

SCREEN ADDICTION AND MYOPIA

A 21st Century Eye Health Challenges in Dhaka, Bangladesh

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Abstract:

This journal investigates the intricate relationship between myopia and excessive screen usage in contemporary society, focusing specifically on Dhaka, Bangladesh. The rising incidence of digital devices and the growing time spent in front of screens have elevated concerns about a possible link between extended screen exposure and the development or progression of refractive error like myopia. Targets of study to review existing literature, ways practical studies, and consider relevant data to provide a broad understanding of the relationship between myopia and screen usage. The aim is to add valuable perceptions for healthcare professionals, researchers, and policymakers to manage the challenges posed by the digital age on eye health.

This research delves into the nuanced relationship between screen addiction and myopia, addressing the challenges to eye health in Dhaka, Bangladesh, in the 21st century. This study aims to provide an understanding of how excessive screen time contributes to myopia, particularly within the unique sociocultural context of Dhaka. The literature review reveals a global trend of increasing myopia rates, with a growing body of research linking this phenomenon to prolonged screen exposure. By synthesizing international studies, this paper identifies common themes, methodological variations, and gaps in the existing knowledge base. Notably, the review underscores the necessity of localized investigations to understand the unique factors influencing myopia in Dhaka, Bangladesh.

Employing a mix of surveys, eye examinations, and sociocultural assessments, the study aims to capture a holistic view of the interplay between screen addiction and myopia. Ethical considerations, participant recruitment strategies, and the selection of relevant variables are discussed to ensure the validity and reliability of the findings. Epidemiological analysis unveils the prevalence of myopia in the Dhaka population, dissecting demographic factors contributing to vulnerability. Comparative analyses by international data offer insights into the distinctiveness of myopia in this South Asian metropolis. The study also explores potential biological mechanisms, shedding light on the physiological changes in the eye induced by excessive screen use and the role of environmental factors unique to Dhaka.

In assessing intervention and prevention strategies, the paper critically evaluates existing approaches and recommends culturally sensitive methods tailored to the specific needs of Dhaka. This section highlights the importance of a multi-faceted approach that considers technological, educational and environmental causes in mitigating impact of screen induced myopia. The discussion about public health implications delves into the broader societal consequences of rising myopia rates linked to screen addiction. Proposing policy recommendations, the study addresses the challenges faced by Dhaka and offers insights on global applicability, emphasizing the need for proactive measures in safeguarding eye health in the digital age.

KEYWORDS:

Myopia, Dhaka, Bangladesh, Screen Addiction, Eye Health Challenge, 21st Century, Vision Problems, Digital Devices, Technology Impact, Public Health, Screen Time, Eye Care.

INTRODUCTION:

The 21st century has accompanied in an era of exceptional technological advancements, marked by the universal presence of screens in whole daily life. The global use of smart phones, laptops, tablets, computers and various screens like procedures has transformed the way we communicate, work, and interest ourselves. This digital revolution has not been without significances and a growing concern turns around its potential impact on our ocular health, specifically the progression of myopia. This journal showing critical relationship between screen addiction and myopia with specific focus on the urban landscape of Dhaka, Bangladesh.

Myopia, commonly known as nearsightedness, has experienced a notable increase in occurrence globally, prompting inquiries into the contributing factors behind this surge. Simultaneously, individuals are increasingly immersed in a digital environment, spending extended hours engaging with screens for work, education, and recreation. This juxtaposition necessitates a critical inquiry into whether the surge in myopia is intricately linked to the escalating prevalence of screen addiction.

The urban situation of Dhaka district, Bangladesh, offers a unique background for this investigation. It is one of the densely populated City in the world with a growing technological scenery, Dhaka captures the contests and opportunities arising from the junction of rapid development and digitalization. This study aims to unravel the complex interplay between screen addiction and myopia within this dynamic context, offering insights that transcend geographical boundaries.

