

The Relationship Between Autistic Traits, Internet Addiction, Perceived Social Support and Life Satisfaction

İdil UMUT¹ , Sezen KÖSE² 

¹Ege University Institute of Health Sciences, Drug Addiction Department, Izmir, Türkiye

²Ege University School of Medicine, Child and Ado-lescent Psychiatry Department, Izmir, Türkiye

ABSTRACT

Introduction: We aimed to examine the relationship between autistic traits, internet addiction and multidimensional perceived social support in individuals aged over 18 years in a non-clinical population sample.

Methods: Volunteers were invited to the study via social media and e-mail, and the data were collected using an online questionnaire form. The research sample consists of 355 participants. The socio-demographic and internet usage information of the participants were collected via the Personal Information Form. Autism-Spectrum Quotient (AQ), Young-Internet Addiction Test (Y-IAT), Multidimensional Scale of Perceived Social Support (MSPSS), and The Satisfaction with Life Scale (SWLS) which were administered to the participants.

Results: As the AQ scores increased, the scores of the Y-IAT also increased, and MSPSS and SWLS scores decreased. According to our results, autistic traits (ATs) were associated with internet addiction, perceived social support and life satisfaction. A positive and significant relationship

was found between internet addiction and the sub-dimensions of the autism spectrum questionnaire, such as social skills, shifting attention, attention to detail and communication scores. We stated that 10% of the total variance regarding internet addiction, 8% of the total variance regarding social support and 2% of the total variance regarding life satisfaction are explained by autistic traits. Also, as the level of internet addiction increases, the perceived social support and life satisfaction levels decrease.

Conclusion: Individuals with more ATs are more prone to internet addiction. ATs negatively predicted the perceived social support and life satisfaction. Preventive and therapeutic algorithms need to be developed for individuals with autistic traits.

Keywords: Autistic traits, internet addiction, life satisfaction, social support

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INTRODUCTION

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder with persistent deficits in communication, social interaction and understanding, developing and maintaining relationships, and also atypical sensory issues, insistence on sameness, limited and repetitive interests and behaviors (1). It has been reported that it affects approximately 1–3% of children and adults (2–4). One of the central features of ASD is the significant variability in symptom severity in clinical populations. However, the most common phenotypic presentation of genetic susceptibility to ASD is subclinical autistic traits (ATs) rather than the full-blown clinical disorder (5). In relatives of individuals with ASD; these subclinical traits can be seen in cognitive, communicational, social skills, behavioral context and personality traits; which is referred to as the broad autism phenotype (BAP) (6,7), and it is more common compared to the control group (8,9). Sub-threshold social skill deficiencies, communication problems and some personality traits such as rigidity, hesitation, anxiousness, undemonstrativeness, sensitivity to criticism are seen in BAP, which could lead to lower quality and quantity of friendships during adulthood, by affecting social functionality (6).

Highlights

- Individuals with more autistic traits (ATs) are more prone to internet addiction.
- ATs negatively predicted the perceived social support and life satisfaction.
- Developing algorithms to prevent internet addiction in individuals with AT is needed.

Unstable and rapidly changing real social-life conditions pose difficulties for autistic individuals/individuals with ATs (10). Online relationships are seen as sincere, reliable and less threatening than real-life friendships. Individuals who feel alone and not understood may turn to virtual relationships in order to blend into society and feel good (11). Various studies have examined the relationship between ATs and internet use.

Correspondence Address: Sezen Köse, Ege University School of Medicine, Child and Ado-lescent Psychiatry Department, Bornova, Izmir, Türkiye • **E-mail:** sezenkocen@gmail.com

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In a non-clinical sample of 390 people, individuals with more ATs were found to be more prone to compulsive internet use. It has been stated that repetitive and stereotypical behaviors seen in ASD may be associated with a high level of compulsive internet use, and internet use may be preferred instead of face-to-face interaction due to inadequacies in social communication (12). Being prone to repetitive behaviors may predispose individuals to gaming addiction.

Shumaker & Brownell (1984) defined social support as the exchange of resources between more than one individual, that contributes to the well-being of the recipient (13). Social support has a protective effect, helps to cope with negative situations, and has positive and healing effects on health (14). A study with 39 male participants aged 13–17 years with ASD showed that PSS from family, classmates, and close friends was protective against loneliness, and loneliness was negatively correlated to PSS (15). In a sample of adults with ASD, as loneliness increased, life satisfaction decreased, leading to the conclusion that having better friendships in terms of quality and quantity reduces loneliness (16).

In this study, we aimed to examine the relationship of ATs with internet addiction (IA) and multidimensional PSS in a non-clinical adult sample, since such studies are scarce in the literature. We hypothesized that individuals a) who score higher on the autism-spectrum questionnaire (AQ) also have higher internet addiction scores; b) who score higher on the AQ have lower perceived social support; c) perceived social support is associated with internet addiction; d) autistic traits are associated with internet addiction, social support and life satisfaction.

