DOI: https://doi.org/10.30841/2708-8731.1.2026.354635
UDC 612.661+618.17

The prevalence of menstrual disorders in the adolescents

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The objective: **to study the prevalence of menstrual cycle (MC) disorders in adolescent girls.**
Materials and methods**. A survey of 172 adolescent girls in the age of 14–17 years old was conducted. The interview was based on the structured questionnaire which included the positions about general health, menarche, menstruations, gynecological diseases, school activity, family anamnesis and social factors. Inclusion criteria: age 14–17 years, period after menarche ≥ 1 year, voluntary agreement to fulfill the survey, signed concept of the adolescent girl and her parent to take part in the study.**
Results**. In most girls (144 (83.72%)) menstruation began at the age of 11–14 years, and lasted for 2–8 days in 165 (95.93%) participants. Normal duration of MC was reported by 129 (75.00%) adolescents. 143 (83.14%) participants informed about some menstrual disorders, only 29 (16.86%) participants had no complaints. 116 (67.44%) girls reported dysmenorrhea. 44 (25.58%) adolescents had irregular MC during the last year. Only 10 (5.81%) individuals complained on heavy menstrual bleeding according to self-assessment. Prevalence of premenstrual symptoms was 36.63% (63 individuals). The most common of them were those related to emotional sensitivity. 137 (79.65%) girls reported the impact of menstrual disorders on their daily activities. Among 143 adolescents with menstrual disorders, only 48 (33.57%) girls visited the physician for medical help.**
Conclusions**. Most of adolescent girls have menstrual disorders. The most prevalent menstrual problems in the adolescent girls are dysmenorrhea and premenstrual symptoms. But there is a low level of requests by adolescents for medical help.**
Keywords: *menstrual cycle, adolescents, menstrual disorders, chronic stress, obesity, polycystic ovary syndrome, diabetes mellitus, heavy menstrual bleeding, premenstrual syndrome, endometriosis, quality of life.*

Поширеність розладів менструального циклу серед підлітків

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Мета дослідження: вивчення поширеності розладів менструального циклу (МЦ) у дівчат підліткового віку.
Матеріали та методи. Проведено опитування 172 дівчат-підлітків віком 14–17 років. Інтерв'ю базувалося на структурованій анкеті, яка включала питання щодо загального стану здоров'я, менархе, менструацій, гінекологічних захворювань, шкільної активності, сімейного анамнезу та соціальних факторів. Критерії включення: вік 14–17 років, період після менархе ≥ 1 року, добровільна згода на повне заповнення анкети, підписана згода дівчини-підлітка та її батьків на участь у дослідженні.
Результати. У більшості дівчат (144 (83,72%)) менструація почалася у віці 11–14 років, а її тривалість становила 2–8 днів у 165 (95,93%) учасниць. Про нормальну тривалість МЦ повідомили 129 (75,00%) осіб. 143 (83,14%) учасниці зазначили наявність деяких менструальних проблем, тоді як лише 29 (16,86%) не мали жодних скарг. Дисменорею відмічали 116 (67,44%) дівчат. Нерегулярний МЦ протягом останнього року спостерігався у 44 (25,58%) осіб. Лише 10 (5,81%) учасниць повідомили про сильну менструальну кровотечу за результатами самооцінки. Поширеність передменструальних симптомів становила 36,63% (63 особи), при цьому найбільш частими були симптоми, пов'язані з емоційною лабільністю. 137 (79,65%) дівчат повідомили, що порушення МЦ впливають на їхню повсякденну активність. Серед 143 осіб із порушеннями МЦ лише 48 (33,57%) звернулися до лікаря.
Висновки. Більшість дівчат-підлітків мають порушення МЦ. Найпоширенішими менструальними проблемами є дисменорея та передменструальні симптоми. Водночас рівень звернень підлітків по медичну допомогу залишається низьким.
Ключові слова: *менструальний цикл, підлітки, розлади менструального циклу, хронічний стрес, ожиріння, синдром полікістозних яєчників, цукровий діабет, тяжка менструальна кровотеча, передменструальний синдром, ендометріоз, якість життя.*

Reproductive function is an important parameter of the female's life. The development of woman's organism begins before the puberty period. Menstrual cycle (MC) is an important process of the female organism in different age periods [1]. Its correct functioning depends on many factors, including gynecological and non-gynecological influences. The process of regulation of menstrual function is still not stable in puberty period. There is an immaturity of the hypothalamic-pituitary-gonadal axis which is usually associated with anovulation which cause the menstrual disorders.

Nowadays gynecological problems in adolescents are very spread. Among the most common gynecological problems in

ISSN 2708-8723 (print)
ISSN 2708-8731 (online)

adolescents are menstrual disorders like menstrual irregularities, heavy menstrual bleeding (HMB), dysmenorrhea, amenorrhea, polycystic ovary syndrome (PCOS), hyperandrogenism, contraception and sexual life, sexually transmitted diseases [2]. The results of E. Yılmaz et al. who studied 771 female adolescents showed that the most of the girls had complaints on menstrual disorders (84.4%), among them 56.5% had irregular menstruations (including HMB 22.3%), dysmenorrhea – 14.8% (all cases of primary dysmenorrhea), 13.1% – amenorrhea cases, PCOS – 6.1% [3]. According to the research of M. Agarwal et al. during 2016–2020 years, among 2,000 female adolescents who visited gynecological department for the medical care, 63.45% had medical disorders, abdominal pain – 15.6%, vaginal discharges – 7.2% [4]. Another research demonstrated that the most spread menstrual disorders in adolescents are dysmenorrhea 56.8%, premenstrual syndrome (PMS) – 30.2%, HMB – 21.0% [5]. 13% of adolescents reported that premenstrual symptoms decrease their daily activity [5]. According to the results of China population the rate of dysmenorrhea was 72% among 1,449 adolescents [6].

