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Evaluation of Digital Addiction Levels in Children and Adolescents with Asthma: A Case-Control Study

Astımlı Çocuk ve Ergenlerde Dijital Bağımlılık Düzeylerinin Değerlendirilmesi: Bir Vaka-Kontrol Çalışması

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Abstract

Aim: Asthma remains the most prevalent chronic condition among children, significantly affecting their health and contributing to increased school absenteeism. Digital addiction, defined by the excessive use of digital technologies, has become prevalent across different age groups, emerging as a significant societal concern. This study aims to evaluate the levels of digital addiction in children with asthma and compare these findings with those of their healthy peers, thereby contributing to a better understanding of the factors influencing asthma management in the digital age.

Material and Method: This cross-sectional case-control study was conducted at the outpatient pediatric clinic and the child psychiatry department of Konya Beyhekim Training and Research Hospital between December 2023 and March 2024. Data collection involved structured interviews with both the participants and their parents, during which details regarding device usage over the preceding six months were gathered.

Results: A total of 170 participants were recruited for the study, consisting of 56 females and 114 males, with a median age of 11 years (interquartile range: 5). The overall Digital Addiction Scale for Children score was also significantly higher in the asthma group compared to controls (p=0.003). The optimal threshold obtained from the receiver operating characteristic analysis was 50.5 points, which provided a sensitivity of 63.5% and a specificity of 60%. A significant association was identified between digital addiction and asthma with p=0.002 and an odds ratio of 2.613 (95% CI: 1.407-4.853).

Conclusion: Children and adolescents with asthma exhibit notably higher total digital addiction scores than their healthy counterparts, suggesting a potential association that merits further research. There is a need for comprehensive prospective investigations to clarify the nature of the relationship between asthma and digital addiction.

Keywords: Adolescent, asthma, children, digital addiction

Öz

Amaç: Astım, çocuklar arasında en yaygın kronik hastalık olmaya devam etmekte olup, onların sağlığı üzerinde önemli etkiler yaratmakta ve okul devamsızlığının artmasına katkıda bulunmaktadır. Dijital bağımlılık, dijital teknolojilerin aşırı kullanımı ile tanımlanmakta ve farklı yaş gruplarında yaygın hale gelmiş, önemli bir toplumsal sorun olarak ortaya çıkmaktadır. Bu çalışma, astımlı çocuklardaki dijital bağımlılık düzeylerini değerlendirmeyi ve bu bulguları sağlıklı akranları ile karşılaştırmayı, böylece dijital çağda astım yönetimini etkileyen faktörlerin daha iyi anlaşılmasına katkıda bulunmayı amaçlamaktadır.

Gereç ve Yöntem: Bu kesitsel vaka-kontrol çalışması, Aralık 2023 ile Mart 2024 tarihleri arasında Konya Eğitim ve Araştırma Hastanesi'nin ayaktan çocuk polikliniğinde ve çocuk psikiyatrisi departmanında gerçekleştirilmiştir. Veri toplama süreci, hem katılımcılarla hem de aileleriyle yapılandırılmış görüşmeler yapılarak, son altı ay boyunca cihaz kullanım detaylarının toplandığı aşamayı içermektedir.

Bulgular: Çalışmaya toplamda 170 katılımcı dahil edilmiştir; bunların 56'sı kız ve 114'ü erkektir. Katılımcıların medyan yaşı 11 yıl (çeyrek aralığı: 5) olarak belirlenmiştir. Astım grubundaki toplam Dijital Bağımlılık Ölçeği puanı, kontrol grubuna göre istatistiksel olarak anlamlı derecede daha yüksektir (p=0.003). Alıcı işletim karakteristik analizi ile elde edilen optimal eşik 50.5 puan olup, bu eşik %63.5 duyarlılık ve %60 özgüllük sağlamıştır. Dijital bağımlılık ile astım arasında p=0.002 anlamlı bir ilişki saptanmış ve odds oranı 2.613 (95% CI: 1.407-4.853) olarak bulunmuştur.

