



Measures To Prevent Myopia Among Adolescents

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ABSTRACT

Myopia, or nearsightedness, has become a global public health concern, especially among adolescents. The increasing prevalence of myopia in younger populations is largely attributed to lifestyle changes, including prolonged screen time, limited outdoor activity, and high educational pressures. If left unmanaged, progressive myopia can lead to severe complications, including retinal detachment, glaucoma, and vision loss. This article explores the causes, contributing factors, and preventive strategies for myopia in adolescents. A comprehensive approach combining behavioral changes, environmental modifications, and medical interventions is essential to mitigate its impact. Strategies like promoting outdoor activities, reducing screen time, and regular eye examinations are crucial. Additionally, advances in optical and pharmacological treatments, such as myopia control lenses and atropine eye drops, are discussed. The paper emphasizes the importance of early intervention and awareness campaigns in curbing the myopia epidemic.

Keywords:

Myopia, adolescents, preventive measures, screen time, outdoor activities, myopia control, eye health.

Introduction

Myopia, commonly referred to as nearsightedness, is a refractive error in which distant objects appear blurry while close objects are seen clearly. It occurs when the eyeball is too long, or the cornea is excessively curved, causing light to focus in front of the retina instead of directly on it. While myopia is primarily considered a genetic condition, environmental and lifestyle factors significantly contribute to its rapid progression, particularly among adolescents.

Over the past few decades, the global prevalence of myopia has increased dramatically, with the World Health Organization (WHO) estimating that nearly 50% of the world's population could be myopic by 2050 [1]. Adolescents are particularly vulnerable due to their high levels of screen exposure, educational demands, and reduced outdoor activities. Early-onset myopia

in childhood or adolescence tends to progress more rapidly and increases the risk of developing high myopia, a severe form associated with sight-threatening complications [2].

The adolescent years are critical for eye health, as this is when the eyes undergo significant developmental changes. Without timely intervention, myopia can significantly impact academic performance, quality of life, and long-term ocular health. This article aims to provide a detailed analysis of measures to prevent myopia among adolescents, focusing on behavioral strategies, environmental modifications, and medical treatments.

Main Part

1. Causes and Contributing Factors of Myopia in Adolescents

Genetic Factors:

Family history is a strong predictor of myopia. Children with one or both myopic parents are at a higher risk due to inherited genetic predispositions [3].

Lifestyle and Environmental Factors:

Prolonged Near Work: Excessive reading, studying, and screen usage contribute to increased accommodative stress on the eyes, a known risk factor for myopia development [4].

Limited Outdoor Activity: Lack of exposure to natural light has been strongly linked to myopia progression. Outdoor activities stimulate dopamine release in the retina, which slows eye elongation [5].

Screen Time: Adolescents spend significant hours on digital devices for entertainment and educational purposes, which contributes to eye strain and myopia [6].

Educational Pressures:

Competitive academic environments, particularly in East Asian countries, where myopia rates are highest, demand long hours of near work and exacerbate the condition [7].

2. Preventive Measures for Myopia

Effective prevention requires a combination of lifestyle changes, environmental adjustments, and early medical intervention.

2.1 Behavioral Changes

Promoting Outdoor Activities:

Encouraging adolescents to spend at least 2 hours daily outdoors has been shown to reduce the risk of developing myopia. Exposure to natural light is essential for healthy eye development [8].

Reducing Screen Time:

Limiting screen exposure to no more than 2 hours per day for recreational purposes is recommended. Implementing the 20-20-20 rule (looking at something 20 feet away for 20 seconds every 20 minutes) helps reduce eye strain [9].

Creating Balanced Schedules:

Integrating frequent breaks during study sessions and promoting a balance between academics and physical activities is crucial. Schools and parents should encourage active participation in sports and hobbies.

2.2 Environmental Modifications

Optimizing Lighting Conditions:

Ensuring adequate lighting while reading or studying can minimize eye strain. Proper desk ergonomics, including adjustable chairs and desks, also support healthy posture and eye health [10].

Reducing Glare from Digital Screens:

Blue-light-blocking glasses and screen filters can reduce the harmful effects of digital devices. Additionally, using digital devices at arm's length and avoiding use in dark rooms are recommended [11].

2.3 Medical Interventions

Regular Eye Examinations:

Adolescents should undergo annual eye check-ups to detect early signs of myopia and prevent its progression. Eye care professionals can prescribe appropriate corrective measures such as glasses or contact lenses [12].

