# Association Between Breakfast and Dysmenorrhea in Female College Students at Faculty of Medicine, Pelita Harapan University

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## Abstract

**Background:** Breakfast is an activity of eating and drinking that usually takes place after waking up until 9 A.M. and can fulfill 20-25% of daily nutritional needs. Unsupervised skipping breakfast can affect women's ovarian and uterus dysfunction. Dysmenorrhea is one of the diseases that can reduce productivity and quality of life in women. Previous studies have found a high incidence of dysmenorrhea in female college students who didn't have breakfast. Currently, there isn't much data regarding the association between breakfast and dysmenorrhea in female college students in Indonesia.

**Aim:** The aim of this study is to discover the association between breakfast and dysmenorrhea in female college students of Faculty of Medicine at Pelita Harapan University.

**Methodology:** This study is an unpaired analytical comparative categoric design study with a cross-sectional method. Data was collected from 60 college students of Faculty of Medicine at Pelita Harapan University using breakfast questionnaire, WaLLID score for dysmenorrhea, IPAQ-SF and PSS-10 were used to control the confounding variables. The data was analyzed using SPSS 23.

**Results:** Among 60 samples were collected, the majority of female college students didn't have breakfast habit by 55%. There are 76.7% of female students who suffer dysmenorrhea, 91.7% have moderate and severe stress levels, 85% have high physical activity, and 70% of female college students have normal nutritional status. The results of the analysis showed that the p value > 0.05 for the association between breakfast with dysmenorrhea.

**Conclusion:** There is no significant association between breakfast and dysmenorrhea.

## Introduction

Breakfast is an activity of eating and drinking that usually takes place after waking up until 9 in the morning and can fulfill 20-25% of daily nutritional needs.[1,2] Healthy breakfast that is done regularly can form a more organized lifestyle, increase and fulfills daily nutritional needs and its quality, provides a long satiety effect so that activities can be carried out until noon and also reduces the desire to consume high - calorie snacks.[3,4] Skipping breakfast can increase the risk of eating disorders and affect ovarian and uterus function in adolescent girls.[3] A study in Pakistan found that 55.9% of university students sometimes and rarely eat breakfast.[4] The study conducted by Husnah in Banda Aceh found that most students sometimes eat breakfast (61.5%).[5]

Dysmenorrhea is menstrual pain that is characterized by cramps, intermittent, and centered on the lower abdomen.[6] Dysmenorrhea may occur due to an imbalance of prostaglandin hormones so that the uterus muscles contract strongly and usually occurs at the beginning of menstruation.[7] According to the World Health Organization (WHO), the prevalence of dysmenorrhea in the world is around 16.8 - 81%.[8] Dysmenorrhea can reduce productivity and decrease the quality of life in women.[9] In the United States, almost 90% of women suffer from dysmenorrhea with 10-15% experiencing severe dysmenorrhea while in Indonesia, 54.9% of women suffer dysmenorrhea and around 14% of adolescents do not attend school due to dysmenorrhea.[7,8]

In studies conducted in Japan, Palestine and China, it was found that many female college students who skipped breakfast had a high incidence of dysmenorrhea and irregular menstruation.[10] A study conducted by Husnah in Banda Aceh on high school students showed a significant relationship between breakfast and the severity of dysmenorrhea.[5] There is not much data on the association between breakfast habits and dysmenorrhea in female college students, especially in the Faculty of Medicine, which has more activities than other faculties. Based on the data above, this study aims to discover the association between breakfast and dysmenorrhea in female college students of Faculty of Medicine at Pelita Harapan University.

## Methods

### Participants and Study Design

The study was conducted using an unpaired categorical comparative analytic study design with a cross-sectional research method. Samples were taken using the convenience sampling method. Data were obtained from questionnaires distributed online from April to May 2023 to all medical college students at Pelita Harapan University through social media. Then the data were sorted based on the inclusion criteria and exclusion criteria, which are not having menarche age less than 12 years and not having a family history of dysmenorrhea. The total number of respondents obtained in this study was 60 respondents.