METHODS

Participants and Procedure

This study was approved by the Medical Research Ethics Committee of Ege University Medical Faculty (Date: 17.12.2020; No: 20-12.1T/43). The study information and links were shared on researchers' social media accounts (Instagram, Facebook) and e-mail groups (friendship and psychologist colleagues' groups) to invite to participate. Data were collected between 14.01.2021–22.01.2021, through an on-line questionnaire survey from volunteer participants who approved to participate. The application duration of the scales was calculated as approximately 20 minutes. The research population is individuals over the age of 18. In the two-way hypothesis test, $\alpha=0.05$ was selected as 95% power, and the required sample size to detect the -0.2 difference between the null hypothesis correlation of 0 and the alternative hypothesis correlation of 0.2 was calculated as 319. Individuals who agreed to participate and filled out the scales completely were included in the study.

The sample consists of 355 participants. The socio-demographic information and internet usage information were collected by the Personal Information Form. Autism-Spectrum Quotient (AQ), Young Internet Addiction Test (Y-IAT), Multidimensional Scale of Perceived Social Support (MSPSS), and The Satisfaction with Life Scale (SWLS) were filled by the participants.

Materials

Personal Information Form: This form was developed by the authors and used to collect sociodemographic information and internet usage habits.

Autism Spectrum Questionnaire (AQ): The Autism-Spectrum Questionnaire (AQ) was developed by Baron-Cohen et al. (2001) to determine the degree of ATs in adults with normal intellectual level. It consists of a total of 50 questions in five domains; social skills, attention switching, attention to detail, communication and imagination. The

answers defining the autism phenotype were scored 1 point. Higher scores indicate higher ATs (17). The test-retest reliability coefficient of the Turkish version of the AQ was 0.72, and Cronbach's alpha was 0.64 (9).

Young Internet Addiction Test (Y-IAT): It is a scale consisting of 20 questions developed by Young (1998) to determine IA. Each item is scored in a 6-point Likert type, and scored between 0–100 in total (11). Bayraktar (2001) adapted the scale to Turkish and a score of 50 or lower is defined as “no symptoms”, between 50–79 as “limited symptoms”, 80 and above are defined as “pathological internet user” (18).

Multidimensional Scale of Perceived Social Support (MSPSS): The scale developed by Zimet et al. (1988) was adapted into Turkish by Eker and Arkar (1995) and was revised in 2001 (14,19,20). It evaluates three sub-dimensions of PSS; from family, friend and significant other. It is a 7-point Likert type scale and consists of 12 items. Each subscale consists of 4 items. Higher scores indicate higher PSS (20).

The Satisfaction with Life Scale (SWLS): Diener et al. (1985) developed the SWLS to measure life satisfaction by asking participants about their general judgments about their lives. It is a 7-point Likert-type, 5-item scale (21). The Turkish adaptation was done by Köker, and the coefficient was determined as 0.85 (22). Higher scores indicate higher life satisfaction.

Statistical Analysis

Data analysis was performed with IBM Statistical Package for Social Sciences (SPSS) program version 18. Independent sample t-test was used in pairwise comparisons, one-way ANOVA was used if the variances were homogeneous, and Kruskal-Wallis test was used if the variances were non-homogeneous. To test normality, Kolmogorov-Smirnov test was used if the group sample size was greater than 50, and Shapiro-Wilks was used to test normality if it was lower than 50. ATs are the independent variable; IA, multidimensional PSS and life satisfaction are the dependent variables. Socio-demographic information was also examined as independent variables. Pearson correlation was used to determine the relationship, and regression analysis was used to show how the dependent variable was explained by the independent variables. Basic regression analysis was used to determine whether the independent variable significantly predicted the dependent variable and how well the independent variable explained the changes in the dependent variable. A “p” value lower than 0.05 was considered significant.

RESULTS

Sociodemographic Characteristics and Internet Usage Information

Three hundred fifty five participants aged between 18–81 years old were involved in the online-survey study. Of the participants, 257 (72.4%) were female and 98 (27.6%) were male. The mean age was found to be 44.07 years. Of the participants, 73.2% were university graduates and 17.7% were at post-graduate education level. While 66.2% were employed, 13.8% were retired, 10.1% were students and 9.9% were unemployed. Sociodemographic data are presented in Table 1. While 49.6% of the participants reported that they can receive social support from the internet, the majority of the participants (87.3%) preferred to receive it face-to-face.

Scores Obtained from Scales According to Socio-demographic Variables

According to age groups; there was no significant difference in the AQ-total, social skills, and communication subscale scores ($p>0.05$), however, a significant difference was found in AQ- attention to detail ($p=0.003$), attention switching ($p=0.025$), and imagination ($p= <0.001$) subscale

Table 1. Sociodemographic and internet usage characteristics of participants

Variables	n	%
Gender		
Female	257	72.4
Male	98	27.6
Age categories (years)		
18-25	79	22.3
26-39	53	14.9
40-59	197	55.5
60+	26	7.3
Education		
Secondary school	1	0.3
High School	31	8.7
University graduate	260	73.2
Postgraduate	63	17.7
Employment		
Yes	235	66.2
No	35	9.9
Retired	49	13.8
Student	36	10.1
With whom does she/he live?		
Alone	55	15.5
With family	286	80.6
With friends	14	3.9
Initiation of Internet use		
Preschool	10	2.8
Elementary school	46	13
Secondary school	46	13
High school	32	9
University	32	9
After the university	188	53
Duration of Internet Use (hours)		
0-2 h	156	43.9
2-5 h	154	43.4
5-8 h	29	8.2
8-11 h	12	3.4
11-14 h	2	0.6
>14 h	1	0.3
Do you think you receive social support over the internet?		
Yes	176	49.6
No	179	50.4
Preference to receive social support		
Face to face	310	87.3
Via internet	45	12.7

