

The Relationship Between Home Internet Use, Familial Characteristics, and Clinical Severity in ADHD Youth

DEHB'li Çocuk ve Ergenlerde Evde İnternet Kullanımı, Ailesel Özellikler ve Klinik Şiddet İlişkisi

Burçin Şeyda Karaca¹ , Ahmet Güleç² 

¹Atatürk City Hospital, Clinic of Child and Adolescent Psychiatry, Balıkesir, TÜRKİYE

²Balıkesir Atatürk City Hospital, Clinic of Child and Adolescent Psychiatry, Balıkesir, TÜRKİYE

Abstract

Background: This study aimed to examine the relationship between home internet use habits, familial sociodemographic characteristics, and clinical disease severity in children and adolescents diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD).

Materials and Methods: This retrospective and descriptive study included 81 children and adolescents with ADHD aged 6-17 years who were followed at the Child and Adolescent Psychiatry Outpatient Clinic of Balıkesir City Hospital between 2023 and 2025. Clinical severity was assessed using the Clinical Global Impression-Severity (CGI-S) scale. Digital life variables, including age at first internet use, daily internet and gaming duration, device ownership, and household internet rules, together with familial sociodemographic characteristics, were evaluated. Pearson correlation analyses were performed in the full sample, and independent predictors of CGI-S scores were subsequently examined using a three-step hierarchical multiple linear regression model conducted in treatment-naïve participants.

Results: The mean age of the participants was 9.77±3.00 years, and 70.4% were male. The mean age at first internet use was 5.97±2.64 years. CGI-S scores were significantly associated with paternal age, paternal daily internet use duration, and age at tablet acquisition. In hierarchical regression analyses performed in treatment-naïve participants, the inclusion of digital life variables increased the explained variance to 59.5%. Paternal daily internet use emerged as the strongest independent predictor of CGI-S scores ($\beta=0.572$, $p=0.001$).

Conclusions: Clinician-rated clinical severity in children and adolescents with ADHD is associated not only with individual characteristics but also with home-based digital life habits and parental digital behaviors, underscoring the importance of evaluating family digital life characteristics during the clinical assessment and management of children and adolescents with ADHD.

Keywords: Attention-deficit/hyperactivity disorder, Internet use, Clinical severity, Familial characteristics

Öz

Amaç: Bu çalışmanın amacı, Dikkat Eksikliği ve Hiperaktivite Bozukluğu (DEHB) tanılı çocuk ve ergenlerde ev içi internet kullanım alışkanlıkları, ailesel sosyodemografik özellikler ve klinik hastalık şiddeti arasındaki ilişkiyi incelemektir.

Materyal ve metod: Bu retrospektif ve tanımlayıcı çalışmaya, 2023-2025 yılları arasında Balıkesir Şehir Hastanesi Çocuk ve Ergen Psikiyatrisi Polikliniği'nde izlenen, 6-17 yaş aralığında DEHB tanılı 81 çocuk ve ergen dahil edilmiştir. Klinik hastalık şiddeti Clinical Global Impression-Severity (CGI-S) ölçeği ile değerlendirilmiştir. İlk internet kullanım yaşı, günlük internet ve dijital oyun kullanım süreleri, dijital cihaz sahipliği, ev içi internet kullanım kuralları ile birlikte ailesel sosyodemografik özellikler değerlendirilmiştir. Değişkenler arasındaki ilişkiler tüm örnekleme Pearson korelasyon analizi ile incelenmiş; CGI-S puanının bağımsız yordayıcıları ise farmakolojik tedavi almayan katılımcılarda gerçekleştirilen üç aşamalı hiyerarşik çoklu doğrusal regresyon analizi ile incelenmiştir.

