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Consultations for Obstetric and Gynecological Problems in the Pediatric Population in a Tertiary Care Hospital Setting

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ABSTRACT

Objective: The aim of this study was to describe the gynecological issues encountered in Turkish children and adolescents who were referred from pediatric clinics to the obstetrics and gynecology department.

Materials and Methods: This descriptive study was conducted at Mersin University Hospital. Data were obtained through a retrospective review of medical records of patients aged 0-18 years who were admitted to pediatric clinics between January 2015 and December 2022 were subsequently referred to the obstetrics and gynecology department. The findings were presented as numerical data and percentages.

Results: A total of 943 consultations were evaluated. Of these, 1.5% involved children, while 98.5% involved adolescents. The median age of the 14 pediatric patients was 8 years (range: 4–9 years). These patients were referred for persistent vaginal discharge (57.1%), prolonged vaginal spotting (28.6%), or concerning accidental perineal trauma (14.3%). The median age of the 929 adolescent patients was 16 years (range: 10–18 years). The most common conditions identified in adolescent patients included menstrual disorders (65.4%), conditions associated with adolescent pregnancy (22.4%), ovarian disorders (4.4%), persistent vaginal discharge (3.9%), persistent vulvar disorders (1.5%), accidental soft-tissue injury of the perineum (1.1%), dissatisfaction with genital appearance (1%), retained tampon in the vagina (0.2%), and rectovaginal fistula (0.1%). The most prevalent menstrual disorders were irregular menstruation, dysmenorrhea, and amenorrhea, in that order of frequency. Heavy menstrual bleeding was the most common form of irregular menstruation.

Conclusion: An obstetrics and gynecology consultation can contribute to a holistic approach in the care of children and adolescents with obstetric and gynecological conditions.

Keywords: Adolescent, child, consultation, gynecological problems, obstetric conditions.

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INTRODUCTION

In pediatric and adolescent gynecology (PAG), a multitude of issues arise depending on the developmental stage of the child and the degree of estrogenization. Pediatric and adolescent patients present to pediatric clinics with a range of gynecological concerns that vary according to

their age. In prepubertal children, the most common presenting complaints involve external genital findings or conditions such as vulvovaginitis, labial adhesions, or nonspecific pruritus. In adolescents, the reasons for consultation include disorders of pubertal development, menstrual symptoms and disorders, sexuality, contraception, and adolescent pregnancy.[1]

Certain gynecological conditions are particularly relevant to the pediatric population, while others typically manifest in adulthood but have a distinct etiology and require a different approach to treatment in children and adolescents. Consequently, the management of gynecological problems in these age groups necessitates specialized knowledge. PAG clinics have been established for individuals under the age of 18 who present with obstetric and gynecological conditions. However, these individuals are often evaluated by pediatricians and adult gynecologists, as PAG clinics are not available in every country or in every medical center. The need for interprofessional collaboration among healthcare professionals in the field of PAG remains essential.[1–3] In most centers in Türkiye, as in our hospital, children and adolescents with gynecological conditions are admitted to pediatric clinics and subsequently referred to the adult obstetrics and gynecology department for diagnosis, treatment, and follow-up.

Common gynecological conditions that result in hospital admission during childhood and adolescence include precocious puberty, primary and secondary amenorrhea, menstrual disorders, ovarian masses, ovarian torsion, genital inflammation, atypical genitalia, labial adhesions, teenage pregnancy, contraception, and dissatisfaction with genital appearance. The prevalence of PAG issues may vary between countries and between regions within the same country.[3,4] To the best of our knowledge, there is no current literature discussing obstetric and gynecological problems in the Turkish pediatric population. The objective of this study was to describe the gynecological issues encountered in Turkish children and adolescents who were referred from pediatric clinics to the obstetrics and gynecology department of a single university hospital in a province where patients from all socioeconomic backgrounds are admitted. The dissemination of consultation experiences may inform the design of health services in the field of PAG and guide future studies whose results can be generalized to the broader community.

MATERIALS AND METHODS

The data for this descriptive study were obtained through a retrospective examination of medical records in the hospital automation system of patients aged 0–18 years who were admitted to the pediatric clinics of Mersin University Hospital between January 1, 2015 and December 31, 2022, and subsequently referred to the obstetrics and gynecology department. The consultations requested due to complaints that were persistent, recurrent, prolonged, or worrisome to parents were examined. The consultation request and response notes were subjected to a comprehensive review. The departments that requested consultations were recorded. Descriptive data were collected on the age, presence of chronic disease, presenting complaint, reason for requesting consultation, gynecological problems detected, and treatment and follow-up plans of the patients. The records of 943 female patients for whom consultations requested were accessed, and all of these cases were included in the study. The data set did not include any patients who had previously been evaluated for the same complaint and who had applied for follow-up care, or cases of sexual assault cases for which the relevant data could not be accessed in the hospital automation system. The study was approved by the Mersin University Clinical Research Ethics Committee on November 23, 2022 (2022/767) and was conducted in accordance with the ethical standards described in the Declaration of Helsinki. Informed consent was not applicable, as this study involved retrospectively collected data.