scores, Y-IAT ($p<0.001$), MSPSS ($p=0.021$) and SWLS ($p<0.001$) scores. The highest level of IA was found in the 18-25 age group, and the Y-IAT scores decreased in the older group. MSPSS scores were higher in the 26-39 years and 40-59 years age group (Table 2). In the male participants, the AQ-total ($p=0.024$) and Y-IAT ($p=0.008$) scores were higher; in the females, MSPSS ($p=0.002$) and SWLS ($p=0.034$) scores were higher (Table 2). The mean rank of the Y-IAT scores were the highest in the student group, followed by the non-working, working and retired groups ($p<0.001$). Satisfaction with life scale score significantly differed between age and employment groups ($p<0.001$). The highest SWLS scores were found in the working and retired groups (26.2 ± 5.7 ; 26.6 ± 5.5 , respectively) (Table 2).

The AQ-total ($p<0.001$) and Y-IAT scores ($p<0.001$) of the participants who preferred to receive social support via the internet were found to

be significantly higher. Of the subscales of AQ; social skills, attention switching, communication and imagination scores were also higher in this group (Table-2). While the MSPSS total scores and SWLS scores of individuals who preferred to receive social support via the internet did not differ, MSPSS-friends subscale mean score was higher in those who reported to prefer face-to-face social support (face-to-face social support 24.14 ± 4.9 vs online social support 21.67 ± 5.6 ; $p=0.002$).

Participants who scored 50 points or lower on Y-IAT were determined as "asymptomatic", between 50-79 points "with limited symptoms", and those who scored 80 and above were as "pathological internet users". None of the participants scored 80 and above in this study. Autism spectrum questionnaire total score ($p=0.001$), AQ-attention switching ($p<0.001$) and AQ-communication score ($p=0.021$) was significantly higher in those with limited symptoms compared to asymptomatic ones (Table 2).

Table 2. Findings concerning scores obtained from scales according to socio-demographic variables

	AQ-total mean ± SD	AQ-SS mean ± SD	AQ-C mean ± SD/ mean rank	AQ-AD mean ± SD	AQ-AS mean ± SD/ mean rank	AQ-I mean ± SD/ mean rank	Y-IAT mean ± SD/ mean rank	MSPSS mean ± SD	SWLS mean ± SD/ mean rank
Total participants (n: 355)	17.32±5.5	3.51±2.2	2.04±1.7	5.12±2.2	3.91±1.8	3.19±1.8	21.48±13.1	67.03±14.7	25.41±6.08
Gender, p^a	0.024	0.714	0.007	0.227	0.457	0.107	0.008	0.002	0.034
Female (n=257)	16.91±5.6	3.49±2.2	1.88±1.6	5.04±2.2	3.86±1.8	3.10±1.8	20.25±12.3	68.54±14.1	25.84±6.0
Male (n=98)	18.38±4.9	3.58±2.2	2.47±1.9	5.36±2.2	4.02±1.8	3.45±1.8	24.72±14.7	63.08±15.8	24.31±6.1
Age groups, p^{b,c}	0.506	0.347	0.554	0.003	0.025	0.000	<0.001^c	0.021	<0.001^c
18-25 (n=79)	17.49±5.4	3.29±2.1	2.05±1.9	5.49±2.1	4.43±2.0	2.65±1.6	30.04±14.1/244.2	64.63±14.9	23.75±6.0/148.5
26-39 (n=53)	16.30±4.9	3.26±2.1	1.74±1.5	5.51±2.4	3.66±1.6	2.55±1.7	24.36±12.9/204.9	68.98±14.9	23.40±7.5/152.2
40-59 (n=197)	17.55±6.6	3.60±2.1	2.11±1.5	5.06±2.2	3.76±1.6	3.51±1.8	18.10±11.4/150.4	68.33±14.2	26.70±5.2/198.6
60+ (n=26)	17.04±5.5	4.04±2.7	2.12±1.9	3.73±1.7	3.92±1.6	3.77±1.9	15.27±7.4/130.6	60.50±15.9	24.88±6.5/164.0
							sd: 3; χ^2 : 56.3		sd: 3; χ^2 : 18.4
Employment, p^{b,c}	0.95	0.657	0.905 ^c	0.507	0.037^c	0.010^c	<0.001^c	0.29	<0.001
Yes (n=235)	17.30±5.5	3.48±2.2	2.08±1.6/180.5	5.03±2.2	3.74±1.6/168.7	3.40±1.9/189.2	20.91±12.8/173.8	67.55±14.9	26.20±5.7
No (n=35)	17.03±5.6	3.83±2.1	1.89±1.5/169.2	5.03±1.7	4.31±2.1/196.4	2.60±1.6/146.2	27.46±15.6/219.5	65.94±14.9	21.23±6.5
Retired (n=49)	17.24±4.8	3.65±2.0	1.84±1.2/172.4	5.27±2.5	3.92±1.5/180.7	3.10±1.4/174.1	15.10±9.3/122.9	68.37±13.8	26.59±5.5
Student (n=36)	17.78±5.9	3.22±2.3	2.22±2.1/177.5	5.61±2.3	4.58±2.0/216.8	2.56±1.6/140.7	28.14±12.0/239.7	62.89±14.3	22.78±6.7
			sd: 3; χ^2 : 0.564		sd: 3; χ^2 : 8.48	sd: 3; χ^2 : 11.27	sd: 3; χ^2 : 33.28		
Social support preference, p^a	<0.001	0.001	<0.001	0.65	0.014	0.004	<0.001	0.104	0.139
Face to face (n=310)	16.84±5.3	3.36±4.5	1.86±1.6	5.14±2.3	3.82±1.8	3.09±1.8	20.43±12.5	67.52±14.8	25.26±6.2
Online (n=45)	20.62±5.2	4.53±2.2	3.29±1.7	5.00±1.9	4.51±1.4	3.93±1.8	28.73±15.1	63.69±14.0	26.44±4.7
Y-IAT score, p^a	0.001	0.111	0.021	0.297	<0.001	0.850	<0.001	0.415	0.742
<50 (n=344)	17.15±5.4	3.85±1.7	1.98±1.6	5.10±2.2	3.85±1.7	3.20±3.2	20.22±11.1	67.15±14.7	25.43±6.1
50-79 (n=11)	22.64±6.4	4.55±2.5	3.91±2.3	5.82±1.5	5.73±1.8	3.09±3.1	61.18±7.1	63.45±15.1	24.82±6.5

