

Socio-Economic Implications of Refractive Errors: The Way Forward

Dear Editor:

This letter showcases the socio-economic implications of uncorrected refractive errors and factor militating against spectacle use for its correction, especially in low- and middle-income countries as well as offers some ways forward.

Maintenance of good eye health is essential, as clear and functional vision is critical for achieving people's potential educationally and economically, and maintaining their independence, and well-being. This is evident from the initiatives taken in different communities to help individuals with visual impairments manage everyday activities independently.^{1,2}

Despite the important functions of the eyes, many people do not take appropriate care of their eye health through regular routine eye checkups or adherence to eye care practitioner's instructions regarding their eye health status. This may result in avoidable vision problems or blindness and subsequent complications due to negligence and their unawareness.³ Nevertheless, having a good understanding of common eye issues enables people to pursue timely treatment and follow recommended solutions, ultimately enhancing their vision and improving their overall eye health.⁴

Uncorrected refractive errors are often not considered to be a primary global health concern, yet its far-reaching public health and socio-economic implications remain indisputable, particularly in low- and middle-income countries and individual welfare.^{2,5} If uncorrected refractive errors are left unaddressed for an extended period, associated complications

include amblyopia, strabismus (manifest eye deviation), and diplopia (double vision).^{2,4} Clinically, presbyopia is not classified as a refractive error but an error of accommodation due to physiological reduction in amplitude of accommodation.² However, for the purposes of my letter, the term refractive error includes presbyopia.

Globally, uncorrected refractive errors significantly contribute to avoidable visual impairment or blindness, as emphasized by the World Health Organisation (W.H.O.).^{6,7} Avoidable visual impairment or blindness could easily be prevented, treated, or managed by known, cost-effective means.² According to a 2019 global estimate by the W.H.O., more than 2.3 billion individuals were affected by refractive errors, with 670 million experiencing visual impairment due to insufficient access to corrective treatment.^{8,9,10} Most affected people are in rural and developing countries.^{11,12} Furthermore, "the National Blindness and Visual Impairment Study Survey Group in Nigeria (2005-2007) revealed that refractive errors were the cause of 1.4% of avoidable blindness in individuals aged 40 years and above at the survey period."²

The cause of refractive errors remains unclear. However, the associated risk factors include heredity, nutrition, environment, eye's axial length, corneal shape, age, and diseases.¹³ It has no gender, age, race, professional, or socio-economic status barriers.¹⁴ It is seldom preventable and overuse of the eyes does not exacerbate it. Also, nutrition and environmental changes do not prevent refractive errors as they are mostly related to the shape or length of the eyeball and genetics. They occur when light entering the eye fails to focus effectively on the retina with accommodation relaxed due to the abnormal shape or length of the eyeball. However, nutrition can help prevent eye diseases, such as night blindness from vitamin A deficiency, but this is different from wrong focusing of light on the retina. However, environment may affect the progression of the errors,

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especially myopia in children and even though it is neither the cause nor a means of preventing errors if one is genetically prone.¹⁵ Those affected most are children who spend less time outdoors and more time indoors, on near tasks more often, and children who have parents with myopia.¹⁵ Refractive errors can easily be assessed, quantified, and corrected with spectacle lenses, contact lenses, or photorefractive surgery.^{2,14} The preference of the correction type depends on the cost, profession, and the individual's socio-economic status and lifestyle.¹⁴ Others are the individual's prescription (type of refractive error), corneal thickness and shape, pupil size and pupillary distance, age, and eye health, which must be carefully evaluated.

One of the socio-economic implications of uncorrected refractive errors is its economic burden. It results in substantial economic losses due to reduced productivity, increased health care costs, and lost opportunities.^{2,6} Uncorrected refractive errors and other associated causes of avoidable visual impairment result in an estimated annual global productivity loss of about US\$411 billion in purchasing parity, according to the Lancet Commission's Conservative estimates of 2020.^{1,8} Furthermore, addressing uncorrected refractive errors, cataracts, and presbyopia alone would require an investment of US\$244, US\$24.8, and between US\$25 billion and US\$54 billion respectively.^{1,8,16}

