Available online at www.medicinescience.org

ORIGINAL ARTICLE

Medicine Science International Medical Journal

Medicine Science 2026;15(1):233-42

Diagnostic profiles, comorbidity, and service utilization in child and adolescent psychiatry: Comparing single- and multi-center follow-up

Makbule Esen Oksuzoglu[1], Yusuf Selman Celik[2]

[1]*Kastamonu Universiy, Faculty of Medicine, Department of Child and Adolescent Psychiatry, Kastamonu, Türkiye*
[2]*Ankara Etlik City Hospital, Department of Child and Adolescent Psychiatry, Ankara, Türkiye*

Received 17 September 2025; Accepted 28 October 2025
Available online 23 February 2026 with doi: 10.5455/medscience.2025.09.248

Abstract

Child and adolescent psychiatric disorders represent a substantial global health burden, and continuity of care is often undermined by fragmented service use and poor follow-up. In Turkey, little is known about how multi-center follow-up influences diagnostic distribution, comorbidity, treatment patterns, and service utilization. This retrospective chart review included 3,511 patients (0–18 years) evaluated at a tertiary-level child and adolescent psychiatry outpatient clinic in Turkey during January 2024. Data extracted from electronic records included sociodemographic features, referral type, presenting complaints, DSM-5 diagnoses, comorbidities, psychotropic use, adverse effects, socioeconomic status, and follow-up recommendations. Patients were categorized as single-center (exclusive follow-up at the study site) or multi-center (concurrent or prior follow-up in another clinic). Among 3,511 patients (1,769 single-center; 1,742 multi-center), multi-center patients were older (10.8 vs 9.8 years; p<.001) and more often male, with higher comorbidity, psychotropic initiation, and adverse effects; high SES was more common in single-center care, and ~10% of visits were unnecessary, over half due to duplicate evaluations in multi-center patients. ADHD was the most common diagnosis, particularly in the multi-center group (34.0% vs. 24.9%), while anxiety disorders and depressive disorders were more frequent in single-center patients (p<.001). Multi-center follow-up reflected greater clinical complexity with more neurodevelopmental disorders, comorbidity, and adverse effects, whereas single-center follow-up was linked to internalizing disorders. Unnecessary appointments highlighted the need for integrated referrals, effective triage, and parent psychoeducation to improve continuity of child and adolescent mental health care in Turkey.

Keywords: Child and adolescent psychiatry, multi-center follow-up, health service utilization, continuity of care, treatment adherence, comorbidity

Introduction

Child and adolescent psychiatric disorders constitute a major component of the global mental health burden. Early detection, sustained follow-up, and timely treatment are essential for preventing chronicity, functional impairment, and escalating health-care costs. Nevertheless, continuity of care remains a major challenge. Missed appointments, fragmented service use, and poor adherence to recommendations are frequent and may undermine treatment effectiveness [1]. International research indicates that fewer than two-thirds of children and adolescents with mental health problems receive professional support, with barriers operating at multiple levels, including stigma, limited knowledge, confidentiality concerns, logistical obstacles, and financial constraints [2]. In the United States, similar barriers have been documented: in a study of five major cities, only 17% of child psychiatrists and 40% of pediatricians offered an appointment for a simulated case of adolescent depression, with wait times for psychiatry averaging 30 days longer than pediatrics. Appointment availability was also strongly influenced by insurance status, with lower access for children on Medicaid [3].

Although evidence-based interventions have improved accessibility, engaging families in sustained treatment continues to be challenging. Barriers such as long waiting times, limited therapeutic alliance, and skepticism about treatment effectiveness often lead to disengagement [4]. Engagement encompasses not

CITATION
Esen Oksuzoglu M, Celik YS. Diagnostic profiles, comorbidity, and service utilization in child and adolescent psychiatry: Comparing single- and multi-center follow-up. Med Science. 2026;15(1):233-42.

Corresponding Author: Makbule Esen Oksuzoglu, Kastamonu Universiy, Faculty of Medicine, Department of Child and Adolescent Psychiatry, Kastamonu, Türkiye
Email: esenmakbule@gmail.com

DOI: 10.5455/medscience.2025.09.248

only attendance but also attitudinal and behavioral investment in care, and dropout may occur at any stage of treatment. Given these global challenges, it is essential to explore how such barriers manifest in specific national health systems. In Turkey, fragmented referrals, overlapping consultations across centers, and repeated evaluations remain particularly salient issues in child and adolescent mental health care.

Several retrospective studies from Turkey have described the sociodemographic and clinical features of children presenting to psychiatric outpatient services. A study conducted in 2019 reported that Attention-Deficit/Hyperactivity Disorder (ADHD), anxiety disorders, and depressive disorders were the most frequent diagnoses, with sex-specific differences [5]. Similarly, research published in 2023 found ADHD to be the most common presenting complaint and diagnosis among first-time applicants, with comorbidity identified in nearly one-fourth of cases [6]. Consistent with these results, a 2015 study reported ADHD as the leading diagnosis in a larger sample, followed by speech disorders and anxiety disorders, again with comorbidity present in about one-quarter of patients [7]. In addition, dropout rates exceeding 40% have been documented, with both patient- and treatment-related factors influencing continuity [8]. Policy initiatives, such as the disability evaluation report for children (SNRC), have further highlighted the need to document service utilization patterns and to identify subgroups requiring sustained psychiatric monitoring [9,10].

Treatment adherence and engagement are shaped by multiple factors, including socioeconomic status, clinical severity, and comorbid medical conditions. Medication initiation and tolerability also affect continuity; while adverse effects may reduce adherence, combining pharmacological and psychoeducational approaches has been associated with improved follow-up [11,12]. However, little is known about how concurrent follow-up across multiple centers influences these dynamics, and whether it promotes continuity or exacerbates fragmentation of care. Similarly, "unnecessary appointments"—such as visits for developmental concerns within normal limits or repeated consultations after prior evaluations—remain an underexplored dimension of service use, with implications for both efficiency and equity.

