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A Comprehensive Child Psychiatry Approach for Managing Patients with Differences of Sexual Development in a Multidisciplinary Setting: An Alternative Follow-up Model

N. Burcu Özbaran[1], Hazal Yağmur Yılancıoğlu[2], İpek İnal Kaleli[1], Yağmur Beste Cankorur Haklı[1], Ceren İçöz[1], Deniz Özalp Kızılay[3], Samim Özen[3]

[1]*Ege University Faculty of Medicine, Department of Child and Adolescent Psychiatry, İzmir, Türkiye*
[2]*Bakırçay University Çiğli Training and Research Hospital, Department of Child and Adolescent Psychiatry, İzmir, Türkiye*
[3]*Ege University Faculty of Medicine, Department of Pediatric Endocrinology, İzmir, Türkiye*

What is already known on this topic?

Differences of sexual development (DSD) is a complex spectrum of conditions that requires a multidisciplinary approach, including psychiatric support. These patients are at a higher risk for psychiatric disorders, particularly depression and anxiety. However, long-term psychiatric follow-up is often inadequate within existing healthcare systems, leading to significant gaps in psychosocial adaptation. Current guidelines emphasize the importance of structured psychiatric care for patients with DSD, yet no standardized follow-up model has been established. Moreover, research investigating the impact of psychiatric support on patient outcomes and the effectiveness of clinical training models in DSD management remain limited.

What this study adds?

This study introduces a structured psychiatric follow-up model for patients with DSD, integrating psychiatry residents into multidisciplinary care. Findings suggest that this model maintains patient care quality while enhancing psychiatric training, improving residents' skills in DSD management. Unlike previous research focusing on medical aspects, this study highlights the importance of long-term psychiatric follow-up and offers a practical framework for integrating psychiatric care into DSD management.

Abstract

Objective: To examine the implementation of a new psychiatric follow-up model for patients with differences of sexual development (DSD), a group of conditions affecting gender determination and differentiation, focusing on the model's impact on patient care and residents' training.

Methods: Data from patients monitored between March 2000 and November 2023 and 28 child and adolescent psychiatry residents in a tertiary-care center were analyzed. Data was collected before and after implementing the new model using psychiatric assessment and the Clinical Global Impression (CGI) and Global Assessment Scale (GAS).

Results: The patient cohort consisted of 129 patients with DSD, of whom 10 (7.75%) were lost to follow up. Of the remaining 119 patients, 89 (74.8%) were monitored by two expert specialists prior to the model's implementation, while 30 (25.2%) were cared for by junior child and adolescent psychiatry residents under supervision following the implementation of the new model. The mean age of the patients was 10.86±6.32 years. No significant differences in the prevalence of psychiatric disorders or in CGI or GAS scores before and after implementing the new education model were found ($p>0.05$). The most common psychiatric diagnosis in our sample was attention-deficit/hyperactivity disorder (19.4%), followed by intellectual disability and major depressive disorder, each accounting for 14.0%. Residents reported enhanced competence in managing patients with DSD (14.3%), improved communication skills, and better

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Address for Correspondence: Hazal Yağmur Yılancıoğlu, MD, Bakırçay University Çiğli Training and Research Hospital, Department of Child and Adolescent Psychiatry, İzmir, Türkiye
E-mail: drhazalyagmur@yahoo.com **ORCID:** orcid.org/0000-0002-2720-0833

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identification of subthreshold psychiatric symptoms (25%), as well as a greater understanding of the multidisciplinary approach (14.3%).
Conclusion: This study highlighted the importance of structured psychiatric support in the management of DSD. Furthermore, the education of future psychiatrists was subjectively improved.

Keywords: Child and adolescent psychiatry, consultation-liaison psychiatry, differences of sexual development, education model, psychiatric follow-up, residency training

Introduction

Differences of sexual development (DSD) are a group of conditions involving developmental challenges in the processes of gender determination and differentiation, occurring in approximately 1 in 4,500 to 5,500 births (1,2). International consensus guidelines recommend a personalized treatment approach managed by a multidisciplinary team to support individuals with DSD. Child and adolescent psychiatry (CAP) is one of the essential specialties within this multidisciplinary team (2,3).

CAP plays an important role in the comprehensive assessment of an individual with DSD, as they are reported to be at higher risk for certain psychiatric conditions. Lifetime prevalence rates for depression and anxiety disorders in this population are approximately 7.1% and 19.2%, respectively. Moreover, these patients may encounter challenges related to gender identity development, body image, and self-esteem (4,5,6). Therefore, providing psychiatric support to both the patients and their families from the moment they receive the DSD diagnosis is part of optimal management of DSD (7).