### Research Instrument

Data were obtained from a questionnaire regarding breakfast habits and WaLLID score as a measure of dysmenorrhea. IPAQ-SF and PSS-10 were also used to control for confounding variables. The WaLLID score stands for Working ability, Location, Intensity, Days of pain, Dysmenorrhea which is one of the tools to diagnose dysmenorrhea and can predict sick leave. The WaLLIDD score contains several questions about dysmenorrhea such as: 1) the number of pain locations according to anatomy (none, lower abdomen, lumbar region, lower limbs, and inguinal region), 2) Wong-Baker range of pain (no pain at all, only a little pain, a little more pain, more pain, much more pain, extremely pain), 3) the number of days when menstrual pain is felt (0, 1-2, 3-4, ≥ 5), 4) the frequency of pain until the woman cannot do her activities (never, almost never, almost always, always). Each variable has a score between 0 and 3 with the final score ranging from 0 to 12 points. With a total score of 0 means no dysmenorrhea, scores 1-4 have mild dysmenorrhea, scores 5-7 have moderate dysmenorrhea, and scores 8-12 have severe dysmenorrhea.[25]

### Statistical Analysis

Data analysis was conducted using Microsoft Excel 2021 (Microsoft, 2021) for organizing the data and analyzed using

Statistical Package for the Social Sciences 23 (IBM, 2016). Chi square test is used to analyze the association between breakfast and dysmenorrhea in female college students of Faculty of Medicine at Pelita Harapan University. In this research, confounding variables will be controlled by excluding the variables of early menarche age and family history of dysmenorrhea, then stratified analysis is used for the variables of physical activity, stress level, and overnutrition status.

## Results

**Table 1.** Respondents Characteristics

| Characteristics | Frequency (n) | Percentage (%) |
|---|---|---|
| **Breakfast Habits** | | |
| Always breakfast | 27 | 45 |
| Never breakfast | 33 | 55 |
| **Dysmenorrhea** | | |
| Dysmenorrhea | 46 | 76.7 |
| No Dysmenorrhea | 14 | 23.3 |
| **Stress Level** | | |
| Mild stress | 5 | 8.3 |
| Moderate-Severe stress | 55 | 91.7 |
| **Physical Activity** | | |
| Low physical activity | 9 | 15 |
| High physical activity | 51 | 85 |
| **BMI** | | |
| normal nutritional status | 42 | 70 |
| overnutrition status | 18 | 30 |

## Respondents Characteristic

From 60 respondents whose data have met the exclusion and inclusion criteria and have been processed with the SPSS application, it was found that the general description of the characteristics of respondents at Pelita Harapan University Faculty of Medicine students was that the majority of female college students were not used to having breakfast (55%), had a high incidence of dysmenorrhea (76.7%), had moderate and severe stress levels (91.7%), had high physical activity (85%), and had normal nutritional status (70%).

## Statistical Test Results

**Table 2.** Statistical Test Results

| Breakfast Habits | Dysmenorrhea | | P Value | Odds Ratio (OR) | CI (95%) |
|---|---|---|---|---|---|
| | No Dysmenorrhea n (%) | Dysmenorrhea n (%) | | | |
| **Breakfast** | 5 (19) | 22 (81) | | | |
| **Never breakfast** | 9 (27) | 24 (73) | 0.624 | 0.606 | 0.176-2.088 |

According to the analysis results, the p value is 0.624. The p value > 0.05 indicates that there is no significant association between breakfast and dysmenorrhea in female college students of Faculty of Medicine at Pelita Harapan University.

## Statistical Test Results Based on Confounding Factors

**Table 3.** Statistical Test Results Based on Mild Stress Level

| Breakfast Habits | Dysmenorrhea | | P Value | Odds Ratio (OR) | CI (95%) |
|---|---|---|---|---|---|
| | No Dysmenorrhea n (%) | Dysmenorrhea n (%) | | | |
| **Breakfast** | 1 (100) | 0 (0) | | | |
| **Never breakfast** | 1 (25) | 3 (75) | 0.819 | - | 0.733-21.838 |