With the VISION 2020: The Right to Sight initiative, the W.H.O. and the International Agency for the Prevention of Blindness aimed to provide affordable spectacles lenses for refractive error correction.^{7,9} Despite this initiative, the prevalence of uncorrected refractive errors continues to be significant, particularly in communities with limited or insufficient access to health care.^{2,17} This is due to several barriers, including the lack of awareness, low demand, or acceptance of spectacles when necessary.^{18,19} Low acceptance can result from harmful belief systems, societal influence, and misconceptions that wearing spectacles can deteriorate vision or weaken eye strength.^{17,19} These challenges can cause even educated people to favour cultural norms over scientific evidence and medical advice for refractive error management.³ Other contributing factors include shortage of qualified

eye care professionals, who can deliver essential information and management, financial limitations and costly corrective devices, inadequate government oversight and clinical regulation, urban–rural disparities in service availability, predominance of private sector in refractive and optical services, and low public awareness regarding spectacles.^{1,2,18}

Spectacles remained the most affordable, non-invasive, and widely acceptable method for correcting refractive errors, offering high success rates in improving visual acuity and overall quality of life.¹⁸ Refractive errors can also be corrected by contact lenses and photorefractive surgery, but these options can be expensive. Contact lenses are fragile, easily lost, difficult to maintain, and may lead to complication if not used properly. Spectacles and contact lenses can also serve as fashion and protective devices, helping to hide eye defects and symbolizing dignity.¹⁷

In some low- and middle-income countries like Nigeria, even in jurisdictions where free spectacles lenses are available, many individuals who need them often face stigma that compels them to avoid wearing them. This stems from concerns about being seen as having a visual impairment. Such stigma can lead to serious psychosocial consequences, including anxiety and depression, social isolation, and diminished self-esteem.^{2,19} Others view refractive errors and spectacles as a form of divine punishment or curse, believing they can be resolved through prayer, fasting, or exercise. Some think dietary changes, traditional medicines, or spiritual cleansing can effectively address refractive errors.²

The Way Forward

Understanding people's perceptions of refractive errors and its corrective measures can help eye care professionals tailor effective solutions. This knowledge can also inform eye care policy to identify public needs about refractive errors and prioritize them in health programs, thereby improving productivity and reducing economic losses.

Correcting refractive errors should not merely be viewed as a visual necessity. It is also a crucial step toward promoting social justice, equal opportunities

(education and employment), improved overall quality of life, and reduced socio-economic disparities, especially in low- and middle-income countries.

Community-focused initiatives are needed to curb the rising prevalence of refractive errors and ensure accessible and equitable eye care services for all, regardless of age, gender, socio-economic status, or location.^{16,20} Eye care professionals should advocate for strengthened refractive error services and affordable spectacle lenses at all levels of health care. Professionals should also advocate for integrated eye care in national and social health insurance plans to improve accessibility and affordability.

Community health care workers should be trained and used in effective eye care services delivery, especially in rural communities. An in-depth and feasibility study of telemedicine application should be carried out to reach rural areas.

Educational and awareness programs about refractive errors should be launched through various communication media to promote the importance of regular eye examination and the availability of affordable corrective options.

Comprehensive school vision screening programs should be incorporated into the curricula to facilitate timely identification and management of refractive errors in children.

As well, workplace vision assessment should be implemented for employees in different organizations to boost productivity and safety, particularly in low- and middle-income countries and provinces or states of developed countries where it is yet to be implemented.¹⁶

The W.H.O. member states endorsed a global target for improving effective refractive errors coverage by 40 percentage points by 2030. They also endorsed the global initiative to strengthen refractive error care — Services, Personnel, Education, Cost, and Surveillance (SPECS 2030) — through the provision of quality, affordable, and people-oriented refractive care service to all who need it. Both of these programs should be implemented to the fullest to achieve their objectives.^{16,20} Other nations, organizations, institutions, and private sector representatives should endeavour to join the Global

SPECS Network for efficient universal refractive errors control.²⁰

Finally, the global prevalence of refractive errors underscores the urgent need for everyone across borders to mitigate its socio-economic implications through effective resource allocation and co-ordinated global eye health approach among stakeholders, professionals, and policy-makers. Tackling refractive errors goes beyond public health. It is also vital for unlocking economic development, promoting social equity, and enhancing overall human well-being.

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