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Full Length Research Article

RELEVANCE OF THE ALMA-ATA DECLARATION TO EYE HEALTH PROMOTION: IMPLICATIONS FOR BINOCULAR VISION OUTCOMES

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ABSTRACT
Health promotion is a vital part of primary health care (PHC) that enables individuals and societies to take control of their own health. The Alma-Ata Declaration emphasizes health literacy, disease prevention and control and community involvement as pillars of PHC for the early detection and diagnosis of health-related events. These pillars directly advance the 2030 Agenda by ensuring healthy lives and well-being (SDG 3), fostering the knowledge necessary for quality education (SDG 4), and sustaining a productive workforce for inclusive economic growth (SDG 8). This review aimed to evaluate the relevance of the Alma-Ata Declaration to eye health promotion and implications for binocular vision (BV) outcomes. A narrative review design was used to synthesize existing literature on the relevance of the Alma-Ata Declaration to the promotion of binocular vision. Published literature was synthesized through Google Scholar, PubMed, and African Journals Online electronic databases. Health education and behavioural interventions were associated with reduced digital eye strain and improved accommodative and vergence function. Community-based and school screening programs enhanced early detection of binocular vision anomalies. Policy-driven initiatives enabled large-scale screening and improved access to pediatric eye care. Multi-sectoral collaboration, including integration of education and technology sectors, improved diagnostic accuracy and functional visual outcomes. Integrating eye care into PHC facilitated early diagnosis, preventing long-term binocular dysfunction. Integration of Alma-Ata Declaration principles into modern eye care systems offers a sustainable approach to reducing not only avoidable blindness but also binocular vision dysfunction, which significantly impacts quality of life and productivity.

Keywords: Alma-Ata Declaration, Amblyopia, Binocular vision, Health Promotion, Primary Health Care

INTRODUCTION

The Alma-Ata Declaration defined health promotion as an essential component of primary health care, emphasizing health literacy, disease mitigation and community involvement, along with broader intersectoral action to tackle social factors influencing health, for early detection and diagnosis of health-related events (Moyegbone et al., 2021). Notably, the Declaration explicitly includes health promotion in the scope of PHC, listing it as one of the core elements alongside nutrition, sanitation, immunization and maternal and child health (World Health Organization-United Nations Children Fund, 1978). The approach is rooted in principles of equity, community participation, and multisectoral collaboration. Notably, the Declaration explicitly includes health promotion within the scope of PHC, listing it as one of the core elements alongside nutrition, sanitation, immunization, and maternal and child health (World Health Organization-United Nations Children Fund, 1978). The approach is rooted in principles of equity, community participation, and multisectoral collaboration (Ogor et al.,2026). It recognizes that achieving health for all requires action beyond the health sector, involving agriculture, education, housing, and industry (World Health Organization-United Nations Children Fund, 1978; Birn, 2018). Health promotion under Alma-Ata is not limited to individual behavior change but aims to empower communities and transform structural conditions that influence health (Odoko et al., 2021).

Alma-Ata Declaration affirms that PHC focuses on major health challenges within a community through appropriate promotion, prevention, and rehabilitative interventions, confirming health promotion as a central, ongoing function rather than a supplementary activity (World Health Organization-United Nations Children Fund, 1978). Basic health promotion components are rooted in a holistic, participatory, and multi-sectoral approach that empowers individuals and communities to assume responsibilities for their own health (Agege et al., 2020). Recent evidence indicates that behavioural factors, particularly prolonged near work and digital device use, are strongly associated with accommodative and vergence dysfunction, contributing to digital eye strain and visual fatigue (Morse & Oatts, 2025). Health education interventions targeting these behaviours have been found to enhance visual habits and alleviate symptoms, supporting Alma-Ata's emphasis on preventive health strategies. Furthermore, binocular vision disorders such as amblyopia are highly time-sensitive, with treatment outcomes strongly dependent on early detection and adherence to therapy. Studies demonstrate that early screening and intervention can reduce the prevalence of amblyopia by up to 60%, with early treatment significantly improving binocular outcomes (Birch et al., 2021). These findings reinforce the Alma-Ata principle that early, community-based care is more effective than late-stage intervention. Primary health care-based screening enables early identification and referral of binocular vision anomalies, ensuring timely intervention. Despite the global trend toward integrating eye care into PHC systems as one of the most effective strategies for reducing avoidable blindness and improving functional vision outcomes, low-resource countries, including Nigeria, have yet to comply with the Alma-Ata principle fully. This review aimed to evaluate the relevance of the Alma-Ata Declaration to eye health promotion and its implications for binocular and functional vision outcomes.