So, dysmenorrhea is one of the most spread menstrual pathologies in adolescent girls. 1,545 adolescent girls in Poland were interviewed [7]. 51% of participants had painful menstruations, 42% – heavy menstruations, 21% – irregular MC [8]. Persons with dysmenorrhea had more often absences in school, mental problems (anxiety, panic attacks), among them there were more smokers and drug users [8]. Moderate and severe dysmenorrhea according to the Working Ability, Location, Intensity, Duration of pain Dysmenorrhea scale (WaLIDD) had 37.9% and 41.2% of female adolescents among 2,737 adolescent girls aged 15 to 18 years [9]. 26% of girls informed about school absentness because of dysmenorrhea, 36% – problems with concentrations due to dysmenorrhea, 39% – problems to solve test and do homework. As to the reasons of severe dysmenorrhea in adolescence, it was found that among 267 adolescents 106 (39.7%) had ultrasound findings of endometriosis, 24.5% – endometrioma, 44.3% – adenomyosis, 56.6% – posterior deep infiltrative endometriosis, 54.7% – fibrotic thickening of the uterosacral ligaments [10]. Also, more frequency of combination of endometriosis and adenomyosis was determined in the 17–20 years age group compared to the age group of 12–16 years ($p = 0.03$).

Another study demonstrated the relationship between mental health in adolescent girls and pain during menstruation [11], in particular, girls with dysmenorrhea have increased level of anxiety, depression, psychological distress compared with girls without painful menstruations. Also, there is decreased school attendance in female adolescents with dysmenorrhea [12]. As to the influence of regular physical exercise on the MC parameters in adolescent girls the results of S. Bicici Ulusahin et al. demonstrated that in volleyball athletes girls 10–19 years old the intensity of dysmenorrhea is lower than in nonathletes [13]. At the same time there was no significant different in the menarche age, duration of MC, amount of bleeding between athletes and nonathletes girls [13].

HMB can occur in 37% of adolescents [14]. Usually, the reasons of HMB in adolescents are related to non-gynecological diseases such as coagulopathies, iron deficiency anemia, mood disorders [14]. The cross-sectional study which was conducted in Sweden and included 394 girls after 15 years old demonstrated that the rate of HMB is 53% among adolescents, and the frequency of iron deficiency – 40% [15]. The scientists reveled an association between foods habits, in particular, the diet with meat insufficiency, HMB and iron deficiency, in whom the odds of iron deficiency was in 13.5 more often than in omnivore adolescents with normal menstrual bleeding. In other research it was found that among 345 adolescents with HMB 40 (11.6%) persons had bleeding disorders including 12 cases (30%) of von Willebrand disease, followed by coagulation factor deficiencies (11 cases (27.5%)), thrombocytopenia (8 (20%), and platelet function defects (6 (15%)) [16].

The results of self-bleeding assessment tool and pictorial blood loss assessment chart in 331 female adolescents demonstrated that 20% of girls had HMB [17]. Special attention should be paid for the risk of bleeding disorders like coagulopathies. Among 122 female adolescents with mean age 13.7 ± 1.9 years who had HMB 57.8% of participants had anovulation, 42.7% – irregular MC, 25% – PCOS, thyroid diseases were diagnosed in 4.6% adolescents, hyperprolactimeia – 2.3%, one girl had von Willebrand disease [18]. There is a spread of iron deficiency anemia in adolescent girls which is associated with diet, menarche, heavy and irregular menstrual bleeding [19].

As to the rate of PMS in this cohort of adolescents, it was 33.9% [8]. Also, adolescents with PMS had increased anxiety, panic attacks ($p < 0.001$), higher stress level ($p < 0.001$), reported poorer school performance ($p = 0.002$), among them there were more smokers and who used alcohol in the last 30 days. 2,970 girls after menarche in Korea were studied [20]. The rate of PMS was 70.5%, with the frequency of such symptoms as irritability (43.8%), breast tenderness (27.5%), abdominal bloating (32.8%), depressive symptoms (15.5%) [20]. The mood changes by PMS are associated fluctuations of female steroids hormones across the MC [21–23].

The objective: to study the prevalence of menstrual disorders in adolescent girls.

MATERIALS AND METHODS

The study was conducted in communal non-commercial enterprise "City Clinical Hospital № 1" of Ivano-Frankivsk City Council. 172 schoolgirls in the age of 14–17 years old were interviewed. The interview was based on the structured questionnaire which included the positions about general health, menarche, menstruations, gynecological diseases, school activity, family anamnesis and social factors. The period of survey was from 01.01.2024 till 01.05.2025. Inclusion criteria: age 14–17 years, period after menarche for 1 year and more, voluntary agreement to fulfill the survey, signed concept of the adolescent and her parent to take part in the study. Exclusion criteria: absence of menarche, congenital abnormalities of female genital organs, chromosomal abnormalities, severe extragenital pathology,

ISSN 2708-8723 (print)
ISSN 2708-8731 (online)

coagulopathies. The study and the questionnaire were approved by Ethics Committee (protocol No. 119/21 dated February 24, 2021), Ivano-Frankivsk National Medical University. The study was conducted according to the Declaration of Helsinki "Ethical Principles of Medical Research Involving Human Subjects".

