




## Article

# Menstruation-Related Symptoms and Associated Factors among Female University Students in Vietnam

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**Abstract:** Menstruation and menstrual-related symptoms, stress, and lifestyle factors can significantly affect the health and academic lives of university students. This study aimed to explore menstruation-related symptoms and associated factors among female university students in Vietnam. This study used a cross-sectional design. Data from 349 students were analyzed for menstrual and menstruation-related symptoms using the Menstrual Distress Questionnaire (MDQ). We found that 92.0% and 98.9% of the students had menstrual-related symptoms in the pre- and intra-menstrual phases, respectively. The most common symptoms in each phase were backache (71.1%) in the pre-menstrual phase and fatigue (90.3%) in the intra-menstrual phase. Menstruation-related symptoms were associated with stress. These results contribute significantly to our understanding of menstrual health among Vietnamese university students. These findings imply the need to strengthen support systems for university students, especially by providing proper information about menstruation and managing stress.

**Keywords:** menstrual-related symptoms; female university students; MDQ; stress; Vietnam



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## 1. Introduction

Dysmenorrhea and pre-menstrual syndrome (PMS) are health problems worldwide, and their prevalence varies by country. A meta-analysis reported that PMS is observed in 12% of women in France, whereas it affects as many as 98% of women in Iran, with an average worldwide prevalence of 47.8% [1]. Dysmenorrhea, characterized by painful menstruation, affects approximately 71.1% of women [2]. A significant proportion of women experience menstrual-related symptoms worldwide, with variations across countries, including developing countries such as Vietnam.

Over the past few decades, Vietnam has made considerable economic progress. However, similar to many other developing nations, it faces various social challenges. The global emphasis on sexuality education in many countries and the concept of sexual and reproductive health education appear to be relatively recent in Vietnam [3]. Currently, there is no established formal sexuality education program in schools, including menstrual education, and a significant number of teachers, parents, and students in Vietnam lack the essential knowledge on psychosexual development and sexuality [3]. One study has shown that many adolescents in Vietnam do not have adequate knowledge on reproductive health [4].

Similar to numerous low-resource countries, education on maintaining menstrual hygiene in Vietnam is reported to be limited [5].

As Vietnam continues to experience economic development, an increasing number of young Vietnamese people are opting for higher education opportunities abroad [6]. A notable proportion of these individuals choose Japan [7]. With an increasing number of international students, technical intern trainees, and foreign workers in Japan [8], it is challenging to provide adequate healthcare services for these populations. Foreign workers may have difficulty accessing healthcare services in Japan [9]. Therefore, there is a need to provide reproductive health-related support to individuals immigrating to Japan.

Contrary to the increasing trend of newly arriving foreign populations, including Vietnamese people, in Japan, very few studies have been conducted on this specific population regarding menstruation-related issues after their arrival in Japan. Our study on menstrual irregularities among female international students in Japan revealed that Vietnamese students exhibited higher levels of menstrual-related symptoms before coming to Japan, which subsequently decreased after their arrival [10]. Another study found that Vietnamese technical intern trainees in Japan reported experiencing menstrual irregularities after arrival [11]. Therefore, it is evident that support related to menstruation plays a crucial role in helping foreign female nationals achieve their goals upon arrival in Japan.

Considering the anticipated increase in the number of Vietnamese individuals coming to Japan or other countries, it is essential to understand the prevalence and characteristics of menstruation, menstruation-related symptoms, menstrual education, and knowledge among Vietnamese individuals living in Vietnam, especially among female university students. However, limited information is available about the menstrual status and issues faced by Vietnamese individuals residing in Vietnam, both before and after they go abroad. A study conducted on Vietnamese individuals aged 17–42 years, both in Vietnam and abroad, revealed that 58.8% of the respondents experienced menstrual pain. Menstrual pain is more prevalent among younger individuals, and individuals who moved to Korea were found to have a higher risk of dysmenorrhea than those living in Vietnam [12]. Another survey showed that 10.3% and 1.3% of Vietnamese female students who were aged 18–45 years old and living in Vietnam were diagnosed with PMS and Pre-menstrual Dysphoric Disorder (PMDD), respectively [13]. In summary, studies dedicated to establishing baseline data on dysmenorrhea and PMS in Vietnam are lacking.

