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Prevalence and Severity of Digital Addiction among Middle School Children: An Observational Study

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I. INTRODUCTION

"Technology is a useful servant but a dangerous master." – Christian Lous Lange (Nobel Laureate)

In today's digital age, children are increasingly immersed in technology from an early age, often before they fully develop the cognitive and emotional tools to manage its influence. This phenomenon, commonly referred to as digital addiction, has emerged as a pressing concern among educators, psychologists, and parents.

Digital addiction refers to a behavioural pattern in which an individual exhibits compulsive, excessive, or poorly controlled use of digital media/devices (including internet, smartphones, social media, gaming), resulting in psychological distress, social or occupational (or educational) impairment, withdrawal symptoms when use is reduced, and a loss of self- regulation despite adverse consequences. Particularly vulnerable are children in schools, a developmental window marked by rapid intellectual growth, social exploration, and identity formation.Research indicates that excessive screen time—whether through mobile devices, gaming platforms, or social media— can disrupt sleep patterns, reduce physical activity, and impair academic performance (1) .

Global pooled prevalence estimates (year 2022 to 2025) were 26.99% for smartphone addiction, 17.42% for social media addiction, 14.22% for Internet addiction, 8.23% for cybersex addiction, and 6.04% for game addiction. Higher prevalence of digital addiction was found in Eastern Mediterranean region and low/lower-middle income countries. Males had higher risk for Internet and game addiction. An increasing trend of digital addiction during the past two decades was found, which dramatically worsened during COVID-19 pandemic(9). A systematic review & meta-analysis of 50 studies (in 19 states) found that among Indian students, the prevalence of Internet Addiction (IA) ranges from **~ 19.9%** (using a stricter Young's Internet Addiction Test (Y-IAT) cut-off of 50) to ~ 40.7% (using a lower cut-off of 40).(11) Survey among children 5-16 years (by Baatu Tech) Children 5-16, sample 1,000 via parents behaviors indicative of digital addiction, screen exposure etc.~60% of children showed behaviors that could indicate digital addiction. 70-80% of children exceed "recommended limits" daily. Only ~10% parents using parental control features.(9)

Severe IA (using high thresholds like Y-IAT ≥ 70) was ~ 12.7%, or lower (~ 4.6%) if using a still higher cut off (≥ 80) in some versions. Males tend to have higher rates of problematic internet or gaming use. Higher age (in the adolescent range), greater access (e.g. internet at home), certain living arrangements associated with higher risk. Poor sleep quality is frequently associated: in studies among college students, those with IA tend to have worse sleep. (11)

Moreover, digital addiction has been linked to anxiety, attention deficits, and diminished social interaction (3). A study of elementary students revealed that parental involvement and digital literacy play a critical role in moderating addictive behaviors (2).

The most disturbing examples is the Blue Whale Challenge, an online phenomenon that emerged around 2016, where vulnerable youth were manipulated through a series of dangerous tasks that culminated in self-harm and, in some reported cases, suicide. While debated for its scale and authenticity, the phenomenon underscored the dark side of compulsive digital engagement, highlighting how online platforms can be exploited to target psychologically fragile individuals.

A. What changes take in the Brain Chemistry Of Digital Addiction?

"Dopamine is the reward neurotransmitter, a chemical that's released when we get what we want, when we want it! – dopamine release is much more based on the speed at which we get what we want, rather than what we're actually getting, because digital media use by nature gives us what we want, quickly and continuously, dopamine release naturally occurs, and we need the "brakes" of the prefrontal cortex to help us get off at appropriate times.

"Unfortunately, in our teenagers and in our kids, their brakes are not as developed as when they get older. When you have underdeveloped brakes and you're on your screen, what can happen is that you just keep going and you don't get off – that's when you start to have problems, because when you finally do get out, you're still craving it". Children may respond to these intense cravings with irritability, defiance/aggression, and going to extreme lengths to get back on their screens.(4)

B. In relation to this, following mix of negative impacts can be expected:

1) Healthcare burden: Rising costs from treating mental health and physical illnesses linked to digital overuse.
2) Digital rehab industry: By 2050, digital detox camps, AI-guided therapies, and neurostimulation devices may be a multi-billion-dollar sector.
3) Policy enforcement: Governments may regulate addictive design (e.g. banning infinite scroll, capping VR immersion hours for children).
4) Isolation paradox: Hyper-connected digitally, but greater real-world loneliness and weaker community ties.
5) Relationship strain: Marital conflicts, reduced family time, "digital infidelity" (VR/AI
6) relationships) emerging as social challenges(2)
7) Generational gaps: Older adults resisting immersion vs younger generations deeply tied to digital life, creating conflicts in values and priorities.
8) Workplace burnout: 24/7 connectivity erodes work–life balance. "Always on" culture
9) leading to stress and early burnout.
10) Digital performance pressure: Dependence on AI may increase efficiency but reduce intrinsic human skills, making workers feel replaceable.
11) Attention economy dominance: Employers may even compete for employees' attention, blurring lines between work and leisure(10).

C. Related to the digital addiction, few recent developments have taken place

1) Indian government passed the Promotion and Regulation of Online Gaming Act, 2025, aiming to regulate online gaming and banned some forms of real-money gaming, with concern about addiction risks.(9)
2) AIIMS Delhi is opening a Centre for Advanced Research on Addictive Behaviours (CAR-AB), focusing on technology addiction among youth, prevention, early intervention, etc.
3) Hospitals (e.g. Mysore's JSS Medical College) are starting "special clinics" for
4) digital well-being / behavioural addictions. (The Times of India)
5) Ongoing research includes combining digital trace data (e.g. from TikTok) with surveys, predictive modelling, and "addiction-aware" algorithms for social media recommenders.(9)

D. Effects Of Digital Addiction

Digital addiction significantly alters children's daily routines and health habits:

1) Sleep Deprivation: Screen time before bed disrupts melatonin production, reducing sleep duration and quality.
2) Reduced Physical Activity: Time spent on screens replaces outdoor play and exercise, contributing to sedentary behavior.
3) Unhealthy Eating Habits: Mindless snacking during screen use and exposure to junk food ads promote poor nutrition.
4) Mental Health Concerns: Increased screen time correlates with anxiety, depression, and social withdrawal due to limited face-to-face interactions.
5) Digital addiction affects cognitive and academic outcomes in several ways:
6) Lower Grades: Studies show a drop in academic scores with increased gadget use— children using devices over 5 hours/day scored 58% vs. 85% for those using 1–2 hours/day.
7) Reduced Attention Span: Constant digital stimulation impairs focus and memory retention.
8) Procrastination and Distraction: Social media and games divert attention from studies, leading to poor time management.
9) Educational Burnout: Emotional exhaustion from digital overload reduces motivation and engagement with schoolwork(4).

The digital addiction has 9 core criteria:

1) *Deception*

Deception refers to the intentional act of hiding, minimizing, or lying about one's engagement with digital devices, games, or online activities in order to avoid parental monitoring, disciplinary action, or social disapproval. In children with digital addiction, deception may manifest as secretly using devices, manipulating screen- time limits, denying excessive use, or fabricating excuses for poor academic or social performance.(1)

Future problems in functional performance due to deception and digital addiction in children may include:

a) Academic decline: Skipping homework or lying about school tasks completed because of excessive digital use.

b) Reduced executive function: Impairments in attention, memory, and problem- solving from overuse, coupled with avoidance behaviors.
c) Social dysf unction: Difficulty maintaining trust with parents, teachers, and peers due to consistent deceptive behaviors.
d) Emotional regulation issues: Increased guilt, anxiety, or conflict arising from hidden use.
e) Occupational performance deficits: Challenges in managing daily routines, participating in play, and engaging in age-appropriate responsibilities.

2) Conflict

Conflict refers to the persistent interpersonal tensions, disagreements, and disruptions that arise between children and their parents, peers, or teachers as a result of excessive and uncontrolled digital device or gaming use. In digital addiction, conflict often manifests when children resist screen-time limits, neglect academic or household responsibilities, or prioritize online engagement over real-world interactions.

Future problems in functional performance due to conflict and digital addiction in children may include:

a) Academic conflict: Ongoing disputes over homework, study time, or classroom attention can impair learning, reduce achievement, and damage student–teacher relationships.
b) Family conflict: Frequent arguments with parents regarding screen use may undermine trust, communication, and emotional stability at home.
c) Peer conflict: Excessive digital involvement can lead to reduced participation in play, cooperative activities, or social bonding, affecting social skill development.
d) Occupational performance deficits: Long-term conflict may limit the child's ability to balance roles (student, family member, friend), impacting independence and productivity in adolescence and adulthood.
e) Future outcomes: Unresolved conflict linked with digital overuse may contribute to chronic stress, poor emotional regulation, and maladaptive coping patterns that hinder functional and academic growth.

3) Displacement

Displacement refers to the substitution of meaningful, developmentally appropriate, and functional daily activities (such as studying, physical play, family interaction, hobbies, or sleep) with excessive digital use. In children with digital addiction, essential tasks are "displaced" by screen-based engagement, leading to an imbalance in occupational roles and routines.

