

Lifestyle Risk Factors and Occurrence of Primary Dysmenorrhea among Adolescents: Suggested Guidelines

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Abstract

Background: Primary dysmenorrhea (PD), a painful menstrual flow without any pelvic disease, is characterized by spasmodic discomfort that is primarily felt in the lower abdomen. Major contributing factors that up the severity of primary dysmenorrhea are lifestyle choices. **Aim:** It was 3 folds: (1) assess the occurrence of primary dysmenorrhea among adolescents, (2) explore the effects of specific lifestyle variables on the occurrence and severity of primary dysmenorrhea, and (3) design suggested guidelines to avoid occurrence of primary dysmenorrhea. **Design:** A cross sectional study was utilized. **Sample:** a convenience sample of 200 adolescents was recruited. **Setting:** Faculty Of Nursing, Mansoura University Egypt, **Tools:** Three tools were utilized to collect data; 1) Interviewing Questionnaire schedule, 2) dysmenorrhea assessment scale and 3) Lifestyle risk factors assessment questionnaire. **Results:** the mean age of adolescent was 21.3 ± 1.34 years with 91% of them had primary dysmenorrhea. There was statistical significant relation between occurrence of primary dysmenorrhea and academic level, age at menarche, daily activities, skipping breakfast, type of food, amount of fast food, drink caffeine, number of cups of water per day, physical activities ($p < 0.05$). **Conclusion:** Primary dysmenorrhea is found to be highly prevalent among adolescent. There was a correlation between life style risk factors and the occurrence of primary dysmenorrhea among adolescent as daily activities, skipping breakfast, type of food, number of fast food, drink caffeine, number of cups of water per day, physical activities ($p < 0.05$). **Recommendations:** Ongoing health education programs must be offered by nurses to adolescents that will consequently enhance their knowledge and practices that reduce the occurrence of primary dysmenorrhea and improve their health status.

Keywords: life style risk factors, primary dysmenorrhea, adolescents.

Introduction

Dysmenorrhea is a common complaint among adolescent girls who are menstruation, and it is a serious health issue because it affects 50–90% of the general population and has an impact on both future fertility and lifestyle choices. Dysmenorrhea, or painful menstruation, is marked by intense, excruciating cramping in the lower abdomen. It is frequently accompanied by additional symptoms like sweating, headaches, nausea, vomiting, diarrhea, and trembling, all of which happen just before or during the menses. For teenage girls, it is the main reason for missed school days. Dysmenorrhea can be primary, without an underlying organic pathology, or secondary, with a clear pathology. Secondary dysmenorrhea, which is more prevalent in

women older than 20 years old and is brought on by underlying pelvic problems or pathology (Karanth & Liya, 2018).

Primary dysmenorrhea (PD) is referred to pain with no obvious pathological pelvic disease and almost first occurs in females 20 years of age or younger after their ovulatory cycles become established. Primary dysmenorrhea (PD) is caused by prostaglandin-induced uterine contractions. Primary dysmenorrhea tends to occur with the onset of ovulatory cycles and usually improves with time, coincides with the onset of menstrual bleeding, and frequently associated with other prostaglandin-mediated symptoms such as nausea, vomiting, diarrhea, and dizziness. The pain is sharp and crampy, and is located in the lower midline. The pelvic

examination of a non-menstruating client with primary dysmenorrhea should not demonstrate tenderness or other pathological changes (Matthewman, Lee, & Kaur, 2018).

Among adolescents, primary dysmenorrhea prevalence varies between 16% and 93%, with severe pain perceived in 2 to 29 % of the studied girls. (Akiyama, Goren, Basurto, Komori & Harada, 2018). Another study was done by Al-Jefout, Seham, Jameel, and Luscombe, (2015), which reported that; 80.9% among 550 female students in six universities across Jordanian. The majority had moderate (56%) to severe (34.6%) menstrual pain which significantly affected their daily living activities and studying ability. In the same line primary dysmenorrhea detected among 53.8% of the studied students and 67.3% complained of premenstrual symptoms with a significant association between dysmenorrhea and class absenteeism (Karki & Gupta, 2017).

Lifestyle risk factors were significantly associated with the intensity of primary dysmenorrhea, including underweight; lower family income, an irregular menstrual cycle, an earlier age at menarche, a maternal history of dysmenorrhea, and skipping breakfast (Hu, Tang, Chen, Kaminga, & Xu, 2020). Moreover, short sleeping hours less than 6 hours every day and sports activity levels, eating behavior, physical activities, stress, and social relationships are associated with primary dysmenorrhea, while self-care and smoking, drinking, and drug use are not associated (Bavil, Dolatian, Mahmoodi, & Baghban, 2016). Several risk factors have been proven to increase the occurrence of primary dysmenorrhea as early age at menarche (< 12 years), heavy or prolonged menstrual flow, smoking, positive family history and obesity. From menarche and throughout the pubertal years there are significant rise in depressive features and anxiety and smoking activities. PD has different levels of negative impacts on the physical, psychological and social functions of women, leading to short-term absences from study or work. Despite the high prevalence of PD among adolescents and young women worldwide, PD is often poorly treated and even disregarded by health professionals, pain researchers and the women themselves (Hailemeskel, Demissie, & Assefa, 2016).

The study of lifestyle risk factor domains has received very little attention; despite the fact that adopting an appropriate lifestyle can lessen the severity of primary dysmenorrhea since healthy eating habits and regular exercise are the most effective treatments for treating the symptoms of menstrual disorders and averting further complications. It is crucial for all adolescents with menstrual disorders, whether overweight or in the healthy weight range, to adopt a healthy intake of nutrients, vitamins, and minerals in addition to focusing on exercise guidelines. This is because a modified healthy lifestyle incorporating the complementary components of health promoting and preventing health behavior can reduce health risks by raising the adolescent level of healthy well-being, self-actualization, and personal fulfilment as reported by Indu, Gurika, Dinesh, and RK (2020).

