Shahid Bahonar University of Kerman

Veterinary and Comparative Biomedical Research

Online ISSN: 3060 – 7663

Original Research

Doi:10.22103/Vcbr.2024.23847.1025

Prevalence of various menstrual disorders and their associated clinical factors in the first two years after menarche

A. Sakhaei [1], F. Bazrafkan [2], R. Ghorbani [3], A. Soneishargh [4]*

[1]*Graduated from the Faculty of Medicine, Semnan University of Medical Sciences, Semnan, Iran*
[2]*Obstetrics & Gynecology Department, Faculty of Medicine, Semnan University of Medical Sciences, Semnan, Iran*
[3]*Department of Community Medicine, Faculty of Medicine, Semnan University of Medical Sciences, Semnan, Iran*
[4]*Graduated from the Faculty of Sciences, Neyshabour branch, Islamic Azad University, Neyshabour, Iran*

Correspondence:

Author email:
Azam.sakhae@gmail.com

Article history:

Received: 06 May 2024
Revised: 14 July 2024
Accepted: 02 August 2024
Published: 15 August 2024

Keywords:

Clinical factors
Menarche
Menstrual disorders

Abstract In this cross-sectional study, two high schools in Semnan county were selected through cluster sampling and a total of 386 students who had experienced their first two years post-menarche were examined to identify the presence and type of menstrual disorders, as well as factors such as age at menarche, body mass index, chronic illnesses, medication use, and family history of menstrual issues. The participants' ages ranged from 12 to 18 years. The findings revealed that menstrual disorders were quite common during the first two years after menarche, affecting 48.2% of participants. Polymenorrhea was the most frequently reported disorder at 34%, while menometrorrhagia was the least common at 5.4%. The study indicated that individuals with a body mass index below 15 or above 25 were more likely to experience menstrual disorders, suggesting a correlation between body mass index and menstrual health. Those who experienced menarche at a later age tended to have more menstrual irregularities. Additionally, a positive family history of menstrual disorders was more commonly found among sisters or mothers of individuals with amenorrhea compared to those with other menstrual issues, although no significant link was established between menstrual status and family history. Despite the high incidence of menstrual disorders, only a small percentage (5.5%) sought medical help. The results of this study are largely consistent with international research, with minor variations likely attributed to geographical factors, dietary habits, ethnicity, and other influences, as sexual maturation and related issues can differ based on these elements.

Introduction

In general, the disruption of the menstrual cycle is one of the most common reasons for women to visit specialists in this field [1] and is considered one of their fundamental problems. This is because it can cause excessive bleeding, leading to anemia, which can result in weakness, fatigue, irritability, and headaches. Lead to polycystic ovary syndrome, resulting in related issues such as hirsutism, amenorrhea or oligomenorrhea, and obesity [2]. Result in anovulation, causing infertility and recurrent miscarriages, which can create numerous challenges for families [1]. Contribute to decreased bone mineral density, leading to osteoporosis, which is a complication of amenorrhea. Moreover, these disorders can be the source of many psychological issues,

including depression, feelings of low self-esteem, and mental weakness, subsequently hindering progress in various social, economic, and cultural levels. Sometimes, some of these menstrual disorders are caused by premature ovarian failure, which, if not treated in time, can lead to early menopause, causing the individual to experience post-menopausal complications at a young age. On the other hand, because dysfunctional uterine bleeding occurs, by definition, in the context of cycles without ovulation, adolescents in the early years of menstruation are the most susceptible candidates for this condition [2]. Although the prevalence of this issue is not mentioned in any reference books, the latest published articles in this area have identified a significant prevalence for each of the menstrual disorders. For example, in a study conducted in Poland on 1,615 young girls visiting a gynecology clinic from 1980 to 1990, published in 1995, the prevalence of oligomenorrhea was reported at 17.6% and hypermenorrhea at 10.5% [3]. In another study conducted in Oslo, Norway, on 193 young girls aged 14-17, published in 1993, five cases of amenorrhea were reported [6]. Since disruptions in the menstrual cycle and issues related to puberty vary based on geographical conditions, dietary habits, and ethnicity, it is likely that the statistics obtained in our region may not align with foreign statistics. As mentioned, various societies worldwide face such problems; however, these issues tend to be more common in the early years after menarche. Furthermore, unlike other health problems, such issues are less frequently addressed by educators and health officials in schools. Consequently, young girls may remain unaware of the consequences of such disorders and might feel ashamed to discuss their problems, delaying visits to doctors and struggling with the repercussions for an extended period. It seems that the occurrence of menstrual cycle disruptions is related to multiple factors such as changes, age of menarche, stress and nutrition, exercise, psychological and social status, socio-economic conditions, the presence of chronic diseases and the use of specific medications, as well as a family history of such disorders in sisters and mothers and other related factors [4, 5, 6, 7, 8, 9].

