

Effect of Passive Smoking on Dysmenorrhea among Secondary School Students: Instructions Guideline

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Abstract

Background: Dysmenorrhea is referred as a severe, painful, cramping sensation in the lower abdomen.

Aim: To determine the effect of passive smoking on the menstrual regularity & evaluate the relationship between passive smoking exposure and dysmenorrhea.

Subject and method: A cross sectional descriptive research design was used for conducted this study, the sample included five schools which represents east, west, center, sportive and experimental langue school at Assiut city, one class was randomly selected to represents the school, an interview questionnaire used to assess the students exposure to passive smoking and wither they suffer from dysmenorrhea and menstrual irregularity or not.

Results: More than half of the sample were life in urban area, 38.2% of them suffer from menstrual irregularity and 32.9% suffer rom dysmenorrhea, it was observed a statistical a significant relation between exposure to passive smoking and presence of dysmenorrhea, and menstrual irregularity.

Conclusion: The current study finding reflect that more than half of the students were exposed to passive smoking for more than one day/ week, it was observed also a significant relation between amount of exposure to other's smoking and presence of dysmenorrhea, and menstrual irregularity.

Recommendations: Improve community awareness about health hazards of passive smoking especially menstrual health.

Keywords: Dysmenorrhea, passive smoking, menstrual regularity.

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I. Introduction

Dysmenorrhea is referred as a severe, painful, cramping sensation in the lower abdomen and also having other symptoms such as sweating, headaches, nausea, vomiting and diarrhea, all occurring just before or during the menstrual cycle (**Lentz et al. 2012**). Dysmenorrhea is also known as painful menstruation. Primary and Secondary dysmenorrhea are two different types of dysmenorrhea. Primary dysmenorrhea usually occurs in women 20 years or younger after their ovulatory cycles become established. It is the occurrence of pain with no obvious pathological pelvic disease, wears secondary dysmenorrhea is caused by underlying pelvic conditions or pathology and is more common in women older than 20 years (**Lentz et al. 2012**). According to **Harlow in (2008)**, primary dysmenorrhea can be caused by: First menstruation at the age of less than 12 years, a long menstrual periods, and severe menstrual flow, having a family history that also have primary dysmenorrhea, overweight and smoking. Dysmenorrhea is observed to be the most common symptom of all menstrual complaints. In developing countries, it poses a greater burden of disease than any other gynecological complaint (Patel V, 2006). There is a major impact on health-related quality of life, work productivity, and health-care utilization on women, who is in very weak and infirm condition (**Titilayo, 2009**). Dysmenorrhea plays the important role in economic losses and reason for these economic losses are the costs of medications, medical care, and decreased productivity.

A study conducted by senior high school girls at Australia reporteded that 93% of teenagers having menstrual pain, while other finding has reported that adult women are less consistent in reporting prevalence of dysmenorrheal and often focus on a specific group, with rates varying from 15% to 75%. . The outcome of another study is 41% of the participants (young adults aged 26 years or less) had limitations in their daily activities due to dysmenorrhea In dysmenorrhea has been suggested to relate to age, smoking higher body mass index, earlier age at menarche, null parity, longer and heavier menstrual flow and family history of dysmenorrhea are appear to be the most common causes o dysmenorrhea (**Mishra, 2000 and Parveen , 2009**). Women using oral contraceptives generally report less severe dysmenorrhea (**Juang, 1996**). Depression and

stress have also been shown to increase the risk of dysmenorrhea. Other common factors, such as education, marital status, employment, alcohol consumption, and physical activity, show largely negative or inconclusive results.

Passive smokers are those non-smokers who inhale cigarette smoke and the emissions from burning tobacco because of being around smokers. Passive smokers are three times more dangerous than active smokers. This is caused by the levels of harmful compounds in the body of passive smokers is a larger number, because the poison is sucked through the cigarette smoke from active smokers are not filtered. Also the side stream smoke which inhaled by passive smokers is the result of combustion with low temperature, this condition makes the combustion becomes less complete and releases more chemical materials (Syahdrajat, 2007).

