Hindawi
Perspectives in Psychiatric Care
Volume 2023, Article ID 3864073, 11 pages
https://doi.org/10.1155/2023/3864073

Research Article

The Need for Psychiatric Assessment in Children with Down Syndrome and Factors Affecting Their Use of Mental Health Services: A Cross-Sectional Study from Turkey

Gökçe Yağmur Efendi,[1] **Merve Çıkılı Uytun**,[2] **Esra Yürümez**,[2] **Didem Behice Öztop**,[2] **Tuğba Menteşe Babayiğit**,[2] **and Birim Günay Kılıç**[2]

[1]*Şanlıurfa Mehmet Akif İnan Research and Training Hospital, Şanlıurfa, Turkey*
[2]*Ankara University, Ankara, Turkey*

Correspondence should be addressed to Gökçe Yağmur Efendi; gokceefendi@gmail.com

Received 11 June 2023; Revised 9 September 2023; Accepted 20 September 2023; Published 3 October 2023

Academic Editor: Gianpiero Greco

Objective. Down syndrome (DS) is the most common cause of intellectual disability. Children with DS may have difficulty accessing psychiatric services because their mental health problems are often unrecognized. This study aimed to assess the mental health needs of children with Down syndrome and the elements that may affect their access and referral to psychiatric services. *Methods*. In this single-center cross-sectional study, we evaluated 72 children with Down syndrome and assessed the factors affecting their use of mental health services by using a questionnaire completed by parents. We compared the clinical symptom profiles of young preschool-aged children with Down syndrome ($n = 26$) with typical ($n = 26$), developmental delay ($n = 15$), and autism spectrum disorder (ASD) group ($n = 28$) to evaluate mental health problems. The Schedule for Affective Disorders and Schizophrenia for School-Aged Children: Present and Lifetime Version DSM-5 (K-SADS-PL) was administered. Parents completed the child behavior check list for ages 6–18 and 1½-5, depending on the child's age. *Results*. Although most patients with Down syndrome (51.4%) had psychiatric symptoms reported by parents at the initial assessment, the most frequent reason (62.5%) for applying to our psychiatric clinic was to submit an application for a medical report. The majority of patients with Down syndrome (56%) had a psychiatric disorder, and attention deficit and hyperactivity disorder was the most common diagnosis. *Conclusion*. Clinicians should not overlook the need for psychiatric assessment, early diagnosis, and collaboration between pediatricians and child psychiatrists, which are crucial during medical evaluation and follow-up of children with Down syndrome.

1. Introduction

Down syndrome (DS) is the most common genetic cause of intellectual disability (ID). It is estimated to occur in every 700–800 live births with a global incidence of more than 200,000 cases per year [1]. Although the overall life expectancy of individuals with DS has dramatically increased with improved medical care, mental health needs and the incidence of psychiatric conditions, especially for young children, are relatively unknown owing to difficulties in accurate identification [2, 3].

DS is associated with neuropathological alterations in neuronal proliferation and differentiation, which lead to various neurological, cognitive, and behavioral problems through brain structural and functional abnormalities [4, 5]. ID is present in most cases, and the intelligence quotient (IQ) spreads across an extensive range, with an average IQ of approximately 50, which is defined as moderate cognitive impairment [6]. Using multiple research methods and different populations, many studies have documented that, compared with the general population, individuals with ID are at a much higher risk for behavioral, emotional, and psychiatric problems [7]. However, it is emphasized that, compared with other groups of children with intellectual disabilities, children with DS are at a lower risk for significant psychopathology. Previous studies have shown that people with DS score significantly lower than their counterparts with IDs on standardized rating scales of maladaptive behavior [7, 8]. Studies comparing DS with other IDs show that 30–40% of children with intellectual disabilities of mixed etiology have significant psychopathology, while this percentage is detected as only 18–23% for children with DS [9–11]. On the other hand, these children still show more behavioral problems than their typically developing siblings or peers. Children with DS are reported to be at a higher risk of oppositionality, inattention, speech problems, difficulty concentrating, attention-seeking, and impulsivity [12].

Despite their sociability or kindness, it has been reported that individuals with DS have difficulties with specific social cognitive tasks, including identifying the intentions or thoughts of others in the theory of mind tasks [13]. Recent studies have also shown that 6–16% of children with DS may have comorbid autism spectrum disorder (ASD), which is 17–20 times higher than the estimated ASD prevalence in the general population [14]. Diagnosing ASD has challenges in the DS population due to the behavioral diagnostic criteria of the disorder that may overlap with the phenotypical patterns associated with DS [15]. However, when ASD has been diagnosed, cognitive impairment and delay in the development of language and adaptive behavioral skills may be more severe [14].

The current study aimed to investigate the following (1) factors affecting applications to psychiatric services by children and adolescents with DS and (2) behavioral problems of toddlers and preschool children with DS and compare them with ASD, developmentally delayed (DD), and typically developing (TD) toddlers. Two main hypotheses are proposed: (1) psychiatric evaluation may be delayed in children with DS and various sociodemographic characteristics may affect this situation and (2) toddlers and preschool children with DS would have more significant behavioral problems than children with DD and TD children but fewer behavioral problems than children with ASD.

