

Use of social media and autistic traits in adolescents diagnosed with major depressive disorder

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ABSTRACT

Objective: The purpose of this study was to evaluate the relationship between social media use and smartphone use and autistic traits in adolescents diagnosed with major depressive disorder (MDD). **Methods:** Fifty-six adolescent patients diagnosed with MDD were included. The Autism Spectrum Questionnaire-Adolescent Version (ASQ-A), the Social Media Use Disorder Scale (SMDS), the Smartphone Addiction Scale-Short version (SAS-SV) the Children's Depression Inventory, and Schedule for affective disorders and schizophrenia for school-age children-present and lifetime version-Turkish version were applied to the participants. **Results:** The mean total ASQ-A score was determined to be below the defined cutoff points. Adolescents diagnosed with depression with high autistic traits (AT) showed a significantly higher depression score than the low AT group. In the correlation analysis, a significant positive relationship was determined between the depression score and the SMDS score ($r=0.301$) and between the SMDS score and the SAS-SV score ($r=0.603$). In the correlation analysis of the ASQ-A and the SMDS subscales, a significant positive relationship was determined between social skills and persistence, social skills and escape, and communication and withdrawal. **Conclusion:** The current study results present a different perspective that the determination of autistic traits in the depressive disorder could be important in determining treatment strategies. When determining the treatment strategies for adolescents diagnosed with depressive disorder, it may be important to determine autistic traits and to strengthen and support these difficulties by providing psychosocial interventions to increase social skills and communication in the context of cognitive and behavioral interventions to replace social media use for the adolescents to feel better and avoid stressful situations and negative mental states. Further long-term studies could show whether autistic traits create vulnerability to depression. (*Anatolian Journal of Psychiatry* 2020; 21(6):641-648)

Keywords: autistic traits, social media, adolescents, smartphone, major depressive disorder

Majör depresif bozukluğu olan ergenlerde sosyal medya kullanımı ve otizm spektrumuna özgü özellikler

ÖZ

Amaç: Bu çalışmanın amacı, majör depresif bozukluk (MDB) tanısı konan ergenlerde sosyal medya kullanımı ve akıllı telefon kullanımı ile otizm spektrumuna özgü özellikler arasındaki ilişkiyi değerlendirmektir. **Yöntem:** MDB tanısı konmuş 56 ergen hasta çalışmaya alındı. Otizm Spektrum Anketi-Ergen Versiyonu (OSA-E), Sosyal Medya Kullanım Bozukluğu Ölçeği (SMKBÖ), Akıllı Telefon Bağımlılığı Ölçeği-Kısa Versiyon (ATBÖ-KV), Çocuklar için Depresyon Ölçeği ve Okul Çağı Çocukları için Duygulanım Bozuklukları ve Şizofreni Görüşme Çizelgesi-Şimdi ve Yaşam Boyu Versiyonu-Türkçe Uyarlaması katılımcılara uygulanmıştır. **Bulgular:** Ortalama toplam OSA-E puanının tanımlanan kesme puanının altında olduğu bulunmuştur. Yüksek derecede otizm spektrumuna özgü özellikleri

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olan ergenlerin, düşük derecede otizm spektrumuna özgü özellikleri olan gruba göre istatistiksel olarak anlamlı düzeyde daha yüksek depresyon puanına sahip olduğu gözlenmiştir. Korelasyon analizinde, depresyon puanı ile SMKBÖ puanı ($r=0.301$) ve SMKBÖ puanı ile ATBÖ-KV puanı ($r=0.603$) arasında anlamlı pozitif ilişki saptanmıştır. ASA-E ve SMKBÖ alt ölçeklerinin korelasyon analizinde sosyal beceriler ve dayanma, sosyal beceriler ve kaçış, iletişim ve yoksunluk arasında anlamlı düzeyde pozitif ilişki belirlenmiştir. **Sonuç:** Bu çalışma sonuçları depresif bozuklukta otizm spektrumuna özgü özelliklerin belirlenmesinin, tedavi stratejilerinin belirlenmesinde önemli olabileceğine ilişkin farklı bir bakış açısı sunmaktadır. Depresif bozukluğu olan ergenler için tedavi stratejilerini belirlerken, ergenlerin kendilerini daha iyi hissetmeleri ve stresli durumlardan ve olumsuz zihinsel durumlardan kaçınmaları için sosyal medya kullanımının yerini alacak bilişsel ve davranışsal müdahaleler bağlamında sosyal becerileri ve iletişimi arttırmak için ruhsal-toplumsal müdahaleler sağlamada otizme spektrumuna özgü özellikleri belirlemek ve bu zorlukları güçlendirmek ve desteklemek önemli olabilir. İleride yapılacak uzun dönemli çalışmalar otizm spektrumuna özgü özelliklerin depresyona karşı savunmasızlık yaratıp yaratmadığını gösterebilir. (*Anadolu Psikiyatri Derg* 2020; 21(6):641-648)

