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menstrual cycle

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THE RELATIONSHIP NUTRITIONAL STATUS WITH THE MENSTRUAL CYCLE AND DYSMENORRHEA INCIDENT IN MIDWIFERY DIPLOMA UNUSA

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ABSTRACT

Menstrual cycle is the distance between the first day of menstruation with the first day of next menstruation. Dysmenorrhoea or pain during menstruation is the most common gynecological complaint experienced by adolescents as primary dysmenorrhea that associated with a normal ovulatory cycle without pelvic abnormality. The factor of menstrual cycle's regularity is the hormone imbalance with several causes such as stress, disease, changes in routine, lifestyle and weight. Nutritional status is assessed from body mass index (BMI). After obtained the respondents who experience dysmenorrhea and then categorized based on the degrees of dysmenorrhoea and the regularity of menstrual cycle. Relationship BMI with menstrual cycle was analyzed using Chi Square test with p = 0.000 (p <0.05) it means there is a relationship between BMI with menstrual cycle. The use of hormones in livestock breeding will affect adolescent growth. Teenagers who consume these foods tend to be fat and have a high body mass index. The cause of the longer cycle of menstruation is increase amount of body fat followed raising level of estrogen in the blood. The relationship of BMI with disminorea was analyzed using Spearman test, BMI had negative correlation (r = -0.114) with dysminorrhea incidence and there was no correlation between BMI and dysminorrhea (p> 0,05). The absence of a relationship can be due to BMI underweight and overweight category can experience primary dysmenorrhea.

Keyword : BMI, Menstrual cycle, dysminorrhea

INTRODUCTION

Adolescence is one of the human development period. Adolescence is a period of transition from childhood to adulthood marked by physical, psychological and psychosocial changes (Dieny, 2014).

In adolescent girls, puberty is characterized by the onset of menstruation (menarche). Menarche is the first common menstruation in the range 10-16 years old or early adolescence in the middle of puberty before entering the reproductive period. Menstruation is periodic bleeding from the uterus that begins about 14 days after ovulation periodically caused endometrial breakdown (Bobak, 2004 in Sukarni & Wahyu, 2013)

Menstrual cycle is the distance between the first day of menstruation with the first day of the next menstruation. Normal menstruation is the final result of an ovulatory cycle. The ovulatory cycle begins with the growth of some antral follicles at

the beginning of the cycle followed by the ovulation of a dominant follicle, which occurs mid-cycle.

Ovulation that occurs regularly every month will result in regular menstrual cycles, whereas anovulatory cycles are menstrual cycles without previous ovulation. The prevalence of anovulatory cycles most commonly in women under 20 and over 40 years old (Prawirohardjo, 2011). According to Wolfenden (2010) in Hutami (2010), the most influential factor in the regularity of the menstrual cycle is hormonal imbalances. There are many factors that can cause disturbed hormonal regulation, they are stress, disease, changes in routine, lifestyle and weight. Menstruation is the result of a very neat of the axis Hypothalamus - pituitary-Ovary (H-H-O). Follicular phase estrogen production is explained by the two-cell, two-gonadotropin mechanism At the beginning of the cycle, LH receptors exist only in theca cell, and FSH receptor in the granulosa cells. FSH-induced aromatization of androgen in the granulosa results in the production of estrogen (Speroff, 2011).

Dysmenorrhea is a common gynecological condition with painful menstrual cramps of uterine. Two categories of dysmenorrhea are primary and secondary dysmenorrhea. Primary dysmenorrhea refers to menstrual pain without any pelvic pathology. These symptoms have underlying cause of elevated endometrial prostaglandins and their metabolites.Primary dysmenorrhea is an important clinical as well as social problem affecting more than 50% of menstruating women (Moolraj Kural, 2015).

The etiology of primary dysmenorrhea is not precisely understood, but most symptoms can be explained by the action of prostaglandins, particularly PGF2alpha which is released during endometrial sloughing. As menstruation begins, PGF2alpha stimulates myometrial contractions, ischemia, and sensitization of nerve endings. The clinical evidence of this theory is quite strong. Women with more severe dysmenorrhea have higher levels of PGF2alpha in their menstrual fluid (Chauhan,2012)

Dysmenorrhea is believed to be one affecting activities of women adversely. Majority (72.9%) of the participants experienced menstrual pain. More than 50% dysmenorrheic subjects experienced pain every menstrual cycle (Omidvar,2012). The study in Mexico with title "Primary dysmenorrhea among Mexican university students: prevalence, impact and treatment" there were 62.4% who suffered from dysmenorrhea (Ortiz, 2010) . In Indonesia dysmenorrhea prevalence is 64.25% consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhoea (Oktaviana, 2012)

There are several risk factors that may increase dysmenorrhea: women smoker, women who drink alcohol during menstruation, overweight and obese women, infertile women, early menarche, have a similar history in family (Daminius,2006). One of the factors that increase the risk of disminorhea is obesity, its related to nutritional status. Adolesence need to consume a balanced diet because it is very needed at the time of menstruation. Malnutrition affect the growth, the damage organ function also will cause disruption of reproductive function. This will also affect

the disruption of the menstrual cycle. If this is ignored then the impact will occur complaints that cause discomfort during the menstrual cycle (Paath dan Erna, 2004).