To the best of our knowledge, no current studies have evaluated the psychiatric problems of children with DS and the factors affecting their admission to psychiatric clinics in Turkey. We believe that investigating these research topics in a Turkish sample will contribute to the literature. We aimed to investigate the factors that may affect the use of psychiatric services by children and adolescents with DS and their psychiatric problems.

2. Methods

2.1. Participants. Seventy-two patients with DS aged 0–20 years were included in the study between December 1, 2018, and December 1, 2021. All participant children with DS aged 0–20 years were evaluated for sociodemographic and clinical variables, and a subgroup of children with DS aged 0–60 months was compared with other children diagnosed with DD and healthy children regarding psychiatric symptoms. Child and adolescent psychiatrists at Ankara University managed the treatment and follow-up processes of all children and adolescents enrolled in this study.

For preschool-aged children between 0 and 60 months, we had three control groups to investigate whether young children with DS have different problem areas and symptoms compared with their TD peers as well as children with DD and ASD. There were 26 young children with DS, 26 TD children, 27 children with ASD, and 15 children with mild-to-moderate ID in the preschool-age group. Toddlers and preschool children were assessed in the Infant Mental Health Unit of the Child and Adolescent Psychiatry Department of Ankara University Hospital. Diagnoses were made based on the DC: 0–5 Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood. The exclusion criteria for the ASD, DD, and TD groups were having a chronic neurological disease or any other chronic illness, institutional care, and refusal to participate in the study. There were no exclusion criteria for the DS group except for institutional care and refusal to participate in the study. TD children were selected from among the patients who applied to the pediatric outpatient clinics for minor acute illnesses such as mild viral coughs and colds, and their developmental levels were consistent with their ages according to the Ankara Developmental Screening Inventory.

The local Ethics Committee of Ankara University approved the study protocol on November 2018. Children and their parents, who agreed to participate in this study, were invited to participate and informed about the research procedures. Written and verbal consent was obtained from the parents before enrollment in the study.

2.2. Instruments

2.2.1. Sociodemographic Questionnaire. A sociodemographic questionnaire examining the sociodemographic features of the children and parents was structured by the researchers for use in clinical interviews. The questionnaire included perinatal and developmental history, children's age, school attendance, academic performance, family structure, and information about prenatal screening. Physicians completed this form by directing the questions to the parents during the initial interviews.

2.2.2. Kiddie-Schedule for Affective Disorders and Schizophrenia (Present and Lifetime Version—K-SADS-PL-DSM-5). The K-SADS-PL-DSM-5 is a semistructured interview that was originally developed by Kaufman and colleagues and is widely used for diagnosing psychiatric disorders in children aged 6–18 years. It screens the diagnostic data for psychiatric disorders and symptoms. It was administered to parents by a child psychiatrist. A psychiatric diagnosis was noted if determined by the K-SADS-PL interview. K-SADS-PL-DSM-5 Turkish version has been found to be valid and reliable [16].

2.2.3. Child Behavior Check List (CBCL). The child behavior check list for ages 6–18 (CBCL 6–18) is a widely used scale to assess social functioning and identify problem behaviors in children and consists of 20 competence items and 118 problem items. The CBCL provides scores for eight syndrome profiles: anxious/depressed, withdrawn/depressed, somatic complaints, social problems, thought problems, attention problems, rule-breaking behavior, and aggressive behavior. A Turkish adaptation and standardization study of the CBCL was conducted with 6 to 18-year-old children [17].

The child behavior check list for ages 11/2–5 years is used to evaluate children aged between 18 months and five years and 11 months. Similar to CBCL 6–18, this tool is a multidimensional and standardized 100-item scale used to assess the frequency of specific behaviors that parents have observed in their children over the past two months [18]. Turkish adaptation and standardization study of the CBCL 11/2 to 5 years has been conducted by Yurduşen et al. [19].

2.3. Procedure. The sociodemographic characteristics of the groups were examined using the sociodemographic questionnaire. Psychiatric assessments were performed by an experienced child psychiatrist certified to apply the Schedule for Affective Disorders Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL). For younger children for whom the K-SADS-PL is not age-appropriate, a detailed assessment was performed by a group of professionals experienced in infant mental health diagnostic assessment using DC: 0–5 criteria [20]. Parents were requested to complete the child behavior check list for ages 6–18 years and 11/2–5 years, depending on the child's age. All participating children were evaluated using an age and development-appropriate intelligence test administered by an experienced child psychologist.

2.4. Statistics. The variables were investigated using visual (histograms and probability plots) and analytical methods (Kolmogorov–Smirnov test) to determine whether they were normally distributed. Descriptive analyses were presented using means and standard deviations for normally distributed, and median and interquartile range (IQR) for non-normally distributed variables. While investigating the associations between non-normally distributed and/or ordinal variables, the correlation coefficients and their significance were calculated using Spearman's test. Statistical analyses were performed using the SPSS software version 22.0. Statistical significance was determined as $p < 0.05$.