Anahtar sözcükler: Otizm spektrumu özellikleri, sosyal medya, ergenler, akıllı telefon, majör depresif bozukluk

INTRODUCTION

Autism spectrum disorder (ASD) is a neurodevelopmental, heterogeneous disorder with onset in early childhood, which manifests with impairment in reciprocal social communication and social interaction, and limited and repeated behavioral patterns, interests, or activities. In the Diagnostic and Statistical Manual of Mental Disorders Handbook, Fifth Edition (DSM-5), all the disorders in the autism spectrum are in the diagnostic category of ASD.¹ ASD causes lifetime difficulties in social, emotional, and behavioral areas. Comorbidities are common in individuals diagnosed with ASD, and in >50%, comorbid physical and mental conditions may be seen. Although many psychiatric disorders are seen together, the most common are attention deficiency hyperactivity disorder (ADHD), mood, and anxiety disorders.^{2,3}

There is some uncertainty about the prevalence of depressive disorders in individuals with ASD. Studies that have evaluated the lifetime and current prevalence of unipolar depressive disorders in children, adolescents and adults diagnosed with ASD have reported high rates of depressive disorder in individuals with ASD. When compared with typically developing individuals, the probability of experiencing depression throughout life is 4-fold higher in those with ASD. From these results, it has been recommended that individuals with ASD are screened regularly and evaluated in respect of treatment for depression.⁴

In clinical and general population sampling, the determination of individuals who do not meet ASD diagnostic criteria but have autistic traits is important in respect of interventions that can be made for diagnosis, treatment, and prevention related to difficulties experienced by these individuals. Accordingly, studies have shown that

several psychiatric conditions such as anxiety disorders, social anxiety, ADHD, mood disorders, and obsessive-compulsive disorder (OCD) are associated with characteristics specific to autism spectrum.⁵⁻⁸ In studies that have examined autism symptoms below the threshold, high rates of depressive disorder have been reported in the parents and relatives of children with autism, independently of the child having been diagnosed with autism.⁹⁻¹¹

Individuals with autistic traits have been reported to have compulsive internet use. Community-based studies have indicated a relationship between an increase in autistic traits and the use of the Internet in a compulsive manner.¹² The repeated and stereotypic behaviors associated with autistic traits may increase compulsive Internet use. Although the Internet is an attractive and useful tool for individuals with autistic characteristics, close monitoring may be important so that this use does not have a negative effect on social relationships.

In recent years there has been an increase in research on smartphone addiction and excessive and compulsive social media use. Despite no official diagnosis, social media addiction and smartphone addiction show several clinical characteristics similar to those of other addictions, primarily tolerance, withdrawal, conflict, salience, relapse, and mood modification.^{13,14} These individuals may suffer from emotional, relationship, and health-related problems.¹⁵ Studies have shown a significant association and positive correlation between mental disorders and symptoms such as ADHD, OCD, anxiety, depression, and social media addiction.¹⁶ Similarly, an association has been shown between excessive smartphone use and depression, anxiety, and impulsiveness.^{17,18}

Compulsive internet use behaviors can be seen

in individuals who feel lonely or do not have good social skills, resulting in harmful effects on other important areas of life, such as work, school, and relationships. Individuals showing this type of increased use can distance themselves from healthy social activities, and this can result in them feeling more lonely.¹⁹ When the widespread use of social media is taken into consideration, there can be seen to be critical importance in examining factors that may be related to social media use and determining interventional methods to deal with social media use and the characteristics specific to that use.

