



ISSN - 0975-2366

International Journal of Pharmaceutical Research

www.ijpronline.com



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Research Article

Omega-3 Fatty Acids Relieve Dysmenorrhea among Female Senior high School Students

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Received: 05.07.20, Revised: 02.08.20, Accepted: 03.09.20

ABSTRACT

The purpose of this research was to determine the relationship between omega-3 fatty acid consumption and dysmenorrhea in female students of Senior High School. An analytic observational research with cross-sectional design study was conducted on 137 students of senior high school 57 in West Jakarta. The students' omega-3 fatty intake data were obtained by interviews through semi quantitative-food frequency questionnaire (SQ-FFQ) that was analyzed by Nutrisurvey program. Meanwhile, the data of the occurrences of dysmenorrhea was acquired by interviews of Working ability, Location, Intensity, Days of pain, Dysmenorrhea (WaLIDD) score. The data was analyzed by IBM SPSS Statistics ver. 26 to determine the relationship between dependent variable and independent variable with Chi-Square tests. Out of 137 female students aged 14-18 years old, 43.8% of female students experienced dysmenorrhea, and 50.40% consumed sufficient omega-3 fatty acids. The result of Chi-Square analysis indicates that $p < 0.001$ showed a significant relationship between omega-3 fatty acids consumption and the incidence of dysmenorrhea. There is a significant correlation between consumption of omega-3 fatty acids and dysmenorrhea among students of senior high school.

Keywords: Omega-3 Fatty Acids, Female Students, Dysmenorrhea**INTRODUCTION**

The word 'menstrual' is derived from a Latin word "Menstruus" which means monthly, menstrual cycle is the way a woman's body prepare for pregnancy. On average, a menstrual cycle lasts for 21-35 days and most female experience one cycle for as long as 28 days. Menstrual cycle is regulated by complex hormonal interaction and thus affect and cause changes on the reproductive organs. Every woman will experience menstrual cycle each month since puberty until menopause [1].

Menarche is the occurrence of first menstrual period on female adolescent, menarche age on Asian women ranges from 11.6-13 years old while on Caucasian women from 11.96-12.93 years old [2]. Menopause is the cessation of ovulation permanently, menopausal transition is characterized by the change in estradiol and FSH levels and irregularity of menstrual cycle [3]. Menopause age of white women ranges from 50-52 years old, African-American and Latin women ranges from 48-50 years old, while on Malay-Philippines women menopause occurs earlier within the range of 47-48 years old [4].

Menstruation is characterized by blood and endometrial debris coming out of the vagina, the discharge of blood and endometrial debris is assisted by light rhythmical contraction of the myometrium. Excessive uterine contraction will

result in overproduction of prostaglandin and cause menstrual cramps [1].

Menstrual cramps which is termed as dysmenorrhea is the most common menstrual symptom among female adolescents, according to the basic pathophysiology, dysmenorrhea is classified into primary and secondary dysmenorrhea. Primary dysmenorrhea is a menstrual pain without any organic diseases. Primary dysmenorrhea begins close to the onset of menarche (<20 years old) [5]. The cause of primary dysmenorrhea is not clear yet. However, the responsible cause has been identified, that is the overproduction prostaglandin in uterus, especially Prostaglandin F₂-alpha (PGF₂a). Female with dysmenorrhea has higher level of prostaglandin, peaking at the first two days of menstruation [6], most women experience this type of dysmenorrhea [7].

The characteristic of primary dysmenorrhea is the finding of lower abdominal pain with or without radiation to the back or legs. The pain usually lasts for 8 to 72 hours and usually occurs in the beginning of menstruation. The diagnosis of dysmenorrhea is made clinically, to determine and differentiate it from secondary dysmenorrhea is done by prescribing oral contraception or non-steroidal anti-inflammatory drugs (NSAIDs), if patient shows improvement of symptoms it indicates a primary dysmenorrhea. If there are no improvements, then radiologic imaging and

laboratory tests can be carried out to exclude other pelvic pathological conditions [8].