3. Results

3.1. Sociodemographic Variables of Children with DS and Their Parents. The sociodemographic and clinical characteristics of the children and their parents are shown in Table 1. The age range of the children was between 6 months and 20 years, with a mean age of 7.51 (±4.40). It was found that more than one-third of mothers who were not actively participating in the workforce (35.9%) quit their jobs because of having a child with DS. The kinship between parents was present in approximately one in five families.

3.2. Clinical Variables of Children with DS. Most patients (57%) had no prenatal diagnosis of DS. A large percentage of patients had comorbid medical conditions (80.3%), and the most common were cardiac comorbidities. All patients had GDD or ID within a varying range. The age range for starting special education was 6–60 months, with a mean age of 20.15 months (±14.24). Even though all patients had GDD or ID, 12.5% of the patients were not attending a special education program at the time of assessment. The clinical characteristics of the children are presented in Table 2.

3.3. Clinical Variables and Outcomes of Children Associated with Psychiatric Assessment. The mean age of the first psychiatric assessment was 4.16 years (±2.8). More than half of the patients (56%) had a psychiatric disorder diagnosed by a child psychiatrist, and ADHD was the most common diagnosis in our sample. More than half of the patients (62.5%) were referred from pediatric clinics. Although a significant percentage of patients (51.4%) had psychiatric symptoms reported by parents at the initial assessment, the most common reason for applying to our psychiatric clinic was to submit an application for a medical report needed to receive special education (62.5%) (Table 3).

3.4. The Outcomes of Correlation Analyses. Age at the first psychiatric assessment had a positive and moderate correlation with maternal and paternal age ($r = 0.3$, $p = 0.008$; $r = 0{,}35$, $p = 0.002$, respectively) and a negative and moderate correlation with maternal and paternal educational status ($r = -0.36$, $p = 0.002$; $r = -0{,}42$, $p < 0.001$, respectively). Age at the time of starting special education had a negative but weak correlation with maternal educational status. The duration of special education also had a positive and moderate correlation with maternal and paternal age ($r = 0.39$, $p = 0.001$; $r = 0.41$, $p < 0.001$, respectively).

The correlation of sociodemographic variables with clinical variables and outcomes is analyzed and summarized in Table 4.

3.5. Sociodemographic Variables of Preschool-Aged Children. There were 26 children with DS, 15 with ID, 28 with ASD, and 26 TD children under the age of 6 years. The mean age was 39.0 (±11.9) months for TD children, 35.7 (±10.3) months for children with ASD, 37.6 (±9.3) months for children with GDD, and 42.8 (±16.7) months for children with DS. There were statistically significant differences between the four groups in terms of "fathers' education," "mothers' occupation," and "fathers' occupation" (Table 5).

3.6. Clinical Variables of Preschool Children. There was a statistically significant difference between the four groups in terms of "reasons for applying to a psychiatric clinic" and

Table 1: Sociodemographic variables of children with DS and their parents.

Variables	Mean (*n*)	Standard deviation (%)
Age (years)	7	4.7
Gender		
Female	39	54.2
Male	33	45.8
Maternal age	39.3	7.3
Paternal age	41.8	7.4
Maternal educational status		
Illiterate	2	2.8
Primary school	25	34.8
High school	23	31.9
University and higher education	22	30.5
Paternal educational status		
Illiterate	0	0
Primary school	23	32
High school	24	33.3
University and higher education	25	34.7
Maternal employment status		
No employment	40	55.6
Currently employed	32	44.4
Reasons for mothers' unemployment		
Dismissal	8	20.5
To meet the needs of the child with DS	14	35.9
Other reasons	17	43.6
Paternal employment status		
No employment	10	13.9
Currently employed	62	86.1
Kinship between parents		
No	56	77.8
Yes	16	22.2

Table 2: Clinical variables of children and adolescents with DS.

Variables	Median (*n*)	IQR (%)
Prenatal diagnosis		
Present	31	43.1
Absent	41	56.9
Presence of medical		
Illness	57	80.3
Present	14	19.7
Absent		
Medical comorbidities		
Cardiac	18	31
Neurological	12	20.7
Endocrinological	11	19
Ophthalmological	9	15.5
Musculoskeletal system related	6	10.3
Other	2	3.5
Attending special education		
Yes	63	87.5
No	9	12.5
Age at beginning to attend special education (months)	20	15
The duration of special education (years)	5	5
GDD/ID		
Mild	23	32.9
Moderate	32	45.7
Severe	15	21.4

IQR: interquartile range, GDD: global development delay, and ID: intellectual disability.

Table 3: Clinical variables of children associated with psychiatric assessment.

