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Correlation between nutritional status and primary dysmenorrhea based on work ability, location, intensity, days of pain, and dysmenorrhea (Walidd) Score

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Abstract

Dysmenorrhea is a condition of cramps or pain during menstruation. Dysmenorrhea that usually occurs in young women is primary dysmenorrhea. The incidence of primary dysmenorrhea is very high, caused by various risk factors, one of which is nutritional status. An abnormal Body Mass Index can cause pain during menstruation. This study aimed to determine the relationship between nutritional status and the incidence of primary dysmenorrhea based on the WaLIDD score at the Medical Faculty of the Indonesian Christian University (UKI). This research is an analytical study with a cross-sectional approach conducted in November 2020. Data were collected on nutritional status using a height and weight questionnaire and dysmenorrhea data using the WaLIDD score questionnaire. The sampling technique in this study used purposive sampling, with a total sample of 429 female students. The results of the Chi-Square Statistical Test obtained a p-value of 0.047 ($p < 0.05$), which can be concluded that there is a relationship between nutritional status and the incidence of primary dysmenorrhea based on the WaLIDD score at the Medical Faculty of UKI.

Keywords: Menstrual pain; Body Mass Index; WaLIDD Score

1. Introduction

Dysmenorrhea is a condition of cramps or pain during menstruation. [1] There are two types of dysmenorrhea, namely primary and secondary dysmenorrhea. Primary dysmenorrhea is menstrual pain without organic disease disorders, while organic abnormalities cause secondary dysmenorrhea in the reproductive organs. [2] Dysmenorrhea experienced by young women is generally primary dysmenorrhea. [2; 3] Primary dysmenorrhea occurs due to increased prostaglandin (PG) F2-α which results in increased myometrial contractions and endometrial blood vessel vasoconstriction, resulting in endometrial ischemia, which causes the sensation of pain. [1; 2] Primary dysmenorrhea causes a reduction in daily activities and quality of life. [2] Currently, there is a new method for diagnosing dysmenorrhea and knowing the level of dysmenorrhea, namely Working ability, Location, Intensity, Days of pain, and Dysmenorrhea (WaLIDD) Score, which was first published by Tehran et al. in 2018. [4] A WaLLID score >6 can enforce dysmenorrhea easily and quickly.

The incidence of dysmenorrhea globally reaches more than 50% of women in every country. [5] A high prevalence of dysmenorrhea was found in Taiwan at 92.5%, the United States at 85%, and Italy at 84.1%. [6] The incidence of dysmenorrhea in Indonesia is 64.24%, with 54.88% primary dysmenorrhea and 9.36% secondary dysmenorrhea. 5 The incidence of primary dysmenorrhea peaks in late adolescence and early 20s. [1] The high incidence of primary dysmenorrhea is related to various risk factors; one of the risk factors that cause primary dysmenorrhea is nutritional status. Nutritional status can be assessed using simple indicators: Body Mass Index (BMI) measurements. Women with abnormal body mass index are associated with primary dysmenorrhea. [5] Low-calorie intake, body weight, and fat

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mass are found in women with a lower BMI than normal, resulting in a decrease in the body's resistance to pain. [7] In women who are overweight, there is an increase in fatty tissue, which can increase levels of prostaglandins and estrogen hormones in the body, which trigger menstrual pain. [2]

Based on research conducted by Rafique and Al-Sheikh [2] at Immam Abdulrahman Bin Faisal University, Dammam, found 85.7% of female students suffer from primary dysmenorrhea. There is a significant association specifically between BMI and dysmenorrhea, with underweight and obese women having a higher risk of primary dysmenorrhea. One study in Indonesia conducted by Pande and Purnawati [8] on female students at the Faculty of Medicine, University Udayana, found 74.9% had primary dysmenorrhea but found no relationship between BMI and primary dysmenorrhea. Therefore, researchers are interested in researching the relationship between nutritional status and the incidence of primary dysmenorrhea based on Working ability, Location, Intensity, Days of pain, and Dysmenorrhea (WaLIDD) Score at the Medical Faculty of UKI.

Based on the above background, the research problem is formulated, namely, "Is there a relationship between nutritional status and the incidence of primary dysmenorrhea based on Working ability, Location, Intensity, Days of pain, Dysmenorrhea (WaLIDD) score in female students class of 2017 - 2020 at the Faculty of Medicine, Indonesian Christian University in 2020 ?" The purpose of this study was to determine the relationship between nutritional status and the incidence of primary dysmenorrhea based on the Working Ability, Location, Intensity, Days of Pain, Dysmenorrhea (WaLIDD) Scores for female students in the 2017-2020 class at the Faculty of Medicine, the Christian University of Indonesia in 2020.

2. Literature Review

Nutrients are substances in the body's food for metabolic processes. Nutritional status is a condition that arises due to a balance between the intake of nutrients from food and the need for nutrients needed for the body's metabolism. [9] Nutritional status can be used as an illustration of daily nutritional intake in individuals, and the nutritional status of each individual varies, depending on nutritional intake and body needs. A person with good nutritional status is not susceptible to infectious and degenerative diseases. [10] Anthropometric measurements can assess nutritional status by calculating BMI. Body Mass Index is the most frequently used indicator to determine the nutritional status of individuals over the age of 18 years. [10] The advantage of BMI is that height and weight are easy to measure, while the disadvantage of BMI is that it cannot show a person's body fat percentage. Body Mass Index is calculated using the formula: [11; 12] BMI classification can refer to the classification according to the World Health Organization (WHO), which is presented in Table II.1, and the threshold according to the Ministry of Health of the Republic of Indonesia (MOH RI) which is presented in Table II.2. In this study, threshold limits were used according to the Ministry of Health, because the thresholds had been adjusted based on clinical experience for the benefit of Indonesia. [10] Various factors affect nutritional status: genetic factors, food intake, body image, physical activity, and lifestyle. [13]

Dysmenorrhea comes from the Greek word "dys," which means difficult or painful, "meno," which means month, and "rrhea," which means flow. So dysmenorrhea is painful menstrual flow. [14] Dysmenorrhea is painful menstruation or menstrual cramps that occur at the start of menstruation and last several hours to days. [1] Dysmenorrhea is the most common gynecological disorder in women with various complaints, namely pain that is centered in the suprapubic area and can radiate to the lower back as well as mood swings, fatigue, headaches, and nausea during menstruation. [15]