Bulgular: Katılımcıların yaş ortalaması 9,77±3,00 yıl olup %70,4'ü erkekti. İlk internet kullanım yaşı ortalaması 5,97±2,64 yıl olarak bulundu. CGI-S puanları; baba yaşı, babanın günlük internet kullanım süresi ve tablet edinme yaşı ile anlamlı ilişki gösterdi. Farmakolojik tedavi almayan katılımcılarda gerçekleştirilen hiyerarşik regresyon analizinde, dijital yaşam değişkenlerinin modele eklenmesiyle açıklanan varyans %59,5'e yükseldi. Nihai modelde babanın günlük internet kullanım süresi, CGI-S puanının en güçlü bağımsız yordayıcısı olarak belirlendi ($\beta=0,572$; $p=0,001$).

Sonuç: DEHB tanılı çocuk ve ergenlerde klinisyen tarafından değerlendirilen klinik hastalık şiddeti yalnızca bireysel özelliklerle değil, aynı zamanda ev içi dijital yaşam alışkanlıkları ve ebeveynlerin dijital medya kullanım davranışları ile de ilişkilidir. Bu bulgular, DEHB'li çocuk ve ergenlerin klinik değerlendirme ve yönetim sürecinde aile bağlamındaki dijital yaşam özelliklerinin de sistematik olarak değerlendirilmesinin önemini göstermektedir.

Anahtar Kelimeler: Dikkat eksikliği ve hiperaktivite bozukluğu, İnternet kullanımı, Klinik şiddet, Ailesel özellikler

Corresponding Author: Burçin Şeyda Karaca, Atatürk City Hospital, Clinic of Child and Adolescent Psychiatry, Balıkesir, TÜRKİYE

E-mail: burcinsaydakaraca@gmail.com / **ORCID ID:** 0000-0001-5338-6865

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Introduction

Attention-Deficit/Hyperactivity Disorder (ADHD) is one of the most frequently diagnosed neurodevelopmental disorders in childhood and adolescence, with a reported worldwide prevalence of approximately 5-7% (1). Core clinical features include difficulties in sustained attention, impulsivity, and excessive motor activity; the diagnosis is established when these symptoms exceed developmentally expected levels (1). As the clinical severity of ADHD increases, impairments extend beyond behavioral symptoms to include significant difficulties in cognitive functioning, academic performance, and social adaptation, with deficits in executive functions having a particularly pronounced impact on daily functioning (2,3). The etiology of ADHD is multifactorial and is thought to result from complex interactions between genetic vulnerability and environmental factors (4).

In recent years, children's exposure to digital technologies at increasingly younger ages has become an important environmental factor that may influence the clinical presentation of ADHD (5). With digital devices becoming an integral part of daily life, recommended limits for screen time are frequently exceeded, and access to the internet has shifted into early childhood (6). This situation may pose a greater risk for children with ADHD, who already experience structural difficulties in attention regulation, impulse control, and time management (7). Existing studies suggest that increased screen time and intensive digital media use are associated with heightened ADHD symptom severity, sleep disturbances, reduced academic functioning, and impaired social interactions (8). Conversely, when digital media use is limited and appropriately structured, relative improvements in behavioral regulation and attentional processes have been reported (9).

The relationship between ADHD and digital media use is shaped not only by individual child characteristics but also by the broader familial and environmental context. Family structure, quality of parent-child interactions, parental attitudes toward digital media use, and regulatory frameworks within the home environment may substantially influence children's digital behavior patterns and clinical presentation (10,11). Research indicates that inconsistent boundaries, insufficient parental supervision, and maladaptive parenting practices may be associated with increased ADHD symptom severity, whereas structured and predictable family environments characterized by higher parental awareness may exert a protective effect (12). Socioeconomic conditions also appear to play a significant

role, as lower socioeconomic status may increase exposure to environmental stressors and limit access to regulatory resources, thereby influencing clinical severity (13). In this context, the digital organization of the home environment has been associated with behavioral outcomes, cognitive development, and functional capacity (13).