Future problems in functional performance due to displacement and digital addiction in children may include:

a) Academic performance: Study time and homework are displaced by gaming or social media, resulting in poor learning outcomes and declining grades.
b) Physical health: Outdoor play, exercise, and healthy sleep patterns are replaced by sedentary screen use, contributing to obesity, fatigue, or poor motor development.
c) Social skills: Real-world peer interaction is displaced by virtual interaction, limiting opportunities to develop empathy, communication, and cooperation.
d) Family roles: Participation in household responsibilities or bonding activities is reduced, affecting independence and role balance.
e) Occupational performance deficits: Long-term displacement may impair the child's ability to manage time, balance roles, and perform effectively across academic, social, and self-care domains in adolescence and adulthood.

4) Problems

Problems refer to the adverse consequences and disruptions that arise in a child's daily life, learning, health, and social relationships as a result of excessive and uncontrolled digital use. In the context of digital addiction, problems manifest as measurable difficulties in cognitive, emotional, social, physical, and academic domains, which interfere with age-appropriate development and occupational performance.

Future problems in functional performance due to preoccupation and digital addiction in children may include:

a) Academic: Decline in attention, memory, motivation, and achievement due to displacement of study time and poor concentration.
b) Cognitive: Impaired executive functions (planning, problem-solving, impulse control).
c) Social: Reduced peer interaction, poor communication skills, increased conflict with family and teachers.

d) Emotional/Behavioral: Irritability, anxiety, mood swings, or dependence on devices for coping.
e) Physical: Sleep disturbances, sedentary lifestyle, eye strain, obesity, and fatigue.
f) Occupational Performance: Inability to balance roles (student, child, peer), difficulty managing time and routines, and reduced engagement in meaningful non- digital activities.

5) Preoccupation

Preoccupation refers to the persistent and dominant focus on digital devices, games, or online activities, such that the child frequently thinks about or plans the next session of use, even when engaged in other tasks. In digital addiction, preoccupation often leads to neglect of responsibilities, daily routines, social interactions, and learning activities.

Future problems in functional performance due to preoccupation and digital addiction in children may include:

a) Academic impact: Difficulty concentrating in class, incomplete homework, or poor learning retention due to constant thoughts about gaming or device use.
b) Cognitive impairment: Reduced attention span and executive function deficits, as mental resources are preoccupied with digital engagement.
c) Social difficulties: Limited real-world interaction, weaker communication skills, and increased conflict with family or peers.
d) Emotional consequences: Anxiety, irritability, or frustration when unable to access devices or complete digital tasks.
e) Occupational performance deficits: Disruption of daily routines, inability to manage multiple roles (student, family member, friend), and decreased participation in meaningful activities beyond screens.

6) Relapse

Relapse refers to the return to excessive or uncontrolled digital device or gaming use after a period of attempted reduction, abstinence, or successful control. In children with digital addiction, relapse often occurs despite awareness of negative consequences, prior interventions, or parental restrictions, indicating difficulty in self-regulation and habit control.

Future problems in functional performance due to relapse and digital addiction in children may include:

a) Academic: Recurrent overuse after attempts to reduce screen time can disrupt homework completion, study schedules, and classroom engagement.
b) Cognitive: Persistent cycles of relapse impair attention, memory, and planning, limiting learning efficiency.
c) Social: Relapse may trigger repeated conflicts with parents, teachers, or peers due to broken commitments or rules.
d) Emotional/Behavioral: Feelings of guilt, frustration, and anxiety may develop with repeated failures to control use.
e) Occupational performance deficits: Difficulty maintaining routines, managing responsibilities, and engaging in balanced activities, which can persist into adolescence and adulthood.

7) Mood Modification

Mood modification refers to the use of digital devices, games, or online activities as a means to alter emotional states, such as to relieve stress, escape from negative feelings, or induce pleasure and excitement. In children with digital addiction, mood modification becomes a primary motivator for excessive use, leading to dependence on screens for emotional regulation rather than adaptive coping strategies.

Future problems in functional performance due to mood modification and digital addiction in children may include:

a) Academic: Children may prioritize device use to improve mood over completing homework or attending classes, leading to declining academic performance.
b) Cognitive: Reliance on screens for emotional regulation can reduce development of problem-solving, attention control, and adaptive coping skills.
c) Social: Seeking mood modification through devices may reduce engagement in real- life social interactions, impairing social skill development.
d) Emotional/Behavioral: Over Reliance on digital activities for mood regulation can increase irritability, anxiety, or depression when access is restricted.
e) Occupational performance deficits: Daily routines, family responsibilities, and healthy recreational activities may be displaced, limiting the child's ability to participate effectively in multiple roles.

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8) Withdrawal

Withdrawal refers to the emotional, behavioral, or physiological distress experienced by a child when access to digital devices, games, or online activities is reduced or blocked. Symptoms can include irritability, anxiety, restlessness, mood swings, or difficulty concentrating. Withdrawal reflects the child's dependence on digital engagement for emotional regulation and reward.

Future problems in functional performance due to withdrawal and digital addiction in children may include:

a) Academic: Difficulty concentrating, completing homework, or attending classes when digital access is restricted, leading to poor academic outcomes.
b) Cognitive: Impaired attention, memory, and executive functioning due to stress or preoccupation with device use.
c) Social: Increased conflict with parents, teachers, or peers due to behavioral symptoms during periods of restricted access.
d) Emotional/Behavioral: Heightened irritability, anxiety, or mood instability, which can affect participation in daily routines and social interactions.
e) Occupational performance deficits: Disruption in daily routines, inability to balance roles (student, family member, peer), and decreased engagement in meaningful activities beyond digital use(11).

9) Tolerance

Tolerance refers to a psychological and behavioral adaptation where a child requires increasing amounts of screen time or more stimulating digital content to achieve the same level of satisfaction, excitement, or emotional relief they once experienced with less.

Future problems in functional performance due to tolerance and digital addiction in children may include:

a) Cognitive and Academic : Difficulty concentrating without digital stimulation, reduced ability to delay gratification or manage boredom, poor academic performance due to distraction and fatigue
b) Emotional : Increased irritability when denied access to devices, heightened anxiety or depressive symptoms, low frustration tolerance in everyday situations
c) Social : Preference for virtual interactions over real-life relationships, poor communication and empathy skills, avoidance of conflict resolution or teamwork
d) Behavioral : Resistance to non-digital activities or routines, escalation of oppositional behavior when screen time is limited, Dependency on digital rewards for motivation.
e) Occupational performance **deficits:** Sleep disturbances due to late-night screen use, sedentary lifestyle leading to obesity or poor fitness, eye strain, headaches and posture problems

Various standardized scales are used for assessment of digital addiction viz, the Game Addiction Scale for Children (GASC), Young's Internet Addiction Test (IAT), Demographic and Internet use questionnaires, Indigenous Internet Addiction Scale, Compulsive Internet Use Scale (CIUS), Digital Addiction Scale for Teenagers (DAST), Digital Parenting Awareness Scale (DPAS) and Digital Game Addiction Scale for Children (DGAS-child form).

The Digital Addiction Scale for Children: Development and Validation by Nazir

S. Hawi & Maya Samaha published in 2017 aimed to develop and validate the Digital Addiction Scale for Children (DASC) to measure digital addiction behaviors among children, providing a reliable and valid psychometric tool for research and practice with objective were to design a scale that specifically addresses children's digital usage behaviours rather than adapting adult-focused instrument; establish the construct validity, reliability, and factor structure of the Digital Addiction Scale for Children; provide a standardized measure for identifying different levels of problematic digital use among children; contribute to the theoretical understanding of digital addiction in childhood and facilitate further empirical studies.

This dissertation aims to explore the multifaceted effects of digital addiction on children in grades 4 to 7, examining its severity. By synthesizing existing literature and analyzing current trends, the study seeks to provide actionable insights for educators, parents, and policymakers to foster healthier digital habits among young learners(2).

II. REVIEW OF LITERATURE

1) Digital game addiction in elementary students: The impact of digital literacy, parental styles, and background variables. Journal of Pedagogical Research studied by Mazman Akar, S. G., & Özer, M. published in 2025

Aimed to investigate the predictors of digital game addiction among elementary school students, with a specific focus on the roles of digital literacy, parental styles, and background variables such as gender, screen time, and screen activity with objectives to examine the prevalence and patterns of digital game addiction in elementary school children, analyze the impact of demographic and background factors (gender, technology use, daily screen time, and screen activity) on digital game addiction, determine the

influence of digital literacy dimensions—intended use, technical knowledge, and privacy/security knowledge—on digital game addiction, explore how parental styles, particularly acceptance/involvement and psychological autonomy, contribute to children's digital game addiction. It was Quantitative, cross-sectional study. Total 530 participants from fourth-grade students from four primary schools in Turkey were recruited for study. Scale of Digital Game Addiction for Children, Digital Literacy Scale for Primary School Students, Parental Style Scale were administered. Statistical analysis using multiple regression to determine the predictive power of digital literacy, parental styles, and background variables on digital game addiction. Mean digital game addiction scores were moderate across the sample. Boys had higher mean scores than girls (t-test, $p < .05$). Model significance: F-statistic significant at $p < .001$. Results shown that digital game addiction in children is a multifaceted issue shaped by both individual and contextual factors. Parenting styles also play a vital role: higher levels of acceptance, involvement, and psychological autonomy reduce the risk of addiction, aligning with earlier evidence that authoritative and supportive parenting fosters healthy digital engagement. Overall, the study underscores the importance of a holistic approach that integrates digital literacy education and constructive parental mediation to reduce digital game addiction risks and promote balanced technology use among children.