The objectives of this research are manifold. Firstly, it seeks to comprehensively review existing literature to establish a foundation for understanding the global landscape of myopia and screen-related behaviors. Secondly, the study endeavors to provide an in-depth epidemiological analysis of myopia prevalence in Dhaka considering demographic nuances that may influence these trends. Furthermore, the investigation delves into the biological mechanisms underlying myopia development in the context of prolonged screen exposure. As society navigates this screen-driven era, the implications for public health cannot be overstated. This journal aims not only to illuminate the potential risks posed by screen addiction to ocular health but also to propose intervention and prevention strategies tailored to the socio cultural dynamics of Dhaka. In doing so, it seeks to contribute valuable insights that extend the discourse on myopia beyond individual experiences, addressing the broader challenges faced by communities in a rapidly evolving digital landscape.

In essence, "Screen Addiction and Myopia: A 21st Century Eye Health Challenge in Dhaka, Bangladesh" represents an effort to bridge the realms of technology, health, and society, providing a holistic exploration of the intricate relationship between screen usage and myopia in the context of Dhaka, while offering implications and recommendations with global resonance.

Myopia:

Another name is nearsightedness. It is a refractive error of the eye that affects distance vision. Eye having myopia, distant objects appear blur and close objects can be see easily. That type phenomena will occur when eyeball is too long or cornea is too bent. That is why light entering into the eye is focused in front of retina. The primary symptoms of myopia include difficulty seeing distant objects such as road signs, TV, chalkboards, or the faces of people at a distance. Individuals with myopia often compensate by bringing objects closer to their eyes to see them more clearly.

Myopia is a condition of common refractive error and its incidence has been growing globally. Specially in urban areas with a high prevalence of near work activities such prolonged screen time. The condition diagnosed through eye examination by corrective lenses (glasses or contact lenses) are commonly prescribed to help focus light directly onto the macula (part of retina), allowing for clearer vision.

While myopia is correctable and high myopia can be related with high risk of other eye related issues like retinal detachment (RD), glaucoma and cataracts. Routine eye checkup are essential to monitor, provide latest spectacle power and manage myopia and various interventions counting lifestyle changes and specific treatments, may be recommended to control its progression, particularly in children and adolescents.



Figure 1: Screen Addiction

OVERVIEW:**Occurrence of Myopia:**

Myopia is a prevalent refractive error observed globally, with a noticeable rise in its occurrence, particularly in urban settings. The prevalence of myopia displays variation based on factors such as age, ethnicity, and geographical location.

Relationship with Screen Exposure:

Several research studies projected that a connection between prevalence of myopia and excessive screen exposure is elevated, particularly among children and teenagers. Extended engagement in activities demanding close visual attention, such as reading or using screen like devices, is frequently recognized as a contributing factor to the growth of myopia.

DATA POINTS:**Screen Time Duration:**

Studies showing a positive association among the duration of screen time and the danger of myopia. Data showing that children with extensive daily screen time have a higher risk of developing myopia compare with limited screen user.

Outdoor Time:

Insufficient outdoor time, often linked with increased screen time, has been linked to a higher risk of myopia. Data may show a negative correlation between outdoor activity and the incidence of myopia.

Age and Onset:

Data might reveal that myopia tends to onset at younger ages in individuals with significant screen exposure from a young age. The age of myopia onset might decrease in populations with higher screen use.

Geographical Variances:

Prevalence rates and the impact of screen time on myopia can vary by region and socioeconomic factors. Some areas with high technology use may exhibit a higher prevalence of myopia.

PHENOMENA AND AFFECTION:**Prolonged Near Work:**

Extreme screen time includes sustained periods of near work like reading or using devices very close. Extended near work is related with increased risk of developing myopia, particularly in children.

Reduced Outdoor Time:

Excessive screen time may lead to a reduction in outdoor activities, as children spend more time indoors engaged with screens. Incomplete outdoor exposure has a linked to higher risk of myopia expansion. Outdoor activities have a defensive effect counter to myopia.

