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Prevalence of Primary Dysmenorrhea and its Relationship with Body Mass Index

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Abstract

Background: Dysmenorrhea, or painful menstruation, is a major gynaecology condition that occurs each month. Primary dysmenorrhea is episodes of menstrual pain without a cause.
Objectives: The study investigates the prevalence of primary dysmenorrhea and whether body mass index affects primary dysmenorrhea.

Method: The study is a cross-sectional study conducted in medical schools of the University of Sulaimani of Iraq among 302 young female students aging between 18-25 years old, single or without any past obstetrical history. The study had begun in August 2022 till August 2023. The study was done using a Pretested dysmenorrhea questionnaire to be filled out by participants, based on body mass index (BMI) categorized into four groups (underweight, normal weight, overweight and obese). participants were also categorized into mild, moderate, and severe dysmenorrheic groups based on numeric pain relating scale.

Results: the one-year prevalence of primary dysmenorrhea was found to be 80.5%, meant that majority suffered from primary dysmenorrhea However, there was no significant correlation between their body mass index and the severity of the pain (p-value=0.16), number of patients who were underweight and had severe pain were only 15 cases, and those who were classified as obese and complained of severe pain were only 3 in numbers. the mean age in the majority of the volunteers (66.9%) were ranging between 21-24 years. 79.8% of the female participants had normal BMI while only 2.3% had BMI>30.

Conclusion: While dysmenorrhea is one of the common gynecological problems and highly prevalent among female medical students that adversely affects daily routine and social life, it is not related to the body mass index of the female; most of them not seeking medical help therefore they need education and counseling to determine the exact cause and method to cope with it.

Keywords: Body mass index, Dysmenorrhea, Menstrual pain, Primary dysmenorrhea

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Introduction

According to Weismann (2004), dysmenorrhea is a periodic pain that accompanies the menstrual cycle and is common and accompanies most menstrual periods. Traditionally classified as cramps, the pain is frequently accompanied by a low backache, headache, nausea, and vomiting.[1] There are two types of dysmenorrhea, primary and secondary, which are among the most prevalent gynecologic illnesses.[2] While primary dysmenorrhea refers to menstrual pain that cycles and is not associated with a pathology, secondary dysmenorrhea often exacerbates conditions such as endometriosis, leiomyomas, PID, adenomyosis, endometrial polyps, and obstruction of the menstrual outlet. Because of this, various gynecologic symptoms, including dyspareunia, dysuria, irregular bleeding, or infertility, may be linked to secondary dysmenorrhea. Primary dysmenorrhea typically starts shortly after menarche, in contrast to secondary dysmenorrhea. However, the characteristics of pain usually do not allow for the distinction between the two types, and primary dysmenorrhea is usually identified only when known related causes have been ruled out.[1] Dysmenorrhea, which is additionally a prevalent problem among women of reproductive years, likewise causes teenage girls to leave school for short periods.[3] Age at menarche, amount of menstrual flow, body mass index, genetic predisposition, active or passive smoking, usage of hormonal contraceptives, socioeconomic level, food, stress, and mental health conditions are some of the factors that might cause dysmenorrhea.[4] Systematic reviews reveal high prevalence estimates of pelvic pain; between 16 to 91% of women of reproductive age experience dysmenorrhea.[5] A prospective study that used one-year diaries and involved college students discovered that 72% of tracked periods were uncomfortable, with the first day of menses being the most prevalent time. At least one episode of unbearable pain was reported by 60% of the study participants.[6] Referring to a long-term study of a typical demographic of Swedish women discovered that Ninety percent of women aged 19 and sixty-seven percent of women aged 24 had dysmenorrhea. Ten percent of the 24-year-olds said their discomfort made it difficult for them to go about their everyday lives. Few teenagers see a doctor concerning dysmenorrhea; instead, the majority self-medicate with over-the-counter medications.[3] It is believed that prostaglandins cause dysmenorrhea. Menstruation commences with the release of prostaglandins by endometrial cells during endometrial sloughing. Prostaglandins induce ischemia and myometrial contractions. Prostaglandin levels in menstrual fluid are higher in women with more severe dysmenorrhea, and they peak in the first two days of menstruation. Furthermore, connected to secondary dysmenorrhea are prostaglandins. However, based on the kind of concomitant pelvic disease, anatomic reasons are also suspected.[1] Body mass index (BMI) and dysmenorrhea have been linked by research that focuses on how body weight may affect the onset and severity of menstruation pain. Healthcare practitioners can better target their interventions for women suffering from dysmenorrhea by comprehending this link. The aim of this research is to study whether there is any association between severity of the pain and body mass index.