Chen et al., (2000) proved that the nicotine in women significantly reduced the effect of endometrial blood flow, and increased spending on prostaglandin F₂-alpha is common in women with dysmenorrhea. This may explain the relationship between passive smoke and primary dysmenorrhea. A study conducted in New Zealand and found that increasing level of prevalence and severity of dysmenorrhea due to cigarettes smoking. The heavy smokers are having the highest increasing level of prevalence and severity of period pain (Pullon, Reinken & Sparrow, 1988). It have been suggested that stop smoking and stay away from second-hand smoke might be favorable or women who is at risk of dysmenorrhea (Durain, 2004). Smoking increases the severity of dysmenorrhea by comparing smokers and nonsmokers (Chung, Yao & Wan, 2005; Wang et al, 2005). Smoking is more dangerous to health which is the refusal activity. A cigarette burns at 900°C and produce smoke tobacco. The smoke tobacco itself contains over 4000 chemical materials; many of them are toxic and dangerous. Main smoke and side stream smoke are two different types of cigarette smoke.

Aim of the study

1. To determine the effect of passive smoking on the menstrual regularity.
2. To evaluate the relationship between passive smoking exposure and dysmenorrhea.

Subject & Methods

Study Design:

A cross sectional descriptive research design was used for conducted this study.

Setting:

The study was carried out at five governmental secondary school in Assiut City, which represents east, west & center of Assiut city. These schools are: El-Walidia preparatory –secondary school for girls that (represents the eastern sector), El-Nahda preparatory-secondary school for girls that represents (the center sector), and El- Hamara school for girls that represents (the western), Badr school which is represent an experimental language school & El- Hamara sportive school for girls.

Sample:

Totally 258 students get involved in the study with 98% response rate. Eight students were excluded from the study as they complain from polycystic ovarian syndrome (PCO), and five of them don't attended menarche & 17 were not complete the questionnaire. The total number of studied students was 228 students. One class from the second academic year which represents the school recruited from the first of September to the end of May 2015.

Sample size:

The schools was chosen randomly from all Assiut city schools by divided the schools into four groups which represents (east, west, middle and excremental) then choose one school from each group randomly, the sportive school is only one school. To choose the class, all classes name was written at papers every one contain name o certain class then one paper chosen randomly. This class was represents the school.

The sample chosen according to the following criteria:

Inclusion criteria:

- 1) All students attending menarche for 1 year at least.
- 2) Accepted to participate in the study.
- 3) Students attending menarche.
- 4) Free from gynecological and medical problems (diabetes, PCO, late menarche, etc.....)

Tools of the study:

Self-administer questionnaire was developed by the researcher in an Arabic language based upon a review of current and previous national and international literature to assess the effect of passive smoking exposure on menstrual regularity and presence of dysmenorrhea. It was included the following parts:

First part:

Included socio demographic characteristics of the students such as; age, residence, education and job of parents and their income details.

Second part:

This included questions to collect data related to menstrual history such as: the first occurrence of menstruation, menstrual re-occurrence, interval and duration of menstrual re-occurrence, presence of dysmenorrhea and their sisters or mothers were suffer from dysmenorrhea or not.

Third part:

This part include assessment of student's exposure to passive smoking at home and traffic, this part contain questions about number of smokers at home, duration of exposure every day and number of days / week which they were exposed to passive smoking.

Fourth part:

Including questions to assess student's knowledge about health effect of exposure to passive smoking as asking about effect of passive smoking on female reproductive health, menstrual health and student's also asked about source of their knowledge.

Fifth part:

Which includes assessment of student's behavior when they exposed to other's smoking at home or/ and traffic, they asked about their response as open windows, leave the place, asking the smokers to stop smoking or leave the room until finish the smoking.

Field work:

This part include; preparatory phase, pilot study and data collection procedure.

Preparatory phase:

A review of the current and past available literature on the various aspects of the study using textbook, articles and magazines were done in order to give a clear picture about the subject and to develop the questionnaire. This review was helpful in developing the tool which used in this study. Tool constructed by the researcher and reviewed by three experts of obstetrics and gynecological nursing staff.

Pilot study:

A pilot study was done on 10% (29 students) of the sample to assess the clarity, completeness and understanding of the tool. It was very useful to find out the actual time required to fill the questionnaire, based on the results of the test study, the study tool was modified. The sample which included in the test study was removed from the main study sample.

Ethical considerations:

1. There is no risk for study subject during application of the research.
2. The study following the common ethical principles.
3. Oral consent was obtained from the student who is eagerly ready to join in the study, after explaining the nature and the purpose of the study.
4. Confidentiality and anonymity was assured.
5. The student had a right for deny to join and / or quit from the study without any rational at the point of any time.