Based on the presence or absence of observable causes, dysmenorrhea can be divided into primary dysmenorrhea and secondary dysmenorrhea. [2; 16] It occurs in women aged 30 to 40 and can be accompanied by other symptoms, namely dyspareunia, sub-fertility, and abnormal bleeding.[1; 16] various risk factors can affect the occurrence of primary dysmenorrhea, including age, early menarche, prolonged menstrual periods, nutritional status, family history, and smoking. [1; 8]

During menstruation, there is a decrease in the level of the hormone progesterone, which stimulates endometrial cells to release prostaglandins. Prostaglandins play a role in stimulating uterine contractions, myometrial contractions, ischemia, and sensitization of nerve endings. Prostaglandin F2α stimulates rhythmic contractions of the uterine myometrium to help expel blood and remnants of the endometrium from the uterus during menstruation. Increased release of PGF2α causes uterine contractions that are too strong and excessive, causing menstrual pain. The increased contraction causes endometrial blood vessel vasoconstriction, resulting in ischemia and necrosis of the tissue, which can cause menstrual pain. [17] Prostaglandin E2 (PGE2) stimulates the sensitization of nerve endings, thereby making nociceptors in the uterus hypersensitive to bradykinin action and painful stimuli. In women with primary dysmenorrhea, increased levels of the posterior pituitary hormone vasopressin during menstruation can cause

dysrhythmic contractions of the uterus that reduce blood flow to the uterus and cause uterine hypoxia and myometrial hypersensitivity. [2]

Identifying dysmenorrhea and assessing the degree of dysmenorrhea can use the Work Ability, Location, Intensity, Days of pain, Dysmenorrhea (WaLIDD) Score presented in Table II.3. [4] The WaLIDD score is a new method from research by Teherán et al. [4] in 2018 with the title WaLIDD score. It is a new tool for diagnosing dysmenorrhea and predicting medical leave in university students. The WaLIDD score can be used to identify dysmenorrhea, with a score of >6 for experiencing dysmenorrhea and <6 without dysmenorrhea. Assessment of the degree of dysmenorrhea based on the WaLIDD score obtained 0 without dysmenorrhea, 1-4 mild dysmenorrhea, 5-7 moderate dysmenorrhea, and 8-12 severe dysmenorrhea. [4] Apart from using the WaLIDD score to identify the degree of dysmenorrhea, you can use the Verbal Multidimensional Scoring System (VMSS), Numerical Rating Scale (NRS), and Visual Analog Scale (VAS). The scoring system using the VMSS is determined based on the severity of pain, the impact of pain on daily activities, systemic symptoms, and the need for analgesic drug use. Identification of the degree of dysmenorrhea using NRS and VAS is determined based on the intensity of pain experienced. [18]

Based on the results of a study by Ju et al. [19] stated that there is a relationship between dysmenorrhea and BMI, with underweight and overweight-obese women having a higher risk of experiencing primary dysmenorrhea. In women with BMI <18.5, there may be insufficient intake of nutrients in the body, resulting in a weak physical condition and decreased resistance to pain. [1] The results of this study are supported by the research of Mohapatra et al., [7] namely in women with low body weight, it will interfere with the secretion of gonadotropin hormones so that it will have an impact on menstrual pain. This study's results differ from those obtained by Octavia et al. [20] in 2017, which stated that there was no significant relationship between being underweight and the incidence of primary dysmenorrhea. Women with BMI > 25.0 have a lot of adipose tissue that produces pro-inflammatory mediators, one of which is PGF2α, a vasoconstrictor. [1] Increased adipose tissue and cholesterol can also cause an increase in the hormone estrogen. Increased prostaglandins and estrogen hormones can cause primary dysmenorrhea. [1; 17] The results of a study conducted by Syed and Rao [21] reported that there was no significant relationship between excess weight and obesity with the incidence of dysmenorrhea.

3. Research Method

It is an analytic observational study with a cross-sectional approach to determine the relationship between nutritional status and the incidence of primary dysmenorrhea based on the WaLIDD score in female students class 2017 – 2020 at the Medical Faculty of UKI 2020. The research data collection was carried out simultaneously using a questionnaire. The research was conducted at the Faculty of Medicine at the Indonesian Christian University. The research was conducted from October to December 2020. The population in this study was the Medical Faculty of UKI class of 2017 – 2020 which is still active until 2020, totaling 439 people. Sampling using the purposive sampling technique, namely in selecting the sample, refers to the criteria determined by the researcher. The instruments in this study were the nutritional status questionnaire and the dysmenorrhea questionnaire. The dysmenorrhea questionnaire used the WaLIDD score from Teherán et al. [4], which the researchers then translated into Indonesian. This questionnaire has been tested for the quality of the data by testing its validity and reliability. With an interpretation of >6 experiencing dysmenorrhea and <6 not experiencing dysmenorrhea. Determination of the incidence of dysmenorrhea was carried out using the presented WaLIDD Score. The score obtained from the questionnaire can also be used to assess the degree of dysmenorrhea. With an interpretation of no dysmenorrhea, a score of 0; mild dysmenorrhea, a score of 1-4; moderate dysmenorrhea, a score of 5-7; and severe dysmenorrhea, a score of 8-12. Nutritional status questionnaire to determine the respondent's weight. The instrument for measuring nutritional status uses the BMI indicator. Nutritional status was determined using BMI analysis adjusted to the Ministry of Health thresholds presented. The data collected in this study are primary data and secondary data. Primary data was obtained from online questionnaires to identify dysmenorrhea and nutritional status. The secondary data obtained was in the form of the number of Medical Faculties of UKI. The data obtained from the research results with the questionnaire is converted into tabular form and will be analyzed using the IBM SPSS Statistics 16.00 program. Data processing in this study went through 4 stages: editing, coding, entry, and cleaning. Data analysis in this study will be carried out in several stages, namely univariate analysis and bivariate analysis. Before collecting data, the researcher will explain to all prospective research respondents regarding the aims and objectives of the research. Prospective respondents must fill out an informed consent form if they are willing to participate in this study. The respondent's information is confidential, and the researcher will not include the respondent's name on the data collection sheet.