MATERIALS AND METHODS

This study utilized a narrative review design to synthesize existing literature on the relevance of the Alma-Ata Declaration to health promotion and binocular vision. A total of sixty-five (65) published works were initially identified through critical searches of Google Scholar, PubMed, and African Journals Online (AJOL)

electronic databases as well as the Mendeley reference library. Additional articles were obtained through manual searches of reference lists of relevant studies. Keywords used included 'Alma-Ata Declaration', 'Alma-Ata Declaration and eye health/eye care', 'health promotion and binocular vision', 'health promotion and eye health', 'community engagement and eye care/eye health'. Boolean operators such as "and" and "or" were applied to refine search outputs. Studies included peer-reviewed journals, conference reports, and English-language global or national health proceedings that explicitly focused on eye health/vision, the Alma-Ata principles, health promotion, or binocular vision. Research articles published within the last five years were given preference to ensure the relevance of recent information. However, older publications were included due to their empirical and historical significance to this review. The majority of the articles included were studies focused on Nigeria and sub-Saharan Africa, as well as other developing countries, given their shared geographical and environmental settings. Duplicated publications, proceedings without empirical or policy relevance, and studies lacking methodological clarity were excluded. Following titles and abstract screening and text review, 44 articles were included in the final manuscript.

RESULTS

Basic Components of Health Promotion

The basic components of health promotion in eye care, aligned with the Alma-Ata Declaration, emphasize the integration of primary health care, community participation, and intersectoral action to prevent avoidable blindness, as shown in Figure 1.

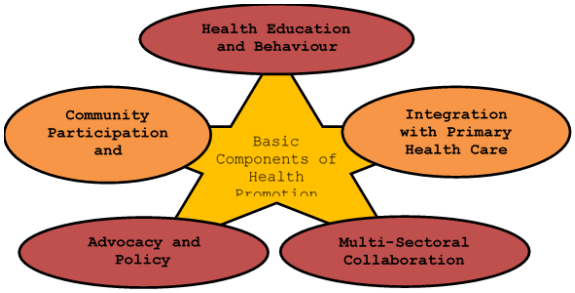

Figure 1: Basic components of health promotion

Educating communities about preventable eye diseases such as trachoma, vitamin A deficiency and cataracts, among others, helps promote early care-seeking and preventive practices (Hubley & Gilbert, 2006). Active community involvement in planning, implementing, and evaluating eye care services emphasizes Alma-Ata's call for self-reliance and local control over endemic eye diseases (Durrance-Bagale et al., 2022; Shukla, 2022). Community involvement includes training of community health workers and volunteers for eye screening, eye health promotion, and drug distribution (Moyegbone et al., 2020; Luangphituck et al., 2025). Training community health workers on basic vision care and health literacy promotion enables early detection and referral, consistent with Alma-Ata's vision of using local resources (Mueller, Keel and Cieza, 2021). It is paramount that eye care be embedded within PHC systems, alongside other elements such as maternal and child health, immunization, nutrition, and sanitation initiatives, to address the root causes of visual impairment and avoidable blindness (Moyegbone et al., 2020; Moyegbone et al., 2021). Regarding advocacy and policy development, it is necessary for all actors and stakeholders in the healthcare sector to promote national and local policies for blindness prevention, including resource allocation and the inclusion of eye health in universal health coverage agendas (Hubley & Gilbert, 2006). Additionally, multisectoral collaboration among sectors such as education, water and sanitation and agriculture helps create adequate supportive environments for eye care (Moyegbone et al., 2020). For example, an adequate water supply helps maintain facial cleanliness, thereby preventing trachoma (WHO, 1978; Hubley & Gilbert, 2006). These components reflect the Alma-Ata principles of equity, accessibility, and community ownership in achieving "Health for All," with eye health as an integral part of primary care (Ogor et al., 2026).

