challenges of workforce attrition and absenteeism.[32 33]

In Sierra Leone, ophthalmic community health officers and ophthalmologists alternatively sought advice from either eye care staff from upper-level facilities or internationally, calling networks in the USA using technology.[27 36]

Primary health staff transfers and turnover were reported as barriers to intervention success in India, Rwanda and South Africa.[21 24 29] Where this barrier was noted in Rwanda, efforts were then made to generate a continual supply of primary eye care nurses by including eye care into the nursing training curriculum.[24] Female Health Workers in Pakistan and Ophthalmic Community Health Officers in Sierra Leone experienced remuneration or promotion issues, and distrust from community members and hospitals who did not accept their referrals, leading to significant job dissatisfaction despite gaining additional skills and responsibilities.[27 30]

Delegating eye care responsibilities to non-eye healthcare workers', such as Accredited Social Health Activists, Female Health Workers, teachers and nurses, or switching to comprehensive integrated protocols, led to observations or reports from workers regarding the lack of time for service provision due to competing priorities or significant increases in consultation time.[18 26 29 30 35]

External funding from governmental and non-governmental organisations were required to facilitate service provision programmes, yet they were often limited and finite, suggesting lack of sustainability.[20 24 26 27] Other challenges for workers to adhere to new integrated service provision processes included health workers' perceptions that most eye-related issues were non-urgent,[30] hierarchical culture in a primary care practice[29] and an inability to implement a sustainable scale up.[19]

Guidelines and care pathways

Twelve papers developed or provided integrated eye care guidelines, protocols, pathways, manuals and training modules for non-eye care specific workers. Intervention strategies included Integrated Management of Neonatal and Childhood Illness protocol and procedures,[18] hypertension and diabetes guidelines and care pathways for primary care workers,[28 29 37–39] screening protocols for community and hospital health workers to detect vision impairment, cataracts or retinopathy of prematurity,[25 30 40] guidelines and training manuals on the management or referral of eye conditions for primary health staff[21 22 27 34] and clinical protocols provided in the primary care nursing education curriculum.[24]

Healthcare workers reported challenges to guidelines and clinical pathway adherence including difficulty with Integrated Management of Neonatal and Childhood Illness protocols,[18] a mobile decision support tool requiring too many data elements to be collected which impacted patient flow,[28] and Accredited Social Health Activists who were unable to complete their outreach work due to inaccessibility of clinical records.[29] Reducing the number of data elements,[28] having an additional coordinator, and external help from the research team assisted in improving service provision.[29] Furthermore, a key component of several eye care pathways is referring patients when required. Unestablished or poorly integrated referral systems constrained primary care workers from providing effective care.[27 30 34]

Patient adherence to care pathways were hindered by lack of information, poor past experiences with referrals, costs of medication or procedures at upper-level facilities[27 30] and difficulties in following new processes that led to preferential use of doctors rather than nurses for NCD management.[29] Integrated care pathways that included

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support groups for learning about NCD management were appreciated by patients.[37]

Shared infrastructure and structural integration with other services

Eleven papers described strategies for sharing infrastructure and structural integration with other services including co-locating ophthalmic services with NCD or infectious disease services,[36 38–41] integrating eye care indicators within health management information systems,[20] project teams sharing space with subregional health offices,[19] health supervisors incorporating eye care supervision with other health areas,[26] creating a dedicated retinopathy of prematurity screening space and providing more blenders and oxygen saturation monitors in neonatal units,[25] counselling services with diabetes care[28] and incorporating NCD care in primary health services.[29] However, few studies reported any factors impacting integration success. Coordination appeared to be a contributor to the success of shared infrastructure. An eye hospital in Sierra Leone noted a well-coordinated effort was required to incorporate infectious disease specialists and laboratory testing with cataract services to ensure the safety of health workers when exposed to Ebola virus survivors, that involves a complex consenting process, and timely sample collection and testing prior to surgery.[36]

In Tanzania not assigning the responsibility to integrate eye health records into medical records led to inconsistencies in service delivery.[20] In primary healthcare settings, integrating medical records improved hypertension and diabetes management, contributing to diabetic retinopathy prevention.[39] Delivering other services, such as counselling and eye care services present in the same facilities, were all well-received by patients.[28 38]