The diagnoses made in pediatric and obstetrics and gynecology clinics were examined based on anamnesis, physical examination, and laboratory results. Gynecological problems were identified through a comprehensive approach, including a detailed menstrual, gynecological, and medical history; a general physical examination; a gynecological examination when required; and laboratory tests, including complete blood count, coagulation profile, hormone profile, urinalysis, vaginal discharge culture, pregnancy test, genetic tests, pelvic ultrasonography, and/or pelvic magnetic resonance imaging (MRI). These findings were categorized as follows: i) Persistent vaginal discharge, prolonged vaginal spotting, and worrisome accidental perineal injury in children; ii) Pregnancy, menstrual disorders, ovarian disorders, persistent vaginal discharge, persistent vulvar disorders, worrisome accidental perineal injury, dissatisfaction with genital appearance, and other

KEY MESSAGES

- Common childhood gynecological problems include persistent vaginal discharge, prolonged vaginal spotting, and concerning perineal trauma.
- Common adolescent gynecological problems include menstrual disorders, conditions related to adolescent pregnancy, and ovarian disorders.
- Sharing experiences regarding the diagnosis, treatment, and follow-up of obstetric and gynaecological problems can contribute to the development of the pediatric and adolescent gynecology specialty in Türkiye.

Table 1. Age distribution of patients

Age group	n	%
Child	14	1.5
4–6 years	3	0.3
7–9 years	11	1.2
Adolescent	929	98.5
Early adolescence (10–13 years)	161	17.1
Middle adolescence (14–16 years)	437	46.3
Late adolescence (17–18 years)	331	35.1
Total	943	100.0
Age (in years)		
Median (IQR)	16 (14-17)	
Min–Max	4-18	
Mean±SD	15.3±2.1	

Min: Minimum; Max: Maximum; IQR: Interquartile range; SD: Standard deviation.

conditions in adolescents. To define menstrual disorders, the guidelines established by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists were utilized. Diagnostic criteria for polycystic ovary syndrome (PCOS) in adolescents included otherwise unexplained persistent evidence of ovulatory dysfunction (as indicated by a menstrual abnormality, based on chronologic and gynecologic age-appropriate standards) and clinical and/or biochemical evidence of androgen excess (hyperandrogenism).[5–7]

Statistical Analysis

The data were subjected to statistical analysis using the Statistical Package for the Social Sciences (SPSS) version 21.0.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as the median (interquartile range), while categorical variables were expressed as frequency (number) and percentage (%). The results were presented in accordance with the standards for descriptive statistics. A chi-square test was performed to assess differences in frequencies among the early, middle, and late adolescent groups. The level of statistical significance was accepted as $p<0.05$.

RESULTS

This study evaluated 943 consultations. Upon examination of the departments requesting consultation, it was observed that 622 (66%) of the consultations were initiated from outpatient clinics, 279 (29.5%) from the pediatric emergency department, 38 (4.1%) from inpatient services, and four (0.4%) from the pediatric intensive care unit. The median age of the patients was 16 years (range: 14–17 years). The age characteristics of the patients are presented in Table 1.

The median age of child patients was 8 years (range: 7–9). These patients were referred for evaluation due to persistent vaginal discharge, prolonged vaginal spotting, or concerning accidental perineal trauma. In patients presenting with persistent vaginal discharge (n=8), the discharge was diagnosed as leukorrhea and managed with observation without the need for treatment. Among the four children who presented with prolonged vaginal spotting, two had vulvar trauma due to an accident, one had a urinary tract infection (UTI), and one had a bleeding disorder. Medical treatment was arranged for the skin injury findings in the two children who presented with perineal trauma due to a fall.

The reasons for admission and consultation of adolescent patients are presented in Table 2. The median age of the 929 adolescent patients was 16 years (range: 14–17). Of these patients, 208 (22.4%) had adolescent pregnancy. The median age of pregnant adolescents was 17 years (range: 16–18). Abdominal pain was the most common reason (44.7%) for presentation and consultation in pregnant adolescents. The median age of the 721 non-pregnant adolescents was 15 years (range: 14–16). The most common reason for presentation and consultation in non-pregnant adolescents was irregular menstruation, with 391 cases out of 721 (54.2%). A total of 419 adolescents (419/721, 58.1%) exhibited irregular menstruation in conjunction with hirsutism or acne. The second most common reason for consultation was dysmenorrhea (95/721, 13.2%), while the third most common reason was amenorrhea (74/721, 10.3%). A total of 94 adolescents (94/721, 13%) presented with amenorrhea accompanied by hirsutism, eating disorders, and galactorrhea.