Although previous studies have primarily focused on children's screen time or digital media exposure, relatively few have simultaneously examined home internet use habits, familial sociodemographic characteristics, and parental digital behaviors in relation to clinician-rated ADHD severity. Therefore, the present study aimed to examine the relationship between home internet use habits, familial sociodemographic characteristics, and clinician-rated clinical severity in children and adolescents with ADHD. Daily digital use patterns, timing of exposure to digital devices, and home-based regulatory factors were evaluated within a familial and sociodemographic context. By considering ADHD severity within the broader home digital environment rather than solely through individual neurodevelopmental characteristics, this study seeks to contribute to a more comprehensive understanding of the environmental and familial factors associated with ADHD in the digital era.

Materials and Methods

Participants and Study Design

This study was designed as a retrospective and descriptive investigation using the medical records of patients diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD) who were followed at the Child and Adolescent Psychiatry Outpatient Clinic of Balıkesir Atatürk City Hospital. Study data were obtained from the electronic medical records of children and adolescents who were consecutively evaluated between 2023 and 2025, within the period covered by the local ethics committee approval.

The study sample consisted of children and adolescents aged 7-17 years who met the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) diagnostic criteria for ADHD and had completed the routine initial clinical assessment at the outpatient clinic (14).

Patients with incomplete clinical records and those diagnosed with comorbid neurodevelopmental or psychiatric disorders, including autism spectrum disorder, intellectual disability, psychotic disorders, oppositional defiant disorder, and conduct disorder, were excluded to obtain a more clinically homogeneous sample.

Information regarding pharmacological treatment at the time of the initial clinical assessment was obtained from the electronic medical records. In our outpatient clinic, digital life characteristics are routinely assessed during the initial clinical evaluation of children and adolescents with ADHD. Accordingly, both CGI-S scores and digital life variables were obtained from the same initial outpatient assessment to ensure temporal consistency between clinician-rated clinical severity and digital life characteristics. Descriptive statistics and correlation analyses were performed using the full study sample ($n=81$). To minimize the potential confounding effect of pharmacological treatment on clinician-rated clinical severity, hierarchical regression analyses were restricted to treatment-naïve participants ($n=32$). This approach was adopted to evaluate the associations between familial and digital life characteristics and ADHD clinical severity without the potential influence of pharmacological treatment.

All procedures were conducted in accordance with the ethical standards of the institutional research committee and the principles of the Declaration of Helsinki.

Ethical Approval

Ethical approval for this study was obtained from the Clinical Research Ethics Committee of Balıkesir Atatürk City Hospital (approval no: 2025/12/142, date: December, 25, 2025). The study was designed with a retrospective methodology and conducted using data obtained solely from electronic medical records. Owing to the retrospective nature of the study and the anonymized analysis of patient data, the requirement for obtaining individual informed consent was waived by the ethics committee. All procedures were performed in accordance with the ethical standards of the institutional research committee and the principles of the Declaration of Helsinki.

Sociodemographic Variables

Sociodemographic data were extracted from standardized clinical intake forms and electronic medical records. Variables included age, sex, and educational level of the child, as well as parental cohabitation status, maternal and paternal ages, education levels, family structure (nuclear or extended), and family socioeconomic status (SES). Socioeconomic status was determined based on clinician-recorded evaluations reflecting parental education, occupation, and reported income level. These variables were evaluated as contextual factors that may influence both digital media use patterns and clinical severity in children and adolescents with ADHD (13,15).

Digital Life Characteristics

Digital life-related variables were extracted from the electronic medical records and were based on information routinely obtained from caregivers during the initial outpatient assessment. These variables included daily total internet use duration, daily digital gaming time, age at first internet use, age at tablet acquisition, ownership of digital devices (smartphone, tablet, computer), and the presence of household rules regarding internet use. In addition, maternal and paternal daily internet use durations were recorded as indicators of parental digital media engagement. Digital life variables were evaluated as environmental characteristics reflecting the home digital context rather than isolated child-specific behaviors (15,16).