Blue Light Exposure:

Screens produce blue light and prolonged exposure of it, especially before bedtime in dark room affect circadian rhythms and sleep patterns. Disruption of sleep patterns can indirectly influence myopia development as sleep is crucial for overall eye health.

Accommodative Demand:

Constant focusing on a nearby screen can lead to increased accommodative demand, requiring sustained effort from the eye muscles. Prolonged accommodative effort is associated with myopia development, especially when combined with other risk factors.

Parental Myopia and Genetics:

Genetic factors play an important role in myopia and children with myopic parents may have a higher disposition. Excessive screen time might exacerbate genetic predispositions, leading to a higher likelihood of myopia in children.

Educational Impact:

Increased screen time is often associated with educational activities, including online learning. While educational content is essential, excessive screen use for educational purposes may contribute to the overall time spent on near work, potentially impacting myopia development.

Screen Time Management:

Lack of effective screen time management and adherence to proposed guideline. Children who is not following recommended limits on screen time, he/she will be at a higher risk of development of myopia.

Technological Devices:

Different devices have changing effects on health status of eye and the type of screen (e.g., tab, smartphone and computer) may influence myopia development. Some studies suggest variations in myopia risk based on the type of devices using and the viewing condition.

Prolonged Near Work:

Extreme screen time involves prolonged periods of near work like reading or using digital devices very close. Prolonged near work is associated with an increased risk of developing myopia in children.

Reduced Outdoor Time:

Excessive screen time lead to decrease outdoor activities as children devote more time at indoors engaged with screens. Limited outdoor exposure has been linked to a higher risk of myopia development. Outdoor activities are thought to have a protective effect against myopia.

Blue Light Exposure:

Screens emit blue light and prolonged exposure, especially before bedtime, may affect circadian rhythms and sleep patterns. Disruption of sleep patterns can indirectly influence myopia development as sleep is crucial for overall eye health.

Occurrence of Screen Addiction:

Increasing commonness of screen addiction, particularly among the youth in Dhaka. Understanding the interaction of these facts is vital for developing effective policies to address the growing concern of myopia in children associated with excessive use of screen. Current research continues to improve our thoughtful of the relationship between myopia and screen use, it's vital to stay informed about the latest findings in this field.



Figure 2: High Myopic Spectacle

Studies have explored the connection among prolonged near work, extensive screen time, and the development or development of myopia. Here is an overview of key findings from relevant research:

Epidemiological Studies:

A meta-analysis issued in the journal of "Ophthalmology"(2015) examined multiple studies and found that an important association between near work activities (reading, writing and screen time) and development of myopia, particularly in children and youths.

Outdoor Activities and Myopia:

The "Sydney Myopia Study"(2008) established that increased outdoor activities reduced danger of myopia. The study also suggested that spending more time outdoors might counterbalance the effects of prolonged near work, including screen time.

Role of Screen Time:

A longitudinal study circulated in "JAMA Ophthalmology"(2015) investigated association between screen time and myopia in children. The investigators concluded that increased screen time, especially for activities such as video gaming, was significantly related with a higher occurrence of myopia.

Parental Impact on Myopia Risk and Screen Exposure:

Research from "Singapore Cohort Study of the Risk Factors for Myopia" (2012) highlights a connection between paternal myopia and an elevated risk of myopia in children. Moreover, the study indicates that the extent of this risk amplifies with prolonged engagement in near work activities, which includes screen exposure.

Intervention Studies:

A randomized precise trial published in "JAMA Ophthalmology" (2016) explored the effects of reducing near work and increasing outdoor activities on myopia progression in children. The study suggested that interventions focusing on outdoor events could slow the development of myopia.

Association with Refractive Error:

The "Beijing Children Eye Study" (2015) examined the relationship between near work activities and refractive error. The study found a significant association between the quantity of time expended on near work, including screen time and the prevalence of myopia.