a: Independent sample t-test; b: ANOVA test; c: Kruskal-Wallis test; p < 0.05 indicates statistical significance.

AQ-AD: autism-spectrum quotient attention to detail subscale score; AQ-AS: autism-spectrum quotient attention switching subscale score; AQ: autism-spectrum quotient total score; AQ-C: autism-spectrum quotient communication subscale score; AQ-I: autism-spectrum quotient imagination subscale score; AQ-SS: autism-spectrum quotient social skills subscale score; MSPSS: multidimensional scale of perceived social support; SD: standard deviation; SWLS: The satisfaction with life scale; Y-IAT: Young internet addiction test.

Table 3. Correlations of autistic traits, internet addiction, perceived social support and life satisfaction

	AQ	AQ-SS	AQ-AS	AQ-AD	AQ-C	AQ-I	Y-IAT	MSPSS	MSPSS. Fam	MSPSS. Fr	MSPSS. Sigo	SWLS
AQ	-											
AQ-SS	0.676 ***	-										
AQ-AS	0.602 ***	0.262 ***	-									
AQ-AD	0.324 ***	-0.140 **	0.046	-								
AQ-C	0.694 ***	0.485 ***	0.348 ***	-0.095	-							
AQ-I	0.567 ***	0.305 ***	0.131 *	-0.044	0.367 ***	-						
Y-IAT	0.322 ***	0.159 **	0.358 ***	0.108 *	0.299 ***	0.015	-					
MSPSS	-0.290 ***	-0.212 ***	-0.172 **	-0.31	-0.230 ***	-0.205 ***	-0.219 ***	-				
MSPSS. Fam	-0.231 ***	-0.144 **	-0.178 **	-0.058	-0.142 **	-0.136 *	-0.278 ***	0.727 ***	-			
MSPSS. Fr	-0.346 ***	-0.299 ***	-0.117 *	-0.024	-0.321 ***	-0.238 ***	-0.287 ***	0.750 ***	0.525 ***	-		
MSPSS. Sigo	-0.154 **	-0.100	-0.119 *	-0.004	-0.119 *	-0.129 *	-0.039	0.832 ***	0.334 ***	0.378 ***	-	
SWLS	-0.159 **	-0.169 **	-0.150 **	0.000	-0.073	-0.082	-0.236 ***	0.404 ***	0.419 ***	0.331 ***	0.244 ***	-

Pearson's correlation was used for the related variables, and the correlation coefficient r given in the Table 3. *p<0.05, **p<0.01, ***p<0.001 indicates statistical significance.

AQ-AD: autism-spectrum quotient attention to detail subscale score; AQ-AS: autism-spectrum quotient attention switching subscale score; AQ: autism-spectrum quotient total score; AQ-C: autism-spectrum quotient communication subscale score; AQ-I: autism-spectrum quotient imagination subscale score; AQ-SS: autism-spectrum quotient social skills subscale score; MSPSS. Fam: multidimensional scale of perceived social support family subscale score; MSPSS. Fr: multidimensional scale of perceived social support friends subscale score; MSPSS: multidimensional scale of perceived social support scale score; MSPSS. Sigo: multidimensional scale of perceived social support significant others subscale score; SWLS: the satisfaction with life scale score; Y-IAT: Young internet addiction test.