Sonuç: Astımlı çocuk ve ergenlerin toplam dijital bağımlılık puanları, sağlıklı akranlarına göre belirgin şekilde daha yüksektir; bu durum, daha fazla araştırmayı gerektiren potansiyel bir ilişkiyi düşündürmektedir. Astım ve dijital bağımlılık arasındaki ilişkinin doğasını netleştirmek için kapsamlı prospektif araştırmalara ihtiyaç vardır.

Anahtar Kelimeler: Ergen; astım, çocuklar, dijital bağımlılık

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INTRODUCTION

Asthma is the most prevalent chronic condition among children, significantly impacting their health and leading to increased school absenteeism.[1-3] The management of asthma is particularly challenging due to the interplay of various lifestyle factors such as reduced physical activity, sedentary behavior, poor nutrition, and obesity, all of which can exacerbate the condition.[4] In recent decades, participation rates in physical activity among children have notably declined, coinciding with a concerning rise in screen time.[5] This increase in digital engagement has resulted in a surge in sedentary behaviors, negatively affecting children's overall health outcomes.[6]

Digital addiction (DA), characterized by excessive use of digital technologies, has become widespread across different age groups and has emerged as a significant societal concern.[7,8] The pervasive use of digital devices, especially for social media, has been linked to various health issues, including poor sleep quality and increased stress levels.[9-11] Research has established connections between early childhood insomnia, internet addiction (IA), and disruptions in circadian rhythms, highlighting the need for early identification of at-risk children.[12,13]

Furthermore, the psychological issues associated with DA can complicate effective asthma management, further hindering treatment efforts.[14] Understanding the relationship between asthma and DA is essential, as digital addiction may create barriers to effective asthma management and treatment adherence. For instance, children with high levels of DA may engage less in physical activities crucial for asthma control and may neglect their treatment regimens due to distractions from digital devices.

Interventions targeting digital addiction in this population could promote increased physical activity and improve asthma outcomes. Given the rising prevalence of both asthma and DA, there is a significant gap in the literature regarding the specific impacts of DA on children diagnosed with asthma. This study aims to evaluate the levels of DA in children with asthma and compare these findings with those of their healthy peers. By addressing this gap, our research seeks to enhance the understanding of how digital behaviors uniquely affect children with chronic conditions like asthma, ultimately contributing to more effective pediatric asthma management strategies in the digital age.

MATERIAL AND METHOD

The research protocol received approval from the Ethics Committee of KTO Karatay University (approval number 2023/020), and informed consent was obtained from the parents of all participating children.

Study Design and Setting

This cross-sectional case-control study was conducted at the outpatient pediatric clinic and the child psychiatry department of Konya Beyhekim Training and Research Hospital between December 2023 and March 2024.

Sample Size Determination

The sample size was determined based on an estimated asthma prevalence of 11.5% in children reported in previous research.[15] Essential parameters, including a 5% alpha error, a 10% effect size, and 80% power, were established using G*Power 3.1.9.7 software. Consequently, the minimum required sample size was calculated to be 170 participants—comprised of 85 patients with asthma and 85 age-matched healthy controls.

Participants

The study evaluated 85 randomly selected children and adolescents with asthma aged between 6 and 17.9 years. 85 age- and sex-matched healthy children constituted the control group. Asthma was diagnosed according to the Global Initiative for Asthma criteria, specifically identifying individuals who had experienced recurrent wheezing within the past year.[16] The control group consisted of children and adolescents who attended pediatric outpatient clinics for non-specific ailments and consented to participate in the study. Participants were divided into two groups according to their ages: 6-11.9 years old (children) and 12-17.9 years old (adolescents).