While secondary dysmenorrhea is defined as menstrual pain accompanied by abnormalities in the pelvic region, such as adenomyosis, endometriosis, and uterine myoma. Adenomyosis and endometriosis are the most common cause of secondary dysmenorrhea [8], [9]. It is said that prostaglandin plays an important role in the development of endometriosis by upregulating steroidogenic acute regulatory protein and aromatase which in turn inhibit apoptosis and cause cell proliferation. In pelvic inflammatory disease, it is also found that increased prostaglandin level causes edema and increases abnormal sensitivity to pain. Administration of NSAIDs may reduce the inflammation related to pelvic inflammatory disease and its complication [10]. It is estimated that the prevalence of dysmenorrhea is considerably high but the number varied between 45%-93% and the highest prevalence was reported among adolescents [6]. The World Health Organization defines teenagers or adolescents as those aged between 10-19 years old [11].

People tolerated dysmenorrhea as it is accepted as a normal aspect of a female's menstrual cycle, therefore they do not report the complaint nor seek medical help. Up to three to thirty-three percent of women experience severe pain on the first to third day of menstrual cycle which cause them to be absent from school or work. Other than causing restrictions in performing daily activities, dysmenorrhea also causes bad sleep quality, low academic performance in adolescents, and also has a bad effect on mood which can cause depression and anxiety [6].

In 2018 in Kuwait, 58.2% of High School female students who experience dysmenorrhea had at least once missed study activities at school and 13.9% missed at least one exam [12]. In Central Jakarta, the prevalence of dysmenorrhea was 87.5% [13]. During the academic year of 2016/2017 in Indonesia, there were 13,496 High Schools with 2,654,752 female students, 73.43% of them aged between 16-18 years old [14].

There are many factors that contribute to dysmenorrhea, among them are body mass index, age, menarche age, smoking, hormonal contraceptive use, NSAIDs use, and psychological factors such as stress [15]. Furthermore, dysmenorrhea is also affected by omega-3 fatty acids and omega-6 fatty acids diet and their eicosanoid derivatives including Leucotriene (LT), Lipoxin (LX), and Prostanoids. Prostanoids include Prostacyclin (PGI), Thromboxan (TX), and Prostaglandin (PG) [16].

Prostaglandin is present in almost all mammalian tissue. Prostaglandin possess crucial physiological and pharmacological activities. It is synthesized in the body of organisms from unsaturated fatty acids eicosanoids (such as arachidonic acid). Three different eicosanoic fatty acids (20 carbons) will produce 3 eicosanoid groups, which are Prostaglandin (PG) 1, PG2, and PG3 [16].

Omega-3 fatty acids such as alpha linoleic acid (ALA), eicosapentaenoic acid (EPA), and docosahexanoic acid (DHA) contain anti-inflammatory properties due to their effect in promoting synthesis of leukotriene and PG3 which inflammatory effects are lower compared to omega-6 fatty acids [16].

Omega-3 fatty acids which also called n-3 is a type of double unsaturated fatty acids, omega-3 fatty acids are essential long chain fatty acids. These fatty acids are classified as essential because they are not produced in the body, omega-3 fatty acids are easily found in food sources such as fish and grains [17].

According to a study done by [18] in Babol, Iran, consumption of omega-3 fatty acids supplements may lower the incidence of dysmenorrhea. In the study, they compared the effect of supplementation with *Clupeonella grimmi* fish oil which is rich in omega-3 fatty acids and a placebo on female aged 18-22 years old, divided into two groups, the result showed that the group receiving placebo experienced more frequent menstrual pain compared to the group receiving fish oil supplements.

On the contrary, in a study done by [15] in Semarang, Indonesia in 2017 on 90 high school students aged 15-17 years old, the result showed that female students who consumed sufficient omega-3 fatty acids have a higher rate of dysmenorrhea.

Due to the controversy in study results on the association between omega-3 fatty acids consumption with the incidence of dysmenorrhea and considering the highest prevalence of dysmenorrhea is in high school years, the researchers chose to investigate the association of omega-3 fatty acids consumption with the incidence of dysmenorrhea in female high school students.

METHODOLOGY

This study is an analytic observational study with cross-sectional design, this study is included in clinical science study, done during September-November 2019 in Senior High school 57 West Jakarta. The sample population were female students of Senior High school 57 West Jakarta in the academic year 2019/2020 aged between 14-18 years old.

The study was performed on 137 subjects across 9 different classes, the sampling was done proportionally using simple random sampling, a hundred and thirty-seven subjects met the inclusion criteria. the inclusion criteria are female student of Senior High school 57 West Jakarta of academic year 2019/2020 who have menstruated, not on hormonal contraception, not currently consuming NSAIDs, do not smoke ≥ 10 cigarettes/day, whose body mass index (BMI) do not fall in Underweight or Obese range according to Asia Pacific criteria of BMI classification and have completed informed consent.