Table 1 below shows how the five core PHC components of the Alma-Ata Declaration operate at different yet complementary levels to improve binocular vision and reduce visual impairment. Health education and behaviour change act at the individual level, modifying risky visual habits (e.g., prolonged screen use), thereby reducing digital eye strain and improving accommodative and vergence function. Community participation improves access and uptake of services, leading to early detection of binocular anomalies (e.g., strabismus) and timely management of amblyopia. Advocacy and policy development operate at the population/system levels, scaling up screening programs and ensuring the inclusion of binocular vision care in national health priorities. Multi-sectoral collaboration integrates health, education, and technology sectors, improving screening coverage and linking visual function to academic and occupational performance. Primary health care integration ensures early diagnosis, referral, and continuity of care, which are essential for preventing long-term binocular dysfunction and avoidable blindness.

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Table 1: Alma-Ata Components and their Impact on Binocular and Functional Vision Outcomes

Component	Key Interventions	Recent Evidence	Mechanism Linking to Binocular Vision	Specific Binocular and Functional Vision Outcomes
Health Education & Behaviour Change	- Screen-time regulation education - Eye health awareness campaigns - Routine eye examination promotion - School-based eye health programs	- Behavioural factors (e.g., prolonged near work, screen exposure) linked to accommodative and vergence dysfunction (Waseem et al., 2023) - Early compliance improves amblyopia outcomes (Morse & Oatts, 2025)	- Reduced visual stress from near work - Improved compliance with treatment - Early care-seeking behaviour	- Reduced digital eye strain and visual fatigue - Improved accommodative amplitude and vergence function - Prevention of amblyopia progression
Community Participation & Empowerment	- School vision screening - Community outreach programs - Use of community health workers - Home-based screening tools	- Community/home screening improves early detection of amblyopia (Sii et al., 2023). - Increased screening uptake with photoscreeners (Stults et al., 2024)	- Increased accessibility and early case identification - Improved follow-up and compliance	- Early detection of binocular vision anomalies (e.g., strabismus) - Prevention of amblyopia - Improved binocular development in children
Advocacy & Policy Development	- National screening programs - Policy inclusion of pediatric eye care - Funding for screening technologies - Standardized clinical guidelines	- Large-scale screening improves detection of amblyopia risk factors (Oatts et al., 2025) - Amblyopia recognized as a major preventable visual disorder (El Harrak, 2025)	- Policy-driven scale-up of screening - Standardization of diagnostic protocols	- Reduced population-level amblyopia prevalence - Early detection of binocular dysfunction - Improved access to pediatric eye care
Multi-sectoral Collaboration	- School-health integration - NGO partnerships - AI/technology-assisted screening - Public-private partnerships	- AI-based screening systems show high diagnostic accuracy (Shu et al., 2024) - Eye-tracking systems improve detection of visual abnormalities (Zrinšćak et al., 2021)	- Integration of education, health, and technology sectors - Improved screening accuracy and reach	- Early detection of binocular anomalies - Improved academic and occupational visual performance - Enhanced diagnostic precision
Eye Care Integration into PHC	- Eye care integration into PHC - Training PHC workers - Routine childhood vision screening - Referral systems	- Early screening reduces amblyopia prevalence by up to 60% (Birch et al., 2021) - Early treatment reduces residual amblyopia by ~70%-Screening protocols detect binocular anomalies (Birch et al., 2021)	- Early diagnosis at community level - Timely referral and treatment - Continuity of care	- Prevention of amblyopia and long-term visual impairment - Improved vergence and accommodative function - Sustained binocular visual performance

DISCUSSION

Health promotion plays a critical role in addressing binocular vision anomalies (BVAs), such as convergence insufficiency, decompensated heterophoria, and vertical heterophoria, by raising awareness, facilitating early detection, and supporting non-invasive interventions. These conditions, affecting an estimated 21–38% of the population, often go undiagnosed due to subtle or non-specific symptoms such as headaches, eye strain, dizziness, and reading difficulties, particularly in children and individuals with neurological conditions (Richard, 2022). School-based vision screening programs help identify BVAs early, preventing academic underachievement. Children with undetected binocular deficits may struggle with sustained near work despite normal distance vision (Hussaindeen *et al.*, 2018; Mayro *et al.*, 2018). Health promotion increases awareness among parents, teachers, and primary care providers about the signs of BVAs. Studies show that symptom surveys in clinical settings identify 50–60% of patients needing further binocular vision testing (Richard, 2022).

