



RESEARCH ARTICLE

Autistic traits, emotional recognition and empathy in adolescents with gender dysphoria

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ABSTRACT

Objective: Gender dysphoria (GD) is defined as an apparent incongruence between the sex assigned at birth and the experienced gender. The aim of this study is to evaluate the basic milestones of autistic symptoms in adolescents diagnosed with GD and to compare them with the control group.

Method: The Sociodemographic Information Form, the Reading the Mind in the Eyes Test (RMET) and DANVA (Non-Verbal Diagnostic Accuracy Test), the Ka-Si Empathy Scale, and the Social Response Scale (SRS) were used. The psychiatric symptoms were evaluated using the Child Behavior Checklist (CBCL).

Results: A total of 36 adolescents, diagnosed with GD (n=17) and a control group (n=19), included to the study. The GD group and control group were similar in terms of mean age. Of the GD group, 29.4% had a CBCL total score, 35.3% had a CBCL internalization score and 11.8% had a CBCL externalization score above their respective cut-off points. The GD group had significantly higher scores in the SRS social subscale than the control group (t=2.227, p=0.033). SRS social score was found to be predicted by group and gender variables (df=3, F=5.064).

Conclusion: Having male biological sex and having GD increased the SRS social subscale score. It was found that internalizing problems such as depression and anxiety were common in adolescents with GD and their social skills were impaired compared to the control group.

Keywords: Emotion recognition, empathy, gender dysphoria, social skills

INTRODUCTION

The concept of gender is part of the identity which relates one's body, thoughts, feelings and behaviors to sexuality. Gender identity is supposed to be a part of a multi-parametric structure with the co-parameters such as gender expression, biological sex and sexual orientation. Gender dysphoria (GD) is defined as an apparent incongruence between the sex assigned at birth and the experienced gender (1). Mental disorders

may co-occur with GD in adolescents, such as anxiety disorders, mood disorders and disruptive behavioral disorders (2,3). Autism Spectrum Disorder (ASD), on the other hand, is a developmental disability that can result in social, communication and behavioral challenges as well as emotion recognition and empathy problems (1). Broad-spectrum ASD is seen in approximately one out of every 64 children (4). In recent years, there have been studies showing that GD, neurodevelopmental disorders and autistic features

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frequently coexist in adolescents (5,6). Although ASD and GD are not defined as interrelated experiences, it is shown in the literature that ASD is over-represented in children with GD with a 15% diagnostic rate (2) and vice versa (7,8). It is noteworthy that, according to ICD-9 diagnostic criteria, children with ASD were over four times as likely to be diagnosed with GD (7).

Furthermore, increasing attention has been drawn to the difficulties in social functioning in GD. Adolescents with GD give irrelevant answers in conversations, have difficulty understanding jokes, and cannot distinguish between strangers and acquaintances, all of which limit their social relationships. Studies on the biological basis of GD have reported that adolescents with GD have retardation in verbal fluency compared to their peers (9,10). A recent review with a large database focuses on the high prevalence rate of ASD in children and adolescents with symptoms of GD (11), which increases the need for self-advocacy and interpersonal communication as well as gender affirmation complexities (8). It is not surprising that such a condition can aggravate internalization and externalization of problems in a social context. Indeed, compromised social skills devalued executive functions, and autism-associated obsessional interests may potentially result in a misdiagnosis of autism if a child with GD demonstrates a strong interest in gendered items (12–14). Regarding the complicated structure of the context, the environmental and structural mechanisms that create social difficulties have not been adequately clarified.

The aims of this study is to evaluate empathy, emotional recognition and social skills, which are the structural elements of autistic symptoms, and to determine the predictors of socialization in adolescents with GD. We hypothesize that adolescents with GD may have difficulties in social interactions. Elucidating the basic domains of social difficulties in adolescents with GD may clarify the preventive interventions. Our study, to the best of our knowledge, is one of the researches conducted on GD in Turkey.

METHOD

Study Design and Participants

The research was planned as a cross-sectional study. The study sample consisted of 17 adolescents between 13 and 18 years of age, who had applied to the Marmara University Pendik Training and Research Hospital Child and Adolescent Psychiatry Outpatient Clinic between 2014–2018, and had GD according to DSM-5 diagnostic criteria. Our hospital is one of the most

important centers in Istanbul province with a large collection area that evaluates adolescents with GD, and applications for GD are accepted without an appointment from neighboring provinces.

