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Original Research

Relationship between Nutritional Status, Exercise Level and Recreational Level with Dysmenorrhea in Nursing Students at Airlangga University

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ABSTRACT

Introduction: Dysmenorrhea is a pain that occurs when a woman experiences menstruation with characteristics of pain that is felt before or during menstruation in a short time. It caused by a poor physiological condition. This study aims to analyzed the relationship between nutritional status, exercise level and recreation level with dysmenorrhea.

Methods: This research was an analytic survey with cross sectional design. The number of samples taken were 116 students who fit the inclusion criterias, they were students of regular nursing faculty in the 2019 class, 18 and 19 years old and not yet married. Exclusion criteria included being pregnant and undergoing hormonal therapy. Instrument for dysmenorrhea using the Numeric Rating Scale (NRS) and questionnaire. Measurement nutritional status using the Mid Upper Arm Circumference (MUAC). Exercise and recreation also use a questionnaire as an instrument. Data were analyzed using Spearman Rho test with a significant α=0.05. This study was conducted at one of the public universities in Surabaya East Java.

Results: The result of the analysis of nutritional status, exercise level and recreation level were showed a significant relationship, nutritional status (r=0.206, p=0.026), exercise level (r=-0.224, p=0.015) and recreation level (r=-0.272, p=0.003).

Conclusion: Dysmenorrhea. Poor nutritional levels were tended to increase dysmenorrhea, less exercise levels were tended to cause severe dysmenorrhea and less recreational levels were also tended to cause severe dysmenorrhea. Health education about fulfilling nutrition, maintaining health by continuing to exercise and making time for recreation will reduce the risk of dysmenorrhea.

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1. INTRODUCTION

Menstrual pain or dysmenorrhea is one of the problems for women who are experiencing menstruation. Pain that arises from contractions of the uterine muscles, apart from causing discomfort during activities, can also interfere with women's daily activities, so that even work cannot be completed properly. Dysmenorrhea can be caused by poor physiological conditions. Dense activities can lead to not meeting one's physiological needs. This is experienced by many students who are busy with their lectures, so that their nutritional, sports and recreational or entertainment needs cannot be fulfilled. Meanwhile, these basic needs greatly influence physiological conditions.

Suryani and Sibero, (2014) define dysmenorrhea as pain in the lower abdominal area to the pelvis. Menstruation caused by production of chemicals called prostaglandins, which can to increase menstrual pain. The cause of pain comes from the uterine muscles, like all other muscles, the muscles of the uterus can contract and relax. Menstrual pain can occur so badly that the woman is unable to carry out her usual activities.

Incidence of dysmenorrhea in the world is very large. On average more than 50% of women in every world experience it. Research in the United States states that dysmenorrhea affects 30% -50% of women of reproductive age and 10% -15% of them lose job opportunities, interfere with learning activities at school and family life. Meanwhile, the prevalence rate in Indonesia is 85% of the entire population of women of reproductive age, consisting of 60-75% experiencing moderate and severe STDs. Likewise, incidence of dysmenorrhea in Indonesia is quite high, but there are very few people who go to health services, namely only 1% -2% (Jiu, 2016). Then the incidence rate in East Java was 64.25% consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea. In Surabaya, incidence of dysmenorrhea reached 1.07 - 1.31% of the number of visits by dysmenorrhea patients in the hospital.

Based on the results of a preliminary study on 20 female students at the Faculty of Nursing, Airlangga University in 2019, students who experienced dysmenorrhea were 100%, with mild dysmenorrhea by 35%, moderate dysmenorrhea 50% and severe dysmenorrhea 15%. 50% of dysmenorrhea that occurs caused by lack of physical exercise or exercise, then 25% caused by psychological conditions, 15% by eating unhealthy foods and the rest is due to lack of sleep. Then 68.4% of students had their activities disrupted when they experienced dysmenorrhea, even some students could not attend lectures when dysmenorrhea was mostly experienced by the 2019 class.