DSD may impact psychosexual development, a process that continues to evolve, particularly throughout adolescence and well into adulthood (8). Studies suggest that while patients often have access to psychiatric support at the time of diagnosis, some may face difficulties accessing the full range of multidisciplinary care during follow-up (2). One study exploring patient experiences with care revealed that while medical services were accessible, there were gaps in psychosocial support. Patients expressed a desire for continuous access to psychosocial support throughout their lives (9). A multicenter study conducted across six countries found that psychiatric issues persist for these patients into adulthood, highlighting the need for ongoing psychiatric follow-up into adulthood. Therefore, transitioning from adolescent to adult psychiatric care, while ensuring ongoing monitoring for residual issues and maintaining the sustainability and effectiveness of psychiatric services, will be important (5). Effective long-term follow-up requires specialist centers with an experienced multidisciplinary team, as emphasized in consensus reports (2).

The literature defines detailed approaches and management strategies for gender assignment including multidisciplinary teamwork; however, there is a relative scarcity of studies that thoroughly explore the psychiatric care provided to these patients (10).

DSD Council Structure and Function

For over twenty years, the multidisciplinary DSD council at Ege University has collaborated across various specialties, including pediatric endocrinology, pediatric surgery, pediatric urology, pediatric genetics, medical genetics, and child psychiatry, monitoring a substantial number of patients. The council convenes monthly and each meeting is dedicated to discussing new and follow-up cases, with the goal of developing individualized, holistic care plans for each patient and their family.

Endocrinologists contribute insights into hormonal status and prognosis, surgeons and urologists assess potential surgical interventions in consultation with psychiatry to ensure psychosocial readiness, and geneticists provide diagnostic clarity and guidance on family history. The CAP team evaluates psychological well-being, emotional resilience, and family dynamics to inform the timing and scope of medical decisions. Within this framework, our clinic plays a key role by offering psychosocial support and psychiatric follow-up for the team (11). The psychiatric follow-up results from the Ege multidisciplinary DSD council have been presented in several studies (11,12,13).

The Department of Child and Adolescent Psychiatry at Ege University provides care for children and adolescents aged 0-18 years, with follow-ups organized in various subunits based on the patients' age and diagnoses. Psychiatry residents in specialty training rotate through all clinical subunits and receive supervision from relevant faculty members. Children and adolescents with physical illnesses like DSD are monitored in the consultation-liaison (CL) outpatient subunit. All DSD cases are managed within this unit under the supervision of a faculty member (NBÖ), who specializes in gender development and CL psychiatry. Patients also receive ongoing follow-up from relevant pediatric specialties, ensuring a full multidisciplinary approach.

As part of this multidisciplinary follow-up process, all children diagnosed with DSD by the pediatric endocrinology department who are deemed at risk for psychiatric disorders, or who present with significant psychiatric symptoms, are referred to the CAP CL outpatient subunit. Previously, DSD patients were managed by two experienced faculty members in child psychiatry. To address increasing clinical demands and simultaneously enhance residency training, a new psychiatry follow-up model was introduced, allowing residents in the CL subunit to conduct patient evaluations and coordinate treatments under supervision of faculty members.

Structure of the Psychiatric Follow-up Model

In the previous model used at our center, psychiatric care for DSD patients was provided solely by two experienced faculty members. The revised model incorporated psychiatry residents into the care process under close supervision, aiming to both sustain high-quality follow-up and enhance residency education.

In the new training and DSD patient follow-up model, the CAP resident in the CL subunit conducts a comprehensive assessment of the patient and their family, based around the patient's unique psychiatric needs, under the supervision of a faculty member, and coordinates necessary treatment, ensuring that a psychiatric follow-up plan is individually tailored for each case. Individuals with gender dysphoria or gender confusion, those experiencing uncertainty, and those presenting symptoms related to depression and anxiety are closely monitored at least once every two weeks. Patients experiencing mood disorders, such as depression, and those with severe anxiety symptoms were provided with psychopharmacological treatment when necessary, including antidepressants and anxiolytics, and were predominantly followed up with supportive psychotherapy and cognitive-behavioral approaches.

