EFFECT OF SCREEN TIME ON PHYSICAL, EMOTIONAL AND BEHAVIORAL FUNCTIONING OF CHILDREN DURING THE TIME OF LOCKDOWN

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Abstract

Background & Objective: Screen time has now become a most concerned issue around the world due its negative effects on children' health. COVID-19 was declared as a pandemic by World Health Organization (WHO) during March 2022 and lockdown was one of the strategy to control disease transmission. This study aims to investigate whether this lockdown caused an increase in screen time and what are its effects on physical, emotional, and behavioral functioning of children.

Methods: It was a cross-sectional study including a sample of 260 mothers of children aged 5–13 years from Karachi, Lahore and Islamabad, during March to June 2021. A google survey form was developed and participants were invited using a google link on social media, parents' groups, Whats app groups and school facebook pages. Screen time was measured in number of screen hours per day. Physical health was evaluated through body mass index (BMI) reports. Children's Emotional Adjustment Scale (CEAS) and Strengths & Difficulties Questionnaire (SDQ) were used for behavioral and emotional problems. Coefficient of correlation and t-test was used for examining the difference of means.

Results: About 244 (94%) mothers reported that screen time of their children is significantly increased during COVID-19 lockdown. There was a negative relationship observed between screen time with temper and anxiety control ($r= -0.13$; $p= 0.04$). However, a positive relationship was found for hyperactivity ($r= 0.74$; $p<0.001$) and conduct problems ($r= 0.18$; $p= 0.003$). We found a gender difference for screen time ($t= 4.39$; $p=0.001$) and hyperactivity ($t= 2.35$; $p= 0.02$), where boys were more hyperactive than girls. No significant difference was obsereved for BMI and pro-social behavior.

Conclusion: Screen time among children is considerably increased during lockdown and this is associated with low temper control, anxiety, hyperactivity, and conduct problems. Remedial strategies are required at national level; media and school authorities can play a vital role in this regard.

Key Words: Screen time; Lockdown; Hyperactivity, Conduct problems; Temper control; Anxiety control

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Screen time has become a problematic phenomenon during the last few years throughout the world, which is attributed to more access to variety of electronic media devices. Television remained a predominant type of screen among children, however, now video games, computers, smart phones, and tablets, are occurring from a progressively young age.[1] The current generation uses electronic devices as a central part of their daily life; children and adolescents spend most of the time using increasingly growing variety of digital media devices for their leisure. The youth is having an excessive screen use over the recommended limit of two hours per day by the health professionals.[2] The use of smart phones which encourages multi-screening, and allows access to every type of content, is drawing attention of the researchers to study its effects on chil-

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dren's mental health.[3] The research found negative effects of screen time on the development of cognitive abilities, and also indicated its positive relationship with sleep problems, obesity, and anxiety.[1]

Obesity is the rapidly growing global public health concern and is significantly associated with morbidity and mortality.[4,5] Over the past years, obesity has been tripled among adolescents.[6] Screen time has been found as one of the major predictors of weight gain and overall physical health. Another suggested factor which links computer-related activities to obesity is an increase in passive food consumption.[7] The association between screen use and obesity can be described better by physical inactivity, reduced sleep, and exposure to advertising negatively affects the dietary choices of the youth.[8-10] The relationship between media devices and sleep duration relates from infancy through adolescence.[11] Magee et al.[12] argued that both screen time and sleep duration can be influenced by obesity because sedentary lifestyle may be more common in obese children. Attention deficit/hyperactivity disorder (ADHD) which is taken in the category of neurodevelopmental disorders but children in the normal population may exhibit various symptoms of ADHD (impulsivity, hyperactivity, and attention problems) on a continuous basis. It has been found that such behaviors are associated with the excessive use of screen, especially violent video games.[13] Children and adolescents, aged 6–17, diagnosed with impulsiveness and attention related problems are seen to have an excessive screen time.[14]

Physical aggression is defined as behavior intended to harm another,[15] and may include hitting, kicking, and biting, is positively related to the exposure to media (particularly violent media).[16] Several research studies have demonstrated a significant relationship between screen time and aggressive behavior.[17,18] Long-term use of smart phones has been seen significantly correlated with emotional and psychological issues among school children like feeling restless or anxious in the absence of tablets/smart phones and being jealous of others' smartphone.[19] The reciprocal relationship between video games/computer use, social phobia, and generalized anxiety was also observed during a one-year period of adolescence.[20]

On 11th March 2020, WHO declared COVID-19 outbreak a pandemic,[21] and immediate call for lockdown around the world to control its expansion. This lockdown caused the inability to move, and the children were bounded to stay at home. All the academic institutions switched to internet applications. Such change in social and physical environment during lockdown may have created number of social and psychological issues in Pakistan and a great deal of research is focusing on this phenomenon recently; therefore it is necessary to explore effects of screen time on children. The current study aims to investigate whether this lockdown caused an increase in screen time and what were its effects on physical, emotional, and behavioral functioning of children in three major cities of Pakistan.