Myopia Control Lenses:

Specialized contact lenses, such as orthokeratology (Ortho-K) lenses, and multifocal glasses have shown promise in slowing myopia progression by redistributing light focus on the retina [13].

Pharmacological Treatments:

Low-dose atropine eye drops have been effective in reducing the progression of myopia. These drops work by relaxing the ciliary muscles and preventing excessive eye elongation [14].

3. Educational and Public Health Initiatives

Raising Awareness:

Campaigns targeting parents, educators, and adolescents can emphasize the importance of eye health and preventive measures. Schools should integrate vision care programs into their curriculum [15].

School-Based Interventions:

Schools play a critical role in preventing myopia. Measures such as increasing outdoor recess time, reducing homework load, and educating students about eye care can have significant benefits [16].

Research and Development:

Ongoing studies on gene-environment interactions and new treatment modalities are crucial for understanding and managing myopia. Governments and healthcare organizations should invest in research to

improve preventive and therapeutic strategies [17].

Conclusion

Myopia is a growing concern, particularly among adolescents, who are increasingly exposed to environmental and lifestyle risk factors. Preventing myopia requires a multi-pronged approach, including promoting outdoor activities, reducing screen time, optimizing study environments, and leveraging medical interventions. Early diagnosis through regular eye examinations and the adoption of innovative treatments, such as myopia control lenses and atropine eye drops, can effectively slow myopia progression.

Public health initiatives and educational campaigns are essential to raise awareness and ensure the widespread adoption of preventive measures. By prioritizing eye health, we can significantly reduce the burden of myopia and improve the quality of life for future generations.

References

1. Holden, B. A., et al. (2016). Global prevalence of myopia and high myopia. *Ophthalmology*, 123(5), 1036-1042.
2. Saw, S. M., & Wong, T. Y. (2003). Myopia: Current concepts and unresolved questions. *The Lancet*, 361(9357), 132-134.
3. Morgan, I. G., et al. (2018). Myopia prevention: A review. *Experimental Eye Research*, 170, 53-60.
4. Huang, H. M., et al. (2015). Prolonged near work and myopia. *Ophthalmic & Physiological Optics*, 35(3), 245-247.
5. Rose, K. A., et al. (2008). Outdoor activity reduces the prevalence of myopia in children. *Ophthalmology*, 115(8), 1279-1285.
6. Wu, P. C., et al. (2020). Effects of screen time on myopia development. *British Journal of Ophthalmology*, 104(8), 1118-1121.
7. Chua, S. Y., & Foster, P. J. (2014). Myopia research in Asia. *Eye*, 28(2), 169-176.
8. Jones, D., & Sinnott, L. T. (2016). Outdoor activity and myopia. *Journal of Vision*, 16(1), 35.
9. American Academy of Ophthalmology. (2021). Blue light and your eyes. Retrieved from aao.org.
10. Yam, J. C., et al. (2019). Myopia control measures. *Asia-Pacific Journal of Ophthalmology*, 8(5), 385-389.
11. Lin, Z., et al. (2014). Efficacy of myopia control lenses. *Investigative Ophthalmology & Visual Science*, 55(3), 1776-1783.
12. Si, J. K., et al. (2015). Atropine in the control of myopia. *Journal of Ophthalmology*, 2015, 1-8.
13. Iskandarova Sh.T., Rasulova N.F., Azamatova F.A. // Eurasian journal of medical and natural sciences, volume 4, issue 1, part 2, 2024 yil, 13-17 betlar
14. Rasulova N.F., Azamatova F.A., // Science and innovation international scientific journal volum 3 issue 9 september 2024y, Uzbekistan.
15. Rasulova N.F., Azamatova F.A. // Xalq tabobati va zamonaviy tibbiyot, yangi yondashuvlar va dolzarb tadqiqotlar ilmiy amaliy konferensiya, 56-59 betlar
16. Rasulova N.F., Azamatova F.A. // II International Multidisciplinary Conference "Prospects and Key Tendencies of Science in Contemporary World" page 175-182.
17. Мусаев, Ш., Шомуродов, К., & Исомов, М. (2020). Частота и характеристика переломов нижней челюсти у детей. *Stomatologiya*, 1(1 (78)), 45-48.
18. Isomov, M. M. (2020). Features of etiopathogenesis and the course of inflammatory processes of periapical tissues in women during pregnancy (review of literature)/Isomov MM, Shomurodov KE, Olimjonov KJ, Azimov IM. *Biomedicine and practice.-2020.-№ SI-2.-Pp*, 833-838.
19. Исомов, М. М., Шомуродов, К. Э., & Ахмадалиев, Н. Н. (2020). МОНИТОРИНГ ГОСПИТАЛИЗИРОВАННЫХ БЕРЕМЕННЫХ ЖЕНЩИН С ОДОНТОГЕННЫМИ ВОСПАЛИТЕЛЬНЫМИ ЗАБОЛЕВАНИЯМИ ЧЛЮ ЗА 2017-2019