However, in the present study, several of the aforementioned factors that could not be examined due to limited resources were excluded, and the remaining factors could be the subject of a new research study.

Materials and Methods

Study Population

First and second-year high school female students constitute our target population, as previous research indicates that the onset of menarche occurs between the ages of 12 and 14 years.

Sampling Method

The sampling method used is cluster sampling. Randomly selected high schools in the city of Semnan were chosen, and all first and second-year students enrolled in these schools were surveyed. A total of 386 adolescents participated, which is deemed sufficient given the expected prevalence rate of menstrual disorders at 50%, with a 95% confidence level and a 5% margin of error.

Research Implementation Method

The questionnaires were distributed among the first and second-year students, who were our target population. Once sufficient trust was established the questionnaires were filled out and then collected, and personal interviews were conducted with selected individuals.

Data Analysis Method

Data analysis was performed in two parts: part 1, determining the prevalence of various menstrual disorders to achieve our primary objective, the type of disorder was determined for each questionnaire based on the definition of each disorder, and the percentage was calculated. Some individuals had 2 or 3 types of disorders in their menstrual cycle. The overall prevalence of menstrual disorders was also determined. Part 2,

determining the clinical factors associated with menstrual disorders, to test the presence or absence of the mentioned association, a group with menstrual disorders and another group without menstrual disorders were considered. Using the Chi-square test and contingency tables, the correlation between the selected clinical factors from those associated with menstrual disorders and the presence of such disorders was examined. All Statistical analyses were performed using SPSS 16 (SPSS for Windows, SPSS Inc, Chicago, Illinois). Differences were considered statistically significant when the calculated P value was less than 0.05.

Results

Out of the 368 students who were surveyed, 48.2% of them had menstrual disorders in the first 2 years after menarche. The breakdown by type of disorder shown in Figure 1.

Types of Menstrual Disorders

As observed in the Figure 1, polymenorrhea is the most common menstrual disorder in the first two years after menarche, with a prevalence of 34%. In contrast, menometrorrhagia is considered the rarest type of disorder in the menstrual cycle during the first two years after the onset of menstruation, with a prevalence of 5.4%. However, if amenorrhea is also taken into account, it would be the rarest type of menstrual disorder (4.3%). This is because individuals with amenorrhea have not yet menstruated, making it impossible to assess any disorder. Furthermore, reference books classify amenorrhea separately from other menstrual disorders, which is why it is not mentioned in the Figure 1.

Table 1: Relative frequency (%) distribution of the cases based on menstrual status and BMI (Body Mass Index)

	BMI					
	10-15	**15-20**	**20-25**	**25-30**	**30-40**	**Over 40**
A	36.4	59.2	49.6	26.6	0	0
B	63.6	40.8	50.4	73.4	100	100

A: Without menstrual disorders
B: With menstrual disorders

Amenorrhea

Among the individuals surveyed, 17 had not yet menstruated. There are two definitions for primary amenorrhea: the first is the absence of menstruation by age 14 without the appearance of secondary sexual characteristics. In this study, 13 individuals had not menstruated by age 14, so they were interviewed regarding the appearance of secondary sexual characteristics, including breast development and the growth of pubic and underarm hair. Those who had developed secondary sexual characteristics do not meet the definition of amenorrhea, and since they have not yet reached menarche, they were excluded from the study (9 individuals). The second definition of amenorrhea is the absence of menstruation by age 16, accompanied by the appearance of secondary sexual characteristics. In this study, 4 individuals had not menstruated by age 16. These individuals were also interviewed regarding the appearance of secondary sexual characteristics, and all were found to have developed them. Therefore, all of them can be classified as having amenorrhea, and none were excluded from the study.