Assessment of Digital Addiction

To assess DA among participants, we employed a scale initially developed by Hawi et al. and subsequently adapted into Turkish by Kaçmaz et al.[8] The evaluation encompassed a range of electronic devices, including PlayStation, Xbox, laptops, computers, tablets, iPads, and smartphones. Participants reported their usage patterns, which included activities such as engaging with social media platforms (e.g., YouTube, Instagram, Snapchat, and WhatsApp) and playing video games.

Data collection involved structured interviews conducted with both the participants and their parents, during which details regarding device usage over the preceding six months were gathered. Following the initial evaluation, participants were referred to the child psychiatry department for a comprehensive assessment of their DA levels.

The Digital Addiction Scale for Children (DASC) comprised 25 items categorized into two sub-dimensions: interpersonal relationships and introverted factors. The interpersonal relationships sub-dimension included items related to conflict, deceit, and relapse, while the introverted factors sub-dimension encompassed mental preoccupation, tolerance, withdrawal, and mood fluctuations. Participants responded to each item using a 5-point Likert scale ranging from "never" (1 point) to "always" (5 points). Higher total scores indicated a greater risk of DA, with overall scores ranging from 25 to 125 (**Table 1**).[8]

Table 1. Digital addiction scale for children

1	I spend most of my time using my device when I'm not at school.
2	I feel the need to spend more time when I'm using my device.
3	I feel anxious when I can't use my device.
4	I lie to my family about the time I spend using my device.
5	Using my device helps me forget my problems.
6	I don't spend time with my family because I prefer to use my device.
7	I'm spending more and more time on my device.
8	I get upset or angry when they tell me I need to put my device down.
9	My family tries to stop me from using my device or limit it, but they can't succeed.
10	I sleep less because I use my device.
11	When my device isn't with me, I think about what I'd do on it (video games, social media, messaging, etc.).
12	I get frustrated when I can't use my device (I feel bad).
13	I have issues with my family regarding the time I spend on my device.
14	The most important thing in my life is using my device.
15	Using my device is more fun than doing other things.
16	I lie to my family about what I'm doing when I use my device.
17	I can't control my device usage.
18	I've lost interest in my hobbies or other activities because I prefer using my device.
19	When I stop using my device, I start again before long.
20	I check my device when I'm doing my homework or important things.
21	I feel let down (bad) when I'm asked to stop using my device.
22	I argue with my family when they tell me to stop using my device.
23	I spend way too much money on things related to my device.
24	Using my device makes me feel better when I'm feeling down.
25	Even though my grades at school keep dropping, I keep using my device.

Note: interpersonal relationships (items 4, 6, 9, 10, 13, 16, 17, 18, 19, 20, 22, 23, and 25) and introverted factors (items 1, 2, 3, 5, 7, 8, 11, 12, 14, 15, 21, and 24).

Exclusion Criteria

Exclusion criteria for this study included mental retardation, any physical disabilities that could limit the use of technological devices, and parental refusal to participate.

Statistical Analysis

The distribution of parameters was evaluated using the Shapiro-Wilk test. For normally distributed data, descriptive statistics were reported as mean ± standard deviation, whereas non-normally distributed data were presented as median and interquartile range (IQR). Categorical variables were summarized using frequencies and percentages. For comparative analyses, the Mann–Whitney U test or the independent t-test was applied to continuous variables, while the chi-square test was utilized for categorical variables. The cut-off value of the total DASC score as a DA level predictor was calculated by use of a receiver operating characteristic (ROC) curve. Results were considered significant if $p<0.05$. All statistical analyses were performed using the SPSS software package for Windows, version 21.0.