Patients and methods

The study was a cross-sectional study that included 302 participants and was conducted at the University of Sulaimani in Sulaymaniyah, Kurdistan region of Northern Iraq. The study begun on 10.6.2022 until 10.6. 2023.The study was done among

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female students in medical colleges (schools of medicine and nursing). The inclusion criteria were any female student between 18 and 25 years old who was interested in participating and without any past obstetrical history. The exclusion criteria were female age >25 years, any medical disorder that causes lower pelvic pain, e.g., corn's disease, and any pelvic disease that causes pelvic pain, such as endometriosis. The information collected using questionaries; after demographic data BMI was taken and calculated using the formula weight in Kg/Height^2 in meter, and based on the BMI criteria by world health organization(WHO), the students were classified into four groups: underweight, normal weight, over weight and obese groups, students with BMI< 18 considered underweight, students with BMI 18.5-24.9 considered normal, students with BMI 25-29.9 were considered over weight, and those with BMI> 30 as obese. Then full history about menstrual characteristics after that dysmenorrhea characteristics, the Visual Analog Scale for pain (VASP) were used as tools for pain score, VASP consisted of a 10-cm horizontal scale with the descriptors 0 (no pain) on the left and 10 (worst possible pain) on the right. Students were asked to place a mark on the line that corresponded to the level of pain intensity they felt. Higher points indicate increased levels of pain. After those questions about site and timing of the pain done since timing distinguishing primary from secondary dysmenorrhea, and whether affecting daily activity, strategies to cope with dysmenorrhea, ever visited emergency department, or consulted specialist. The research investigation's questions were coded following data collection, yet previously entering the data and analysis. An Excel spreadsheet was used for data entry, and IBM SPSS Statistical Package for the Social Sciences, version 24.0, was used for statistical analysis. Based on the intensity of discomfort, the ANOVA test was utilized to determine the statistical significance of the mean BMI differences across the groups. Diagrammatically describing a few study variables involved the use of various bar chart types. For statistical testing, a significance threshold of 0.05 was used to P values. Data collection started after approval of the research protocol by the research protocol ethics committee of Kurdistan Higher Council of Medical Specialties / Ministry of Higher Education and Scientific Research /Kurdistan Region Government - İraq, with approval number (30191132) on October 10th 2022.

Results

In the cross-sectional study, 325 young females volunteered; however, 23 dropped out due to incomplete data. The demographic data are shown in Table (1). The mean age of the participants was 21.4±1.8 (range 18-25 years), with a mean BMI of 21.98 ± 3.33; participants from inside the city were 86.4%, and 64% from the College of Medicine.

Table (1): Demographics and BMI

Socio-demographic	Frequency	%
College		
Medicine	195	64.6%
Dentistry	5	1.7%
Nursing	57	18.9%
Pharmacy	4	1.3%
Technical college of health	27	8.9%
Technical institute	14	4.6%
Residency		
Inside City	261	86.4%
Outside city	41	13.6%
Age		
Mean ± SD	21.4 ± 1.8	
18 - 20 Years	94	31.1%
21 - 24 Years	202	66.9%
25 - 32 Years	6	2.0%
Body mass index		
Mean ± SD	21.98 ± 3.33	
< 25 (Normal)	241	79.8%
25 - 29.99 (Overweight)	54	17.9%
≥ 30 (Obese)	7	2.3%
Total	302	100.0%

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Menstrual cycle characteristics are shown in Table (2); the majority of the cases of menarche age (49.0%) was 11-12 years, 45.4% of menstrual length ranging from 25-28 days, and 46.4% menstrual duration for 5-6 days.

Table (2): Characteristics of the menstrual cycle

Menstrual cycle characteristics	Frequency	%
Menarche age		
8 - 10 Years	13	4.3%
11 - 12 Years	148	49.0%
13 - 14 Years	125	41.4%
15 - 16 Years	16	5.3%
Menstrual length		
15 - 24 Days	19	6.3%
25 - 28 Days	137	45.4%
29 - 32 Days	108	35.8%
33 - 36 Days	23	7.6%
> 36 Days	15	5.0%
Menstrual duration		
2 - 4 Days	24	7.9%
5 - 6 Days	143	46.4%
7 - 8 Days	126	41.7%
9 - 12 Days	9	3.0%
Total	302	100.0%

Table (3) shows details of dysmenorrhea: 80.5% suffer from primary dysmenorrhea, out of which 4.3 % had very severe pain, 21.5% had severe pain, 39.1% had moderate pain, 21.5% had mild pain, the most common site of pain was lower abdomen being 79.8%, the timing of the pain in 76.8% was pain during the cycle and in 39.4% before the cycle.