Evidence-based interventions show that vision therapy, comparable to physical therapy for the visual system, is effective for managing BVAs. Health promotion supports patient adherence to office- and home-based vision therapy, especially after concussion, in attention-deficit/hyperactivity disorder (ADHD), or Lyme disease (Hussaindeen *et al.*, 2018; Richard, 2022). Aligning with the Alma-Ata Declaration, integrating binocular vision assessment into primary care ensures equitable access to eye care (Moyegbone *et al.*, 2021). Lifestyle and environmental modifications such as ergonomic screen use, visual breaks, and proper lighting are evidence-based behavioral change strategies to mitigate digital eye strain and binocular vision anomalies. Ergonomic screen positioning (20–28 inches away, 15–20° below eye level) reduces accommodative and vergence demands, particularly beneficial for individuals with convergence insufficiency or decompensated heterophoria (Pucker *et al.*, 2024; Manna, 2026). Proper lighting and glare reduction minimize visual discomfort and stabilize binocular function, especially in individuals with heightened sensitivity due to BVA (Pucker *et al.*, 2024; Manna, 2026). The behavioral change of the 20-20-20 rule (i.e., for every 20 minutes focus on near object tasks; a 20-second break is required to look at an object 20 feet away) can help lessen ocular surface symptoms and improve accommodative facility for

enhanced binocular and functional vision outcomes (Talens-Estarelles *et al.*, 2023; Redondo *et al.*, 2025).

In communities, many BVAs are typically misinterpreted. Common misconceptions about binocular vision anomalies (BVAs) include;

i. The belief that symptoms like headaches, dizziness, and reading difficulties are solely due to learning disorders (e.g., ADHD or dyslexia), anxiety, or chronic migraines when they may stem from undiagnosed BVAs such as convergence insufficiency or vertical heterophoria (Genizi *et al.*, 2013).

ii. Another myth is that standard eye exams can detect all vision problems (Alhazmi *et al.*, 2024). Standard eye exams often fail to detect binocular vision anomalies (BVAs) because they primarily assess visual acuity and ocular health rather than functional eye coordination (Tong *et al.*, 2021). Christian *et al*. (2018) found that over 75% of children with reading difficulties had normal 20/20 vision. However, more than one-third exhibited abnormal results on binocular vision tests, such as convergence insufficiency or accommodative dysfunction.

iii. In some cultures, strabismus (crossed eyes or squints) is incorrectly attributed to spiritual or supernatural causes, such as the "evil eye" or divine punishment. However, peer-reviewed evidence confirms that strabismus results from anatomical, neurological, or refractive abnormalities, including cranial nerve palsy, refractive errors, prematurity, and genetic factors—not spiritual forces (Alemayehu *et al.*, 2022). Consequently, misconceptions delay care-seeking behavior and contribute to stigmatization and amblyopia. A study in Ethiopia found that 45.1% of adults had poor knowledge of strabismus, with many holding superstitious beliefs about its cause, underscoring the need for health promotion to correct myths and encourage early treatment (Alemayehu *et al.*, 2022).

iv. Children outgrow lazy eye (Amblyopia). Children do not outgrow amblyopia (lazy eye) without treatment. It is a neurodevelopmental disorder of the visual cortex that results in reduced vision in one eye due to altered binocular input during the critical stage of visual pathway development (Morse & Oatts, 2025). Without intervention, amblyopia can lead to permanent visual impairment. Peer-reviewed evidence confirms that early treatment is essential, as visual plasticity declines with age. While treatment can be effective beyond age 7, younger children show faster and greater improvement (Boniquet-Sanchez & Sabater-Cruz, 2021). The Amblyopia Treatment Studies (ATS) demonstrate that timely intervention with optical correction, patching, or atropine significantly improves visual outcomes, but untreated amblyopia persists into adulthood in most cases (Birch *et al.*, 2021; Boniquet-Sanchez & Sabater-Cruz, 2021).