This study aimed to explore the menstruation status, menstruation-related symptoms, and associated factors among female university students in Vietnam. Additionally, this study aimed to establish baseline data that could contribute to health support initiatives for menstruation in the Vietnamese population. By comprehending the baseline situation in Vietnam, it is possible to identify and address the specific needs of individuals upon their arrival in Japan. These findings may also prove valuable to the Vietnamese authorities in enhancing menstrual education and offering the necessary support measures.

## 2. Materials and Methods

### 2.1. Study Design

This cross-sectional study was targeted at Vietnamese university students using a self-reported web survey to collect information on menstruation-related symptoms, lifestyle, and stress. The data were collected from 19 September to 3 October 2023.

### 2.2. Participants

The participants were female students at a large-scale Vietnamese public university specialized in healthcare and located in a provincial city in Northern Vietnam. The inclusion criteria were students who were female undergraduate students on the nursing course. The exclusion criteria were students who did not agree to participate, were pregnant, or were within a year of giving birth and presently using hormones for gynecological treatment and contraception, which could affect their menstrual status and menstrual-related symptoms. Out of all 433 nursing female students invited to participate in the study,

374 completed responses were received. After excluding 17 participants who were using hormonal medication for gynecological treatment and 8 using hormonal contraceptives, 349 respondents were finally included in the analysis.

### 2.3. Procedure

We explained the purpose and protocol of the survey, including ethical considerations, before asking the students to participate. This study was created using the SurveyMonkey® online survey tool (<https://jp.surveymonkey.com/>, accessed on 9 August 2023). We provided the participants with a URL and QR code for the survey. On the first page of the web survey, informed consent was obtained by checking the button to agree to participate, after which the participants answered the questions anonymously.

### 2.4. Measurements

We designed the questionnaire as referred to in our previous studies [10,14–16]. The questionnaire underwent translation into Vietnamese by two proficient medical experts, followed by a back-translation and content verification by the authors. Furthermore, the local version was pretested on several volunteers before commencing the actual data collection. The questionnaire contained the following parts:

#### 2.4.1. Demographic and Lifestyle Measurements

The questionnaire included questions on demographic factors (grade, age, body weight, body height, age at menarche, whether participants were currently visiting a gynecologist or receiving hormone therapy) and lifestyle (living status, frequency of eating breakfast and exercising, sleeping hours, smoking and drinking habits).

#### 2.4.2. Menstruation-Related Measurements

This section of the questionnaire included perceived menstrual pain intensity on a scale of 0–10. The Menstrual Distress Questionnaire (MDQ; 46 items) [17] was used to measure common symptoms and feelings associated with menstruation. We added eating behavior questions (three items), which were found in our previous studies to be common symptoms in the perimenstrual cycle [15,16]. The participants rated each item on a five-point scale ranging between 0 and 4, with 0 indicating no feeling of symptoms and 4 indicating severe symptoms during two periods: four days before menstruation and during menstruation. The 46 MDQ items are divided into eight symptom subscales: pain (six items), water retention (four items), autonomic reactions (four items), negative affect (eight items), impaired concentration (eight items), behavioral changes (five items), arousal (five items), and control (six items). In this study, Cronbach's alpha coefficients for the total MDQ during pre-menstruation and intra-menstruation were both 0.96. This section also covered items about menstrual status (menstrual cycle, regularity, duration, perceived volume, and medical history); individuals were consulted about menstruation, participation in menstrual education, knowledge level about PMS and dysmenorrhea, methods for coping with menstrual pain, and impact on academic performance during the pre- and intra-menstrual phases.