II. Methods

The investigator obtained an official permission from the director of education, Assiut city and also, an official permission was obtained from the dean of faculty of Nursing & ethical committee after explanation of the nature & aim of the study. An oral consent was obtained from the students after the researcher introduce herself to the students and explain the aim and nature of the study. The students informed about proper confidentiality of the obtained information, and it will be used only for a research purpose. The students also informed that they had a right to quit from the study at the point of any time without any care for her, the student interview for 1to 2 days /week for at least 2 weeks (some schools needed more than 2 weeks), a self-administer questionnaire which was in Arabic language had given to the students at the time of first visit and they asked to fill it after explanation of the questions, any other questions related to the questionnaire were answered by the investigator. Exposer to passive smoking was explained to the students as exposer to other's smoking for 15 mints /day, dysmenorrhea also defined to the student as prior to the next menstrual bleeding. A pain at abdominal or low back during menstrual bleeding is known as menstrual pain. In this study, two or more than

two days of menstrual pain during menstrual bleeding is known as dysmenorrhea (Chen et al., 2000)., to assess the students exposure to passive smoking they asked some questions;(1) have you stayed with any smokers in same house? (1) No, there were not; (2) Yes, there were. (2) If yes, how many smokers lived with you? (1) Nobody; (2) Only one person; (3) Two or more persons. (3) Did you stay during smoking more than 15 minutes in a day? (1) Yes; (2) No. And final question, (4) How often it was happen? (1) Never; (2) One day per week; (3) 3 to 5 days/week; (4) More than 6 days/week (one day was defined as an exposure >15 min). After students fill the questioner they divided into groups, each group contain 15 student according to their school schedule of free time Health education had been given to the students about general health hazards of passive smoking at the time of second visit, then the outcome of passive smoking on the female reproductive system and menstrual cycle, the researchers provide them with information about passive smoking . The students informed that exposure to passive smoking through long time may be expose her to many health hazards as lung cancer, chest asthma and particularly harming the reproductive system as time of fertility after marriage, they informed also that many studied find a relation between exposure to passive smoking and fertility, . The students also informed about proper attitude when they exposed to passive smoking at home and also at traffic. Menstrual health and menstrual regularity is a very important factor on presence of healthy pregnancy, so the relation between menstrual health & pregnancy explained to the students. Also the proper action when they exposed to passive smoking explained as; open windows, and ask from the smokers to stop smoking or stay outside the room until finish his smoking, if the situation not proper for the previous action at least leave this place. Any other questions was answered, the most commonly asked question from the student was the relation between exposure to passive smoking and menstrual pain.

Statistical design:

The data was tested for normality using the Andrson-Darling test for homogenicity variance prior to further statistical analysis. Categorical variables were described by number and percentage, where continues variables described by mean and standard deviation (mean & SD). Chi-square test used to compare between categoral variables & t-test used to compeer between continuous variables. A two- tailed $P \leq 0.05$ was considered statistically significant. All analysis was done by using the IBM SPSS (20) software.

III. Results

Table (1): Distribution of student's family according to their tocio-temographic Characteristics.

Item	No.=228	%
Residence:		
1) Rural	101	44.3
2) Urban	72	31.6
3) Simi- urban	55	24.1
Mother's educational level:		
1) Illiterate	40	17.5
2) Read & write	43	18.9
3) Preparatory education	33	14.5
4) Secondary	60	26.3
5) University.	52	22.8
Mother's occupation:		
1) Employed	63	27.6
2) House wife	165	72.4
Father's educational level:		
1) Illiterate	19	8.3
2) Read & write	42	18.4
3) Preparatory education	31	13.6
4) Secondary	59	25.9
5) University.	77	33.8
Father's occupation:		
1) Employment	87	38.2
2) Farmer/ manual work	71	31.2
3) Professional	36	15.8
4) Non Professional	34	14.9
Family income:		
1) Less than 1000 E.P.	74	32.5
2) 1000-2000 E.P.	119	52.2
3) More than 2000 E.P	35	15.4

Table (1): This table show the sample according to their socio-demographic finding, 44.3% of them live in rural area and 31.6 followed by 24.1% of the sample live in urban & Simi-urban respectively. According to mother's level of education more than one quarter (26.3%) of them were secondary educated followed by one fifth (22.3%) were university educated and only 17.5% were illiterate. As regard to mother's occupation most of them (72.4%) were house wife. For the father's level of education, more than one third (33.8%) of them had a university educated and about one quarter (25.9%) were secondary educated. According to the family income , more than half of them (52.2%) their income varied between 1000 to 2000 EP.