Most students who are active in college usually rarely exercise because of the demands of their lecture activities. So that it triggers an imbalance in the body's physiological functions. Dense lecture activities are one of the triggers for stress. Stress itself is one of the causes of dysmenorrhea. Stress can relieved by recreation. Individuals who take part in recreational activities that are physically active have higher levels of physical health and well-being with lower mental illness scores (Iwasaki, Zuzanek & Manel, 2011 in(Montgomery, 2016).

Improvement of the body's condition can supported by doing physical exercise or so-called exercise. Exercise has many benefits for the body, namely improving muscle and joint flexibility and improving blood circulation in the body. In addition, stress can increase the sympathetic system, causing an increase in uterine muscle contractions. Thus exercise can decrease the sympathetic system which then results in a decrease in dysmenorrhea symptoms (Vaziri et al., 2015). Adequate nutritional fulfillment can help improve physiological poorness. A body that has less body mass will affect reproductive hormones, so it can affect the menstrual process. A good body condition will increase endurance so that the effects caused by menstrual pain resolved.

Virginia Henderson's theory explains the basic human needs which into four components, where these basic needs can affect human physiological conditions. These two things will influence each other. If basic needs are not met, it will affect their physiological conditions. If a person meets their basic needs, their physiological condition will be good, so that they can decrease incidence of pain during

menstruation. In order to balance the physiology of the body, it also requires a balance between physical activity, rest, recreational activities and fulfillment of body nutrition. Thus expected that a balance between physical activity and balanced rest can decrease menstrual pain (Halloran, 1996).

2. METHOD

2.1 Design

This study is an analytic survey with a cross-sectional design. This study aims to decide whether there is a relationship between nutritional status, level of exercise and level of recreation in students of the Faculty of Nursing, Airlangga University.

2.2 Population

2.2 Population, Samples, and Sampling

The sample required in this study were 116 female students who fit the inclusion and exclusion criteria that the researcher had determined. The inclusion criteria are regular students of the Faculty of Nursing 2019, aged 18 and 19 years and not married. Exclusion criteria included being pregnant and undergoing hormonal therapy. The number of respondents from the beginning to the end of the study remained the same.

2.3 Variables

The independent variables in this study are nutritional status, exercise level and recreation level. The dependent variable in this study was the intensity of dysmenorrhea

2.4 Instruments

The instrument used for dysmenorrhea used the Numeric Rating Scale (NRS) and a questionnaire. Measurement of nutritional status using the Upper Arm Circumference (LILA). Measurements made on the variable level of exercise using a questionnaire and calculation of the length of time the respondent did exercise in one week. This questionnaire was adopted from the research of Ainuriza Rachma I.Y in 2018, with a validity test value above 0.6 and Cronbach's alpha value in a reliability test of 0.356. Meanwhile, the recreation level variable uses a questionnaire with positive and negative questions, each consisting of 8 questions. In the questionnaire used, respondents were asked to mark how often they exercise. The results of the validity test on this questionnaire are 0.515 (the lowest value) and 0.771 (the highest value) and the Cronbach's alpha value in the reliability test is 0.757.

2.5 Procedure

This research was conducted on 31 May - 23 June 2020 which was conducted online. The questionnaire used is in the form of google form and the measurements in this study were carried out by respondents by sending evidence of measurements sent to researchers.

2.6 Analysis

Data were analyzed using the Spearman Rho test with a significant $\alpha = 0.05$.

2.7 Ethical Clearance

The ethical process was carried out on May 28, 2020 with No: 2021-KEPK to obtained a certificate of passing the ethical test. After that, proof of passing the ethical test was used as a prerequisite to have implementation of this research.

3. RESULT

Based on the table 1, it explains the demographic characteristics of the 2019 Faculty of Nursing student based on age and time since menarche. The students of class 2019 who were respondents in this study were 23.3% aged 18 years and 76.7% 19 years old. Meanwhile, the time since student menarche varies greatly, from 2 years to 10 years. Most of the students had experienced menstruation for 7 years, namely 37 students (31.9%).