**Table 4.** Statistical Test Results Based on Moderate-Severe Stress

| Breakfast Habits | Dysmenorrhea | | P Value | Odds Ratio (OR) | CI (95%) |
|---|---|---|---|---|---|
| | No Dysmenorrhea n (%) | Dysmenorrhea n (%) | | | |
| **Breakfast** | 4 (15) | 22 (85) | | | |
| **Never breakfast** | 8 (28) | 21 (72) | 0.270 | 0.477 | 0.123-1.824 |

**Table 5.** Statistical Test Results Based on Low Physical Activity

| Breakfast Habits | Dysmenorrhea | | P Value | Odds Ratio (OR) | CI (95 %) |
|---|---|---|---|---|---|
| | No Dysmenorrhea n (%) | Dysmenorrhea n (%) | | | |
| **Breakfast** | 0 (0) | 5 (100) | | | |
| **Never breakfast** | 1 (25) | 3 (75) | 0.906 | - | 0.757-2.348 |

**Table 6.** Statistical Test Results Based on High Physical Activity

| Breakfast Habits | Dysmenorrhea | | P Value | Odds Ratio (OR) | CI (95%) |
|---|---|---|---|---|---|
| | No Dysmenorrhea n (%) | Dysmenorrhea n (%) | | | |
| Breakfast | 5 (23) | 17 (77) | 0.157 | 0.772 | 0.213-2.797 |
| Never breakfast | 8 (28) | 21 (72) | | | |

**Table 7.** Statistical Test Results Based on Normal Nutritional Status

| Breakfast Habits | Dysmenorrhea | | P Value | Odds Ratio (OR) | CI (95%) |
|---|---|---|---|---|---|
| | No Dysmenorrhea n (%) | Dysmenorrhea n (%) | | | |
| Breakfast | 3 (15) | 17 (85) | 0.838 | 0.378 | 0.083-1.730 |
| Never breakfast | 7 (32) | 15 (68) | | | |

**Table 8.** Statistical Test Results Based on Overnutrition Status

| Breakfast Habits | Dysmenorrhea | | P Value | Odds Ratio (OR) | CI (95%) |
|---|---|---|---|---|---|
| | No Dysmenorrhea n (%) | Dysmenorrhea n (%) | | | |
| Breakfast | 2 (29) | 5 (71) | 0.263 | 1.800 | 0.191-16.980 |
| Never breakfast | 2 (18) | 9 (82) | | | |

### Stress Level

From tables 3 and 4, it is found that the p value in the statistical test results based on mild stress level is 0.819 and at moderate-heavy stress level is 0.270 so it can be concluded that there is no significant association between breakfast and dysmenorrhea in female college students based on stress levels.

### Physical Activity

From tables 5 and 6, it is found that the p value in the statistical test results based on low physical activity is 0.906 and at high physical activity is 0.157 so it can be concluded that there is no significant association between breakfast and dysmenorrhea in female college students based on physical activity.

### BMI

From tables 7 and 8, it is found that the p value in the statistical test results based on normal nutritional status is 0.838 and at overnutrition status is 0.263 so it can be concluded that there is no significant association between breakfast and dysmenorrhea in female college students based on BMI.

## Discussion

### Breakfast Overview

The results of this study found that there were more college female students who were not accustomed to having breakfast (55%) compared to college female students who were accustomed to having breakfast (45%). This is in accordance with research conducted by Husnah in Banda Aceh who found that the number of high school students who sometimes do breakfast (61.5%) is greater than students who often have breakfast (38.5%).[5] This is also in line with research conducted in Japan by Tomoko Fujiwara who found that the number of college female students who sometimes or always skip breakfast (95.9%) is much greater than college female students who never skip breakfast (4.1%).[10] There are several reasons that could make college female students do not have the habit of having breakfast such as: schedules that are too busy so they do not have time for breakfast, no one to help prepare breakfast, or having to go out of the house to buy food just for breakfast before doing their lecture activities.[11]