Table 3 presents the gynecological problems identified in non-pregnant adolescents following pediatric evaluation and obstetrics and gynecology consultation. A total of 608 (84.4%) of the 721 non-pregnant adolescents exhibited menstrual disorders. The most prevalent menstrual disorders were irregular menstruation (56.5%), dysmenorrhea (14.8%), and amenorrhea (13.1%). Among the various forms of irregular menstruation, the most common was heavy menstrual bleeding, observed in 22.3% of cases. All 107 adolescents with dysmenorrhea were diagnosed with primary dysmenorrhea. Among the 94 adolescents with amenorrhea, 29 (30.9%) were diagnosed with primary amenorrhea and 65 (69.1%) with secondary amenorrhea. The most prevalent cause of primary amenorrhea was identified as hypogonadotropic hypogonadism, while the most common cause of secondary amenorrhea was PCOS.

Simple ovarian cysts were identified in 23 (60.5%) of 38 adolescents who underwent ultrasonographic evaluation for various urinary or gastrointestinal reasons and were found to have an incidental ovarian mass either in our center or an

Table 2. Reasons for obstetrics and gynecology consultations among adolescent patients (n=929)

	n	%
i. Pregnancy-related complaints	208	22.4
Abdominal pain	93	10.0
Vaginal bleeding	37	4.0
Premature rupture of membranes	20	2.2
Routine antenatal care	14	1.5
Trauma	8	0.9
Traffic accident	4	0.4
Fall accident	4	0.4
Suicide attempt	6	0.6
Vaginal discharge	6	0.6
Nausea and vomiting	5	0.6
Postpartum hemorrhage	5	0.6
Seizures	3	0.3
Exposure to violence	3	0.3
Shortness of breath	2	0.2
Rash-related illnesses	2	0.2
Reduced fetal movement	2	0.2
Peripheral edema	1	0.1
Labor	1	0.1
ii. Non-pregnancy-related complaints	721	77.6
Irregular menstruation	391	42.1
Dysmenorrhea	95	10.2
Amenorrhea	74	8.0
Incidental ovarian cysts or masses	41	4.4
Persistent vaginal discharge	36	3.9
Irregular menstruation with hirsutism	22	2.4
Amenorrhea with hirsutism	14	1.5
Persistent vulvar conditions	14	1.5
Vulvar pain	7	0.8
Condyloma	4	0.4
Vulvar pruritus	3	0.3
Perineal trauma	10	1.1
Dissatisfaction with genital appearance and associated anxiety	9	1.0
Irregular menstruation with acne	6	0.6
Amenorrhea with eating disorder	3	0.3
Amenorrhea with galactorrhea	3	0.3
Foreign body in the vagina	2	0.2
Stool discharge from the vagina	1	0.1

external center. Among three adolescents who underwent ultrasonographic evaluation due to acute abdominal pain and were found to have an ovarian mass, one was diagnosed with ovarian torsion, one with ovarian cyst rupture, and one with tubal ectopic pregnancy (Table 3).

Leukorrhea and non-specific vulvovaginitis were observed in 86.1% (n=31) and 13.9% (n=5), respectively, of the 36 adolescents evaluated for persistent vaginal discharge. In vaginal discharge samples taken from adolescents with leukorrhea, normal vaginal flora was identified. The patterns of microorganisms in cases of non-specific vulvovaginitis were mixed and included the following combinations: *Candida* and *Lactobacilli* (n=2), *Candida* and *Staphylococci* (n=1), *Candida* and *Escherichia coli* (n=1), and *Candida* and *Enterococcus faecalis* (n=1). Bartholin cysts or UTIs were identified in adolescents presenting with vulvar pain, while candidiasis was observed in those presenting with vulvar itching (Table 3).

In 10 adolescents presenting with accidental perineal injury, a soft tissue injury of the perineum was identified as a consequence of a fall or impact. In two adolescents who presented for evaluation of a foreign body in the vagina, a retained vaginal tampon was identified (Table 3).

A distribution analysis of gynecological problems according to age groups revealed that the most prevalent gynecological issue in early adolescence was menstrual disorder (83.8%), followed by ovarian cyst (4.4%) and dissatisfaction or concern about genital appearance (4.4%). In the middle adolescent period, menstrual disorders (73%) and ovarian cysts (7.1%) were the most prevalent conditions. In late adolescence, menstrual disorders (46.6%) and adolescent pregnancy (46.2%) were the most prevalent conditions. The frequencies of pregnancy, ovarian disorder, and menstrual disorders, including heavy menstrual bleeding, irregular cycles without a pattern, polymenorrhea, and amenorrhea, were significantly different among early, middle, and late adolescence groups ($p<0.001$) (Table 4).

Among the adolescents, 185 (185/929, 19.9%) had chronic diseases, with a median age of 15 years (range: 14–17). Nine of the adolescents with chronic disease were pregnant, representing 4.9% of this group. Table 5 presents the gynecological issues identified in adolescents with chronic diseases.