The statistical data included descriptive statistics, and were analyzed in the program Statistical Package for the Social Sciences (IBM SPSS Statistics), version 23.

RESULTS AND DISCUSSION

In most of the girls (144 (83.72%)) the menarche started in the period of 11–14 years old, in 21 (12.21%) persons it has begun in 10–11 years, in 7 (4.07%) – 15–16 years old (Table 1). 165 (95.93%) girls indicated that the duration of menstruation was from 2 till 8 days, 7 (4.07%) persons – more than 8 days. About normal duration of MC reported 129 (75.00%) of adolescents. For the period of the survey 128 (74.41%) individuals had regular MC, in 89 (51.74%) of them the regularity started in 1–2 years after the first menstruation, in 39 (22.67%) – more than 2 years.

The prevalence of gynecological problems was among the observed individuals (Table 2). 143 (83.14%) adolescents informed about some menstrual problems, only 29 (16.86%) participants had no complaints. Some participants had 2 and more complaints. 116 (67.44%) girls informed about pain in low abdomen (mostly), back, thighs during menstruations (dysmenorrhea). Among them every menstruation was painful in 83 (48.26%) persons. Most of the girls (73 (42.44%)) described the character of the pain as cramp pain, 43 (25.00%) – as constant dull pain. 76 (44.18%) participants reported about severe and/or moderate pain.

44 (25.58%) of adolescents informed about of irregular MC during the last year. Among them 12 (6.98%) participants had 1 episode of irregularity, 32 (18.60%) – 2–4 episodes.

Only 10 (5.81%) persons reported about HMB by self-perception. Others participants had moderate menstrual blood flow. 6 (3.49%) adolescents reported about constant heavy menstruations, 4 (2.32%) adolescents had HMB periodically.

Pathological discharges by self-perception from vagina between menstruations had 49 (28.49%) persons. 35 (20.35%) girls said that they have periodically mucous discharges with bad aroma, 4 (2.33%) participants informed about of yellow or grey color discharges, 12 (6.98%) – about increased volume.

The prevalence of the symptoms of PMS was indicated in 63 (36.63%) persons. The most spread of them were connected with emotional liability such as anxiety and irritability (46 (26.74%)), feeling of the depression (8 (4.65%)), frequent changes of mood (36 (20.93%)), fatigue (18 (10.46%)), difficulty in concentration (31 (18.02%)). Among physical symptoms of PMS such as breast tenderness (32 (18.60%)), peripheral edema (17 (9.88%)), headache (3 (1.74%)) were the most spread. Special attention is ought to be paid to such clinical manifestation as acne vulgaris. 96 (55.81%) of girls suffered from this symptom especially before periods always or periodically. Also, 102 (59.88%) participants indicated on increased greasy skin before menstruations always or periodically.

Table 1

The main parameters of MC in girls adolescents

Parameters of MC	Number (n = 172)	Rate, %
Menarche, age, years:		
10–11	21	12.21
12–14	144	83.72
15–16	7	4.07
Duration of menstruation, days:		
normal, ≤ 8	165	95.93
prolonged, > 8	7	4.07
Duration of MC, days:		
< 24	22	12.79
24–38	129	75.00
> 38	21	12.21
MC:		
regular	128	74.42
irregular	44	25.58
Volume of menstrual bleeding:		
moderate	162	94.19
heavy	10	5.81

Note: MC – menstrual cycle.

Table 2

Complaints on menstrual problems among adolescent girls

Complaints	Number (n = 172)	Rate, %
Number of adolescents with complaints	143	83.14
Dysmenorrhea	116	67.44
Irregular menstruations	44	25.58
HMB	10	5.81
PMS	63	36.63

Notes: HMB – heavy menstrual bleeding; PMS – premenstrual syndrome.

Ovarian cysts in the last year were diagnosed in 12 (6.98%) girls. Most of them were follicular cysts and resolved by themselves. 3 (1.74%) individuals had dermoid cyst and were operated in the age of 16 years old.

137 (79.65%) girls reported about influence of menstrual disorders of their daily activity. Thus, the participants had limitations in their activity. They informed that usually in such days they don't do household duties, missed or limit hobbies, don't meet with friends. School activity was decreased in the periods of the menstruation in 107 (62.21%) girls. Also 24 (13.95%) persons missed usually one school day during the menstruation because of the pain in low abdomen very often (every 1–2 menstrual periods), periodically (once in 3–5 menstruations a year) – 17 (9.88%) girls. 35 (20.35%) persons informed that periodically they don't do home tasks. In all these cases such decrease of lifestyle is connected with pain syndrome.