Variables	Median (n)	IQR (%)
Age at the first psychiatric assessment	4	2
Way of applying to the psychiatry clinic		
Upon the parents' demand	18	25
Referral from other pediatric clinics	45	62.5
Other	9	12.5
Reason for applying to the psychiatry clinic		
To apply for a medical report which is needed to get "*special education*"	45	62.5
General psychiatric assessment	14	19.4
Psychiatric problems	10	13.9
Referral from other pediatric departments	3	4.2
Presence of any psychiatric concerns reported by caregivers at the first psychiatric assessment		
Yes	37	51.4
No	35	48.6
Presence of any psychiatric diagnosis identified by a child psychiatrist		
No	33	45.8
ADHD	21	29.2
Behavioral problems	9	12.5
ASD	5	6.9
Anxiety	3	4.2
Depression	1	1.4
Need for psychopharmacological treatment		
Yes	32	44.4
No	40	55.6

IQR: interquartile range, ADHD: attention deficit hyperactivity disorder, and ASD: autism spectrum disorder.

Table 4: Correlation of the sociodemographic variables with clinical variables of children.

Variables		Age at the first psychiatric assessment	Age at the first admission to hospital	Age at starting special education	The duration of special education	Prenatal diagnosis
Mothers' age	r	0.309^{**}	0.158	0.213	0.396^{**}	0.149
	p	0.008	0.194	0.089	0.001	0.210
Fathers' age	r	0.357^{**}	0.189	0.184	0.419^{**}	0.195
	p	0.002	0.120	0.142	0.000	0.100
Mothers' educational status	r	-0.361^{**}	−0.116	-0.264^{*}	−0.031	−0.124
	p	0.002	0.343	0.034	0.800	0.300
Fathers' educational status	r	-0.423^{**}	−0.208	-0.341^{**}	−0.141	−0.148
	p	0.000	0.087	0.005	0.253	0.216

"way of applying to a psychiatry clinic." The most common reason for applying to our clinic was "applying upon parents" demand' for children with DS (50%). The results are presented in Table 6.

3.7. Clinical Variables and Outcomes of Preschool Children Associated with Psychiatric Assessment. There were no significant differences between the four groups regarding problem behaviors assessed using the "child behavior check list 1.5–5" scale. All groups were similar in terms of "anxiety/depression," "aggressive behavior," "somatic complaints," "withdrawn," "sleep problems," and "oppositional defiant problems" subscales. Although there was a trend towards significant differences in sleep problems, the difference was not statistically significant (Table 7).

4. Discussion

Most of the literature mainly focuses on the IDs of children with DS and fails to capture the complex background of psychiatric disorders that may be present. Information regarding associated psychiatric conditions, developmental attributes, and psychiatric treatment outcomes in children with DS is scarce.

In the present study, we assessed 72 children with DS and 56% were diagnosed with a psychiatric disorder. ADHD was the most common psychiatric disorder (29.2%) and was followed by behavioral problems (12.5%) and ASD (6.9%), respectively. Early reports showed that most children with DS did not have a coexisting psychiatric or behavioral disorder, and the available estimates of psychiatric comorbidity ranged from 18% to 38% [11, 12]. The higher rate of

Table 5: Sociodemographic variables of preschool children.

Groups	DS ($n = 26$) n (%)/mean ± SD	ASD ($n = 28$) n (%)/mean ± SD	DD ($n = 15$) n (%)/mean ± SD	TD ($n = 26$) n (%)/mean ± SD	p
Age (months)	48 ± 31	35.7 ± 10.3	37.6 ± 9.3	39 ± 11.9	0.22
Gender					
Male	13 (50)	17 (60.7)	9 (60)	14 (53.8)	0.85
Female	13 (50)	11 (39.3)	6 (40)	12 (46.2)	
Mothers' age (years)	35.9 ± 6.5	33.2 ± 5.6	34 ± 5.9	34.1 ± 5.9	0.44
Fathers' age (years)	38.8 ± 6.4	36.2 ± 5.2	37.5 ± 4.6	39.1 ± 4.9	0.19
Mothers' education					
Primary School	4 (15.4)	5 (17.9)	1 (6.7)	2 (7.7)	0.89
Secondary School	5 (19.2)	3 (10.7)	4 (26.6)	4 (15.4)	
High School	7 (26.9)	6 (21.4)	3 (20)	7 (26.9)	
University and Higher	10 (38.4)	14 (50)	7 (46.7)	13 (50)	
Fathers' education					
Primary School	1 (3.8)	3 (10.7)	2 (13.3)	0 (0)	0.03
Secondary School	5 (19.3)	5 (17.9)	0 (0)	1 (3.8)	
High School	10 (38.5)	11 (39.3)	3 (20)	8 (30.8)	
University and higher	10 (38.5)	9 (32.1)	10 (66.7)	17 (65.4)	
Mothers' occupation					
Housewife	14 (57.6)	13 (46.5)	10 (66.8)	15 (57.7)	0.04
Government employee	12 (46.1)	9 (32.1)	1 (6.6)	9 (34.6)	
Self-employed	0 (0)	6 (21.4)	4 (26.7)	2 (7.6)	
Fathers' occupation					
Unemployed	4 (15.4)	1 (3.6)	1 (6.7)	1 (3.8)	0.01
Government employee	22 (84.6)	15 (53.6)	5 (33.4)	9 (34.6)	
Self-employed	0 (0)	12 (42.8)	9 (59.9)	16 (61.5)	

IR, interquartile range; SD: standard deviation; DS: down syndrome; ASD: autism spectrum disorder; GDD: global developmental delay; TD: typical development.