Table 4. Predictive power of autistic trait levels on internet addiction, perceived social support and life satisfaction

	B	Std. Error	β	t	p
Internet Addiction					
Constant	8.08	2.19		3.68	0.000
AQ	0.774	0.121	0.322	6.39	0.000
R=0.322, R ² =0.104, F (1,353)=40.921, p<0.01					
Perceived Social Support					
Constant	80.58	2.49		32.29	0.000
AQ	-0.783	0.137	-0.290	-5.69	0.000
R=0.290, R ² =0.084, F (1,353)=32.451, p<0.01					
Life Satisfaction					
Constant	28.47	1.06		26.85	0.000
AQ	-0.177	0.058	-0.159	-3.03	0.003
R=0.159, R ² =0.025, F (1,353)=9.188, p<0.01					

Regression analysis;
 AQ=Autism-spectrum quotient total score; B: unstandardized regression coefficient; R2: Coefficient of determination; β (Beta): standardized coefficient.
 p<0.05 indicates statistical significance.

Correlation and Regression Analysis of Scales

While AQ-total score and Y-IAT score were found to be moderately positively correlated, $r=0.322$, $p<0.001$; MSPSS ($r=-0.290$, $p<0.001$) and SWLS ($r=-0.159$, $p<0.01$) were negatively correlated to AQ-total (Table 3). MSPSS was negatively correlated to Y-IAT ($r=-0.219$, $p<0.001$), and positively correlated to SWLS ($r=0.404$, $p<0.001$). In addition, Y-IAT is negatively correlated to SWLS ($r=-0.236$, $p<0.001$). The details about the correlations between AQ subscale scores, Y-IAT, MSPSS subscale scores and SWLS were shown in Table 3.

In the regression analysis, AQ-total score was found to be a significant predictor of Y-IAT ($R=0.322$, $R^2=0.104$), MSPSS ($R=0.290$, $R^2=0.084$), and SWLS ($R=0.159$, $R^2=0.025$) ($p<0.01$). As a result, 10% of the total variance regarding IA, 8% regarding PSS and 2% regarding life satisfaction can be explained by ATs (Table 4).

DISCUSSION

In this study, we examined the relationship of ATs with IA, multidimensional PSS and life satisfaction in a non-clinical adult sample. ATs were found to be a significant predictor of IA, multidimensional PSS and life satisfaction; 10% of the total variance regarding IA, 8% regarding PSS and 2% regarding life satisfaction can be explained by ATs.

In our study, the level of ATs and IA in males, and the level of PSS and life satisfaction in females are higher. In a Chinese and German sample consisting of 1524 adult participants, ATs were found to be higher in males in the German sample, similar to our results. The difference was not found significant in Chinese participants (23). Consistent with our findings, ATs (9,17,23–26) and IA levels (27–29) were found to be higher in males in other studies. ASD, a neurodevelopmental disorder, is known to be more common in males (2). It is an expected result that ASD and ATs, which we know to persist into adulthood and also cause social interaction problems which affect life in adulthood (3–5,30), are more common in males. Additionally, Köse et al. (2010) found that performance of females was better than males in the social skills, communication and imagination subscales of AQ (9). In our study, although social skills and imagination sub-scores did not differ between genders, we concluded that communication skills were better in females. Bora et al. (2017) found a significant difference only in the communication subscale between the genders, and stated that the communication difficulties in males were more prominent (5). The studies also found PSS (31,32) and life satisfaction (33,34) are higher in females. This result in PSS may be due

to the fact that females can establish more satisfying social relationships (32). Better AQ-communication skill scores in our study in favor of females were associated with PSS, supporting this finding.

The level of IA was the highest in the 18–25 age group and decreased in the older ages, consistent with Akcan and Element’s (2020) study (35). Quite similar to our study, Zhang et al. (2021) concluded that the level of IA decreased with increasing age (23). According to our clinical observations, reasons such as less parental control, increased need for social participation and expansion of social networks, more time spent on internet use for communication and entertainment purposes, and yet also the lower rates of participation in full-time professional employment compared to other ages could play a role in the highest rates of internet use in the 18–25 age group.

Internet usage level is higher in those with high ATs compared to those who are asymptomatic. Romano et al. (2013) found a moderate positive correlation between AT and IA (36). A positive correlation was found between AT and IA in a study conducted with a total of 1524 adult participants in China and Germany. The researchers concluded that the individuals with ATs may prefer online social interactions as it allows more comfortable and safe communication, and reported that this may cause unhealthy online behaviors (23). Unstable and rapidly changing real social-life conditions pose difficulties for autistic individuals/ individuals with ATs who already have communication difficulties (10). Online relationships are seen as sincere, reliable and less threatening than real-life friendships; they can be preferred over real-life relationships because of the ease of anonymous communication and the control of the information to be shared. Unmet social needs in real life can be supported by online relationships (11). In support of this interpretation, we found that the participants who preferred to receive social support via the internet had significantly higher AT and IA levels compared to those who preferred face-to-face. It has been stated that 4% of the increase in variance in the level of internet addiction in the Chinese sample and 11% in the German sample can be explained by autistic traits (25). This ratio in our study has been found as 10%.