Among 143 adolescents with menstrual disorders only 48 (33.57%) girls visited the doctor (gynecologist, pediatrician or dermatologist) with their menstrual problems: 37 (25.87%) participants consulted gynecologist

ISSN 2708-8723 (print)
ISSN 2708-8731 (online)

because of pain syndrome in low abdomen (dysmenorrhea), 3 (2.09%) – disorders of MC, 9 (6.29%) – ovarian cysts, 4 (2.80%) – pathological vaginal discharges, itching in vulva area. 12 (8.39%) persons visited dermatologist because of the skin problems before menstruation. Self-medication was typical for adolescents. In 56 (39.16%) cases they consulted with their parents (mostly, with mother), in 19 (13.29%) – with other adolescents, 11 (7.69%) – read in internet. 9 (6.29%) adolescents did not discuss their problems with anyone before.

The literature research which was dedicated to the study of association of chronic physical diseases with menstrual disorders in adolescent aged 10–19 years revealed only 43 articles among 1,451 articles at the primary search [24]. Most of the articles included small groups of participants. In one meta-analysis which involved 933 patients with type 1 diabetes there was found a significant association of later menarche age in adolescents with type 1 diabetes ($p < 0.001$), higher concentration of hemoglobin A1c [24]. The results demonstrated the association between chronic stress, diabetes mellitus with ovarian disorders [25–28].

The results of other multicentral research which included 714 adolescent girls 13–19 years old revealed that irregular menstruations had 23.4%, pain during menstruations 61.9% [29]. Among factors that were associated with menstrual irregularity were early menarche age ≤ 12 years ($p < 0.01$), sleep duration less than 5 hours per day ($p = 0.04$), moderate ($p = 0.03$) and high perceived stress level ($p < 0.01$). The results study of B. Bannour et al. which included 160 female adolescents found that the prevalence of dysmenorrhea is 68%, also another pain was typical of 40% of participants – headache [30]. Their results inform about the lack of knowledge in female adolescents about the menstrual problems. According to the results of cross-sectional study which was conducted in Sweden the rate of dysmenorrhea among 1,054 schoolgirls was 55.1%, 11.75% of participants had severe dysmenorrhea [31]. The results of T. Liu et al. demonstrated the frequency of dysmenorrhea in 1,003 adolescent girls with age of 11–15 years who had menstruations was 41.8% [32]. Our study confirmed the rate of dysmenorrhea in adolescents at the level of 67.44% which is consistent with the data of other scientists.

It was found that dysmenorrhea in adolescents can lead to increased risk of chronic pelvic pain in the future, in adult period, in reproductive age [33]. In the study of C. N. Kyathanahalli et al. it was found the inflammatory mechanisms in the development of dysmenorrhea in adolescent girls which reveal as significantly higher concentrations of prostaglandin F2α in menstrual discharges than in girls without pain menstruations [34]. Also, a moderate-small positive correlation was determined between prostaglandin F2α ($r = 0.37$, $p = 0.004$) or prostaglandin E_2 concentration ($r = 0.28$, $p = 0.046$) and menstrual pain intensity were moderate to small that can indicate about inflammatory processes. As to the significance of body weight in mechanisms of menstrual disorders there are controversial results. No association with body mass index (BMI) and these menstrual problems (dysmenorrhea, HMB, PMS) were found [5]. While the study of T. Liu et al. found that girls with overweight/obesity (odds ratio (OR) = 1.35) also had higher rate of dysmenorrhea (OR = 1.35; confidence interval [0.79–2.33]) [32]. It was determined that increased prostaglandin F2α in urine and underweight are associated with primary dysmenorrhea in adolescents, while there is no relation of primary amenorrhea and overweight [35].

In other research which included 195 Brazilian adolescents found that 20.51% of adolescents had HMB (among them 57.5% had irregular menstruations), 38.53% were diagnosed anemia. 61% of adolescents informed about the decrease in quality of life [36]. PMS usually occur also in puberty period. Its rate among 417 adolescents was 61.2%, among them 50.6% had severe premenstrual symptoms, 49.4% – mild-moderate manifestations [37]. The results of survey of 3,037 female adolescents determined the prevalence of PMS in 26.2% of girls, 23.3% – irregular menstrual bleeding, 15.9% – HMB [38]. The presence of menstrual pain and more intensive premenstrual symptoms were associated with higher sleep disorders scores, persons with more pain severity had shorter sleep duration. In adolescent girls with PCOS and irregular menstruations there are significant lower adiponectin ($p = 0.019$) and vaspin ($p = 0.037$) concentrations, and higher Retinol-Binding Protein 4 levels compared with girls adolescents with regular menstruations [39]. It was found the association of later menarche age, dysmenorrhea, irregular MC and increased BMI more than 28 kg/m^2 with increased risk of depression and anxiety [40]. The prevalence of HMB according to our study is not coordinated with the results of other researchers, our data demonstrate the lower rate of HMB in adolescents by self-perception (5.81%), but the rate of irregular menstruations (25.58%) consistent with the data of other scientists.

The psychological issues are associated to menstrual disorders very often. It is well-known that fluctuations of sexual steroid hormones, namely estradiol, through the MC are related to mood changes in females [41–43]. The recent study of the estrone-3-glucuronide and pregnanediol glucuronide changes through the MC in adolescents 11–14 years old revealed that a weak negative correlation between mood parameters like irritability, anhedonia, concentration difficulty, and conflicts and estrone-3-glucuronide [44]. According to the results of systematic review the frequency of HMB in adolescents is 4–63%, dysmenorrhea – 42–94% [45]. Most of them (80%) had psychological and physical problems like sleep disorders, mood disorders, pelvic pain, impairment of daily activity, decreased quality of life. Most of the participants (> 62%) reported that their mothers are the first resource of information about menstrual disorders, on the second place (10–65%) – their friends, which is corresponded with our data (39.16% and 13.29%, respectively). Severe dysmenorrhea was significantly more frequent among girls with any psychological symptom, depression, anxiety, self-injury, and suicide ideation compared to girls without the same manifestations [45]. This demonstrates the need of complex

approach to the correction of menstrual disorders including the correction of mental health [31].