The consultations of pregnant adolescents indicated that 46.1% of the cases were planned for obstetric follow-up without treatment. Among the non-pregnant adolescents, 28.4% were scheduled for pediatric and gynecological follow-up without treatment, while 6.4% were scheduled for multidisciplinary follow-up, which included pediatric subspecialties, gynecology, medical genetics, pediatric

Table 3. Gynecological conditions diagnosed in non-pregnant adolescent patients (n=721)

	n	%
i. Menstrual disorders	608	84.4
Irregular menstruation	407	56.5
Heavy menstrual bleeding	160	22.3
Dysfunctional uterine bleeding	145	20.2
Bleeding disorders	15	2.1
Irregular cycles without a pattern	112	15.6
Oligomenorrhea	107	14.8
Polymenorrhea	28	3.8
Dysmenorrhea	107	14.8
Primary dysmenorrhea	107	14.8
Secondary dysmenorrhea	–	–
Amenorrhea	94	13.1
Primary amenorrhea	29	4.1
Hypogonadotropic hypogonadism	16	2.2
Chronic disease-related	13	1.8
Anorexia nervosa	2	0.3
Obesity	1	0.1
Turner syndrome	5	0.7
Imperforate hymen	4	0.6
Complete Müllerian Agenesis (MRKH syndrome)	2	0.3
XY complete gonadal dysgenesis	2	0.3
Secondary amenorrhea	65	9.0
Polycystic ovary syndrome	44	6.1
Anorexia nervosa	8	1.1
Chronic systemic illness	6	0.8
Hyperprolactinemia	3	0.4
Psychological stress	2	0.3
Late-onset congenital adrenal hyperplasia	2	0.3
ii. Ovarian disorders	41	5.6
Simple ovarian cyst	23	3.2
Complex ovarian cyst	12	1.7
Multifollicular ovaries	3	0.4
Ovarian torsion	1	0.1
Ruptured ovarian cyst	1	0.1
Tubal ectopic pregnancy	1	0.1
iii. Persistent vaginal discharge	36	5.0
Leucorrhoea	31	4.3
Non-specific vulvovaginitis	5	0.7
iv. Persistent vulvar disorders	14	2.0
Vulvar pain caused by Bartholin cyst	4	0.6
Vulvar pain secondary to urinary tract infection	3	0.4
Condyloma acuminata	4	0.6
Candidiasis	3	0.4
v. Accidental perineal soft-tissue injury of clinical concern	10	1.4
vi. Dissatisfaction with genital appearance and associated anxiety	9	1.2
Labial hypertrophy	6	0.8
Partial labial adhesion	1	0.1
Aesthetic concern despite normal appearance	2	0.3
vii. Other conditions	3	0.4
Retained tampon in the vagina	2	0.3
Rectovaginal fistula	1	0.1

Table 4. Frequency of pregnancy and gynecological conditions across age groups (n=929)

	Early adolescence (n=161)	Middle adolescence (n=437)	Late adolescence (n=331)	p*
Pregnancy	2 (1.2)[a]	53 (12.1)[b]	153 (46.2)[c]	<0.001
Menstrual disorders	135 (83.9)[a]	319 (73.0)[b]	154 (46.5)[c]	<0.001
Heavy menstrual bleeding	60 (37.3)[a]	65 (14.9)[b]	35 (10.6)[b]	<0.001
Irregular cycles without a pattern	19 (11.8)[ab]	71 (16.2)[a]	22 (6.6)[b]	<0.001
Oligomenorrhea	15 (9.3)	53 (12.1)	39 (11.8)	0.623
Polymenorrhea	14 (8.7)[a]	11 (2.5)[b]	3 (0.9)[b]	<0.001
Primary dysmenorrhea	16 (9.9)	56 (12.8)	35 (10.6)	0.495
Primary amenorrhea	0 (0)[a]	20 (4.6)[b]	9 (2.7)[b]	0.015
Secondary amenorrhea	11 (6.8)[ab]	43 (9.8)[a]	11 (3.3)[b]	0.002
Ovarian disorders	7 (4.3)[a]	31 (7.1)[a]	3 (0.9)[b]	<0.001
Persistent vaginal discharge	5 (3.1)	19 (4.3)	12 (3.6)	0.751
Persistent vulvar disorders	1 (0.6)	7 (1.6)	6 (1.8)	0.581
Clinically significant accidental perineal soft-tissue injury	3 (1.9)	6 (1.4)	1 (0.3)	NA
Dissatisfaction with genital appearance and associated anxiety	7 (4.3)	1 (0.2)	1 (0.3)	NA
Retained tampon in the vagina	0 (0)	1 (0.2)	1 (0.3)	NA
Rectovaginal fistula	1 (0.6)	0 (0)	0 (0)	NA

*: Chi-square test. Data are presented as numbers and percentages. a, b, c: Values with different superscripts indicate statistically significant differences between age groups (p<0.05).