Following three levels of prevention; community health nurses, obstetrics and gynecological nurses have a critical role regarding prevention and management of primary dysmenorrhea. They stimulate community awareness toward the problem particularly in its control. They should expand their roles regarding primary dysmenorrhea through proper early management of adolescents' cases who have experienced menstrual disorders. Effective lifestyle adjustments require cooperation between different agencies for benefits of provision of welfare and recreational activities. Adolescents' motivation improves their positive feeling regarding primary dysmenorrhea and pain control (Ethridge, Mackellar & Branson, 2015; Wilson, 2015). Thus, the main objective of the current study is to assess primary dysmenorrhea and to explore relation with lifestyle risk factors among adolescents.

Significance of the study

The prevalence of primary dysmenorrhea In Egypt was (62%) according to study was conducted by Abdel-Sattar, Mansour, Mostafa, and Abdel-Azim (2018) with moderate pain 74.6% of them. A cross-sectional study was performed in Alexandria, Egypt on a sample of 900 ever-married women aged (18–59) years, concluded that the prevalence of dysmenorrhea was 55.3%, pain was perceived as severe in approximately one third of them 32.2%, while, moderate cramping pain and moderate heaviness reported in 40% of them (Muhammad, Nossier, & El-Dawaiaty, 2011).

In, Egypt, dysmenorrhea was reported by 66% of 285 students at Zagazig University, 28.4% of them graded their pain as mild, 24.2% as moderate, and 13.3% as severe prevalence of menstrual disorders and its effect their health status and quality of life (Nooh, Abdul-Hady, & El-Attar, 2016). Primary dysmenorrhea is a serious clinical problem that places considerable public health burden. There are insufficient literatures on associations among socio-demographical characteristics, lifestyle risk factors and menstrual cycle factors with severity of PD and the experiences of adolescents to increase the understanding of phenomenon and its implications on their life (Abu Helwa, Mitaeb, Al-Hamshri & Sweileh, 2018).

There are a few researches examining the prevalence dysmenorrhea and the correlated lifestyle risk factors, however in Egypt there are scanty of published studies conducted in this area among adolescents. Thus, the findings of the current study will contribute to enhance knowledge regarding occurrence of primary dysmenorrhea among adolescents and will find out its' correlated lifestyle risk factors. Consequently, this study will help community health nurses, obstetrics and gynecological nurses to have data base about primary dysmenorrhea among adolescents and lifestyle risk factors. Furthermore, the current research will be carried out in an attempt to describe to what extent the study sample are at risk of various health problems, this may guide the planning for future interventions for them, and it might also generate an attention and motivation for further researches in this area of study, (Stanhope, & Lancaster, 2015) & (Karout, Soubra, Rahme, Khojah, & Itani, 2021).

Aim of the study

The aim of the current study was of 3 folds: (1) assess the occurrence of primary dysmenorrhea among adolescents, (2) explore the effects of specific lifestyle variables on the occurrence and severity of primary dysmenorrhea, and (3) design suggested guidelines to avoid occurrence of primary dysmenorrhea.

Research Questions

To achieve the aim of the current study, the following research questions were developed:

Q1. What is the occurrence level of primary dysmenorrhea among adolescents?

Q2. What are the correlated life style risk factors and primary dysmenorrhea among adolescents?

Subjects and Methods

Research design

A cross sectional study design was utilized to achieve the aim of the current study.

Setting

The current study was conducted at Faculty of Nursing; Mansoura University, which is one of the public universities in Egypt and has been enrolling students from different regions. The participants of the study were all regular female nursing students who were selected from first year to fourth year levels.

Sample

A convenience of 200 adolescents at faculty of nursing were recruited according to the following inclusion criteria: single, had menarche, aged between 18–25 years old and willing to participate in the study, while any adolescent was diagnosed with any gynecological disorder was excluded from the current study.

Study Tools

Three tools were utilized to collect data for the current study, interviewing questionnaire schedule, dysmenorrhea assessment scale and another adopted tool, lifestyle risk factors assessment questionnaire.

Tool I: Interviewing Questionnaire

Schedule: it was developed by the researchers and divided into three sections: (a) Demographic characteristics of adolescents, which include personal data such as age, place of resident, health insurance. (b) Anthropometric measures of adolescents: which include height, weight, and body mass index. (c) Adolescents menstrual history as; age of menarche, menstrual regularity, menstrual interval duration, menstrual bleeding duration, amount of blood.

Tool II: Dysmenorrhea Assessment Scale:

This tool was a modified questionnaire adapted from Vlachou et al. (2019) data for evaluation of the dysmenorrhea grade, which includes the effect of menstrual pain on activity of daily living, degree of pain if was (mild, moderate, or severe).

Scoring system. According to Numerical Rating Scale (NRS), it's a line with equidistant marks from 0 to 10, (1-3 for mild pain, 4-7 for

moderate pain, and 8-10 for severe pain) , using analgesic, and physical symptoms as; vomiting, nausea, headache, diarrhea and fatigue according to the scoring system used for dysmenorrhea.

Grade 0. (no dysmenorrhea): menstruation is not painful and daily activities are not affected.

Grade 1. (mild): menstruation is painful but seldom inhibits normal activity and pain killers are rarely required.

Grade 2. (moderate): painful menstruation and affects daily activities.

Grade 3. (severe): is a painful menses that severely limit normal daily activities and results in noticeable symptoms (such as headache, fatigue, vomiting and diarrhea) and refractory to analgesics.

Tool III: Lifestyle risk factors assessment questionnaire: This tool was adopted from Ibrahim, Elsayed, Reyad, and Azzam (2018), this tool includes lifestyle habits as; dietary habits (type of dietary intake, frequency, skipping meals, drinking water, fruits intake, vegetable intake, sweats intake, caffeine intake, soft drinks, fast food), smoking, sleeping hours, watching T.V, computer using and exercise.

Tool Validity and Reliability:

Study tools were designed and adapted after extensive literature review and sent to a panel of five experts' staff in the field of community and maternity nursing, Faculty of Nursing – Cairo University and Mansoura University. Each expert on the panel was asked to examine the instruments for face and content validity. Modifications were made based on of panel's judgment of the clarity of the sentences and appropriateness of the content, while reliability of the study tools was tested using Cronbach's α (alpha) ($r=0.88$).

Procedures:

Before conducting the study the researchers reviewed of the recent literatures to construct and prepare tool for data collection and an official permission was granted from the vice dean of the student affair at the Faculty of Nursing at Mansoura University. Data collection was carried out from the first of October till the end of December 2020. The procedure was carried out through interviewing and assessment of

adolescents' life style risk factors and primary dysmenorrhea.