We found a positive and significant relationship between IA and social skills, attention switching, attention to detail and communication scores of AQ. Social skill deficiencies, limitations in social interactions and a tendency of repetitive behaviors in people with ATs may play a role in the tendency to use the Internet. Zhang et al. (2021) found a positive correlation between communication scores of AQ and IA (25). Romano

et al. (2013) suggested that those with autistic traits may prefer to interact via the internet and this may not be seen as problematic internet use (37). Based on all these findings, one possible explanation can be that online interactions require fewer social cognitive abilities, in which individuals with higher ATs have deficiencies, than mutual human relationships. Considering that online interactions are less threatening than real-life friendships, their anxiety caused by communication may decrease, their attention may increase. Alternatively, it may also be possible for individuals with higher ATs to avoid interactions even if it is online, spend time with less interactive content and continue to use these environments compulsively. Because these possibilities may vary between individuals, it is thought that further and detailed research is necessary in order to establish the cause-effect relationship individually to develop necessary interventions. The ATs and problems in the attention switching and communication domains were higher in the participants with limited symptoms of IA compared to the groups without symptoms according to the Y-IAT cut-off scores. In accordance with our findings, Zhang et al. (2021) reported that AQ total and sub-scale scores increased as the increased IA level, except for the attention to detail (25). Zhang's et al.'s (2021) study included 929 Chinese participants, aged 18–32, who were mostly male (74.9%) and students (91.6%), and 595 German participants who were mostly female (71.6%) and had a wide age range (18–82 years; mean: 23.16±8.15). 86.6% of German participants were students. Although 74.2% of our 355 participants were female, in line with the German population, the median age of our participants was higher (44.07; range: 18–81 years) than the cited study. Additionally, 10.1% of our sample consisted of students which is lower than the said two populations. Therefore, the different results may be due to our lower total sample, the number of samples showing limited symptoms, socio-cultural factors or cross-sectional design. Additionally, the online data collection method may have affected the results.

As ATs increased, PSS and its sub-dimensions (from family, friends, and a significant other) decreased. ATs can explain the 8% of the total variance regarding PSS. To our knowledge, only one study reported that the PSS level, especially in the sub-dimension from friends, was lower in the ASD group compared to ADHD and controls (37). No study examining ATs and MPSS in a non-clinical adult sample was found. The deficiencies of theory of mind, social judgment, social communication and interaction in ASD, may cause them to be alone and unable to activate their social support networks. On the other hand, the inadequacy of the environment in terms of providing support to individuals with autistic characteristics could affect the results. It is stated that social deficits are an important and permanent basic symptom in adolescence and adulthood phenotypes in ASD, and cause problems in establishing peer relationships (30). While there is an increase in motivation for social relations and the need for more people in the individuals having average IQ levels, and even if they have friendships, it has been determined that the level of closeness, empathy, and support is lower for individuals with ASD (38,39).

In our study, the level of life satisfaction decreased as ATs increased. It was observed that 2% of the total variance in life satisfaction was explained by ATs. In a study conducted with ASD and non-clinical sample groups, the life satisfaction levels of the ASD participants were lower (40). Additionally, despite having a higher IQ or verbal skills, quality of life and independent living were found to be lower than their peers without ASD during adulthood (41).

Supporting our hypothesis, a low-level significant and negative relationship was found between IA and PSS; as the level of PSS from family and friends increased, IA decreased. In the studies investigating IA and PSS conducted with a sample of university students, findings similar to our study were obtained (27,42). There are also studies that found a

positive correlation between loneliness and IA (29,43), and that loneliness decreases as PSS increases (44). We also found that as the level of IA increased, the level of life satisfaction decreased, consistently with other studies (27,29,35). As PSS in all dimensions increased, life satisfaction also increased, similarly to Şahin and Yıldırım (2019)'s findings (45). These findings show the importance of social support in terms of well-being. As the PSS increases, the individual may feel happier and better, as it will be easier for the person to have a positive outlook on life and to overcome the problems in their life (32).

Our study has limitations, such as being cross-sectional, which does not allow for temporal relationships between the study variables. In addition, being based on self-reports may have subjected the study to response bias. However, self-reporting addictive behaviors correlated in previous research with standardized measures of addiction (46). Third, the gender distribution in our sample is noteworthy, with a significant majority (72.4%) of participants being female and, while interpreting the results, this should not be disregarded. Future research should aim for a more balanced sample which might reveal different patterns in the relationships among ATs, IA, MSPSS, and SWLS. Additionally, this study was conducted during the COVID-19 pandemic restrictions which might have affected the generalizability of our findings. Participants may have used the internet more than usual, and also experienced lower social support and life satisfaction due to the pandemic and its restrictions. Even though the pandemic may have impacted our findings, these conditions were valid for all participants. Moreover, the online data collection method may have reduced the reliability of the results.

Despite these limitations, this study will contribute to the literature in terms of autistic traits and internet addiction.

According to our results, autistic traits were associated with internet addiction, perceived social support and life satisfaction. There are few studies in the literature investigating these relationships, and detailed research is needed both to reveal relationships and to develop prevention and intervention strategies. In particular, variables such as coping strategies and specific types of internet usage might influence the relationship between ATs and IA, might offer additional insights and should be considered in future studies.

Ethics Committee Approval: This study was approved by the Medical Research Ethics Committee of Ege University Medical Faculty (Date: 17.12.2020; No: 20-12.1T/43).

Informed Consent: Data were collected between 14.01.2021–22.01.2021, through an on-line questionnaire survey from volunteer participants who approved to participate.