Clinical Global Impression Scale

Clinical severity was assessed using the Clinical Global Impression-Severity (CGI-S) scale. The Clinical Global Impression (CGI) scale was originally developed by Guy to provide a global assessment of illness severity, improvement, and treatment-related side effects in psychiatric disorders (17). The CGI-S is a 7-point Likert-type scale ranging from 1 ("normal, not at all ill") to 7 ("among the most extremely ill") and reflects the clinician's overall judgment of symptom severity and functional impairment relative to individuals with the same diagnosis.

The CGI-S has been widely used in both clinical practice and research settings and is considered particularly suitable for heterogeneous neurodevelopmental conditions such as ADHD, where global clinical judgment provides meaningful complementary information beyond symptom counts (18).

Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics software. The distributional properties of continuous variables were assessed using visual methods (histograms and Q-Q plots) and analytical techniques, with normality evaluated using the Shapiro-Wilk test. Continuous variables were presented as mean $\pm$ standard deviation (SD), whereas categorical variables were summarized as frequencies (n) and percentages (%).

Pearson correlation analyses were initially conducted to examine the associations between Clinical Global Impression-Severity (CGI-S) scores and all familial and digital life variables in the full study sample ($n=81$). Correlation coefficients (r) and corresponding p values were reported. Variables demonstrating statistically significant univariate associations with CGI-S scores, together with clinically relevant demographic covariates

determined a priori, were subsequently entered into the hierarchical regression model according to their theoretical relevance.

To minimize the potential confounding effect of pharmacological treatment on clinician-rated clinical severity (CGI-S), hierarchical multiple linear regression analyses were restricted to treatment-naïve participants. Accordingly, regression analyses were performed only in participants who were not receiving pharmacological treatment at the time of assessment (n=32).

A three-step hierarchical multiple linear regression model was constructed to identify independent factors associated with CGI-S scores. In the first step, child age, sex, and family socioeconomic status (SES) were entered as potential demographic confounders. In the second step, paternal age was added to evaluate the contribution of familial characteristics. In the third and final step, digital life variables-including maternal daily internet use, paternal daily internet use, and age at tablet acquisition-were entered to determine their incremental contribution to clinician-rated clinical severity beyond demographic and familial characteristics.

Model performance was evaluated using the coefficient of determination (R^2), adjusted R^2 , and the change in explained variance (ΔR^2). The statistical significance of each successive block was assessed using the F-change statistic.

Before model interpretation, regression assumptions were evaluated. Normality of residuals was assessed using visual inspection of histograms and normal probability (P-P) plots.

Independence of residuals was evaluated using the Durbin-Watson statistic, and multicollinearity was assessed using variance inflation factor (VIF) values. VIF values below 5 were considered indicative of the absence of problematic multicollinearity. Regression results were reported as standardized beta (β) coefficients, p values, and VIF values. All statistical tests were two-tailed, and a p value of less than 0.05 was considered statistically significant.

Results

A total of 81 children and adolescents diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD) were included in the study. Participants were between 6 and 17 years of age, with a mean age of 9.77 ± 3.00 years (95% confidence interval [CI]: 9.10-10.43). The sample consisted of 57 boys (70.4%) and 24 girls (29.6%), reflecting the well-established male predominance observed in ADHD populations (Table 1).

Regarding sociodemographic characteristics, the mean grade level was 4.71 ± 2.95 (95% CI: 4.01-5.40). The mean maternal age was 36.16 ± 7.67 years (95% CI: 34.40-37.92), whereas the mean paternal age was 40.18 ± 5.89 years (95% CI: 38.81-41.54). On average, both mothers and fathers had completed at least high school education, and most families were classified as having a middle socioeconomic status. The majority of participants were living in nuclear family structures (Table 1).

