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SCREEN TIME AND CHILD HEALTH: AN INTEGRATIVE REVIEW ACCORDING TO AYURVEDA AND MODERN SCIENCE

Ayurveda

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ABSTRACT

The rapid growth of digital technology has significantly increased screen exposure among children worldwide. Screen time refers to the duration spent using electronic devices such as televisions, smartphones, tablets, computers, and gaming consoles (1,2). Although digital media offers educational and recreational benefits, excessive exposure has emerged as a serious public health concern due to its association with physical, psychological, and developmental disorders in children (3,4).Recent studies indicate that prolonged screen exposure contributes to sedentary behaviour, childhood obesity, digital eye strain, sleep disturbances, cognitive impairment, and emotional instability (5,6). Additionally, excessive device usage interferes with social interactions and academic performance (7,8).From an Ayurvedic perspective, child health depends on the balanced functioning of body, mind, and sensory organs. Ayurveda, particularly Kaumarbhritya, emphasizes regulation of sensory inputs and daily routine (9,10). Excessive screen exposure can be considered Atiyoga of Chakshu Indriya, leading to Vata and Pitta imbalance, resulting in visual fatigue and behavioural disturbances (11,12).This integrative review evaluates the impact of screen time on child health using both modern medical and Ayurvedic perspectives and suggests preventive strategies (4,9).

KEYWORDS

INTRODUCTION

The 21st century has witnessed remarkable technological advancement, leading to increased accessibility of digital devices among children (2). Screen exposure begins early in life and is now a routine part of education and entertainment (3).

Screen time refers to time spent using devices with visual displays. While moderate use may support learning, excessive exposure has raised significant health concerns (1,7).

Studies show that excessive screen use reduces physical activity, disturbs sleep, and contributes to behavioural issues and obesity (5,6). It is also linked with impaired cognitive development and reduced social interaction (7,8).

The World Health Organization recommends limiting sedentary screen time to ensure proper growth and development (4,15).

Ayurveda describes child health under Kaumarbhritya, emphasizing balanced sensory usage and lifestyle practices (9,10). Excessive screen exposure disrupts sensory equilibrium, leading to various disorders (11).

Aim and Objectives

Aim:

To evaluate the impact of screen time on child health from modern and Ayurvedic perspectives.

Objectives:

1. To analyse physical and psychological effects of screen exposure (1,5).
2. To understand Ayurvedic interpretation of these conditions (9,11).
3. To explore preventive strategies integrating both systems (4,10).

Materials and Methods

This study is a narrative review based on scientific literature and classical Ayurvedic texts (1,9).

Data sources include PubMed, WHO guidelines, peer-reviewed journals, and Ayurvedic classics (4,10).

Ayurvedic references include Charaka Samhita, Sushruta Samhita, Kashyapa Samhita, and Ashtanga Hridaya (9–12).

RESULTS

Physical Health Effects

Childhood Obesity

Excessive screen time significantly contributes to sedentary behaviour, which is a major risk factor for childhood obesity. Children engaged in prolonged screen viewing often exhibit reduced participation in outdoor activities and physical exercise. Furthermore, screen use is frequently associated with unhealthy dietary patterns, including increased consumption of high-calorie snacks and sugar-sweetened beverages. This combination of physical inactivity and poor nutrition leads to positive energy imbalance, ultimately resulting in excessive weight gain and increased risk of metabolic disorders (5,3).

Musculoskeletal Problems

Prolonged use of digital devices, particularly in improper postures, exerts continuous strain on the musculoskeletal system. Children often adopt awkward positions such as forward head posture, rounded shoulders, and slouched sitting while using smartphones or tablets. Over time, this leads to neck pain, backache, shoulder stiffness, and early development of postural abnormalities. If left unaddressed, these issues may predispose children to chronic musculoskeletal disorders in later life (3).

Digital Eye Strain

Extended exposure to digital screens imposes excessive stress on the visual apparatus, leading to a condition commonly referred to as digital eye strain or computer vision syndrome. Children may experience symptoms such as eye dryness, irritation, burning sensation, blurred vision, and recurrent headaches. Continuous focusing on screens reduces blinking rate, thereby disturbing tear film stability and causing ocular discomfort. Long-term exposure may also increase the risk of refractive errors such as myopia (6).

Sleep Disturbances

Screen exposure, especially during evening hours, adversely affects sleep physiology. The blue light emitted from digital devices suppresses melatonin secretion, a hormone essential for regulating the sleep–wake cycle. This disruption in circadian rhythm results in delayed sleep onset, reduced total sleep duration, and poor sleep quality. Inadequate sleep further impacts physical growth, cognitive performance, and emotional stability in children (6,15).

Cognitive and Developmental Effects

Excessive engagement with digital media during critical periods of brain development can negatively influence cognitive functions. Children exposed to prolonged screen time may exhibit delayed speech and language development due to reduced verbal interaction with caregivers. Additionally, overstimulation from fast-paced digital content can impair attention span, concentration, and memory

retention. These factors collectively contribute to decreased academic performance and hinder overall intellectual development (7,8).