The mental disorders of the adolescents participating in our study were evaluated with KD-SADS and the evaluation of GD-related symptoms was done according to DSM-5 criteria. The mental capacities of all adolescents who were admitted to our child psychiatry clinic with GD symptoms were investigated by brief IQ tests such as Kent EGY, Porteus or WISC-IV. The exclusion criteria for the case group were: mental disability, chronic and severe medical illness, seizure-like neurological disorder, history or symptoms of psychosis and Autism Spectrum Disorder. Two adolescents from the case group were excluded from the study with the diagnosis of mental disability. The control group consisted of 19 adolescents with similar age and gender characteristics as the case group. To form the control group; 23 adolescents and their families who were relatives of health care professionals, and had not applied previously to a psychiatry clinic, were invited to our study through social media such as Google Questionnaire. One adolescent was excluded due to mental difficulties, and 3 adolescents were excluded due to incomplete questionnaires. A total number of 19 volunteer adolescents who met the study criteria were included in the study as the control group.

In our study, the Sociodemographic Data Form, Child Behavior Checklist, KA-SI Empathy Scale, Social Responsiveness Scale, Danva Test (Non-Verbal Diagnostic Accuracy Test) and Reading the Mind in the Eyes Test were used. The study protocol was approved by the Marmara University Faculty of Medicine Ethics Committee (09.2018.780). Written informed consent was obtained from the parents and adolescents.

Clinical Measures, Psychopathology

Data including the parent's educational level, the number of individuals in the family and the average level of income were evaluated using the sociodemographic data form developed by the researcher. The diagnoses were determined according to the Schedule for Affective Disorders and Schizophrenia for School-Age Children- Now and Lifetime Version- Turkish Adaptation (K-SADS-PL) (15) for all adolescents. In the interview, diagnoses that could not be screened with (K-SADS-PL) were evaluated by clinical interview based on the DSM-5 diagnostic criteria (1). Assessment of Emotion Recognition, The Diagnostic Analysis of Nonverbal Accuracy 2-Adult Faces and Child Faces (DANVA).

Table 1: Comparison of GD and control group in terms of familial characteristics

	GD group (n=17)		Control group (n=19)		Statistical analysis
	n	%	n	%	
Education level of the mother					
Illiterate	0	0.0	3	15.8	$\chi^2=13.034$, $p=0.011$
Primary school	6	35.3	1	5.3	
Middle school	3	17.6	2	10.5	
High school	6	35.3	3	15.8	
University	2	11.8	10	52.6	
Education level of the father					
Illiterate	0	0	0	0	$\chi^2=10.353$, $p=0.016$
Primary school	7	41.2	2	10.5	
Middle School	3	17.6	2	10.5	
High school	6	35.3	5	26.3	
University	1	5.9	10	52.6	
Parents live together	14	82.4	16	84.2	$\chi^2=0.022$, $p=0.881$
	Mean±SD				
Number of family members	4.47±1.12		4.31±1.29		t=0.381, p=0.706
Monthly per capita income (Turkish Lira)	1123.12±595.94		1236.84±857.78		t=-0.447, p=0.658

GD: Gender dysphoria; SD: Standard deviation.

The DANVA 2 measures individual differences in the accurate sending and receiving of non-verbal social information with standard-content facial expressions and consists of 24 items (16,17). The emotion (happy, sad, angry, and fearful) expressed in each screen is assessed by multiple choice.

The “Reading the Mind in the Eyes Test” (RMET)

The Reading the Mind in the Eyes Test is an advanced cognitive empathy test that measures mentalization skills, which analyses the eyes and eye contours of male and female actors (Baron-Cohen et al., 2001) (18). Each item contains a total of four mental state definitions, one of which is emotionally equivalent and three of which are misleading. The participant is asked to choose the word that describes what the person in the photo is thinking or feeling, based solely on visual information. The Turkish version of the test applied to children was validated by Alev Girli (19).