Table (3): Nature of the pain

Nature of the pain	Frequency	%
Do you have Pain		
Yes	243	80.5%
No	59	19.5%
Severity of pain		
No pain	59	19.5%
Mild	47	15.6%
Moderate	118	39.1%
Severe	65	21.5%
Very severe	13	4.3%
Site of pain		
Lower abdomen		
Yes	241	79.8%
No	61	20.2%
Back		
Yes	172	57.0%
No	130	43.0%
Legs		
Yes	124	41.1%
No	178	58.9%
Inguinal region		
Yes	87	28.8%
No	215	71.2%
Timing of pain		
Before cycle		
Yes	119	39.4%
No	183	60.6%
During cycle		
Yes	232	76.8%
No	70	23.2%
Which day of the cycle		
First – second day	139	46.0%
Third – fifth day	14	4.6%
Daily life activities affected		
Yes	135	44.7%
No	167	55.3%
Total	302	100.0%

The coping strategies of participants are presented in Figure (1). Participants reported numerous coping strategies for dysmenorrhea. The most common strategies reported were resting (66.6%), followed by taking medications.

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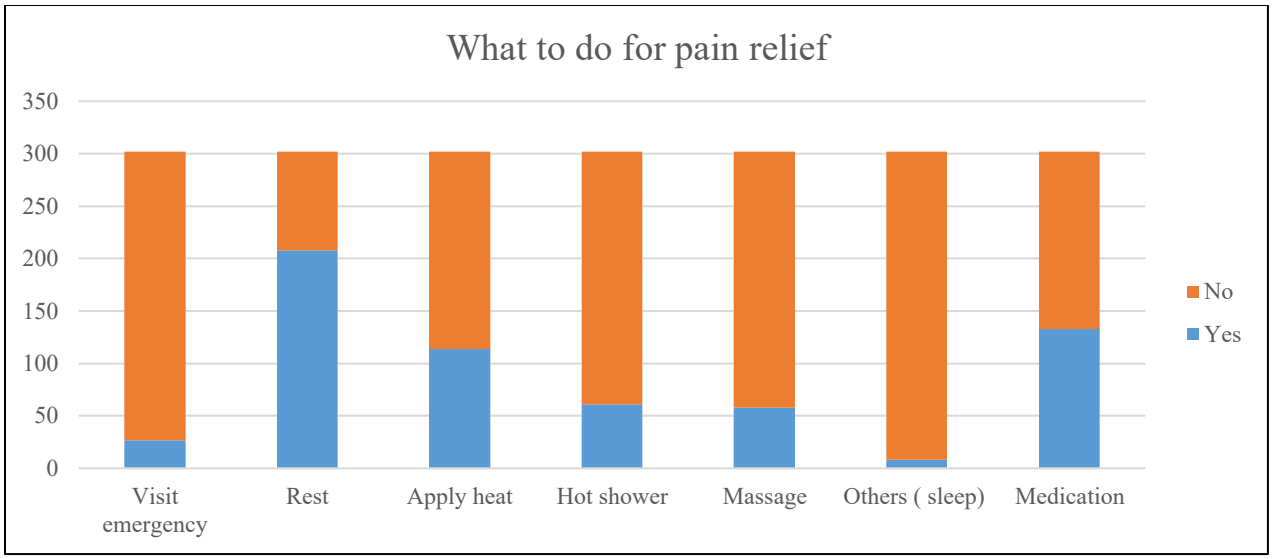

Figure (1): Coping strategies for pain relief

The last two tables, (4) and (5), show pain severity in relation to BMI table (4) done by ANOVA test, the result was not significant p value= 0.007, and Table 5, done by Chi-square test, also not significant with p value=0.16, meaning that there is no relationship of BMI to the severity of the pain.