The table 2, shows the frequency distribution of the dependent and independent variables in this study. The nutritional status of female students is mostly normal with 84 female students (72.4%), with obesity nutritional status of 15.5%. However, there were still students who had below normal nutritional status, namely moderate depletion (10.3%) and severe depletion (1.7%). The next variable is the level of sports among female students of class 2019. A number of 81 female students (69.8%) had low level of exercise, while 34 female students (29.3%) had enough levels

of exercise. However, there is also one student who has excess level of exercise (0.9%). The level of recreation has three categories, namely poor, adequate and good. A number of 14 female students (12.1%) did not do enough recreation. Then there were 51 female students who did recreation with enough and good levels (44.0%). The last variable is dysmenorrhea, which is felt by almost all respondents in this study.A total of 2 female students (1.7%) did not feel pain during menstruation. Then, the highest number of female students, namely 42 female students (36.2%) felt severe pain when they were menstruating. While mild pain was felt by 39 female students (33.6%) and moderate pain was felt by 33 female students (28.4%)

Table 1. Distribution of Respondents' General Data Characteristics Relationship between Nutritional Status, Sports Level and Recreation Level with dysmenorrhea in Students of the Faculty of Nursing, Airlagga University (n=116)

Respondent Demographic Characteristics	**n**	**%**
Age		
18 Years	27	23.3
19 Years	89	76.7
Total	116	100
Time Since Menarche		
2 Years	1	0.9
3 Years	1	0.9
4 Years	4	3.4
5 Years	22	19.0
6 Years	25	21.6
7 Years	37	31.9
8 Years	21	18.1
9 Years	4	3.4
10 Years	1	0.9
Total	116	100

Table 2. Distribution of Independent and Dependent Variables in the Relationship between Nutritional Status, Sports Level and Recreation Level with Dysmenorrhea in Students of the Faculty of Nursing, Airlangga University (n=116)

Respondent Demographic Characteristics	**n**	**%**
Nutritional Status		
Severe Depletion	2	1.7
Moderate Depletion	12	13.3
Normal	84	72.4
Obesity	18	15.5
Total	116	100
Exercise Level		
Less	81	69.8
Enough	34	29.3
Excess	1	0.9
Total	116	100
Recreation Level		
Less	14	12.1
Enough	51	44.0
Well	51	44.0
Total	116	100
Dysmenorrhea		
No Pain	2	1.7
Mild	39	33.6
Moderate	33	28.4
Severe	42	46.2
Total	116	100

Table 3. Analysis of Relationship between Nutritional Status and Dysmenorrhea in Students of Faculty of Nursing Airlangga University (n=116)

Nutritional Status	Dysmenorrhea								Total	
	No Pain		Mild		Moderate		Severe			
	n	%	n	%	n	%	n	%	n	%
Obesity	0	0.0	3	2.6	1	0.9	14	12.1	18	15.5
Normal	1	0.9	31	26.7	31	26.7	21	18.1	84	72.4
Moderate Depletion	1	0.9	4	3.4	1	0.9	6	5.2	12	10.3
Severe Depletion	0	0.0	1	0.9	0	0.0	1	0.9	2	1.7
Total	2	1.7	39	33.6	33	28.4	42	36.2	116	100.0
				r= 0.206		p= 0.026				

Table 4. Analysis of Relationship between Sports Level and Dysmenorrhea in Students of the Faculty of Nursing Airlangga University (n=116)

Sport Level	Dysmenorrhea								Total	
	No Pain		Mild		Moderate		Severe			
	n	%	n	%	n	%	n	%	n	%
Less	0	0.0	24	20.7	23	19.8	34	29.3	81	69.8
Enough	2	1.7	14	12.1	10	8.6	8	6.9	34	29.3
Excess	0	0.0	1	0.9	0	0.0	0	0.0	1	0.9
Total	2	1.7	39	33.6	33	28.4	42	36.2	116	100.0
				r= -0.224		p= 0.015				