Table 5. Gynecological conditions diagnosed in adolescents with chronic diseases (n=185)

	n	%	Chronic disease
Menstrual disorder	145	78.4	Hematologic (n=42), neurologic (n=21),
Ovarian cysts	17	9.2	nephrologic (n=16), gastrointestinal-hepatobiliary (n=12),
Leucorrhoea	8	4.3	psychiatric (n=12), endocrinologic (n=10),
Vulvar candidiasis	3	1.6	oncologic (n=9), cardiovascular (n=7),
Aesthetic concern despite normal genital appearance	2	1.1	connective tissue (n=10), asthma (n=4), metabolic (n=2)
Rectovaginal fistula	1	0.5	
Pregnancy	9	4.9	
Routine antenatal care	7	3.8	Epilepsy (n=5), nephrolithiasis (n=1),
Hypertension	1	0.5	heart failure (n=1), essential hypertension (n=1),
Vulvovaginitis	1	0.5	peptic ulcer (n=1)

surgery, pediatric psychiatry, dermatology, plastic and reconstructive surgery, dietician services, and medical social worker. The treatment and follow-up plans for adolescent patients are presented in Table 6.

A summary of gynecological problems and menstrual disorders found in adolescents is presented in the Appendix 1, based on an analysis of the available literature.

DISCUSSION

A clinical examination and medical history are often sufficient for the diagnosis and treatment of gynecological problems in the pediatric population. However, pediatricians may require the expertise and technical assistance of gynecologists due to limited clinical experience in PAG and the lack of evidence-based data on typical genital findings in the literature.[1,2]

Table 6. Treatment and follow-up plans for adolescent patients (n=929)

	n	%
Pregnancy cases (n=208)		
Obstetric follow-up without medical intervention	96	46.1
Labor management	55	26.5
Live birth outcomes	53	25.5
Stillbirth outcomes	2	1.0
Symptomatic medical treatment	53	25.5
Abortion	4	1.9
Gynecological problems (n=721)		
Medical treatment	443	61.4
Pediatric-gynecologic follow-up without treatment	205	28.4
Multidisciplinary follow-up care	46	6.4
Surgical intervention	27	3.8

The present study examined the reasons for consultation, diagnoses, treatments, and follow-up practices of patients who were referred to the obstetrics and gynecology department from pediatric clinics. It was observed that 1.5% of the cases presented for consultation were in children, while 98.5% were in adolescents.

Gynecological problems are uncommon in the neonatal and infantile periods. In fact, the majority of gynecological conditions that are thought to be pathological are, in reality, merely anatomical variations or physiological conditions.[8] The youngest patient in our study was 4 years old. The reason younger patients with gynecological problems were not included in this study is that these patients were referred to pediatric surgery and related pediatric subspecialty clinics rather than to the obstetrics and gynecology department. For instance, we have experience in the management of newborns and infants presenting with vaginal discharge, menstrual-like bleeding, vulvovaginitis, or atypical genitalia in pediatric clinics. Additionally, we have expertise in the management of newborns and infants presenting with foreign bodies in the vagina, vaginal bleeding as a result of genital trauma, gynecologic tumors, congenital malformations, labial adhesions, interlabial or ovarian cysts or masses, through pediatric surgery consultations. Given the absence of a PAG clinic within our hospital, this approach has been implemented.

A study of 6,605 Korean children aged less than 10 years presenting to the PAG clinic with childhood gynecological problems revealed that the most common complaints were abnormal external genitalia (absence of the vagina or imperforate hymen), vaginal discharge, and abnormal findings detected during routine examination. Other common complaints included vaginal itching, vaginal spotting, trauma, abdominal pain, dysuria, and precocious puberty. The most prevalent diagnosis was labia minora adhesion, followed by vulvovaginitis.[9] The indications for gynecological consultation in childhood in our study also included vaginal discharge, vaginal spotting, and perineal trauma. In China, 78.5% of children aged 0–9 years were admitted to the PAG clinic for genital inflammation, 11.4% of admissions were for precocious puberty, while 5.2% were for routine physical examination. Other reasons for presentation included menstrual disorders, genital trauma, childhood masturbation, genital anomalies, or reproductive system tumors.[10] Patients with genital anomalies, neoplasia, or puberty disorders were not included in the present study because they were referred to pediatric surgery and/or related pediatric subspecialty clinics, rather than to the obstetrics and gynecology department.

Gynecological problems represent a significant proportion of hospital admissions among adolescents, ranging from 3.3% to 16.8%.[11,12] To the best of our knowledge, there is no definitive data on the prevalence of these conditions in Türkiye. In previous studies, 7.5–27% of the adolescents attending obstetrics and gynecology outpatient clinics were early adolescents, while 71–92.5% were middle or late adolescents.[13–17] In our study, the majority of adolescent cases, approximately 80%, were middle or late adolescents. It has been reported that adolescents presenting with various gynecological complaints are, in order of frequency, late, middle, and early adolescents or middle, late, and early adolescents.[18,19] In our study, we determined this frequency as middle, late, and early adolescents.