Interviewing and assessment:

All adolescents from various academic levels were invited to participate in the current study voluntarily. Adolescents who met the inclusion criteria and willing to participate in the study were recruited. The researcher explained the aim of the study to the nursing students to gain their cooperation and formal consent through individual interviewing with each adolescent which took nearly 15-20 minutes to complete the needed data at the students' waiting area. All recruited adolescents filled (Interviewing Questionnaire Schedule) which consisting of data related to personal characteristics, menstrual history, and general examination for height, weight, and body mass index (kg/m^2) was done. Identifying grades of dysmenorrhea and pain severity using dysmenorrhea assessment scale. Students who identified as severe dysmenorrhea (Grade 3) were referred for specialist as needed. Then, lifestyle risk factors (habits as; dietary habits and exercise routine was assessed, the assessment results was documented in (Lifestyle Risk Factors Assessment Questionnaire). Then the researchers suggested guidelines for adaptive lifestyle to minimize occurrence of primary dysmenorrhea among adolescents and to promote their health.

Ethical considerations:

An official permission from the faculty of nursing vice dean for the education and students affairs moreover, an approval will be obtained from the Faculty of Nursing Research Ethics Committee, Faculty of nursing, Mansoura university were obtained to conduct the proposed study. Oral and written informed consent was taken from each subject who was willing to participate in the research. The researchers introduced themselves to adolescents who were met the inclusion criteria and informed them about the purpose of the study in order to obtain their acceptance to participate in this research and emphasized that the study posed no risks or hazards on their health. All adolescents were informed that, participation in the research is voluntary and any one can withdraw from this study at any time without giving any reason. Confidentiality of the subjects was assured through coding the data, a unique identifying number was assigned to the data collected for each subjects. The subjects were assured that, the

data will not be reused in another research without their acceptance.

Pilot study

Twenty adolescent (10%) who met the criteria for inclusion were recruited for the pilot study based on the total number of the sample. The pilot study was carried out to check clarity of items in the tools questions, time needed to answer questions. Additionally, to identify any difficulties that may arise and need to be handled before applying the study. All adolescents participated in the pilot research were included in the research sample.

Statistical Analysis

Statistical package for the social science (SPSS) software, version 23 was used for data entering and analysis. Data management was done by coding and entering responses into computer. The investigator checked all data to avoid any discrepancies. Descriptive statistics were used to analyze the sample population: mean, standard deviations and frequency distributions were used. Inferential statistics: chi square was used test for qualitative data. Regarding level of significance, for all statistical tests done, the threshold of significance was fixed at the 5% level (P-value). A P-value > 0.05 indicates a statistically non-significant results and the P-value \leq 0.05 indicates a statistically significant results, P-value \leq 0.01 indicates as highly significant result.

Results

The statistical findings were presented in the following order: **The first section** is devoted to description of the demographic characteristics of adolescents. **The 2nd, 3rd, and 4th sections** present the result that answered the research questions in relation to variables such as primary dysmenorrhea, life style and relations among study variables.

Table 1 displays the demographic data of 200 adolescents in the study, whose age's ranged from 20-24 years old with a mean age of 21.3 ± 1.34 years. Forty-seven percent of adolescents their age were less than 22 years old, 31 % of the adolescents their age were less than 20 years old and 22% of the adolescents their age was less than 24 years old. Also 80% of them were live in urban area, while 20% of them were live in rural area.

Figure 1 reflects that, 49% of the adolescents were in the fourth level of university

education, while 9% of them were in the first level.

Table 2 shows that, the mean body weight of adolescents was (62.6 ± 12.56) Kg, 68% of them their body weight ranged from $50 < 75$ kg, 14% of them were $75 < 100$ kg, while 17% of them were less than 50kg. Regarding body mass index (BMI) of adolescents: 63% of them have normal body weight (18.5-24.9), 25% of them were overweight, and 7% of them were obese, while 5 % of them were underweight with mean of (23.78 ± 4.3) Kg/m².

Table 3 clarifies that; the mean age of menarche was (14.07 ± 1.53) years old, 60% of them had the menarche at age of ($13 < 16$ years), 35% of adolescents were ($11 < 13$ years) and only 5% of adolescents their age at menarche was more than 16 years. Sixty-nine percent of adolescents had regular menstruation and 7% have excessive amount of blood during menstruation. The mean duration of menstruation was (5.03 ± 1.47) days and the mean of interval between menstruations was (27.7 ± 4.92) days.

Table 4 and figure 2 reveals that, the prevalence of occurrence of primary dysmenorrhea was (182) 91% of the study sample with mild, moderate and sever pain (17%, 44%, 39%) respectively. Forty-six percent of the subjects the pain affect strongly on their daily activities, while 8% of them the pain prevent following their daily activities. Regarding to the use of analgesic to relief pain, 40% of the participants always use analgesic to relief pain, 36% of them rarely use it and 22.8 % of them doesn't use analgesic. Moreover, participants who have physical symptoms during menstruation as; nausea, vomiting, headache, diarrhea and fatigue with percentage of (38.5%, 14.3%, 53.8%, 34.1% and 58.7%) respectively.

Figure 3 clarifies that, 91 % of adolescents have primary dysmenorrhea divided into three grades. Grade 2 was detected among 52% of adolescents as reported by them, while grade 1 was presented in 31% as compared to grade 3 presented in 8% of them. While 9 % of adolescents have Grade zero which means no signs of primary dysmenorrhea.

Regarding to dietary habits of adolescents, table 5 shows that, 47% of them eating 3 times/day, 33% of them eat twice /day, 53% of the them eat from home while, 36% of them eat from out of home. The main sources of adolescents' meals were carbohydrates,

vegetables, fruits and meat (30%, 6%,5%, 4%) respectively and 50% of them reported that they eat all types of food. Out of 200 adolescents; 45% eaten fast food 2-3 times/ week, 36% of them drank water 3-4 cups/ daily and 35% drank (5-6) cups of water/day.