Screen Time and Sleep Patterns:

Research published in "Scientific Reports" (2018) advised a link between screen time at evening and disrupted sleep patterns. Disrupted sleep is associated with increased risk of myopia, this study decorated a prospective indirect mechanism through which screen time may influence myopia.

While these studies provide valuable understandings to the correlation between long time near work and extensive screen time and myopia. It's important to note that myopia is a critical condition disposed by genetic, environmental and lifestyle factor. The current body of research underlines the importance of balancing screen time with outdoor activities and accepting strategies to reduce the risk of myopia, particularly in children and youths.

Dhaka Specific Considerations:

Literature discussing how rapid urbanization and lifestyle changes in Dhaka might contribute to myopia and screen addiction.

Elevated Screen Time and Myopia:

The surge in screen time, notably propelled by the prevalent use of smart phones, computers, and various digital devices, has been related with a heightened occurrence of myopia. Prolonged engagement in near work tasks, like extensive reading or extended use of electronic device is believed to play a role on the onset and advancement of myopia.

Urbanization and Lifestyle Changes:

Rapid urbanization often leads to lifestyle changes, including longer working hours, increased academic pressures, and sedentary behaviors. Urban environments may offer limited outdoor spaces for recreational activities, which could further contribute to an increase in indoor activities, including screen based activities.

Influence of Surroundings:

The availability of green spaces and exposure to natural settings in urban environments can influence ocular well-being. Adequate outdoor time has been linked to a reduced likelihood of myopia development. Additionally, suboptimal lighting and air quality in city settings could potentially influence visual health.

Educational Pressure:

In urban areas, there is often a high level of competition in education, leading to increased reading and study time. This intense academic pressure may contribute to myopia development.

Technological Advances and Adoption:

The rapid adoption of digital technologies in urban areas may lead to increased screen time, especially among younger populations. This constant exposure to screens can contribute to both myopia and screen addiction.

Mobile Phone Usage Uptake:

The growth of mobile phone usage in Bangladesh, particularly in urban area like Dhaka, is a prominent phenomenon, this flow is attributed to the widespread accessibility and cost-effectiveness of smart phones, causing in complex screen assignation. Individuals utilize these devices for miscellaneous purposes like social media interactions, entertainment feeding and communication activities.

Internet Connectivity:

Improvements in internet connectivity, including the expansion of 5G networks, have facilitated easy access to online content. High-speed internet enables users in Dhaka to engage in streaming services, online gaming, and social media, contributing to prolonged screen usage.

Social Media Engagement:

The pervasive popularity of social media platforms in Dhaka mirrors global trends. Utilized for social interaction, news consumption, and entertainment, platforms like Facebook, Instagram and Twitter have become integral to daily life. The continuous influx of updates and notifications may contribute to patterns of frequent usage.

E-commerce Growth:

The rise of e-commerce in Dhaka has changed the way people shop. The suitability of online shopping, coupled with various promotional offers, encourages individuals to pass more time on e-commerce platforms, contributing to increased screen time.

Digital Entertainment:

Dhaka's technological landscape includes a thriving digital entertainment industry. Streaming services, online gaming, and other digital entertainment options are readily accessible, providing individuals with a plethora of content that can be consumed on screens.

Educational Technology:

The use of technology in education is also growing in Dhaka. With the adoption of e-learning platforms and digital educational tools, students may find themselves spending more time on screens for studying and assignments.

Entertainment and Distraction:

The diverse range of digital entertainment options provides individuals in Dhaka with constant sources of distraction. Whether through online games, videos, or social media, the allure of entertainment on screens can contribute to addictive behaviors.

Work and Education:

The integration of technology into work and education in Dhaka means that individuals spend a significant portion of their day on screens. This constant exposure may contribute to screen use. Addressing screen addiction in Dhaka requires a multi-layered method including awareness campaigns, promoting digital literacy and inspiring healthy screen use habits. Moreover, it's vital for entities, families, and educational organizations to recognize the possible bad impacts of excessive screen time and take step to moderate them. Highlight any studies examining the prevalence of digital device use in the population.