The assessment of nutritional status with anthropometry by the use of Mass Index Body (BMI). Body Mass Index is a simple tool to monitor the nutritional status of adults, especially those related to underweight and overweight.

METHOD

The present study was of a Cross-sectional design was conducted in D3 midwifery Program of FKK UNUSA starting from November 2016 until January 2017. The population in this study was 221 people, the sample was 144 people with the range 18-22 years old. Inclusion criteria in this study are female students who are status as active students of Midwifery Diploma of FKK UNUSA Class of the year 2015 and 2016 with 18-22 years old, and have got menstruation. Exclusion criteria in this study that is not present when data collection and have certain diseases such as leukemia, diabetes mellitus and blood disorder.

Respondents fill out the questionnaire voluntery then filling out the inform consent sheet. Responent calculated the weight using *Onemed* brand. Dysmenorrhoea was assessed using questionnaire which adapted from previous research.

Respondents were categorized as dysmenorrhoea if they experienced lower abdominal cramp when menstruation of the last 6 months, pain appeared at the time of menstruation, first day of menstruation or day 1st until 3 rd day of menstruation. After receiving the respondents including primary dysmenorrhea, then categorized the degree of pain based on the effect of primary dysmenorrhoea on daily activities and the effectiveness of drugs which used to reduce pain. menstrual cycle data obtained from the questionnaire. Respondents observed the regularity of her menstrual cycle over the past 6 months.

The data were analyzed using SPSS 16.0 software. Descriptive analysis was performed for respondent age, age of menarche, BMI, regularity of menstrual cycle, and dysmenorrhoea degrees. Analysis the relation of nutrient status (Body mass index) with menstrual cycle using Chi Square test and relationship nutritional status with dysminorhea incident were analyzed using Spearman Rank Test test.

RESULT

Based on the analysis, 144 respondents with age range 18-22 years old obtained IMT data as follows:

Table 1. Frequency Distribution of IMT in midwifery diploma students Class of the year 2015 and 2016

IMT categories	Frequency	Percent
Underweight (< 18.5)	24	16
Normal range (18.5 -22.9)	84	58.3
Overweight (≥ 23)	37	25.7
Total	144	100

Result of analysis for IMT category, highest percentage is Normal range category that is IMT 18,5 until 22,9.

Table 2. Frequency Distribution of menarche in midwifery diploma students Class of the year 2015 and 2016

Menarche	Frequency	Percent
Early (≤ 11 yo)	18	12.5
Medium (12-13 yo)	97	67.4
Late (≥ 14 yo)	29	20.1

Based on age distribution table,midwifery diploma students most menarche at 12 to 13 years old

Table 3. The frequency distribution of menstrual midwifery diploma students

Menstrual cycle	Frequency	Percent
irregular	29	20.1
regularly	115	79.9

Approximately 79.9% of midwifery diploma students in class of the year 2015-2016 have regular menstrual cycles.

Table 4. The Frequency Distribution of dysmenorrhea incidence midwifery diploma student class of 2015-2016

Dysminorrhea incident	Frekuensi	Percent
Not dysminorrhea	12	8.3
Mild dysminorrhea	111	77.1
Moderate dysminorrea	18	12.5
Severe dysminorrhea	3	2.1
Total	144	100.0

From the table, midwifery diploma students mostly experienced dysmenorrhea. As many as 77% of respondents have mild dysmenorrhea.

Table 5. BMI correlation with menstrual cycle

	BMI	Menstrual cycle
Chi-Square	40.042[a]	51.361[b]
df	2	1
Asymp. Sig.	.000	.000

Based on statistical analysis using Chi Square test, BMI has correlation with menstrual cycle with p= 0.000

Table 6. BMI correlation with dysmenorrhea incidence

			IMT	disminorea
Spearman's rho	IMT	Correlation Coefficient	1.000	-.114
		Sig. (2-tailed)	.	.172
		N	144	144
	Disminore	Correlation Coefficient	-.114	1.000
		Sig. (2-tailed)	.172	.
		N	144	144

Based on statistic analysis using Spearman Rank test, BMI has negative correlation (r = -0.114) with incidence of dysminorrhoea incident but there is no relation between BMI with disminorea

DISCUSSION

Relationship of nutritional status with menstrual cycle

Majority of respondents have regular menstrual cycle with the most menarche ages at 12-13 years old. Many factors affect the regular or irregular the menstrual cycle in adolescents. According to Wolfenden (2010) in Hutami (2010), the most influential factor in the regularity of the menstrual cycle is hormonal imbalances. There are many factors that can disturbed

hormonal regulation, some of which are stress, disease, changes in routine, lifestyle and weight.