#### 2.4.3. Stress-Related Measurements

This section of the questionnaire covered various aspects of stress levels, including menstrual stress, general health, family relationships, friendships, romantic relationships, academic performance, career aspirations, and economic status, which were selected based on previous studies [18,19]. The participants rated each item on a five-point scale ranging between 0 and 4, with 0 indicating no feeling of stress and 4 indicating severe stress.

### 2.5. Statistical Analysis

Each categorized variable is expressed as a number with percentage. Continuous variables are expressed as means with standard deviations (SDs) or medians with 25th and

75th percentiles. The MDQ score was calculated as the total score and the score for each of the eight subscales; each of them is presented as a median (25th and 75th percentiles) and mean with SD. The Shapiro–Wilk test was used to check for normal distribution. The Wilcoxon signed-rank test was used to analyze the differences between the two phases (pre- and intra-menstrual phases) for the total MDQ score and subcategories and the three items about the symptoms of eating behavior. Spearman’s correlation test was used to determine the associations between the MDQ total scores and other factors. Statistical significance was set at  $p < 0.05$ . Statistical analyses were conducted using SPSS Statistics version 28.0 (Windows; IBM Corp., Armonk, NY, USA).

### 3. Results

#### 3.1. Demographic Data

Table 1 presents the characteristics of the 349 respondents that were eligible for the data analysis. The mean ( $\pm$ SD) age of the students was  $19.3 \pm 1.3$  years (range, 17–23 years), and the mean age at menarche was  $13.5 \pm 1.3$  years (range, 10–19 years). Body mass index (BMI) was calculated using weight and height.

**Table 1.** Respondents’ characteristics ( $N = 349$ ).

	Mean	SD	Number	Percent
Age (year)	19.3	1.3		
Menarche Age (year)	13.5	1.3		
Height (cm)	156.8	5.1		
Weight (kg)	48.8	7.5		
BMI (kg/m <sup>2</sup> )	19.8	2.8		
Grade				
1st Year			116	33.2
2nd Year			92	26.4
3rd Year			71	20.3
4th Year			70	20.1

#### 3.2. Menstruation-Related Characteristics

Table 2 provides information on various aspects of the participants’ menstrual cycles and gynecological consultations. Approximately 75.6% of the respondents had a menstrual cycle length of 25–38 days, and only 35.5% had regular menstruation. Additionally, most respondents experienced bleeding for 3–7 days (96.8%) and perceived a moderate bleeding volume (86.0%). A total of 14.6% of the respondents reported having consultations with gynecologists for various reasons, with menstrual irregularities and dysmenorrhea being the common causes. The individuals that they consulted on account of gynecological concerns were primarily mothers and friends.

**Table 2.** Menstruation-related characteristics ( $N = 349$ ).

Item	Category	Number	Percent
Cycle Length	25–38 days	264	75.6
	Others	85	24.4
Regularity	Regular	124	35.5
	Somewhat irregular	174	49.9
	Irregular	51	14.6
Bleeding Days	3–7 days	338	96.8
	Others	11	3.2
Perceived Bleeding Volume	Little	21	6.0
	Moderate	300	86.0
	Plenty	28	8.0
Having Gynecological Consultation	Yes	51	14.6
	No	298	85.4

Table 2. Cont.

Item	Category	Number	Percent
Reasons for Gynecological Consultation (multiple-answer) ( <i>n</i> = 51)	Irregularity	38	
	Dysmenorrhea	13	
	PMS	2	
	Fibroma	3	
	Endometriosis	2	
	Adnexitis and vaginitis	3	
	Regular check-up	1	
Consultants except Medical Doctors (multiple-answer)	Mother	312	
	Sisters	78	
	Friends	123	
	School health staff	5	
	Other school staff	6	
	Pharmacists	21	
	Others	2	

### 3.3. Awareness and Impact during the Pre- and Intra-Menstrual Phases

As shown in Table 3, 45.3% of the respondents reported that their academic performance was affected by pre-menstrual symptoms, 8.9% were absent in class due to menstrual symptoms during their pre-menstrual phase, 61.0% had menstruation symptoms during their intra-menstrual phase, and 19.2% were absent in class during their intra-menstrual phase. More students knew a lot about dysmenorrhea (42.7%) than PMS (19.2%). The students reported that they were taught about it mainly by their families at home.