Potential clinical factors associated with menstrual disorders

The abovementioned information pertains to primary amenorrhea, while secondary amenorrhea was not found in our study population. Next, potential clinical factors associated with menstrual disorders were examined.

Body Mass Index (BMI)

Reference books categorize BMI into four main groups: Acceptable: 20-25, overweight: 25-30, obese: 30-40, very obese: over 40. A BMI below 20 is not classified.

Thus, a BMI of around 20 is considered normal. However, in the current study, most individuals examined had a BMI below 20. Since a BMI below 20 has not been previously classified, we can derive significant results by categorizing it into two subgroups: 15 - 20 and

10 - 15. Therefore, this classification has been made in this study, but not compared with other menstrual disorders. From the following table, it can be inferred that individuals with a BMI below 15 and above 25 are more likely to experience menstrual disorders, whereas those with a relatively normal BMI mostly do not have menstrual issues (Table 1). The results of the Chi-square test indicate a relationship between BMI and menstrual status, with an average BMI of 19.4.

Table 2: Relative frequency (%) distribution of the cases based on their menstrual status at the age of menarche

	Age of menarche			
	12	**13**	**14**	**≥15**
A	52	62	49	26
B	48	38	51	74

A: Without menstrual disorders
B: With menstrual disorders

Age of Menarche

In this study, the participants had menarche ages ranging from 10 to 16 years, with an average age of 13.4 and a standard deviation of 0.9. However, as mentioned, eight of these students were not in the first two years after menarche, all having ages of 10 and 11, and were thus excluded from the study. Therefore, the remaining participants had menarche ages between 12 and 16 years. The results of the Chi-square test also indicate a correlation between the occurrence of menstrual disorders and the age of menarche. Table 2, presents the relative frequency distribution of the students surveyed based on their menstrual status at the age of menarche. As observed, individuals with a higher age of menarche are more likely to experience menstrual disorders compared to those who menstruated at younger ages. The average age of menarche in individuals with irregular cycles is higher than that of those with regular cycles (13.5 with a standard deviation of 0.91 compared to 13.2 with a standard deviation of 0.89).

Family history of menstrual disorders

According to the content in Tables 3 and 4, the prevalence of menstrual disorders is higher among individuals who have a family history of menstrual disorders in their sisters or mothers (54.21%) compared to those without such a history (46.9%). However, there was no statistically significant relationship between menstrual status and the history of menstrual disorders in the family.

Table 3: Relative frequency (%) distribution of the cases based on menstrual status and the history of menstrual disorders in sisters or mothers

	History of menstrual disorders in sisters or mothers		
	With experience	**Without experience**	**Had no information**
A	46	53	63
B	54	47	32

A: Without menstrual disorders
B: With menstrual disorders

Medication use and presence of underlying conditions

Given that the number of samples reporting chronic illness along with the use of specific medications is very low, it appears that our sample size may not be sufficient to adequately assess the impact of specific underlying conditions or medications on the occurrence of menstrual cycle disorders. Therefore, the results obtained may not be generalizable. As noted, certain types of diseases, such as thyroid disorders, which have been shown to affect the occurrence of menstrual disorders, are observed in individuals with menstrual irregularities. However, no clear conclusions can be drawn regarding the impact of medication use.

Other Results Obtained

The results mentioned below are not part of the study's objectives, but they seem to provide useful insights.

Table 4: Relative frequency (%) distribution of the cases based on the history of menstrual disorders in sisters or mothers with amenorrhea compared to other menstrual disorders

	History of menstrual disorders in sisters or mothers	
	With experience	Without experience
A	87.5	12.5
B	33.5	66.5

A: Without menstrual disorders
B: With menstrual disorders

Amount of bleeding

Individuals without menstrual disorders generally experience moderate bleeding during each menstrual cycle (81.5%) compared to those with menstrual disorders (67.4%). In contrast, heavy bleeding is more common among individuals with menstrual irregularities (21.4% vs. 8%). The incidence of light bleeding does not significantly differ between the two groups.

Menstrual history status

A total of 22.5% of individuals who currently do not have menstrual disorders previously experienced menstrual irregularities. This suggests that the likelihood of experiencing a disorder at the onset of menstruation may be even higher than estimated, with only 30 individuals having had regular periods since menarche.