Individuals without gender-related uncertainties or difficulties, and with a stable psychiatric profile, were evaluated every three to six months. Psychiatric supervision is conducted weekly for half a day by the psychiatric team coordinator. The members of the psychiatric team in this model include a specialist supervisor in CAP, a resident physician, a psychologist from the CAP psychiatry CL subunit team, and a social worker. The resident physician may refer patients to the psychologist for testing or additional psychological and/or psychosocial interventions when deemed necessary. Parental evaluation and consultations are conducted by either the assigned social worker or the psychologist, tailored to individual needs. All procedures are carried out under the supervision of the team coordinator, who specializes in CAP, CL psychiatry and gender development (13).

To ensure continuity of patient care and follow-up, the same child psychiatry resident follows each DSD patient throughout their entire residency, regardless of rotation schedules, including rotations in adult psychiatry and pediatric neurology. This approach is intended to strengthen the child physician residents' skills in providing long-term, cross-disciplinary care, while fostering consistent management and a sustained, trusting relationship between physician and patient-particularly in sensitive domains such as gender development and identity. This model enables child psychiatry residents to maintain continuity in monitoring their patients, even as they rotate through different outpatient clinics, allowing for close observation of developmental progress and adjusting treatment as necessary. The model is based on the premise that continuity with a single clinician is a priority for DSD cases, where careful monitoring of growth and psychosocial changes is particularly important. This approach aims to strengthen the therapeutic relationship and ensure continuity for both patients and residents while also enhancing the education of the residents in the field of pediatric CL psychiatry (Figure 1).

The aim of the present study was to describe the implementation of this revised training and DSD patient follow-up model, which was initiated in 2022. While existing literature emphasizes the role of multidisciplinary teams in the holistic care of DSD (10,14), fewer studies have examined the educational impact of these systems within child psychiatry training. Collaboration within the team in managing such rare cases, along with supervision of individual follow-ups, is very important in child psychiatry training (15). Our focus is therefore twofold: firstly, to assess the model's effectiveness in providing psychiatric care to patients with DSD, and secondly to evaluate the contribution of this model to resident training in pediatric CL psychiatry.

Methods

Measures: DSD Patients

Sociodemographic Data Form: the form collected data on patients' and family members' mental and physical health status, including age at diagnosis, initial clinic visit age, psychiatric follow-up frequency, pediatric treatment plans, scheduled surgeries, hospitalizations, and psychiatric medication use.

Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS-PL): Psychiatric diagnoses were established using the K-SADS, a validated, semi-structured diagnostic interview aligned with DSM-IV and DSM-5 criteria (16). This tool is widely used in CAP, with established validity and reliability in the Turkish population (17).

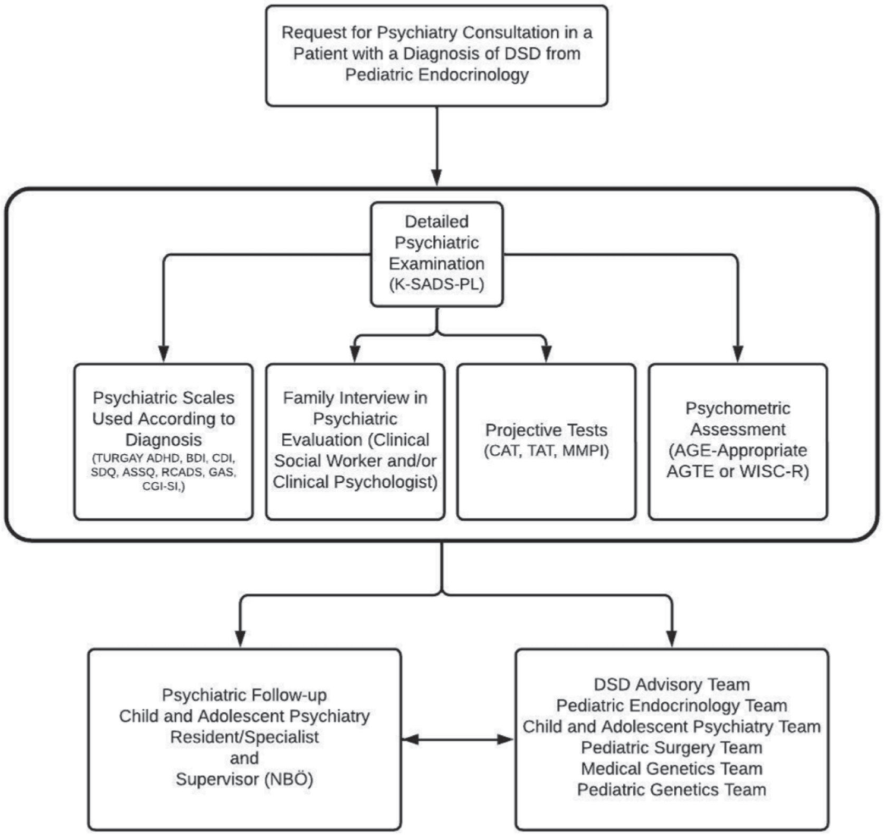

Figure 1. Psychiatric assessment flowchart for a patient referred to the pediatric CL outpatient clinic