Table 3. Impact and awareness during pre- and intra-menstrual phases (*N* = 349).

Category	Phase		Number	Percent
Impact on academic performance	Pre-menstrual	Not affected	191	54.7
		Hardly affected	131	37.5
		Quite affected	24	6.9
		Fully affected	3	0.9
	Intra-menstrual	No affected	136	39.0
		Hardly affected	160	45.8
		Quite affected	49	14.0
		Fully affected	4	1.1
Absence (at least a day) during last one year	Pre-menstrual	Absent	31	8.9
		No	318	91.1
	Intra-menstrual	Absent	67	19.2
		No	282	80.8
Knew about PMS		Knew a lot	67	19.2
		Knew a little	116	33.2
		Did not know much	70	20.1
		Did not know	96	27.5
Knew about PMS mostly from this source ( <i>n</i> = 253)		Family (parents etc.)	112	44.3
		Elementary school	1	0.4
		Junior high school	37	14.6
		High school	45	17.8
		University	44	17.4
Knew about dysmenorrhea		Knew a lot	149	42.7
		Knew a little	160	45.8
		Did not know much	18	5.2
		Did not know	22	6.3

Table 3. Cont.

Category	Phase	Number	Percent
Knew about dysmenorrhea mostly from this source ( <i>n</i> = 327)	Family (parents etc.)	210	64.2
	Elementary school	2	0.6
	Junior high school	52	15.9
	High school	46	14.1
	University	19	5.8

### 3.4. Intensity of Menstruation Pain and Pain Relieving Methods

The perceived intensity of menstrual pain without any coping methods was measured using a scale between 0 and 10, and 6.0% reported that they did not perceive any pain. The mean ( $\pm$ SD) intensity of menstrual pain was 4.4 ( $\pm$ 2.6). Table 4 provides an insight into how individuals manage and alleviate menstrual pain. A total of 47.6% of the participants used pain-relieving methods. Among the non-medication methods, warming techniques, such as using clothes, blankets, hot packs, and hot water, were the most common, followed by rest; excluding specific foods/drinks that are spicy, sour, or cold; consuming specific foods/drinks, such as chicken soup or coconut; and exercise. Regarding using medication, they used painkillers from pharmacies, painkillers prescribed by doctors, and traditional medications. In contrast, 183 respondents did not use any specific pain-relieving method, 156 students could bear the pain, and 22 did not know how to cope with it.

Table 4. Pain-relieving methods (*N* = 349).

Item	Category	Number	Percent
Pain-relieving method applied	No	183	52.4
	Yes	166	47.6
Pain-relieving method (multiple-answer)	Warming	130	
	Taking rest	121	
	Foods (drinks) excluded	44	
	Foods (drinks) incorporated	34	
	Exercise	21	
	Pharmacy painkillers	63	
	Prescribed painkillers	24	
	Traditional medicine	9	

### 3.5. Menstruation-Related Symptoms

The number of students who had any menstruation-related symptoms was 321 (92.0%) in the pre-menstrual phase and 345 (98.9%) in the intra-menstrual phase. The ten most frequent pre- and intra-menstrual MDQ symptoms are shown in Table 5. The most common symptoms in each phase were backache (71.1%) in the pre-menstrual phase and fatigue (90.3%) in the intra-menstrual phase. Regarding eating behaviors, the prevalence of craving for snacks was the most common in both phases, including frequencies of craving for snacks and sweets, and increased appetite was more common during the intra-menstrual phase compared to that during the pre-menstrual phase.