In summary, although existing studies provide valuable insights, important gaps remain. Data from Turkey are limited regarding predictors of sustained follow-up, the impact of multi-center pathways, and the characteristics of unnecessary visits. Furthermore, the interplay between psychiatric diagnoses, comorbidity, medication use, socioeconomic status, and follow-up recommendations has not been systematically examined.

Considering previous findings, children and adolescents who receive care from multiple psychiatric centers often have more complex clinical profiles, higher rates of externalizing and neurodevelopmental disorders, and greater psychotropic medication use compared to those followed consistently in a single setting. This pattern may reflect fragmented continuity of care and difficulties in coordination between institutions. Accordingly, we hypothesized that patients in the multi-center follow-up group would exhibit (1) higher frequencies of ADHD, autism spectrum disorder, and comorbid psychiatric diagnoses, (2) greater likelihood of psychotropic medication initiation, and (3) lower socioeconomic status. In contrast, the single-center follow-up group was expected to show (1) a predominance of internalizing disorders such as anxiety and depression, (2) fewer comorbidities, and (3) higher socioeconomic status.

Material and Methods

Study Design and Setting

This retrospective chart review was conducted at the Child and Adolescent Psychiatry Outpatient Clinic of Etlik City Hospital, Ankara, Turkey. The present study analyzed a cohort of 3.511 children and adolescents evaluated at this tertiary outpatient clinic over a one-month period (January 1–31, 2024). Variables included sociodemographic characteristics, referral type, presenting complaints, DSM-5 clinical diagnoses, comorbid medical conditions, initiation of psychotropic medication, adverse drug effects, socioeconomic status, and follow-up recommendations. The study included all patients who presented to the outpatient clinic through the National Centralized Appointment System (NCAS), were referred from inpatient units, were evaluated through forensic requests, or were assessed in the disability evaluation clinic (Special Needs Report for Children, SNRC) during the study period. The one-month time frame (January 2024) was selected to ensure a manageable scope of data extraction while maintaining homogeneity in appointment availability and avoiding seasonal variations related to school holidays or staff rotations.

The study protocol was approved by the Etlik City Hospital Clinical Research Ethics Committee (Approval No: AEŞH-BADEK-2024-473, Date: May 22, 2024) and was conducted in accordance with the principles of the Declaration of Helsinki. Given the retrospective design and the use of anonymized data, the requirement for informed consent was waived.

Participants

A total of 4.928 patient encounters were identified in the hospital's electronic health record system (EHR) during the study period. Of these, 170 originated from inpatient referrals, 4.144 from the NCAS, and 614 from the SNRC. Among these encounters, 544 patients (approximately 11% of the initial appointment pool) did not attend or canceled their visits. Most were first-time applicants who failed to appear after scheduling through the national NCAS system. Because no diagnostic or sociodemographic data were recorded for these cases, they were excluded from the analytic sample. In addition, 873 cases were excluded due to incomplete diagnostic or sociodemographic information (e.g., missing diagnosis, referral type, or age/sex data). To avoid duplication, only the first encounter per unique patient was retained, resulting in a final analytic sample of 3.511 patients (see Figure 1).

DOI: 10.5455/medscience.2025.09.248

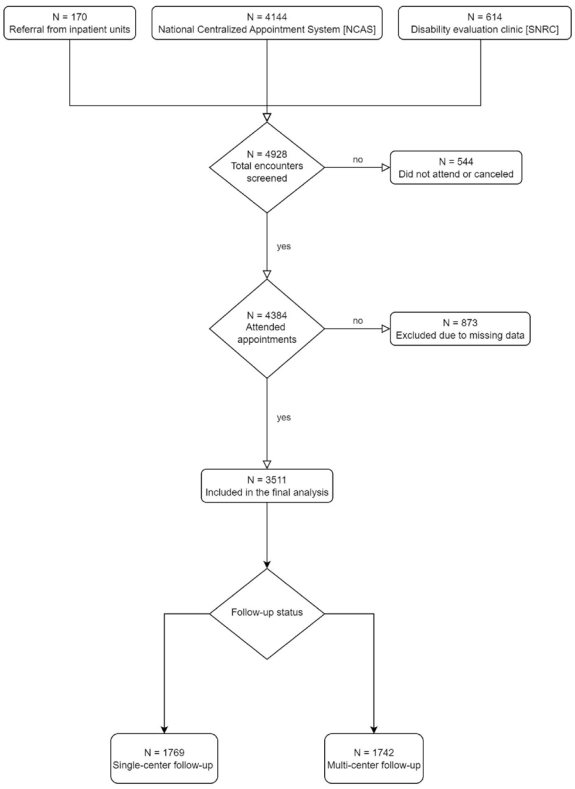

Figure 1. Flow diagram of patient selection and inclusion in the final analysis

Inclusion criteria were: (1) age between 0 and 18 years and (2) undergoing at least one psychiatric evaluation in the outpatient clinic during the study period. Exclusion criteria were: (1) absence of a psychiatric evaluation during the specified period and (2) being outside the defined age range.

Data Collection and Variables

Data were extracted retrospectively from the Keydata EHR by a board-certified child psychiatrist and a psychiatry resident. All personal identifiers were removed before analysis to ensure confidentiality. The following variables were collected:

Sociodemographic data: age, sex, and socioeconomic status (low, middle, high [SES]), classified according to parental occupation and reported household income based on Turkish Statistical Institute (TURKSTAT) standards.