Table (4): Correlation between severity of pain and BMI

Severity / BMI		N	BMI		P value
			Mean	Standard Deviation	
Severity of pain	No pain	36	24.80	9.83	0.007
	Mild	56	21.38	3.00	
	Moderate	126	22.11	3.27	
	Severe	70	21.67	3.56	
	Very severe	14	22.45	2.83	
Total		302	22.21	4.65	

BMI: Body mass index

Table (5): Correlation of pain severity and who classification of BMI

		BMI groups				Total	P value
		Underweight	Normal	Overweight	Obese		
Severity of pain	No pain	5	19	10	2	36	0.16
	Mild	11	38	7	0	56	
	Moderate	12	89	21	4	126	
	Severe	15	40	12	3	70	
	Very severe	0	11	3	0	14	
Total		43	197	53	9	302	

BMI: Body mass index

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Discussion

Menstrual cramps, also known as dysmenorrhea, are characterized as periodic pain that is directly associated with the menstrual cycle. Either before or at the start of menstrual flow, the pain starts, and it goes away during menstruation. The lower back, upper legs, or pelvis may all be affected by the pain. During the first six months following menarche, once ovulatory cycles are established, primary dysmenorrhea typically manifests.[7] Primary dysmenorrhea's etiology and pathophysiology are not entirely understood; uterine prostaglandins (PG), especially PGF2α, are known to trigger most symptoms once menstruation starts because they release these endometrial cells that have broken down. PGF2α induces ischemia, sensitization of nerve terminals, and myometrial contractions. Women with more severe dysmenorrhea had higher amounts of PGF2α in their menstrual blood, which supports this notion.[8] Additionally, some research has suggested that leukotriene and vasopressin levels may be elevated.[9,10] Several studies have shown an increased prevalence of dysmenorrhea in the low BMI group.[11,12] Our investigation into the potential relationship between BMI and dysmenorrhea yielded results indicating a lack of statistically significant correlation between these two variables. According to a long-term study by Ju et al. concluded that there is an increased prevalence of dysmenorrhea in both underweight and overweight females, with a U-shaped relationship between dysmenorrhea and BMI,[13] despite that there was no stronger relationship in our study among the obese female students. The findings were quite the opposite of another study done by Rafique et al. which also showed a higher prevalence of moderate and severe dysmenorrhea in the underweight group in comparison to obese one.[14] The frequency, intensity, or duration of dysmenorrhea, as well as menstrual regularity, were not significantly linked with BMI in the study, meaning that BMI was not statistically significant with dysmenorrhea (p=0.16, not significant). Normal-weight students were more likely than others to experience severe dysmenorrhea; these findings are consistent with another study done by Khodakarami et al.[15] In comparison to the underweight group, Singh et al. found that the frequency of dysmenorrhea was greater in the overweight/obese group. However, there was no connection between BMI and the frequency or severity of dysmenorrhea.[16] Furthermore, low BMI was substantially related to dysmenorrhea, according to Hashim RT et al a study done in Saudi Arabia.[12] However, being overweight was considered to be a significant risk factor for dysmenorrhea in research by Harlow et al.[17] Furthermore, Montero et al. demonstrated that in contrast dysmenorrhea was not substantially correlated with BMI and attempts to lose weight were significantly associated with dysmenorrhea.[18] In the study, we found that females' everyday activities were affected by dysmenorrhea by 44.7%, which resulted in college absences and the incapacity to engage in normal activities and hobbies. the research supports that of a study done in Kuwait by Al-Matouq S et al, in their study 58% missed at least one day of academic school.[19] In the present study, the majority of menarche age was between 11-12 years old age, which is very similar to two other studies done in Turkey by Cakir Met.al, and Demir SC et.al .[20,21] In comparison in the Khodakarami et al. study, the mean age was 12.9, which is much lower than previous reports in Hamadan this may be linked to lifestyle changes.[15] The Coping strategies for the pain majority were taking rest (66%), followed by taking medications, after that applying heat packs or taking a hot shower, this was consistent for the study by Guvenc et al. were they had same result about coping ways for pain relief.[4] This study offers

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valuable data to illustrate the frequency of dysmenorrhea among medical and nursing students, as well as the strategies employed to manage it. It is believed that this will be a valuable resource for healthcare professionals in providing health education to students.

Conclusion

Female medical students frequently experience dysmenorrhea, which is a serious issue and the main reason for not attending school or college, however the study did not establish a significant connection between BMI and dysmenorrhea. we recommend future studies to include larger sample size or fixing any limitation.

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