2) *Digital addiction: Are children in danger? Are parents aware? Journal of Pediatric Nursing studied by Fatma Yilmaz Kurt et al.published in 2025*

Aimed to determine the digital game addiction levels of secondary school students and to examine parental awareness against their children's digital game addiction with objective to assess the prevalence and severity of digital game addiction among secondary school students, measure parental awareness of digital addiction using the Digital Parenting Awareness Scale (DPAS), to analyze the correlation between parental awareness and children's digital game addiction levels, to evaluate whether demographic factors (age of parents and children) influence addiction and awareness levels.

It was a Descriptive and correlational study. 392 secondary school students were recruited for study. Digital Parenting Awareness Scale (DPAS) and Digital Game Addiction Scale for Children (DGAS-child form) was administered. Normality checked with skewness and kurtosis; descriptive statistics (mean, SD, frequency, %); Pearson chi-square for correlations. The mean DGAS score was 47.31 ± 16.19, indicating moderate levels of digital game addiction. Parents had a generally high level of digital awareness. Weak positive correlation between DGAS and RM (Role Modeling) subscale of DPAS. Moderate positive correlation with DN (Digital Neglect) subscale. Weak negative correlation with EU (Effective Use) and PR (Parental Regulation) subscales.

The study concludes that higher parental digital awareness contributes to reducing children's digital game addiction. Effective parental strategies, such as regulation and guiding effective use, act as protective factors. Conversely, digital neglect or excessive parental role modeling of digital use may worsen addiction risks in children.

3) *Effects of memory and attention on the association between video game addiction and cognitive/learning skills in children: mediational analysis published in 2024 in by Ali Kappi et al.*

Aimed to study the effects of memory and attention on the association between video game addiction and cognitive/learning skills in children: mediational analysis with objective to examine the mediating roles of attention and memory in the relationship between video game addiction and cognitive/learning skills in children, in order to identify whether these cognitive processes explain how problematic gaming impacts learning outcomes. A cross-sectional research approach. 169 children between the ages of 9 and 13 who satisfied the inclusion requirements were included in the study, and their moms answered the questionnaires. Between February and May, a period of roughly four months, the data gathering procedures were carried out. A variety of instruments were used to gather the data, including the Learning, Executive, and Attention Functioning (LEAF) Scale, the Children's Memory Questionnaire (CMQ), the Game Addiction Scale for Children (GASC), the Sociodemographic Interview, and the Clinical Attention Problems Scale. Results shown that video game addiction was significantly associated with poorer attention and memory. There was a significant indirect effect of video game addiction on cognitive and learning skills through attention, but not through child memory. It suggested attention-focused interventions could help mitigate negative learning outcomes.

4) *The digital addiction scale for children: Psychometric properties of the Turkish version was studied by Bagatarhan, T., & Siyez, D. M. published in 2023*

Aimed to adapt the Digital Addiction Scale for Children (DASC) into Turkish and to examine its psychometric properties among children aged 9–14 years, providing a culturally appropriate and reliable tool for early identification of digital addiction risk in Turkish children with objective to assess the prevalence and severity of digital game addiction among secondary school students, measure parental awareness of digital addiction using the Digital Parenting Awareness Scale (DPAS), analyze the correlation

between parental awareness and children's digital game addiction level, evaluate whether demographic factors (age of parents and children) influence addiction and awareness levels.
It was Descriptive and correlational study. 392 secondary school students were recruited for the study was assessed on students. Normality checked with skewness and kurtosis; descriptive statistics (mean, SD, frequency, %); Pearson chi-square for correlations.The results shown the mean DGAS score was 47.31 ± 16.19, indicating moderate levels of digital game addiction.
The study concludes that higher parental digital awareness contributes to reducing children's digital game addiction. Effective parental strategies, such as regulation and guiding effective use, act as protective factors. Conversely, digital neglect or excessive parental role modeling of digital use may worsen addiction risks in children.

5) *Zhou et al. (2022) emphasized that excessive screen time among children—especially through social media, gaming, and streaming—leads to disrupted sleep patterns, reduced physical activity, and increased sedentary behavior. These lifestyle changes contribute to obesity, anxiety, and depression, affecting the holistic well-being of children*

Aimed to explore the prevalence and impact of digital addiction among children, with particular focus on its influence on lifestyle habits, psychological health, and academic performance with objectives were to identify the extent of digital technology use among children and adolescents, examine the physical, psychological, and social consequences of excessive digital engagement, to highlight the role of family, parental mediation, and socio- demographic factors in shaping digital addiction, to assess evidence-based interventions and preventive strategies for reducing digital addiction and its negative outcomes.
It was narrative synthesis approach. Relevant research studies were identified through systematic searches in academic databases studies were selected if they focused on children and adolescents (6–18 years) and examined the relationship between excessive screen use and health outcomes such as sleep disruption, physical inactivity, obesity, anxiety, depression, and overall well-being. Non-peer-reviewed articles, studies on adults, and papers without empirical evidence were excluded. Reported smartphone addiction prevalence varied widely from 5% to 30% depending on country, sample, and scale used. The Smartphone Addiction Scale (SAS) and Mobile Phone Problem Use Scale (MPPUS), both reporting Cronbach's alpha reliability above 0.80. Higher usage was statistically correlated with anxiety ($r \approx .25$–.35), depression ($r \approx .20$–.30), and stress ($r \approx .20$–.28). Age and gender effects were inconsistent; some studies found higher risk among females (χ^2 tests, $p < 0.05$).
It indicated that digital addiction has become a significant global issue, with detrimental effects on children's physical health, psychological well-being, cognitive functioning, and educational outcomes. Excessive screen time is linked to sleep disturbances, obesity, anxiety, depression, and impaired communication skills. Academic decline, self- injurious behaviors, and social withdrawal are commonly reported consequences. Socioeconomic background, parenting styles, and parental digital use emerge as strong predictors of children's digital habits. Preventive interventions, including cognitive- behavioral therapy, mindfulness, recreational activities, and parental mediation strategies, show promise in mitigating risks. The findings emphasize the urgent need for multi-sectoral strategies involving families, schools, and health professionals to promote balanced and healthy digital engagement.

6) *Dong, H., Yang, F., Lu, X., & Hao, W.studied Internet Addiction and Related Psychological Factors Among Children and Adolescents in China During the Coronavirus Disease 2019 (COVID-19) Epidemic published in 2020*

Aimed to assess Internet use characteristics and objectively examine the potential psychological factors associated with Internet addiction (IA) during the COVID-19 epidemic with the objective for early identification of children at risk of problematic use of digital devices and/or becoming addicted to Digital devices and stimulate further research concerning children from different cultural and contextual settings.
It was Cross-sectional, anonymized, self-reported survey. Participants total 2,050 including children and adolescents recruited for study (mean age = 12.34 ± 4.67 years; 48.44% female) from China. Instruments used for study were Young's Internet Addiction Test (IAT), Depression, Anxiety and Stress Scale (DASS-21), Demographic and Internet use questionnaires. Linear regression analysis to examine correlations between psychological factors and IAT scores was performed.2.68% of participants met the criterion for addictive Internet use (IAT ≥ 70), 33.37% were classified as problematic Internet users (IAT between 40 and 69). Increased Internet usage during the COVID-19 epidemic, including higher frequency and duration of recreational Internet use.
The study observed excessive Internet use among Chinese children and adolescents during the COVID-19 outbreak. Psychological factors such as depression and stress, along with demographic variables like age and gender, were identified as key factors influencing Internet addiction. The authors recommend extended family and professional support for vulnerable individuals during such unprecedented times.

7) Is smartphone addiction really an addiction? Journal of Behavioral Addictions published in 2018 by Panova, T., & Carbonell, X.

Aimed to review the existing literature on "smartphone addiction" and determine whether excessive and problematic smartphone use meets the criteria of an addiction or whether it should rather be framed differently with objective to examine quantitative and qualitative studies on smartphone use/addiction and assess how they define and measure "smartphone addiction"; to what extent the features typically used to define addiction (e.g. tolerance, withdrawal, loss of control, negative consequences) are demonstrated in smartphone-use literature; compare the severity of consequences of excessive smartphone use with those of formally recognized addictions; propose whether alternative conceptualisations ("problematic use", "maladaptive use") are more appropriate than addiction for describing excessive smartphone behaviour.

It was a comprehensive review of both quantitative and qualitative studies on smartphone addiction. The demographics of participants, including age, gender, and cultural background.

The instruments used to assess smartphone addiction, such as self-report questionnaires and behavioral assessments. It was that instead of labeling it "smartphone addiction", researchers should use terms like "problematic use" or "maladaptive use" which better fit the evidence.