Table 1. Sociodemographic, digital life, and clinical characteristics of the sample

Variable	N	Min	Max	Mean $\pm$ SD	95% CI
Age (years)	81	7	17	9.77 $\pm$ 3.00	9.10-10.43
Sex - Male, n (%)				57 (70.4%)	
Sex - Female, n (%)				24 (29.6%)	
CGI-S (Severity)	81	1	5	3.42 $\pm$ 1.19	3.13-3.72
Grade level	81	1	12	4.71 $\pm$ 2.95	4.01-5.40
Mother's age (years)	81	24	52	36.16 $\pm$ 7.67	34.40-37.92
Mother's education level	81	1	6	3.78 $\pm$ 1.03	3.54-4.01
Father's age (years)	81	30	57	40.18 $\pm$ 5.89	38.81-41.54
Father's education level	81	0	6	3.84 $\pm$ 1.13	3.58-4.10
Family structure	81	1	6	1.56 $\pm$ 1.23	1.28-1.84
Family SES	81	1	5	3.29 $\pm$ 1.08	3.04-3.54
Age at first internet use (years)	81	2	13	5.97 $\pm$ 2.64	5.36-6.59
Computer ownership	81	1	2	1.25 $\pm$ 0.44	1.15-1.35

Table 1. Continued

Smartphone ownership	81	1	2	1.39±0.49	1.28-1.51
Tablet ownership	81	1	2	1.48±0.50	1.36-1.60
Daily total internet use (hours)	81	0	8	3.73±1.96	3.28-4.17
Daily digital gaming (hours)	81	0	8	3.13±2.04	2.67-3.59
Mother's daily internet use	81	1	4	2.28±0.99	2.06-2.51
Father's daily internet use	81	1	4	2.48±1.03	2.22-2.73
Household internet rules	81	1	5	3.65±0.82	3.46-3.84
Home internet use (weekday, hours)	81	0.5	6	2.12±1.31	1.58-2.66
Home internet use (weekend, hours)	81	1	6	2.72±1.51	2.10-3.34

Min: Minimum, Max: Maximum, SD: Standard deviation, CI: Confidence interval, Values are presented as mean±standard deviation (SD) and 95% confidence interval (CI) for continuous variables, and as number (n) and percentage (%) for categorical variables. Higher values in coded variables indicate higher levels of the corresponding characteristic. CGI-S: Clinical global impression-severity, CGI-I: Clinical global impression-improvement, CGI-SE: Clinical global impression-side effects, SES: Socioeconomic status

Digital life characteristics showed that the mean age at first internet use was 5.97±2.64 years (95% CI: 5.36-6.59). Participants reported a mean daily total internet use of 3.73±1.96 hours (95% CI: 3.28-4.17) and a mean daily digital gaming duration of 3.13±2.04 hours (95% CI: 2.67-3.59). Mean home internet use was 2.12±1.31 hours on weekdays (95% CI: 1.58-2.66) and 2.72±1.51 hours on weekends (95% CI: 2.10-3.34). Most participants owned or had access to digital devices, including smartphones, tablets, and computers, and household rules regarding internet use were commonly reported despite relatively high daily internet use durations (Table 1).

The mean Clinical Global Impression-Severity (CGI-S) score was 3.42±1.19 (95% CI: 3.13-3.72), indicating that most participants had a moderate level of clinical severity (Table 1).

Pearson Correlation Analysis

Pearson correlation analyses performed in the full study sample (n=81) demonstrated significant associations between CGI-S scores and several familial and digital life variables (Table 2). Higher paternal age was moderately associated with greater clinical severity ($r=0.513$, $p<0.001$). Earlier age at tablet acquisition was associated with higher CGI-S scores ($r=-0.358$, $p=0.037$). In addition, both maternal daily internet use ($r=0.228$, $p=0.042$) and paternal daily internet use ($r=0.357$, $p=0.001$) were positively associated with CGI-S scores, indicating that longer parental internet use was related to greater ADHD clinical severity.