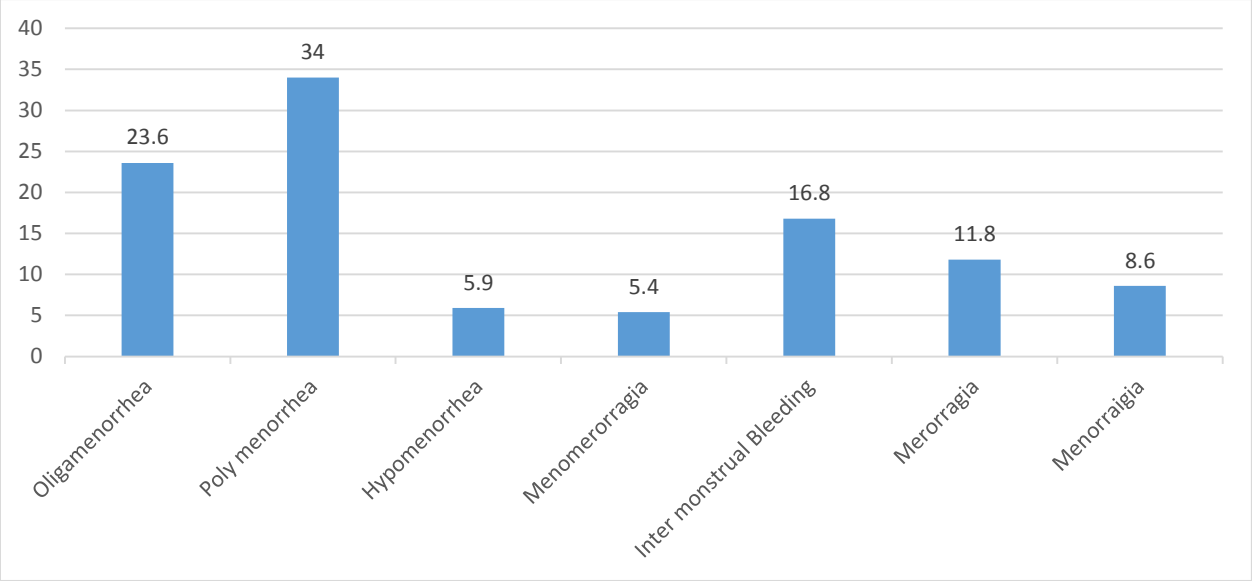

Fig 1. The frequency (%) of various menstrual disorders in the first 2 years after menarche

Discussion

A review of the results obtained from this research, along with a comparison to statistics from external sources, clarifies several points that we will address individually. As mentioned, the overall prevalence of menstrual disorders has not been reported in existing literature; however, we have demonstrated that menstrual cycle irregularities are quite common. Despite this, there is little encouragement for students to seek follow-up care, indicating their lack of awareness regarding the consequences of untreated or improperly managed conditions, or their reluctance to discuss their issues due to embarrassment. The prevalence rates of various types of menstrual disorders do not differ significantly from those reported in studies conducted in other countries. For example, the prevalence rates of amenorrhea, oligomenorrhea, and hypermenorrhea in studies from countries such as Poland and Norway were reported as 5%, 17.6%, and 10.5%, respectively.

In our study, the rates were found to be 4.3%, 23.6%, and 8.6%. These minor differences in disorder prevalence can be attributed to geographical, dietary, and ethnic factors, as sexual maturity and related issues vary based on these elements. Therefore, it is not surprising to observe such discrepancies. One notable observation from the questionnaire responses is that many individuals do not consider their menstrual cycles to be irregular, even when they experience disturbances, simply because the intervals and duration of bleeding are consistent. This reflects a lack of awareness among students, which stems from the insufficient attention given by families and school health officials to these important issues. As previously mentioned, the questionnaires were revised after providing necessary explanations. Reference materials indicate that individuals with obesity often face menstrual issues, and recent articles highlight that irregular menstrual cycles are more pronounced in athletes with normal or low body weight. Our findings support both cases, suggesting that individuals with a BMI below 15 and above 25 are significantly more prone to menstrual irregularities. Research conducted in other countries has shown that changes in the age of menarche and delays in its onset are associated with a family history of such problems, particularly in mothers. Our study revealed a significant prevalence of family history of menstrual disorders among individuals with amenorrhea, although no clear correlation was found between other menstrual disorders and family history in mothers or sisters [7, 9]. As previously mentioned, the results of this study do not provide substantial evidence to confirm the effects of medications or underlying conditions on menstrual cycle irregularities due to sample size limitations and clinical testing capabilities. A larger and more comprehensive study could potentially establish this relationship. However, the occurrence of goiter and hypothyroidism in individuals with menstrual irregularities suggests that endocrine disorders can impact the menstrual cycle, a point noted in published literature on women's health. Consistent with findings from external studies, our research indicates that delays in the onset of menarche are associated with menstrual disorders. As noted previously, individuals with menstrual irregularities tend to have a higher age of menarche.