4. Result and Discussion

This research was conducted at the Medical Faculty of UKI in November 2020. Data were obtained through a questionnaire at the Medical Faculty of UKI batches of 2017, 2018, 2019, and 2020. The study sample consisted of 439 female students, the results obtained were 410 female students who met the inclusion criteria (93.4 %) female students and as many as 29 (6.6%) female students did not meet the inclusion criteria.

Table 1 Age characteristics at the Medical Faculty of UKI

Age Characteristics	Total	Percentage
18	76	18,5
19	107	26,1
20	120	29,3
21	90	22,0
22	15	3,7
23	2	0,5
Total	410	100,0

The age characteristics of the Medical Faculty of UKI can be seen in Table 1; the distribution of 18-year-old students was 76 (18.5%) students, 107 (26.1%) 19-year-old students, the most 20-year-old students were 120 (29, 3%), female students aged 21 were 90 (22.0%), and female students aged 22 and 23 were 15 (3.7%) and 2 (0.5%) respectively.

Table 2 Characteristics of menstruation at the Medical Faculty of UKI

Menstrual Characteristics	Total	Percentage
Age of Menarche		
<11 years old	28	6,8
11-15 years old	369	90,0
>15 years old	13	3,2
Menstrual Length		
<3 days	4	1,0
3-4 days	164	40,0
5-7 days	234	57,0
>7 days	8	2,0
Menstrual Cycle		
<28 days	55	13,4
28-30 days	269	65,6
31-35 days	70	17,1
>35 days	16	3,9
Menstrual Cycle Regularity		
Yes	285	69,5
No	125	30,5
Total	410	100,0

Table 2 shows the menstruation characteristics in this study, including the age of menarche, the length of menstruation, the menstrual cycle, and the regularity of the menstrual cycle. The age of menarche was the most at the age of 11-15 years with 369 (90.0%) students, followed by 28 (6.8%) students aged <11 years, and >15 years with 13 (3.2%) students. 234 (57.0%) female students experienced the longest menstrual period of 5-7 days, followed by 164 (40.0%) female students for 3-4 days, while >7 days and <3 days were 8 (2), respectively. ,0%) and 4 (1,0%) female students. Female students most commonly experienced menstrual cycles for 28-30 days, reaching 269 (65.5%) female students, followed by 31-35 days by 70 (17.1%) female students, <28 days by 55 (13.4%) female students, and >35 days as many as 16 (3.9%) female students. Menstrual characteristics were seen from the regularity of the menstrual cycle; the group of female students with regular menstrual cycles was 285 (69.5%) female students, while those with irregular menstrual cycles were 125 (30.5%) female students.

Table 3 Characteristics of Dysmenorrhea at the Medical Faculty of UKI

Characteristics of Dysmenorrhea	Total	Percentage
Dysmenorrhea Complaints		
Yes	307	74,9
No	103	25,1
Family History		
Yes	216	52,7
Mother	112	27,3
Siblings	82	20,0
Other	22	5,4
No	194	48,8
Consumption of Analgesic Drugs		
Yes	71	17,3
No	339	82,7
Go to the doctor		
Yes	11	2,7
No	399	97,3
Total	410	100,0

Following Table 3, it was found that 307 (74.9%) female students experienced complaints of dysmenorrhea, while 103 (25.1%) female students did not experience dysmenorrhea complaints. Based on family history, 216 (51.2%) female students had a history of the same complaint in their families. Meanwhile, 194 (48.8%) female students did not have a history of complaints in the family. During dysmenorrhea, 72 (17.5%) female students consumed analgesic drugs, but more female students did not, namely 338 (82.4%) female students. There were also 11 (2.7%) female students who went to the doctor because of dysmenorrhea. However, it was dominated by female students who did not go to the doctor because of dysmenorrhea, with as many as 399 (97.3%) female students.

The nutritional status of the Medical Faculty of UKI is presented in Figure 1. The results of the study found that at most, 259 (63.2%) female students had normal BMI, followed by 88 (21.5%) female students who had fat BMI, and 63 female students who had thin BMI (15.4%) female students.

Based on the research data in Figure 2, the prevalence of primary dysmenorrhea that interferes with activities based on the WaLIDD Score at the Medical Faculty of UKI reached 104 (25.4%), female students, while female students without dysmenorrhea reached 306 (74.6%) female students.

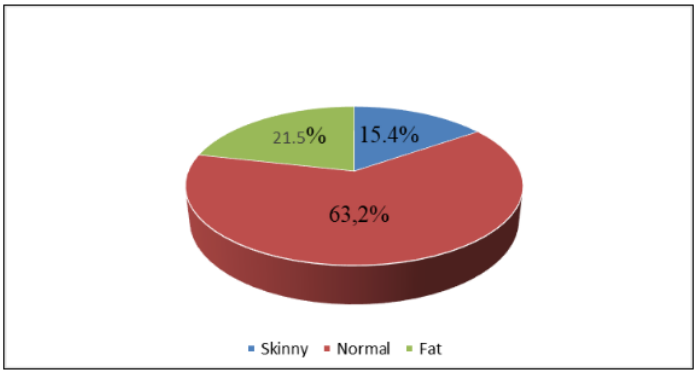

Figure 1 Description of the Body Mass Index (BMI) of the Student of the Faculty of Medicine at the Indonesian Christian University

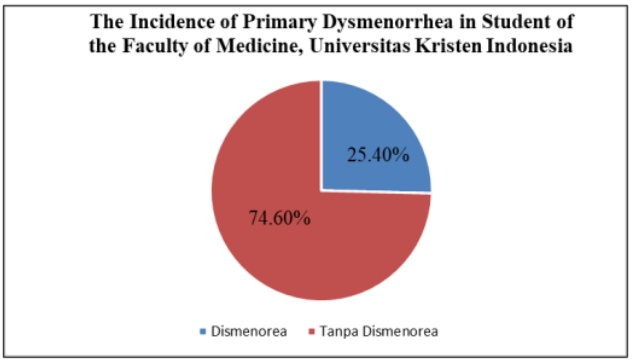

Figure 2 Prevalence of dysmenorrhea based on the WaLIDD Score in female students at the Faculty of Medicine at the Indonesian Christian University

