World Nutrition Journal |eISSN 2580-7013

ORIGINAL PAPER

Association between Breakfast and Dysmenorrhea Degrees of SMAN 2 Students in Banda Aceh, Indonesia

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Received 9th March 2018
Accepted 11th August 2018

Link to DOI:
10.25220/WNJ.V02.i1.0006

Journal Website:
www.worldnutrijournal.org

Abstract

Introduction: Dysmenorrhea is a common problem in women which can affect personal health and quality of life. Several risks of dysmenorrhea including age, age of menarche, nutritional status, marital status, family history, physical activity and food intake. Breakfast is a energy supply needed in the first hours of daily activities. The purpose of this study was to determine the relationship of breakfast with dysmenorrhea degree in high school students of SMAN 2 Banda Aceh, Indonesia. **Methods:** The design of the study was analytic observational with cross sectional approach in first, second and third year students of SMAN 2, Banda Aceh, Indonesia. **Results:** There were 24 students (18.2%) who routinely consumed breakfast, 36 students (27.2%) sometimes and 41 students (31.1%) rarely consumed breakfast, respectively. The total of 60 students (45.5%) experienced mild dysmenorrhea pain, 5 students (3.8%) with unbearable and 35 students (26.5%) with moderate pain. Statistical analysis showed there was a significant relationship between breakfast with degrees of dysmenorrhea (p = 0.022) with strong correlation coefficient (r = 0.2). **Conclusion:** We concluded that regular breakfast habit can reduce the degree of dysmenorrhea.

Keywords breakfast, dysmenorrhea degrees, visual analog scale

Introduction

Optimal health is important for every person including women, which can be achieved by healthy lifestyle. This includes breakfast and physical activity.[1] Food consumed will affect the body's metabolism and provide energy.[2] Many teenagers are often on a diet to maintain physical appearances. One of the diet methods teens or students do is having an irregular breakfast or even none at all.[3]

Dysmenorrhea can lead to decreased productivity as well as can majorly cause decrease of the quality of life (QoL) status.[3,4] Prevalence of dysmenorrhea in the world is 28%–71.7%.[2] In the United States, reports showed almost 90% of women suffered from dysmenorrhea, 10–15% had heavy menstrual pain, and lost 1.7 million workdays every month due to menstrual pain.[3] The prevalence of menstrual pain in Indonesia is 54.89% which, among them, 14% of adolescents and students were absent from school due to menstrual pain.[3] Primary dysmenorrhea often occurs at the age 17–22 years old whereas secondary dysmenorrhea occurs at age above 23 years old due to pelvic organ abnormalities. Women who are less than 25 years old have twice

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the risk of developing dysmenorrhea with moderate to severe pain compared to those who are 25–35 years old. Primary dysmenorrhea, which often affects growing and developing adolescents, can affect psychologically.[4]

Research by Fujiwara[4] in Japan found that young women who did not have breakfast had higher degrees of menstrual pain in comparison with those who had breakfast regularly. Nearly 50% of women who experienced dysmenorrhea and 10% of women suffer from severe menstrual pain for 1-3 days on each menstrual cycle.

Poor nutrition can affect growth and reproductive function, which then can cause menstrual disorders. During menstruation, especially in the luteal phase, there is an increase of nutritional needs, thus balanced nutrition can reduce dysmenorrhea.[5,7] Dysmenorrhea affects individual health, quality of life and family economy.[2]

Dysmenorrhea is characterized by cramping pain which begins before or immediately after menstruation and may last for 28–72 hours.[6] Premenstrual Syndrome (PMS) is an abdominal symptoms (abdominal pain or bloating), headache, back and calf pain. Women with PMS are 56.1 times more likely to have dysmenorrhea.[8] Women who experienced discomfort are 1.75 times more tendency to have dysmenorrhea and anxious women tends to be 2.17 times more likely to experience dysmenorrhea.[1,9]

Several studies in Indonesia regarding the relationships of breakfast with students' achievement and concentration, the effect of and the habit in having breakfast were done. The research regarding relationship between breakfast and the degree of dysmenorrhea in high school students has not been done in Aceh, even though dysmenorrhea can disrupt the body's immune system thus increase their absent in school which then affect their achievement. Aceh people are not used to eat breakfast at 7 or 8 am thus they generally have breakfast during break time around 10 am. This research was done in SMAN 2 school because it is located in the coastal area where most students were from families of fishermen and traders, who often do daily activities starting early in the morning. Therefore breakfast was eaten after completing their activities.