They emphasize understanding smartphone use in its sociocultural context, considering motivations, gratifications, compensatory functions etc. Suggest future research should improve methodological rigour: use longitudinal designs, clinical samples, standardised measures, clearer definitions. Academic decline, self-injurious behaviors, and social withdrawal are commonly reported consequences. Socioeconomic background, parenting styles, and parental digital use emerge as strong predictors of children's digital habits. Preventive interventions, including cognitive-behavioral therapy, mindfulness, recreational activities, and parental mediation strategies, show promise in mitigating risks. The findings emphasize the urgent need for multi-sectoral strategies involving families, schools, and health professionals to promote balanced and healthy digital engagement.

8) An Analysis of the Effects of the Blue Whale Game on Children and Young People studied by Nursel Yalcin and Mehmet Semih Ozcan, published in April 2018

Aimed to investigate the psychological and social impacts of the Blue Whale game on children and adolescents with the objective to Identify the underlying reasons why young individuals participate in the game, analyze the game's structure and its potential to lead to self-harm or suicide, evaluate the effectiveness of existing preventive measures and propose recommendations for safeguarding youth.

It was Descriptive scanning model and Qualitative research utilizing document review. Analysis of reports, case studies, and media coverage related to the Blue Whale game were done. Examination of incidents reported globally, with a focus on Russia, Europe, and India.The study primarily utilized qualitative data; however, some quantitative information was referenced:Reports indicating over 130 suicides linked to the game in a short period.Incidents reported from multiple countries, highlighting the game's widespread impact. Conclusion of the study was that the Blue Whale game represents a significant health risk for adolescents and young adults, particularly those with psychological vulnerabilities. Its covert nature and the psychological tactics employed make it challenging to detect and prevent.

The study underscores the critical role of parents, educators, and policymakers in monitoring online activities and implementing protective measures.

9) The Digital Addiction Scale for Children: Development and Validation by Nazir S. Hawi & Maya Samaha published in 2017

Aimed to develop and validate the Digital Addiction Scale for Children (DASC) to measure digital addiction behaviors among children, providing a reliable and valid psychometric tool for research and practice with objective were to design a scale that specifically addresses children's digital usage behaviours rather than adapting adult-focused instrument; establish the construct validity, reliability, and factor structure of the Digital Addiction Scale for Children; provide a standardized measure for identifying different levels of problematic digital use among children; contribute to the theoretical understanding of digital addiction in childhood and facilitate further empirical studies. It was Quantitative, cross-sectional study. 530 participants from fourth-grade students from four primary schools in Turkey. Scale of Digital Game Addiction for Children, Digital Literacy Scale for Primary School Students, Parental Style Scale. Statistical analysis using multiple regression to determine the predictive power of digital literacy, parental styles, and background variables on digital game addiction. ean digital game addiction scores were moderate across the sample. Boys had higher mean scores than girls (t- test, $p < .05$). Model significance: F-statistic significant at $p < .001$. The final regression model accounted for about 31% of the variance ($R^2 \approx 0.31$) in digital game addiction scores.

Result was successfully developed and validated the Digital Addiction Scale for Children, confirming its reliability, internal consistency, and factorial validity. The scale demonstrated that digital addiction in children can be systematically assessed through a psychometric tool rather than subjective observation. Their findings emphasize the importance of early identification and measurement, enabling educators, parents, and researchers to better understand and address the consequences of excessive digital use among children.

10) Throuvala MA, Griffiths MD, Rennoldson M, Kuss DJ. studied School-based Prevention for Adolescent Internet Addiction: Prevention is the Key. A Systematic Literature Review published in 2018

Aimed to systematically review school-based prevention programmes for Internet Addiction (IA) and gaming addiction among adolescents and evaluate their effectiveness, strengths, and limitations to inform the development of future prevention initiatives with the objectives to identify school-based prevention programmes and protocols targeting Internet Addiction and gaming among adolescents, evaluate the effectiveness of these programmes in reducing problematic Internet use, to highlight methodological limitations, risks of bias, and challenges in existing interventions, to suggest best practices and directions for future school-based prevention initiatives. Systematic Literature Review has been done. Sample of Studies: 1,597 initial hits → narrowed through screening to final set of relevant studies. Narrative synthesis due to heterogeneity of study designs, interventions, and outcomes. Sample sizes varied from 90 to 1,843.

They concluded from the study that evidence for school-based prevention of Internet Addiction and gaming among adolescents is scarce and inconsistent. Existing programmes demonstrate potential but suffer from methodological weaknesses and limited long-term validation.

11) Prevalence and Determinants of Internet addiction among Indian Adolescents by Sakthivel Arthanari, Najam Khalique, M. Athar Ansari, Nafis Faizi published in Indian Journal of Community Health published in 2017

Aimed to determine the prevalence of internet addiction in the school-going adolescents of Aligarh with objectives to estimate the prevalence of internet addiction among students of class 9th to 12th, assess the socio- demographic factors associated with internet addiction, identify the pattern of internet usage and its association with addiction levels, determine the relationship between age, gender, and place of access with internet addiction.It was a cross-sectional study was conducted in selected English medium schools of Aligarh district, Uttar Pradesh, during the period July 2014 to June 2015. Approval for the study was obtained from the Institutional Ethics Committee of Jawaharlal Nehru Medical College, Aligarh Muslim University.

It was a cross sectional study on a total of 12 english medium schools, Aligarh were randomly chosen for the study, out of which 8 gave consent. Students enrolled in class 9th to 12th were included in the study. Socio-demographic profile and pattern of internet use and Young's Internet Addiction Test (IAT) was administered.A multistage sampling technique was adopted. Systematic random sampling with probability proportion to size (PPS) was employed to select students from each class.

Data were collected using a structured questionnaire consisting of : Socio-demographic profile and internet use pattern (purpose, access time, expenditure, place of access, average duration of use during weekdays/weekends); Young's Internet Addiction Test (IAT), a 20- item, 5-point Likert scale, measuring compulsive internet use. Scores ranged from 0–100. The IAT demonstrated good psychometric validity with six subscales (Salience, Excess use, Neglecting work, Anticipation, Lack of self-control, Neglecting social life). Reliability of subscales ranged from Cronbach's alpha 0.54–0.82, with overall internal consistency $\alpha = 0.93$ in previous Indian studies. Results have shown prevalence: 35.6% of students were found to have Internet addiction (this includes mild/moderate levels presumably according to cut-offs) ; Males had a higher rate (40.6%) vs females (30.6%). The study concluded that internet addiction is widely prevalent among school-going adolescents in Aligarh and needs attention.

12) Holistic Investigation of the Relationship between Digital Addiction and Academic Achievement among Students studied by Tülübaş T, Karakose T, Papadakis S. A. published in year 2013

Aimed to provide a holistic, field-level investigation of the scientific literature on the relationship between digital addiction (DA) and academic achievement (AA) by combining bibliometric performance analysis and science-mapping methods (using Web of Science data) to reveal thematic structure, evolution, influential actors, and research gaps in the DA–AA research domain with objectives to conduct a science-mapping analysis (co-word clustering, thematic mapping, thematic evolution) to identify main research themes and how they evolved across time-periods; identify the most influential authors, institutions, and countries contributing to the DA–AA literature; detect under-researched or emerging themes and methodological gaps to suggest directions for future research and policy/practice implications. SciMAT was software tool. SciMAT allows for defining and visualizing

thematic trends in a research field, exhibiting its thematic evolution across different periods of its development, and thus determining the scope and performance of scholarship in the field. SciMAT analysis is compelling since it enables observing the evolution of a research field over sequential periods and helps reveal the structural and dynamic aspects of the field in a longitudinal manner.

The paper is a *combined bibliometric and science mapping analysis* rather than an empirical observational or experimental study. The data were obtained from the *Web of Science (WoS) database*, considered by the authors as providing comprehensive coverage of quality journals.

118 articles were included in the final dataset.Analytical Tools / Techniques. *SciMAT* software was used for science mapping. This tool allows analysis of themes, their evolution over time, and the conceptual structure of a field. The thematic structure of the research field was examined; for instance, what kinds of digital addiction are most studied (smartphone, social media, etc.), what are the correlates (self-efficacy, life satisfaction, etc.). They divided the dataset into discrete time periods (three periods) to see how themes shift over time.

The study suggested that there was negative association between problematic digital use and academic performance, but the relationship is complex and context dependent. Mediators/moderators such as time management, motivation/self-efficacy, life satisfaction, family context, and the educational vs recreational purpose of use are important and explain heterogeneity across studies. It call for more integrative, longitudinal, and context-sensitive research (and for studies that move beyond single-subtype analyses) so that interventions/policies can more precisely target the mechanisms (e.g., improving time management or promoting purposeful educational use). It also highlight that some studies report educational benefits from digital tools depending on usage patterns, so simplistic “digital = bad” conclusions should be avoided.