Myopia and Educational Implications:

High rates of myopia in Dhaka may have implications for the educational system. Students with myopia may face challenges in the classroom, potentially affecting academic performance and future opportunities.

Economic Consequences:

The financial implications of myopia are noteworthy, encompassing heightened healthcare expenses for visual acuity correction and potential productivity setbacks due to compromised eyesight. Tackling myopia in Dhaka holds the promise of economic advantages, lessening the strain on healthcare resources and enhancing the efficiency of the workforce.

Promoting Awareness and Education:

Within the empire of public health there is a documented need to distribute information regarding myopia, its allied risk factors, and preventive strategies. Initiating educational campaigns that cater to diverse audiences, including the general public, parents, and healthcare professionals are active in effectively addressing the challenge of myopia.

Influence of Screen Addiction on Mental Well-being:

The prolonged and excessive use of screens, commonly termed as screen addiction, has been a subject of concern due to its potential association with mental health challenges. Existing literature may delve into the repercussions of screen addiction, examining its impact on stress levels, anxiety disorders, and sleep disturbances within the population of Dhaka.

Physical Health Consequences:

Lengthy screen use specially poor ergonomic practices may contribute to physical health issues like musculoskeletal problems. Public health literature capacity discuss plans to promoting healthy screen habits to solve these significances.

Access to Eye Care Services:

Public health studies could examine the accessibility of eye care services in Dhaka. Factors such as the availability of optometrists, affordability of eye care, and the effectiveness of vision screening programs may be considered in addressing myopia.

Government Initiatives:

Literature might discuss the role of government policies and initiatives in promoting eye health and addressing screen addiction. Public health interventions, such as school-based programs and community outreach could be explored.

Preventive Measures:

Research may focus on identifying effective preventive measures for myopia and strategies to reduce screen addiction. This could include recommendations for outdoor activities, screen time guidelines, and community-based interventions.

Here I am showing a Table and Bar chart distribution of 2130 having different types refractive error out of 14916 students at 43 Primary and High School surveyed by me on 2022 during Online Classes:

Type of Error	Male	Female	Total	% Age
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Myopia	580	601	1181	55.45%
Hyperopia	10	20	30	1.4%
Astigmatism	185	295	480	22.53%
Mixed	12	28	40	1.89%
Comp. Myopic Astig	187	190	377	17.7%
Comp. Hyperopic Astig	13	9	22	1.03%
	987	1143	2130	100%