v. The misconception that prolonged near tasks such as reading cause squint. The myth that prolonged reading causes strabismus (squints) is not supported by scientific evidence (Assaye *et al.*, 2020). Strabismus results from neuromuscular imbalances in eye alignment, often due to genetic, neurological, or refractive factors, rather than excessive near work such as reading (Noer *et al.*, 2024). While prolonged near tasks may exacerbate symptoms in individuals with pre-existing binocular vision disorders, they do not cause strabismus. A large population-based study found no causal link between reading duration and the development of strabismus, confirming that near work is not a primary etiological factor (Friedman *et al.*, 2009).

Key contributions of health promotion to the rectification of health-related misconceptions are:

i. ***Raising public and professional awareness:*** Raising public and professional awareness among educators, pediatricians, and mental health providers about the visual origins of seemingly non-ocular symptoms is essential (Odoko *et al.*, 2021). Binocular vision anomalies such as convergence insufficiency can mimic ADHD symptoms, including inattention, fidgeting, and poor reading comprehension. According to Borsting et al. (2005), children with convergence insufficiency had a threefold higher likelihood of being diagnosed with ADHD, and visual symptoms significantly correlated with attention deficits, underscoring the need for interdisciplinary awareness and comprehensive vision evaluation before psychiatric diagnosis. Health literacy, being an aspect of health promotion, is known to affect treatment adherence and patient outcomes. A clear communication style and use of the teach-back method can help debunk many myths and half-truths about BVAs (Pergolizzi & LeQuang, 2025). Awareness initiatives and vision health campaigns have been linked to higher rates of eye care utilization among risk populations in Australia from 61% to 70% (Müller et al., 2007), highlighting the critical public health implication that targeted health promotion effectively reduces the burden of preventable vision loss by facilitating early detection and management of sight-threatening conditions.

ii. ***Promoting early screening in schools and primary care to prevent academic underachievement:*** Early vision screening in schools and primary care is critical for identifying BVAS that are often misattributed to learning disabilities. According to Wood et al. (2018), children with poor performance on binocular vision tests, such as the Developmental Eye Movement (DEM) test, scored significantly lower on standardized academic assessments in reading, spelling, and numeracy, even after controlling for socioeconomic status. This implies that undiagnosed binocular vision disorders are a modifiable risk factor for academic underachievement and that integrating comprehensive functional vision screenings into routine child health protocols is necessary to prevent long-term educational disparities and reduce the burden of misdiagnosed learning disabilities.

iii. ***Advocating for integrated eye care:*** Integrated eye care within PHC conforms to the Alma-Ata Declaration's goals, including equity, accessibility, and community-based healthcare services (Nusrat *et al.*, 2018). Research analysis confirms that primary eye care (PEC) should be fully integrated into PHC systems to mitigate avoidable blindness, ensure early detection of conditions like amblyopia and strabismus, which are

often misattributed to learning disabilities, and adequately manage them (Moyegbone *et al*., 2020). Lee *et al*. (2023) further emphasize that integrated population-centred eye care (IPEC) is essential for universal health coverage and requires coordination across health, education, and social services.

Conclusion

Health promotion, as a cornerstone of the Alma-Ata Declaration, is pivotal in advancing binocular vision care and overall visual health. Empowering individuals and communities to take control of their health fosters preventive behaviors, dispels misconceptions about binocular vision anomalies, and promotes early detection and treatment. Aligned with the Declaration's principles of equity, community participation, and inter-sectoral collaboration, health promotion integrates education, improved access to services, and advocacy. Leveraging technological advancements and evidence-based public health strategies, it holds significant potential to minimize the impact of preventable visual disability and enhance visual outcomes globally in the future.

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