Conclusion

Overall, the results of this study corroborate previous findings that menstrual disorders are highly prevalent in the first two years following menarche.

Since individuals at high risk for menstrual disorders are primarily in high school, it is essential to involve health educators comprehensively. Increased focus on these issues, highlighting the consequences and complications, fostering a close and friendly relationship, and encouraging students to discuss their concerns openly, along with referring such individuals to medical professionals, should be included in the agenda of these dedicated educators. This necessitates their awareness of the consequences of menstrual disorders and the importance of timely treatment.

Further research into other clinical causes related to menstrual disorders, such as stress, exercise, nutrition, and socio-economic factors, is necessary and should be conducted in a larger population. Therefore, collaboration between parents, schools, and relevant authorities is crucial to facilitate such studies.

Given that obesity and extreme thinness significantly influence the menstrual cycle, authorities should encourage students to engage in appropriate physical activities and maintain a balanced diet.

As indicated by the results, polymenorrhea is the most common menstrual disorder. Therefore, individuals who visit clinics for anemia treatment should also be evaluated for their menstrual history and receive appropriate care.

Acknowledgements

Not applicable

Conflict of interest

The authors declare that they have no competing interests.

Ethical approval

All applicable national guidelines for the care of cases were followed.

References

1. Ryan, Kenneth J., Berkowitz, Ross S., Barbieri, Robert L. .Kistner's gynecology principles and practice, 1995
2. Joseph Loscalzo, Anthony Fauci, Dennis Kasper, Stephen Hauser, Dan Longo, J. Larry Jameson, Harrison's Principles of Internal Medicine, 21ed. by The McGraw-Hill Companies, Inc.
3. Hall, J. E. (2015). Guyton and hall textbook of medical physiology (13th ed.). W B Saunders.
4. Williams obstetrics / [edited by] F. Gary Cunningham, Kenneth J. Leveno, Steven L. Bloom, Catherine Y. Spong, Jodi S. Dashe, Barbara L. Hoffman, Brian M. Casey, Jeanne S. Sheffield. 24th edition. New York : McGraw-Hill Education/Medical, 2014
5. Graber, Julia A. Brooks-Gunn, Jeanne Warren, Michelle P. The antecedents of menarcheal age: Heredity, family environment, and stressful life events. Child Dev , 1995, 66(2) 346-59.
6. Khan AD, Schroeder DG, Martorell R, Rivera JA, Age at menarche and nutritional supplementation, J-Nutr, 1995, 125 (4 suppl) 10905-10965.
7. Yeshaya A, Orvieto R, Dicker D, Karp M, Ben-Rafael Z, Menstrual characteristics of women suffering from insulin-dependent diabetes mellitus., Int-J-Fertil Menopausal stud, 1995, 40(5), 269-73.
8. Broso R, Subrizi R, Stress and Intensity of athletic training on menstrual functions, Minerva Ginecol, 1996, 48(3)99(106)
9. Walczak LM, Komorowska A, Zydowicz-Mucha E, Analysis of menstrual Cycle irregularities in adolescents, Ginekol- Pol, 1995, 66(5),280(3).

ss
How to cite this article:
Sakhaei, A., Bazrafkan, F., Ghorbani, R., Soneishargh, A. Prevalence of various menstrual disorders and their associated clinical factors in the first two years after menarche. Veterinary and Comparative Biomedical Research, 2024, 1(2): 77 – 83.