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REFERENCES

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, 5th ed. Washington: American Psychiatric Publishing; 2013. [Crossref]
2. Maenner MJ, Warren Z, Williams AR, Amoakohene E, Bakian AV, Bilder DA, et al. Prevalence and characteristics of autism spectrum disorder among children aged 8 years-autism and developmental disabilities monitoring network, 11 Sites, United States, 2020. *MMWR Surveill Summ.* 2023;72:1–14. [Crossref]
3. Brugha TS, Spiers N, Bankart J, Cooper SA, McManus S, Scott FJ, et al. Epidemiology of autism in adults across age groups and ability levels. *Br J Psychiatry.* 2016;209:498–503. [Crossref]

4. Dietz PM, Rose CE, McArthur D, Maenner M. National and state estimates of adults with autism spectrum disorder. *J Autism Dev Disord.* 2020;50:4258-4266. [\[Crossref\]](#)
5. Bora E, Aydın A, Saraç T, Kadak MT, Köse S. Heterogeneity of subclinical autistic traits among parents of children with autism spectrum disorder: Identifying the broader autism phenotype with a data-driven method. *Autism Res.* 2017;10:321-326. [\[Crossref\]](#)
6. Bolton P, Macdonald H, Pickles A, Rios P, Goode S, Crowson M, et al. A case-control family history study of autism. *J Child Psychol Psychiatry.* 1994;35:877-900. [\[Crossref\]](#)
7. Losh M, Childress D, Lam K, Piven J. Defining key features of the broad autism phenotype: a comparison across parents of multiple- and single-incidence autism families. *Am J Med Genet B Neuropsychiatr Genet.* 2008;147B:424-433. [\[Crossref\]](#)
8. Bishop DV, Maybery M, Maley A, Wong D, Hill W, Hallmayer J. Using self-report to identify the broad phenotype in parents of children with autistic spectrum disorders: a study using the autism-spectrum quotient. *J Child Psychol Psychiatry.* 2004;45:1431-1436. [\[Crossref\]](#)
9. Köse S, Bora E, Eremiş S, Aydın C. Psychometric features of Turkish version of autism-spectrum quotient. *Anadolu Psikiyatri Derg.* 2010;11:253-260.
10. Senju A. Atypical development of spontaneous social cognition in autism spectrum disorders. *Brain Dev.* 2013;35:96-101. [\[Crossref\]](#)
11. Young KS. Internet addiction: the emergence of a new clinical disorder. *Cyberpsychol Behav.* 1998;1:237-244. [\[Crossref\]](#)
12. Finkenauer C, Pollmann MM, Begeer S, Kerkhof P. Brief report: examining the link between autistic traits and compulsive internet use in a non-clinical sample. *J Autism Dev Disord.* 2012;42:2252-2256. [\[Crossref\]](#)
13. Shumaker SA, Brownell A. Toward a theory of social support: Closing conceptual gaps. *J Soc Issues.* 1984;40:11-36. [\[Crossref\]](#)
14. Zimet GD, Dahlem NW, Zimet SG, Farley GK. The multidimensional scale of perceived social support. *J Pers Assess.* 1988;52:30-41. [\[Crossref\]](#)
15. Lasgaard M, Nielsen A, Eriksen ME, Goossens L. Loneliness and social support in adolescent boys with autism spectrum disorders. *J Autism Dev Disord.* 2010;40:218-226. [\[Crossref\]](#)
16. Mazurek MO. Loneliness, friendship, and well-being in adults with autism spectrum disorders. *Autism.* 2014;18:223-232. [\[Crossref\]](#)
17. Baron-Cohen S, Wheelwright S, Skinner R, Martin J, Clubley E. The autism-spectrum quotient (AQ): evidence from Asperger syndrome/high-functioning autism, males and females, scientists and mathematicians. *J Autism Dev Disord.* 2001;31:5-17. [\[Crossref\]](#)
18. Bayraktar F. The role of internet use in adolescent development (Master Thesis). Ege University Institute of Social Sciences; 2001.
19. Eker D, Arkar H. Perceived social support: psychometric properties of the MSPSS in normal and pathological groups in a developing country. *Soc Psychiatry Psychiatr Epidemiol.* 1995;30:121-126. [\[Crossref\]](#)
20. Eker D, Arkar H, Yaldız H. Factor structure, validity and reliability of revised form of the multidimensional scale of perceived social support. *Türk Psikiyatri Derg.* 2001;12:17-25. [\[Crossref\]](#)
21. Diener E, Emmons RA, Larsen RJ, Griffin S. The satisfaction with life scale. *J Pers Assess.* 1985;49:71-75. [\[Crossref\]](#)
22. Köker S. Comparison of life satisfaction levels of normal and problematic adolescents: normal ve sorunlu ergenlerin yaşam doyumu düzeyinin karşılaştırılması (Master's Thesis). Ankara University Institute of Social Sciences, 1991.
23. Zhang Y, Sindermann C, Kendrick KM, Becker B, Montag C. Individual differences in tendencies toward internet use disorder, internet literacy and their link to autistic traits in both China and Germany. *Front Psychiatry.* 2021;12:638655. [\[Crossref\]](#)