The dependent variable is omega-3 fatty acids and the independent variable is the consumption of omega-3 fatty acids. Data collected including identity, age at menarche, history of smoking, history of hormonal contraception use, history of NSAIDs use, dysmenorrhea data, and omega-3 fatty acids intake data. Data collection of dysmenorrhea severity was performed by interviewing one by one the respondents of the research that have been chosen based on simple random sampling, using Working ability, Location, Intensity, Days of Pain, Dysmenorrhea (WaLIDD) score [19].

The working ability points of WaLIDD are assessed based on how often menstrual pain prevents you from carrying out their daily activities while in dysmenorrhea. There are 3 scores for working ability points, a score of 0 is if it doesn't interfere at all, a score of 1 if it almost never interferes with daily activities, a score of 2 if it almost always interferes with daily activities and a score of 3 if it always interferes with daily activities. Points related to pain location, we give respondents some anatomic locations of the body that are most likely to occur due to dysmenorrhea pain that is chosen consisting of the lower abdomen, lumbar region, lower limb area and inguinal area, they are allowed to choose 1 or more locations, if they don't feel pain anywhere then the score is 0, if there is 1 pain location then the score is 1, if there are 2-3 pain locations then the score is 2, if there is pain 4 locations then the score is 3 [19].

For pain intensity points we show Wong Baker FACES pain scale which has been reclassified to adjust the four level scale, respondents are welcome to choose the picture that best represents the severity of their menstrual pain, a score of 0 will be given if they choose an image that represents "no pain at all", a score of 1 will be given if the image chosen represents a "little pain", a score of 2 will be given to those who choose an image that represents "hurts little more" and "hurts even more", while a score of 3 will be given to those who choose the picture that represents the "hurts of the whole lot" and the "worst hurts". the

last is the point of the duration of pain felt due to dysmenorrhea, there are a total of 3 scores, for a score of 0 is given if they do not feel pain at all, while a score of 1 is given if they feel pain for 1-2 days in the period of dysmenorrhea, then given a score 2 if they feel pain for 3-4 days and a score of 3 is given to those whose pain is at least 5 days or even more [19].

The interpretation of the scores are 1-6 (no dysmenorrhea) and >6 (dysmenorrhea). The WaLIDD score is a new tool that is utilized to identify dysmenorrhea. The WaLIDD score is developed by a group of researchers in Colombia, it can be used to identify dysmenorrhea and also identify the severity of dysmenorrhea [19].

Data for consumption of omega-3 fatty acids were collected from interviews using Semi Quantitative-Food Frequency Questionnaire (SQ-FFQ) then the data were processed using Nutrisurvey program. The questionnaire consisted of list of food with high omega-3 fatty acids and the frequency of their consumption, it is consisting of whether they don't eat the food at all, or they eat the food every day, if every day they are asked how many times a day, or they eat the food every week, if every week they are asked every week how many times and finally if it turns out that only eating food choices in the questionnaire on a monthly basis, then also asked how many times a month, we divide it in the form of 1x per day or 2x per day or 3 times or more a day, this also applies to frequencies that are weekly and monthly so the data can be input into the nutrisurvey program one by one and converted automatically to determine the amount of their daily consumption of omega-3 fatty acids, the questionnaire also consist of serving sizes, and serving method. Data collection will be done by interviews of the subjects. To determine the serving size, authors will use references from portionmetry developed by the Ministry of Health of Indonesia [20].

The amount of omega-3 needed is different for every person, the necessary consumption is affected by gender and age. According to Regulation by Ministry of Health of Republic of Indonesia Number 75 Year 2013 on Nutritional Daily Value (Angka Kecukupan Gizi/ AKG/ RDA) Recommended for Indonesian People, daily consumption of omega-3 for a male aged over 13 years old is 1.6 grams, while for a female aged over 13 years old is 1.1 grams per day [20].

Data collected then processed using IBM SPSS Statistics ver. 26 with editing, coding, data cleaning, and data entry processes. Univariate analysis was carried out to describe characteristics of each study variables and bivariate analysis was carried out for the dependent and independent variables using Chi-square test.