III. AIMS AND OBJECTIVES

A. Aim

To evaluate prevalence and severity of digital addiction among school-going children in grades 4 to 7 using Digital Addiction Scale for children (DASC)**.**

B. Objectives

1) Primary Objective

To evaluate the presence of following core addiction criteria/symptoms of digital addiction amongst students

- Mood modification
- Withdrawal
- tolerance
- deception
- conflict
- displacement
- problems
- preoccupation

2) Secondary objective

To provide recommendations for awareness, prevention, and early intervention strategies for digital addiction in school children.

IV. NEED FOR THE STUDY

1) The widespread use of digital devices among children has increased the risk of digital addiction, which can affect cognitive, social, and emotional development.

2) Excessive device use may lead to preoccupation, mood changes, tolerance, withdrawal, relapse, conflicts, and functional difficulties in academics and daily life.

3) However, systematic assessment of digital addiction in this age group is limited.

4) The Digital Addiction Scale for Children (DASC) provides a reliable method to evaluate the presence, severity, and core symptoms of digital addiction.

5) This study is an attempt to identify at-risk, addicted children, understand impact of digital addiction on functional performance, and inform awareness, prevention, and early intervention strategies for healthy digital habits.

V. MATERIALS AND METHODOLOGY

This study has been conducted in Occupational Therapy School and Center, GMCH, Nagpur during the period of 6 months of internship from 1 april 2025 to 30 september 2025.

1) Type Of Study: CROSS SECTIONAL STUDY using DIGITAL ADDICTION SCALE FOR CHILDREN: (DASC).
2) Study Procedure: For the present study, a total of 110 students were selected by convenience sampling from Shree Radhe Prathmik Government School, Balaji nagar, a government-run institution.
3) Place Of Study: Occupational Therapy School and Center, GMCH, Nagpur DURATION OF STUDY: 4 months

A. *Sample Design*

Permission to use scale for research purpose from author was granted via email. Consent from school authority and verbal consent from students were taken prior to the assessment. General demographics such as name, age, sex, grade were taken followed by the Digital Addiction Scale for Children (DASC) was administered on the participants. The scale is self-reported, and students were instructed to respond to all items independently, based on their personal experiences. Clear instructions were provided prior to administration to ensure accurate responses.

B. *Selection Criterion*

110 students were selected for the study but 10 students were excluded due to denial of consent and behavioural issues.

1) *Inclusion Criterion*

- Grade 4 to grade 7.
- Age 9-14 years.
- Cognitively and Physically fit.

2) *Exclusion Criterion*

Those having any behavioural problems and Intellectual Disability.

C. *Instrumentation*

Students of grade 4 to 7 of Government school, Marathi medium was recruited for the study. Rapport was built with them. DASC was translated in marathi and hindi. Students WERE asked demographic details – age, gender, grade, and other relevant characteristics, digital device usage – type of device most frequently used (e.g., smartphone, laptop, tablet, gaming console), history of device acquisition – age/year at which students received their first smartphone, laptop, or other digital devices, patterns of usage – frequency and purpose of device use. Participants were provided with the questionnaire in a classroom setting after obtaining necessary permissions from the school administration. They were instructed to answer each item honestly and independently. Clarifications were provided by the researcher when required.

The Digital Addiction Scale for Children (DASC) ANNEXURE[A]

Is a standardized tool developed by Hawi & Samaha (2020) to assess the level of digital addiction among children and adolescents. The permission to use scale and interpretation from the author was granted via email. It is designed to measure problematic and excessive use of digital devices, including smartphones, tablets, computers, and gaming devices.

The scale consists of 25 items that cover key domains of digital addiction such as:

- Withdrawal symptoms
- Loss of control
- Compulsive use
- Higher scores indicate greater levels of digital addiction.

1) *Administration*

The DASC is a self-report scale. In this study, it was administered ON students in a classroom setting after a brief explanation. The participants were instructed to respond honestly based on their typical digital device usage patterns.

2) *Reliability and Validity:*

The scale has demonstrated high internal consistency (Cronbach's $\alpha > 0.90$) and good construct validity in previous studies, making it a reliable tool for assessing digital addiction in children and adolescents.

3) Use in Research

The DASC has been widely used in cross-sectional studies examining the prevalence of digital addiction, its association with academic performance, sleep quality, mental health, and social behavior among school-age children(1).

Permission to use scale for research purpose from author was granted via email. Consent from school authority and students were taken prior to the assessment. DASC was translated in marathi and hindi.

VI. OBSERVATION AND RESULTS

This Observation using DASC (Digital Addiction Scale for Children) thus, obtained in the forms of charts and graphs.

Table .1. No. of students using various digital devices

Sr. no.	TYPES OF DIGITAL DEVICES	NO. OF STUDENTS
1)	SMARTPHONE	87
2)	LAPTOP	24
3)	COMPUTER	38
4)	TABLET	19
5)	GAMING DEVICE	51

Table 1. Shows no. of students using various digital devices ranging from smartphones, tablets, laptops, computers, gaming devices. Smartphone is being used by 87 students out of 100. But it doesn't mean that they don't use other devices. Laptop users are 24 students and computer users are 38 students. Gaming devices are used by 51 students who may also uses other digital devices.

Table 2 History of digital device acquisition in years

Sr. no.	TYPE OF DIGITAL DEVICE	HISTORY OF ACQUISITION IN YEARS And no. of students		
		< 1 year	1 to 5 years	5 years <
1)	SMARTPHONE	14	58	15
2)	LAPTOP	8	13	6
3)	COMPUTER	21	11	8
4)	TABLET	9	7	3
5)	GAMING DEVICE	30	21	0

This table .2. shows the history of device acquisition – since when students received their first smartphone, laptop, or other digital devices. Smartphones: Most students
(58) have been using smartphones for 1 to 5 years, while 14 got them within the last year, and 15 have used them for over 5 years. Laptops: 13 students have used laptops for 1 to 5 years, 8 for less than a year, and 6 for more than 5 years. Computers: 21 students acquired their computers within the last year, 11 between 1–5 years, and 8 for over 5 years. Tablets: 9 students started using tablets within a year, 7 for 1–5 years, and only 3 for more than 5 years. Gaming devices: The highest number (30) got them within a year, 21 have used them for 1–5 years, and none for over 5 years.

Table .3. History of digital device acquisition in years (%)

Sr.No.	Type of Digital Device	<1 year(%)	1 to 5 years(%)	> 5 years	Total (students)
1)	Smartphone	16.87%	69.88%	13.25%	87
2)	Laptop	29.63%	48.15%	22.22%	27
3)	Computer	52.50%	22.50%	20%	40
4)	Tablet	40.91%	31.82%	13.64%	22
5)	Gaming Device	58.82%	41.18%	0%	51

Table 3. Smartphones are mostly owned for 1–5 years (about 70%), showing stable usage. Laptops are relatively newer—around 30% are less than a year old. Computers are the oldest devices, with over half (52.5%) being <1 year old (perhaps new installations or lab systems). Gaming devices are also relatively new, with none older than 5 years. Tablets show moderate turnover, mostly between <1 year and 5 years.

A. Scoring

Likert scale for the criterion of digital addiction

- Never = 1
- Rarely = 2
- Sometimes = 3
- Often = 4
- Always = 5

Total no. of components= 25

Students are classified as mild addiction, moderate addiction and severe addiction of digital devices on the basis of the criterion met.

MILD ADDICTION	4-5 criteria are met
MODERATE ADDICTION	6-7 criteria are met
SEVERE ADDICTION	7-8 criteria are met

B. Sample Size

110 students were selected for the study. But 10% students were excluded due to behavioural problems and denied consent. Therefore, 100 students from grade 4 to grade 7 were recruited for study.

- Male students = 63
- Female students = 37
- No. of students:

Grade 4	16 students
Grade 5	40 students
Grade 6	14 students
Grade 7	30 students

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Table .4. No. of items present under criteria and minimum scores to be considered.

CRITERION	ITEMS	be considered for affectation
DECEPTION	ITEM 4; ITEM 16	>=6
CONFLICT	ITEM 9; ITEM 22	>=6
DISPLACEMENT	ITEM 6; ITEM 18; ITEM 20	>=9
PROBLEMS	ITEM 10; ITEM 13 ITEM 23; ITEM 25	>=12
PREOCCUPATION	ITEM 14; ITEM 1; ITEM 11	>=9
RELAPSE	ITEM 17; ITEM 19	>=6
MOOD MODIFICATION	ITEM 5; ITEM 15; ITEM 24	>=9
WITHDRAWAL	ITEM 3; ITEM 8 ITEM 12; ITEM 21	>=12
TOLERANCE	ITEM 2; ITEM 7	>=6

Table 4 shows no. of items present under the criteria and minimum score to be considered for affectation. For deception, conflict, relapse, tolerance the score should be greater than or equal to 6; displacement, preoccupation, mood modification have 3 items and the score considered would be greater than or equal to 9; problems and withdrawal have 4 item and score to be considered is greater than or equal to 12.