B. V. Waghmare et al. indicate the psychological and cultural considerations like addressing stigma and taboos, cultural influence on adolescent gynecological health, mental health aspects. Very important is the access to healthcare, because there are, in particular, barriers to healthcare for adolescents, confidentiality and privacy, lack of awareness and knowledge, stigma and embarrassment, financial barriers, negative attitude to healthcare providers [2]. Adolescents with menstrual dysfunction had worse sleep and increased stress level compared with girls without menstrual disorders [46].

It was found a relationship between stress coping and primary dysmenorrhea. Adolescent girls with moderate stress coping had 1.66 times more probability of primary dysmenorrhea, with severe difficulty – 1.97 times compared with adolescents without difficulty coping with stress [6]. The results of cross-sectional study about the relation of physical activity and stress with pain intensity caused by primary dysmenorrhea in female adolescents found that stress level has positive strong correlation with dysmenorrhea pain ($r = 0.782$, $p < 0.001$) and physical activity – strong negative correlation with dysmenorrhea pain ($r = –0.748$, $p < 0.001$) [47]. Also, the level of stress was approved to influence on ovary disruption during puberty on rats' models [48].

The parameters and characteristic of social environment also impact on the development of menstrual disorders in adolescents. It was found that among 1,331 adolescents the 92.1% had one symptom of PMS. PMS severity was positively associated with collective exposure to political violence, high levels of human insecurity and depression-like symptoms [49]. In our study the PMS had the third of participants (36.6%) and most of them had mood symptoms.

Among 6,715 adolescent girls in India the rate of menstrual disorders was 61.8%, among these cases severe pain in abdomen or back had 90% of participants, severe distress or irritation – 26%, HMB – 21%. Only 14.3% of adolescents consulted the physician and received the treatment for their symptoms, 62% – had no treatment [50]. It was determined that in 389 adolescent girls who are till 18 years old and who received the medical care for psychiatry problems the frequency of dysmenorrhea was 68.4%, irregular menstrual bleeding – 91.4% [40]. According to the results of B. S. Haliç et al. 48.2% of 299 adolescent girls had HMB and only 23.4% of patients with HMB consulted the doctor for this reason [51]. As to the quality of life, adolescent girls with HMB had lower score levels of life quality compared to the normal menstruation girls, except the score of physical health dimension. In our study only one third (33.57%) of adolescents consulted physician for their menstrual disorders.

The results of study of F. Koçoğlu et al. demonstrated that the number of consultations with physician about menstrual problems increased after the educational programs which were proposed to adolescents compared the period before education [52]. Also, it was found the positive effect of cognitive behavioral therapy, narrative therapy, and a gender-sensitive approach in the correction of premenstrual symptoms in adolescents which allowed to decrease the intensity of psychological symptoms [53]. As the most spread reason for abnormal uterine bleeding in adolescents is anovulatory disorders, the basic management medical care for it is hormonal treatment [54]. The alternative treatment is studied for the girls with primary dysmenorrhea such as acupressure [55]. The results of a single-blind randomized controlled trial which included 56 female adolescent students with primary dysmenorrhea demonstrated that significantly decrease of pain during menstruations according to the visual analogue scale wham using acupressure [55]. It was found a positive clinical effect of aquatic and aerobic exercises on the intensity of pain in adolescents with primary dysmenorrhea and improvement their quality of life with better correction of quality of life by aquatic exercises [56]. The use of vitamin D in female adolescents with primary dysmenorrhea is the additional therapeutic treatment prescription [57].

CONCLUSIONS

Most of adolescent girls have menstrual disorders. The most prevalent menstrual problems in the adolescent girls are dysmenorrhea and premenstrual symptoms. But there is a low level of requests by adolescents for professional medical help.

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ISSN 2708-8723 (print)
ISSN 2708-8731 (online)