Table 1: Different Types Refractive Error

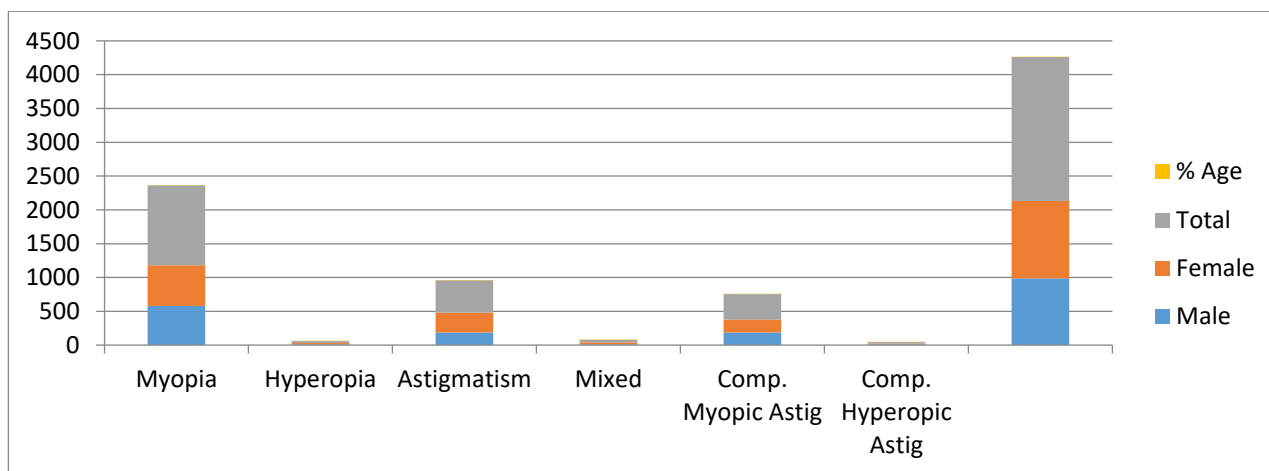


Chart 1: Distribution of Different Types Refractive Error

Myopia: Here 580 male and 601 female students diagnosed as myopia in a total of 1181 students. This accounts for approximately 55.45% of the surveyed population.

Hyperopia: There were only 10 male students and 20 female students diagnosed with hyperopia, totaling 30 students. This represents approximately 1.4% of the surveyed population.

Astigmatism: Among the surveyed students, 185 males and 295 females were diagnosed with astigmatism, amounting to 480 students in total. This comprises approximately 22.53% of the surveyed population.

Mixed: There were 12 male students and 28 female students with mixed refractive errors, totaling 40 students, or about 1.89% of the surveyed population.

Compound Myopic Astigmatism: There were 187 male students and 190 female students diagnosed with compound myopic astigmatism, totaling 377 students. This represents approximately 17.7% of the surveyed population.

Compound Hyperopic Astigmatism: There were 13 male students and 9 female students diagnosed with compound hyperopic astigmatism, totaling 22 students, or about 1.03% of the surveyed population.

RECOMMENDATIONS AND INTERVENTIONS:

Guidelines for Screen Time:

Health organizations may have recommendations for daily screen time limits for different age groups. Data could reflect adherence rates to these guidelines and their impact on myopia rates.

Interventions:

Some studies may present interventions or educational programs aimed at reducing screen time and preventing myopia. Effectiveness data could be available, indicating the success of specific interventions.

LIMITATIONS:

Methodological Differences: Variations in study methodologies, definitions of screen time, and diagnostic criteria for myopia can lead to diverse findings. Data interpretation should consider these methodological differences.

Evolution over Time:

Trends in myopia prevalence and its relationship with screen time may evolve over time due to changes in technology use patterns and lifestyle.

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CONCLUSION:

The literature reviewed provides valuable insights into the complex relationship between the screen time and the development of myopia in children. The identified factors, including prolonged near work, reduced outdoor time, blue light exposure, accommodative demand, genetic predispositions, educational impact, screen time management, and the influence of different technological devices, collectively contribute to our understanding of this multifaceted issue.

The evidence suggests that excessive screen time, particularly when associated with a lack of outdoor activities is a important risk factor for myopia in children. Prolonged near work and increased accommodative demand are consistently highlighted in the literature as contributors to the development and progression of myopia. Moreover, the interplay of genetic factors and ecological influences, such as screen time habits, underlines the need for a broad understanding of the causes of myopia in the pediatric population.

Despite the prosperity of information, certain gaps and limits in the existing literature should be recognized. Variability in study procedures, sample sizes, geographic locations may influence the generalizability of findings. Moreover, the rapidly evolving scenery of technology and educational follows requires ongoing research to stay up-to-date of developing trends and their implications for eye health.

Moving forward, interventions and strategies to mitigate the impact of excessive screen time on myopia development in children should consider the identified risk factors. Encouraging outdoor activities, promoting healthy screen time habits, and integrating these findings into educational policies are potential avenues for public health initiatives. Future research should address these gaps and explore pioneering styles to address the growing concern of myopia in the context of 21st-century lifestyles.

In conclusion, the reviewed literature highlights the importance of a complete and multidisciplinary approach to address the complex interaction between screen time and myopia in children, pointing to safeguard eye health in the digital age.

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