Table 5. Analysis of the Relationship between Recreation Level and Dysmenorrhea in Students of the Faculty of Nursing Airlangga University (n=116)

Recreation Level	Dysmenorrhea								Total	
	No Pain		Mild		Moderate		Severe			
	n	%	n	%	n	%	n	%	n	%
Less	0	0.0	7	6.0	0	0.0	7	6.0	14	12.1
Enough	0	0.0	10	8.6	15	12.9	26	22.4	51	44.0
Excess	2	1.7	22	19.0	18	15.5	9	7.8	51	44.0
Total	2	1.7	39	33.6	33	28.4	42	36.2	116	100.0
				r= -0.272		p= 0.003				

Based on table 3, which shows the results of data analysis using Spearman Rho, with a significance level of α = 0.05, it has obtained r = 0.206 and p value = 0.026. The p value in the analysis results is less than 0.05, meaning that H1 was acceptedand H0 was rejected. The results of the data analysis above show that nutritional status and dysmenorrhea have a relationship. While the correlation coefficient (r = 0.206) means that the relationship is weak and direction of the relationship between these variables is unidirectional. This means that the better the nutritional status, the dysmenorrhea pain that is felt will be getting better.

Tabel 4 displaying the results of data analysis using the Spearman Rho test with a significance level of α = 0.05, the results of the correlation value r = -0.224 and p = 0.015. P value is less than 0.05, so H1 has accepted and H0 has rejected, it means that the variable level of exercise and dysmenorrhea has a relationship. Then, the coefficient value of r = -0.224 means that the relationship between the two variables is weak. Meanwhile, the negative value on the coefficient means that the relationship between the variable level of exercise and dysmenorrhea is not unidirectional, meaning that if the level of exercise is higher, the level of dysmenorrhea will decrease and vice versa.

The results of data analysis in table 5.5 using the Spearman Rho analytical test with a significance level of α = 0.05, the results of the correlation coefficient r = -0.272 and p = 0.003. The p value itself is less than 0.05, then H1 is accepted and H0 is rejected, meaning that the level of recreation and dysmenorrhea has a relationship. Then the strength of this correlation can be seen at the value of r which means it has a strong enough relationship. Furthermore, the negative r value means that the relationship between the level of recreation and dysmenorrhea is not unidirectional, meaning that if the level of recreation is higher, the level of dysmenorrhoea tends to decrease, and vice versa.

4. DISCUSSION

4.1 The Relation between Nutritional Status and Dysmenorrhea in Students of the Faculty of Nursing, Airlangga University

move. The results of the data analysis indicated that there was a relationship

between nutritional status and dysmenorrhea. The relationship between the two has weak and unidirectional strength. This means that if the nutritional status increases, dysmenorrhea will also increase. Most of the respondents who had better nutritional status felt the level of dysmenorrhea pain which was getting better and vice versa. The point is, if the nutritional status has headed towards normal, the dysmenorrhea pain that is felt tends to get better. Nutritional status that has classified as normal tends to feel mild and moderate dysmenorrhea. Normal nutritional status with mild dysmenorrhea and normal nutritional status with moderate dysmenorrhea are both equal. Meanwhile, respondents with abnormal nutritional status tended to experience severe dysmenorrhea. The results of the analysis show that the strength of the poor correlation means that the relationship that occurs in the nutritional status variable and dysmenorrhea is the correlation value (r) close to zero, which is equal to 0.206. This occurs because the increase or decrease in the value of nutritional status is not always proportional to the increase / decrease in the value of dysmenorrhea, so that the linear relationship between nutritional status and dysmenorrhea is poor. Meanwhile, respondents with abnormal nutritional status tended to experience severe dysmenorrhea. The results of the analysis show that the strength of the weak correlation means that the relationship that occurs in the nutritional status variable and dysmenorrhea is the correlation value (r) close to zero, which is equal to 0.206. This occurs because the increase or decrease in the value of nutritional status is not always proportional to the increase / decrease in the value of dysmenorrhea, so that the linear relationship between nutritional status and dysmenorrhea is weak. The results of this study corresponding with research conducted by (Abadi Bavil et al., 2018) and (Budiarti, 2018) there is a significant relationship and indicates that normal nutritional status tends to feel mild dysmenorrhea and vice versa. Nutritional status is one of the risk factors for dysmenorrhea (Brincart et al., 2014). Fat in the body plays an important role in regulation in the reproductive system. Obesity has indicated of a risk factor for pain and an increase in pain duration. Fat in the body plays an important role in regulation in the reproductive system. Obesity has indicated of a risk factor for pain and an increase in pain duration (Sloane, 2005 in Luluk, 2016). Lack of fatty tissue can lead to under production of estrogen, which can interfere with the menstrual cycle and ovulation (Misra et al., 2019).