RESULTS

Demographic Characteristics and Digital Addiction Scale Results for Children

A total of 170 participants were recruited for the study, consisting of 56 females and 114 males, with a median age of 11 years (IQR: 5). Statistical analysis revealed no significant differences in age or sex between the asthma group and the control group ($p>0.05$). In assessing DA, the median scores for interpersonal relationships, introversion factors, and total DASC scores were as follows: for males, 23 (IQR: 14), 29 (IQR: 14), and 54 (IQR: 26), respectively. For females, the corresponding scores were 22.5 (IQR: 19), 26.5 (IQR: 21), and 53.5 (IQR: 38). Although males exhibited higher scores across these domains, the differences were not statistically significant ($p >0.05$ for all comparisons). When evaluating these scores by age group, adolescents demonstrated median scores of 24 (IQR: 17) for interpersonal relationships, 30 (IQR: 16) for the introversion factor, and 56 (IQR: 36) for the total DASC score. In contrast, children achieved median scores of 22 (IQR: 13), 27 (IQR: 13), and 52 (IQR: 25), respectively. While adolescents showed higher scores than children, the differences did not reach statistical significance ($p >0.05$ for all comparisons).

In our analysis, we aimed to provide a comprehensive understanding of the DASC scores by evaluating specific items separately. This approach allows for a nuanced interpretation of how distinct factors, such as interpersonal relationships and introversion, contribute to overall DA, particularly in children with asthma. The separation of analyses helps to identify specific areas where interventions may be tailored for the asthma group, as these factors may require different prevention and treatment strategies. By analyzing the individual item scores, we can better understand the components of DA and how they manifest differently between asthmatic and non-asthmatic participants. **Table 2** summarizes the clinical characteristics of both cohorts. The analysis revealed that specific items on the DASC scored significantly higher in the asthma group compared to controls, particularly items 1, 3, 5, 6, 7, 12, 13, 16, 18, and 19. Within the asthma group, higher scores were particularly evident for items related to interpersonal relationships (specifically items 6, 13, 16, 18, and 19) and introversion factors (items 1, 3, 5, and 12). Consequently, asthmatic participants exhibited significantly elevated scores on both interpersonal relations and internal factors relative to their non-asthmatic counterparts. The overall DASC score was also significantly higher in the asthma group compared to controls ($p=0.003$) (**Figure 1**).

Table 2. Clinical features of children and adolescents with asthma and healthy controls

Variable	Subjects		p value
	Asthma (n: 85)	Healthy Controls (n: 85)	
Sex (Female/Male) (n, %)	28/57 (32.9/67.1)	28/57 (32.9/67.1)	
Age (years)	11 (4)	11 (5)	
Scores of Digital Addiction Scale for Children (DASC)			
Item 1 (point)	4 (1)	3 (2)	0.036
Item 2 (point)	3 (2)	3 (2)	0.918
Item 3 (point)	2 (3)	1 (2)	0.005
Item 4 (point)	1 (1)	1 (1)	0.050
Item 5 (point)	3 (2)	2 (2)	0.011
Item 6 (point)	3 (3)	2 (2)	0.007
Item 7 (point)	3 (2)	2 (2)	0.012
Item 8 (point)	3 (2)	2 (3)	0.084
Item 9 (point)	2 (3)	2 (2)	0.395
Item 10 (point)	1 (2)	1 (2)	0.617
Item 11 (point)	2 (3)	2 (2)	0.111
Item 12 (point)	2 (2)	2 (2)	0.049
Item 13 (point)	3 (2)	2 (2)	0.001
Item 14 (point)	1 (1)	1 (0)	0.353
Item 15 (point)	2 (3)	2 (2)	0.068
Item 16 (point)	1 (2)	1 (0)	0.005
Item 17 (point)	2 (3)	2 (2)	0.179
Item 18 (point)	2 (2)	1 (1)	0.048
Item 19 (point)	3 (2)	2 (2)	0.009
Item 20 (point)	2 (2)	1 (2)	0.389
Item 21 (point)	2 (3)	2 (2)	0.108
Item 22 (point)	2 (3)	2 (2)	0.065
Item 23 (point)	1 (0)	1 (0)	0.281
Item 24 (point)	3 (2)	3 (1)	0.093
Item 25 (point)	1 (3)	1 (1)	0.093
Sub-dimension scores of DASC			
Interpersonal relationships (point)	26 (15)	19 (13)	0.002
Introverted factors (point)	31 (16)	25 (14)	0.007
Total DASC score (point)	60 (30)	47 (28)	0.003

Values are expressed as median (IQR).