Table (2): Distribution of the students according to their menstrual data.

Item	No.=288	%
Duration of the cycle:		
1) Less than 3 days	178	78.1
2) From 3-7 days	46	20.2
3) More than 7 days	4	1.8
Regularity of the cycle:		
1) Regular	141	61.8
2) Irregular	87	38.2
Interval of the cycle:		
1) Every 21 days.	67	29.4
2) Every 28 days.	122	53.5
3) 35 days and more	39	17.1
Regularity of menstrual cycle among sisters:		
1) Regular	139	61.0
2) Irregular	57	25.0
3) Don't have a sisters	32	14.0
Presence of dysmenorrhea:		
1) Yeas	153	67.1
2) No	75	32.9

Table (2): This table shows that the majority of the sample (78.1) had bleeding for less than 4 days, as regard menstrual regularity 61.8% of people had a proper bleeding rotation and 38.2% had an improper bleeding rotation, 53.5% of people had their menstrual interval was 28 days. It is observed also that more than two thirds of them (67.1%) were suffer from dysmenorrhea. As regards to sister's menstrual pattern about two thirds of them (61.0%) had a regular menstrual pattern while 25.0% of them had an irregular menstrual pattern.

Table (3): Data about exposure to passive smoking inside and outside home.

Items	No.= 228	%
There is a smokers inside home:		
1) Yes	121	53.1
2) No	107	46.9
Exposure to passive smoking at least 15 mints/ week.		
1) Yes	132	57.9
2) No	96	42.1
Duration of exposure/ week:		
1) Don't happen	96	42.1
2) 1day/week	38	16.7
3) 3-5days/week	33	14.5
4) More than 6 days/week	61	26.8
Did you expose to passive smoking at traffic		
1) Yes	195	85.5
2) No	33	14.5

Table (3): This table show that more than half of students (53.1%) were live with smokers, while 46.9% there house free from smoking, as regard to the duration of expose to smoking/week; more than half of the sample (57.9%) were exposed to passive smoking for less than 15 mints/ day, while 42.1% exposed to others smoking for more than 15 mints/day. Regarding to exposure to passive smoking at traffic; the majority of the sample (85.5%) were exposed to passive smoking.

Table (4): Distribution of the students according to their knowledge about passive smoking.

Items	No.	%
Are passive smoking affect menstrual cycle?		
1) Yes	140	61.4
2) No	86	37.7
3) I don't know	2	0.9
Did passive smoking affect women's reproductive health?		
1) Yes	175	76.8
2) No	52	22.8
3) Don't know	1	0.4
Source of information:		
1) Study	98	43.0
2) Mother	75	32.9
3) Mass media	55	24.1

When you expose to passive smoking what do you do?		
1) Don't do any think	34	18.9
2) Leave the place	67	29.4
3) Open windows	69	30.3
4) Asking for stop smoking	49	21.5

Table (4): This table illustrated that 61.4% of the students reported that exposure to passive smoking will affect the menstrual cycle and majority of them (76.8%) of them know that exposure to passive smoking affect women's reproductive health, as regard to the source of information, the school study is the most source of the student's information about passive smoking (43%) followed by the student's mothers (32.9%) and rest of them (24.1%) aquaria there knowledge from mass media.30.3% of the students open doors when they exposed to others smoking followed by 29.4% of them leave the place, while only 21.5% of them asking for stop smoking.

Table (5): Relation between exposure to passive smoking and dysmenorrhea.