Table 2. Correlation analysis between CGI-S scores and familial and digital variables

CGI Scale	Variable	r	p value
CGI-S (Severity)	Paternal age	0.513	<0.001
CGI-S (Severity)	Age at tablet acquisition	-0.358	0.037
CGI-S (Severity)	Maternal daily internet use	0.228	0.042
CGI-S (Severity)	Paternal daily internet use	0.357	0.001

Pearson correlation analysis was performed. CGI-S: Clinical global impression-severity

Hierarchical Regression Analysis

To minimize the potential confounding effect of pharmacological treatment on clinician-rated clinical severity, hierarchical

multiple regression analyses were performed only in treatment-naïve participants (n=32). CGI-S score served as the dependent variable in all regression models (Table 3).

Table 3. Hierarchical regression analysis predicting CGI-S scores (Model 3)

Variable	Standardized β	p value	VIF
Age	0.439	0.047	2.595
Sex	0.046	0.766	1.400
Family SES	-0.001	0.996	1.275
Paternal age	0.237	0.127	1.327
Maternal daily internet use	-0.054	0.718	1.313
Paternal daily internet use	0.572	0.001	1.383
Age at tablet acquisition	-0.414	0.053	2.467

This table presents the standardized β coefficients, p values, and variance inflation factor (VIF) values from the final step (Model 3) of the hierarchical regression analysis conducted to predict Clinical Global Impression-Severity (CGI-S) scores. Positive β values indicate variables associated with increased CGI-S scores, whereas negative β values indicate inverse associations. VIF values below 5 indicate the absence of problematic multicollinearity within the model.

SES: Socioeconomic status

Model 1: Demographic Variables

In the first model, child age, sex, and family socioeconomic status (SES) were entered as control variables. This model was not statistically significant ($R^2=0.020$, adjusted $R^2=-0.085$, $F(3,28)=0.19$, $p=0.902$), explaining only 2.0% of the variance in CGI-S scores. None of the demographic variables significantly predicted clinical severity.

Model 2: Addition of Familial Characteristics

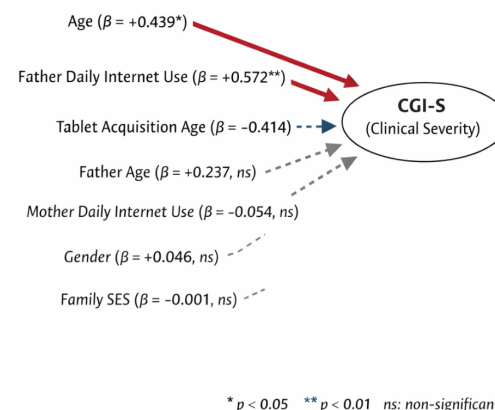
Adding paternal age significantly improved model performance ($\Delta R^2=0.276$, F change(1,27)=10.57, $p=0.003$), increasing the explained variance to 29.6%. Paternal age emerged as a significant independent predictor of CGI-S scores ($\beta=0.531$, $p=0.003$), whereas age, sex, and family SES remained non-significant.

Model 3: Addition of Digital Life Variables

In the final model, maternal daily internet use, paternal daily internet use, and age at tablet acquisition were added. The inclusion of these variables significantly improved the model ($\Delta R^2=0.300$, F change(3,24)=5.92, $p=0.004$), resulting in a final explained variance of 59.5% ($R^2=0.595$, adjusted $R^2=0.477$).

Paternal daily internet use emerged as the strongest independent predictor of CGI-S scores ($\beta=0.572$, $p=0.001$). Child age was also positively associated with clinical severity ($\beta=0.439$, $p=0.047$). Age at tablet acquisition demonstrated a borderline association with CGI-S scores ($\beta=-0.414$, $p=0.053$), suggesting that earlier tablet acquisition tended to be associated with greater clinical severity, although this finding did not reach conventional statistical significance. Maternal daily internet use, paternal age,

sex, and family socioeconomic status were not independently associated with CGI-S scores in the final model (Table 3, Figure 1).