Methods

Subject and Study Design

This study used observational analytic design with cross sectional approach. The study was conducted from 6th to 13th of January 2018 in the first, second and third year of high school students of SMAN 2, Banda Aceh, Indonesia. A total subject of 132 students were taken by nonprobability sampling with stratified random sampling method. Inclusion criteria are all students of SMAN 2 (first, second and third year), had history of dysmenorrhea since menarche, not suffering from chronic disease (diabetes, hypertension, hyperthyroidism, ovarian cyst, or uterine fibroids), not suffering from secondary dysmenorrhea, not taking NSAID (nonsteroidal anti-inflammatory drugs), unmarried, and not doing routine physical activity. Measurement of dysmenorrhea was done by visual analogue questionnaire scale (VAS) with pain ruler 0–10 cm. Breakfast data was obtained using Food Frequency Questionnaire (FFQ) interview technique. Then, data were analyzed. Bivariate analysis was done with Spearman correlation test with 95% confidence interval (CI) $\alpha < 0.05$.

Results

There were a total of 132 subjects. The subjects' characteristics are shown in Table 1. The results showed that most subjects are 17 years old (69.7%) and age of menarche at age 10 years old (32.6%). Most subjects had normal nutritional status (53.8%), did not use any NSAID medicine (79.3%) and did not do routine physical activity (39.4%).

Table 1. Characteristics of the subjects (n=132)

Characteristics	Frequency (n)	Percentage (%)
Age, y		
16	10	7.6
17	92	69.7
18	27	20.4
19	3	2.3
Age of Menarche, y		
8	1	0.8
9	17	12.9
10	43	32.6
11	35	26.5
12	25	18.9
13	9	6.8
14	2	1.6
Nutritional status		
Thin	28	21.2
Normal	71	53.8
Fat	22	16.7
Obesity type I	10	7.6
Obesity type II	1	0.8
Medicine Use		
Yes	27	20.3
No	105	79.3
Marital Status		
Single	132	100
Married	-	-
Smoking		
No	132	100
Yes	-	-
Physical Activity		
5x/Week	-	-
4x/Week	9	6.9
3x/Week	10	7.6
2x/Week	14	10.6
1x/Week	47	35.6
Never	52	39.4

The frequency distribution of breakfast pattern of the subjects can be seen in Table 2.

Table 2. Frequency of subjects' breakfast pattern (n=132)

Breakfast	Frequency (n)	Percentage (%)
Never	3	3.2
Rarely	41	31.1
Sometimes	36	27.2
Often	28	21.2
Always	24	18.2

As shown in Table 2, most students rarely eat breakfast (31.1%). There were only 24 students (18.2%) who consumed breakfast routinely.

The frequency distribution of dysmenorrhea pain degree of the subjects can be seen in Table 3.

Table 3. Dysmenorrhea pain degree frequencies (n=132)

Dysmenorrhea Degrees	Frequency (n)	Percentage (%)
Unbearable Pain	5	3,8
Severe Pain	17	12,9
Moderate Pain	35	26,5
Mild Pain	60	45,5
No Pain	15	11,3

As shown in Table 3, most subjects had mild degree of pain (45.5%). Unbearable pain was noted in as many as 5 students (3.8%).

Table 4 shows the analysis of association between breakfast patterns to dysmenorrhea degrees. According to data analysis results in Table 4, subjects who had "rarely" and "sometimes" breakfast patterns experienced mild (41.5%) and moderate dysmenorrhea pain (33.3%), respectively. However, those who never had breakfast tend to have moderate pain dysmenorrhea degree (66.7%). Subjects who always had breakfast were mostly experienced mild (50%) and no pain (20%). There was a significant relationship between breakfast with the degree of dysmenorrhea ($p=0.022$), in which the correlation coefficient were strong ($r=0.2$).

Table 4. Association between Breakfast to Degrees of Dysmenorrhea (n=132)

Breakfast	Dysmenorrhea Degrees (n, %)										p value	r
	Unbearable pain		Severe pain		Moderate pain		Mild pain		No pain			
Never	-	-	-	-	2	(66.7)	-	-	1	(33.7)	0.022	0.2
Rarely	1	(2.4)	7	(17.1)	13	(31.7)	17	(41.5)	3	(7.3)		
Sometimes	1	(2.8)	7	(19.4)	12	(33.3)	12	(33.3)	4	(11.1)		
Often	2	(7.1)	2	(7.1)	6	(21.4)	14	(50)	4	(14.3)		
Always	1	(20)	1	(5.9)	2	(5.7)	17	(28.3)	3	(20)		