Clinical presentation: type of admission (outpatient via the NCAS, inpatient referral, forensic request, or SNRC evaluation) whether the visit was a first vs. repeat consultation, and primary presenting complaint (academic problems, anxiety/restlessness, behavioral problems, speech–language difficulties, depressive symptoms, developmental delay, autism spectrum symptoms, sleep problems, enuresis/encopresis, obsessive–compulsive symptoms, self-harm/suicidality, tics/stereotypies, eating disorder symptoms, neglect/abuse, psychotic or manic symptoms, disability evaluation referral, forensic referral, or other).

Psychiatric diagnoses: presence and type of diagnosis, determined according to Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria during routine clinical evaluation (e.g., ADHD, anxiety disorders, speech disorders, specific learning disorder, depressive disorders, mild/moderate–severe intellectual disability, autism spectrum disorder, eating disorders/obsessive compulsive disorder [OCD], or other). Patients with no diagnosis or only subthreshold symptoms were categorized separately.

Comorbidity and organic pathology: presence of psychiatric comorbidity and coexisting organic conditions (neurological, endocrinological, oncological, genetic, or other).

Treatment variables: initiation of psychotropic medication, type of medication prescribed (methylphenidate, atomoxetine, antidepressants, antipsychotics, guanfacine, or other), and occurrence of adverse drug effects, which were identified if explicitly documented in clinical notes.

Service use and follow-up: recommendations for follow-up (continuation of diagnostic evaluation, treatment monitoring, or other reasons), presence of follow-up in another child and adolescent psychiatry center, and classification of unnecessary appointments. An appointment was considered unnecessary if no psychiatric disorder was identified and the presenting issue could be managed without psychiatric intervention. Specifically, visits were labeled "unnecessary" when the presenting concern reflected normal development within age expectations, test-related anxiety manageable through psychoeducation, or duplicate consultations after all assessments had already been completed in another center.

After data collection, patients were categorized into two groups based on their follow-up history. The single-center group included patients who had received psychiatric evaluation and follow-up exclusively at the study hospital, without documentation of follow-up visits in any other child and adolescent psychiatry clinic. The multi-center group comprised patients whose EHR explicitly indicated concurrent or prior follow-up in at least one other child and adolescent psychiatry clinic during the same period. This definition was based entirely on EHR documentation rather than parental report, ensuring objective classification.

Statistical Analysis

All analyses were conducted using IBM SPSS Statistics version 26 (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented as frequencies and percentages for categorical variables and as means with standard deviations for continuous variables. Between-group comparisons (single- vs. multi-center follow-up) were performed using chi-square (χ^2) tests for categorical variables and independent-samples t tests for continuous variables. Effect sizes were also calculated and reported for key comparisons (Cramer's V for χ^2 tests, Cohen's d for t tests, and odds ratios with 95% confidence intervals for logistic regression). A two-tailed p value of<.05 was considered statistically significant. For significant χ^2 results, adjusted

DOI: 10.5455/medscience.2025.09.248

residuals and percentage differences were examined to determine the direction of group differences.

Subsequently, all variables that showed significant differences in group comparisons were entered into binary logistic regression analyses to identify independent predictors of multi-center versus single-center follow-up. A backward: conditional method was employed to derive the final model. Variables with high multicollinearity were excluded to ensure model stability; for example, due to strong correlation between NCAS and SNRC, only NCAS was retained, while the test-anxiety variable was excluded because of its very small subgroup size (n=6). Odds ratios (ORs) with 95% confidence intervals (CIs) were reported to quantify the strength of associations. Model fit was evaluated using the Hosmer–Lemeshow test, classification accuracy, Cox & Snell R^2, and Nagelkerke R^2 statistics.

Given the exploratory nature of the study and the large number of variables examined, no formal correction for multiple comparisons (FDR) was applied. However, this limitation is acknowledged in the Discussion, and findings should be interpreted with caution due to potential inflation of Type I error.

Result

Table 1 summarizes sociodemographic and clinical characteristics by follow-up status. The mean age differed significantly between groups, with single-center patients being younger on average (M=9.8, SD=4.5) than multi-center patients (M=10.8, SD=4.1), t=–6.65, p<.001, Cohen's d=0.23. Gender distribution differed significantly, with boys more common in the multi-center group than in the single-center group, $\chi^2(1, N=3511)=9.75$, p=.002, Cramer's V=0.05. Admission type also varied, $\chi^2(3, N=3511)=12.18$, p=.006: disability evaluations (SNRC) were more frequent in the multi-center group, whereas outpatient admissions were slightly more common in the single-center group.

A higher proportion of multi-center patients were new admissions (61.8% vs. 56.0%), $\chi^2(1, N=3511)=12.46$, p<.001. Presenting complaints differed substantially across groups, $\chi^2(18, N=3511)=182.58$, p<.001, Cramer's V=0.23. Academic problems were reported more frequently in the multi-center group (39.2% vs. 30.0%), while anxiety–restlessness (17.4% vs. 10.2%) and depressive symptoms (6.4% vs. 3.9%) were more frequent in the single-center group. Developmental delay (7.6% vs. 4.0%) and autism spectrum–related symptoms (4.2% vs. 2.2%) were also more common in the multi-center group. Behavioral problems, speech–language difficulties, and parental limit-setting issues were distributed more evenly. Rare complaints, including obsession–compulsion, self-harm, and psychotic symptoms, were infrequent with only minor group differences.

Table 2 presents current psychiatric diagnoses, organic pathologies, psychiatric comorbidity, and socioeconomic status by follow-up status. Diagnostic distribution differed significantly, $\chi^2(10, N=3511)=331.05$, p<.001, Cramer's V=0.31. ADHD was more frequent in the multi-center group (34.0% vs. 24.9%), whereas anxiety disorders (15.6% vs. 11.3%) and depressive disorders (5.8% vs. 3.9%) were more common in the single-center group. Specific learning disorder (11.8% vs. 3.8%), mild intellectual disability (7.3% vs. 3.3%), autism spectrum disorder (6.2% vs. 2.0%), and moderate-to-severe intellectual disability (1.5% vs. 0.9%) were observed more often in the multi-center group. A larger proportion of single-center patients had no psychiatric diagnosis or only subthreshold symptoms (31.5% vs. 12.6%).