Assessment of Social Skills

The Social Responsiveness Scale (SRS), developed by Constantino in 2000, has 3 main subscales that enable the evaluation of social responsiveness,

communication and motor stereotypes (20,21). In the scale, there are a total of 65 items, 39 of which are related to reciprocal social behaviors, 6 of which are related to the social use of language, and 20 of which are on autistic behavior. As the score obtained from the scale increases, the severity of social impairment also increases. Although the Turkish validity and reliability study of the scale has not been published, it was previously used by Ünal et al. (22), in a large sample study on school-age children. In this study, the internal consistency of SRS (Cronbach's alpha) was calculated as 0.86, and as a result of the factor analysis, it was decided to evaluate the test as a whole (in a single factor). The test-retest reliability of the Turkish version of SRS based on the data obtained at 6-month intervals was found to be high (Pearson's $r=0.53$, $p<0.001$).

Assessment of Empathy

The KA-SI Empathic Tendency Scale, Adolescent Form consists of 13 items, 6 of which measure cognitive empathy, and 7 of which measure emotional empathy. As the scores obtained from the scale increase, the empathic tendency increases. The scale was developed by Kaya and Siyez in 2010 (23).

Table 2: Comparison of the GD group and the control group in terms of DANVA Scores

	GD group (Mean±SD)	Control group (Mean±SD)	Statistical analysis
DANVA-child total error	5.58±3.50	4.57±2.47	t=1.006, p=0.321
DANVA-child happiness	14.58±24.65	14.52±21.50	t=0.008, p=0.994
DANVA-child sadness	14.23±17.92	11.10±18.42	t=0.515, p=0.610
DANVA-child anger	58.29±28.54	56.21±31.34	t=0.208, p=0.837
DANVA-child fear	12.88±17.08	12.47±14.64	t=0.077, p=0.939
DANVA-adult total error	7.11±3.42	6.63±2.79	t=0.469, p=0.642
DANVA-adult happiness	10.82±11.77	14.26±14.68	t=-0.769, p=0.447
DANVA-adult sadness	23.35±17.29	24.00±18.92	t=-0.107, p=0.916
DANVA-adult anger	42.00±18.91	38.10±18.87	t=0.617, p=0.540
DANVA-adult fear	24.29±11.12	23.84±17.17	t=0.092, p=0.927

GD: Gender dysphoria; DANVA: The diagnostic analysis of nonverbal accuracy; SD: Standard deviation.

Table 3: Comparison of GD group and control group according to Social Responsiveness Scale and KA-SI Empathic Tendency Scale

	GD (Mean±SD)	Control (Mean±SD)	Statistical analysis
Social Reciprocity Scale			
Social skills	89.68±10.39	79.57±15.43	t=2.227, p=0.033
Communication	9.43±2.50	8.31±3.07	t=1.169, p=0.251
Stereotypes	22.25±5.23	20.57±5.59	t=0.907, p=0.371
ADHD Like	16.00±2.87	15.21±3.27	t=0.751, p=0.458
Basic autism symptoms	13.25±3.08	14.10±4.50	t=-0.642, p=0.525
Total	121.37±16.29	108.47±21.29	t=1.982, p=0.056
KA-SI			
Emotional	31.17±9.58	30.63±5.78	t=0.209, p=0.836
Cognitive	23.41±3.39	23.15±3.48	t=0.221, p=0.826
Total	54.58±10.05	53.78±8.00	t=0.265, p=0.793

GD: Gender dysphoria; SRS: Social Responsiveness Scale; ADHD: Attention Deficit Hyperactivity Disorder; SD: Standard deviation.

Statistical Evaluation

Statistical Program for Social Sciences (SPSS for Windows, 22.0) was used to analyze the data. The Chi-square (χ^2) test or Fisher's Exact test was used for comparison of categorical data, and the Student's t-test was used for comparison of numerical data. The factors predicting social responsiveness were analyzed using hierarchical multiple regression. The level of significance was accepted as $p \leq 0.05$ for all analyses.

RESULTS

Sociodemographic Variables

A total of 36 adolescents took part in the study including those diagnosed with GD (n=17) and a control group (n=19). There was no significant difference in gender between the GD group (35.3% male) and the control group (47.4% male) ($\chi^2=0.538$, $p=0.463$). The GD group

(14.88±1.69) and the control group (14.94±1.68) were similar in terms of mean ages ($t=-0.115$, $p=0.909$). The familial characteristics of the GD group and the control group are given in Table 1. The GD group and the control group completed their first words at a mean age of 10.93±2.69 and 7.89±1.24, their first sentences 18.12±5.72 and 13.84±1.42, walking 11.87±0.88 and 14.10±1.48, and toilet training 24.50±8.34 and 23.57±3.45 months, respectively. A statistically significant difference was found between the two groups in the first word ($t=4.159$, $p=0.000$), first sentence ($t=2.917$, $p=0.010$) and walking ($t=-5.486$, $p=0.000$) milestones.