Table 6 reflects that; In relation to diet pattern, 33% of adolescents drinking cola for 2-3 times /week. Adolescents eating biscuits and cake 40% of them ate it (2-3 /week), 31% of them eating vegetables (once/day), 62 % of them eating fruits (once/day) and eating meat (once/day) as reported by 74% of them, 48% of adolescents drinking milk (once/day), while 40% of them did not drink the milk at all and 36% of them drinking caffeine (2/day).

Table 7 shows that; watching TV for 1-2hrs/day detected among 41% of adolescents while, 32% of them watching it for 3-4hrs/day. In addition, 35% of them used computer for 3-4 hrs. /day, 26% used it for 1-2hrs/day. Twenty-seven percent of them slept less than 5 hrs./day while, 36% of them slept from 5 hrs.to less than 7 hrs. /day and 34% of them slept 7 hrs. to less than 9 hrs. /day. Also, 75% of adolescents did not practice any kind of physical exercise while, 25%

of them practiced walking sport and another types of sports.

Regarding to relation between personal characteristics of adolescents and occurrence of primary dysmenorrhea table (8) shows that there was statistical significant relation between primary dysmenorrhea and academic level ($\chi^2=8.68$, $P= 0.033$). Also, there was highly statistical significant relation between primary dysmenorrhea and adolescents age at menarche, daily activities ($\chi^2=66.17$, $P= 0.001$, $\chi^2=112.08$, $P= 0.001$ respectively). While there was no statistical significant relation between primary dysmenorrhea and place of residence place ($\chi^2=4.35$, $P= 0.226$).

Concerning relation between life style behavior and occurrence of primary dysmenorrhea table (9& 10) shows that, there was statistically significant relation between skipping breakfast, type of food, fasting food, water per day, drinking caffeine , regular exercise and occurrence of primary dysmenorrhea ($p=0.001$). While there was no statistical significant relation between; number of food outside the home, sources of diet, sleeping hours per day and occurrence of primary dysmenorrhea ($p > 0.05$).

Section I: Demographic characteristics of the study sample: Table (1-2-3), Figure (1)

Table (1): Frequency and percentage distribution of demographic characteristics among adolescents (n=200).

Variables	No.	%
Age:		
-20	62	31.0
-22	94	47.0
-24	44	22.0
Mean \pm SD	21.3\pm1.34	
Place of Residence:		
Rural	40	20.0
Urban	160	80.0

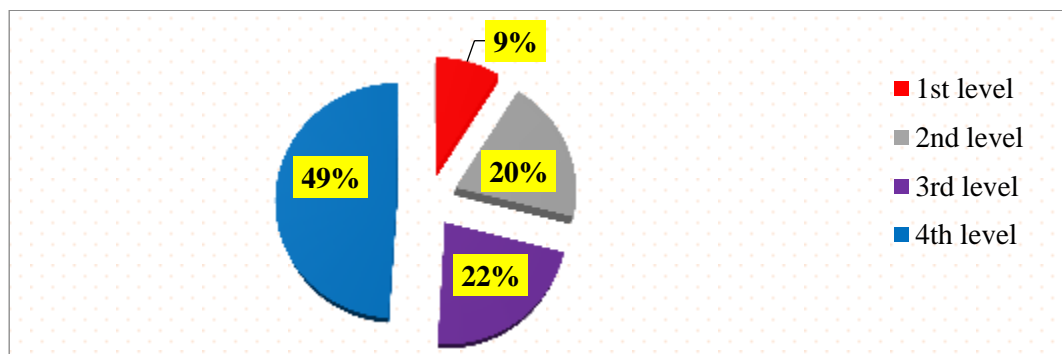


Figure (1): Frequency distribution of adolescents according to their academic level (n=200)

Table (2): Frequency distribution of anthropometric measures of adolescents (n=200)

Anthropometrics measures	Categories	No.	%
Weight	<50 KG	34	17.0
	50-<75 KG	136	68.0
	75<100KG	28	14.0
	100 kg and more	2	1.0
Mean \pm SD	62.6\pm12.56		
Height	<150 cm	6	3.0
	150-175 cm	194	97.0
Mean \pm SD	161.78\pm5.79		
Body Mass Index (BMI)	<18.5 (underweight)	10	5.0
	18.5-24.9 (normal)	126	63.0
	25-29.9 (overweight)	50	25.0
	30 and more (obese)	14	7.0
Mean \pm SD	23.78\pm4.3		

Table (3): Frequency distribution of menstrual history among adolescents (n=200)

Menstruation Variables	Categories	No.	%
Age at menarche	11<13 years	70	35.0
	13<16 years	120	60.0
	16<18 years	10	5.0
Mean \pm SD	14.07\pm1.53		
Regularity	Yes	158	79
Amount of blood	Scanty	12	6.0
	Moderate	174	87.0
	Heavy	14	7.0
Duration	2-3 days	28	14.0
	4-5 days	100	50.0
	6-7 days	60	30.0
	8-10 days	12	6.0
Mean \pm SD	5.03\pm1.47		
Mean interval between period/days	27.7\pm4.92		

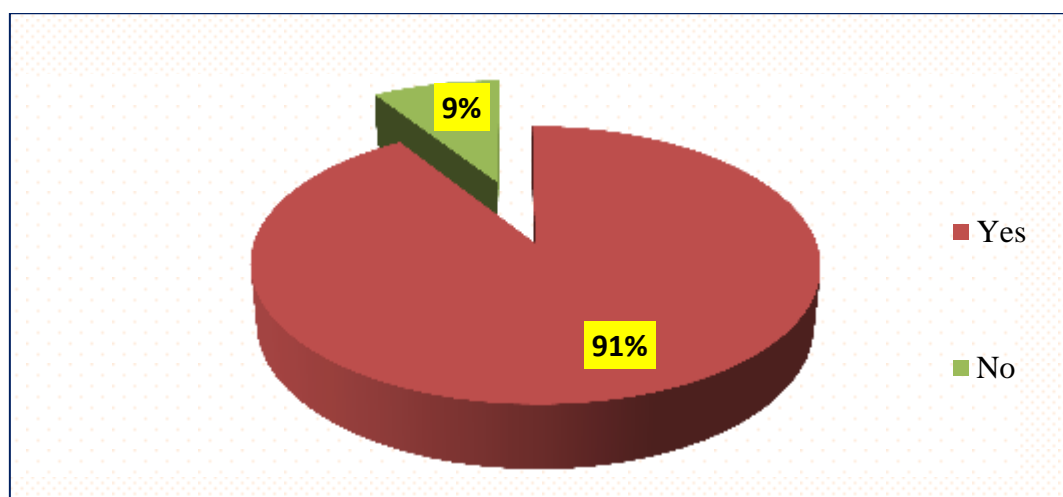
Section II: Primary dysmenorrhea assessment among adolescents: figures (2, 3) and table (4).**Figure (2):** Frequency distribution of adolescents according to occurrence of primary dysmenorrhea (n=200).