Organising dedicated spaces for eye care workers within relevant services or support organisations were considered strategic approaches to developing eye care. A dedicated retinopathy of prematurity screening room and incubator were built within the neonatal unit to generate awareness among paediatricians of the eye care service.[25] In Ethiopia, Essential Services for Health project teams situated themselves in health offices to enable stakeholder engagement, build capacity and improve sustainability of integrated child health interventions.[19] However, when sharing spaces for chronic disease care with other clinical services, a lack of appropriate resources for managing different conditions in consultation rooms led to inefficiencies.[39]

Referral systems

Four papers described different approaches to strengthening referral systems between community or primary healthcare to secondary or tertiary hospitals. In El Salvador, those with NCDs had a Community Family Health Team that coordinated care closely with a Specialised Community Health Team, that included eye care.[37] In Tanzania, primary healthcare workers were advised to refer children needing additional eye care to a project-associated eye hospital, to keep records of the referral and to contact the dedicated Childhood Blindness Coordinator who would follow-up with parents.[23] In Kenya, electronic referrals through Peek Vision and SMS (short messaging service) reminders to parents showed an increase in referral uptake for children to attend a secondary hospital.[31] In China, informing parents that the recommended referral centre for their children had trained eye care providers from an esteemed tertiary hospital also increased referral uptake to attend secondary-level services.[41] Easy referrals through technology were considered a useful approach, although patient, system and geographical factors continued to hinder referral compliance including long wait times before receiving an appointment, travel time to the hospital, affordability, limited previous experience with eye care and the lack of perceived need for care.[37 41]

Procurement and supply chain management

Six papers described integrating procurement and supply chains of eye care resources with other health systems. Receiving district, state or national support for supplying eye medications had variable impact that depended on the level of engagement and communication with the district or regional suppliers. In India, Rwanda and El Salvador, reports of regular engagement and advocacy for eye medication procurement appeared to improve supplies and avoid shortages.[24 28 37] In South Africa, tensions between staff cadres and ineffective communication led to supply management issues when attempts were made to engage pharmacists for supplying ophthalmic medications in primary healthcare centres.[21] In Tanzania, it was reported that antimicrobial eye drops and ointments were expected but rarely received when integrated with the Medical Stores Department. Although the outcomes in Tanzania were reported to be due to lack of health systems funding,[20] there was also no mention on the communication with different system levels.

DISCUSSION

Our review has identified and described a variety of approaches to integrating eye care services within health and other systems, and also reported a range of barriers and facilitators to implementation efforts across different low-income and middle-income settings. Our findings call into question what is needed to support ‘integration’ and ‘people centredness’ in line with the WHO’s IPEC approach.

Almost all included papers reported efforts to integrate eye care through more than one intervention type (prevention, promotion and treatment), though none attempted to integrate rehabilitation services. The dearth of information regarding the integration of rehabilitation care with other services or systems emphasises the need for more attention in this area. We have interpreted rehabilitation interventions in eye care to be services for those with irreversible vision impairment or blindness,

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also known as low vision. It has been long recognised that low vision services have been poorly integrated into mainstream eye care,[42] and recommendations on improving integration involve sharing infrastructure with clinical low vision services in secondary and tertiary eye care centres, improving referral networks and detection and monitoring at primary care levels.[43] The majority of studies in this review were conducted at primary and community care levels, and as eye care rehabilitation has focused on integrating into mainstream eye care systems rather than broader healthcare systems, which might explain gaps in the literature.

The 2030 Rehabilitation Initiative, launched in February 2017, focusses on a range of disabilities including vision loss.[44] Although one of the top 10 priority areas for the initiative is integrating rehabilitation in the health sector,[44] the Guide for Action was only published in 2019,[45] hence there is limited availability of evidence on implementation. Many countries have, at best, only progressed to releasing national strategic plans, and are yet to implement rehabilitation integration strategies. However, more collaborative research with policymakers, and health and disability service providers is needed to develop localised strategies to improve integration of rehabilitation services, as there is currently little evidence to inform future interventions.

The majority of included studies were conducted in the African region, therefore limited information available from the Latin America and Western Pacific regions. Additionally, most studies involved integrating eye care services with other services at the same (primary/community level) or different levels of the health system through human resources development.