RESULTS AND DISCUSSION

The study was done between September to November 2019, data was obtained from 137 respondents aged 14-18 years old and the mean

age was 16.131 years old, they were female students of Senior High school 57 West Jakarta of academic year 2019/2020.

Table 1: Frequency Distribution of Menarche Age, Body Mass Index, Incidence of Dysmenorrhea, and Omega-3 Consumption in Female Students of Senior High School 57 West Jakarta

Variables	Frequency (n=137)
Menarche Age	
<12	30
≥12	107
Smoking	
Do not Smoke	135
Smoke	2
Body Mass Index	
Normal	114
Overweight	23
Incidence of Dysmenorrhea	
Dysmenorrhea	60
No Dysmenorrhea	77
Omega-3 Consumption	
Sufficient	69
Insufficient	68

Table 2 showed that from 137 study respondents, the majority of them that is 107 (78.1%) respondents experienced first menstruation at age ≥12 years old, while the rest 30 female students experience first menstruation at under 12 years old.

Smoking behavior characteristics on respondents, as many as 135 students (98.5%) stated that they do not smoke, there were only 2 female students of Senior High school 57 West Jakarta who smoke. It showed that almost all female students of Senior High school 57 West Jakarta do not smoke.

On body mass index characteristics, from 137 study subjects whose data chosen for analysis, as many as 114 students (83.2%) have a body mass index within normal range. This result showed that the number of female students of Senior High school 57 West Jakarta with normal BMI is more prevalent than those with overweight BMI.

On the frequency distribution of respondents according to the presence of dysmenorrhea, from 137 respondents, there were 60 respondents (43.8%) who experience dysmenorrhea based on WaLIDD score of >6. From this data, it can be stated that almost half of female students of SMAN 57 experience dysmenorrhea.

Table 2: Mean, Median, Minimum, and Maximum Omega-3 Consumptions in Female Students of Senior High School 57

Variables	Mean	Median	Modus	Min	Max
Omega-3 Fatty Acids Consumption	1.6313	1.1100	0.73 ^a	0.05	13.35

There were several modus values, the lowest score is presented

The characteristics of the respondents based on omega-3 fatty acids consumption from 137 study subjects showed that 69 (50.4%) study subjects' daily consumption of omega-3 fatty acids were sufficient according to RDA. The highest omega-3

fatty acids consumption of all 137 subjects was 13.35 grams/day while the lowest was 0.05 grams/day and the mean daily consumption of omega-3 fatty acids was 1.631 grams/day. This data showed that only half of female students of SMAN 57 consumed sufficient omega-3 fatty acids.

Table 3: Description of Menarche Age, Omega-3 Fatty Acids Consumption, and Incidence of Dysmenorrhea

Variables		Incidence of Dysmenorrhea		
		No Dysmenorrhea	Dysmenorrhea	P value
Menarche Age	<12 years old	13 (43.3%)	17 (56.7%)	0.108
	≥12 years old	64 (59.8%)	43 (40.2%)	
Omega-3 Fatty Acids Consumption	Sufficient	58 (84.1%)	11 (15.9%)	<0.001
	Insufficient	19 (27.9%)	49 (72.1%)	
Menarche Age	<12 years old	13 (43.3%)	17 (56.7%)	0.108
	≥12 years old	64 (59.8%)	43 (40.2%)	

According to Table 4 on menarche age variable, respondents who did not experience dysmenorrhea with menarche age <12 years old were 13 people (43.3%) while those with menarche age ≥12 years old were 64 students (59.8%). Respondents who experienced dysmenorrhea with menarche age <12 years old were 17 people (56.7%) while those who experienced dysmenorrhea with menarche age ≥12 years old were 43 people (40.2%). The statistical analysis showed p value of 0.108, meaning that there was no significant association between menarche age and the incidence of dysmenorrhea.

On the omega-3 fatty acids consumption variable, we found that subjects who consumed sufficient daily omega-3 and did not experience dysmenorrhea were 58 people (84.1%), while for those who consumed insufficient daily omega-3 were 19 people (13.9%) and those who consumed sufficient daily omega-3 but experience dysmenorrhea were only 11 people (15.9%) and for those who consumed insufficient omega-3 daily were 49 people (72.1%). The statistical analysis showed p value 1 which showed there is a very significant association between omega-3 fatty acids consumption and the incidence of dysmenorrhea.