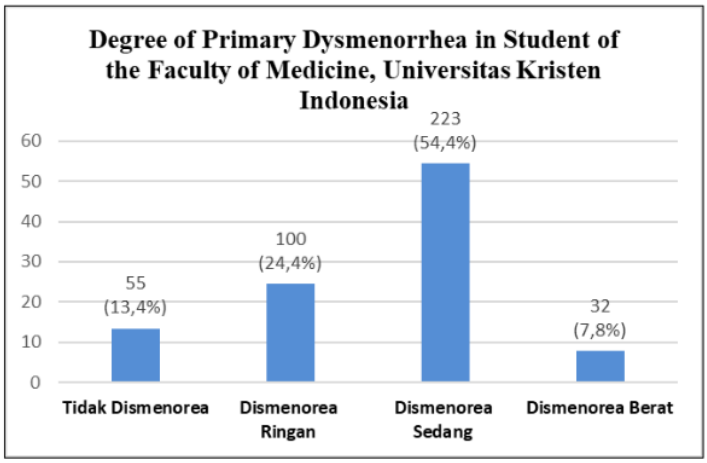

Figure 3 Degree of Dysmenorrhea based on WaLIDD Score

The most degrees of dysmenorrhea based on the WaLIDD Score at the Medical Faculty of UKI were moderate degrees of dysmenorrhea with 233 (54.4%) female students, followed by mild and non-dysmenorrhea, each with 100 (24.4%) female students and 55 (13.4) %) female students, while only 32 (7.8%) female students experienced a severe degree of dysmenorrhea, following Figure IV.3 which has been presented above. The WaLIDD Score characteristics consist of acting ability, location of pain, pain intensity, and duration of pain, which have been presented in Table IV.4. Based on the acting ability of female students who were almost undisturbed reached 174 (42.4%), female students, followed by 131 (32%) female students undisturbed, and as many as 93 (22.7%) and 12 (2.9%) female students respectively while on the move almost always disturbed and always disturbed. The location of pain in dysmenorrhea usually occurs in the lower abdomen, lower back, thigh area, and lower leg. In the study, it was found that 67 (16.3%) female students did not have pain locations, while most female students felt pain at one location, as many as 180 (43.9%) female students, 153 (37.3%) 2-3 locations female students, and four locations as many as 10 (2.4%) female students.

Female students who experienced slightly more intense pain to pain reached 210 (51.2%), female students, followed by a slight pain intensity of 92 (22.4%) female students and more painful to very painful intensity of 47 (11.5%) female students, while the female students who did not experience pain were 61 (14.9%) female students. The duration of pain experienced by female students during dysmenorrhea was the most for 1-2 days, as many as 313 (76.3%) female students, followed by 3-4 days and >5 days respectively by 29 (7.1%) and 2 (0.5 %) female students, and found 66 (16.1%) female students who did not experience pain.

Table 4 Characteristics of Workability, Location, Intensity, Days of Dysmenorrhea (WaLIDD) Score

Characteristics of WaLIDD	**Total**	**Percentage**
Activity Ability		
Not distrubed	131	32,0
Hardly distrubed	174	42,4
Almost always distrubed	93	22,7
Always distrubed	12	2,9
Location		
None	67	16,3
1 location	180	43,9
2-3 locations	153	37,3
4 locations	10	2,4
Intensity		
No pain	61	14,9
Little pain	92	22,4
A little more pain – pain	210	51,2
More pain – very painful	47	11,5
Length of Pain		
0 day	66	16,1
1-2 day/s	313	76,3
3-4 days	29	7,1
≥5 days	2	0,5
Total	410	100,0

Table 5 The relationship between nutritional status and the incidence of primary dysmenorrhea based on the WaLIDD Score

Variable		Dysmenorrhea		Total	P value
		With dysmenorrhea	Without dysmenorrhea		
Nutritional status	Normal	57 (22,0%)	202 (78,0%)	259 (100%)	0,041
	Abnormal	47 (31,1%)	104 (68,9%)	151 (100%)	
Total		104 (25,4%)	306 (74,6%)	410 (100%)	

Table 5 shows the relationship between nutritional status and the incidence of primary dysmenorrhea. It was found that 259 female students had normal nutritional status, of which 52 (22.0%) female students had primary dysmenorrhea and 202 (78.0%) female students did not experience primary dysmenorrhea. Meanwhile, among female students with abnormal nutritional status (thin and fat), 47 (31.1%) female students experienced dysmenorrhea, and 104 (68.9%) female students without dysmenorrhea. The results of the chi-square test statistic obtained p = 0.041, so it can be concluded that there is a significant relationship between nutritional status and the incidence of primary dysmenorrhea.

Table 6 The relationship between nutritional status and the degree of primary dysmenorrhea based on the WaLIDD Score

Variable	Degree of Dysmenorrhea				Total	P value
	No Pain	Mild	Moderate		Severe	
Nutritional status Skinny	5 (7,9%)	16 (25,4%)	31 (49,2%)	11 (17,5%)	63 (100%)	0,067
Normal	39 (15,1%)	60 (23,3%)	144 (55,6%)	16 (6,2%)	259 (100%)	
Fat	11 (12,5%)	24 (27,3%)	48 (54,5%)	5 (5,7%)	88 (100%)	
Total	55 (13,4%)	100 (24,4%)	223 (54,4%)	32 (7,8%)	410 (100%)	

The relationship between nutritional status and the degree of primary dysmenorrhea is presented in Table IV.6. It was found that the degree of dysmenorrhea most commonly experienced was moderate dysmenorrhea, reaching 223 female students, including 31 female students with thin nutritional status, 144 female students with normal nutritional status, and 48 female students with obese nutritional status. One hundred female students experienced a mild degree of dysmenorrhea, most of whom had a normal nutritional status of 60 female students, followed by the obese nutritional status of 24 female students and 16 female students with poor nutritional status. Meanwhile, 32 female students experienced severe dysmenorrhea, 16 female students had normal nutritional status and 11 female students, and five female students with thin and obese nutritional status. The statistical test found that the value of p = 0.067 means no relationship between nutritional status and the degree of primary dysmenorrhea based on the WaLIDD Score.