Type of Signs in the Case Group and Accompanying Diagnosis

The duration between the age of onset of signs (9.23±3.92 years) and the age of admission to the clinic (14.00±2.09 years) was about 4.76±4.07 years.

Table 4: Regression model showing the variables affecting social skills in children with GD

Independent variables	Non-standardized coefficients		Standardized coefficients		Confidence interval 95%	
	Beta	Standard error	Beta	p	t	
Constant	97.098	9.716		<0.001	(77.283)–(116.914)	
Maternal education level	-2.847	1.582	-273	0.082	(-6.074)–(0.380)	
Group	-10.088	4.275	-361	0.025	(-18.807)–(-1.369)	
Gender	9.225	4.285	324	0.039	(0.485)–(17.964)	
R=0.573 R ² =0.329 F=5.064 P=0.006						

GD: Gender dysphoria.

The symptoms of GD were seen in the fields of attitude (52.9%), dressing (17.6%), games (17.6%), both attitude and dressing (5.9%) and both attitude, dressing and games (5.9%).

About 82.4% (n=14) of adolescents with GD have at least one comorbid psychiatric disorder and the rates of these diagnoses are as follows: Major Depressive Disorder (52.9%), Attention-Deficit/Hyperactivity Disorder (47.1%), General Anxiety Disorder (35.3%), Specific Phobia (23.5%), Oppositional Defiant Disorder (ODD) (17.6%), Bipolar Disorder (17.6%), Social Phobia (11.8%), Obsessive-Compulsive Disorder (5.9%), and Panic Disorder (5.9%).

Emotion Recognition

In RMET, no difference was found between the GD group (20.94±2.70) and the control group (19.78±2.14) (t=1.422, p=0.164). In the DANVA Scores, the GD group and the control group had similar results (Table 2).

The Social Responsiveness Scale and KA-SI Empathic Tendency Scale

The Gender Dysphoria group had higher scores on the SRS social subscale than the control group. On the other hand, SRS total, SRS communication, and SRS motor stereotypes subscales did not differ between the groups. The GD Group and the Control Group were similar regarding the KA-SI Empathic Tendency Scale. (Table 3).

Multiple linear regression was performed to assess the impact of several factors on the SRS social subscale. The model contained four independent variables (maternal education level, group and gender) (Table 4). As shown in Table 4, two independent variables made a statistically significant contribution to the model (group and gender).

DISCUSSION

To our knowledge, it is one of the first studies investigating GD in adolescence from Turkey. We

identified relatively high rates of comorbidities in adolescents with GD such as ADHD and internalizing problems such as depression and anxiety. We also noted social skills, possibly suggesting that interpersonal relationships were impaired in GD. Our findings highlight that male biological sex and having GD deteriorate the social skills in adolescents with GD.

Over the last 40 years, the prevalence of GD has increased from "apparently rare" to 1.4% in men and 0.3% in women (1). It is also claimed that adolescents with GD may have structural differences in emotional recognition, empathy and social interaction (24). Therefore, in our study, we investigated the effect of GD, which has been attracting more attention in recent years, on social skills and empathy. In a large-scale study, it was reported that GD was accompanied by a mental disorder at a rate of approximately 60%, with the most common mental disorders being personality disorders, mood disorders, dissociative disorders and psychotic disorders (25). Moreover, the current literature shows neurodevelopmental disorders including ADHD, mood disorders, anxiety disorders, and emotional and behavioral problems in adolescents with GD (5,9). Recent studies show that symptoms of ASD (one of the neurodevelopmental disorders), are seen more than expected in children and adolescents with GD (26), and autistic individuals are more diverse in the gender identity spectrum (27). Our results support the previous literature stating that the mental disorders accompanying GD are ADHD (47.1%), major depression (52.9%) and common anxiety disorder (35.3%). This is an expected finding confirming that depression and anxiety symptoms may occur due to confounding environmental factors such as bullying and isolation in GD. A study using the Social Responsiveness Scale (SRS), suggests that 45 to 68% of young people with GD have autistic symptoms based on criteria including 'has difficulty in relating to peers' (9,6,28). On the other hand, neurodevelopmental soft signs such as ADHD and ASD symptoms (29–31), may