DSD: differences of sexual development, K-SADS-PL: kiddie schedule for affective disorders and schizophrenia, ADHD: attention deficit and hyperactivity disorder, CGI: clinical global impression, GAS: global assessment scale, CL: consultation-liaison

Global Assessment Scale (GAS): A 0-100 scale assessing overall well-being and functionality, incorporating symptom severity, social competence, and problem-solving ability (18). The GAS, later adapted as the Global Assessment of Functioning, is a single-item clinician rating of overall psychosocial functioning on a 0-100 scale. Similar to the Clinical Global Impression (CGI), it is grounded in clinical judgment and has strong face validity, which has supported its adoption in many countries without the need for extensive validation studies. Its simplicity and global nature have made it a standard outcome measure in psychiatric research and practice.

CGI: A standardized three-item tool evaluating illness severity, treatment response, and side effects, frequently used in clinical research (19). The CGI scale is a clinician-rated measure of overall illness severity and treatment response. It is intentionally simple and based on clinical observation, providing a face-valid global index rather than a detailed psychometric instrument. Due to its practicality and high face validity, the CGI has been widely used internationally without formal validation studies in many languages or cultural contexts.

Measures: CAP Residents

Visual Analogue Scale (VAS): A 0-10 scale used to quantify subjective experiences. In this study, VAS assessed CAP residents' perceived competence in managing DSD patients and the model's impact on complex psychiatric conditions, including gender dysphoria (20).

Study Sample

This study presents the follow-up data of 129 patients who were monitored under the "Ege DSD Model" for DSD at our clinic between March 2000 and November 2023. The inclusion criteria were: 1) being followed-up by our hospital's DSD Council; and 2) to have undergone at least one psychiatric evaluation. Patients who were followed by the DSD council but had not been referred to psychiatric services were excluded, as they were deemed outside the scope of this study. Informed consent and verbal assent were sought and obtained from all patients and their families.

Furthermore, the psychiatric training benefits, perceived management competencies, and contributions to consultation skills of 28 participating CAP residents who had completed their training under this model were also evaluated.

The study received approval from the Ege University Medical Research Ethics Committee (approval number: 24-5.1T/46, date: 23.05.2024).

Statistical Analysis

Statistical analyses were performed using SPSS for Windows, version 25.0 (IBM Corp., Armonk, NY, USA). Sociodemographic variables and psychiatric diagnoses of DSD patients are reported as percentages. Differences in psychiatric disorders before and after the model implementation were assessed using the chi-square test, as the two groups were independent. Changes in CGI and GAS scores for individual patients at two time points (T1—start of follow-up and T2—last psychiatric interview) were analyzed with the Wilcoxon Signed Ranks test, due to the non-normal distribution of scores across groups and time points. To compare CGI and GAS scores between the pre- and post-model groups, the Mann-Whitney U test was employed separately for T1 and T2.

Results

The potential patient cohort consisted of 129 patients with DSD and the resident cohort included 28 doctors associated with the DSD follow-up model. The mean ± standard deviation age of the patients was 10.86 ± 6.32 years. Out of the 129 patients, 10 (77.5%) were lost to follow-up, leaving 119 patients for the analysis. Among these, 89 (74.8%) were monitored by two expert faculty members, while 30 (25.2%) patients were cared for by junior doctors under close supervision following the implementation of the new model. Supervision meetings regarding DSD patients were held at least once a week, and participation of the residents in the monthly DSD multidisciplinary council was mandatory.

The most frequently diagnosed psychiatric disorder in our sample was attention deficit hyperactivity disorder (19.4%), followed by intellectual disability and major depressive disorder, each at 14.0%. There were no significant differences in the rates of psychiatric disorders before and after the model's implementation, indicating that the prevalence of these disorders was consistent whether patients were followed by a single faculty member or by residents, under supervision. Psychiatric diagnoses observed in DSD patients before and after model implementation are summarized in Table 1. In addition, there were no significant differences in either GAS or CGI scores before and after model implementation (Table 2). Supplementary Table 1 provides a detailed overview of the various differences in sex development including karyotype and the psychiatric disorders associated with them.