Table 6: Clinical variables of preschool children.

Groups	DS ($n = 26$) n (%)	ASD ($n = 28$) n (%)	DD ($n = 15$) n (%)	TD ($n = 26$).n (%)	p
Reason for applying to psychiatry clinic					
Problems with toilet training	4 (15.4)	3 (10.7)	5 (33.3)	14 (53.9)	0.03
Speech delay	2 (7.7)	5 (17.9)	2 (13.3)	1 (3.8)	
Temper tantrums	1 (3.8)	1 (3.6)	2 (13.3)	1 (3.8)	
Not responding to one's own name	1 (3.8)	2 (7.1)	0 (0.0)	1 (3.8)	
To get counselling	2 (7.7)	1 (3.6)	0 (0.0)	1 (3.8)	
No complaints	16 (61.5)	0 (0.0)	0 (0.0)	0 (0)	
Other reasons	0 (0)	16 (57.1)	6 (40)	8 (30.8)	
Presence of medical illness					
Yes	2 (30.8)	7 (25)	2 (13.3)	4 (15.4)	0.53
No	18 (69.2)	21 (75)	13 (86.7)	22 (84.6)	
Way of applying to psychiatry clinic					
Referral from the social pediatrics department	8 (30.8)	1 (3.6)	2 (13.3)	4 (15.4)	0.03
Applying upon parents' demand	13 (50)	10 (35.7)	5 (33.3)	6 (23.1)	
Referral from the general pediatrics department	3 (11.5)	7 (25)	1 (6.7)	8 (30.8)	
Referral from the developmental pediatrics department	1 (3.8)	6 (21.4)	5 (33.3)	4 (15.4)	
Referral from another medical center	1 (3.8)	4 (14.3)	2 (13.3)	4 (15.4)	
Interaction guidance recommendation					
After psychiatric assessment					
Yes	16 (61.5)	19 (67.9)	8 (53.3)	12 (50)	0.57
No	10 (38.5)	9 (32.1)	7 (46.7)	12 (50)	
Additional recommendations					
After psychiatric assessment					
None	16 (61.5)	8 (28.6)	3 (20)	11 (42.3)	0.06
Kindergarten	4 (15.4)	10 (35.7)	6 (40)	9 (34.6)	
Further assessment using the working	5 (19.3)	5 (17.9)	5 (33.3)	4 (15.4)	
Model of the child interview	1 (3.8)	3 (10.7)	1 (6.7)	2 (7.7)	
Referral of caregivers to psychiatry	0 (0.0)	2 (7.1)	0 (0.0)	0 (0.0)	
Referral of the child to other medical departments for additional assessment					
Presence of medical illness					
Yes	2 (30.8)	7 (25)	2 (13.3)	4 (15.4)	0.53
No	18 (69.2)	21 (75)	13 (86.7)	22 (84.6)	

DS: down syndrome, ASD: autism spectrum disorder, GDD: global developmental delay, TD: typical development.

psychiatric disorders in our sample may be explained by the fact that children who applied to our psychiatric clinic were enrolled in the study. It is well known that ADHD is commonly associated with other neurodevelopmental disorders, such as DS, with research indicating a prevalence between 31 and 43.9%, and our results are consistent with previous research [21, 22]. One unanticipated finding was that there was a lower percentage of ASD in our DS sample. Only 6.9% of the patients had an ASD diagnosis. In contrast, previously reported ASD prevalence estimates in the DS population are much higher, ranging from 10 to 41% [22, 23]. However, earlier studies also reported ASD prevalence rates similar to or even lower than our findings (~5% in the DS group) [24]. This discrepancy could be attributed to different methods of gathering information about the presence of psychiatric disorders. Other possible explanations for this may be changes in ASD diagnostic criteria over time, different characteristics of the study population, and the use of various psychiatric measures.

Nearly half of the patients with DS (45.7%) had moderate ID, followed by mild (32.9%), and severe ID (21.4%). The results obtained by Maatta et al. [25] and Wester Oxelgren et al. [26] are inconsistent with our results, as both studies reported a higher prevalence of severe ID in children with DS. This result may be explained by the fact that both studies used government medical records to access their patient populations. On the other hand, we evaluated patients who had applied to our psychiatry outpatient department. As our clinic serves as a third-step medical facility, the study sample may not represent the features of the general population, and different results may be associated with the characteristics of our patient population. Previous research has shown that waiting time for an appointment is the most commonly reported barrier to accessing mental health services [27]. Although child and adolescent psychiatry services are rapidly developing in Turkey, there are still a limited number of professionals, and the waiting time for an appointment may be longer, especially for third-step medical facilities. Therefore, it would be speculated that parents of patients with more severe ID may perceive behavioral problems as more "apparent" and "urgent" and apply to other medical facilities with shorter waiting times for appointments.