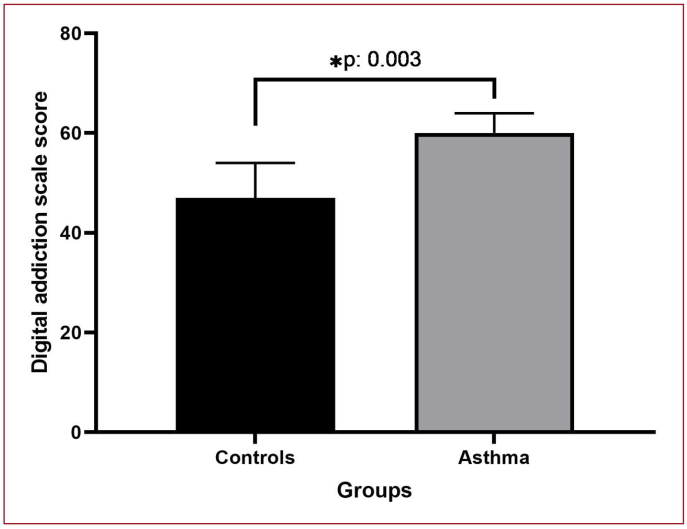

Figure 1. The digital addiction scale score in children and adolescents with asthma and healthy controls

No significant differences were observed when analyzing the total DASC scores or individual item scores based on sex within both the asthma and control groups (p >0.05) (**Table 3**). Furthermore, age categories (children versus adolescents) did not yield notable differences within either group (p >0.05). As depicted in **Figure 2**, the total DASC score was effective in distinguishing between subjects with asthma and those without, with an area under the curve (AUC) of 0.630 (standard error 0.043, 95% confidence interval: 0.547–0.714, p=0.003). The optimal threshold obtained from the ROC analysis was 50.5 points, which provided a sensitivity of 63.5% and a specificity of 60%. This cut-off value was determined by maximizing the balance between sensitivity and specificity using Youden's Index, which yielded a value of 0.24 for this threshold. A total DASC score above 50.5 was observed in 88 out of 170 participants (52%). Notably, among asthmatic individuals, 54 out of 85 (63.5%) exceeded this cut-off, in contrast to only 34 out of 85 (40%) in the control group, indicating a significant difference favoring the asthma cohort. Additionally, a significant association was identified between DA and asthma, with p=0.002 and an odds ratio of 2.613 (95% CI: 1.407-4.853).

Table 3. Comparison of DASC scores of children and adolescents with asthma and healthy controls by sex