Items	Presence of dysmenorrhea				P. value
	Yes		No		
	No.	%	No.	%	
Presence of smokers at home:					
1) Yeas	80	52.3	41	54.7	0.735
2) No	73	47.7	34	45.3	
Number of smokers at home:					
1) 1-2 persons	125	81.7	67	89.3	0.137
2) 2-4 persons	28	18.3	8	10.7	
Exposure to passive smoking at home:					
1) Yeas	89	58.2	43	57.3	0.904
2) No	64	41.8	32	42.7	
Duration of exposure to passive smoking/ week					
1) Don't happened	67	43.8	29	38.7	0.105
2) One day/ week	19	12.4	19	25.3	
3) 3-5days/week	24	15.7	9	12.0	
4) More than 6 days/ week	43	28.1	18	24.0	
Exposure to passive smoking at home and traffic transportation:					
1) Yeas	137	89.5	58	77.3	0.014
2) No	16	10.5	17	22.7	

P. value \geq 0.05

Table (5): This table illustrated the relation between dysmenorrheal and exposure to passive smoking, it was observed a statistical significant relation between exposure to passive smoking at home and traffic and presence of dysmenorrhea (P value \geq 0.05).

Table (6): Relation between exposure to passive smoking and menstrual pattern.

Items	Menstrual regularity				P. value
	Regular		Irregular		
	No.	%	No.	%	
Presence of smokers at home:					
3) Yes	73	51.8	48	55.2	0.617
4) No	68	48.2	39	44.8	
Number of smokers at home:					
3) 1-2 persons	120	85.1	72	82.8	0.637
4) 2-4 persons	21	14.9	15	17.2	
Exposure to passive smoking at home:					
3) Yes	83	85.9	49	56.3	0.706
4) No	85	41.1	38	43.7	
Duration of exposure to passive smoking/ week					
5) Don't happened	56	41.8	37	42.5	0.983
6) One day/ week	23	16.3	15	17.2	
7) 3-5days/week	20	14.2	13	14.9	
8) More than 6 days/ week	39	27.7	22	25.3	
Exposure to passive smoking at home ant traffic transportation:					
3) Yes	128	90.8	67	77.0	0.004
4) No	13	9.2	20	23.0	

P. value \geq 0.05

Table (6) This table illustrated the relation between menstrual pattern and exposure to passive smoking, it was observed a statistical significant relation between exposure to passive smoking at home and traffic and presence of menstrual regularity (P value ≥ 0.05).

IV. Discussion

Passive smoking or Secondhand smoke is defined as exhalation or breathing of the other's smoking. Secondhand smoke exposure doesn't have any risk-free level; though passing exposure can be harmful to health (U.S. Department of Health and Human Services, 2014). During the time of gestation, women may have gynecologic disorder due to dysmenorrhea. The study reported also that there is an interdependence relation between current cigarette smoking and presence of dysmenorrhea. Another study explained about the disadvantages of current cigarette smoking on menstrual cycle (Chen et al., 2000) whereas some studies rarely explained about disadvantages of passive smoking and risk of dysmenorrhea. This study was conducted to find out the relationship between to environmental tobacco smoke and the frequency of dysmenorrhea for young girls. As regarded to socioeconomic the current study finding reflect that more than half of the sample are life in urban and semi urban area, more than one quarter of their mothers were secondary educated and most of them are house wife. The family income are ranged from 1000 to 2000 E.P./month. The present study reflect that the average age of menarche is 13.1 ± 1.4 and most of the students have a menstrual duration less than 4 days with mean age of bleeding 2.9 ± 1.7 days. Near to two third of them have a regular menstrual pattern, while more than one third complaining from irregular menstrual pattern. As regard to presence of dysmenorrhea; more than two third of the students are suffer from dysmenorrhea.