The mean age of the first psychiatric assessment was 4.16 years (±2.8) for children with DS, while the patients'

Table 7: CBCL subscale scores of preschool children.

CBCL subscales	DS ($n = 26$) Mean ± SD	ASD ($n = 28$) Mean ± SD	DD ($n = 15$) Mean ± SD	TD ($n = 26$). Mean ± SD	p
Aggressive behavior	18.73 ± 9.92	16.6 ± 8.18	21.4 ± 11.1	17.07 ± 9.91	0.35^{*}
Anxiety/depression	5.03 ± 3.05	5.07 ± 2.64	5.53 ± 2.66	4.07 ± 2.11	0.35^{*}
Somatic complaints	4.30 ± 3.28	4.44 ± 2.87	5.46 ± 3.68	3.96 ± 2.64	0.5^{**}
Withdrawn	4.15 ± 3.28	3.74 ± 2.36	4.33 ± 2.96	3.03 ± 2.52	0.41^{**}
Sleep problems	4.80 ± 2.85	4.74 ± 2.89	6.8 ± 2.48	4.84 ± 2.05	0.056^{**}
Oppositional defiant problems subscale points	4.57 ± 2.5	4.70 ± 2.05	4.93 ± 2.71	4.65 ± 2.63	0.88^{**}

*One way ANOVA, **Kruskal–Wallis, CBCL.

mean age of starting special education was 20.15 months (±14.24). These findings suggest that most patients apply to other pediatric departments to begin the process necessary for government-supported special education. Although most of the patients (51.4%) had psychiatric symptoms, the most common reason for applying to our psychiatric clinic was to obtain a medical report for government-funded special education (62.5%). This finding suggests that most parents would have never applied for mental health services if it were not for the medical report. Previous research has demonstrated that after the diagnosis of the child's disability, families not only have complex feelings about the disabled child but also confusion about where to apply to get help for their children. This may be a barrier to accessing mental health services [28].

Another striking result is that most of the patients with DS (62.5%) were referred to us by the pediatrics department. As collaboration with other medical specialties is crucial for child and adolescent psychiatric services, this finding is satisfactory and shows that our clinic works closely with other pediatric departments. As the mean age of the first psychiatric assessment was 4.16 years, it can be suggested that additional training may be necessary to raise awareness among pediatricians about younger children's mental health needs.

The age at the first psychiatric assessment of children with DS was positively and moderately correlated with maternal and paternal age and negatively and moderately correlated with maternal and paternal educational status. Therefore, it is logical to conclude that "older" parents tend to normalize their child's mental health issues more frequently. Although child and adolescent psychiatry in Turkey has a history of more than 50 years, public awareness of the mental health needs of children and adolescents is developing at a slower rate. On the other hand, as the education level of parents increases, the age at the first psychiatric assessment decreases. This finding contradicts previous research, which showed no significant relationship between maternal education status and seeking professional help for child's mental health problems [29]. Although our results match with the clinical observations of the researchers, additional studies are needed to develop a full picture of the relationship between parental education and seeking psychiatric services for children.

Regarding the comparison of preschool children, it is interesting that the most common reason for applying to our psychiatry clinic was "applying upon parents" demand' for children with DS. As several pediatric specialties regularly follow most young children with DS because of accompanying medical problems, our prediction for the most frequent referral reason of this group was "referral from pediatrics." As mentioned earlier, this may reflect insufficient referrals from pediatric departments for this age group due to the low awareness of the mental health needs of younger children. Additional collaboration between child psychiatry and pediatric departments may be necessary to raise awareness of young children's mental health challenges. Another possible explanation for this may be that most children with DS are regularly followed up by other pediatric departments beginning at a young age; parents of these children probably receive developmental suggestions, such as enrolling their children in preschool during their medical visits. For this reason, pediatricians may not have felt the need to refer patients to the child and adolescent psychiatry department because of parents' concerns, which can be alleviated with developmental counseling.

Another thought-provoking result included a lack of significant differences among the four preschool age groups regarding problem behaviors assessed by the "child behavior check list 1.5-5" scale. Contrary to expectations, this study did not find a significant difference between the four groups in terms of "anxiety/depression," "aggressive behavior," "somatic complaints," "withdrawn," "sleep problems," and "oppositional defiant problems." Griffith et al. [30] demonstrated that mothers of children with autism rate their children as having significantly lower social competence and engagement in a higher frequency of problem behaviors than mothers of children with DS and mixed etiology ID. Many other researchers have reported that children with DS have fewer behavioral problems than children with ID [11]. There may be several explanations for the contradiction between our results and previous findings. The mean age of our sample was younger than that in most studies, and the frequency of mental disorders increased with age in children with DS. It may be speculated that differences in behavioral problems do not manifest early in life, and specific behavioral characteristics may settle over time and become more observable as children age. Another explanation might be that the symptom severity of our ASD cases was "mild" as our center is the leading infant mental health provider in the region, and most patients referred to our center are the "grey zone" cases. This may mean that the clinician is unclear about the presence of ASD and may refer the child to our clinic. The ASD cases in our sample did not have as many problematic behaviors as expected.