Variable	Subjects				p value
	Asthma		Healthy Controls		
Sex (Female/Male) (n, %)	Female	Male	Female	Male	
Age (years)	11.5 (5.5)	11 (4)	11 (6.3)	12 (5)	0.778
DASC scores					
Item 1 (point)	4 (1)	4 (1)	3 (2)	3 (2)	0.840
Item 2 (point)	3 (2)	3 (2)	3 (2)	3 (1)	0.973
Item 3 (point)	3 (3)	2 (2)	1.5 (2)	1 (2)	0.173
Item 4 (point)	1 (3)	1 (1)	1 (1)	1 (1)	0.390
Item 5 (point)	3 (2)	3 (2)	3 (3)	2 (2)	0.147
Item 6 (point)	2.5 (3)	3 (3)	2 (2)	2 (2)	0.851
Item 7 (point)	3 (2)	3 (2)	3 (3)	2 (2)	0.989
Item 8 (point)	3 (2)	3 (2)	2 (3)	2 (3)	0.759
Item 9 (point)	3 (3)	2 (3)	3 (3)	2 (2)	0.880
Item 10 (point)	1.5 (3)	1 (2)	1 (2)	1 (1)	0.525
Item 11 (point)	2.5 (2)	2 (3)	1 (2)	2 (2)	0.915
Item 12 (point)	2 (3)	2 (2)	2 (2)	2 (2)	0.265
Item 13 (point)	3 (3)	2 (2)	2 (2)	2 (2)	0.825
Item 14 (point)	1 (1)	1 (1)	1 (0)	1 (1)	0.577
Item 15 (point)	2 (3)	2 (3)	2 (2)	2 (2)	0.254
Item 16 (point)	1 (2)	1 (1)	1 (0)	1 (0)	0.275
Item 17 (point)	3 (3)	2 (3)	1 (3)	2 (2)	0.387
Item 18 (point)	1.5 (3)	2 (2)	2 (2)	1 (1)	0.961
Item 19 (point)	2.5 (2)	3 (3)	2 (3)	2 (2)	0.802
Item 20 (point)	1.5 (2)	2 (2)	2.5 (3)	1 (2)	0.673
Item 21 (point)	2 (3)	2 (3)	2 (2)	2 (2)	0.912
Item 22 (point)	2 (3)	2 (3)	2 (3)	2 (2)	0.463
Item 23 (point)	1 (0)	1 (0)	1 (0)	1 (0)	0.550
Item 24 (point)	2.5 (3)	3 (2)	2 (1)	3 (1)	0.620
Item 25 (point)	1.5 (3)	1 (3)	1 (2)	1 (1)	0.756
Sub-dimension scores of DASC					
Interpersonal relationships (point)	24(19)	27 (16)	19 (20)	20 (11)	0.743
Introverted factors (point)	33 (20)	30.5 (15)	23.5 (23)	25 (13)	0.977
Total DASC score (point)	60 (37)	61 (27)	45 (44)	48 (26)	0.989

Values are expressed as median (IQR).

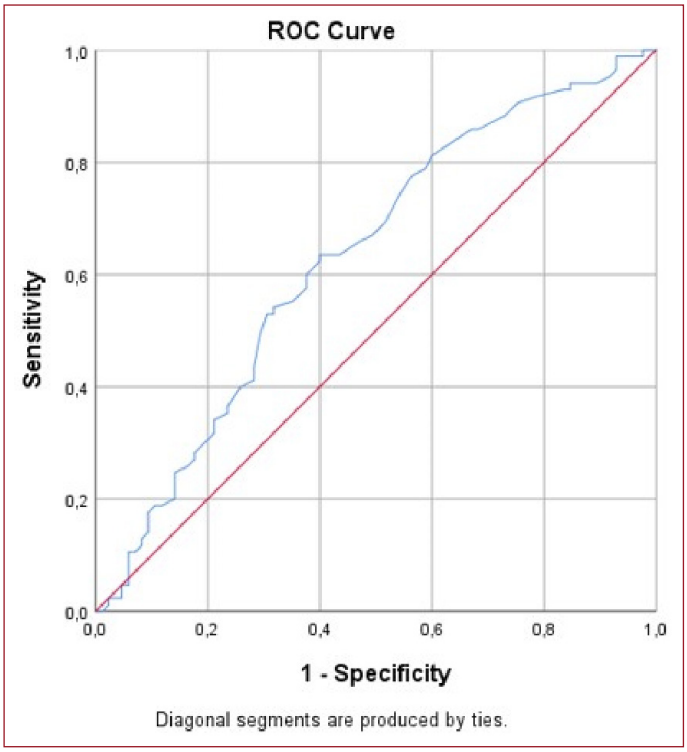

Figure 2. ROC curve analysis of total DASC score for distinguishing in children and adolescents with asthma and healthy controls