Organic pathology prevalence did not differ significantly, $\chi^2(1, N=3511)=0.85$, p=.357 (16.8% vs. 18.0%). However, pathology type varied, $\chi^2(4, N=644)=16.04$, p=.003. Neurological conditions were more frequent in the multi-center group (39.2% vs. 29.9%), while endocrinological disorders were more common in the single-center group (15.4% vs. 7.6%). Oncological and genetic conditions were less frequent but slightly more prevalent in the multi-center group. Comorbid psychiatric diagnoses were significantly more frequent in the multi-center group (42.8% vs. 22.7%), $\chi^2(1, N=3511)=160.28$, p<.001, Cramer's V=0.21. Socioeconomic status also differed significantly between groups, $\chi^2(2, N=3511)=26.09$, p<.001, with low SES nearly equally represented (46.1% vs. 47.1%), middle SES slightly more common among multi-center patients (50.1% vs. 47.4%), and high SES more prevalent in the single-center group (6.5% vs. 2.9%).

Table 3 presents group comparisons of medication use, adverse drug effects, follow-up recommendations, and unnecessary appointments between single-center and multi-center patients. Medication initiation was also higher (57.6% vs. 44.2%), $\chi^2(1, N=3511)=63.33$, p<.001, Cramer's V=0.13. Among those prescribed medication, distribution of drug categories differed significantly, $\chi^2(9, N=1862)=51.09$, p<.001. Methylphenidate was more often used in the multi-center group (54.1% vs. 42.6%), whereas fluoxetine (16.9% vs. 10.8%) and sertraline (19.8% vs. 12.1%) were more common in the single-center group. Antipsychotic prescriptions were slightly higher in the multi-center group, particularly risperidone (10.2% vs. 8.7%) and aripiprazole (3.7% vs. 1.8%). Adverse drug effects were also reported more frequently (7.7% vs. 4.6%), $\chi^2(1, N=3511)=14.21$, p<.001. The overall rate of follow-up recommendations did not differ significantly, $\chi^2(1, N=3511)=3.25$, p=.072, with most patients in both groups receiving recommendations (87.3% vs. 85.2%). However, reasons differed, $\chi^2(2, N=3511)=64.86$, p<.001. Continuation of diagnostic evaluation was more common in the single-center group (40.6% vs. 27.1%), whereas treatment monitoring was more often recommended in the multi-center group (68.1% vs. 54.2%).

Unnecessary appointments were comparable across groups (10.2% vs. 10.6%), $\chi^2(1, N=3511)=0.14$, p=.707, but underlying reasons differed, $\chi^2(5, N=352)=133.50$, p<.001, Cramer's V=0.45. In the single-center group, these were often related to normal development without psychopathology (25.7%), adolescent–parent conflict (11.1%), or parental boundary-setting difficulties (16.4%). In the multi-center group, over half (50.8%) occurred after comprehensive assessments had already been completed elsewhere and families sought additional consultation.

DOI: 10.5455/medscience.2025.09.248

Table 1. Sociodemographic and clinical characteristics of patients by follow-up status

Variables		Single-Center Follow-Up (N=1769)	Multi-Center Follow-Up (N=1742)	Statistics	
		n (%)	n (%)	χ2	p
Age (years)	M (SD)	9.8 (4.5)	10.8 (4.1)	t= -6.650	<.001
Gender	Girl	800 (45.2%)	697 (40.0%)	9.748	.002
	Boy	969 (54.8%)	1045 (60.0%)		
Type of Admission	Consultation from inpatient unit	3 (.2%)	5 (.3%)	12.179	.006
	Outpatient clinic (NCAS)	1549 (87.6%)	1476 (84.7%)		
	Disability evaluation (SNRC)	185 (10.5%)	241 (13.8%)		
	Forensic request	32 (1.8%)	20 (1.1%)		
First Admission	No	990 (56.0%)	1077 (61.8%)	12.455	< .001
	Yes	779 (44.0%)	665 (38.2%)		
Presenting Complaint	Academic problems	530 (30.0%)	683 (39.2%)	182.581	< .001
	Anxiety–restlessness	308 (17.4%)	177 (10.2%)		
	Behavioral problems	244 (13.8%)	261 (15.0%)		
	Speech–language problems	202 (11.4%)	155 (8.9%)		
	Depressive symptoms	113 (6.4%)	68 (3.9%)		
	Developmental delay	71 (4.0%)	133 (7.6%)		
	Parental limit-setting difficulties	52 (2.9%)	45 (2.6%)		
	Autism spectrum symptoms	39 (2.2%)	74 (4.2%)		
	Sleep problems	21 (1.2%)	17 (1.0%)		
	Enuresis–encopresis	17 (1.0%)	21 (1.2%)		
	Obsession–compulsion	9 (.5%)	32 (1.8%)		
	Self-harm–suicidality	8 (.5%)	15 (.9%)		
	Tics–stereotypies	11 (.6%)	10 (.6%)		
	Eating disorder–related symptoms	7 (.4%)	5 (.3%)		
	Neglect–abuse	6 (.3%)	3 (.2%)		
	Hallucinations–delusions–dissociation	3 (.2%)	9 (.5%)		
	Manic/hypomanic symptoms	0 (.0%)	1 (.1%)		
	Referral for disability evaluation from other departments	89 (5.0%)	23 (1.3%)		
	Forensic referral without psychiatric diagnosis	12 (.7%)	0 (.0%)		
	Other	27 (1.5%)	10 (.6%)		