Table (4): Frequency distribution of adolescents according to their menstrual characteristics (n=182).

Variables	Categories	No.	%
-Pain severity:	Mild	31	17.0
	Moderate	80	44.0
	Severe	71	39.0
-Effect on daily activities:	No effect	27	15.0
	Rarely affect	56	31.0
	Affect strongly	84	46.0
	Prevent daily activities	15	8.0
-Need for analgesia:	No need	41	22.8
	Rarely use it	66	36.0
	Always use it	73	40.0
	Doesn't affect pain	2	1.2
-Premenstrual symptoms ^a	Nausea	70	38.5
	Vomiting	26	14.3
	Headache	98	53.8
	Diarrhea	62	34.1
	Fatigue	156	58.7

Note. ^a Responses are not mutually exclusive.

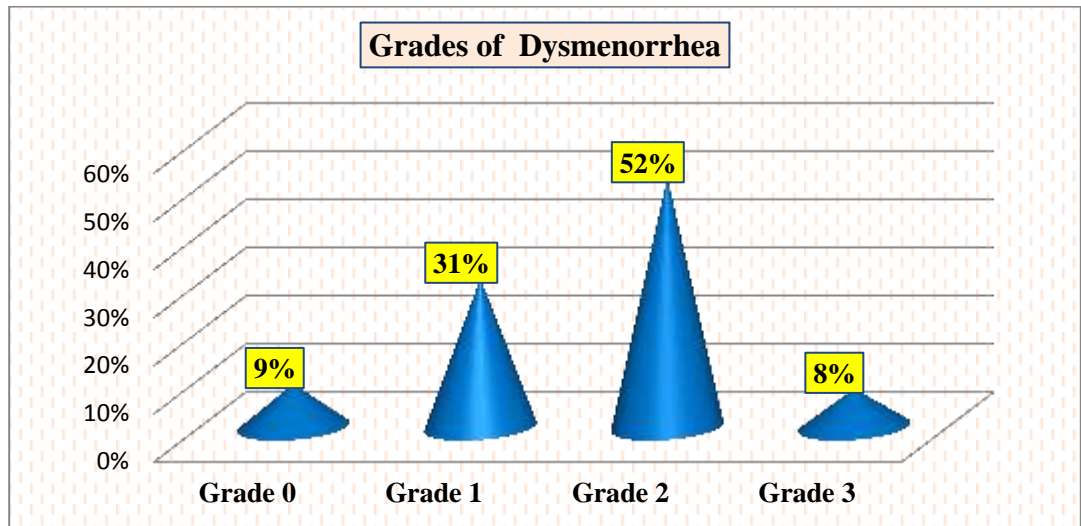


Figure (3): Frequency distribution of adolescents according to grades of dysmenorrhea (n=200)

Section III: Lifestyle risk factors among the study sample: Table (5, 6,7)**Table (5):** Frequency distribution of adolescents regarding their life style (dietary habits) (n=200).

Dietary habits	No.	%	Dietary habits	No.	%
-Mean number of diets /day	2.91±0.81		-Type of food in daily diet:		
-Source of diet:			Meat	8	4.0
Home	106	53.0	Carbohydrates	60	30.0
Out of home	72	36.0	Vegetables	12	6.0
University campus residence	22	11.0	Fruits	10	5.0
-Number of diet from outside home:			Fish	2	1.0
Rarely	18	9.0	Beans	4	2.0
Once /week	60	30.0	Sugar	4	2.0
2/week	68	34.0	All	100	50.0
3/week	54	27.0	- No. of water cups/day:		
-Skipping breakfast:			1-2/day	16	8.0
Rarely	60	30.0	3-4/day	72	36.0
Once /week	58	29.0	5-6/day	70	35.0
2/week	52	26.0	7-8/day	30	15.0
3/week	30	15.0	9 and more /day	12	6.0
-No of fast food:			- Drinking cola		
Rarely	30	15.0	Rarely	50	25.0
Once /week	60	30.0	Once /week	64	32.0
2-3/week	90	45.0	2-3/week	66	33.0
4 Or more/week	20	10.0	4 & more/week	20	10.0

Table (6): Frequency distribution of adolescents regarding their life style (Diet Pattern) (n=200).

Diet Pattern	No.	%	Diet Pattern	No.	%
- Eating biscuit or cake:			- Eating proteins /day:		
Rarely	22	11.0	Sometimes	8	4.0
Once /week	54	27.0	Everyday	148	74.0
2-3/week	80	40.0	Every 2 days	30	15.0
4&more/week	44	22.0	Every 3 days	14	7.0
- Eating vegetables /day:			- Drinking milk /day:		
Sometimes	116	58.0	No	80	40.0
Once /day	62	31.0	Once /day	96	48.0
2/ day	20	10.0	2/ day	16	8.0
3&more/ day	2	1.0	3&more/ day	8	4.0
- Eating fruits /day:			- Drinking caffeine/day:		
Sometimes	4	2.0	No	22	11.0
Once /day	124	62.0	Once /day	48	24.0
2/ day	52	26.0	2/ day	72	36.0
3&more/ day	20	10.0	3&more/ day	58	29.0

Table (7): Frequency distribution of adolescents regarding their lifestyle (Daily Activity Style) (n=200).