METHODS

This cross-sectional study was conducted through an online survey after the approval of Research Ethics Board of PACT (Pakistan Association of Cognitive Therapists), approval number: PACT/2021.300. The study duration was 3 months (March 2021 to June 2021). A sample of 260 mothers of children aged 5–13 year, having no physical or mental disability, was taken through an online google survey from Karachi, Lahore and Islamabad. The google survey link was promoted on social media in various groups of parents including class what's app groups and Facebook groups of different schools. Screen time was measured in number of hours spend in front of screen per day. Physical health was evaluated through Body Mass Index (BMI), by asking mothers about height and weight of their children.

Children's Emotional Adjustment Scale (CEAS) is a parent-rated measure used to assess emotional competence of children across the four domains (Temper control, Anxiety control, Mood repair, Social Assertiveness).[22] Its anxiety control and temper control subscales were used in the current study. Strengths & Difficulties Questionnaire (SDQ) is a brief emotional and behavioral assessment tool for children and adolescents, comprising of 5 scales with 5 items each (Hyper-

activity Scale, Emotional Problems Scale, Peer Problems Scale, Conduct Problems Scale, Prosocial Behavior Scale).[23] In the present study, 3 subscales have been taken including hyperactivity scale, conduct problems scale, and prosocial behavior scale. Both scales are highly valid and reliable for evaluating emotional and behavioral functioning of children. We used mean and standard deviation to present quantitative data and difference of means was examined using student's test. Correlation was calculated using Pearson Product Moment correlation analysis. Hierarchical linear regression analysis was used to predict the effects related to screen time. A p-value of less than 0.05 was considered statistically significant. All analyses were conducted using SPSS version 21.

RESULTS

Table 1 shows the demographic characteristics of the children under study. Mean age of children was 8.43 ± 2.27 where 133(51%) were males, living in joint family (52.7%). About 244 (94%) mothers reported that screen time of their children is significantly increased during lockdown. The average hours spent in front of screen per day was 5.75 with standard deviation 1.58. The most common type of screen was smartphones or tablets (52%), television (29%), computer/laptop (14%), and video games (5%). Regarding body mass index (BMI), the average BMI was 28.60 with standard deviation 8.57. There was no significant relationship between screen time and BMI i.e., with an increase in screen time, BMI does not increase. However, the direction of relationship remained positive (r= 0.06; p= 0.34). The results about temper control confirmed that there is a negative relationship between screen time and temper control (r = -0.13; p= .04), with an increase in screen time, temper control decreases. Likewise, screen time negatively predicted temper control (β= -0.13, p=0.04), indicating that screen time was associated with aggression among children. Similarly, anxiety control analysis showed the negative correlation between screen time and anxiety control (r = -0.13; p= 0.04). Moreover, hierarchical linear regression analysis showed significantly negative prediction ((β= -0.13, p= 0.04). Screen time predict is better predictor of anxiety among children. We found positive relationship between screen time and hyperactivity (r= 0.74; p= 0.001). Furthermore, screen time predicted hyperactivity among children (β= 0.74, p= 0.001). The percentage of children falls in various ranges of hyperactivity is depicted in Figure 1. Screen time also showed a positive relationship with conduct problems (r= 0.18; p= 0.003). Moreover, regression analysis demonstrated that screen time causes conduct problems among children (β= 0.18, p= 0.003). Parents mostly reported temper tantrums, fights, and obedience issues, however stealing and lying problems were not reported. The percentage of children falls in various ranges conduct scale is given in Figure 2.

Table 1: *Demographic characteristics of children in the study (n=260)*

Characteristics	Mean ± SD
Age (in years)	8.43 ± 2.27
Grade (in years)	3.55 ± 2.34
Gender	**Frequency (%)**
Male	133 (51)
Female	127 (49)
Parent's living status	
Live together	254 (97.7)
Separated/divorced	6 (2.3)
Family system	
Nuclear	123 (47.3)
Joint	137 (52.7)

Abbreviations: SD, standard deviation;