Table 7 shows the relationship between age and the incidence of primary dysmenorrhea based on the WaLLIDD score; as many as 104 female students experienced dysmenorrhea, with the highest age distribution at the age of 20 with 31 female students, 28 female students at the age of 18, followed by 21 and 19 aged 25 and 18 respectively female students, and 22 years old as many as two female students. At the age of 23 years, there were no respondents who experienced dysmenorrhea. A total of 306 female students did not experience dysmenorrhea, including 48 female students aged 18 years, equally as many as 89 female students at the ages of 19 and 20 years, followed by 65 female students aged 21 years, and female students who did not experience dysmenorrhea at the ages of 23 and 23 years respectively 13 and 2 female students. Based on the chi-square test, the value of p=0.042 was obtained, so it can be interpreted that there is a significant relationship between age and the incidence of primary dysmenorrhea based on the WaLLIDD score at the Medical Faculty of UKI.

Table 7 The relationship between age and the incidence of primary dysmenorrhea based on the WaLIDD Score

Variable		Dysmenorrhea		Total	P value
		With dysmenorrhea	Without dysmenorrhea		
Age	18	28 (36,8%)	48 (63,2%)	76 (100%)	0,042
	19	18 (16,8%)	89 (83,2%)	107 (100%)	
	20	31 (25,8%)	89 (74,2%)	120 (100%)	
	21	25 (27,8%)	65 (72,2%)	90 (100%)	
	22	2 (13,3%)	13 (86,7%)	15 (100%)	
	23	0 (0,0%)	2 (100%)	2 (100%)	
Total		104 (25,4%)	306 (74,6%)	410(100%)	

Table 8 Relationship between the age of menarche and the incidence of primary dysmenorrhea based on the WaLIDD Score

Variable		Dysmenorrhea		Total	P value
		With dysmenorrhea	Without dysmenorrhea		
Age of Menarche	≤11 years old	11 (39,3%)	17 (60,7%)	28 (100%)	0,080
	11-15 years old	92 (24,3%)	277 (75,7%)	369 (100%)	
	≥15 years old	1 (7,7%)	12 (92,3%)	13 (100%)	
Total		104 (25,4%)	306 (74,6%)	410 (100%)	

Based on Table IV.8, it was found that 104 (25.4%) female students experienced dysmenorrhea; among these female students, most were female students who experienced menarche at the age of 11-15 years, as many as 92 (24.3%) female students, followed by menarche age <11 years as many as 11 (39.3%) female students, and 1 (7.7%) female students with menarche age> 15 years.

Whereas in female students without dysmenorrhea who experienced menarche at the age of <11 years, there were 17 (60.7%), female students with menarch aged 11-15 years there were 277 (75.7%) female students, and as many as 12 (92.3%) female student experienced menarche at the age of >15 years. In the statistical analysis, p = 0.079 was obtained; this indicated no relationship between the age of menarche and the incidence of primary dysmenorrhea.

Table 9 The relationship between the duration of menstruation and the incidence of primary dysmenorrhea based on the WaLIDD Score

Variable		Dysmenorrhea		Total	P value
		With dysmenorrhea	Without dysmenorrhea		
Menstrual Length	<3 days	2 (50,0%)	2 (50,0%)	4 (100%)	0,523
	3-7 days	100 (25,1%)	298 (74,9%)	369 (100%)	
	>7 days	2 (25,0%)	6 (75,0%)	8 (100%)	
Total		104 (25,4%)	306 (74,6%)	410 (100%)	

Table 9 presents data on the relationship between menstrual duration and the incidence of primary dysmenorrhea at the Medical Faculty of UKI. Most female students experienced 3-7 days of menstruation for 369 female students, with 100 (25.1%) female students experiencing primary dysmenorrhea and 298 (74.9%) female students not experiencing

primary dysmenorrhea. However, it was also found that there were 4 and 8 female students with menstruation <3 days and >7 days, respectively. Of the four female students who experienced menstruation <3 days, 2 (50.0%) students experienced primary dysmenorrhea, and the rest did not experience primary dysmenorrhea. In female students with menstruation >7 days, 2 (25.0%) female students experienced primary dysmenorrhea, while 6 (75.0%) female students did not experience primary dysmenorrhea. The statistical test results showed a p-value = 0.523, thus indicating that there was no relationship between the length of menstruation and the incidence of primary dysmenorrhea based on the WaLIDD score at the Medical Faculty of UKI.

Table 10 The relationship between menstrual cycle regularity and primary dysmenorrhea based on the WaLIDD Score

Variable		Dysmenorrhea		Total	P value
		With dysmenorrhea	Without dysmenorrhea		
Menstrual Cycle Regularity	Regular	63 (22,1%)	222 (77,9%)	285 (100%)	0,022
	Irregular	41 (32,8%)	84 (67,2%)	125 (100%)	
Total		104 (25,4%)	306 (74,6%)	410 (100%)	

The relationship between the regularity of the menstrual cycle and the incidence of primary dysmenorrhea at the Medical Faculty of UKI is presented in Table 10. The results showed that 285 female students experienced regular menstrual cycles, of whom 63 (22.1%) experienced dysmenorrhea and 222 (77.9%) students without dysmenorrhea. Whereas in female students with irregular menstrual cycles, it was found that 41 (32.8%) female students experienced dysmenorrhea, and 84 (67.2%) female students did not experience dysmenorrhea. Based on the chi-square statistical test results, the value of p=0.022 was obtained, which means that there is a significant relationship between regular/irregular menstruation and the incidence of primary dysmenorrhea.

Table 11 Relationship of dysmenorrhea complaints to primary dysmenorrhea based on the WaLIDD Score

Variable		Dysmenorrhea		Total	P value
		With dysmenorrhea	Without dysmenorrhea		
Dysmenorrhea Complaints	Yes	104 (33,9%)	203 (66,1%)	307 (100%)	0,000
	No	0 (0,0%)	103 (100%)	103 (100%)	
Total		104 (25,4%)	306 (74,6%)	410(100%)	

Three hundred one female students complained of dysmenorrhea, but based on the WaLIDD Score, only 104 (33.9%) female students were included in the dysmenorrhea category. The remaining 203 (66.1%) female students did not experience dysmenorrhea. The study found that 103 (100%) female students did not have complaints of dysmenorrhea and did not experience dysmenorrhea based on the WaLIDD Score. The chi-square test, p = 0.000, indicated a significant relationship between dysmenorrhea complaints and events based on the WaLIDD Score. It is consistent with the results of the study presented in Table IV.11 concerning the relationship between dysmenorrhea complaints and dysmenorrhea events based on the WaLIDD Score.