Sloane (2005) in Luluk, (2016) said that there were four mechanisms of body fat in influencing regulation of the reproductive system, namely androgens were converted into estrogen in the ovaries by fat tissue. So that in this case fat has an important role as other source in the formation of estrogen. Then body fat can also affect estrogen metabolism. Obese women can cause a decrease in the binding capacity of estrogen with sex-hormone-binding-globulin, which is a blood plasma transport protein that is a link that carries estrogen and testosterone into cells and fat tissue can affect steroid hormones. Obese women who have a lot of fat will experience disturbances in the production of estrogen, too much estrogen were produced, and the ratio of the amount of estrogen and progesterone in the body is not balanced. Existence of this imbalance can cause disturbances in the female reproductive system, one of which is dysmenorrhea.

Whereas thin and very thin women have extreme body mass, this will affect reproductive function and lead to estrogen deficiency and lead to increased levels of prostaglandins. Prostaglandins in high levels in the blood circulation can cause dysmenorrhea (Misra et al., 2019). It would be concluded that women with obesity or depletion can cause an imbalance in estrogen and progesterone levels which can increase the risk of dysmenorrhea. So that respondents with nutritional status of obesity and depletion tend to feel severe dysmenorrhea. Optimal nutrition has been found to reduced severity of dysmenorrhea (Misra et al., 2019). Then a study showed that arachidonic acid in animal fats were involved in the synthesis of prostaglandins, therefore, foods such as meat and dairy products are the main source of arachidonic acid (Molazemet al (2011) in (Abadi Bavil et al., 2018).

Research conducted by Bajalan, Alimoradi and Moafi, (2019) carrying out nutrition and dysmenorrhea by selecting previous studies from 1990 to 2018. There were 38 studies

related to primary dysmenorrhea. Bajalan's research shows that increasing consumption of fruits and vegetables as a source of vitamins and minerals, as well as fish and milk and dairy products has significant results in reducing dysmenorrhea. However, in significant results were also reported on the consumption of other nutrients. Several studies have shown inconclusive findings due to methodological heterogeneity for assessing nutritional habits and different methods for measuring dysmenorrhea pain.

The theory were accordance with the results of this study which showed that respondents with normal nutritional status felt that dysmenorrhea tended to be low and vice versa. Based on the measurement of nutritional status using the upper arm circumference (LILA), most female students had normal nutritional status, followed by the nutritional status of obesity, moderate depletion and severe depletion. The researcher argues, this condition occurs because this research was conducted on early semester students, where lecture activities were not as crowded as middle and final semester students. As a result, the level of stress that is felt is also not as bad as middle and final semester students.

The pandemic has made almost all female students in their homes. Being at home, nutritional needs will be more fulfilled than when students were in a boarding house. In addition, a trip to campus will also be exhausting. Demographic conditions can also affect the nutritional status of female students, the first is the work of parents. This condition will affect the family economy. So that the food consumed daily tends to depend on economic conditions. Second, namely the place of residence, this will affect the types of food that could be consumed. As is the case in big cities, there are many outlets that sell fast food, which does not have a healthy nutritional component.