Both the nature of autistic traits and potential depressive disorder as a result of these characteristics suggest that there could be a relationship with social media use. To the best of our knowledge, there has been no study examining the relationship between social media and smartphone use and autistic traits in adolescents. This study aimed to investigate the relationship between social media use and smartphone use and characteristics specific to the autism spectrum in adolescents diagnosed with depressive disorder.

METHODS

Participants

This study was designed to be a single-center, cross-sectional study. The patients included were those who met the inclusion and exclusion criteria who presented at the Pediatric and Adolescent Mental Health and Diseases Polyclinic of Giresun University Obstetrics and Pediatric Diseases Training and Research Hospital. The sample comprised 56 adolescent patients, aged 13-18 years, who were diagnosed with major depressive disorder (MDD) based on DSM-5. The adolescents included were newly diagnosed with MDD, had received no psychiatric treatment, and demonstrated normal intelligence performance.

The exclusion criteria were defined as any comorbid ASD, psychotic disorder, bipolar disorder, eating disorder, substance abuse, neurological disease, a history of trauma with more than one hour of loss of consciousness, the presence of any unstable or chronic medical disease, or any known sight or hearing defect.

Measures

Following the diagnostic evaluation of the participants identified for inclusion in the study, information was given about the research. Verbal

consent was given by the adolescents and written informed consent was provided by their parents or legal guardian. The scales and tests were then applied. In the clinical interview, the Present and Lifetime Schedule for Affective Disorders and Schizophrenia for School-Age Children Turkish version (K-SADS-PL-T) and a clinical data form were administered by a clinician. The mothers of all the participants completed the Autism Spectrum Questionnaire-Adolescent Version (ASQ-A), and the adolescents completed the Social Media Use Disorder Scale (SMDS), Smartphone Addiction Scale-Short version (SAS-SV) and the Children's Depression Inventory (CDI).

Autism Spectrum Questionnaire-Adolescent Version (ASQ-A):

The items and structure of the ASQ-A form were developed to be the same as the form used to evaluate autistic characteristics and broad autism phenotype in adults in society with a normal IQ and was prepared to be completed by parents.²⁰ Reliability and validity study for the Turkish version has been performed.²¹ The scale evaluates 5 different areas of social skills, attention switching, attention to detail, communication, and imagination with 10 items in each area. The response to each item can be 'I definitely agree,' 'I partially agree,' 'I partially disagree,' or 'I definitely disagree'. Responses recorded of mild/strong autistic-like behavior are scored with 1 point, giving a possible maximum total of 50 points. The threshold value for the ASQ-A has been reported as 30 points.

Schedule for affective disorders and schizophrenia for school-age children-present and lifetime version-Turkish version (K-SADS-PL-T):

The KSADS-PL was developed to determine the present and past psychopathologies of children and adolescents according to the DSM-IV diagnostic criteria. It is a semi-structured interview form.²² Clinical diagnosis is made by combining it with the observations of clinicians. Reliability and validity study for the Turkish version has been performed.²³

Social Media Use Disorder Scale (SMDS):

This form was prepared based on the nine items of the DSM-5 Internet Addiction Scale (preoccupation, tolerance, persistence, withdrawal, escape, problems, deception, displacement, conflict).²⁴ Reliability and validity studies for the Turkish version of the SMD have been performed.²⁵ The scale has been shown to be a reliable and valid tool, which can be used in the 13-18 years age group. Items are answered on an 8-point scale ranging from 0=never to 7=more

than 40 times a day, giving a total score ranging from 0 to 63 points. There is no threshold or cut-off point for the scale. There is a linear relationship between the scale score and the level of social media addiction. High scale scores suggest that social media addiction levels are high.