Table 12 The relationship between a family history of dysmenorrhea and the degree of primary dysmenorrhea based on the WaLIDD Score

Variable		Dysmenorrhea		Total	P value
		With dysmenorrhea	Without dysmenorrhea		
Family History of Dysmenorrhea	Yes	65 (62,5%)	151 (49,3%)	216 (52,7%)	0,020
	No	39 (37,5%)	155 (50,7%)	194 (47,3%)	
Total		104 (100%)	306 (100%)	410 (100%)	

Based on the family history of dysmenorrhea that has been presented in Table 12, it was found that 104 female students experienced dysmenorrhea, of which 65 (62.5%) female students had a family history of dysmenorrhea and 39 (37.5%) female students had no family history of dysmenorrhea. In this study, 306 female students did not experience dysmenorrhea, but 151 (49.3%) female students had a family history of dysmenorrhea, while the remaining 155 (50.7%) female students did not experience dysmenorrhea and did not have a family history of dysmenorrhea. The chi-square test results showed a significant relationship between a family history of dysmenorrhea and the incidence of primary dysmenorrhea (p-value = 0.020).

Table 13 Relationship of analgesic drug consumption to the degree of primary dysmenorrhea based on the WaLIDD Score

Variable	Degree of Dysmenorrhea				Total	P value
	No Pain	Mild	Moderate	Severe		
Consumption of Analgesic Drugs Yes	0 (0,0%)	5 (5,0%)	49 (22,0%)	17 (53,1%)	71 (17,3%)	0,000
No	55 (100%)	95 (95,0%)	174 (78,0%)	15 (46,9%)	339 (82,7%)	
Total	55 (100%)	100 (100%)	223 (100%)	32 (100%)	410 (100%)	

In Table 13, it was found that 71 (17.3%) female students consumed distributed analgesic drugs; five (5.0%) female students had mild dysmenorrhea, 49 (22.0%) had moderate dysmenorrhea, and 17 (53.1%) female students had severe dysmenorrhea. At the same time, as many as 339 female students did not consume analgesic drugs. In the statistical test, the value of p = 0.000 was obtained, so it can be interpreted that there is a significant relationship between the consumption of analgesic drugs and the degree of primary dysmenorrhea.

Table 14 Relationship between going to the doctor and the degree of dysmenorrhea based on the WaLIDD Score

Variable	Degree of Dysmenorrhea				Total	P value
	No Pain	Mild	Moderate	Severe		
Go to the doctor Yes	0 (0,0%)	0 (0,0%)	4 (1,8%)	7 (21,9%)	11 (2,7%)	0,000
No	55 (100%)	100 (100%)	219 (98,2%)	25 (78,1%)	399 (97,3%)	
Total	55 (100%)	100 (100%)	223 (100%)	32 (100%)	410 (100%)	

Based on the research results on the relationship between going to the doctor and the degree of dysmenorrhea in Table 14. There were 11 (2.7%) female students going to the doctor, including female students with moderate degrees of dysmenorrhea, as many as 4 (1.8%) and severe dysmenorrhea, as many as 7 (21, 9%) female students. Meanwhile, 399 female students did not go to the doctor. There is a relationship between going to the doctor and the degree of primary dysmenorrhea, and this can be interpreted from the chi-square test results, which obtained a value of p = 0.000.

The results showed that the prevalence of primary dysmenorrhea at the Medical Faculty of UKI was 25.4% of female students, while the remaining 74.6% did not experience primary dysmenorrhea. It is consistent with the prevalence of dysmenorrhea worldwide, ranging from 20-90% in women. [22] A study conducted at the medical college in Mangolera in 2020 reported that 16% of female students experienced dysmenorrhea which was severe enough to interfere with daily activities and academic attendance. [23] This study also showed that the most common degree of dysmenorrhea experienced by the Medical Faculty of UKI was moderate dysmenorrhea, namely at 54.4% of female students, mild at 24.4%, severe at dysmenorrhea at 7.8% of female students, and no dysmenorrhea of 13 .4% female students. It is in line with the 2020 study conducted by Abubakar et al. [24] found the most degrees of dysmenorrhea based on the WaLIDD score, namely 96 (60.7%) female students experienced moderate dysmenorrhea, 38 (24.1%) severe dysmenorrhea)

female students, and mild degree as many as 24 (15.2%) female students. Primary dysmenorrhea is a gynecological problem often experienced by young women and can interfere with daily activities. [2] Primary dysmenorrhea has a wide range of risk factors, such as nutritional status, age, age at menarche, length of menstruation, regularity of menstrual cycles, and family history. In addition, other factors can cause primary dysmenorrhea that was not examined in this study, namely smoking.

Nutritional status at the Medical Faculty of UKI found that 63.2% of female students had normal BMI, while 36.9% of female students had abnormal BMI, with an incidence of 21.5% obese BMI and 15.4 thin BMI. % student. This result is directly proportional to the 2018 Riskesdas concerning the proportion of nutritional status based on the BMI category in the adult population (age> 18 years) in DKI Jakarta Province, namely 46.6% of the adult population have normal BMI, followed by 15.6% a 29.8% have BMI overweight-obese, and 7.9% had an underweight BMI. [25] Based on the chi-square test results, a significant relationship was found between nutritional status and the incidence of primary dysmenorrhea with a value of p = 0.041 <0.05). The results of this study align with the results of research by Hu et al. [26] and Khalid et al. [27], where there is a significant relationship between nutritional status and primary dysmenorrhea. Meanwhile, a study by Khodakarami et al. [26] showed no relationship between nutritional status and dysmenorrhea. Women with excess nutritional status have excess adipose tissue and cholesterol, which can cause an increase in the hormone estrogen. High hormone estrogen levels will stimulate endometrial proliferation to produce excess prostaglandins, especially PGF2α and PGE2, causing pain during menstruation. [29] Women with obese BMI have a lot of adipose tissue that produces proinflammatory mediators, including prostaglandin. Increased release of prostaglandins causes dysrhythmic uterine contractions resulting in menstrual pain. [17] Excess adipose tissue can also cause pressure on blood vessels so that blood flowing during menstruation becomes obstructed and causes menstrual pain. [1] Whereas in women with a thin BMI, it can be found that there is a decrease in the body's resistance to pain due to inadequate intake of nutrients. [1] According to research by Hidayatih et al. [30] intake of nutrients that affect dysmenorrhea is iron and calcium. If there is a lack of calcium, the muscles can experience cramps; as a result, the muscles cannot relax after contractions. Iron deficiency can disrupt hemoglobin formation so that the amount of hemoglobin in red blood cells will decrease, causing the body to lack oxygen and cause anemia. Anemia can cause disturbances or obstacles to the growth of body cells and cause a lack of body resistance to pain; it can cause menstrual pain. [30]