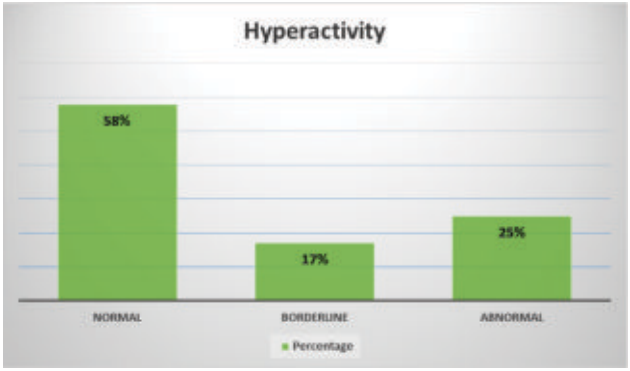

Figure 1. *Children' Ranges of Hyperactivity*

No significant relationship was seen between screen time and prosocial behaviors (r = 0.01; p= 0.86). Independent sample t-test analysis indicated no signi-

ficant gender differences in temper control, anxiety control, conduct problems and prosocial behavior (p>.05). Only screen time (t= 4.39; p=0.001) and hyperactivity (t= 2.35; p= 0.02) has significant gender differences, where boys were more hyperactive and spend more time using screen than girls.

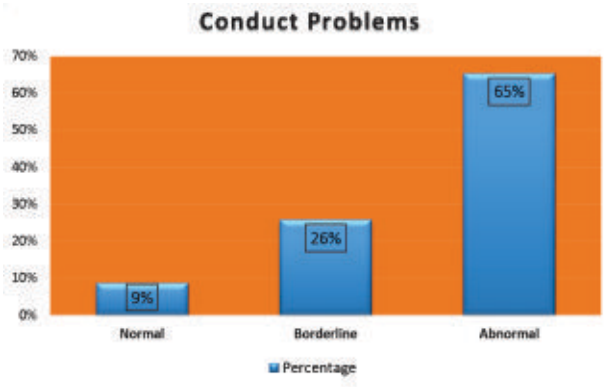

Figure 2. *Children' Ranges of Conduct Problems*

DISCUSSION

International studies have demonstrated that over the past two decades, there is a dramatic increase in screen time among children which is causing emotional problems.[1,17,18] Now in Pakistan, we can also observe that screen is frequently engaging children who have not learned to manage their boredom and rely on media devices to assist them. This engagement in multi-screening has almost break the recommended two hours per day limit of screen by the health experts.[2] Our results show that average number of screen hours per day is more than 5 hours.

Our study explored the significant relationship between screen time with hyperactivity. A meta-analysis,13 consisted of 12 longitudinal studies, 29 cross-sectional studies, and 4 experimental studies, showed a significant small association between screen use and ADHD-related behaviors (r= 0.12), while in our study a strong correlation is seen (r= 0.74; p= 0.001). This difference may occur due to the effects of lockdown since the screen time is markedly increased in this duration. Moreover, previous studies have showed that boys more often exhibit hyperactivity.[24] Boys spend more time on screen than girls and are more fascinated to action-packed and violent media.[25] Both these studies are consistent with our findings. However, these observed gender differences in screen time and hyperactivity do not certainly infer that the impact of screen on hyperactivity and impulsive behaviors is greater for boys than for girls, because boys are generally more aggressive than girls and have a stronger preference for violent videogames.[26]

The present study demonstrated a significant correlation of screen time with anxiety and low temper control. Like hyperactivity, this phenomenon is also very clear and understandable as these symptoms are associated with hyperactivity too.[27] Several studies have explored the link between screen time and aggressive behavior; a study conducted in Lahore, Pakistan found that long-term use of smart phones significantly predicts emotional and psychological issues among children, like feeling anxious in the absence of smartphones and being jealous of anybody's smart phone.[19] Therefore, it is evident in literature that screen time is a significant predictor of emotional health issues such as anxiety and anger control problems.

Results for conduct problems are also significant and parents mostly reported temper tantrums, fights, and obedience issues. A study conducted on children in China, used same assessment scale and found same results.[27] Results for obesity are not significant, however positive in direction. Although, literature describes the relationship of screen time and obesity but most of the studies are conducted on adolescent sample[6] and it can be due to the other eating habit too.[7] Therefore, it can be said that relationship is more significant for adolescents. Our results should be interpreted after considering few limitations. Major limitation of this study was the small sample size of our study, so further studies with larger sample size and more rigorous methodology (considering issue of bias in online surveys, involving population in small cities and rural communities and follow-up studies to see the trend of physical, emotional and behavioural effects) should be conducted in Pakistan to explore the effects of excessive use of screen among children as well as in adolescents.

CONCLUSION

Screen time among children is markedly increased during lockdown, which may be associated with low temper control, anxiety, hyperactivity, and conduct problems. Remedial and preventive strategies are required at national level. Parents should be aware about the harms of excessive screen time. Secondly, different reinforcement techniques should be guided to the parents instead of using screen as a reinforcer of children. Moreover, Physical and outdoor activities should be encouraged. Media and educational institutes can play a vital role in this regard. Our study also highlights the need of psychologists at schools.

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