- гг. НА БАЗЕ КЛИНИКИ ВЗРОСЛОЙ ХИРУРГИЧЕСКОЙ СТОМАТОЛОГИИ ТГСИ. In *Инновационная стоматология* (pp. 116-119).
20. Шомуродов, К. Э., & Исомов, М. М. (2020). Мониторинг стационарной и амбулаторной реабилитации беременных женщин с воспалительными заболеваниями ЧЛО. *Стоматология*, 1, 34-7.
 21. Исомов, М. М., Олимжонов, К. Р., & Шомуродов, К. Э. (2019). *Статистической анализ уранопластики у детей с ВРГН за 2016-2018 годам на базе клиники детской хирургической стоматологии ТГСИ* (Doctoral dissertation, Українська медична стоматологічна академія).
 22. Исомов ММ, Ш. К., & Олимжонов, К. Ж. (2020). Особенности этиопатогенеза и течения воспалительных процессов периапикальных тканей у женщин в период беременности. *Журн. биомед. и практ*, 834-839.
 23. Садикова, Х., Махкамов, Б., Абдувалиев, Н., Мамурбоева, М., & Исомов, М. (2019). Преимущества двухэтапной имплантации с применением пьезоинструментов для костного расщепления и аутогенной плазмы крови, обогащенной тромбоцитами. *Стоматология*, 1(1 (74)), 24-27.
 24. Rasulova, N. F., Jalilova, G. A., & Mukhamedova, N. S. (2023). PREVENTION OF IMPORTANT NON-COMMUNICABLE DISEASES AMONG THE POPULATION. *Евразийский журнал медицинских и естественных наук*, 3(1 Part 2), 21-23.
 25. Махмудова, Н. М., Джалилова, Г. А., Мирдадаева, Д. Д., & Турсунова, Х. Н. (2015). Основные направления медико-социальной помощи инвалидам. *International medical scientific journal*, 49.
 26. Джалилова, Г. А., Умарова, У. М., & Раджапова, Н. А. (2014). Роль средних медицинских работников в учреждениях врачбно-физкультурной службы Республики, науч. *Журнал ПЕДИАТРИЯ,(3-4)*, 88-89.
 27. Умарова, У. М., & Джалилова, Г. А. (2014). Роль врачбно-физкультурной службы в формировании первичной профилактики заболевания. *Сборник тезисов молодых ученых посвященный году здорового ребенка, Ташкент 2014г., стр, 253.*
 28. Искандарова, Ш. Т., Асадова, Г. А., Назарова, С. К., & Джалилова, Г. А. (2022). Охрана здоровья детей. *Учебное пособие, 202.*
 29. Искандарова, Ш. Т., Усманов, И. А., Хасанова, М. И., & Джалилова, Г. А. (2020). Состояние функционирования систем питьевого водоснабжения сельского населения в Узбекистане. In *Университетская наука: взгляд в будущее* (pp. 182-185).
 30. Джалилова, Г. А., Максудова, Н. А., Машрапов, Б. О., & Искандарова, Ш. Т. (2019). ОХРАНА ПРИРОДНОЙ СРЕДЫ УЗБЕКИСТАНА ОТ ЗАГРЯЗНЕНИЯ ХОЗЯЙСТВЕННО-БЫТОВЫМИ СТОКАМИ. In *Здоровый образ жизни и здоровьесберегающее мировоззрение как приоритет национальной политики* (pp. 371-374).
 31. Асадов, Р. Х., & Джалилова, Г. А. (2023). Совершенствование гемодиализной помощи в республике Узбекистан. *Естественные науки в современном мире: теоретические и практические исследования*, 2(2), 5-6.
 32. Джалилова, Г. А., Расулова, Н. Ф., & Мухамедова, Н. С. (2023). Охрана материнства и детства в республике Узбекистан. *Science and innovation*, 2(Special Issue 8), 1971-1974.
 33. Джалилова, Г. А., Эшдавлатов, Б. М., & Одилова, М. А. (2017). Концепция по обоснованию научно-исследовательских работ с целью охраны водных объектов питьевого назначения. *Проблемы современной науки и образования*, (8 (90)), 95-98.