Tasks	Categories	No.	%
Watching T.V hours/day:	No	38	19.0
	1-2 hr. /day	82	41.0
	3-4 hr./ day	64	32.0
	5 hrs. & more/ day	16	8.0
No. of using computer/day	No	44	22.0
	1-2 hr. /day	52	26.0
	3-4 hrs./ day	70	35.0
	>5 hrs.	34	17.0
No. of sleeping hours/day	<5 hrs.	54	27.0
	5-< 7 hrs.	72	36.0
	7-< 9 hrs.	68	34.0
	9-11 hrs.	6	3.0
Regular physical exercise	Yes	50	25.0
Physical exercise/week	1-2 /week	28	14.0
	3-4/ week	12	6.0
	5&more/ week	10	5.0
Smoking	No	200	100.0

Section IV: Relations between variables under the study. Tables (8,9,10)**Table (8):** Relation between personal characteristics of adolescents and occurrence of primary dysmenorrhea (n=182)

Personal Characteristics	Primary dysmenorrhea		χ^2 test	
	No.	%	χ^2	P
Age level				
-20	58	31.9	3.18	0.20
-22	82	45.1		
-24	42	23.1		
Academic level				
First	18	9.9	8.68	0.033*
Second	32	17.6		
Third	40	22		
Fourth	92	50.5		
Residence				
Urban	146	80.2	0.06	0.50
Rural	36	19.8		
Age at menarche				
-11	64	35.2	66.17	0.001**
-13	116	63.7		
-16	2	1.1		
BMI categories				
Underweight	10	5.5	3.19	0.36
Normal	110	60.4		
Overweight	46	25.3		
Obese	14	7.7		
Daily activities				
No affect	12	6.6	112.08	0.001**
Rarely affect	62	34.1		
Strongly affect	92	50.5		
Prevent daily activities	16	8.8		

Note. *Statistically significant at $p \leq 0.05$

**Highly significant at $p \leq 0.001$ level (2-tailed)

Table (9) Relation of lifestyle behavior (diet pattern) and occurrence primary dysmenorrhea among adolescents (n=182).

Life style behavior	Primary Dysmenorrhea		χ^2 test	
	No.	%	χ^2	p
-Source of diet				
Home	96	52.7	0.06	60.9
Out of home	66	36.3		
University campus residence	20	11		
-Number of diet from outside home				
Rarely	16	8.8	4.81	0.18
Once/week	52	28.6		
2/week	66	36.3		
3/week	48	26.4		
-Skipping breakfast				
Rarely	48	26.4	16.87	0.001**
Once/week	56	30.8		
2/week	52	28.6		
3/week	26	14.3		
-Type of food				
Meat	8	4.4	54.61	0.001**
Carbohydrates	54	29.7		
Vegetables	4	2.2		
Fruits	10	5.5		
Fish	2	1.1		
Beans	4	2.2		
Sugar	4	2.2		
All	9	4.9		
-Number of fasting food/week				
Rarely	28	15.4	13.32	0.004**
Once /week	54	29.7		
2-3/week	86	47.3		
4 or more/week	14	7.7		

Note. *Statistically significant at $p \leq 0.05$

**Correlation is highly significant at $p \leq 0.001$ level (2-tailed)

Table (10): Relation between life style behavior and occurrence primary dysmenorrhea among adolescents (n=182).

Life style behavior	Primary Dysmenorrhea		χ^2 test	
	No.	%	χ^2	p
Number of cups of water /day				
1-2/day	14	7.7	11.65	0.04*
3-4/day	68	37.4		
5-6/day	66	36.3		
7-8/day	26	14.3		
9 and more /day	8	4.4		
Number of drinking caffeine/day				
No	20	11	16.82	0.002*
Once /day	44	24.2		
2/ day	70	38.5		
3&more/ day	46	25.3		
Number of sleeping hours				
<5 hrs.	48	26.4	6.99	0.07
5-<7 hrs.	58	31.9		
7-< 9 hrs.	70	38.5		
9 – 11 hrs.	6	3.3		
Regular physical exercise				
Yes	132	72.5	6.59	0.004*

Note. *Statistically significant at $p \leq 0.05$

**Highly significant at $p \leq 0.001$ level (2-tailed)

Discussion

Primary dysmenorrhea is one of the most common complaints among adolescents; it affects the quality of life in their reproductive years. Many risk factors are significantly associated with more severe episodes of dysmenorrhea, these include earlier age at menarche, heavy menstrual flow, smoking, positive family history, obesity and alcohol consumption, dysmenorrhea is a substantial public health burden because of its high prevalence, and because it one of the leading causes of absenteeism from school and work. It is responsible for a significant loss of earnings and diminished quality of life (Ferries-Rowe, Corey, & Archer, 2020). So, it is necessary to assess lifestyle risk factors and occurrence of primary dysmenorrhea.

The current study found that the prevalence of primary dysmenorrhea in adolescents aged between 18 and 24 years old in faculty of nursing, Cairo University was high and that less than one half of them reported moderate to severe primary dysmenorrhea in the same sample. Both prevalence rates tended to peak in the oldest age group, 22–23 years old. The PD prevalence found in this study in the same line within the range of reported values, from 45% to 95% worldwide by (Al-Kindi, & Al-Bulushi, 2011) who studied Prevalence and Impact of Dysmenorrhea among 404 Omani High School Students. However, it is more than the prevalence rates of 64.8%, 85.1%, 85.7% and 88% reported in Western countries in a study of Zurawiecka, and Wronka (2018) to examine the prevalence and factors correlated with primary dysmenorrhea in young female subjects among 1305 female university students in Helsinki, Finland. Furthermore, the moderate to severe PD prevalence found in this study is about two thirds but slightly less than one third reported in Western countries.

There are many studies on prevalence of primary dysmenorrhea among adolescents circulated from Arab Middle Eastern countries. A cross-sectional study conducted in Kingdom of Saudi Arabia to assess the prevalence of dysmenorrhea and associated menstrual symptoms and their self-management

techniques among 197 adolescents discovered that more than one third of university females had severe dysmenorrhea (Al-Dabal, Koura, Al-Sowielem, & Barayan, 2014). Another study among female medical students in Kingdom of Saudi Arabia showed that the prevalence of dysmenorrhea increased to reach less than two thirds. While, in Egyptian study conducted by Abd El-Hameed, Mohamed Ahmed and Ahmed (2011) to assess the prevalence & pattern of dysmenorrhea and to examine the menstrual hygiene practices among 160 adolescents in nursing schools in Elminia, Egypt reported very high prevalence that constitute the majority of participants. While a study from Lebanon to assess the prevalence of dysmenorrhea among adolescent girls in Sidon city and suburbs, Lebanon, and to explore its possible relationship with menstrual experience on 389 female adolescent girls, reported prevalence of dysmenorrhea nearly about three quarters (Santina, Wehbe, & Ziade, 2012). Collectively, these studies confirm the variable nature of prevalence of dysmenorrhea among various female students in different Arab countries and even within the same country. From the researcher's point of view this difference in prevalence of primary dysmenorrhea between countries rely to cultures, lifestyle, and sociodemographic variables.