As evidenced by our findings, adolescents present to obstetrics and gynecology clinics with a range of symptoms, including abdominal pain, menstrual issues, vaginal discharge, vaginal bleeding, urinary symptoms, acne, hirsutism, nausea and vomiting, vulvar trauma, or perineal injury. Gynecological problems frequently encountered include menstrual disorders, teenage pregnancy and related conditions, vaginal discharge, UTIs, and ovarian tumors.[11–24] The five most prevalent gynecological conditions observed in our adolescent patient population were menstrual disorders, conditions associated with teenage pregnancy, ovarian cysts, vaginal discharge, and vulvar disorders.

At least half of the problems identified in PAG are related to menstrual disorders. The most prevalent menstrual disorder is irregular menstruation. The most common forms of irregular menstruation are oligomenorrhea or heavy menstrual bleeding.[12,15,19–24] In our study, menstrual disorders constituted

65.3% of all reasons for consultation and 84.4% of gynecological problems detected. Irregular menstruation was identified as the most prevalent menstrual disorder, and heavy menstrual bleeding was the most prevalent form of irregular menstruation. When menstrual disorders were analyzed according to age groups, heavy menstrual bleeding or polymenorrhea was reported most frequently in early adolescents, and oligomenorrhea or secondary amenorrhea was reported most frequently in middle and late adolescents.[13] In our study, the most common menstrual disorders identified were heavy menstrual bleeding in early adolescents, irregular cycles with no pattern in middle adolescents, and oligomenorrhea in late adolescents. In addition, our study revealed that the frequency of menstrual disorders significantly differed by stage of adolescence.

Dysfunctional uterine bleeding has been identified as the most prevalent cause of menstrual disorders. Other potential causes include PCOS, hypothyroidism, hyperprolactinemia, idiopathic thrombocytopenic purpura, and psychological stress.[14,23–26] Goswami et al.[12] reported that 96% of adolescents with heavy menstrual bleeding exhibited dysfunctional uterine bleeding. We also identified dysfunctional uterine bleeding as the most prevalent cause of heavy menstrual bleeding. The following conditions were identified as causes of menstrual disorders in our study: PCOS, bleeding disorders, chronic disease, anorexia nervosa, hyperprolactinemia, psychological stress, and obesity.

Dysmenorrhea is the most prevalent gynecologic problem and menstrual disorder among adolescents, as evidenced by several studies.[14,16,18,26] In our study, dysmenorrhea was the second most common menstrual disorder. The prevalence of primary dysmenorrhea in adolescents is estimated to range from 45% to 95%. A review of the existing literature reveals that the majority of adolescents presenting with primary dysmenorrhea are middle or late adolescents.[15,27] In our study, 13.2% of non-pregnancy admissions were due to complaints of dysmenorrhea. Primary dysmenorrhea was diagnosed in 14.8% of cases, and among adolescents presenting with primary dysmenorrhea, 85% were in the middle to late adolescent stage. Our study revealed that early, middle, and late adolescence groups did not significantly differ in the frequency of primary dysmenorrhea. The most common cause of secondary dysmenorrhea in adolescents is endometriosis; however, the exact prevalence of endometriosis in adolescents is unknown.[27,28] In the course of our study, no patients exhibited either endometriosis or secondary dysmenorrhea.

In previous studies, amenorrhea has been identified as one of the two most prevalent menstrual disorders among adolescents. The majority of adolescents with amenorrhea have secondary amenorrhea.[15,16,20,24,29] In our study, amenorrhea was the third most common menstrual disorder, with secondary amenorrhea present in the majority (69%) of adolescents with amenorrhea. This finding is consistent with the literature. Additionally, our study revealed that the frequency of primary and secondary amenorrhea significantly differed by stage of adolescence. Müllerian agenesis and imperforate hymen have been identified as the most common causes of primary amenorrhea. Other potential etiologies include hypogonadotropic hypogonadism, androgen insensitivity syndrome, gonadal dysgenesis, Mayer-Rokitansky-Küster-Hauser syndrome, Turner syndrome, vaginal septum, vaginal atresia, cervical agenesis, and severe malnutrition.[12,14,18,20,23–26] We also identified the aforementioned causes in the etiology of primary amenorrhea in our study. PCOS has been reported most frequently in the etiology of secondary amenorrhea. Other reported etiologies include premature ovarian failure, psychological stress, anorexia nervosa, ovarian tumor, hypothyroidism, hyperprolactinemia, hyperandrogenism, hyperglycemia or increased fasting insulin, and pregnancy.[12,18,20,23,24] PCOS may present with a range of symptoms, including heavy menstrual bleeding, irregular menstrual cycles, oligomenorrhea, hypomenorrhea, and secondary amenorrhea.[11,15,22] In our study, PCOS was identified as the most prevalent cause of secondary amenorrhea. However, the prevalence of PCOS in adolescents with irregular menstruation was not evaluated.