In addition, the other factors that affect the menstrual cycle according to Llewellyn, Derek & Jones (2002), namely: nutritional status, uterine abnormalities, physical conditions, gynecological diseases and age. Body Mass Index is a benchmark of nutritional status.

According data analysis there is a significant relationship between BMI with menstrual cycle. Along with the development of technology, the use of chemicals in the process of making food increasingly widespread. The use of hormones in livestock breeding will affect adolescent growth. Adolesence who consume these foods tend to be fat and have a high body mass index. In addition, daily activities and sports also affect. Internet development also reduces the activity of children's so reduce children mobilisation which leads to the tendency of high body mass index. (Shaliha, 2010).

Data analyze by Chi Square test got result p = 0,000 ($p<0,05$) These results indicate that there is a significant relationship between nutritional status and menstrual cycle in adolescent girls.

This study is supported by Felicia (2015)studies. There is a significant relationship between BMI with menstrual cycle. Research conducted by Eni Purwanti (2003) and Dahliansyah (2003) in Adnyani (2013), mentions that there is a relationship between body fat with menstrual cycle. One of the hormones that play a role in the menstrual process is estrogen. These estrogens are synthesized in the ovaries, in the adrenals, placentas, testes, fat tissues and central nervous system. The causes of longer-term menstrual cycles due to increased amount of body fat followed increasing estrogen in the blood. High estrogen levels will provide a negative feed back to GnRh secretion

The increasing amount of estrogen in the blood caused estrogen production in theca cells. Theca cells produce androgens and respond to Luteinizing Hormone (LH) by increasing the number of LDL (low-density lipoprotein) receptors that play a role in the introduction of cholesterol into cells. LH also stimulates the activity of a special protein (P450scc), which causes increasing androgen production. When androgens diffuse into granulosa cells and fat tissue, more estrogen is formed. In obese women not only excess androgens but also excess estrogen,consequently will often occur disorders of ovarian function and abnormal menstrual cycle (Hupitoyo, 2011).

Relationship Nutritional Status with Dysmenorrhea incident

Primary dysmenorrhoea is a type of dysmenorrhoea which is predominantly related to adolescents and young adults. Studies in Indian and Canadian countries also mentioned that primary dysmenorrhoea peaked at the early age of 20 years and decreased with increasing age (Patel, 2006)

Research conducted by Chia et.al (2013), the students of the University of Hong Kong got high prevalence of primary dysmenorrhoeal that is about 80%. Research

in Indonesia that conducted by Dwi (2012) showed the result that the incidence of dysmenorrhea in FKM UI respondents reached 77.9% where the majority of respondents experienced mild dysmenorrhea. Research by Omidvar and Begum (2012) and Khodakarami et al. (2015) found that subjects with underweight BMI experienced dysmenorrhoea rather than overweight BMT

Adolesence with BMI underweight categories that indicate a lack of nutritional intake affect the growth and function of organs that will cause disruption of reproductive function. This has an impact on menstrual disorders including dysmenorrhoea (Yustina, 2011). Body Mass Index with overweight category has excessive fat tissue so there will push blood vessel by the fat tissue in reproductive organs. Its can disturb menstrual process and cause dysmenorrhea (Widjanarko ,2009).

In this study, there was no relationship between BMI with th occurrence of primary dysmenorrhea with p = 0.172 (p> 0,05). The results were also supported by a study of Dwi (2012) which showed that there was no association between BMI and primary dysmenorrhoea with P= 0.161. The absence of a relationship can be due to BMI underweight and overweight category can experience primary dysmenorrhea. Other factors that affect the occurrence of disminorrhea including age under 20 years, smoking, menarche age, menstrual cycle disorders, pelvic infections, psychological, genetic factors, and all these factors can affect the incidence and severity of dysmenorrhea (Al-Dabal et al., 2014).

Psychological conditions take an important role in the incidence of dysmenorrhea. League (2013) states that students are exposed to several stressors during their study period. In women who dysmenorrhea also found high levels of vasopressin. Vasopressin is produced from stress mechanisms caused by stressors faced by a person. Vasopressin plays a role in uterine contractions and causes ischemic consequence of vasoconstriction and can increase prostaglandin synthesis and myometrial activity (Nathan, 2007).

CONCLUSION

Majority of respondents have regular menstrual cycle with the most menarche ages at 12-13 years old. Data analyze by Chi Square test got result p 0,000 (p<0,05) These results indicate that there is a significant relationship between nutritional status and menstrual cycle in adolescent girls. In this study,there was no relationship between BMI with th occurrence of primary dysmenorrhea with p = 0.172 (p> 0,05)

SUGGESTION

The next study is expected to conduct a deeper study and examine other factors that cause disminorrhoea and regularity of the menstrual cycle. Researchers can examine the levels of vasopressin in women disminorea or research the relationship BMI with dysminorrhea by considering the level of stress respondents.

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