**Figure 1.** Standardized β diagram for Model 3 predicting CGI-S

This figure illustrates the standardized regression coefficients (β) from Model 3, the final step of the hierarchical regression analysis conducted to predict Clinical Global Impression-Severity (CGI-S) scores. Solid arrows represent statistically significant predictors, whereas dashed arrows indicate non-significant associations. Positive β coefficients indicate that increases in the corresponding variables are associated with higher CGI-S scores, while negative β coefficients indicate inverse relationships.

* $p < 0.05$, ** $p < 0.01$; ns, not significant.

Across all regression models, no evidence of problematic multicollinearity was observed, with VIF values ranging from 1.02 to 2.60. The Durbin-Watson statistic (1.47) indicated that

the assumption of independence of residuals was satisfied (Table 3).

Discussion

In the present study, a detailed examination of the digital life characteristics of children and adolescents diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD) revealed early exposure to digital technologies and high levels of daily digital media use. The mean age at first internet use was 5.97 years, and participants exhibited substantial daily internet and digital gaming durations. Although most families reported the presence of household rules regarding internet use, digital engagement remained pronounced, particularly during weekends. These findings suggest that digital media occupies a central role in the daily lives of children and adolescents with ADHD and that early exposure is common in this population.

Correlation analyses demonstrated significant associations between clinical severity, as assessed by the Clinical Global Impression-Severity (CGI-S) scale, and several familial and digital variables. Paternal age and paternal daily internet use were positively associated with CGI-S scores, whereas earlier tablet acquisition was associated with greater clinical severity. These findings highlight the potential relevance of both familial characteristics and the timing of digital exposure in shaping ADHD clinical presentation.

Multivariate analyses further clarified these relationships. To minimize the potential confounding effect of pharmacological treatment on clinician-rated clinical severity, hierarchical regression analyses were performed only in treatment-naïve participants. In the hierarchical regression model, the inclusion of digital life variables substantially increased the explained variance in CGI-S scores, with the final model accounting for nearly 60% of the variance. This finding suggests that familial and digital life characteristics together account for substantial proportion of the variability in clinician-rated ADHD severity. Among these variables, paternal daily internet use emerged as the strongest independent factor associated with clinical severity, emphasizing the potential importance of the home digital environment in the clinical presentation of ADHD rather than merely reflecting parallel patterns of digital engagement.

The observed association between parental-particularly paternal-digital media use and ADHD clinical severity aligns with prior research emphasizing the role of parental modeling and the broader family digital climate. Studies have shown that increased parental screen use may interfere with parent-child

interactions, reduce opportunities for behavioral regulation, and contribute to less consistent supervision of children's digital activities (20,21). Within this framework, parental digital behavior may represent an important component of the home digital environment associated with children's symptom expression.

Findings related to early digital device acquisition are also consistent with previous literature. Early and intensive screen exposure during critical developmental periods has been associated with attentional difficulties, reduced executive functioning, and poorer self-regulation (22,23). In the present study, earlier tablet acquisition showed a negative association with CGI-S scores, reaching borderline statistical significance in multivariate analyses. This pattern suggests that early digital exposure may be associated with greater clinical severity, although its effects are likely shaped by interactions with familial regulation practices and individual vulnerability rather than acting as an isolated determinant.

Importantly, several familial demographic variables that were significant in univariate analyses lost their predictive value in the multivariate model. This finding suggests that the association between certain sociodemographic characteristics, such as paternal age, and clinical severity may be explained by their shared relationships with digital life characteristics rather than by an independent association with clinical severity. Such results underscore the importance of evaluating environmental and behavioral mediators when examining the relationship between family characteristics and ADHD outcomes.

The present findings extend existing research by shifting the focus from child-specific screen time to the broader home digital ecosystem. While many studies have examined associations between children's screen use and ADHD symptoms, fewer have incorporated parental digital behaviors as key variables. By demonstrating a strong association between paternal daily internet use and CGI-S scores, this study highlights the importance of assessing parental digital habits during clinical evaluation and management (21,24).