DISCUSSION

This investigation represents the first comparison of DASC scores between children and adolescents with asthma and their healthy peers, revealing significant insights into the association between asthma and DA behaviors. Our findings indicate that children and adolescents with asthma exhibit notably higher total DASC scores compared to their healthy counterparts. Specifically, the total DASC score was elevated in the asthmatic group, with an AUC of 0.630 suggesting moderate discriminatory power, and an optimal cutoff score of 50.5 points identified through ROC analysis. Notably, 63.5% of asthmatic participants surpassed this threshold, compared to only 40% of the control group. This substantial difference underscores a potentially important link between asthma severity and DA patterns, warranting further investigation into how these factors may interrelate.

Our hypothesis proposed that children and adolescents with asthma would exhibit higher levels of DA compared to their healthy peers. The findings of our study substantiate this hypothesis, revealing a significant elevation in DASC score among asthmatic participants. This increased prevalence of DA may be attributed to several factors associated with managing a chronic condition like asthma. Children facing the daily challenges of asthma may turn to digital devices as a coping mechanism, looking for distraction or relief from the stress of their condition. Additionally, the demands of asthma management—such as medication adherence, symptom monitoring, and lifestyle modifications—may inadvertently limit physical activity, leading to increased screen time. As a result, this reliance on digital devices could present barriers to effective asthma management, as engagement in physical activity is crucial for controlling asthma symptoms. Consequently, our findings underscore the need for further investigation into how DA may complicate asthma management and the importance of implementing interventions aimed at addressing DA within this vulnerable population.

In our study, the determination of the cut-off value of 50.5 points for the DASC score, as identified in our ROC analysis, reflects a balance between sensitivity (63.5%) and specificity (60%), which aligns with the principles of Youden's Index. While these values may appear relatively low, they highlight an important consideration in clinical contexts where early identification of at-risk populations is essential. The selected threshold efficiently distinguishes between children with asthma and those without, suggesting that even moderate discriminatory power can be clinically relevant. The implications of these findings suggest that children with asthma may be more susceptible to developing DA behaviors, which could further complicate their asthma management. However, the relatively low sensitivity indicates that some asthmatic individuals may not be identified as having high levels of DA, potentially leading to missed opportunities for early interventions. Therefore, while the cut-off value serves as a useful guideline, it also underscores the need for additional tools or assessments to comprehensively evaluate digital behaviors in this population. Future research could focus on refining the threshold through larger, multi-center studies to improve the diagnostic capabilities of the DASC in clinical practice.

Our study aligns with previous research that suggests an increasing prevalence of IA during adolescence.[17] While we found that DA scores were higher among adolescents than children, the absence of a statistically significant difference indicates that this trend may require more nuanced exploration. Furthermore, the relationship we observed between DA and asthma transcends sex-based differences, as previous studies have shown that males generally exhibit higher levels of DA.[18,19] In our cohort, while males scored higher than females, the lack of statistically significant variation within either group suggests that the correlation between asthma and DA might extend beyond demographic variables.

The mechanisms underlying the association between asthma and DA can be multifaceted. It is hypothesized that problematic internet use may heighten sympathetic activity and lead to increased corticosteroid levels, which could subsequently suppress the immune system.[20-22] Such physiological alterations may exacerbate asthma symptoms and severity. Additionally, visual stressors associated with extensive digital engagement may trigger negative psychological and immunological responses, potentially contributing to asthma exacerbations.[23] The association

between DA and various psychological issues, such as anxiety, sleep disturbances, and obesity, is well-established18 and recent evidence indicates that these psychological stressors may adversely affect asthma control in adolescents.[24]