Smartphone Addiction Scale-Short Version (SAS-SV): The SAS-SV has been shown to be a valid and reliable tool that can be used for adolescents in community and clinical samples.^{14,26} It is a self-reported scale for adolescents to measure their smartphone addiction. Responses to 10 items are given on a 6-point Likert-type scale where 1= I definitely disagree and 6= I definitely agree. The total points of the scale range from 10 to 60 and the cutoff point for both males and females have been found to be 29.5.

Children's Depression Inventory (CDI): The CDI is a 27-item self-reported scale that can be applied to children and adolescents aged 6-17 years.^{27,28} Each item is scored from 0-2 points to give a total depression score. Higher total points indicate a higher level of depression. The cutoff point has been determined as a score of 19.

Statistical analysis

Statistical analysis was performed using SPSS 22.0 (SPSS, Chicago, IL, USA). The conformity of the variables to normal distribution was evaluated visually (histogram and possibility graphs) and with analytical methods (Kolmogorov-Smirnov, Shapiro-Wilks tests). The Mann-Whitney U-test used for comparison of groups. Pearson's correlation analysis was used for correlation analysis. A value of $p < 0.05$ was accepted as statistically significant.

Ethics committee approval

Approval for the study was granted by the Local Ethical Committee with approval no. 20.08/683, dated 09/2019.

RESULTS

The mean age of the participants was 15.6 ± 1.2 years, and 69.6% were female. The most commonly seen comorbid psychiatric disorder was generalized anxiety disorder ($n=8$). The sociodemographic data of the patients, clinical characteristics, depression, autistic traits, and mean scores of social media and smartphone use are shown in Table 1. The frequency of the current use of social media applications was reported as WhatsApp (100%), Instagram (88%), Twitter (64%), Snapchat (54%), Facebook (46%), and TikTok (46%). The mean CDI and SAS-SV scores were above the cutoff values. The mean total ASQ-A score was determined to be below the defined cutoff points.

In the correlation analysis, a significant positive relationship was determined between the depression score and the ASQ-A score ($r=0.412$), and between the CDI and the SMDS score ($r=0.301$), and between the SMDS score and the SAS-SV score ($r=0.603$) (Table 2).

Table 1. Sociodemographic and clinical characteristics of sample

Characteristic (n=56)	n	%
Age (Mean±SD)	15.6±1.2	
Female (%)	69.6	
Comorbidity		
Generalized anxiety disorder	8	14.2
Attention deficit hyperactivity dis.	6	10.7
Obsessive compulsive disorder	2	3.5
Post-traumatic stress disorder	1	1.7
CDI score (Mean±SD)	20.2±9.5	
ASQ-A total score (Mean±SD)	22.3±4.2	
SMDS score (Mean±SD)	15.3±12.5	
SAS-SV score (Mean±SD)	31.4±11.7	

ASQ-A: Autism-Spectrum Questionnaire-adolescent version; SAS-SV: Smartphone Addiction Scale Short Version; SMDS: Social Media Disorder Scale; CDI: Children's Depression Inventory

Table 2. Correlations between autism traits, depressive score, social media, and smartphone usage scores

	ASQ-A total score	CDI score	SMDS score	SAS-SV score
ASQ-A total score	-	0.412 ^a	-0.087	-0.061
CDI score	0.412 ^a	-	0.301 ^a	0.242
SMDS score	-0.087	0.301 ^a	-	0.603 ^b
SAS-SV score	-0.061	0.242	0.603 ^b	-

ASQ-A: Autism-Spectrum Questionnaire-adolescent version; SAS-SV: Smartphone Addiction Scale Short Version; SMDS: Social Media Disorder Scale; CDI: Children's Depression Inventory; ^a: $p < 0.05$; ^b: $p < 0.01$ (Pearson's correlation)

Table 3. Correlations between ASQ-A subscales, SMDS subscales, SAS-SV and CDI scores