Discussion

The results of this study showed most students rarely consumed breakfast (31.1%) compared to those who always had breakfast (18.2%). These results are different from the Fujiwora[11] research in Japan, which shown as much as 65.8% schoolgirl routinely consumed breakfast. Research by Adesola[2] in Nigeria showed 73% routinely ate breakfast. Study by Eittah[12] in Egypt, which were conducted in medical students, showed 73% students routinely consumed breakfast every day, 28% occasionally had breakfast (around 3-4 days per week), 21% often, and 2.5% never. The research concluded the intensity of dysmenorrhea decreased in subjects who were accustomed to eat breakfast. Majority of the students who routinely ate breakfast had more regular menstrual cycles, better nutritional statuses and general health conditions. Routine morning breakfast is recommended because it is ideal for better metabolism and also overcoming dysmenorrhea.

A study by Abbaspour[1] in Iran reported 3% of women experienced severe, 2% unbearable, 44% moderate and 40% mild dysmenorrhea pain, respectively, while around 10% did not experience dysmenorrhea. In this study, among 132 female students, mostly experienced mild degree of dysmenorrhea (45.5%). This differs from research by Caro[9] in India which showed 68% subjects had severe dysmenorrhea. A study by Rigon[13] in Italy showed 56% subjects experienced severe dysmenorrhea. Different degrees of dysmenorrhea pain in each country may be due to differences in breakfast habits, physical activity, nutritional status and other factors such as age, age of menarche, smoking, and genetics which affect dysmenorrhea.[12,13] Socioeconomics may also become the cause of the different coping of menstrual pain.[14] Dysmenorrhea is related to prostaglandin hormone in the uterus which causes stronger and more frequent contractions of the uterus muscles. This reduces the blood flow and thus causes the nerves to be more sensitive to pain. This mechanism happens due to interaction of ovary hormones with the immune system which occurs as a response to progesterone withdrawal.[16]

This study showed significant relationship between breakfast patterns and the degree of dysmenorrhea (p=0.022). This result is similar with study by Eittah[12] which showed breakfast pattern was related to menstrual and premenstrual pain.[12] Study by Fujiwara[4] in Japan showed subjects who had breakfast had lower degree of menstrual pain in comparison with those who had none. Around 71% respondents who did not consume breakfast early would have dysmenorrhea. Excessive or poor nutritional statuses may induce dysmenorrhea, whereas well-balanced nutritional intake with normal nutritional status can reduce the risk of dysmenorrhea.[11]

Diet may help in reducing dysmenorrhea. Intake of nutrients such as soybean fiber, fruits, vegetables and calcium may help to reduce menstrual pain.[2] High salt content food may worsen dysmenorrhea. Fruits, vegetables and seeds contain nutrients which are beneficial to optimizing uterus muscles function, such as magnesium, calcium, and potassium. Food with high arachidonic acid level, such as red meat and poultry products, should be avoided due to its action as PGF_2-alpha precursor and PGE_2.[7,17]

Physical activities or exercises are helpful to reduce dysmenorrhea. Regular exercise can increase the release of beta endorphin into the blood flow, which serves to reduce menstrual

pain.[2,7] Breakfast is a powerful intake of nutrients needs. Young women often skip two meals and prefer snacks which can interfere with appetite. Adolescents have rapid growth, high activity level and, thus, increased nutritional needs. They also require higher source of iron for monthly menstrual cycle.

However, they are more interested in consuming snacks rather than having a proper breakfast at home. Additionally, consuming strict and unhealthy dietary patterns are often practiced to lose weight for unrealistic body image.[5,10] Nevertheless, routine breakfast habit benefits for regular menstrual cycle, normal BMI, reduced menstrual pain and better general health condition.[12] While over and poor nutritional statuses may worsen menstrual pain. Well balanced nutritional intake and accordingly to daily needs may reduce the risk of dysmenorrhea.[11]

Conclusion

This study found significant relationship between breakfast and the degree of dysmenorrhea in high school students of SMAN 2, Banda Aceh. There was a positive correlation between irregular breakfast habits and the increase of dysmenorrhea degree. It is advisable to always have breakfast regularly in order to reduce dysmenorrhea pain and improve general health for women. Students are also encouraged to do regular physical activity and consume well-balanced nutrition to reduce dysmenorrhea.

Conflict of Interest

The authors of this paper declare there is no conflict of interest regarding this research.

Acknowledgement

We would like to thank principals, teachers and students of SMAN 2 Banda Aceh, Indonesia who had helped and participated in this research.

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