There are many factors that could be a risk factor for dysmenorrhea, including age, it is said that women aged under 25 years old have twice the risk for moderate to severe pain than those aged 25-34 years old. Other factor that contribute to dysmenorrhea is menarche age, some studies reported that the risk of dysmenorrhea is significantly reduced on women with menarche age of over 12 years old. There are also results that proof the association between early menarche age and increased risk of dysmenorrhea [21]. Early menarche age cause unpreparedness and also problems for adolescents such as pain during menstruation due to the immature reproductive organs [22]. There are studies who also stated that stress will affect the incidence of dysmenorrhea, it is suggested that the higher the stress level, the higher incidence of dysmenorrhea [21], it is suspected that when someone experience stress

there will be a response that triggers the secretion of corticotropine releasing hormone (CRH) which then stimulate the secretion of adrenocorticotrophic hormone (ACTH) from the anterior pituitary. ACTH will inhibit the secretion FSH and LH [23], the disturbed secretion of FSH and LH will in turn disturb follicular maturation which will disturb the synthesis and release of progesterone. Low progesterone level will increase synthesis of prostaglandin F2-alpha which will triggers the symptoms of dysmenorrhea.

Several studies also showed that women who smoke 10-30 cigarettes a day have an increased risk of dysmenorrhea by 90%, on women who smoke for less than 10 years, the risk increased by 30% and on women who smoke for 10-20 years the risk increased by up to 180% [21]. There are also proof that dysmenorrhea occurs more often on women with underweight and obese BMI. For obese BMI, it is suggested that it is due to the increased level of estrogen which stimulates the endometrial tissue to proliferate which contains prostaglandin F2-alpha [24]. Furthermore, it is also stated that body mass index, parity, stress, food intake, use of NSAIDs such as ibuprofen usually resolve dysmenorrhea complaints due to their activity in inhibiting cyclooxygenase enzymes which will inhibit the production of prostaglandin.

As it is known, the use of hormonal contraception such as oral combination pills can also affect hormonal condition which cause reduced prostaglandin production and effectively reduce dysmenorrhea [25]. There are also genetic factors and food intake including omega-3 fatty acids and omega-6 fatty acids intake which affect the incidence of dysmenorrhea [10]-[12].

To minimize the effect of possible factors that contribute to dysmenorrhea, we exclude respondents with obese BMI (>25) and underweight BMI (<18.5) according to Asia Pacific BMI classification [26] Parity, smoking >10 cigarettes/day, and use of hormonal contraceptives and NSAIDs, from all 9 classes there were only 7 people who stated that they need pain killer when they experience dysmenorrhea.

Almost half of the study subjects, 60 people (43.8) experience dysmenorrhea. As many as 107 people (78.1%) has menarche age ≥ 12 years old, this finding is in accordance with a study by [13] which stated that the average female menarche age ranges between 11.6-13 years old. The statistical analysis between menarche age and the incidence of dysmenorrhea showed p value of 0.108, meaning there was no significant association between menarche age and the incidence of dysmenorrhea.

This finding corresponds to a systematic review done by [21], which showed that from 4 cross sectional studies on the association of menarche age and dysmenorrhea, only 1 showed that there was an association which was menarche age of over 12 years old may lower the risk of dysmenorrhea, but the other 3 studies showed that menarche age has no significant impact on menstrual pain. According to a study by [27], this could be caused by the differences in nutritional intake and the mental health of respondents, this corresponds to a study by [28], which showed that non-pharmacological methods such as diet therapy with fruits and vegetables intake which are suggested as protective factors from menstrual pain, balanced nutrition, low fat diet, some herbal tea, reducing salt intake, diet containing magnesium, zinc, Vitamin B and E will effectively reduce the pain.

From a total of 137 study subjects, 8 consumed omega-3 supplements, and from those 8 people only one experienced dysmenorrhea although their daily omega-3 intake is sufficient according to RDA. Indonesia has a lot of food rich in omega-3 fatty acids, such as *Scomberomorus maculatus* which is also called mackerel (tenggiri) fish or Spanish mackerel. Among the 10 food source included in SQ-FFQ questionnaire used in this study, mackerel fish is the food source containing the highest omega-3 that is 2.6 grams/100 grams [29].