### Dysmenorrhea Overview

The results of this study found that there were more college female students who suffered from moderate and severe dysmenorrhea (76.7%) compared to college female students who did not suffer from

dysmenorrhea or only had mild dysmenorrhea (23.3%). This is in line with research conducted by Marini Agustin at As-syafi'iyah Islamic University Jakarta in the Bachelor of Nursing Study Program, found that the number of female students suffering from mild dysmenorrhea was 13 people (21%) and female students suffering from moderate and severe dysmenorrhea were 49 people (79%).[12] Research conducted by Ketut Anita Herdianti, et al. at Udayana University with the Medical Study Program found that female students suffering from dysmenorrhea were 83 people (86.5%) and female students who didn't have dysmenorrhea were 13 people (13.5%).[13] Other factors that can increase the incidence of dysmenorrhea such as poor sleep quality which can affect the secretion of adrenaline and estrogen hormones which can increase muscle contractions in the uterus and exposure to cigarette smoke which contains nicotine that acts as a vasoconstrictor resulting in an increase in prostaglandin levels.[1]

**Stress Level, Physical Activity, And BMI Overview**

In this study it was found that the number of college female students who experienced moderate and severe stress was higher (91.7%) than female students who did not experience stress or only experienced mild stress (8.3%). This is in line with research conducted at Andalas University Medical Study Program found that the number of students who experienced mild stress was 11.2% with students who experienced moderate and severe stress as much as 88.8%.[15] Based on the results of the study, it was found that the number of college female students who had low physical activity was less (15%) than those who had high physical activity (85%). This is in line with research conducted on health faculty students at Sam Ratulangi University by Lestari E. Liando, et al. with the results found that the number of students who have high physical activity is greater (70.8%) than students with low physical activity (29.2%).[16] In this study it was also found that more female students had normal nutritional status (70%) than female students who had excess nutritional status (30%). This is in line with research conducted on students of the Faculty of Health Sciences at Ibn Khaldun University of Bogor by Chyntia Nurul Adha, et al. who found that the number of students with normal nutritional status was 76.7% and the number of students with excess nutritional status was 23.4%.[17]

Stress in students can occur due to external and internal factors such as the increased responsibility that is felt when moving from a high school student to a college student, the increasing number of tasks that need to be completed or completing the final project which is one of the requirements for a college student to graduate, as well as environmental or cultural changes felt by students studying away from their home.[15] Factors that can affect a person's level of physical activity and nutritional status are gender, age, environmental factors, social support, occupation, physical limitations and economic status.[16] The occurrence of a pandemic can also make a person pay more attention to their health, resulting in a new habit pattern to exercise and care more about clean and healthy living behaviors.[16]

**Analysis Results**

In this study it was found that there is no significant association between breakfast and dysmenorrhea in female college students. This study is not in line with research conducted by Husnah in Banda Aceh in 2018 which found that there was a significant association between breakfast and the severity of dysmenorrhea. The difference in the results of this study can

occur due to several things such as differences in samples where the research conducted by Husnah was 132 high school students, while the sample in this study was 60 students. In addition, the research conducted by Husnah used the VAS (Visual Analogue Questionnaire Scale) questionnaire to measure the incidence of dysmenorrhea while the researchers used the WaLLID Score questionnaire to measure the incidence of dysmenorrhea.[5] This study is also not in line with research conducted by Tomoko Fujiwara conducted on female students at Kanazawa University, Japan. The difference in the results of this study can occur because the research by Fujiwara was conducted in Japan which has a different culture and food nutrition patterns with female college students in Indonesia, the difference in the number of samples of 3,172 people and the observation period for 1 year can also affect the difference in research results with this study.[10]

The results of the analysis based on the stress level factor showed that there was no significant association between stress levels and dysmenorrhea in Pelita Harapan University Faculty of Medicine students. This is different from research conducted by Bajalan on mental health and dysmenorrhea using a systematic review study where it was found that there was a significant relationship between the majority of psychological disorders such as depression, anxiety and stress with dysmenorrhea although the mechanism is still not clearly known so further research needs to be done.[18] There are also studies that are in line with this study such as research conducted by Maryam which was conducted on students of the Faculty of Medicine, Padjadjaran University and Amran which was conducted at the Faculty of Medicine, Hasanuddin University that found there was no significant association between stress levels and dysmenorrhea.[18] In this study, the majority of respondents had moderate stress levels and severe stress, which may cause an imbalance in the distribution of respondents at other stress levels and ultimately result in the possibility for the results of the analysis in the study to be not significantly related.