Psychological and Behavioural Effects

Prolonged screen exposure has been strongly associated with adverse psychological outcomes in children. Increased reliance on digital media may lead to irritability, emotional instability, and reduced frustration tolerance. Children may also develop symptoms of anxiety, depression, and social withdrawal due to decreased real-life interactions. Furthermore, excessive exposure to inappropriate or stimulating content can contribute to aggressive behaviour and attention deficit symptoms, thereby affecting overall behavioural and emotional wellbeing (14).

DISCUSSION

Modern Medical Perspective

Contemporary medical research clearly demonstrates that excessive screen exposure has multifactorial effects on child health. One of the most significant impacts is the reduction in physical activity, as increased time spent on digital devices replaces outdoor play and exercise. This sedentary lifestyle not only contributes to obesity but also affects cardiovascular fitness and overall physical development (5).

In addition, prolonged exposure to screens—especially during evening hours—interferes with normal sleep physiology. The emission of blue light from digital devices suppresses melatonin production, thereby disturbing the natural sleep–wake cycle. As a result, children may experience delayed sleep onset, fragmented sleep, and inadequate rest, which further affects growth, immunity, and cognitive performance (6).

Another important concern is cognitive overload. Continuous exposure to rapidly changing digital content overstimulates the developing brain, making it difficult for children to process information efficiently. This can lead to reduced attention span, poor concentration, and impaired executive functioning. Moreover, excessive reliance on screen-based interaction limits opportunities for face-to-face communication, which is essential for the development of emotional intelligence, language skills, and social behaviour (7).

Ayurvedic Perspective

Ayurveda provides a holistic framework to understand the impact of excessive screen exposure through the principles of Dosha balance and proper utilization of sensory organs (Indriya). According to classical texts, health is maintained when there is a harmonious interaction between the body, mind, and senses. Disturbance in this equilibrium leads to disease (9).

Excessive use of digital screens can be interpreted as Atiyoga (overuse) of Chakshu Indriya (visual sense organ). Continuous visual engagement with bright screens strains the eyes and disturbs their normal functioning, resulting in conditions such as Netra Shosha (dryness of eyes), Drishti Daurbalya (diminished vision), and Shirashoola (headache) (11,12).

From a Dosha perspective, excessive sensory stimulation primarily aggravates Vata and Pitta Doshas. Vata imbalance manifests as restlessness, anxiety, hyperactivity, and disturbed sleep patterns due to its association with movement and nervous system functions. On the other hand, Pitta aggravation—linked with heat and metabolism—leads to symptoms such as eye strain, burning sensation, irritability, and headaches (9,11).

Furthermore, Ayurveda emphasizes the role of Manas (mind) and its qualities—Sattva, Rajas, and Tamas. Excessive exposure to stimulating digital content increases Rajas (activity and agitation) and Tamas (inertia and dullness), thereby disturbing mental clarity and emotional stability. This imbalance may manifest as behavioural disturbances, lack of focus, and reduced cognitive efficiency in children (10).

PREVENTIVE STRATEGIES

Modern Recommendations

Modern paediatric guidelines strongly advocate for the regulation of screen time to minimize its adverse effects. Limiting daily screen exposure according to age, encouraging active play, and promoting outdoor activities are essential steps in maintaining physical and mental wellbeing (4). Creating screen-free environments —particularly during meals and before bedtime—helps in establishing healthy routines and improving sleep hygiene. Parental supervision and mindful selection of age-appropriate content are also crucial in reducing the negative impact of digital media (5).

AYURVEDIC MEASURES

Dinacharya (Daily Regimen)

Ayurveda emphasizes the importance of a structured daily routine to maintain balance in bodily functions. Following Dinacharya—such as timely waking, proper meals, physical activity, and adequate sleep—helps in regulating biological rhythms and preventing lifestyle disorders in children (9).

Netra Protection (Eye Care Practices)

Protection of the eyes is essential in preventing screen-related visual disturbances. Simple practices such as नियमित नेत्र प्रक्षालन (washing eyes with clean water), frequent blinking, and ensuring proper lighting during device use help reduce eye strain. Periodic rest for the eyes and limiting continuous screen exposure are also important preventive measures (11).

Medhya Rasayana (Cognitive Enhancers)

Ayurveda recommends the use of Medhya Rasayana—herbal formulations that enhance cognitive function and मानसिक शक्ति (mental strength). Herbs such as Brahmi (*Bacopa monnieri*), Shankhapushpi (*Convolvulus pluricaulis*), and Mandukaparni (*Centella asiatica*) are known to improve memory, concentration, and overall brain function. These interventions support healthy cognitive development and help counteract the adverse effects of excessive screen exposure (10).

CONCLUSION

Excessive screen time negatively affects physical, cognitive, and psychological health in children (5,6). Ayurveda provides a holistic explanation through sensory overuse and Dosha imbalance (9,11).

An integrative approach combining modern guidelines with Ayurvedic principles is essential for promoting healthy development (4,10).

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