Table.5. Levels of severity as per no. of criteria met

LEVELS OF SEVERITY	NO. OF CRITERION TO BE MET	NO. OF STUDENTS	PERCENTAGE OF STUDENTS
AT RISK OF ADDICTION	<4 criteria are met	54	54%
MILD ADDICTION	eria are met	8	8%
MODERATE ADDICTION	eria are met	14	14%
SEVERE ADDICTION	eria are met	24	24%

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Fig.1. Severity Levels of digital addiction among 100 students

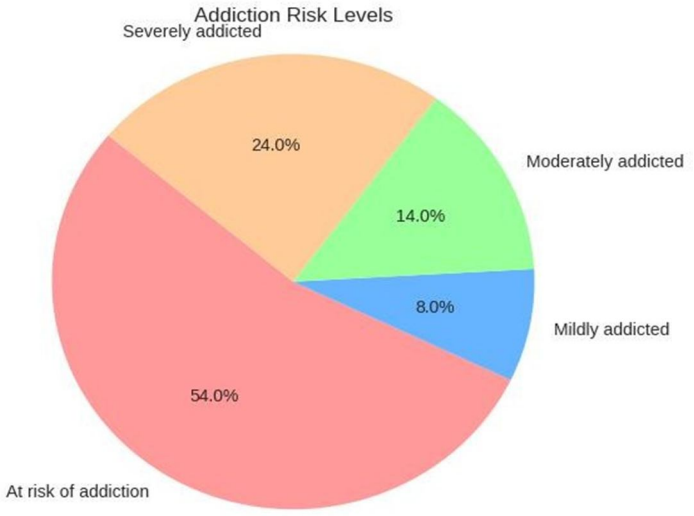


Table no.5. and fig.1. shows the levels of severity of digital addiction; 54% are at risk of addiction, 8% are mildly addicted, 14% are moderately addicted and 24% are severely addicted.

CRITERION	No. of students affected	centage of students affected	Scores to be considered for affectation
DECEPTION	41	41%	>=6
CONFLICT	41	41%	>=6
DISPLACEMENT	42	42%	>=9
PROBLEMS	25	25%	>=12
PREOCCUPATION	45	45%	>=9
RELAPSE	49	49%	>=6
MOOD MODIFICATION	50	50%	>=9
WITHDRAWAL	51	51%	>=12
TOLERANCE	48	48%	>=6

Table .6. No. of students showing affectation in particular criterion

Fig.2. percentage of students affected as per digital addiction criteria

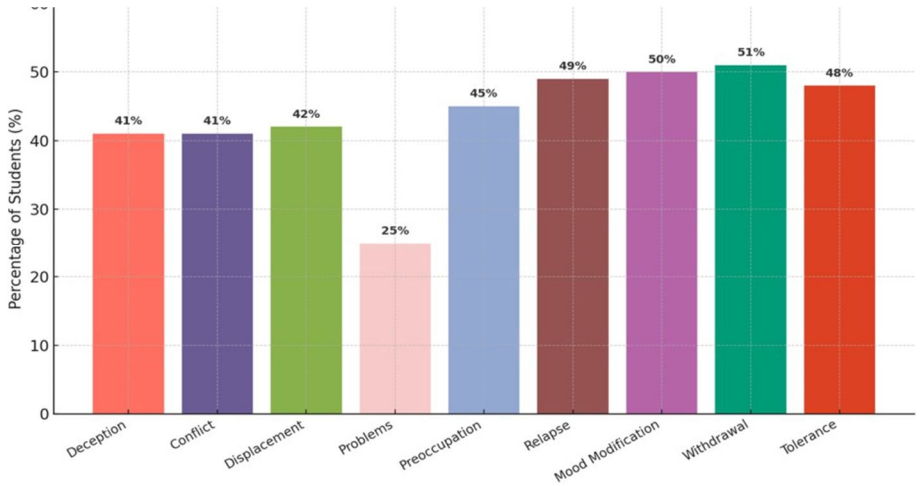


Table no.6. and fig.2. shows that highest percentage of students are getting affectation due to withdrawal i.e. 50% followed by mood modification, relapse, tolerance with 51%, 49%, 48% respectively. Affection due to preoccupation is 45%, Problems is 25%, 42% students have affections due to displacement. 41% of 100 students have shown affectations due to deception and conflict.

VII. DISCUSSION

Aim of the study was to evaluate prevalence and severity of digital addiction among school-going children in grades 4 to 7 using Digital Addiction Scale for children (DASC). Primary objective was to evaluate the presence of following core addiction criteria/symptoms of digital addiction amongst students Mood modification, Withdrawal, Tolerance, Deception, Conflict, Displacement, Problems, Preoccupation. Secondary objective was to provide recommendations for awareness, prevention, and early intervention strategies for digital addiction in school children. The Digital Addiction Scale for Children (DASC) is a standardized tool developed by Hawi & Samaha (2020) which was used to assess the level of digital addiction among children and adolescents.

General demographics such as name, age, sex, grade were taken followed by the Digital Addiction Scale for Children (DASC) was administered on the participants. The scale is self-reported, and students were instructed to respond to all items independently, based on their personal experiences.

Clear instructions were provided prior to administration to ensure accurate responses. Students of grade 4 to 7 of Government school, Marathi medium was recruited for the study. Rapport was built with them. Students were asked demographic details – age, gender, grade, and other relevant characteristics, digital device usage – type of device most frequently used (e.g., smartphone, laptop, tablet, gaming console), history of device acquisition – age/year at which students received their first smartphone, laptop, or other digital devices, patterns of usage – frequency and purpose of device use.

The history of device acquisition – since when students received their first smartphone, laptop, or other digital devices was taken. Table 3. Smartphones are mostly owned for 1–5 years (about 70%), showing stable usage. Laptops are relatively newer—around 30% are less than a year old. Computers are the oldest devices, with over half (52.5%) being <1 year old (perhaps new installations or lab systems). Gaming devices are also relatively new, with none older than 5 years. Tablets show moderate turnover, mostly between <1 year and 5 years.

Smartphone usage surged post-COVID: Most students started using smartphones in the last 1–5 years, likely due to remote learning and increased digital access.

Computer use rose in the past year: Reflects growing school-based digital education and access to devices.

Gaming is the top activity: Highest number of students started gaming in the last year, suggesting its role in entertainment and social bonding.

Tablet use slowly increased: From 7 to 9 students over 5 years, possibly due to educational apps or donations.

This may be due to Smartphones are now essential for communication, academics, and leisure. Their moderate age range (1–5 years) indicates users' reliance on familiar technology and regular upgrades only when necessary.

This study is in accordance with the Prevalence and Determinants of Internet addiction among Indian Adolescents studied by Sakthivel Arthanari, Najam Khalique, M. Athar Ansari, Nafis Faizi published in Indian Journal of Community Health published in 2017 stated that 35.6% of students were found to have Internet addiction (this includes mild/moderate levels presumably according to cut-offs) ; Males had a higher rate (40.6%) vs females (30.6%). The study concluded that internet addiction is widely prevalent among school-going adolescents in Aligarh and needs attention.No. of students using various digital devices ranging from smartphones, tablets, laptops, computers, gaming devices is observed. Smartphone is being used by 87 students out of 100. But it doesn't mean that they don't use other devices. Laptop users are 24 students and computer users are 38 students. Gaming devices are used by 51 students who may also uses other digital devices.

Levels of severity of digital addiction have shown 54% are at risk of addiction, 8% are mildly addicted, 14% are moderately addicted and 24% are severely addicted.

Highest percentage of students are getting affectation due to withdrawal i.e. 50% followed by mood modification, relapse, tolerance with 51%, 49%, 48% respectively. Affection due to preoccupation is 45%, Problems is 25%, 42% students have affections due to displacement. 41% of 100 students have shown affectations due to deception and conflict.

This may be due to Emotional Coping: Students use digital media to relieve stress or loneliness, leading to dependency. Academic & Social Pressure: Online engagement serves as an escape from stress and competition. Instant Gratification: Constant digital rewards trigger addictive dopamine responses. Lack of Supervision: Unstructured time and minimal monitoring promote overuse.

Peer Influence: Social validation and FOMO drive continuous online presence. Poor Digital Awareness: Limited understanding of healthy screen habits. Easy Accessibility: Affordable devices and fast internet encourage habitual use. Post-Pandemic Habits: Online routines formed during lockdown continue excessively.

This study is in accordance with Effects of memory and attention on the association between video game addiction and cognitive/learning skills in children: mediational analysis published in 2024 in by Ali Kappi et al. stated that video game addiction was significantly associated with poorer attention and memory. There was a significant indirect effect of video game addiction on cognitive and learning skills through attention, but not through child memory.

A. Parents And Teachers Feedback On Digital Addiction

PARENTS OBSERVATION / complaints that they have told to principal and class teachers on parents teachers meeting.

1) Watches television for long hours.
2) Becomes aggressive whenever asked to keep phones down.
3) Lost interest in studies.
4) Decreased sleep time.
5) Tend to be at home on smartphones instead of going out to play.
6) Learning amusing words and behaviours from reels.
7) Demanding for new things that they have seen on internet.
8) Need to call name multiple times for them to respond and deny to follow command.