Among the 28 doctors participating in our study, 16 were current residents at our institution, while 12 had completed their training and were CAP specialists at the time of assessment. Table 3 summarizes the participants' expertise in CL psychiatry and DSD, as well as their perceptions of the model.

Both former and current residents reported following up the DSD patients under their care every 1-3 months. The median duration of CL outpatient subunit rotations was similar for residents and specialists, at 3 months. However, residents had a median inpatient rotation duration of zero months, compared to 3 months for specialists. All doctors, regardless of their training level, had followed up with at least one DSD patient, and all specialists had attended the DSD council at least once. The model was positively perceived by the doctors in terms of enhancing psychiatry education, general psychiatric competence, and the management of gender dysphoria.

When asked about the model's impact on psychiatric competence, 4 (14.3%) participants noted an improved understanding of gender, gender dysphoria, and DSD, describing a shift in their perspective towards gender and a deeper appreciation for non-binary thinking. Moreover, 7 (25%) reported enhanced skills in general communication and in identifying psychiatric disorders and subthreshold symptoms. Furthermore, 4 (14.3%) reported a better grasp of the multidisciplinary approach and the importance of coordinating follow-up with other specialties, such as pediatric endocrinology.

Regarding suggestions for improving the model, out of 20 respondents, 9 (45%) had no additional recommendations. Of the remaining participants, 5 (25%) suggested implementing a joint follow-up model or increasing contact with other specialties involved in DSD patients' care. Finally, 6 (30%) recommended more supervision and clearer instructions, preferably in written format, for those just starting follow-up.

Discussion

The present study investigated the psychiatric follow-up model employed in the care of patients with DSD, evaluating its impact on patient care and its contribution to the training of CAP residents. Drawing on data from 119 DSD patients and 28 psychiatry residents, the study highlighted both

Table 1. Psychiatric diagnoses of patients with differences of sex development before and after model implementation

	Before model implementation (n = 99)		After model implementation (n = 30)		Total sample		X^2	p
	n	%	n	%	n	%		
Psychiatric diagnoses, n (%)								
None	55	55.6	14	46.7	69	53.5	0.731	0.392[a]
ADHD*	18	18.2	7	23.3	25	19.4	0.391	0.532[a]
Learning disability	3	3	2	6.7	5	3.9	-	0.366[b]
Intellectual disability	14	14.1	4	13.3	18	14.0	-	0.1000[b]
Autism spectrum disorder	1	1	0	0	1	0.8	-	0.1000[b]
Anxiety disorder	4	4	3	10	7	5.4	-	0.352[b]
Major depressive disorder	13	13.1	5	16.7	18	14	-	0.764[b]
Conduct disorder	5	5	0	0	5	3.9	-	0.590[b]

*: Attention deficit and hyperactivity disorder, [a]: Pearson chi-square test, [b]: Fisher's exact test

Table 2. Changes in global assessment scale (GAS) and clinical global impressions (CGI) scores over time before and after the implementation of the model

	Before model implementation (n = 89)*			After model implementation (n = 30)			Between groups p	
	T1 (M ± SD) Median (min.-max.)	T2 (M ± SD) Median (min.-max.)	p	T1 (M ± SD) Median (min.-max.)	T2 (M ± SD) Median (min.-max.)	p	T1	T2
GAS	81.67 ± 16.35 85 (35-95)	84.89 ± 13.69 95 (35-95)	< 0.001	76.33 ± 17.76 85 (25-95)	83.5 ± 13.46 85 (35-95)	0.006	0.074	0.341
CGI**	3.35 ± 0.88 3 (2-5)	2.59 ± 0.91 2 (1-4)	0.002	3.64 ± 1.15 3.5 (2-6)	2.21 ± .80 2 (1-4)	0.002	0.442	0.211

*: Ten patients were lost to follow-up, **: CGI at T1 n = 31 CGI at T2 n = 14
SD: standard deviation, min.-max.: minimum-maximum

Table 3. Child and adolescent psychiatry residents and specialists' expertise in consultation-liaison psychiatry and patient follow-up