The ages of female students in this study ranged from 18-23 years old, with 120 female students at most aged 20 years. According to higher education statistics released by PDDikti, the age range of diploma 1-diploma 4 and strata 1 students in Indonesia is 19-23 years. [31] Female students who experience dysmenorrhea are most commonly found in female students aged 20. According to Ju et al., [19] age is related to the incidence of primary dysmenorrhea, with women aged under 25 years having a higher risk experiencing primary dysmenorrhea than women over 25 years. Based on statistical tests, the value of p = 0.042 was obtained, which means a relationship exists between age and the incidence of primary dysmenorrhea based on the WaLIDD score at the Medical Faculty of UKI. However, Anagew et al. [32] found no relationship between age and dysmenorrhea, and there was no difference between age and primary dysmenorrhea and secondary dysmenorrhea. Primary dysmenorrhea is most commonly experienced by young women and young adults in the age group of 15-25 years. The frequency will decrease with age and when you have given birth. In line with the study of Shiferaw et al. [33], the most common gynecological complaints are menstrual problems, with the highest prevalence at the age of 20-24 years and, after that, will experience a progressive decline.

Age of Menarche Medical Faculty of UKI, based on research results, found that female students experienced menarche the most at the age of 11-15 years, namely 90.0% of female students, while those who experienced menarche at the age of <11 years were 6.8% female students, and >15 years were 3.2%, female students. It corresponds to a normal menarche age of 11-15 years, [34] with the 2010 Riskesdas results showing the average age of menarche in Indonesia is 13 years [35] Menarche at <11 years is classified as early menarche, while menarche at>15 years is classified as late menarche. In this study, it was found that female students experienced early menarche and late menarche. According to research conducted by Mutasha et al. [36], the age of menarche can be influenced by genetic factors, nutritional status, and socioeconomic conditions. The chi-square test results obtained p = 0.079, so there was no relationship between the age of menarche and the incidence of primary dysmenorrhea based on the WaLLIDD score at the Medical Faculty of UKI. Following the study of Kural et al. [37] stated that there was no significant relationship between the age of menarche and dysmenorrhea. Meanwhile, based on research by Al-Matouq et al. [38], there was a significant relationship between the age of menarche and dysmenorrhea (p-value = 0.005) in female students in Kuwait. Women who experience early menarche, i.e., <11 years, have a long time exposure to prostaglandins and there is unpreparedness of the reproductive organs to function optimally, and the condition of the cervix is still experiencing narrowing, which can result in dysmenorrhea. [23; 38]

The length of menstruation in this study of 410 female students at most 57.0% of female students experienced normal menstrual periods, namely 5-7 days and 3-4 days by 40.0% of female students, followed by >7 days by 2.0% female students and <3 days by 1.0% female students. It corresponds to normal menstrual periods ranging from 3-7 days. If the duration of menstruation is longer than normal, namely >7 days, it is said to be hypermenorrhea, and the duration of menstruation is shorter than normal or <3 days, it is said to be hypomenorrhea. Psychological and physiological factors influence the duration of menstruation. Psychological factors, namely stress, will affect the production of the hormone cortisol, which affects the production of the female hormone estrogen. [17] Physiological factors are related to the production of prostaglandin hormones. The longer a woman has menstruation, the more frequently the uterus contracts so that more prostaglandins are released and can cause pain during menstruation. [39] Psychological factors, namely stress, will affect the production of the hormone cortisol, which affects the production of the female hormone estrogen. [17] Based on the results of statistical tests in this study, there was no relationship between the duration of menstruation and the incidence of primary dysmenorrhea at the Medical Faculty of UKI. In line with the research of Fernandez et al. [40], there was no significant relationship between the duration of menstruation and primary dysmenorrhea.

The regularity of the menstrual cycle was obtained by female students, with regular menstrual cycles reaching 69.5%, while female students with irregular cycles were 30.5%. It follows the theory that menstruation occurs every month at approximately the same intervals and distances each month to form a regular menstrual cycle, and the time of arrival can be estimated. Most female students experience menstrual cycles of 28-30 days. Following the theory, the menstrual cycle varies between 21-35 days, with an average of 28 days. In this study, there was a relationship between the regularity of the menstrual cycle and the incidence of dysmenorrhea at the Medical Faculty of UKI. Following the study of Sznajder et al. [41], there is a relationship between irregular menstruation and gynecological pain (dysmenorrhea, pelvic pain, and dyspareunia). Dysmenorrhea is included in gynecological pain, in women who experience irregular menstruation have a higher risk of experiencing gynecological pain. According to Hamemeskel et al. [42], there is a relationship between irregular menstrual cycles and primary dysmenorrhea. However, in contrast to a study conducted by Abreu-Sanchez et al. [43], it was found that there was no relationship between the regularity of the menstrual cycle and the incidence of dysmenorrhea.