Table 6 shows that the total MDQ score, and all eight scales were significantly higher during menstruation than those before menstruation. The three eating behavior symptoms were also significantly higher during menstruation than those before menstruation.



**Table 5.** Ten most frequent pre- and intra-menstrual MDQs and eating behavior symptoms ( $N = 349$ ).

	Rank	Pre-Menstrual	<i>n</i>	%	Intra-Menstrual	<i>n</i>	%
MDQ items	1	Backache	248	71.1	Fatigue	315	90.3
	2	Cramps	225	64.5	Cramps	308	88.3
	3	Fatigue	223	63.9	Backache	303	86.8
	4	Irritability	191	54.7	Irritability	283	81.1
	5	Mood swings	178	51.0	Mood swings	256	73.4
	6	General aches and pains	174	49.9	General aches and pains	247	70.8
	7	Painful or tender breasts	157	45.0	Poor school/work performance	213	61.0
	8	Tension	139	39.8	Tension	203	58.2
	9	Forgetfulness	133	38.1	Poor motor coordination	192	55.0
	10	Distraction	129	37.0	Difficulty concentrating	191	54.7
Eating behaviors	1	Craving for snacks	146	41.8	Craving for snacks	178	51.0
	2	Craving for sweet	122	35.0	Craving for sweet	170	48.7
	3	Increased appetite	109	31.2	Increased appetite	147	42.1

**Table 6.** Differences in MDQ score and eating behaviors between pre- and intra-menstrual phases.

MDQ Scales	Pre-Menstrual Phase			Intra-Menstrual Phase			<i>p</i> -Value
	Mdn	25th	75th	Mdn	25th	75th	
Pain	4.0	2.0	7.0	7.0	4.0	10.0	<0.001
Water retention	1.0	0.0	3.0	2.0	0.0	3.0	<0.001
Autonomic reaction	0.0	0.0	1.0	1.0	0.0	2.0	<0.001
Negative affect	2.0	0.0	6.0	4.0	2.0	8.0	<0.001
Impaired concentration	1.0	0.0	5.0	4.0	1.0	8.0	<0.001
Behavior change	0.0	0.0	2.0	2.0	1.0	5.0	<0.001
Arousal	0.0	0.0	0.0	0.0	0.0	1.0	<0.001
Control	0.0	0.0	2.0	1.0	0.0	2.0	<0.001
Total MDQ score	12.0	4.0	25.5	23.0	12.0	38.0	<0.001
<b>Symptoms of Eating Behavior</b>							
Increased appetite	0.0	0.0	1.0	0.0	0.0	1.0	<0.001
Craving for sweets	0.0	0.0	1.0	0.0	0.0	1.0	<0.001
Craving for snacks	0.0	0.0	1.0	1.0	0.0	1.5	<0.001

Mdn, median; 25th, 25th percentile; 75th, 75th percentile. The Wilcoxon signed-rank test was used for the statistical analysis.

### 3.6. Lifestyle and Stress

As shown in Table 7, on average, the respondents reported having breakfast approximately 4.2 times a week, achieving approximately 6.9 h of sleep per day, and engaging in exercise around 2.3 times a week. Most of the respondents did not smoke (99.4%) or consume alcohol (68.2%). Regarding stress, academic stress was the most common type of stress.

**Table 7.** Lifestyle and level of stress by category ( $N = 349$ ).

	Mean	SD	Number	Percent
Breakfast Frequency (times/week)	4.2	2.4		
Sleeping Hours (hours/day)	6.9	1.4		
Exercise Frequency (times/week)	2.3	1.9		
Alcohol Drinking	Yes		111	31.8
	No		238	68.2

Table 7. Cont.