The current study revealed that, there was statistically significant relation between age at menarche, academic level, daily living activities and occurrence of primary dysmenorrhea ($p < 0.05$). Also, there is no statistically significant relation between age of the study sample, residence, BMI categories and occurrence of primary dysmenorrhea ($p > 0.05$). In the same line, A study done by Helwa, Mitaeb, Al-Hamshri, and Sweileh (2018) to detect Prevalence of dysmenorrhea and predictors of its pain intensity among 956 female university students in An-Najah National University, Palestine and showed that, no relationship between BMI and dysmenorrhea or severity of pain. In addition to that, no relationship was found between physical activity, smoking, consumption of salty or sweet food and dysmenorrhea or its pain intensity. Similar results by Maruf, Ezenwafor, Morooof, Adeniyi, and Okoye

(2013) were obtained by a study conducted in Nigeria to explore the association of PA and adiposity indices with PD and associated menstrual pain on 1383 female adolescents where researchers reported no significant relationship between dysmenorrhea or its pain intensity with factors such as BMI, waist circumference, and physical activity.

The present study showed that, there was statistically significant relation between skipping breakfast, type of food, fasting food, water per day, drinking caffeine, regular exercise, and occurrence of primary dysmenorrhea ($p=0.001$). Furthermore, no statistically significant relation between number of foods outside the home, sources of diet, sleep hours per day and occurrence of primary dysmenorrhea (>0.005). This may be due to the daily consumption of the four major food groups; research has shown that a diet high in fish, eggs, vegetables, and fruits is associated with a low prevalence of dysmenorrhea. Moreover, eating breakfast helps reduce the incidence of dysmenorrhea (Woolven, 2010).

The current study showed that there was a statistically significant relation between regular exercise and occurrence of primary dysmenorrhea ($p=0.001$). This may be related to regular exercise acts as a non-specific analgesic by improving pelvic blood circulation and stimulating the release of beta-endorphins. Exercise prevents and abates dysmenorrhea by helping to reduce mental pressure, to improve mood, and to reduce the percentage of body fat, which is crucial given that obesity is associated with a high prevalence of dysmenorrhea. These results supported by results of Salehi, Marefati, Mehrabian, and Sharifi (2012) who investigating the effects of Pilate's exercises on the primary dysmenorrhea among 1500 female students in Kerman, Iran and found significant differences between study and control groups in terms of the intensity and duration of pain after eight weeks of Pilates exercise for primary dysmenorrhea (Salehi et al., 2012).

The current study reflected that no one of adolescents were smoking these results contradicted the results of a study conducted by Xiao et al. (2022) to investigate the

association between passive smoking and menstrual discomfort on 2,571 Non-smoking Chinese Nurses student and found a significant relationship between smoking at home and at work and menstrual disorders and dysmenorrhea and that the prevalence of dysmenorrhea was higher in women smokers, While the study done by Bavit et al. (2016) to examine the relationship between lifestyle and primary dysmenorrhea on 250 students with primary dysmenorrhea in Sari University of Medical Sciences, Iran who did not find any significant differences between the two groups in terms of smoking. It may be due to cultures, lifestyle variables, also the nicotine content of cigarettes, which causes vasoconstriction, and the resultant hypoxia then contributes to myometrial contraction.

This study revealed that less than two thirds of adolescents BMI from (18.5- 24.9) that considered as normal with no statistically significant relation between BMI and occurrence of primary dysmenorrhea these results contradicted the results of Ezbarami, Mirzaei, and Esfarjani (2014) who to compare the prevalence and severity of dysmenorrhea among athletes and non-athlete girls and its relationship with body composition on 223 healthy students from Guilan university, Iran and found a significant positive relationship between a high BMI and dysmenorrhea. The disparity of results may be attributed to how BMI is affected by various factors, such as race, age, and gender and how it is not an appropriate obesity index and need more specific measures for validation.

The current study revealed that less than two thirds of adolescents aged from 13<16 years during menarche and the duration of menstrual period of one half of them last from 4-5 days with a positive relation between age of menarche and occurrence of primary dysmenorrhea. These results contradicted the results of Dehnavi, Jafarnejad and Kamali (2018) to determine the effect of 8 weeks of aerobic exercise on the severity of primary dysmenorrhea on 70 students with primary dysmenorrhea in dormitories of Mashhad University of Medical Sciences and found no significant differences were observed between the two groups in terms of age at menarche, duration of menstruation, and menstrual cycle.

While Hashim et al. (2020) who study the prevalence of primary dysmenorrhea and its associated factors, and to assess its effect on the quality of life among 376 female medical students at King Saud University student found a significant relationship between age at menarche and the severity of primary dysmenorrhea, long menstrual cycles, heavy bleeding, and menstruation lasting longer than seven days increase the risk of primary dysmenorrhea). However, Chung, Chen, and Yeh (2012) who study the effectiveness of acupoint stimulation for primary dysmenorrhea who collected Twenty-five RCTs with a total of over 3000 participants and believed that dysmenorrhea was not related to the duration of the menstrual cycle. From researchers' point of view these results may be related to difference in sociodemographic and genetic characteristics between participants.

The results of the current study showed that less than one half of the adolescents had moderate pain that strongly affect daily activities with more than one half of them reported premenstrual fatigue these results to some degree matched with the results of Omidvar, Bakouei, Amiri, and Begum (2016) to ascertain the prevalence, and impact of primary dysmenorrhea in student girls and their management behaviors on 1000 healthy females in South India and found about one half of participants experienced moderate pain and in two thirds of them affect activities of daily living with the majority of them experienced menstrual symptoms including tiredness and back pain furthermore these observations were similar to that reported by Aktaş (2015) who investigated the prevalence and the affecting factors of dysmenorrhea and its effects on overall comfort among 200 female university students at a university in Ankara. The similarities of findings between the studies may be due to that the majority of female experienced premenstrual symptoms that are common in almost female and due to the nature and effect of pain that affect and hinder all activities of daily living.