Based on the data obtained in this study, there are interesting data, namely the presence of respondents who experienced menarche at the age of 16 years, but had experienced dysmenorrhea with a severe degree of pain. This is not in accordance with the theory presented by Novia & Puspitasari (2011 in Yunitasari R, & Sri Rejeki, 2017), dysmenorrhea can occur 1-3 years after menarche, while the respondent has only experienced menstruation for 2 years. Judging from his family history, one of the family members of his biological mother had dysmenorrhea. Then in terms of nutritional status, respondents are obese.

Poverawati (2009 in Sari, 2019) mentions several factors that can affect the age of menarche, among others, psychological aspects, nutritional status, genetic factors, socio-economic factors, exposure to mass media and lifestyle. Based on data collection, one of the data accordance with this theory is the nutritional status of respondents who are in the obesity category. One of the factors that influence formation of hormones is a good nutritional status. This condition can accelerate formation of hormones that affect the arrival of menarche. While obesity can affect condition of the body and the hormone production system which is closely related to occurrence of menarche (Waryana, 2010 in Sari, 2019).

Lifestyle can also affect a person's nutritional status, through one's habits in meeting nutritional needs. Eating fast food which is increasingly prevalent can cause fat accumulation in the body. As stated in the previous discussion, that fat can affect estrogen metabolism, where accumulation of fat can cause a decrease in the binding capacity of estrogen with sex-hormone-binding-globulin, so that excess amounts of estrogen and cause a hormonal imbalance that triggers dysmenorrhea. However, the findings of the researchers showed that respondents did exercise with less duration and frequency, thus increasing risk of respondents experiencing severe dysmenorrhea during menstruasion. It was conveyed in the next discussion regarding the relationship between exercise level and dysmenorrhea.

Another finding in this study was the nutritional status in the category of depletion were experienced mild and moderate dysmenorrhea. On average, respondents with depletion nutritional status has a good level of recreation and a normal age of menarche. Both of these could be reduced the risk of experiencing dysmenorrhea, this confirms the facts. In addition, if the level of recreation is good, it can reduce stress, where stress is one of the risk factors for dysmenorrhea which discussed further in the discussion related to the level of recreation with dysmenorrhea.

The results of the study, which showed a

weak significance, could be caused by the habits of respondents in meeting different nutritional needs, such as skipping breakfast, eating irregularly and following a diet. Various food sources could be consumed to meet the nutritional needs of the body. Several studies examining the food ingredients associated with dysmenorrhea have shown insignificant results. It is possible that respondents with adequate nutrition have a habit of eating unbalanced foods. Supported by a variety of processed foods, fast food and junk food that have been rife lately. This confirms that in nutrition-related studies there is methodological heterogeneity for assessing nutrition itself. Therefore, further research and intervention studies with stronger method was needed.

4.2 Relationship between Sports Level and Dysmenorrhea in Students of the Faculty of Nursing, Airlangga University

The data analysis that the researchers have done shows that there is a significant relationship with weak strength between the level of exercise and dysmenorrhea, but it has a non-unidirectional correlation. Thus, if the level of exercise increases, the dysmenorrhea is felt to tend to decrease and vice versa. Severe dysmenorrhea is mostly felt by female students with less level of exercise, followed by moderate and excessive levels of exercise.

The level of exercise were sufficient for most to feel mild pain, while excessive exercise feels mild pain. Strength of the weak correlation that appears in the analysis results means that the increase / decrease in exercise level data and the increase / decrease in dysmenorrhea data are not always proportional. Therefore, it gives rise to a weak correlation strength result where the correlation value is close to zero, which is equal to -0.224.

The results of this study were accordance with the research that has been conducted by Yudha (2019), Kusmindarti and Munadlifah, (2018) and Temesvari et al., (2019) that there was a significant relationship between exercise habits and dysmenorrhea. But not according to research Herdianti et al., (2019) and Yusuf (2018), which states that there is no relationship between exercise and dysmenorrhea. The exercise was non-pharmacological management that was safe to use, because it uses the body's physiological processes. The management could have reduced menstrual pain (Wulandari, 2011 in Ammar (2016). Muscle stretching were very beneficial, it can help increase oxygenation in the cells and can stimulate blood flow in the lymph system. So it can increase muscle flexibility by restoring muscles and maintaining muscles properly (Santi et al., 2013). So if there were muscle contraction during menstruation, the uterine muscles have been trained with the exercise that has been done.