	Resident n = 16 mdn, (min.-max.)	Specialist n = 12 mdn, (min.-max.)
Residency duration	14 (12-54)	-
Consultation-Liaison psychiatry outpatient clinic rotation (months)	3 (0-3)	3 (2-5)
Consultation-Liaison psychiatry inpatient rotation (months)	0 (0-5)	4.5 (3-9)
DSD* patients followed up	1 (1-2)	2 (1-4)
DSD councils attended	1 (0-2)	2.5 (1-4)
DSD psychiatric competence at PGY-1** (1-10)	7 (3-9)	6 (1-8)
Model's perceived contribution for psychiatric competence for gender dysphoria (1-10)	4 (0-10)	8 (1-10)
Model's perceived contribution for psychiatric competence for gender dysphoria at PGY-1 (1-10)	8 (7-10)	10 (8-10)
Model's perceived contribution for psychiatry education (1-10)	8 (4-10)	10 (7-10)
Model's perceived contribution for general psychiatric competence (1-10)	9 (7-10)	10 (7-10)

*: Differences of sexual development
**: Post graduate year
DSD: differences of sexual development, PGY-1: post-graduate year 1, min.-max.: minimum-maximum

the challenges and the opportunities in managing these complex cases within a multidisciplinary framework, organized under two key themes: optimizing DSD patient care and advancing pediatric CL psychiatry education within the scope of general CAP residency training.

DSD Patient Care

The primary focus when implementing a new model is to ensure and, ideally, improve the quaity of care. In the management and follow-up of patients with DSD, the roles of various disciplines are relatively well-defined, with consensus guidelines detailing the responsibilities of multidisciplinary council members, their working principles, appropriate terminology, and surgical decision-making processes. However, studies have emphasized the importance of integrating psychiatric services into these teams (2).

Our findings revealed no significant differences in psychiatric disorder rates before and after the implementation of our model, indicating that the prevalence of these disorders remained consistent whether patients were followed by a single faculty member or by residents under supervision. This consistency underscores the continuity of care provided throughout the diagnostic and follow-up processes, an essential factor in managing DSD. Despite recommendations for holistic, multidisciplinary care, patients often face challenges in accessing services and may disengage from follow-up over time (2). Given that DSD is typically diagnosed at a very young age, the needs of patients and their families evolve significantly as they progress through developmental stages. Issues, such as gender-related questions, challenges with sex development, and fertility concerns, may emerge, necessitating sustained psychiatric support to address growing anxieties and prevent feelings of alienation arising from the constantly changing physiological and neurodevelopmental landscape (21,22). Consistent follow-up by a single mental health professional may play a pivotal role in mitigating these challenges.

The absence of significant differences in GAS and CGI scores before and after the implementation of the new model indicated a good transition from care provided by a single faculty member to care delivered by a closely supervised resident. This transition not only reduced the workload but also ensured the effective sustainability of psychiatric care, as no significant changes were observed in patients' global functioning or clinical well-being. Although 30 patients previously managed by two senior physicians were redistributed to residents, the exact quantitative reduction in physician workload could not be measured due to the inherently variable nature of follow-up intensity and the multidisciplinary character of care. While supervisors retained overall responsibility, involving residents in the follow-up of high-frequency patients offered both a time advantage and educational benefits and exposure to a very rare clinical population. Beyond measurable outcomes, psychiatric follow-up plays a critical role in maintaining treatment adherence and the clinical course of physical illnesses. Comorbid psychiatric disorders can negatively affect both the progression of physical diseases and treatment compliance (23). Therefore, to ensure diagnostic accuracy and the effective coordination of multidisciplinary care, it is essential that follow-up is conducted by a psychiatrist (24). This approach is particularly valuable in maintaining therapeutic support and fostering trust in the medical team. Notably, while 95% of centers with multidisciplinary councils provide primary psychological support, only 40% maintain continuity of psychiatric services (10,25). Psychiatric professionals in this field often face challenges, including less organization compared to other medical disciplines and significant variability between centers in the scope of psychiatric care and the training of providers (22). In addition, limited data on psychosocial care delivery and training processes have hindered efforts to standardize psychiatric services (22).