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REFERENCES

1. Rosen Vollmar AK, Mahalingaiah S, Jukic AM. The menstrual cycle is a vital sign across the lifespan. Lancet Obstet Gynaecol Womens Health. 2025;1(2):141-5. doi: 10.1016/j.lanogw.2025.100001.
2. Waghmare BV, Jajoo S. Navigating the challenges: A comprehensive review of adolescent gynecological problems. Cureus. 2024;16(3):e56200. doi: 10.7759/cureus.56200.
3. Yılmaz E, Tezol Ö, Durak F, Aytan H. Consultations for obstetric and gynecological problems in the pediatric population in a tertiary care hospital setting. J Clin Pract Res. 2025;47(2):183-93. doi: 10.14744/cpr.2025.89037.
4. Agarwal M, Singh S, Jyoti C, Sinha S, Simran S. Understanding adolescent gynecological issues: A cross-sectional study at a tertiary care center. Cureus. 2024;16(4):e57713. doi: 10.7759/cureus.57713.
5. Salih Y, Hassan AA, AlHabardi N, Adam I. Prevalence and associated factors for dysmenorrhea, heavy menstrual bleeding, and premenstrual syndrome in adolescent schoolgirls in Sudan. BMC Womens Health. 2025;25(1):445. doi: 10.1186/s12905-025-03993-9.
6. Liu H, Han D, Hu Y, Huang L, Wang J, Zhu D. Association between stress and dysmenorrhea among Chinese female adolescent students: A cross-sectional epidemiology study. Sci Rep. 2025;15(1):22180. doi: 10.1038/s41598-025-05152-4.
7. Drejza M, Rylewicz K, Majcherek E, Barwińska J, Łopiński G, Mizgier M, et al. Dysmenorrhea in Polish adolescent girls: Impact on physical, mental, and social well-being-results from POLKA 18 study. J Clin Med. 2024;13(20):6286. doi: 10.3390/jcm13206286.
8. Rylewicz K, Drejza MA, Łopiński G, Majcherek E, Barwińska J, Mizgier M, et al. Correlates of premenstrual syndrome in Polish adolescents-results from POLKA 18 youth-led cross-sectional study. J Clin Med. 2024;13(23):7342. doi: 10.3390/jcm13237342.
9. Ghandour R, Hammoudeh W, Stigum H, Giacaman R, Fjeld H, Holmboe-Ottesen G. The hidden burden of dysmenorrhea among adolescent girls in Palestine refugee camps: a focus on well-being and academic performance. BMC Public Health. 2024;24(1):726. doi: 10.1186/s12889-024-18219-0.
10. Exacoustos C, Mandosi C, Nocita E, Selntigia A, Iacobini F, Monaco G, et al. Severe dysmenorrhea in adolescents need non-invasive ultrasound evaluation to early detect endometriosis/adenomyosis. Eur J Obstet Gynecol Reprod Biol. 2025;313:114639. doi: 10.1016/j.ejogrb.2025.114639.
11. Cameron L, Mikocka-Walus A, Stanley K, Payne LA, Druitt M, Grover S, et al. The relationship between menstrual pain in adolescence and mental health in adolescence and early adulthood. J Psychosom Res. 2025;192:112122. doi: 10.1016/j.jpsychores.2025.112122.
12. Cameron L, Mikocka-Walus A, Sciberras E, Druitt M, Stanley K, Evans S. Menstrual pain in Australian adolescent girls and its impact on regular activities: a population-based cohort analysis based on Longitudinal Study of Australian Children survey data. Med J Aust. 2024;220(9):466-71. doi: 10.5694/mja2.52288.
13. Bicici Ulusahin S, Ozkutlu O, Kafa N. Menstrual symptom differences between adolescent volleyball athletes and non-athletes. Pediatr Exerc Sci. 2025:1-7. doi: 10.1123/pes.2025-0025.
14. Desai D, Joshi M, Upadhyay R, Costescu D, Bhatt MD. A retrospective review of diagnosis and management of heavy menstrual bleeding and co-morbidities in patients seen in Young Women's Blood Clinic. Paediatr Child Health. 2025;30(8):740-5. doi: 10.1093/pch/pxaf064.