B. Teachers Observation that they observed in their students in scholastic performance and behaviours.

1) Students became inattentive in class.
2) Those who used to get 85%, are scoring 65% as they started spending more time on digital devices.
3) Since, phones are not allowed in schools, in lunch breaks students stand beside peon to watch what he or she is scrolling on smartphones.
4) Takes long time to learn simple things.
5) Always discussing about new movies, games, instagram and youtube videos.
6) Mimics dance video from internet and always worry about photos.
7) Became over conscious about their appearance.

C. Scope of School-Based Occupational Therapy in Digital Addiction

1) Early Identification and Screening: Occupational therapists (OTs) in schools can help identify children at risk of digital addiction through observation, teacher/parent reports, and standardized screening tools. They can detect functional difficulties (reduced attention, poor handwriting, decreased participation in play, social withdrawal, sleep issues) linked to overuse of digital devices.
2) Functional Performance and Participation: Digital addiction directly affects academic skills (reading, concentration, writing), social skills (peer interaction, group play), and self-care routines (sleep, eating, hygiene). OTs can assess how digital addiction impacts occupational performance areas: education, play, leisure, and daily living activities.
3) Preventive Programs in Schools: Designing digital hygiene and balance programs that teach children how to use technology in healthy ways. Incorporating classroom-based activities that encourage physical movement, outdoor play, and peer interaction to counter sedentary screen time. Educating teachers and parents about setting boundaries, schedules, and ergonomic practices.
4) Intervention and Rehabilitation:
a) Individualized interventions: Developing behavior modification strategies, sensory diets, and structured routines for children with problematic use.
b) Group-based interventions: Social skills training, cooperative play, mindfulness, yoga, or stress management sessions to reduce reliance on digital devices.
c) Skill-building: Enhancing executive functions (attention, working memory, planning) affected by digital addiction.(14)

5) Collaboration and Advocacy: Working with teachers, school counselors, and parents to develop consistent strategies for managing digital use. Advocating for school policies on screen time regulation, digital-free breaks, and structured use of educational technology.(14)

6) Research and Evidence Building: School-based OTs can contribute to research by documenting how interventions reduce symptoms of digital addiction and improve performance in daily occupations. Building evidence- based frameworks for prevention and rehabilitation programs in the school setting.(14)

D. Intervention and Rehabilitation

1) Individualized interventions: Developing behavior modification strategies, sensory diets, and structured routines for children with problematic use.
2) Group-based interventions: Social skills training, cooperative play, mindfulness, yoga, or stress management sessions to reduce reliance on digital devices.
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E. Collaboration and Advocacy

Working with teachers, school counselors, and parents to develop consistent strategies for managing digital use. Advocating for school policies on screen time regulation, digital-free breaks, and structured use of educational technology.(14)

F. Research and Evidence Building

School-based OTs can contribute to research by documenting how interventions reduce symptoms of digital addiction and improve performance in daily occupations. Building evidence- based frameworks for prevention and rehabilitation programs in the school setting.(14)

The findings suggest that digital addiction in school children presents with addiction-like features such as withdrawal, tolerance, and relapse, which significantly affect emotional regulation and daily functioning. This highlights the urgent need for early identification, preventive education, and school- based interventions. Addressing these issues can help reduce long-term psychosocial and academic consequences.

1) Behavioral treatments: individual characteristics may be crucial in determining internet use and the emergence of internet addiction. The following characteristics of adolescents were positively associated with internet addiction: low self-esteem, reward reliance, low collaboration, and high harm avoidance. Low self-esteem and behavioral issues such as sleep difficulties, violent or depressive symptoms, school dropout, antisocial personality disorder, and alcohol misuse may be linked to poor academic performance(7).
2) Cognitive Behavioral Approach (CBT): Cognitive behavioral therapy (CBT) can help someone with internet addiction disorder identify the sensations and beliefs that lead them to use the Internet inappropriately for personal purposes. The therapy has been found to be effective by number of researchers where it has helped people to improve their mental and emotional health and subsequently lead to behavioral change. Replace maladaptive habits with meaningful occupations (e.g., hobbies, social engagement, physical activity) that support well-being. Facilitate group activities or role-playing to rebuild interpersonal skills and foster real-world connections.Teach strategies for structuring time and creating tech-free zones or schedules.Modify environments to reduce digital temptations (e.g., removing devices from bedrooms, using app blockers)(7).

Intervention to manage digital addiction is as follows :

a) Therapeutic recreation: The professional solution for leisure is therapeutic recreation. People who need individualized help to reach their goals and dreams because of illness, disability, or other life circumstances can benefit from therapeutic recreation, which is the deliberate and careful facilitation of quality leisure experiences and the development of personal and environmental strengths. Those who are addicted to high-risk games engage in less family-friendly leisure activities than those who are addicted to low-risk games. Their desire for hobbies or leisure activities increases as their addiction to the game grows(7,14).
b) Music therapy: As per findings, drumming and associated shamanic and communal activities have been integrated into the substance misuse rehabilitation program. Drumming circles are a valuable adjunctive therapy, especially for recurrent relapses and in situations where other forms of counseling have not worked. Drumming promotes relaxation, hypnotic receptivity, and shamanic (spiritual)experiences. Other rhythmic auditory stimuli, like drumming, force a driving pattern on the brain(7, 14)
c) Art therapy: It help young people with game addiction develop better self- control skills. Consequently, there was a decrease in hostile attitudes and an increase in social interaction with family members and peers(7,14).

d) Motivational Interviewing (MI): MI is a quick, directive, patient-centered method that emphasizes individual responsibility and choice. Most people who are addicted to anything do not seek rehabilitation and instead deny the issue. Therefore, MI is for those who are not prepared to alter their behavior on their own.

e) Mindfulness Behavioral Cognitive Treatment (MBCT): discovered that practicing "mindfulness," a form of meditation that aids in decentering from pessimistic ideas and the depressing emotions they are linked to, maybe a potential remedy. In individuals with three or more depressive episodes, MBCT seemed to avoid relapse. Fundamentally, addiction is a habit. It is thought that an addict acts "mindlessly" or automatically, with minimal understanding of the triggers that lead to substance abuse. Therefore, encouraging mindfulness may show to be a useful strategy for treating other addictions as well.

f) Complementary treatment: Complementary therapies employ a variety of activities and a greater emphasis on environmental variables to treat internet addiction. Numerous researches have been conducted to determine whether particular activities, like music, art, or even exercise, are most successful in reducing the rate at which people use smartphones.

g) This study is in accordance with Zhou et al. (2022) emphasized that excessive screen time among children—especially through social media, gaming, and streaming—leads to disrupted sleep patterns, reduced physical activity, and increased sedentary behavior indicated that digital addiction has become a significant global issue, with detrimental effects on children's physical health, psychological well-being, cognitive functioning and educational outcomes. Socioeconomic background, parenting styles, and parental digital use emerge as strong predictors of children's digital habits. Preventive interventions, including cognitive-behavioral therapy, mindfulness, recreational activities, and parental mediation strategies, show promise in mitigating risks. The findings emphasize the urgent need for multi-sectoral strategies involving families, schools, and health professionals to promote balanced and healthy digital engagement.

G. *Preventing Mildly Addicted Students From Becoming Severely Addicted*

Week	Focus Area	Activities
1	Self- awareness	Digital use diary, goal setting, discussion circle
2	utine and structure	Visual schedule creation, time management games
3	ensory and movement	Obstacle course, yoga, nature walk
4	Social skills	Role-play, cooperative games, group storytelling
5	BT and coping	Thought-challenging worksheets, emotion cards
6	isure and hobbies	Try-it stations: art, music, sports, crafts
7	eview and reflection	Progress check, celebration, future planning

VIII. CONCLUSION

After analyzing the data it can be concluded that Digital addiction is highly prevalent among school-going children (Grades 4–7), with 54% at risk, and 46% already addicted at varying severity levels.

Smartphones are the most widely used devices (87%), followed by gaming devices (51%), computers (38%), and laptops (24%).

Post-COVID, the duration and intensity of device use increased significantly, particularly for smartphones and gaming.

Core addiction symptoms most reported include withdrawal (50%), mood modification (51%), relapse (49%), and tolerance (48%), showing that multiple dimensions of dependency are present.

Parents report behavioral concerns such as aggression, poor academic focus, reduced sleep, and preference for digital over outdoor play. Teachers observed declining academic performance,inattention, preoccupation with media, and changes in classroom behavior. Digital addiction has begun to affect functional performance: academics, social participation, routines, and mental well-being. There is an urgent need for school-based preventive and rehabilitative interventions, including awareness, structured routines, digital hygiene programs, and parent-teacher collaboration.

Occupational therapists have a critical role in early screening, functional assessment, preventive programs, therapeutic interventions, and advocacy within school settings.