SD: standard deviation, NCAS: National Centralized Appointment System, SNRC: Special Needs Report for Children. Values are presented as n (%), Chi-square (χ^2) and p values indicate comparisons between groups with and without follow-up in another center

A binary logistic regression was conducted to examine predictors of multi-center versus single-center follow-up (see Table 4). The final model was constructed by including variables that showed statistically significant group differences in preliminary comparisons (i.e., age, sex, first-time application, ADHD, anxiety disorders, specific learning disorder, depressive disorders, intellectual disability, autism spectrum disorder, psychiatric comorbidity, socioeconomic status, medication use, medication categories, adverse drug effects, diagnostic evaluation, and follow-up reason). Due to the high correlation between NCAS and SNRC variables, only NCAS was retained in the model to avoid multicollinearity. Moreover, the "test-anxiety" variable was excluded because of the very small number of cases (n=6). Using the backward conditional method, the model was iteratively reduced to yield the final set of significant predictors. The final model was statistically significant, $\chi^2(18, N=3511)=683.77$, $p<.001$, indicating that the predictors reliably distinguished between patients who continued in a single center and those who received multi-center care. The model explained 23.6% of the variance (Nagelkerke $R^2=.236$) and correctly classified 68.7% of cases. The Hosmer–Lemeshow test was non-significant in the final step, $\chi^2(8)=14.88$, $p=.062$, suggesting acceptable model fit.

DOI: 10.5455/medscience.2025.09.248

Significant predictors of multi-center follow-up included patient age (OR=1.09), first-time application (OR=1.39), specific learning disorder (OR=2.30), intellectual disability (OR=1.99), autism spectrum disorder (OR=3.08), psychiatric comorbidity (OR=1.88), methylphenidate prescription (OR=1.52), and adverse drug effects (OR=1.40). Conversely, ADHD (OR=0.69), anxiety disorders (OR=0.35), depressive disorders (OR=0.30), and high SES (OR=0.38) were negatively associated with multi-center follow-up, indicating these patients were more likely to remain in single-center care. In addition, having all assessments already completed in another center emerged as the strongest predictor of multi-center follow-up (OR=130), whereas adolescent–parent conflict (OR=0.31) and continuation of diagnostic evaluation (OR=0.71) were associated with remaining in single-center care. Neurological comorbidities also increased the likelihood of multi-center follow-up (OR=1.38), while endocrinological conditions reduced it (OR=0.46).

Table 2. Current psychiatric diagnoses, organic pathologies, psychiatric comorbidity, and socioeconomic status by follow-up status

Variables		Single-Center Follow-Up (N=1769)	Multi-Center Follow-Up (N=1742)	Statistics	
		n (%)	n (%)	$\chi 2$	p
Current Diagnosis	ADHD	441 (24.9%)	592 (34.0%)	331.054	<.001
	Anxiety disorders	276 (15.6%)	197 (11.3%)		
	Speech disorders	167 (9.4%)	134 (7.7%)		
	Specific learning disorder	67 (3.8%)	206 (11.8%)		
	Depressive disorders	102 (5.8%)	68 (3.9%)		
	Mild ID	58 (3.3%)	128 (7.3%)		
	ASD	36 (2.0%)	108 (6.2%)		
	Eating disorders / OCD	29 (1.6%)	42 (2.4%)		
	Moderate–severe ID	16 (.9%)	27 (1.5%)		
	Other	20 (1.1%)	21 (1.2%)		
	Subthreshold / no diagnosis	557 (31.5%)	219 (12.6%)		
Organic Pathology	Absent	1471 (83.2%)	1428 (82.0%)	.849	.357
	Present	298 (16.8%)	314 (18.0%)		
Type of Organic Pathology	Neurological	89 (29.9%)	123 (39.2%)	16.040	.003
	Oncological	16 (5.4%)	29 (9.2%)		
	Endocrinological	46 (15.4%)	24 (7.6%)		
	Genetic	28 (9.4%)	25 (8.0%)		
	Other	119 (39.9%)	113 (36.0%)		
Psychiatric Comorbidity	Absent	1367 (77.3%)	997 (57.2%)	160.283	<.001
	Present	402 (22.7%)	745 (42.8%)		
Socioeconomic Status	Low	816 (46.1%)	820 (47.1%)	26.086	<.001
	Middle	838 (47.4%)	872 (50.1%)		
	High	115 (6.5%)	50 (2.9%)		

Values are presented as n (%). ASD: autism spectrum disorder; ADHD: Attention-deficit/hyperactivity disorder; ID: intellectual disability; OCD: Obsessive–compulsive disorder. Chi-square (χ^2) and p values indicate comparisons between single- and multi-center follow-up groups

DOI: 10.5455/medscience.2025.09.248

Table 3. Comparison of medication use, adverse drug effects, follow-up recommendations, and unnecessary appointments between single-center and multi-center groups