15. Söderman L, Stubbendorff A, Ladfors LV, Bolmsjö BB, Nymberg P, Wolff M. Exploring the effect of menstrual loss and dietary habits on iron deficiency in teenagers: A cross-sectional study. PLoS One. 2025;20(12):e0336688. doi: 10.1371/journal.pone.0336688.
16. Özer E, Akman AÖ, Kurtipek FB, Büyükyılmaz G, Bitkay A, Toksoy Adıgüzel K, et al. Anovulatory bleeding and the spectrum of bleeding disorders: Understanding heavy menstrual bleeding in adolescents. Int J Gynaecol Obstet. 2025. doi: 10.1002/ijgo.70579.
17. De Vaan A, Özcan H, Burger NB, de Leeuw RA, Huirne JAF, van Hanegem N, et al. Heavy or healthy? Assessing menstrual bleeding and bleeding tendency in Dutch adolescents. Res Pract Thromb Haemost. 2025;9(8):103235. doi: 10.1016/j.rpth.2025.103235.
18. Kontbay ÇT, Keskin SZ. Evaluation of heavy menstrual bleeding in adolescents. J Clin Res Pediatr Endocrinol. 2025;17(4):402-09. doi: 10.4274/jcrpe.galenos.2025.2024-11-19.
19. Anwar S, Rauf MK, Farooq M, Khan M, Maqsood W, Gulraiz S. Iron deficiency anemia in teenage girls: The impact of menarche and nutritional care. Cureus. 2025;17(5):e84997. doi: 10.7759/cureus.84997.
20. Lee H, Choi KS, Rhee Y. Prevalence of premenstrual syndrome and its relationship to depression among Korean adolescents: A nationwide cross-sectional study. Taiwan J Obstet Gynecol. 2025;64(2):319-24. doi: 10.1016/j.tjog.2024.08.013.
21. Pakharenko LV, Vdovichenko YuP, Kurtash NY, Basiuha IO, Kravchuk IV, Vorobii VD, et al. Estradiol blood level and ESR1 gene polymorphism in women with premenstrual syndrome. Wiad Lek. 2020;73(12):2581-85. doi: 10.36740/WLek202012105.
22. Pakharenko LV. Effect of estrogen receptor gene ESR1 polymorphism on development of premenstrual syndrome. Reprod Health Woman. 2020;(1):5-8. doi: 10.30841/2708-8731.1.2020.471239.
23. Pakharenko LV. Evaluation of progesterone and progesterone receptor gene PROGINS polymorphism in the development of some forms of premenstrual syndrome. Reprod Health Woman. 2020;(1):10-4. doi: 10.30841/2708-8731.1.2020.471241.
24. Hobbs AK, Cheng HL, Tee EYF, Steinbeck KS. Menstrual dysfunction in adolescents with chronic illness: A systematic review. J Pediatr Adolesc Gynecol. 2023;36(4):338-48. doi: 10.1016/j.jpag.2023.05.005.
25. Zhurakivska O, Bagaylyuk L, Kostitsk I, Miskiv V, Zhurakivskyi V, Diachuk O, et al. The role of galectine-3 in disruption of ovarian during diabetes mellitus and stress. Reprod Health Woman. 2025;(5):58-64. doi: 10.30841/2708-8731.5.2025.337950.
26. Vasyliuk VM, Zhurakivska OY, Kondrat AV, Khabchuk VS. Morphological characteristics of the endocrine function of the heart in comorbid pathology. Pol Merkur Lekarski. 2023;51(3):194-200. doi: 10.36740/Merkur202303102.
27. Zhurakivska O, Zherdova N, Oliinyk R, Pobigun N, Kostitska I, Zhurakivskyi V, et al. Evidence of apoptosis in parvocellular nuclei of hypothalamus in diabetes mellitus. Probl Endocrine Pathol. 2021;78(4):94-103. doi: 10.21856/j-PEP.2021.4.13.
28. Zhurakivska OY, Bodnarchuk YV, Kostitska IO, Kindrativ EO, Andriiv AV, Zhurakivskyi VM, et al. Morpho-functional characteristics liver of rats in early development of streptosotocin diabetes mellitus using cluster analysis. Probl Endocrine Pathol. 2021;(1):84-96. doi: 10.21856/j-PEP.2021.1.11.
29. Hussein N, Shiferaw K, Lonsako AA, Nour TY, Mezmur H. Menstrual irregularity and associated factors among female adolescents in Somali region high schools Ethiopia 2023. Sci Rep. 2025;15(1):36591. doi: 10.1038/s41598-025-20342-w.
30. Bannour B, Rouis N, Bannour R, Alouane C, Saadouli S, Bannour I. Dysmenorrhea in Tunisian high school adolescent girls: Frequency, effects, and