There are 216 female students with a family history of dysmenorrhea at the Medical Faculty of UKI, with 65 female students experiencing dysmenorrhea and the remaining 151 female students not experiencing dysmenorrhea. Meanwhile, 194 female students had no family history of dysmenorrhea. In a study by Unsal et al. [44], the prevalence of female students with a family history of dysmenorrhea was 295 (47.4%). Based on the chi-square test results, there is a relationship between family history and the incidence of primary dysmenorrhea at the Medical Faculty of UKI. It is in line with the study of Mohammed et al. [45] in respondents with a family history of dysmenorrhea, which was 2.4 times more likely to experience dysmenorrhea than female students who did not have a family history of dysmenorrhea. Women with a family history of dysmenorrhea tend to also experience dysmenorrhea, thought to be related to family history and genetics. Girls tend to imitate their mothers' behavior, so mothers play an important role in providing education related to menstruation as a prevention effort. Genetics is related to progressive dysmenorrhea, one of which is caused by endometriosis because endometriosis can be inherited genetically, and the incidence rate will increase 7-10 times if there is a first-degree relative with endometriosis.

This study found that 301 Medical Faculties of UKI complained of pain during menstruation, but based on the WaLIDD score, only 104 (25.4%) female students experienced dysmenorrhea which interfered with their activities. The WaLIDD Score is a new method for assessing the incidence and severity of primary dysmenorrhea, assessed by activity ability, location of pain, pain intensity, and duration of dysmenorrheal pain. [4] At the Medical Faculty of UKI, when experiencing dysmenorrhea, most female students experience a slightly higher pain intensity and are not bothered during activities; this can be related to the degree of dysmenorrhea experienced. The higher the degree of dysmenorrhea experienced, the more it will affect the intensity of pain experienced and the impact on daily activities. In this study, the most commonly experienced degree was moderate 54.4%, followed by mild degree 24.4%. Most of the locations of pain experienced by the Medical Faculty of UKI is felt in 1 location. It follows the theory that many dysmenorrhea complaints experienced by young women are cramps and pain centered in the lower abdomen. Most pain experienced by the Medical Faculty of UKI is 1-2 days. It happens because, on the first day and the second day of menstruation, dysmenorrhea occurs. After all, there is a peak in the increase in prostaglandins.

This study found that the Medical Faculty of UKI had experienced primary dysmenorrhea, took analgesic drugs, and went to the doctor. There were 71 (17.3%) female students who experienced dysmenorrhea and consumed analgesic drugs, while those who did not consume more drugs reached 339 (82.7%) female students. In the research by Sari et al. [46], as many as 53.7% of female students used NSAIDs to treat dysmenorrhea. Dysmenorrhea occurs due to an increase in PGE2 and PGF2-α, for that Non-Steroid Anti-Inflammatory Drugs (NSAIDs) can be given to reduce the production of

PG. The administration of NSAIDs is intended to treat pain by inhibiting the cyclooxygenase-1 and 2 (COX-1 and COX-2) enzymes, thereby reducing PG synthesis. Unable to relieve pain with NSAIDs. This study found a significant relationship between the consumption of analgesic drugs and the degree of primary dysmenorrhea at the Medical Faculty of UKI. Of the 71 female students who took analgesic drugs, the highest percentage was female students with severe dysmenorrhea, namely 53.1%, followed by 22% female students with moderate dysmenorrhea and only 5% female students with mild degrees. Following Ayu et al.'s study, [47] the degree of pain intensity is related to the use of NSAIDs; the higher the pain intensity, the higher the possibility of using NSAIDs. However, each individual has a different intensity and tolerance for pain. This study found that several female students with mild to severe degrees of dysmenorrhea took analgesic drugs to deal with the pain they experienced. A person's pain intensity is influenced by pain response, perception, and experience of pain.

Of the Medical Faculty of UKI who went to the doctor due to dysmenorrhea were 11 (2.7%) female students, 21.7% of female students from the female group with severe dysmenorrhea, and only 1.8% of female students from the moderate dysmenorrhea disorder group went to the doctor for complaints of dysmenorrhea. None of the female students with mild dysmenorrhea went to the doctor. In line with Ammar's research63, out of 57 respondents, only 9 (13.8%) respondents had pain during menstruation checked by a doctor. The most common reason for not seeing a doctor is to think that dysmenorrhea is a normal thing to experience. Based on the test results, a relationship existed between going to the doctor and the degree of primary dysmenorrhea at the Medical Faculty of UKI. Female students who had dysmenorrhea checked by a doctor had moderate to severe degrees of dysmenorrhea. It can be caused by the increasing intensity of pain so that it cannot be treated with analgesic drugs, and high awareness to treat and consult a doctor about the causes of menstrual pain experienced. Because excessive pain can be caused by a disease, one of which is endometriosis. Endometriosis is a serious condition because it can cause infertility; 40% of women who experience infertility suffer from endometriosis.

Based on this study, there was a relationship between nutritional status (p=0.041), age (p=0.042), menstrual regularity (p=0.022), complaints of dysmenorrhea (p=0.000), and family history (p=0.020) to the incidence of primary dysmenorrhea based on WaLIDD Score at the Medical Faculty of UKI. This study also found that the degree of dysmenorrhea had a significant relationship with the consumption of analgesic drugs and going to the doctor. Meanwhile, there was no relationship between the age of menarche (p=0.080) and the length of menstruation (p=0.523) to the incidence of dysmenorrhea and nutritional status (p=0.067) with the degree of dysmenorrhea based on the WaLIDD Score at the Medical Faculty of UKI.

5. Conclusion

From the results of the research that was described in the previous chapter, the following conclusions were drawn: a) The prevalence of nutritional status at the Medical Faculty of UKI found that female students had a normal BMI of 259 (63.2%), followed by female students who had an obese BMI of 88 (21.5%) %) female students and as many as 63 (15.4%) female students have a thin BMI; b) The prevalence of primary dysmenorrhea based on the WaLIDD Score at the Medical Faculty of UKI was 104 (25.4%) female students; c) 369 (90%) female students experience menarche at the age of 11-15 years at the Medical Faculty of UKI, 398 (97%) female students have a menstrual period of 3-7 days, 269 (269) menstrual cycles last 28-30 days 65.6%) female students and regular menstrual cycles as many as 285 (69.5%) female students; and d) There is a relationship between nutritional status and the incidence of primary dysmenorrhea based on the WaLIDD Score. However, there is no relationship between nutritional status and the degree of primary dysmenorrhea based on the WaLIDD Score.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors have no conflicts of interest to declare.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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