The results of the current study indicated that less than one half of adolescents always use analgesics and medical treatment these results disagree with Ks Konapur (2014) for assessing the frequency of dysmenorrhea and

PMS and the effect of dysmenorrhea and PMS on school attendance and daily activities of adolescent girls and their treatment seeking pattern on 304 subjects in Kempegowda Institute of Medical Sciences, Bangalore, India who reported that only a about one quarter of studied girls had sought pharmacological management and the majority of them depended on non-pharmacological methods and only minority of them had sought medical advice also Farotimi, Esike, Nwozichi, Ojediran, and Ojewole (2015) who assess the knowledge, attitude, and healthcare-seeking behavior towards dysmenorrhea among female students at a Private University in Ogun State, Nigeria on 315 female students reported the same results. These results necessity the need for health education about puberty and menstruation as this ignorance might adversely affect the medical attention seeking behavior of dysmenorrhea females and directly affect female health.

The current study revealed a positive relation between the type of food consumed (meat, carbohydrates, vegetables, fruits, fish, beans, sugar) and occurrence of primary dysmenorrhea in addition to drinking caffeine these results go on the same line with the results of a study done by Monday et al. (2019) to investigate the effects of certain diets on the prevalence and severity of dysmenorrhea on 478 High School and College Students in Saint Vincent and Grenadines and found that consumption of caffeinated beverages correlated with dysmenorrhea ($p < 0.05$) and the study reported dysmenorrhea in a large proportion of participants who consumed high quantities of sugars. These results supported by results of Kartal and Akyuz (2018) who studied the effect of diet therapy on primary dysmenorrhea on 67 female university students in Istanbul, Turkey. From the researchers point of view these results rely to that certain foods are said to interfere with the level of estrogen and prostaglandin in the blood, elevated levels of prostaglandins have been seen to be associated with dysmenorrheal Prostaglandins are said to cause endometrial contraction which causes menstrual cramps.

To sum up, the current study highlighted the crucial nursing role in identification of the major lifestyle variables for occurrence of

primary dysmenorrhea among adolescents. Through initiation and application of adapted lifestyle guidelines community health nurses and obstetric health nurses can early detect and intervene to help in prevention of primary dysmenorrhea among adolescents.

Conclusion:

Based on the findings of the present study, it was concluded that there was correlation between life style risk factors and occurrence of primary dysmenorrhea among adolescents as daily activities, skipping breakfast, type of food, amount of fast food, drink caffeine, number of cups of water per day, physical activities ($p < 0.05$). Primary dysmenorrhea is the most common complaint of adolescent. More than two thirds of adolescents mentioned that fatigue was the most premenstrual symptom. Nearly half of the students had a headache, the remaining was nausea, vomiting and diarrhea before menstruation.

Recommendations:

The researchers recommended the following issues, considering their study's findings:

- 1- Ongoing health education programs must be offered by nurses to adolescents that will consequently enhance their knowledge and practices that reduce the occurrence of primary dysmenorrhea and improve their health status.
- 2- Further researches should be conducted on larger samples of adolescents to assess lifestyle risk factors and occurrence of primary dysmenorrhea inside and outside universities.
- 3- Nursing curricula should contain items about menstruation, dysmenorrhea, and methods of management.
- 4- Using media-based health education programmes for primary dysmenorrhea prevention.

Suggested guidelines for adolescents (Healthy lifestyle):

Lifestyle risk factors, including physical activity, diet, recreational, sleep, screen time alcohol and tobacco use are crucial

determinants of both physical and mental health in adolescents. Adolescence might be critical for later health and disease, because there is some evidence stating that habits acquired in this period may track into adulthood. Since adolescence is a critical time to establish the foundations of a person's health, it is important to understand the behavioral practice during the transition from early to late adolescence. Studies on adolescents' healthy habits have focused on the relationship between individual behaviors and their outcome on health (Hu et al., 2020).

Researchers suggested guidelines based on the assessment findings and an extensive review of prior and present regional and global related books, publications, and journals (Bavil et al., 2016; Chang, & Chuang, 2012; Dars, Sayed, and Yousufzai, 2014; Habibi et al., 2015; Indu et al., 2020). It aimed to enhance the effective instructions targeting lifestyle risk factors to protect adolescents' physical health and prevent occurrence of primary dysmenorrhea. Guidelines include simple and clear information about (1) **Diet:** (Decrease intake of caffeine (tea – coffee, cola, chocolate) -Decrease intake of salt in food to reduce fluid retention.-Eat small frequent healthy meals per day to prevent hypoglycemia.-Increase fluid intake.-Avoid alcohol which aggravates depression), (2) **Nutritional self-care:** Dietary supplements as (-Vitamins (B, B6, E) to reduce nervousness, reduce muscular spasm and relieve heavy bloated puffy feeling that is often experienced before the menses), (3) **Regular exercise:** (- Daily exercise can prevent cramps, relieves constipation. -Deep breathing brings more O₂ to the blood which relaxes the uterus; -Aerobic activities as walking alleviate irritability and tension). (4) **Heat and Massage:** (-Using any form of warm application may be beneficial during painful periods.-Massage can also sooth aching muscles, promote relaxation and blood flow). (5) **Sleep Pattern:** sleep is one of the most basic needs of adolescents that greatly affect their quality of life, physical and mental health, and the quality of doing his tasks; it is considered as an important health variable. Healthy sleeping hours reduces stress, anxiety, neural pressures and helps the individual recover energy for a better concentration,

adaptation, and enjoying daily activities. (6) **Stress management:** Psychological disorders such as depression, stress, and anxiety are reported as important factors associated with dysmenorrhea and menstrual disorders. Psychological disorders such as depression, anxiety, and stress might have a bidirectional association with dysmenorrhea; So proper stress management should be followed by adolescents (Healthy Ways to Cope with Stress; Take breaks from watching, reading, or listening to news stories, including those on social media, Take care of yourself and your body, Make time to unwind, Talk to others, Connect with your community- or faith-based organizations, and, Avoid drugs and alcohol).

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