Our findings align with the insights of Ding and Li, who highlighted the effectiveness of intervention programs in alleviating symptoms related to depression, anxiety, and DA among youth.[25,26] This underscores the potential benefits of proactive parental involvement in moderating children's digital engagement. Given the significantly heightened levels of DA observed in our asthmatic population, it is essential to address these behavior patterns to improve asthma management and overall health outcomes. Implementing targeted interventions that focus on reducing DA while simultaneously encouraging active lifestyles may help mitigate anxiety and other comorbid conditions frequently observed in this demographic. However, despite the well-documented negative effects of excessive internet use, particularly concerning psychological well-being,[25,26] we should remain cautious in interpreting these implications for asthma. The specific mechanisms linking IA to asthma are yet to be thoroughly understood, highlighting the need for longitudinal studies to explore these dynamics further. Such research could provide valuable insights into whether interventions targeting digital habits can enhance both psychosocial outcomes and asthma management strategies.

The relationship between IA and asthma presents a complex landscape, underscored by varying findings across populations and studies. Notably, a comprehensive investigation conducted among Korean adolescents established a connection between problematic internet usage and an increased prevalence of asthma.[20] This study not only highlighted the correlation but also revealed that asthmatic individuals had significantly higher interpersonal relationship scores compared to their non-asthmatic counterparts. Our findings resonate with this observation, as we similarly document elevated interpersonal relationship scores within the asthmatic group in comparison to the healthy control group. This may suggest that the psychosocial environment and relationship dynamics might play critical roles in the experience of asthma among adolescents. In contrast, a case-control study involving adult participants reported no significant differences in IA scores when comparing individuals with asthma to healthy controls.[27] Furthermore, this study found no significant relationship between IA and asthma control in the asthmatic cohort. Such discrepancies between studies raise important questions regarding age-related differences in the impact of IA on asthma. Adolescents may experience different psychosocial stressors and coping mechanisms related to their internet use compared to adults, which may help explain the variances in findings. The contrasting results between adolescent and adult populations could stem from several factors. Adolescents are in a critical developmental stage, making their interpersonal relationships and social engagement more susceptible to the effects of digital habits. The significant interpersonal relationship scores observed in our study and the study by Han et al.[20] indicate that relational dynamics may be influenced by digital engagement, which could potentially affect asthma symptoms and management in younger populations.

One of the key strengths of our study is its focus on a population that is often underrepresented in research on digital addiction. By comparing children and adolescents with asthma to healthy peers, we provide valuable insights into the unique challenges faced by this demographic. Furthermore, our use of a validated assessment tool for measuring digital addiction adds robustness to our findings. Importantly, while our study highlights a significant correlation between DA and asthma, it is crucial to acknowledge the limitations inherent in our research design. The cross-sectional nature of our study precludes the establishment of causal relationships between DA and asthma symptoms. Psychiatric comorbidities are indeed common in children with chronic diseases, such as asthma, and can significantly influence both the prevalence and characteristics of digital addiction behaviors. While our study primarily focused on the relationship between DA and asthma, we acknowledge that psychiatric screening was not conducted, and this represents a notable limitation. The absence of a detailed assessment of psychiatric comorbidities may have mediated the relationship we observed, and future research should consider including such screening to better understand these complex interactions.

We recognize the importance of integrating these results to provide a more comprehensive understanding of the implications. The significant association between asthma and DA highlights the need for targeted interventions that consider both physical and mental health in this population.

CONCLUSION

This study provides compelling evidence that DA scores are significantly higher in children and adolescents with asthma compared to healthy peers, suggesting a potential association that merits further research. There is an urgent need for comprehensive prospective investigations to clarify the nature of the relationship between asthma and DA, which could inform clinical practices and interventions aimed at this vulnerable population. By empowering parents, healthcare professionals, and educators to recognize and address the implications of DA, we may foster better health outcomes for children and adolescents with asthma.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of KTO Karatay University Faculty of Medicine Ethics Committee (Decision No: 2023/020).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.
Referee Evaluation Process: Externally peer-reviewed.
Conflict of Interest Statement: The authors have no conflicts of interest to declare.
Financial Disclosure: The authors declared that this study has received no financial support.
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