Based on the results of the analysis of the relationship between physical activity and dysmenorrhea, there is no significant association between physical activity and dysmenorrhea. This is not in line with research conducted by Karmila on high school students of YLPI Pekanbaru and research by Wati conducted on Midwifery Study Program students of Brawijaya University with respondents who do light activities have a 6.5 times greater chance of suffering from dysmenorrhea than respondents who do moderate activities.[18] Research by Motahari-Tabar conducted with the Randomized Clinical Trial method on students of the Faculty of Medicine at Mazandara University, Iran found that the reduction of dysmenorrhea pain due to the effect of exercise can only be seen if the respondent has done the exercise for two consecutive months and other variables such as type, duration, and intensity of physical activity can also affect the results of research analysis.[18] Research by Dehnavi conducted on students of the Faculty of Medicine, Mashhad University, Iran with the clinical trial method also obtained similar results, namely the results of the analysis there was no significant relationship at the beginning of the study and the end of the fourth week, and was only seen at the end of the eighth week.[18] Therefore, it can be interpreted that the results of the analysis in this study found no significant relationship between physical activity and dysmenorrhea due to only observing physical activity for one week where according to the two studies there

was still no visible change and only visible after about two months.

The results of the analysis found in the analysis of the relationship between nutritional status and dysmenorrhea are that there is no significant association between nutritional status and dysmenorrhea. This result is different from the research conducted by Sophia, et. Al on students of SMK Negeri 10 Medan with the kai squared method and also with research by Cholifah and Hadikasari on Midwifery Study Program students at Muhammadiyah University who used the Fisher's Exact test and found that there was a significant relationship between nutritional status and dysmenorrhea.[19] Research that is in line with this study is research conducted by Vlachou on Nursing Study Program students in Greece where it was found that there was no significant difference between smoking, exercise, BMI, and menstrual duration with dysmenorrhea severity.[20] In several studies it was found that women who have excessive visceral fat tissue usually suffer from severe dysmenorrhea.[20] BMI is one way to measure nutritional status in a person but it is unable to describe the proportion of fat contained in a person's body, so this could be one of the factors affecting the results of the analysis in this study resulting in no significant association between nutritional status and dysmenorrhea.[20]

The odds ratio value in the analysis results based on confounding factors in the variables of mild stress and low physical activity cannot be calculated. This is because if calculating the odds ratio based on the formula, there will be a division with zero which means undefined so that the results of the odds ratio calculation cannot be determined. The presence of zero values in the results of this analysis can be caused by an imbalance in distribution where in this study it was found that 91.7% of the majority of female students experienced moderate-severe stress and 85% of female students had high physical activity so that there was a lack of data on female students who experienced mild stress and female students who had low physical activity. The odds ratio value found in the overweight nutritional status variable is 1.8 which can indicate that there is an indication of risk in that variable. In overnutrition status it was also found that the confidence interval or confidence interval had a fairly wide range from 0.191 to 16.980. The confidence interval on the mild stress variable was also found to be quite wide with a lower limit of 0.733 and an upper limit of 21.838. The factor that can make this happen is because the number of samples used is small or only a few.

**Limitation**

The limitation found in this study is that it was conducted using an online questionnaire method that has a high risk of bias because it was not supervised by the researcher when the respondent filled out the research questionnaire. In addition, respondents can also answer the questionnaire excessively or minimize the actual results because the questions contained in the research are sensitive or personal for respondents. Another limitation that can be found by researchers is the short period of observation in the questionnaire which is only carried out for seven days while in previous similar studies it tends to be carried out over a period of one month or one year so that it can affect the results of this study. In a study discussing the differences in recall periods, it was found that the longer the period of time for respondents to recall an event, the more the limit of respondents' errors to answer the research questionnaire, so the researcher chose to use a seven-day time limit in the hope that respondents could still remember the activities they did during the week well.[21]

## Conclusion

In conclusion, the majority of female college students in Faculty of Medicine at Pelita Harapan University didn't have breakfast habits and experienced dysmenorrhea. Based on the results of the analysis there is no significant association between breakfast and dysmenorrhea in female college students of Faculty of Medicine at Pelita Harapan University.

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