Mooen et al.[25] found that ovarian tumors were present in 58.3% and functional ovarian cysts in 41.7% of adolescents evaluated for ovarian masses. In our study, adolescents who presented with an incidental ovarian mass were most frequently diagnosed with either a simple or complicated cyst. All adolescents with an ovarian mass received multidisciplinary follow-up care. Although the majority of ovarian masses are benign, diagnosis and management present various challenges that require a multidisciplinary approach. A team including pediatricians, pediatric and gynaecological surgeons, pathologists, radiologists, fertility specialists, geneticists, and psychosocial services should ensure accurate diagnosis, appropriate and minimally invasive management, minimal psychological impact, and the preservation of fertility in adolescents with ovarian masses.[30]

Leukorrhea is a normal physiological vaginal discharge, with a frequency of 4.8% observed in a previous study including both children and adolescents.[25] In our study, the frequency of leukorrhea was 4.3%. Vulvovaginitis is a prevalent issue in PAG. Seventy-five percent of vulvovaginitis cases are classified as non-specific vulvovaginitis, which develops due to irritation of non-estrogenized, sensitive skin.[31] In our patients presenting with vaginal discharge, non-specific vulvovaginitis was the sole cause other than leukorrhea. These patients were followed up without treatment, with recommendations for vulvar and hand hygiene, as non-specific vulvovaginitis is usually due to infection

with gastrointestinal or respiratory tract flora in the presence of poor perineal and hand hygiene.[31] Previously, *Candida* species and bacterial vaginosis (*Gardnerella vaginalis*, *Streptococcus agalactiae*, *Klebsiella pneumoniae*, *Klebsiella oxytoca*, and *Escherichia coli*) have been reported to cause infectious vaginal discharge in Turkish adolescents.[32] In our study, vaginal discharge due to non-specific vulvovaginitis was associated with *Candida* and excessive growth of gastrointestinal commensal bacteria.

Vulvar pain in adolescents may be caused by two distinct conditions: UTI and Bartholin cyst or abscess.[12,16,18] In our study, we identified these two etiological causes of vulvar pain in middle and late adolescents. The prevalence of candidiasis in adolescents, which causes vulvar itching, is highly variable.[33] We observed a prevalence of candidiasis of 0.3% among all consultations.

Labial adhesions are a common occurrence in children between the ages of three months and three years, with an estimated prevalence of 0.6–5% and a peak incidence between 13 and 23 months. In 88% of cases, the condition is diagnosed before the age of two years.[31] Labial adhesion in early adolescence, which we detected with a frequency of 0.1%, was a case of partial adhesion.

In Türkiye, it is estimated that 3.5% of adolescents have children, and 0.2% have their first child before the age of 15 years.[34] In a study of adolescent singleton pregnancies in Türkiye, İşgüder et al.[35] found that the median age of pregnant adolescents was 19 years (ranging from 15 to 19 years). They also reported a frequency of 2% for postpartum hemorrhage and no cases of stillbirth.[35] In our study, a total of 74% of 208 adolescents who were aware of their pregnancy at the time of presentation and consultation were classified as late adolescents, 25% were identified as middle adolescents, and 1% were early adolescents. Our study revealed that early, middle, and late adolescence groups significantly differed in the frequency of pregnancy, with the highest frequency in the late adolescence group and the lowest in the early adolescence group. We demonstrated that consultations for pregnant adolescents resulted in stillbirth with a frequency of 1% and 2.4% of consultations were requested due to postpartum hemorrhage.

A recent systematic review highlighted that adolescents with chronic diseases may experience delayed menarche and a range of menstrual disorders.[36] Our findings indicate that menstrual disorders represent the most prevalent gynecological issue among adolescents with chronic disease, with a prevalence rate of 78.4%. Furthermore, our findings indicate that adolescents with chronic disease may experience aesthetic concerns about their genital appearance, despite the absence of any apparent genital abnormalities. Adolescents with disabilities and chronic diseases are just as likely to engage in sexual activity as their healthy peers. However, pregnancy in this population may be associated with greater psychosocial difficulties and increased health risks.[37] In our study, 4.9% of adolescents with chronic diseases were found to be pregnant. Among these, 22% experienced health complications such as hypertension or vulvovaginitis.

In the study by Gupta and Mishra,[19] 22% of adolescents with menstrual complaints did not require treatment, 2% required surgical treatment, 9% were hospitalized and received a blood transfusion, 30% received hormone treatment, and 37% received drug treatment. In our study, 34.8% of adolescents with gynecological problems, the majority of whom had menstrual disorders, were followed up without treatment. The remaining 61.4% received hormone or drug treatment, while 3.8% received surgical treatment.