4.1. Limitations and Strengths. The results reported here should be considered in light of some limitations. First, owing to the cross-sectional nature of the present study, we could not assess the possible changes in children's symptoms and parents' attitudes towards mental health services over time. The sample size was relatively small, primarily because it included patients who had visited the child and adolescent psychiatry clinic of Ankara University Hospital. As this study was retrospective in terms of collecting information about the medical history of patients, another limitation may be "recall bias."

To the best of our knowledge, this is the first study to assess factors related to the use of psychiatric services by children with DS. In our study, it is also noteworthy that the mental health problems of preschool children with Down syndrome, where general information is lacking, were examined and compared with those of the control groups. In addition to the parent-reported scales, the use of psychiatric interviews conducted by a child and an adolescent psychiatrist is another strength of this study.

5. Conclusions

In conclusion, our findings suggest that, although many children with DS have psychiatric symptoms, parents are reluctant to apply for child and adolescent mental health services. Further research is needed to highlight the potential causes of this phenomenon since it is well known that early diagnosis and treatment improve outcomes for most psychiatric disorders.

Pediatric departments may be the main source of referral to psychiatric services; therefore, providing psychoeducation to pediatricians about child and adolescent mental health problems and collaboration between the child and adolescent psychiatry department and other pediatric departments are crucial. Further studies are needed to establish the best policies to improve this collaboration.

Even though our study showed no significant difference in "problematic behavior" between young children with DS and their peers with ID/ASD and TD children, regular psychiatric follow-up of young children with DS is important to recognize mental health problems that may manifest as children get older. Despite the fact that children with DS are less prone to psychiatric and behavioral problems than their peers with IDs with other etiologies, pediatricians should be aware of the need for psychiatric consultation during follow-ups, as our study shows that psychiatric diagnoses are not uncommon in children with DS. There is a gap between the first hospital admission and psychiatric referral, which may cause unfavorable mental health outcomes.

Data Availability

The data used to support the study are available from the corresponding author upon request.

Additional Points

(1) Psychiatric disorders are common in children with Down syndrome (DS), and the most frequent psychiatric diagnosis is attention deficit and hyperactivity disorder. (2) Regular psychiatric follow-up of young children with DS is important for recognizing mental health problems that may manifest as children age. (3) A multidisciplinary team conveys many benefits for the management of children with DS.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

[1] A. Contestabile, F. Benfenati, and L. Gasparini, "Communication breaks-Down: from neurodevelopment defects to cognitive disabilities in Down syndrome," *Progress in Neurobiology*, vol. 91, no. 1, pp. 1–22, 2010.

[2] Q. Yang, S. A. Rasmussen, and J. M. Friedman, "Mortality associated with Down's syndrome in the USA from 1983 to 1997: a population-based study," *The Lancet*, vol. 359, no. 9311, pp. 1019–1025, 2002.

[3] M. J. Bull, "Down syndrome," *New England Journal of Medicine*, vol. 382, no. 24, pp. 2344–2352, Jun 11 2020.

[4] M. B. Pulsifer, "The neuropsychology of mental retardation," *Journal of the International Neuropsychological Society*, vol. 2, no. 2, pp. 159–176, 1996.

[5] J. L. Badano, T. M. Teslovich, and N. Katsanis, "The centrosome in human genetic disease," *Nature Reviews Genetics*, vol. 6, no. 3, pp. 194–205, 2005.

[6] W. Silverman, "Down syndrome: cognitive phenotype," *Mental Retardation and Developmental Disabilities Research Reviews*, vol. 13, no. 3, pp. 228–236, 2007.

[7] E. M. Dykens, "Annotation: psychopathology in children with intellectual disability," *Journal of Child Psychology and Psychiatry*, vol. 41, no. 4, pp. 407–417, 2000.

[8] K. Barisnikov and C. Straccia, "Social adaptive skills and psychopathology in adults with intellectual disabilities of nonspecific origin and those with Down syndrome," *Research in Developmental Disabilities*, vol. 87, pp. 31–42, 2019.

[9] S. L. Einfeld, A. M. Piccinin, A. Mackinnon et al., "Psychopathology in young people with intellectual disability," *JAMA*, vol. 296, no. 16, pp. 1981–1989, Oct 25 2006.

[10] B. A. Myers and S. M. Pueschel, "Psychiatric disorders in persons with Down syndrome," *The Journal of Nervous and Mental Disease*, vol. 179, no. 10, pp. 609–613, 1991.

[11] E. M. Dykens and C. Kasari, "Maladaptive behavior in children with Prader-Willi syndrome, Down syndrome, and nonspecific mental retardation," *American Journal on Mental Retardation*, vol. 102, no. 3, pp. 228–237, 1997.

[12] D. A. Coe, J. L. Matson, D. W. Russell et al., "Behavior problems of children with Down syndrome and life events," *Journal of Autism and Developmental Disorders*, vol. 29, no. 2, pp. 149–156, 1999.