	Social skills	Attention switching	ASQ-A Attention to detail	Comm.	Imag.	SAS-SV	CDI
Social Media Disorder Scale							
Preoccupation	0.210	0.005	-0.005	0.079	-0.033	0.492 ^a	0.368 ^a
Tolerance	0.155	-0.077	0.075	0.209	-0.122	0.481 ^a	0.394 ^a
Persistence	0.283 ^a	-0.073	0.035	0.131	-0.195	0.583 ^a	0.158
Withdrawal	0.131	-0.168	0.013	0.413 ^a	0.023	0.364 ^a	0.137
Escape	0.324 ^a	0.130	-0.165	0.139	0.057	0.453 ^a	0.425 ^a
Problems	0.104	0.111	0.090	0.127	0.028	0.344 ^a	0.250
Deception	0.052	0.116	-0.032	0.164	0.057	0.469 ^a	0.397 ^a
Displacement	0.009	0.179	0.026	0.065	0.020	0.473 ^a	0.409 ^a
Conflict	0.130	0.071	0.066	0.009	-0.058	0.450 ^a	0.352 ^a
Smartphone Addiction Scale Short Version SAS-SV							
	-0.248	0.215	-0.170	0.229	0.005	-	0.242
Children's Depression Inventory CDI							
	0.336 ^a	0.210	-0.261	0.297 ^a	0.262	0.242	-

ASQ-A: The Autism-Spectrum Questionnaire-adolescent version ; ^a: Pearson's correlation p<0.05

Table 4. Comparison between high AT and low AT adolescents SMDS, SAS-SV, and CDI scores

	High autistic traits (n=14) Median (Q1-Q3)	Low autistic traits (n=32) Median (Q1-Q3)	z	p
Social Media Disorder Scale				
Preoccupation	0.0 (0.0-1.5)	1.0 (0.0-2.0)	1.58	0.115
Tolerance	0.5 (0.0-1.3)	1.0 (0.0-2.0)	1.40	0.163
Persistence	2.0 (0.5-3.0)	0.0 (0.0-1.3)	2.18	0.029
Withdrawal	2.0 (1.0-3.5)	0.5 (0.0-4.5)	1.11	0.267
Escape	4.5 (1.0-7.0)	3.0 (1.0-6.0)	0.61	0.545
Problems	0.0 (0.0-2.0)	0.0 (0.0-2.0)	0.53	0.597
Deception	0.0 (0.0-1.5)	0.0 (0.0-1.0)	0.28	0.781
Displacement	0.5 (0.0-3.0)	0.0 (0.0-3.0)	0.24	0.811
Conflict	0.0 (0.0-2.0)	0.0 (0.0-2.0)	0.57	0.571
Total	15.0 (7.0-19.0)	10.5 (4.0-15.0)	1.39	0.163
Smartphone Addiction Scale Short Version				
	26.5 (20.7-42.5)	31.0 (26.7-37.0)	1.03	0.302
Children's Depression Inventory				
	25.5 (13.2-33.0)	18.0 (14.0-23.5)	1.98	0.042

In the correlation analysis of the ASQ-A and the SMDS subscales, a significant positive relationship was determined between social skills and persistence (r=0.283), between social skills and escape (r=0.324), and between communication and withdrawal (r=0.413). In the correlation analysis of the depression score and the SMDS subscales, a significant positive correlation was found between the CDI scores and the all SMDS subscales except for persistence, withdrawal, and problem subscales. There was no significant correlation between ASQ-A subscales and SAS-

SV scores (Table 3).

After applying the ASQ-A cut-off point of 30, the patient group is divided into two groups as high autistic traits (AT) and low AT. There was a significant difference was found between persistence (p=0.029) and CDI scores (p=0.042) between high AT and low AT groups (Table 4).

DISCUSSION

This study had three main aims: 1) to evaluate

evaluate characteristics specific to autism in adolescents diagnosed with depression, 2) to evaluate social media use and smartphone use in adolescents diagnosed with depression, 3) to examine whether or not there was a correlation between social media and smartphone use and autistic traits. Some findings were determined in the study supporting the research hypothesis. The study sample comprised 56 patients aged 12-18 years, diagnosed with MDD, of whom 70% were female. These adolescents were diagnosed with a mild level of depression, and the CDI scores (mean 20.2) reflected this clinical level. Although the ASQ-A total scores were below the defined cutoff scores, they were found to be higher than those of adolescent samples showing typical development.^{29,30}