Research that has been conducted by Ketut Alit, Sulistyono and Nurmasitoh (2007), It could be seen that physical exercise in the form of stretch paint exercises which have been done when a woman has dysmenorrhea, the result were stretch pain exercise could have been reduced the level of dysmenorrhea. Perception of pain that were felt by each person weredifferent, this happens because the pain response was a complex process, which involves various aspects. Then on research Noor et al (2015), The results showed that there was a significant relationship between aerobic exercise and prehaid complaints. In this study using a quasy experimental approach, where the sample was divided into a treatment group (aerobic exercise) and a control group (health education). The treatment group has a higher correlation value than the control group.

Dysmenorrhea in women occurs when oxygen cannot be channeled into the blood vessels of the reproductive organs which were undergoing vasoconstriction, causing hypoxia and uterine ischemia. If this condition was accompanied by an increase in oxytocin levels, then a higher vasopressin level will cause irregular uterine contractions. When women exercise regularly and rhythmically, it would have increased their heart rate and respiratory rate to meet the oxygen needs of the body. Therefore the oxygen in the blood vessels would have been available almost twice per minute. So that oxygen would have been delivered to the vasoconstriction blood vessels and reduced risk of uterine hypoxia and ischemia. Exercise could have prevent the accumulation of prostaglandins resulting in ischemia, uterine contractions and pain (Motahari Tabari et al., 2017).

When dysmenorrhea occurs, uterine contractions would have been long and strong, causing fatigue of the uterine muscles. Then it takes physical exercise or light exercise to relieve uterine muscle cramps (Anderson,

2010). Doing exercise could have been stimulated the receptors in the hypothalamus and limbic system that function to control emotions, so that it could be increase the pain threshold when dysmenorrhea. With this endorphin hormone, a person will feel less pain. The pituitary gland produces β-endorphin as a neurotransmitter that could be affect mood to relax and can function as a pain-reducing drug. This indicates that these theories was accordance with the results of this study, that there was a significant relationship between exercise levels and dysmenorrhea.

A study that carried out sports activities with dysmenorrhea by Brown & Brown (2017), by giving intervention to the research sample. The researchers noted that the evidence from non-randomized studies to support the use of exercise in reducing symptoms associated with dysmenorrhea was very limited in terms of the volume and quality of exercise. Brown also noted that further research was needed in this area. It was complicated by subjective nature of the symptoms and confounding factors that may come from the woman's disposition, stress and mood, making it was less likely that exercise can be reduced risk of dysmenorrhea.

This study categorizes the level of exercise into three, namely the level of less, good and excessive exercise. From the data distribution table, it can be seen that most female students do not have enough sports. Then the rest was enough exercise and excess exercise. According to researchers, it was due to the current pandemic, which requires female students to remain at home. So, the sports they were used to do outside the home, such as cycling, jogging, swimming, and so on, could not do as they were before the pandemic.

Exercising at home may also affect the duration of the exercise. It could be because you don't like the sport, because you have accustomed to doing sports outside the home. Boredom can also be felt when exercising at home, so they immediately stop it. Then, exercise together with colleagues can also affect the duration of exercise. Because doing something together with other people tends to be more fun. According to researchers, the things that make exercise have a small chance of reducing the risk of dysmenorrhea are due to the varying factors in exercise activities, namely quality, intensity and duration in relation to menstrual incidence.