A study conducted by Atta et al.,(2016) which is used to investigating the most likely factors of primary dysmenorrhea and its effects on quality of life and general wellbeing, they reported that 12.9 years is consider as the mean age of first occurrence of menstruation for participants. And most of participants (86.5%) were experienced dysmenorrhea. This finding in the same line of our study finding **Atta et al.,(2016)** reported that 86.5% of subjects reported to have a family history of dysmenorrhea with either mother or sister experiencing similar episodes of dysmenorrhea in their menstrual cycles, The current study reflect that more than half of the students are exposing to other's smoking inside home for more than 15minits/wk., and near to half of them exposed to passive smoking for duration 1-6 days/ wk., while majority of the sample exposed to the smoking at traffic. A study conducted by **Ayo-Yusuf et al., (2014)** reported that exposure to secondhand smoke and voluntary adoption of smoke-free home and car rules among non-smoking at South African adults and resulted that 55.9% (almost half of the participants) who are all non-smokers have been affected just because of passive smoking exposure from at least from one source (in the home, workplace, cafe/restaurant etc.....). Also **Keshavarz et al., (2013)** conducted a program among Iranian dental students and the program is all about Passive smoking and attitudes towards tobacco. They found that about half of the sample was exposed to passive smoking at home. **Amini te al., (2011)** disagree with this finding, they are reported in their study when they explore the result of passive smoking on the occurrence of first dysmenorrhea among Indonesian women, they reported that the frequency of first dysmenorrhea was lower for unexposed women compared with exposed women. Finally they concluded that 33.3% of women had primary dysmenorrhea among women who were not exposed to other's smoking. As regard distribution of the sample according to knowledge about passive smoking, the current study reflect that more than half of the sample reported that the passive smoking affect the menstrual pattern, and most of them noticed that passive smoking affect women's reproductive health. The mean sources of their knowledge are study followed by knowledge acquired from their mothers, and less role for improve student's knowledge for exposure to passive smoking is through mass media.

A study conducted by Yang et al., (2015) for non-smokers women in china and it is all about childhood passive smoking exposure and age at menarche in Chinese women and reported that a very few people have been affected by passive smoking exposure, which is disagree with the current study finding. For the action taken by the students when they exposed to passive smoking at home or at traffic near to one third of the students were open windows and only one fifth of them asking smoker person to stop smoking, while the rest of them (18.9%) don't do anything toward exposed to passive smoking from others. Tobacco smoking is a regular practice to men except women and children as the majority of the world's passive or involuntary smokers. In many cultures, women are not allowed to smoke in their house especially arab cultures whereas men smoke at home even in front of their children. Adverse to the current study finding the main actions are taking by passively smoked people which reported by **Izzati et al., (2016)** they found in the study which conducted to explore knowledge, attitude and practice towards smoking among international Islamic University Malaysia kuantan communities, that 68.7% of respondents preferred to move away from the smoking area. For studying the relation between exposure to passive smoking & presence of dysmenorrhea, it is observed a significant relation between exposure to passive smoking in both home and traffic and presence of dysmenorrhea, which provide that more exposure to passive smoking has an effect on the girls menstrual cycle.

The cigarette smoke may affect dysmenorrheal since nicotine is a vasoconstrictor which decrease the endometrial blood flow and it s very causal in women with dysmenorrhea. Another studies have been conducted that reported anti-estrogenic effect may cause by cigarette smoke which explained about the interrelationship between ETS exposure and increasing level of frequency of dysmenorrhea. Chen et al., (2000) conducted an eventual study to evaluate the exposure to environmental tobacco smoke and its effect on dysmenorrhea in China. The effect of passive smoking on dysmenorrhea observed in their study appears to affect more than half of sample, which is in the same line of the current study finding. On the other line of the finding of our study, Atta et al., 2016 reported no association was observed in girls who had exposure to passive smoking (45.7%). The current study finding reflect a statistical significant relation between amount of passive smoking exposure & menstrual pattern, as it is observed a relation between menstrual regularity and exposure to passive smoking. The mechanism of the association was not clear. However, previous studies have shown that passive smoking could alter endocrine and menstrual function in the female body

V. Conclusion

The current study finding reflect that more than half of the students were exposed to passive smoking for more than one day/ week, it was observed also a significant relation between amount of exposure to other's smoking and presence of dysmenorrhea, it was observed also a significant relation between exposure to passive smoking and menstrual regularity.

Recommendations:

Based on the study finding the following recommendations are derived:

- 1) Improve community awareness about health hazards of passive smoking especially menstrual health.
- 2) Further study to examine the relation between dysmenorrhea and exposure to passive smoking on a large sample with biochemical assessment.
- 3) The curriculum should contain topics to explain the effect of passive snoking on menstrual health.

Study limitation:

There are several methodological limitations were found to explain this study result, this limitations were:

- 1) There are no biochemical measurements of passive smoking exposure.
- 2) We can't do analysis of subgroups with recurrent/severe dysmenorrhea or of the timing of passive smoking exposure within a specific menstrual cycle in relation to the risk of dysmenorrhea due to our sample size was very small.
- 3) Our ability have been limited to control some confounders because of our measurement of potential confounders was based on self-report rather than objective measurements.

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