In Africa, when healthcare stakeholders were surveyed on health system challenges, the most frequently reported challenge was inadequate human resources.[46] Such issues might be similarly recognised in eye care systems, as highlighted in the interventions addressing human resources in this review. Some of the identified key challenges to integrating human resources, including at the community level for case detection and referrals, were the need for ongoing support and supervision, refresher training and efforts to improve worker retention. Longer-term supports, such as ongoing investment in human resource development, appeared to be beyond the duration of the studies and was rarely monitored. Supportive supervision has been shown to improve worker motivation and job satisfaction,[47] and therefore could contribute to worker retention. However, whether clinical outcomes improve due to supervision has been modest or inconclusive.[32 47]

Even if the challenges of human resources are addressed, additional barriers to sustainability exist, particularly if other critical health system functions are not considered. As observed in this review, additional barriers include having inadequate referral systems, poor supply chain management, inadequate or poorly maintained health information systems, procurement issues and finite financing from government and non-governmental organisations. Similar challenges within health systems strengthening and supportive supervision research have been reported.[46 47] Though some studies in this review attempted to strengthen their health system by integrating multiple critical health system functions, each component often had varying outcomes. The level of integration appeared to be associated with building strong relationships with stakeholders, whether it be supervisor to supervisee, eye care providers and pharmacists or even service providers and funders or policymakers, as well as good coordination when services were integrated through shared infrastructure and co-location of services.

As recommended by the Lancet Commission on Global Eye Health, the eye care workforce should meet population needs, either through dedicated eye health personnel or by integrating eye care competencies within the broader healthcare workforce.[3] Building the eye care workforce through training of more ophthalmologists, optometrists and mid-level ophthalmic personnel is a long process, that alone cannot address the population eye care needs.[3] The IPEC approach recommends a reorientation of evidence-based eye care service delivery towards primary and community healthcare settings that are appropriately resourced.[3 5] This study has highlighted some challenges faced when redistributing eye care provision to other primary care settings where workers might already be at full capacity, have competing priorities, varying capabilities and limited motivation. For each setting, estimating the capacity of primary care to absorb eye care capacities should be cautiously approached, and whether an additional workforce profession is more appropriate and sustainable should be considered. This includes understanding the role of government, non-government and private stakeholders in delivering eye care services across different national settings and coordinating their workforce planning and resource investments to avoid duplication and wastage.

A people-centred approach to healthcare requires effective provider–patient partnerships, and tailoring care to peoples' needs. Consideration of rights and needs, and of responsibilities and capacities of all the constituents and stakeholders of the healthcare system must be balanced.[48] The study populations in this review rarely covered all parties, such as patients, families, healthcare providers, management and policymakers within the design or review of the interventions, the exception being the implementation of safe cataract services for Ebola virus survivors.[36] The limited evidence around collaboration with beneficiaries and communities suggests that eye care integration is not currently people-centred, which leaves room for more exploration around the role of the patient and/or stakeholders within healthcare integration. Even if there is a shift towards integrated people-centred care, cautious consideration needs to be taken. Patients have demonstrated a perceived improvement in quality of services or have improved usage with integrated services, however there is inconclusive evidence

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to demonstrate integrating healthcare improves patient health outcomes.[49]

It has been suggested that technology advances enable remote eye care (telehealth or teleophthalmology) using either mobile health applications, telecommunication tools or artificial intelligence, and therefore theoretically support a wider and more efficiently organised health workforce to deliver care.[3] Investments into telehealth eye care technology and services in primary care settings have focused on screening purposes.[31 50 51] However, increasing the availability of screening has had mixed results in equating to patients complying with recommended referrals, and receiving appropriate care.[31 52 53] Although improving availability of technology could improve care usage, referral compliance were faced with barriers.[31] Investment into technology for service delivery needs to be coupled with addressing patient adherence barriers.

CONCLUSION

Integrating eye care services, workers, capacities and needs into primary and community care services in low-resource settings are influenced by existing resource limitations, competing healthcare priorities and the need for ongoing support, coordination and funding. Eye care integration is challenging and complex, especially when settings have varying cultural, social and political situations. This review has highlighted a need for people-centred approaches to be a central principle, and to consider multiple critical health system functions and their potential elements of integration when planning future interventions. Additional interventions with evaluation, to investigate the integration of low-vision rehabilitation services into other healthcare levels and services are needed.

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ORCID iDs

Ling Lee http://orcid.org/0000-0003-0908-7280
Elise Moo http://orcid.org/0000-0002-6132-8427
Aryati Yashadhana http://orcid.org/0000-0003-2573-8637

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