The daily consumption need of omega-3 fatty acid is affected by gender and age. According to Regulation by Ministry of Health of Republic of Indonesia Number 75 Year 2013 on Nutritional Daily Value (Angka Keukupan Gizi), daily consumption of omega-3 needed for a female aged over 13 years old is 1.1 grams per day [20]. Therefore, only consuming 50 grams of mackerel fish will be sufficient to provide daily need of omega-3 fatty acids. Not only mackerel fish, there are also other food source that can provide daily need of omega-3 fatty acids such as Kembung fish, Salmon, Anchovy, or it can also be provided from consuming omega-3 fatty acids pills [29], [30].

Statistical analysis of the omega-3 fatty acids consumption variable showed p value of <0.001 meaning that there is a significant association between omega-3 fatty acids consumption and the incidence of dysmenorrhea, this is in accordance with a study by [18] on 36 females aged 18 – 22 years old in Babol, Iran, which showed that consumption of omega-3 fatty acids supplement can lower the incidence of dysmenorrhea with a p value of 0.001.

However, this study contradicts with a study by [15] in Semarang, Indonesia in 2017 on 90 females aged 15-17 years old, which showed that female students who consumed sufficient omega-3 fatty acids experience higher rate of dysmenorrhea, this could be due to the different type of food source and serving method. In the study by [15] stated that the average consumption of omega-3 fatty acids in the respondents were categorized as good, but the serving method was inappropriate. It is suggested in the study that processing the fish by boiling or steaming is better than frying. Frying cause significant change in reduction of omega-3 fatty acid level of the fish up to 50% from its fresh condition. Meanwhile, on this study we found many of the respondents who consume omega-3 fatty acids in the form of dumplings which were processed by steaming.

This result is also in accordance with theoretical basis of the study that is omega-3 fatty acids has anti-inflammatory properties, the eicosanoic produced by omega-3 has weaker inflammatory effect than those produced by omega-6. Moreover, ALA (omega-3) also competes with linoleic acid (LA) omega-6 to fight over enzymes in their metabolism, those enzymes are desaturase enzymes and elongase enzymes [17].

ALA will produce EPA which in turn will produce eicosanoic whose inflammatory effect is more minimal which are prostaglandin 3 alpha, thromboxane 3, leukotriene a5, leukotriene c5, leukotriene d5, and prostacyclin 3. Furthermore, ALA will be converted to DHA which will produce resolvins which in turn will help inhibit the activity of prostanoid and help resolve the effect of inflammation. Meanwhile, omega-6 fatty acids will produce arachidonic acid whose metabolism product has more potent inflammatory effect such as prostaglandin E2, prostaglandin F2 alpha, thromboxane 2, leukotriene a4, leukotriene b4, leukotriene c4, and leukotriene d4 [31].

Omega-3 fatty acids will produce eicosanoic which has anti-inflammatory properties while omega-6 fatty acids produce eicosanoic with pro-inflammatory properties. Therefore, consumption of omega-3 fatty acids may counter dysmenorrhea by reducing the level of omega-6 fatty acids in cell membranes which then can be converted to

prostaglandin F2 alpha and prostaglandin E2 that caused pain during menstruation or dysmenorrhea [31], [32].

Even though this study proves that there is a significant association between omega-3 fatty acids consumption and dysmenorrhea, this study has limitations including the study design was cross-sectional and other factors such as stress which cannot be excluded because stress and dysmenorrhea influence one another and also physical activity factors which is known to have an impact on the incidence of dysmenorrhea. Overall, SQ-FFQ can represent a person's nutritional intake status with good accuracy and reliability and can be accepted as an ideal dietary assessment to determine association, however this method is highly dependent on the subjects' memory recall [20].

Future studies on the subject may include other factors such as physical activity and stress as the independent variables. Furthermore, future studies can also be carried out with prospective cohort experimental design with the same variables.

CONCLUSION

Result from the study done in Senior High school 57 West Jakarta during September to November 2019 showed that less than half (43.8%) of female students of Senior High school 57 West Jakarta experienced dysmenorrhea and sufficient dietary consumption of omega-3 fatty acids was found only on half of the female students of Senior High school 57 West Jakarta. The result of further analysis using statistical Chi-square test showed that there was significant association between omega-3 fatty acids consumption and the incidence of dysmenorrhea ($p < 0.001$) on female students of Senior High school 57 West Jakarta

ACKNOWLEDGMENT

Authors thank all parties involved in Senior High school 57 West Jakarta. The authors also thank other parties whom cannot be mentioned in detail who have contributed in the conduction of this study.

CONFLICT OF INEREST

None

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