Variables		Single-Center Follow-Up (N=1769)	Multi-Center Follow-Up (N=1742)	Statistics	
		n (%)	n (%)	χ2	p
Medication Initiation	No	987 (55.8%)	738 (42.4%)	63.333	<.001
	Yes	782 (44.2%)	1004 (57.6%)		
Medication Category	Methylphenidate	333 (42.6%)	545 (54.1%)	51.088	<.001
	Atomoxetine	34 (4.3%)	39 (3.9%)		
	Fluoxetine	132 (16.9%)	109 (10.8%)		
	Sertraline	155 (19.8%)	122 (12.1%)		
	Risperidone	68 (8.7%)	103 (10.2%)		
	Aripiprazole	14 (1.8%)	37 (3.7%)		
	Olanzapine	3 (.4%)	8 (.8%)		
	Quetiapine	5 (.6%)	4 (.4%)		
	Guanfacine	1 (.1%)	3 (.3%)		
	Other	37 (4.7%)	37 (3.7%)		
Adverse Drug Effects	No	1687 (95.4%)	1608 (92.3%)	14.206	<.001
	Yes	82 (4.6%)	134 (7.7%)		
Follow-Up Recommended	No	224 (12.7%)	257 (14.8%)	3.245	.072
	Yes	1545 (87.3%)	1485 (85.2%)		
Reason for Follow-Up	Continuation of Diagnostic Evaluation	628 (40.6%)	403 (27.1%)	64.860	<.001
	Treatment Monitoring	837 (54.2%)	1011 (68.1%)		
	Other	80 (5.2%)	71 (4.8%)		
Unnecessary Appointment	No	1589 (89.8%)	1558 (89.4%)	.142	.707
	Yes	180 (10.2%)	184 (10.6%)		
Reason for Unnecessary Appointment	Normal Development (0–6 years), No Psychopathology	44 (25.7%)	7 (4.0%)	133.497	<.001
	Parental Boundary-Setting, No Psychopathology	28 (16.4%)	18 (10.2%)		
	Test Anxiety, Psychoeducation Sufficient, Not Diagnostic Level	6 (3.5%)	0 (.0%)		
	Adolescent–Parent Conflict, No Psychopathology	19 (11.1%)	4 (2.3%)		
	All Assessments Already Completed in Another Center, Requested Additional Consultation Here	-	90 (50.8%)		
	Other	73 (42.7%)	58 (32.8%)		

Values are presented as n (%). ASD: autism spectrum disorder; ADHD: Attention-deficit/hyperactivity disorder; ID: intellectual disability; OCD: Obsessive–compulsive disorder. Chi-square (χ^2) and p values indicate comparisons between single- and multi-center follow-up groups

DOI: 10.5455/medscience.2025.09.248

Table 4. Binary logistic regression analysis predicting multi-center vs. single-center follow-up

Predictor Variable	B	SE	Wald	df	p	OR (Exp[B])	95% CI for OR
Age (years)	0.087	0.010	75.18	1	<.001	1.091	[1.070, 1.113]
First-time application (yes)	0.327	0.086	14.59	1	<.001	1.387	[1.173, 1.640]
ADHD (yes)	–0.375	0.158	5.62	1	.018	0.687	[0.504, 0.937]
Anxiety disorders (yes)	–1.040	0.155	45.03	1	<.001	0.354	[0.261, 0.479]
Specific learning disorder (yes)	0.834	0.180	21.54	1	<.001	2.302	[1.619, 3.273]
Depressive Disorders (yes)	–1.204	0.206	34.29	1	<.001	0.300	[0.201, 0.449]
Mild ID (yes)	0.698	0.193	13.07	1	<.001	2.010	[1.377, 2.934]
Autism spectrum disorder (yes)	1.124	0.227	24.59	1	<.001	3.076	[1.973, 4.796]
Subthreshold/no diagnosis (yes)	–0.910	0.138	43.33	1	<.001	0.403	[0.307, 0.528]
Neurological comorbidity (yes)	0.318	0.161	3.90	1	.048	1.375	[1.002, 1.886]
Endocrinological comorbidity (yes)	–0.771	0.287	7.24	1	.007	0.463	[0.264, 0.811]
Psychiatric comorbidity (yes)	0.629	0.088	51.48	1	<.001	1.876	[1.580, 2.228]
High SES (yes)	–0.959	0.199	23.11	1	<.001	0.383	[0.259, 0.567]
Methylphenidate use (yes)	0.422	0.138	9.28	1	.002	1.524	[1.162, 2.000]
Adverse drug effect (yes)	0.339	0.165	4.23	1	.040	1.404	[1.016, 1.939]
Continuation of Diagnostic Evaluation (yes)	–0.344	0.097	12.43	1	<.001	0.709	[0.586, 0.858]
Adolescent–Parent Conflict, No Psychopathology (yes)	–1.162	0.568	4.18	1	.041	0.313	[0.103, 0.953]
All Assessments Already Completed in Another Center, Requested Additional Consultation Here (yes)	4.870	1.014	23.07	1	<.001	130.28	[17.86, 950.43]
Constant	–0.924	0.142	42.21	1	<.001	0.397	—

ADHD : attention deficit/hyperactivity disorder, ID : intellectual disability, OR : Odds ratio; SES : socioeconomic status; SE : standard error; B : unstandardized coefficients; CI : Confidence interval. Coding: outcome variable : multi-center follow-up (1) vs. single-center follow-up (0). Backward: conditional method was used to derive the final model

Discussion

The present study examined the sociodemographic and clinical characteristics, diagnostic distribution, comorbidity, medication use, and follow-up patterns of children and adolescents evaluated at a tertiary child and adolescent psychiatry clinic over a one-month period. A key focus was the comparison between patients who continued follow-up in a single center and those who received multi-center care. Several important findings emerged. Compared to single-center patients, those followed in multiple centers were older, more often male, and more likely to present with academic or neurodevelopmental complaints such as specific learning disorder, intellectual disability, or autism spectrum disorder. They also demonstrated greater psychiatric comorbidity, higher rates of medication initiation—particularly stimulants—and increased adverse drug effects. Unexpectedly, high SES was more common in the single-center group, while middle SES was slightly more frequent in the multi-center group, a pattern that contrasts with prior international evidence. These findings collectively suggest that multi-center follow-up is linked to higher clinical complexity and fragmented care pathways.