From a clinical perspective, these results suggest that digital life habits should be considered a relevant contextual factor in the assessment and management of ADHD. Addressing parental digital behaviors, increasing awareness of modeling effects, and promoting consistent and feasible household rules regarding digital media use may support more effective regulation of children's digital engagement. In particular, aligning parental behaviors with expectations set for children may enhance the effectiveness of family-based interventions.

The persistence of high digital usage despite the reported presence of household rules highlights that the effectiveness of such rules depends more on consistency and implementation than on their mere existence. This finding supports the need for psychoeducational interventions that emphasize practical, sustainable, and behaviorally consistent digital regulation strategies rather than rigid or abstract restrictions (25).

Limitations and Future Directions

Several limitations of the present study should be acknowledged when interpreting the findings. First, the retrospective and cross-sectional design limits the ability to draw causal inferences regarding the observed associations between digital life characteristics, familial factors, and ADHD clinical severity. Although significant relationships were identified, the temporal directionality of these associations cannot be determined. Longitudinal and prospective studies are therefore needed to clarify whether digital exposure contributes to increased clinical severity over time or whether greater symptom severity leads to increased digital media use.

Second, the study was conducted in a single clinical center with a relatively modest sample size. Although the sample size was sufficient for the applied hierarchical regression analyses, larger multicenter studies would improve the generalizability of the findings across different clinical settings and sociocultural contexts. Future research incorporating more diverse samples may help clarify the extent to which familial and digital factors operate similarly across populations.

In addition, hierarchical regression analyses were restricted to treatment-naïve participants to minimize the potential confounding effect of pharmacological treatment on clinician-rated clinical severity. Although this approach increased the internal validity of the regression analyses, it reduced the sample size and may limit the generalizability of these findings to children and adolescents receiving pharmacological treatment. Future studies including both treated and untreated patients, while appropriately controlling for treatment effects, are needed to determine whether these associations remain consistent across different clinical populations.

Third, digital life variables were derived primarily from caregiver reports and information documented in clinical records. Such data may be subject to recall bias and social desirability effects, potentially affecting the accuracy of reported digital media use durations. The use of objective measures, such as device-based screen time logs or digital usage tracking applications, would strengthen future studies by providing more precise and reliable assessments of digital exposure.

Fourth, although clinical severity was assessed using the Clinical Global Impression-Severity (CGI-S) scale, which provides a valuable global measure of illness severity, the study did not include detailed neuropsychological assessments of executive functioning, attention profiles, sleep parameters, or academic performance. Integrating clinician-rated severity indices with standardized cognitive and functional outcome measures may offer a more comprehensive understanding of the mechanisms linking digital life characteristics to ADHD symptomatology.

Study Limitations

Despite these limitations, the present study highlights the importance of considering digital life characteristics and familial digital behaviors as clinically relevant contextual factors in the assessment and clinical management of children and adolescents with ADHD. Future longitudinal research integrating objective digital exposure data, multidimensional clinical assessments, and family-based intervention frameworks may further elucidate the role of the home digital environment in shaping ADHD clinical outcomes.

Conclusion

Finally, while the study focused on the duration and timing of digital media exposure, it did not differentiate between types of digital content, such as educational use, gaming, or social media engagement. As different forms of digital media may exert distinct effects on attention regulation and behavior, future studies should consider qualitative aspects of digital exposure alongside quantitative measures.

AI Usage Information: No artificial intelligence was used.

Ethical Approval: Ethical approval for this study was obtained from the Clinical Research Ethics Committee of Balıkesir Atatürk City Hospital (approval no: 2025/12/142, date: December, 25, 2025).

Author Contributions:

Concept: A.G., B.Ş.K.

Design: A.G., B.Ş.K.

Data Collection or Processing: B.Ş.K.

Analysis or Interpretation: B.Ş.K.

Literature Search: A.G., B.Ş.K.

Writing: B.Ş.K.

Critical Review: A.G., B.Ş.K.

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