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IX. LIMITATIONS

1) Limited sample size and setting: The study was conducted on only 100 students from a single government school, which restricts the generalizability of the findings to other schools, regions, or socioeconomic groups.
2) Homogeneity of participants: All participants belonged to low socioeconomic status and were from one school. This reduces variability in the sample and does not account for the experiences of children from middle or high socioeconomic backgrounds.
3) Cross-sectional nature: As the study is observational and cross-sectional, it captures data at one point in time. It does not establish causal relationships or show changes in digital addiction patterns over time.
4) Self-reporting and response bias: Information may have been influenced by children's ability to understand and truthfully respond to questions. Social desirability bias or misunderstanding of items could affect accuracy.
5) Exclusion of external factors: The study did not account for important external influences such as parental monitoring, home environment, peer influences, or cultural differences, which may significantly impact digital addiction levels.
6) Age group restriction: The study only included students from grade 4 to grade 7, which excludes younger children and adolescents in higher grades, limiting the scope of age- related comparisons.

X. RECOMMENDATIONS FOR FUTURE STUDY

Considering the limitations following are recommendations are suggested:

1) Larger and more diverse samples: Future studies should include a larger number of participants from multiple schools, encompassing various socioeconomic backgrounds, to enhance the generalizability of findings.
2) Inclusion of different age groups: Expanding the study to include younger children as well as older adolescents would allow for better understanding of developmental differences in digital addiction patterns.
3) Longitudinal research design: Conducting longitudinal studies would help track changes in digital addiction over time and provide insights into causal relationships between screen use and functional performance.
4) Consideration of external factors: Future research should account for variables such as parental monitoring, home environment, peer influence, cultural background, and availability of digital resources, as these may significantly impact children's digital behavior.
5) Mixed-method approach: Combining quantitative scales like the DASC with qualitative methods (e.g., interviews, focus groups) can provide a more holistic understanding of children's digital usage patterns and their psychosocial impact.
6) Intervention-based studies: Research focusing on preventive and interventional strategies—such as digital literacy programs, time management training, and parental guidance—could help address digital addiction more effectively.
7) Policy-level implications: Findings may guide school authorities and policymakers to integrate awareness programs into the curriculum, promoting healthy digital habits among children.

ANNEXURE-A

Instructions:
- "My device" means: PlayStation, Xbox, Wii, laptop, computer, tablet, iPad, smartphone, etc.
- "Using my device" means: to go on social media (YouTube, Instagram, Snapchat, WhatsApp, etc.) and/or to play video games, etc.
- Please put a circle around the word that relates to your use of your device or devices during the last 6 months. There are no right or wrong answers.

1. When I am not at school, I spend a lot of time using my device	Never	Rarely	Sometimes	Often	Always
2. I feel the need to spend more time using my device	Never	Rarely	Sometimes	Often	Always
3. I feel upset when I am not able to use my device	Never	Rarely	Sometimes	Often	Always
4. I lie to my parents about the amount of time I spend using my device	Never	Rarely	Sometimes	Often	Always
5. Using my device helps me to forget my problems	Never	Rarely	Sometimes	Often	Always
6. I do not spend time with my family members because I prefer using my device	Never	Rarely	Sometimes	Often	Always
7. I have spent more and more time on my device	Never	Rarely	Sometimes	Often	Always
8. I feel upset when I am asked to stop using my device	Never	Rarely	Sometimes	Often	Always
9. My parents try to stop or limit me using my device, but they fail	Never	Rarely	Sometimes	Often	Always
10. I am sleeping less because I am using my device	Never	Rarely	Sometimes	Often	Always
11. When I do not have my device, I think about what I do on it (video games, social media, texting, etc.)	Never	Rarely	Sometimes	Often	Always
12. I feel frustrated when I cannot use my device	Never	Rarely	Sometimes	Often	Always
13. I have problems with my parents about the amount of time I spend using my device	Never	Rarely	Sometimes	Often	Always
14. Using my device is the most important thing in my life	Never	Rarely	Sometimes	Often	Always
15. Using my device is more enjoyable than doing other things	Never	Rarely	Sometimes	Often	Always
16. I lie to my parents about what I do on my device	Never	Rarely	Sometimes	Often	Always

17. I am not able to control using my device	Never	Rarely	Sometimes	Often	Always
18. I have lost interest in hobbies or other activities because I prefer using my device	Never	Rarely	Sometimes	Often	Always
19. When I stop using my device, it is not long before I start using it again	Never	Rarely	Sometimes	Often	Always
20. I check my device when I am doing homework or other important things	Never	Rarely	Sometimes	Often	Always
21. I feel frustrated when I am asked to stop using my device	Never	Rarely	Sometimes	Often	Always
22. I argue with my parents when they ask me to stop using my device	Never	Rarely	Sometimes	Often	Always
23. I spend too much money on things for my device	Never	Rarely	Sometimes	Often	Always
24. Using my device makes me feel better when I feel bad	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
25. I continue using my device despite that my grades at school are getting lower and lower	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree

Scoring of particular criterion

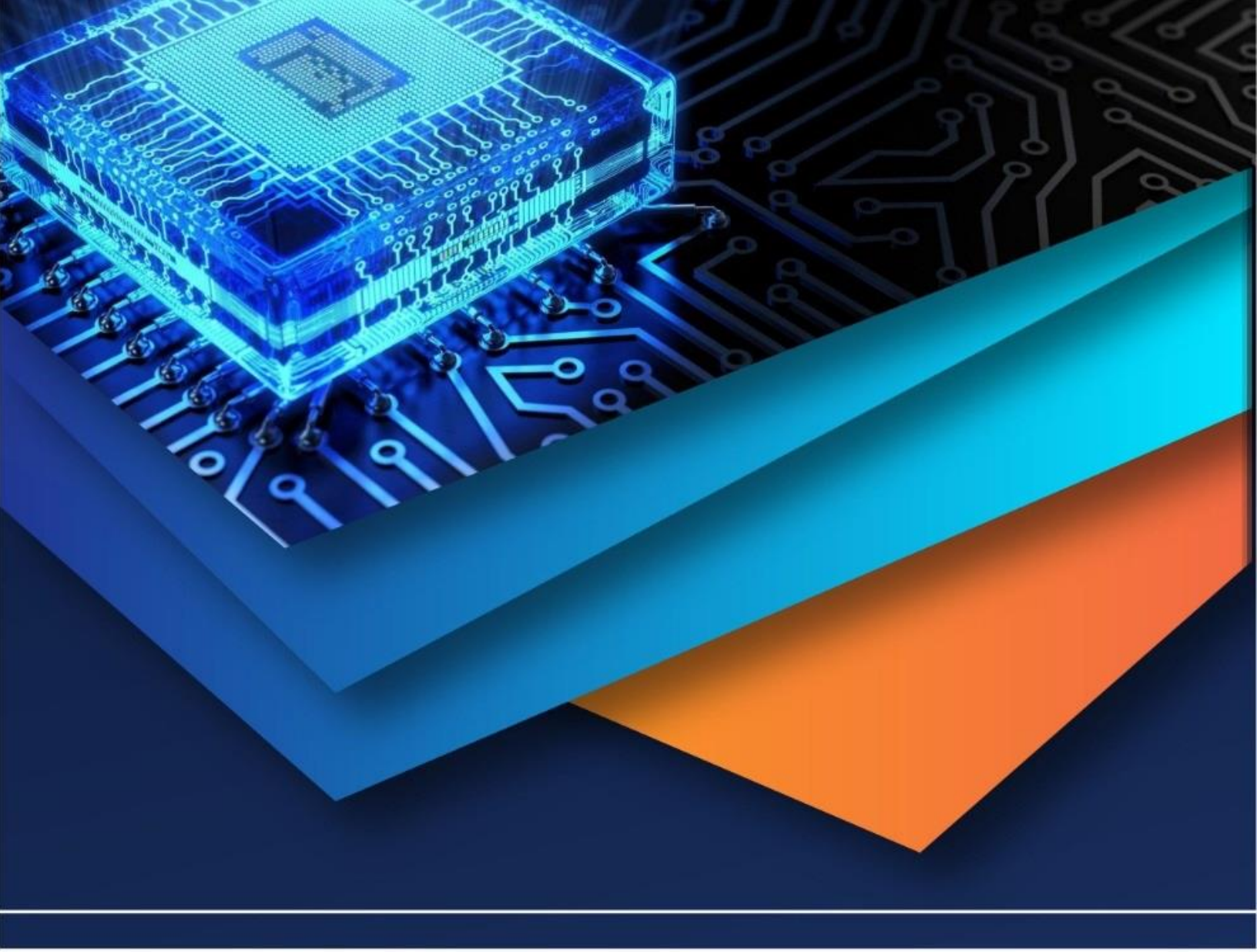
CRITERION	ITEMS	Scores to be considered for affectation
DECEPTION	ITEM 4; ITEM 16	>=6
CONFLICT	ITEM 9; ITEM 22	>=6
DISPLACEMENT	ITEM 6; ITEM 18; ITEM 20	>=9
PROBLEMS	ITEM 10; ITEM 13 ITEM 23; ITEM 25	>=12
PREOCCUPATION	ITEM 14; ITEM 1; ITEM 11	>=9
RELAPSE	ITEM 17; ITEM 19	>=6
MOOD MODIFICATION	ITEM 5; ITEM 15; ITEM 24	>=9
WITHDRAWAL	ITEM 3; ITEM 8 ITEM 12; ITEM 21	>=12
TOLERANCE	ITEM 2; ITEM 7	>=6

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