		Mean	SD	Number	Percent
Smoking	Yes			2	0.6
	No			347	99.4
Living Status	Lives alone			104	29.8
	With family			63	18.1
	With friends			119	34.1
	In a dormitory			63	18.1
Stress Overall	No			138	39.5
	Mild			137	39.3
	Moderate			67	19.2
	Strong			6	1.7
	Severe			1	0.3
Menstrual	No			159	45.6
	Mild			118	33.8
	Moderate			61	17.5
	Strong			11	3.2
	Severe			0	0
Health	No			207	59.3
	Mild			86	24.6
	Moderate			50	14.3
	Strong			6	1.7
	Severe			0	0
Family	No			232	66.5
	Mild			83	23.8
	Moderate			24	6.9
	Strong			10	2.9
	Severe			0	0
Friends	No			225	64.5
	Mild			77	22.1
	Moderate			42	12.0
	Strong			5	1.4
	Severe			0	0
Relationship	No			283	81.1
	Mild			43	12.3
	Moderate			18	5.2
	Strong			5	1.4
	Severe			0	0
Academic	No			77	22.1
	Mild			121	34.7
	Moderate			107	30.7
	Strong			36	10.3
	Severe			8	2.3
Career	No			86	24.6
	Mild			115	33.0
	Moderate			88	25.2
	Strong			51	14.6
	Severe			9	2.6
Economic	No			84	24.1
	Mild			115	33.0
	Moderate			80	22.9
	Strong			51	14.6
	Severe			19	5.4



### 3.7. Association of Demographic, Lifestyle, and Stress with Total MDQ Scores during the Pre- and Intra-Menstrual Phases

The total MDQ scores in the pre-menstrual phase were significantly correlated with the total MDQ score in the intra-menstrual phase ( $r_s = 0.778$ ,  $p < 0.001$ ). As shown in Table 8, the total MDQ scores in both the pre- and intra-menstrual phases were significantly correlated with all the stress level categories.

**Table 8.** Correlation of total MDQ scores during pre-menstrual- and intra-menstrual phases with demographics, lifestyle, and stress.

		Total MDQ Score	
		Pre-Menstrual Phase	Intra-Menstrual Phase
Demographic	Age	0.048	−0.036
	Menarche age	0.030	0.023
	Height	−0.004	−0.021
	Weight	−0.019	−0.007
	BMI	0.002	0.015
Lifestyle	Breakfast frequency	−0.151 **	−0.136 *
	Sleeping hours	−0.056	−0.095
	Exercise frequency	0.038	0.075
	Drinking alcohol	0.141 **	0.041
	Smoking	0.045	0.011
	Living status	0.164 **	0.082
Stress	Overall	0.342 **	0.414 **
	Menstrual	0.392 **	0.538 **
	Health	0.433 **	0.513 **
	Family	0.279 **	0.374 **
	Friends	0.363 **	0.434 **
	Relationship	0.371 **	0.316 **
	Academic	0.425 **	0.498 **
	Career	0.334 **	0.458 **
	Economic	0.380 **	0.451 **

Alcohol consumption: 0 (no), 1 (yes); living status: 1 (living alone), 0 (other). Spearman's correlation test: \*  $p < 0.05$ ; \*\*  $p < 0.01$ .

## 4. Discussion

This is the first study to explore the pre- and intra-menstrual related symptoms among university students in Vietnam. In previous studies, we reported the pre- and intra-menstrual symptoms among university students in Japan [14–16] and international students in Japan [10] using the MDQ, which was also used in the current study.