This study, which may contribute to a more comprehensive approach to the care of children and adolescents with obstetric and gynecological conditions, has several important limitations. The primary limitations are its retrospective design and single-center methodology, which limit the generalizability to the findings. Sociodemographic and anthropometric data, as well as detailed information on chronic disease diagnoses, medication use, and human papillomavirus (HPV) vaccination status, were not available in our dataset. Additionally, the study does not include cases managed solely by other departments, such as forensic medicine, pediatric surgery, pediatric endocrinology, pediatric oncology, and pediatric infectious diseases, without consultation from the obstetrics and gynecology department. Another limitation is the lack of data on factors known to be associated with gynecologic conditions, including personal hygiene, voiding habits, nutritional and dietary patterns, and educational level.

CONCLUSION

A multidisciplinary approach represents the gold standard for improving fertility, sexuality, overall health, and well-being in individuals under the age of 18 with gynecological problems, as well as for ensuring a smooth transition from pediatric to adolescent and adult healthcare services. To support the development of the PAG specialty in Türkiye, it is essential to determine the national prevalence of gynecological problems in children and adolescents. Moreover, sharing experiences across different centers regarding diagnosis, treatment, and follow-up practices is crucial. Conclusions drawn from multicenter studies may increase awareness of PAG among healthcare professionals and encourage national health policymakers to establish dedicated PAG clinics. We believe our study contributes to highlighting this important issue and can serve as a reference for future multicenter studies. PAG clinics would help meet the specific needs of children and adolescents, providing comprehensive care in gynecologic and reproductive health.

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Appendix 1. Common gynecological conditions and menstrual disorders among adolescents

Authors	Age range (n)	Gynecological problems three most common problems and other reported problems	Most prevalent menstrual disorder	Second most prevalent menstrual disorder
Patil et al.[11]	10–19 years n=720	Menstrual disorders (49.8%), teenage pregnancy (40.2%), vaginal discharge (5%) Miscellaneous: abdominal mass, trauma to genital tract, urinary tract infection (UTI)	Irregular menses (54.4%)	Dysmenorrhea (22.4%)
Anuradha and Indira[14]	10–19 years n=312	Menstrual disorders (73.1%), vaginal discharge (11.2%), delayed puberty (3.2%) Miscellaneous: acne and hirsutism, Bartholin abscess	Dysmenorrhea (42%)	Irregular menses (23.1%)
Singh and Singhal[15]	10–19 years n=335	Menstrual disorders (68.4%), vaginal discharge (11%), abdominal pain (8.4%) Miscellaneous: urinary symptoms, acne and hirsutism	Heavy menstrual bleeding (41%)	Amenorrhea (19.7%)
Hirani and Hirani[16]	10–19 years n=400	Menstrual disorders (67.5%), vaginal discharge (12.2%), acne and hirsutism (5%) Miscellaneous: Bartholin abscess, UTI	Dysmenorrhea (42.5%)	Irregular menses (24.1%)
Gupta et al.[17]	11–19 years n=165	Menstrual disorder (75.1%), vaginal discharge (26%), abdominal pain (17.5%) Miscellaneous: urinary complaints, hirsutism, acne, breast complaints, perineal abscess	Polymenorrhea (23%)	Menorrhagia (18.7%)
Rana and Mirza[18]	10–19 years n=396	Menstrual disorders (67.7%), irregular cycles (48.5%), abdominal pain (29.8%) Miscellaneous: abnormal vaginal discharge, acne and hirsutism, obesity, delayed puberty, Bartholin cyst/abscess, breast diseases, abdominal mass, urogenital malformations, UTI, teenage pregnancy, pelvic inflammatory disease	Dysmenorrhea (24.7%)	Oligomenorrhea (19.7%)
Pegu et al.[21]	10–19 years n=824	Menstrual disorders (67.1%), vaginal discharge (18.9%), UTI (9.8%) Miscellaneous: teenage pregnancy, ovarian tumor	Irregular menses (55.2%)	Dysmenorrhea (30.7%)
Kalyankar et al.[22]	11–19 years n=300	Menstrual disorders (52%), vaginal discharge (11.6%), sexual assault (8%) Miscellaneous: UTI, teenage pregnancy, ovarian tumor, ovarian torsion	Oligomenorrhea (55.2%)	Heavy menstrual bleeding (17.3%)
Lakshmi and Roshni[23]	10–19 years n=100	Menstrual disorders (54%), ovarian tumors (25%), teenage pregnancy (8%) Miscellaneous: sexual assault, leucorrhoea, Bartholin's abscess, traumatic vulval injury, congenital adrenal hyperplasia	Heavy menstrual bleeding (16%) Amenorrhea (16%)	Hypomenorrhea and oligomenorrhea (13%)
Authors of this study	10–18 years n=929	Menstrual disorders (65.4%), teenage pregnancy (22.4%), ovarian disorders (4.4%) Miscellaneous: vaginal discharge, Bartholin cyst/abscess, UTI, condyloma acuminata, vulvar candidiasis, perineal trauma, genital appearance dissatisfaction and anxiety, retained tampon in the vagina, rectovaginal fistula	Irregular menses (43.8%)	Dysmenorrhea (11.5%)