absence from school. Int J Adolesc Med Health. 2024;36(3):285-9. doi: 10.1515/ijamh-2024-0025.
31. Gambadauro P, Hadlaczky G, Wasserman D, Carli V. Dysmenorrhea and adolescent mental health: A school-based cross-sectional study. BJOG. 2025;132(9):1278-84. doi: 10.1111/1471-0528.18187.
32. Liu T, Qi D, Zhang L, Hou J, Zhao J, Zhou Y, et al. Academic stress and irregular menstruation influence the dysmenorrhea, school absenteeism and healthcare seeking among adolescent girls in junior high school in Shanghai: A cross-sectional study. Front Reprod Health. 2025;7:1574195. doi: 10.3389/frph.2025.1574195.
33. Reid-McCann R, Poli-Neto OB, Stein K, Dixon S, Cox E, Coxon L, et al. Longitudinal association between dysmenorrhoea in adolescence and chronic pain in adulthood: a UK population-based study. Lancet Child Adolesc Health. 2025;9(11):766-75. doi: 10.1016/S2352-4642(25)00213-5.
34. Kyathanahalli CN, Tu FF, Hellman KM. Inflammatory mechanisms of dysmenorrhea: Novel insights from menstrual effluent in an adolescent cohort. BJOG. 2025;132(11):1626-34. doi: 10.1111/1471-0528.18275.
35. Jusuf EC, Octaviani D, Husain MG, Jumrah. The influence of physical activity, body mass index and urinary levels of prostaglandin (PGF2α) with the incidence of primary dysmenorrhea in adolescents. J Obstet Gynaecol Res. 2024;50(5):909-13. doi: 10.1111/jog.15914.
36. Nakamura RM, Rezende GP, Yela DA, Benetti-Pinto CL. Menstrual pattern and self-reported abnormal uterine bleeding in Brazilian adolescents: A multicenter cross-sectional study. Int J Gynaecol Obstet. 2025;171(2):684-90. doi: 10.1002/ijgo.70243.
37. Akbulut Ö, Jafari L, Aygün Arı D, Pehlivantürk KM, Derman O, Akgül S. Prevalence of premenstrual syndrome in adolescent girls. Turk J Pediatr. 2024;66(3):340-5. doi: 10.24953/turkjpediatr.2024.4669.
38. Kiss O, Arnold A, Weiss HA, Baker FC. The relationship between sleep and menstrual problems in early adolescent girls. Sleep Sci Pract. 2024;8(1):20. doi: 10.1186/s41606-024-00111-w.
39. Foryś E, Drosdzol-Cop A, Małecka-Tendera E, Gawlik-Starzyk AM, Skrzyńska K, Olszanecka-Glinianowicz M, et al. Adipokine profile signature in adolescent girls with menstrual disorders and hyperandrogenism differs from that of regularly menstruating girls. J Clin Med. 2025;14(22):7987. doi: 10.3390/jcm14227987.
40. Gao F, Wei Z, He J, Xue Q, Huang M. The relationship between menstrual issues and depressive and anxiety symptoms in Chinese adolescent female inpatients: a cross-sectional questionnaire-based investigation. BMC Psychol. 2025;13(1):675. doi: 10.1186/s40359-025-03025-z.
41. Pakharenko LV, Vorobii VD, Kurtash NY, Basiuha IO. Association of ACE gene polymorphism with development of premenstrual syndrome. Georgian Med News. 2019;(294):37-41.
42. Pakharenko LV. Evaluation of progesterone receptor gene PROGINS polymorphism in the development of some forms of premenstrual syndrome. New Armenian Med J. 2015;9(2):52-9.
43. Pakharenko LV. Effect of estrogen receptor gene ESR1 polymorphism on development of premenstrual syndrome. Georgian Med News. 2014;(235):37-41.
44. Stumper A, Klusmann H, Peters JR, Andersen EH. Within-person associations between daily ovarian steroid levels and mood-related symptoms in ovulatory and anovulatory early adolescents. Psychoneuroendocrinology. 2025;185:107740. doi: 10.1016/j.psyneuen.2025.107740.
45. Pouraliroudbaneh S, Marino J, Riggs E, Saber A, Jayasinghe Y, Peate M. Heavy menstrual bleeding and dysmenorrhea in adolescents: A systematic review of self-management strategies, quality of life, and unmet needs. Int J Gynaecol Obstet. 2024;167(1):16-41. doi: 10.1002/ijgo.15554.
46. Meyers R, Brna ML, Donahue C, Sweeney E, Howell D, Armento A. Adolescent female athletes with menstrual dysfunction report worse sleep and stress than those without menstrual dysfunction. J Athl Train. 2025;60(6):468-74. doi: 10.4085/1062-6050-0583.24.
47. Triwahyuningsih RY, Rahfiludin MZ, Sulistiyani S, Widjanarko B. Role of stress and physical activity on primary dysmenorrhea: A cross-sectional study. Narra J. 2024;4(1):e685. doi: 10.52225/narra.v4i1.685.
48. Bagaylyuk L, Miskiv V, Antymys O, Zhurakivskyi V, Ivasyuk I, Kondrat I-A, et al. Impact of stress and diabetes mellitus on ovarian disruption during puberty. Reprod Health Woman. 2025(6):18-26. doi: 10.30841/2708-8731.6.2025.341001.
49. Wakabayashi N, Sarhan MBA, Fujiya R, Sugiyama D, Fuse R, Hammoudeh W, et al. Premenstrual syndrome and its association with exposure to political violence, human insecurity, and well-being: A cross-sectional study among Palestinian adolescent refugees. Reprod Health. 2025;22(1):243. doi: 10.1186/s12978-025-02104-z.
50. Chokhandre PK, Vatavati SR, Pundappanavar BI, Hallad JS. Menstrual disorder and its treatment seeking among adolescent girls in India: Evidence from nationwide survey. Int J Adolesc Med Health. 2024;36(6):595-603. doi: 10.1515/ijamh-2024-0101.
51. Haliç BS, Kocaöz S. Heavy menstrual bleeding in adolescents: Prevalence, quality of life, and treatment-seeking behavior. J Obstet Gynaecol Res. 2025;51(8):e70016. doi: 10.1111/jog.70016.
52. Koçoğlu F, Sezer HK, Kocaöz S. The effect of education on adolescents' knowledge of menstrual characteristics and treatment-seeking behavior. Rev Assoc Med Bras (1992). 2025;71(5):e2025003. doi: 10.1590/1806-9282.2025003.
53. Asadi H, Ghamari Kivi H, Akhavi Samarein Z. Development and evaluation of an intervention package to alleviate the psychological effects of premenstrual syndrome in adolescent girls. BMC Womens Health. 2025;25(1):271. doi: 10.1186/s12905-025-03690-7.
54. Kudze T, Hernandez AM. Management of abnormal uterine bleeding in the adolescent patient. Curr Opin Obstet Gynecol. 2025;37(5):311-6. doi: 10.1097/GCO.0000000000001052.
55. Aksoy-Can A, Buldum A, Abiç A, Vefikuluçay-Yilmaz D. The effect of acupressure on pain, menstrual symptoms, and comfort in adolescents with primary dysmenorrhea: a single-blind randomized controlled trial. BMC Complement Med Ther. 2025;25(1):221. doi: 10.1186/s12906-025-04965-0.
56. Abdelrahman AY, El-Kosery SM, Abbassy AH, Botla AM. Effect of aquatic exercise versus aerobic exercise on primary dysmenorrhea and quality of life in adolescent females: A randomized controlled trial. Physiother Res Int. 2024;29(3):e2095. doi: 10.1002/pri.2095.
57. Donayeva A, Amanzholkyzy A, Abdelazim I, Kurmangazin M, Khamidullina Z, Kurmanalina M, et al. The effect of vitamin D on adolescents' primary dysmenorrhea. J Med Life. 2023;16(11):1658-62. doi: 10.25122/jml-2023-0290.

Стаття надійшла до редакції 29.12.2025. – Дата першого рішення 01.01.2026. – Стаття подана до друку 09.02.2026

ISSN 2708-8723 (print)
ISSN 2708-8731 (online)