suggest a biological background of GD. In recent studies, a dual interaction between ASD and GD symptoms was hypothesized (2,32–34). It has been argued that in both experiences, social anxiety symptoms impair daily functioning (35) and have a structural component (36). To our knowledge, there are few studies evaluating social interaction and emotional facial expressions in adolescents with GD. However, it has been reported that children with ASD have difficulty in recognizing facial expressions (37,38) and that younger children with ASD ignore high levels of negative facial emotions such as fear and distress (39). Similarly, it has been shown that social responsiveness and facial expression recognition skills are deteriorated in ADHD (9). On the other hand, there are conflicting results supporting no difference in the ability to recognize facial expressions between autistic children and control groups matched for age and intelligence levels (40,41) It has been stated that there are not always difficulties in recognizing simple and positive emotions in autism, but difficulties are encountered in recognizing subtle and dynamic facial expressions (42,43). In our study, it was found that there was no significant impairment in the recognition of emotional facial expressions and empathy skills in adolescents with GD, although significant difficulties in social interaction were experienced for which being male and having GD were predictive.

The impairment of social skills in adolescents is considered to be multifactorial. The presence of environmental stressors such as social stigma and bullying, especially during adolescence, when identity formation comes to the fore, causes social relations to be affected. Our results may assert that the biological background of emotional recognition and empathy remain intact, and there is no difficulty in reading social cues that shape interpersonal relationships in GD. Despite this, it is considered that the gender roles affirmed by society are impeded in GD and social interactions are impaired especially due to environmental factors such as social isolation and exposure to bullying during adolescence. In addition, our study may conclude that in societies with dystopian characteristics, male adolescents with GD are more affected socio-culturally and are exposed to more environmental stressors. If so, freeing individuals from the two designated boxes of gender and the neurodiverse cohort from the social constrictions allow a more creative gender journey in the twenty-first century understanding of gender.

In this context, establishing supportive systems, organizing social policies, developing preventive programs in schools and media concerning peer bullying and stigmatization, and providing counseling to adolescents at multidisciplinary centers in order to

increase their quality of life will reduce the social difficulties experienced by adolescents with GD. In addition, if comorbid diagnoses such as Attention-Deficit/Hyperactivity Disorder, Major Depressive Disorder and Autism Spectrum Disorder are seen in adolescents with GD, peer and family relationships may deteriorate and academic failure may be observed. Difficulties in social interaction can be prevented through the cooperation of multidisciplinary practices such as psychological guidance units in schools, psychological counseling centers, social-workers and psychiatry clinics. Last but not the least, the devastating effect of psychopathology in social areas can be manipulated with family groups and intervention techniques such as individual psychotherapy. The most important limitation of our study is the limited number of cases. This is due to the fact that the study was conducted in a single center, and the low prevalence of GD in our society since GD is concealed by individuals. Because the control group members were chosen from the relatives of healthcare professionals, the education level of their parents was higher than the study group. This may affect the social skills of adolescents. In our study, in addition to parent-report and self-report scales, face- to-face neuro-emotional tests were applied to evaluate social interaction and emotional recognition skills. However, imaging techniques that could detail the biological background of social interaction were not used. For this reason, it is thought that our study could evaluate social interaction skills in more detail compared to scale-based studies, but the results should be supported by imaging techniques. Moreover, the test for the assessment of social skills, DANVA, has no reliability and validity study in Turkey. However, it is widely used in child psychiatry literature (44). Last but not the least, from a developmental perspective, the GD group walked earlier and talked later than the control group. This may be due to accompanying ADHD to the GD group.

Contribution Categories		Author Initials
Category 1	Concept/Design	K.B.K., Z.T., D.Y., E.D., A.B.E.
	Data acquisition	K.B.K., Z.T., D.Y., E.D.
	Data analysis/Interpretation	K.B.K., Z.T., D.Y., E.D.
Category 2	Drafting manuscript	K.B.K., Z.T., D.Y., E.D.
	Critical revision of manuscript	A.B.E.
Category 3	Final approval and accountability	K.B.K., Z.T., D.Y., E.D., A.B.E.
Other	Technical or material support	K.B.K., Z.T., D.Y., E.D., A.B.E.
	Supervision	A.B.E.

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