These challenges are especially relevant in our context. Although comprehensive epidemiological data are lacking in our country, it is assumed that cases of DSD are more frequently observed due to factors such as the high prevalence of consanguineous marriages and thus the greater incidence of genetically inherited syndromic conditions (26). The elevated rate of intellectual disability identified in our study may also be associated with these genetic and epidemiological characteristics. This unique patient profile enhances both the clinical complexity addressed by our model and its educational value. In this context, the model we present is not merely a local initiative but a sustainable and instructive framework that can be implemented in other high-volume centers with similar characteristics. While it may not be feasible to develop a disorder-specific training curriculum for DSD, integrating this model into existing psychiatry training programs has potential for generalizability in terms of both psychiatric education and service delivery. Moreover, building trust with the treatment team is a central component of DSD psychotherapy. Anger toward the medical system is a well-documented challenge. Breaking through this anger and establishing trust with the treatment team are believed to be more effectively achieved through consistent and well-structured support systems (27). DSD patients also frequently experience concerns about being perceived as shameful or stigmatized (28). Studies have shown a positive correlation between satisfaction with healthcare communication and improved psychosocial outcomes in these patients (29). A follow-up study with DSD patients found that 80% of patients reported needing psychiatric support at some point in their lives, yet only 22.2% (n=218) had received psychological support during childhood or adolescence. Most participants felt that psychological support should always be available (7). These findings from a large-scale, long-term study underline the necessity and continuity of psychiatric follow-up in DSD care. The comparable recovery (CGI) and functionality (GAS) outcomes between the two models further validate the continuity achieved with the new model. By maintaining this continuity through a single senior mental health professional, the therapeutic alliance is strengthened, building trust in the medical system while ensuring the quality and consistency of psychiatric support. The model presented in this study offers a potential solution to these challenges, providing a structured framework that ensures continuity of care, reduces workload, and supports the evolving needs of patients and their families while fostering the development of future psychiatric professionals.

Pediatric CL in CAP Resident Training

The number of child psychiatry specialists in CL services is extremely limited. In recent years, the increasing number of child psychiatry residents has highlighted the growing importance of supervision meetings for managing rare cases in training and education, as the rising demand for skilled supervisors with extensive experience in the field has become harder to meet (15). Due to the challenges in accessing specialists with expertise in this area, systems such as e-consultation are currently being developed for DSD council collaborations. While these systems may improve patient access to specialists, there is no research addressing their sustainability or their ability to meet the increasing demand for resident training (30).

To meet the increasing demands in both education and clinical care, especially for complex conditions like DSD, our clinic implemented a resident training and follow-up model supported by a single faculty member wherein each DSD patient was assigned to a specific resident, who presents the case during supervision meetings. This model has significant potential to enhance child and adolescent psychiatrists' competence and awareness in managing DSD while meeting the increasing psychiatric needs of patients. Under this system, each resident in training was also responsible for presenting the patient's diagnosis, follow-up, and treatment progress during supervision meetings with the faculty member. This approach enriches residents' clinical experience and promotes peer support within the training process.

A review of the literature highlighted the importance of providing consistent supervision in CAP residency training, tailored to specific psychotherapeutic and interdisciplinary skill development needs (31). With the model currently in use, we believe we may contribute meaningfully to this area. While it may not be feasible to design disorder-specific training content for DSD within child psychiatry education, we believe that this model may be effectively integrated into residency programs at high-volume centers, complementing existing educational curricula.

Although no formal comparisons were conducted, the similar number of DSD patient follow-ups managed by residents (median: 1, range: 1-2) and those who had completed their specialty training (median: 2, range: 1-4) was promising, particularly when considered in light of the consistent CGI and GAS scores. The model's perceived impact on psychiatric education and overall psychiatric competence appeared comparable between current residents and specialists who had completed their training. This suggests that the competencies developed during residency were effectively established and translated into professional practice.

Feedback from residents indicated that most participants gained knowledge about gender dysphoria and DSD. However, perceived competence in managing gender dysphoria differed significantly between the two groups. Residents in training reported a median perceived competence of 4 (range: 0-10), compared to a median of 8 (range: 1-10) among specialists, indicating that expertise in this area requires additional time and experience to fully develop, regardless of DSD follow-up exposure during residency. It is known that biased approaches to gender could influence the diagnostic process among some residents (32). In DSD follow-up, the primary concerns of patients and their families often revolve around issues related to gender determination (21). Promoting a non-binary perspective on gender, instead of using terms such as "intersex", is known to improve compliance and collaboration during the information-sharing process (2). In this context, ensuring that young residents understand the contemporary and ethical approaches to DSD is considered crucial for the positive development of future psychiatric services. The increase in residents' knowledge as they transition to becoming specialists demonstrates the model's positive impact on psychiatric education, probably through shifts in residents' perspectives on gender, including a greater appreciation for non-binary thinking.