A moderate level positive relationship was determined between the depression scores and autistic traits. Previous studies have investigated the relationship between autism spectrum and psychiatric comorbidity and reported that there is often a relationship between depressive symptoms and autistic symptoms, with a deterioration seen in social skills with increased depressive symptoms.^{31,32} The most frequent lifetime comorbidity in autism subgroups has been found to be mood disorder.³³ It has been reported that individuals with subclinical autistic traits generally have weak emotional intelligence and psychosocial results. Those with lower autistic traits have been shown to have better psychological health and resilience.³⁴ A relationship between emotional intelligence and resilience has been found obtained partially or fully through the instruments of the ASQ social skills and ASQ communication.³⁴ In the current study, a moderate level correlation was determined between the ASQ-A total score and the severity of depression in newly diagnosed depressive adolescents who had not received any treatment. When the subscores were examined, a significant positive correlation was seen between the ASQ social skills and communication scores and the CDI scores. Although this finding demonstrates the importance of emotional intelligence and resilience shown in previous studies, it shows that these traits could be related to depressive disorders. This result supports that there could be a relationship between depressive disorder and these two subfactors in particular of the autistic traits. Similarly, depressed adolescents in the high AT group were found to have significantly higher depression scores compared to the low AT group. Our study shows that the possible relationship between depression and autistic

traits.

When social media use and smartphone use were examined in the current study, there was seen to be a high-level correlation, and as the smartphone use score was above the cutoff points, this was found to be consistent with smartphone addiction. Previous studies of social media use disorder have reported that this use as a means of avoiding negative mental states and stressful life events.¹⁵ Increasing interest in the internet and social media addiction has been shown by the popular media and researchers, and this interest has been in parallel with the growth in internet access. Internet addiction has been related to depression and social isolation symptoms. It has been reported that psychiatric comorbidities are widespread, especially mood, anxiety, impulsivity control, and substance abuse.³⁵ Similar to previous studies, a positive correlation was shown in the current study between the severity of depression and the intensity of social media use. In our study, we found a high level of correlation between social media use and smartphone addiction. Despite this, while a significant relationship was shown between depression score and social media use, no significant relationship was found between depression score and smartphone addiction. These results indicate that depressed adolescents tend to use social media features such as preoccupation, tolerance, escape, deception, displacement, conflict more than smartphone use. In accordance with the study hypothesis, when the autistic trait and social media use subfactors were examined, a significant relationship was shown between persistence, escape, and withdrawal, which are among the SMDS subscales, and ASQ-A subscales. These findings demonstrate that as the social skills of depressive adolescents deteriorate, they use social media more often to avoid negative emotions, and then they generally feel worse with the increased use of social media. Adolescents who experience difficulty in communication skills stated that they tried to spend less time on social media but they were unsuccessful. When high AT and low AT groups were compared in terms of SMDS subscales, only the persistence subscale was found to be significantly higher in high AT depressed adolescents. However, no significant relationship was found between autistic traits and smartphone addiction.

The identification of comorbidities and psychiatric symptoms in literature appears to be very important with respect to treatment strategies. It

has been reported that the determination of whether conflicting symptoms are in the nature of depression or autism could contribute to the selection of treatment.³⁰ The current study results present a different perspective that the determination of autistic traits in the depressive disorder could be important in determining treatment strategies. Further long-term studies could show whether autistic traits create vulnerability to depression. In contrast to expectations, the current study results showed no correlation between autistic traits and the total scores of social media use and smartphone use. However, when

the subfactors were examined, the depression table obtained suggested that it could be mediated by social media use in these patients. When determining the treatment strategies for adolescents diagnosed with depressive disorder, it may be important to determine autistic traits and to strengthen and support these difficulties by providing psychosocial interventions to increase social skills and communication in the context of cognitive and behavioral interventions to replace social media use for the adolescents to feel better and avoid stressful situations and negative mental states.

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Authors' contributions: B.Ş.: conceptualization, data collection, statistical analysis, supervision, and writing; M.B.U.: conceptualization, statistical analysis, supervision, and writing.

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