[13] S. Giaouri, A. Alevriadou, and E. Tsakiridou, "Theory of mind abilities in children with Down syndrome and non-specific intellectual disabilities: an empirical study with some educational implications," *Procedia-Social and Behavioral Sciences*, vol. 2, no. 2, pp. 3883–3887, 2010.

[14] C. A. Molloy, D. Murray, A. Kinsman et al., "Differences in the clinical presentation of trisomy 21 with and without autism," *Journal of Intellectual Disability Research*, vol. 53, no. 2, pp. 143–151, 2009.

[15] C. Reilly, "Autism spectrum disorders in Down syndrome: a review," *Research in Autism Spectrum Disorders*, vol. 3, no. 4, pp. 829–839, 2009.

[16] F. Ünal, F. Öktem, F. Çetin Çuhadaroğlu et al., "Okul çağı çocukları için duygulanım bozuklukları ve şizofreni görüşme çizelgesi-şimdi ve yaşam boyu şekli-DSM-5 kasım 2016-türkçe uyarlamasının (ÇDŞG-ŞY-DSM-5-T) geçerlik ve güvenirliği," *Türk Psikiyatri Dergisi*, vol. 30, no. 1, pp. 42–50, 2019.

[17] N. Erol, L. Aslan, and M. Akçakin, "The adaptation and standardisation of the child behavior checklist among 6–18-year-old Turkish children," in *Eunethydis Europan Approaches to Hyperkinetic Disorders*, J. Sergeant, Ed., pp. 109–113, Fotorotor Egg, Zurich, Switzerland, 1995.

[18] R. Pérez Robles, M. Ballabriga, E. D. Diéguez, P. Caldeira da Silva, and P. Caldeira da Silva, "Validating regulatory sensory processing disorders using the sensory profile and child behavior checklist (CBCL 1½–5)," *Journal of Child and Family Studies*, vol. 21, no. 6, pp. 906–916, 2012.

[19] S. Yurduşen, N. Erol, and T. Gençöz, “The effects of parental attitudes and mothers’ psychological well-being on the emotional and behavioral problems of their preschool children,” *Maternal and Child Health Journal*, vol. 17, no. 1, pp. 68–75, 2013.

[20] R. L. D. C. Klaehn, *0–5: Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood*, Wiley Online Library, Hoboken, NJ, USA, 2018.

[21] S. Ekstein, B. Glick, M. Weill, B. Kay, and I. Berger, “Down syndrome and attention-deficit/hyperactivity disorder (ADHD),” *Journal of Child Neurology*, vol. 26, no. 10, pp. 1290–1295, 2011.

[22] U. W. Oxelgren, A. Myrelid, G. Anneren et al., “Prevalence of autism and attention-deficit-hyperactivity disorder in Down syndrome: a population-based study,” *Developmental Medicine and Child Neurology*, vol. 59, no. 3, pp. 276–283, 2017.

[23] S. Hepburn, A. Philofsky, D. J. Fidler, and S. Rogers, “Autism symptoms in toddlers with Down syndrome: a descriptive study,” *Journal of Applied Research in Intellectual Disabilities*, vol. 0, no. 0, pp. 48–57, 2007.

[24] M. Ghaziuddin, L. Tsai, and N. Ghaziuddin, “Comorbidity of autistic disorder in children and adolescents,” *European Child and Adolescent Psychiatry*, vol. 1, no. 4, pp. 209–213, 1992.

[25] T. Maatta, T. Tervo-Maatta, A. Taanila, M. Kaski, and M. Iivanainen, “Mental health, behaviour and intellectual abilities of people with Down syndrome,” *Down Syndrome: Research and Practice*, vol. 11, no. 1, pp. 37–43, 2006.

[26] U. Wester Oxelgren, A. Myrelid, G. Annerén, J. Westerlund, J. Gustafsson, and E. Fernell, “More severe intellectual disability found in teenagers compared to younger children with Down syndrome,” *Acta Paediatrica*, vol. 108, no. 5, pp. 961–966, 2019.

[27] W. Iskra, F. P. Deane, T. Wahlin, and E. L. Davis, “Parental perceptions of barriers to mental health services for young people,” *Early Intervention in Psychiatry*, vol. 12, no. 2, pp. 125–134, 2018.

[28] N. Baykoç, E. Acar, İ. Artan et al., *Özel Gereksinimli Çocuklar Ve Özel Eğitim*, Eğiten Kitap, Ankara, Turkey, 2017.

[29] F. J. Zimmerman, “Social and economic determinants of disparities in professional help-seeking for child mental health problems: evidence from a national sample,” *Health Services Research*, vol. 40, no. 5p1, pp. 1514–1533, Oct 2005.

[30] G. M. Griffith, R. P. Hastings, S. Nash, and C. Hill, “Using matched groups to explore child behavior problems and maternal well-being in children with Down syndrome and autism,” *Journal of Autism and Developmental Disorders*, vol. 40, no. 5, pp. 610–619, May 2010.