Residents also reported increased awareness of the importance of a multidisciplinary approach in DSD care and emphasized the need to strengthen coordination with other specialties. This underscores the importance of adopting a holistic approach in the management of DSD patients, as recommended by most consensus guidelines. Suggestions from participants for improving the model should be considered in creating a more effective follow-up process. Implementing a unified follow-up model and enhancing communication with other specialties are fundamental requirements for better monitoring of DSD patients (33). Moreover, providing more supervision and clear guidance for new residents, particularly in written form, may help strengthen the training process.

Study Limitations

This study presents several notable strengths and some important limitations that merit discussion. A major strength of this study was its focus on the psychiatric care of DSD patients, addressing a gap in research, as most studies on DSD have primarily concentrated on other medical fields with limited attention to psychiatric care (7,29,34), highlighting the importance of data collection in the field (35). The maintenance of data records related to the model is especially valuable given the scarcity of data in this area. Furthermore, the findings demonstrated that continuity of care can be effectively maintained through structured follow-up protocols, even with transitions in service providers, offering practical insights into integrating psychiatric services within multidisciplinary councils while emphasizing consistency and therapeutic support. Another strength is its unique focus on improving educational quality by incorporating resident feedback, addressing a gap in the literature predominantly centered on patient and parent perspectives (29,36).

However, the study is not without its limitations. The lack of formal measurements assessing resident training represents a significant shortcoming. In addition, the relatively small number of patients monitored may limit the generalizability of the findings. The study also provided limited exploration of broader systemic challenges, such as access disparities and variability in psychiatric care organization across centers, which require further investigation. No assessment of the workload saving for the senior psychiatrist was made although subjectively, a reduction in workload was reported. Lastly, the scarcity of psychiatric-focused research in DSD and residency training suggests the need for larger-scale studies to validate and expand upon these findings.

This study reflects the experience of a single institution within a specific healthcare and cultural context, which may again limit the generalizability of the findings to other regions or systems. Factors such as institutional structure, healthcare access, cultural perceptions of gender and identity, and training protocols vary widely across countries and may influence the applicability of this model elsewhere. However, we believe that sharing localized models of care, such as the integration of child psychiatry residents into DSD follow-up under structured supervision, can enhance international dialogue on psychiatric service design for rare and complex conditions. By exchanging knowledge across different healthcare settings and cultural frameworks, we may uncover shared challenges and develop more adaptable, collaborative approaches to care. In this context, we view our study as a contribution to a broader effort to optimize psychiatric support for individuals with DSD through mutual learning, reflection, and innovation. Although this model was developed within a tertiary care university hospital, its core elements, such as structured supervision, resident continuity, and multidisciplinary collaboration, are not limited to such institutions. We believe these principles can be adapted across a range of healthcare and training environments, including secondary centers and community-based systems where both psychiatric care and medical education are delivered, beyond highly specialized settings.

Conclusion

This study highlighted the importance of continuity of care in the management of patients with DSD, particularly through the integration of psychiatric services within multidisciplinary care teams. The implementation of a revised follow-up model, shifting some responsibility from a single faculty member to supervised child psychiatry residents, resulted in no significant differences in psychiatric disorder rates or clinical outcome measures. These findings support the model's capacity to maintain high-quality, consistent psychiatric care.

Despite international recommendations for holistic, multidisciplinary care, access to continuous psychiatric services remains limited in many settings. Our results suggest that, with structured supervision and individualized follow-up protocols, continuity can be preserved even as care providers change. This model may serve as a valuable framework for other high-volume centers aiming to balance service provision with resident education.

Ethics

Ethics Committee Approval: The study received approval from the Ege University Medical Research Ethics Committee (approval number: 24-5.1T/46, date: 23.05.2024).

Informed Consent: Informed consent and verbal assent were sought and obtained from all patients and their families.

Footnotes

Authorship Contributions

Concept: N. Burcu Özbaran, Design: N. Burcu Özbaran, Hazal Yağmur Yılancıoğlu, Data Collection or Processing: İpek İnal Kaleli, Yağmur Beste Cankorur Haklı, Ceren İçöz, Deniz Özalp Kızılay, Samim Özen, Analysis or Interpretation: N. Burcu Özbaran, İpek İnal Kaleli, Literature Search: Hazal Yağmur Yılancıoğlu, Writing: Hazal Yağmur Yılancıoğlu.

Conflict of Interest: One of the author of this article, Samim Özen is member of the Editorial Board of the Journal of

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