First, consistent with previous reports from Turkey and other countries [2,5], ADHD emerged as the most common diagnosis, followed by anxiety and depressive disorders. These findings align with recent studies in Turkey reporting ADHD as the leading diagnosis among outpatients [6,7], underscoring the centrality of neurodevelopmental disorders in child psychiatry caseloads. In our sample, ADHD, learning disorders, intellectual disability, and autism spectrum disorder were more prevalent among multi-center patients, whereas internalizing disorders were more common in single-center care. This pattern likely reflects differences in illness chronicity and parental health-seeking behaviors: families of children with neurodevelopmental disorders often pursue multiple professional opinions, while families of younger children with internalizing symptoms may prefer to maintain continuity within a single trusted provider.

Age differences further contextualize these findings. Single-

DOI: 10.5455/medscience.2025.09.248

center patients were significantly younger than those in multi-center care, and this age gradient appears to shape both diagnostic and service use patterns. Younger children were more frequently evaluated for developmental concerns and internalizing symptoms, which can often be managed within a single setting. By contrast, older children and adolescents presented with academic and neurodevelopmental problems, conditions that typically require prolonged follow-up, multidisciplinary input, and sometimes multiple consultations, thereby increasing the likelihood of fragmented service use. These results are consistent with previous evidence that neurodevelopmental disorders show age-related cognitive and clinical heterogeneity requiring person-centered approaches [12], that internalizing and externalizing trajectories diverge across developmental stages [13], and that relatively younger children within a school year are at heightened risk of academic and psychiatric difficulties [14]. These developmental differences may also interact with educational factors; relatively younger students in a grade level often face academic stress and are referred more frequently, as shown in prior population-based studies [14]. Taken together, these data highlight that the age distribution observed in our sample not only reflects diagnostic patterns but also broader developmental and contextual influences on help-seeking.

Second, comorbidity was significantly higher in the multi-center group, consistent with evidence that complex clinical profiles predict fragmented service use [15–17]. The greater prevalence of neurological and oncological comorbidities suggests that concurrent medical follow-up may also contribute to families seeking care from multiple centers. In the Turkish health system, lack of unified electronic records between hospitals further contributes to this fragmentation, underscoring the need for interoperable data systems and interdisciplinary coordination.

Third, psychotropic initiation was more common among multi-center patients. Stimulant use predominated, reflecting the high prevalence of ADHD, while antidepressants were more often prescribed in the single-center group, in line with their higher rates of internalizing disorders. Adverse drug effects were also more frequently reported among multi-center patients, possibly reflecting either closer monitoring of complex cases or increased family concern prompting second opinions. These results parallel reports from the COVID-19 pandemic in Turkey, where case mix shifted toward externalizing disorders and pharmacological interventions became more prominent [18]. This highlights the necessity of structured medication monitoring programs and psychoeducation to reduce unnecessary provider switching.

Fourth, socioeconomic differences emerged in a pattern diverging from prior literature. In our sample, high SES was more common among single-center patients, while middle SES predominated in multi-center care, and low SES was evenly distributed. This pattern contrasts with studies suggesting that high-SES families are more likely to seek multiple consultations [11,19]. In Turkey, however, families with higher SES often have easier access to a preferred tertiary center and may perceive it as sufficiently reliable, reducing the need for external opinions. Conversely, middle-SES families—who have adequate resources but less confidence in system consistency—may consult multiple centers seeking reassurance or documentation for educational support (SNRC). These contextual nuances illustrate how health-seeking behavior is shaped not only by financial capacity but also by trust and navigation ability within the national health system.

Unnecessary appointments—such as visits for normal developmental concerns or repeated consultations after prior assessments—also emerged as a service burden. A substantial proportion of unnecessary visits in the multi-center group consisted of duplicate evaluations despite prior comprehensive assessments, closely paralleling international findings on false-positive emergency psychiatric admissions that strain resources [20]. More than half of these duplications were directly related to parental anxiety or institutional communication gaps rather than true diagnostic uncertainty. This suggests that inefficiencies stem from systemic barriers in triage and information flow rather than parental indecision alone.

Taken together, our findings highlight that fragmented service use is not simply a reflection of family preference but primarily results from systemic gaps in coordination and continuity. Multi-center care was consistently associated with older age, neurodevelopmental diagnoses, greater comorbidity, and more frequent adverse drug effects—indicators of higher clinical complexity. Comparable concerns have been raised internationally; for example, a Norwegian feasibility study showed that children with multiple referrals and complex complaints face greater risks of fragmented care and medical errors, while coordinated interdisciplinary interventions are both feasible and acceptable [21]. These converging lines of evidence underscore the urgency of developing integrated referral pathways, shared electronic health records, and standardized communication protocols between services.

Addressing these patterns requires structural reforms. The integration of the NCAS with child psychiatry triage protocols could prevent overlapping appointments, while shared SNRC evaluation databases could minimize duplicate assessments. Moreover, developing a national child mental health referral network—linking primary care, school counselors, and specialized clinics—would promote continuity and rational resource use. Training initiatives for parents and referrers emphasizing appropriate service utilization and psychoeducation on developmental norms could further reduce unnecessary visits.

Several limitations warrant consideration. The retrospective design precludes causal inference, and reliance on clinical records may have led to underreporting of psychosocial factors. SES classification was based on clinician-recorded data and may not fully capture financial heterogeneity. The one-month time frame limits longitudinal generalizability, and contextual factors such as therapeutic alliance, stigma, or parental attitudes were not systematically assessed. Furthermore, multiple comparisons were

DOI: 10.5455/medscience.2025.09.248

not corrected statistically, which may increase the risk of Type I error, although effect sizes were reported to aid interpretation. Another limitation is that the sample was derived exclusively from a public tertiary hospital, which may underrepresent children and adolescents seeking care in private or university-based psychiatry services. This factor should be considered when generalizing the findings to the broader population.

Despite these limitations, the study has notable strengths. The large sample size, encompassing over 3.500 patients, captured a wide spectrum of referrals (inpatient, forensic, SNRC) and service use patterns. The inclusion of underexplored variables such as multi-center follow-up, unnecessary appointments, and adverse drug effects offers novel insights into systemic challenges in Turkish child and adolescent psychiatry.