24. Umeda M, Shimoda H, Miyamoto K, Ishikawa H, Tachimori H, Takeshima T, et al. Comorbidity and sociodemographic characteristics of adult autism spectrum disorder and attention deficit hyperactivity disorder: epidemiological investigation in the World Mental Health, Japan, 2nd Survey. *Int J Dev Disabil.* 2019;67:58-66. [\[Crossref\]](#)
25. Ruzich E, Allison C, Smith P, Watson P, Auyeung B, Ring H, et al. Measuring autistic traits in the general population: a systematic review of the Autism-Spectrum Quotient (AQ) in a nonclinical population sample of 6,900 typical adult males and females. *Mol Autism.* 2015;6:2. [\[Crossref\]](#)
26. Stefaska-Klar R. Exploring the relationships between autistic traits and subjective well-being among women and men in a non-clinical population. 8th Comparative European Research. 2017;2:155-158.
27. Batgün AD, Kılıç N. Relationships between internet addiction and personality traits, social support, psychological symptoms and some socio-demographic variables. *Türk Psikoloji Derg.* 2011;26:1-10.
28. Karasu F, Bayır B, Çam HH. Examining of the relationship between the internet addiction of university students and thw social support. *Sosyal Bilimler Derg.* 2017;7:372-386. [\[Crossref\]](#)
29. Morsümbül Ü. The association of internet addiction with attachment styles, personality traits, loneliness and life satisfaction. *J Hum Sci.* 2014;11(1):357-372. [\[Crossref\]](#)
30. Seltzer MM, Shattuck P, Abbeduto L, Greenberg JS. Trajectory of development in adolescents and adults with autism. *Ment Retard Dev Disabil Res Rev.* 2004;10:234-247. [\[Crossref\]](#)
31. Baş M, Aksu M, Ünübol H, Hızlı Sayar G. Examining the relationship between job satisfaction and perceived social support in academics [Akademisyenlerde iş doyumunun algılanan sosyal destekle ilişkisinin incelenmesi]. *JOSOC.* 2019;9:345-375.
32. Türköz S, Şahin Kıralp FS. Examination of prospective teachers' subjective well-being, perceived social support and self-containment levels. *OMU J Education Faculty.* 2019;38:51-66. [\[Crossref\]](#)
33. Bulut MB, Yıldız M. The effect of personality traits on life satisfaction of college students. *Turkish J Social Res.* 2020;24:397-412.
34. Yukay-Yüksel M, Çini A, Yasak B. Investigation of social media addiction, loneliness and life satisfaction in young adults. *Ataturk University J Kazım Karabekir Faculty of Education.* 2020;40:66-85. [\[Crossref\]](#)
35. Akcan G, Öge B. Investigation of predictors of technology addiction in young individuals. *Bartın University J Faculty of Letters.* 2020;5:3-26.
36. Romano M, Osborne LA, Truzoli R, Reed P. Differential psychological impact of internet exposure on internet addicts. *PLoS One.* 2013;8:e55162. [\[Crossref\]](#)
37. Alvarez-Fernandez S, Brown HR, Zhao Y, Raitheal JA, Bishop SL, Kern SB, et al. Perceived social support in adults with autism spectrum disorder and attention-deficit/hyperactivity disorder. *Autism Res.* 2017;10:866-877. [\[Crossref\]](#)
38. Shea V, Mesibov GB. Adolescents and adults with autism. In: Volkmar FR, Paul R, Klin A, Cohen D, editors, *Handbook of Autism and Pervasive Developmental Disorders*, Vol 1, 3rd ed. New Jersey: John Wiley & Sons, Inc.; 2005. pp. 288-311. [\[Crossref\]](#)
39. Baron-Cohen S, Wheelwright S. The friendship questionnaire: an investigation of adults with Asperger syndrome or high-functioning autism, and normal sex differences. *J Autism Dev Disord.* 2003;33:509-517. [\[Crossref\]](#)
40. Schmidt L, Kirchner J, Strunz S, Brous J, Ritter K, Roepke S, et al. Psychosocial functioning and life satisfaction in adults with autism spectrum disorder without intellectual impairment. *J Clin Psychol.* 2015;71:1259-1268. [\[Crossref\]](#)
41. Van Heijst BF, Geurts HM. Quality of life in autism across the lifespan: a meta-analysis. *Autism.* 2015;19:158-167. [\[Crossref\]](#)
42. Kavaklı M, Yalçın SB. The examination of the relationship between internet addiction and perceived stress in terms of perceived social support. *J Depend.* 2019;20:175-184.
43. Engelberg E, Sjöberg L. Internet use, social skills, and adjustment. *Cyberpsychol Behav.* 2004;7:41-47. [\[Crossref\]](#)
44. Yılmaz E, Yılmaz E, Karaca F. Üniversite öğrencilerinin sosyal destek ve yalnızlık düzeylerinin incelenmesi. *Genel Tıp Derg.* 2008;18:71-79.
45. Şahin B, Yıldırım A. Investigation of the relationship between internet use and life satisfaction, perceived social support and hopelessness levels in elderly individuals. *EIRJ.* 2019;12:97-106.
46. Widyanto L, Griffiths MD, Brunnsden V. A psychometric comparison of the internet addiction test, the internet-related problem scale, and self-diagnosis. *Cyberpsychol Behav Soc Netw.* 2011;14:141-149. [\[Crossref\]](#)