4.3 The Relationship between Recreation Level and Dsymenorrhea in Students of the Faculty of Nursing, Airlangga University

The results of the data analysis that have been carried out show that there is a significant relationship that is quite strong between the level of recreation and dysmenorrhea, but not in the same direction. It was means that if the level of recreation increases, dysmenorrhea tends to decreased and vice versa. The level of good recreation mostly felt mild pain, the rest had no pain, moderate pain and severe pain. Then recreation with a sufficient level of nothing that does not feel pain. Less recreation with mild and moderate dysmenorrhea has the same number. The analysis of the level of recreation and dysmenorrhea showed a strong correlation. This indicates that each decreased / increased in the level of recreation data was quite proportional to the decreased / increased in dysmenorrhea.

Until now, studies that carried the recreation variable with dysmenorrhea are rare. However, the results of this study can be related to research that carries the relationship between recreation and stress, because stress was a risk factor for dysmenorrhea. The results of this study was accordance with previous research conducted by Montgomery (2016) that the results showed a significant unidirectional correlation. In his research, respondents with high levels of recreational satisfaction tended to experience low levels of stress, and vice versa. Then the results of this studied also have accordance with the research conducted by Baghurst and Kelley (2014) in Montgomery (2016) that there was a significant relationship between recreation and stress reduction. In his research, he also stated that recreation was good for reducing stress levels. Baghurst and Kelley found some of their students had good stress coping after recreation. It was accordance with one of the benefits of recreations were reducing stress. Recreational activities could be produced endorphin hormones that could be control a person's emotions, so they could have made a person calmer. So that recreation could be used as stress management in order to reduced the risk of dysmenorrhea.

The recreation level data distribution table

shows that the level of good and adequate recreation has the same number, the rest is less level recreation. With this pandemic, almost all female students are in their homes. The recreation they do revolve around doing simple activities that could have been done at home, such as reading, watching TV, cleaning the house, listening to music to chatting with family. More than half of the respondents listen to music every day. Their presence at home has a positive impact on them, so they often do refreshing or recreation. Weekends are usually packed with vacation schedules for some people who rarely chat with their families every day due to busy work. However, this pandemic forces them not to have a vacation at the end of the week, so they stay home and do the things they enjoy, whether done together with their families or alone. Because activities in a boarding house are denser than at home, it is easier for them to take the time to refresh their minds. In addition, gathering with family can certainly create peace of mind. It was needs to be emphasized again, that recreation does not only have to do activities outside the home.

Twenty-six respondents had adequate levels of exercise but experienced severe dysmenorrhea. This could also be due to the high level of stress on the respondents. Staying at home is a rule that must have been done during this pandemic, which makes some people feel stressed. Especially for those who have accustomed to doing activities outside the home and meeting many people it creates its own pressure. As a result, they are very easily stressed when they have to be at home for some time. Not a few of them try to keep themselves busy at home by doing various activities, but still could have not reduced the level of stress they feel. This of course could be one of the factors that support the existence of this data.

The various benefits that could be generated by recreational activities are certainly important for increasing campus achievement. It is important to have recreational activities in order to refresh students' minds due to the pressure they get while attending lectures. It was not uncommon for campuses to always encourage students to improve their achievements. If student stress management was good, then the stress and stressors felt by students would be decrease. In addition, the health condition of students would be improved, with this the campus achievement would be increase.

5. CONCLUSION

Based on the results of research and data processing in the study entitled The Relationship of Nutritional Status, Sports Level and Recreation Level with Dysmenorrhea in Students of the Faculty of Nursing, Airlangga University which was held on May 31 to June 23, 2020, data on nutritional status, exercise level, recreation level and dysmenorrhea of nursing student. The nutritional status of female students is mostly normal and they have a low level of exercise. At the recreation level, there are two categories which have the same number, namely the moderate and good categories. Then the dysmenorrhea felt by female students was mostly severe pain. After analyzing the data, it was concluded that there was a significant relationship between nutritional status, level of exercise and level of recreation with dysmenorrhea. Therefore, health education was needed for students of the Faculty of Nursing, Universitas Airlangga about fulfilling nutrition, maintaining health by continuing to exercise and taking time for recreation to reduced risk of dysmenorrhea.

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7. CONFLICT OF INTEREST

The author states that there is no conflict of interest in this study.

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