Conclusion

In conclusion, multi-center follow-up was strongly associated with older age, neurodevelopmental diagnoses, and greater clinical complexity, while single-center follow-up was more characteristic of younger children with internalizing problems and higher SES. Unnecessary appointments reflected systemic inefficiencies rather than family preference. Structural integration of referral systems (NCAS–SNRC), inter-center communication, and parental psychoeducation represent actionable priorities to improve continuity and efficiency in Turkish child and adolescent mental health services.

Acknowledgments
The authors thank the participants for their valuable involvement and gratefully acknowledge the contributions of the child and adolescent psychiatry residents for their assistance in data collection and clinical documentation.

Conflict of Interests
The authors declare that there is no conflict of interest in the study.

Financial Disclosure
The authors declare that they have received no financial support for the study.

Ethical Approval
The study received ethical approval from the Etlik City Hospital Clinical Research Ethics Committee (Approval No: AEŞH-BADEK-2024-473, Date: 22.05.2024).

References

1. Balikci A, Erdem M, Zincir S, et al. Adherence with outpatient appointments and medication: a two-year prospective study of patients with schizophrenia. Klinik Psikofarmakoloji Bülteni. 2013;23:57-64.
2. Radez J, Reardon T, Creswell C, et al. Why do children and adolescents (not) seek and access professional help for their mental health problems? A systematic review of quantitative and qualitative studies. Eur Child Adolesc Psychiatry. 2021;30:183-211.
3. Cama S, Malowney M, Smith AJB, et al. Availability of outpatient mental health care by pediatricians and child psychiatrists in five U.S. Cities. Int J Health Serv. 2017;47:621-35.
4. Gopalan G, Goldstein L, Klingenstein K, et al. Engaging families into child mental health treatment: updates and special considerations. J Can Acad Child Adolesc Psychiatry. 2010;19:182-96.
5. Meriçli M, Yıldız T, Baykal S. Distributions of sociodemographic characteristics, symptoms and diagnoses in cases who referred to child and adolescent psychiatry outpatient clinic. Namik Kemal Med J. 2019;7:140-5.
6. Öz B, Kıvrak AC. Sociodemographic and clinical characteristics of children and adolescents applying to the child psychiatry outpatient clinic in Düzce. Sağlık Bilimlerinde Değer. 2023;13:203-8.
7. Karakoç Demirkaya S, Aksu H, Yılmaz N, et al. Sociodemographic characteristics and diagnoses of individuals referred to a child and adolescent psychiatry outpatient clinic of a university hospital. Meandros Med Dent J. 2015;16:4–8
8. Ersöz Alan B, Öksüzoğlu ME. The examination of factors in dropouts in a child and adolescent psychiatry out-patient clinic. Chron Precis Med Res. 2023;4:281-4.
9. Efendi GY, Temeltürk RD, Çakmak IB. Evaluation of sociodemographic and clinical characteristics of children applying for special needs report to a training and research hospital in Şanlıurfa. Cukurova Med J. 2023;48:616-28.
10. Uygun SD, Cetinkaya M, Efe A, et al. The difficulties encountered in practice for the field of child and adolescent psychiatry after the regulation on assessment of special needs for children (RASNC). Turk J Child Adolesc Ment Health. 2021;28:191-200.
11. De Haan AM, Boon AE, De Jong JT, et al. A meta-analytic review on treatment dropout in child and adolescent outpatient mental health care. Clin Psychol Rev. 2013;33:698-711.
12. Márquez-Caraveo ME, Rodríguez-Valentín R, Pérez-Barrón V, et al. Children and adolescents with neurodevelopmental disorders show cognitive heterogeneity and require a person-centered approach. Sci Rep. 2021;11:18463.
13. Blok E, Geenjaar EPT, Geenjaar EAW, et al. Neurodevelopmental trajectories in children with internalizing, externalizing and emotion dysregulation symptoms. Front Psychiatry. 2022;13:846201.
14. Lien L, Tambs K, Oppedal B, et al. Is relatively young age within a school year a risk factor for mental health problems and poor school performance? A population-based cross-sectional study of adolescents in Oslo, Norway. BMC Public Health. 2005;5:102.
15. Platell M, Cook A, Fisher C, Martin K. Stopped, delayed or discouraged: What are the barriers for adolescents fully engaging in the mental health system? Int J Ment Health Addict. 2020;18:1264-93.
16. Warnick EM, Gonzalez A, Robin Weersing V, et al. Defining dropout from youth psychotherapy: How definitions shape the prevalence and predictors of attrition. Child Adolesc Ment Health. 2012;17:76-85.
17. Broersen M, Frieswijk N, Kroon H, et al. Young patients with persistent and complex care needs require an integrated care approach: Baseline findings from the multicenter Youth Flexible ACT study. Front Psychiatry. 2020;11:609120.
18. Yazkan-Akgül G, Yıldırım Budak B, Erdoğdu AB, et al. Child and adolescent psychiatry outpatient clinic referrals during COVID-19 pandemic in Turkey. Psychiatry Clin Psychopharmacol. 2022;32:140-8.
19. Cottrell D, Hill P, Walk D, et al. Factors influencing non-attendance at child psychiatry out-patient appointments. Br J Psychiatry. 1988;152:201-4.
20. Isaac L, Sutton T, Kahlon J, et al. Child-adolescent emergency psychiatry: Addressing false positive admissions. Front Psychiatry. 2024;15:1321702.
21. Lygre RB, Gjestad R, Norekvål TM, et al. An interdisciplinary intervention for children and adolescents with multiple referrals and complex health complaints: A feasibility study. BMC Health Serv Res. 2023;23:847.