The number of students who reported having any menstruation-related symptoms in the MDQ items was 321 (92.0%) in the pre-menstrual phase and 345 (98.9%) in the intra-menstrual phase, which is as high as the results for Japanese university students (96.5% and 99.3%) [15]. A survey of Vietnamese students using the PMS screening tool [13] reported that 11.6% of the students had PMS/PMDD. The current study found that in both the pre-menstrual and menstrual phases, the common symptoms, including backache, cramps, fatigue, irritability, mood swings, general aches, and pain, were similar. These symptoms belonged to the MDQ subscales of “pain” and “negative affect.” Regarding pre-menstrual symptoms, a survey conducted in the Japanese population showed that skin blemishes or disorders were the most common, followed by water retention, such as swelling, which was in the top five, and negative affect [15]. Another Japanese study showed that skin blemishes or disorders were the most common, followed by irritability and fatigue [20]. However, the current study revealed that Vietnamese individuals experience pain as the most common symptom. In the intra-menstrual phase, the current study showed a symptom pattern, including fatigue, cramps, backache, irritability, and mood swings, which is similar to the results of previous studies among Japanese students [15]. The most common symptoms

associated with primary dysmenorrhea in China are cramps, weakness, backache, facial blemishes, and irritability [21], similar to the current results. Regarding eating behavior, the current study showed a similar pattern of craving for snacks and sweets and increased appetite. In comparison, a study among Japanese students showed that a craving for sweets was more common than a craving for snacks [15], although international students in Japan preferred snacks to sweets [10]. This difference may be attributed to the racial or cultural variations in the study population. We previously reported median (25th and 75th percentiles) MDQ total scores of 22.0 (12.0, 41.0) in the pre-menstrual phase and 34.0 (17.0, 52.5) in the intra-menstrual phase in Japanese university students [15]. Compared to this result, the total median MDQ scores (12.0 in the pre-menstrual phase and 23.0 in the intra-menstrual phase) in the current study were much lower. Notably, the pre-menstrual median MDQ for the pain subscale (4.0 [2.0, 7.0]) among Vietnamese students was higher than the same score among Japanese students (3.0 [1.0, 6.0]) [15], although all other subscales showed much lower scores. In contrast, the menstrual pain intensity reported by the students was relatively mild (score 4.4/0–10), which might be lower than that in other study results using visual analogue scale scores, of 6.0 in Turkey [22] and 6.99 in Romania [23]. Further investigation is needed to determine how Vietnamese students perceive menstrual pain compared to other racial groups or whether the difference in symptom severity is due to subjective judgement bias rather than racial variations. Comparison with students of other racial backgrounds was difficult because there were limited studies using the 46-item MDQ to investigate menstrual-related symptoms in university students. Investigations using the same questionnaire or scale may be required to better understand these characteristics.

Regarding the associated factors, in the current study, we found a correlation between overall stress and different types of stress and menstrual symptoms in both the pre- and intra-menstrual phases. These findings support the premise that stress is associated with menstrual distress, which has been reported in a previous systematic review of medical students [24] and in Japan [25,26], among students in Korea [27,28], among international students in China [29], and among Syrian students [30]. A study conducted among college students in Nigeria revealed that those who experienced academic stress were approximately twice as likely to develop menstrual disorders [31]. However, the association between the subcategories of stress, including academic stress and menstrual symptoms, in different populations is under-reported. This result may serve as a basis for comparisons in future studies. It is imperative to raise awareness of this connection, advocate for counseling, and implement support systems for individuals experiencing stress. On the other hand, lifestyle factors were not correlated with menstrual symptoms. In the current study, we observed that the mean BMI (SD) was 19.8 (2.8) kg/m<sup>2</sup>, indicative of a normal range. Future investigations might be needed to impact of abnormal weight on the symptoms.

It is known from the literature that female university students' experiences of menstruation can negatively impact their education [32]. A relationship has been reported between dysmenorrhea and absenteeism among Spanish students [33]. In the current study, almost half of the study population reported pre-menstrual and intra-menstrual symptoms having an impact on their academic performance. Severe dysmenorrhea has also been associated with university absence [22]. College absenteeism due to menstrual pain was reported in 21.5% of patients in a study conducted in Pakistan [34]. Pre-menstrual (8.9%) and menstrual (19.2%) absenteeism were found in the current study and are consistent with previous studies. With over 90% of participants reporting symptoms, it is conceivable that the severity of these symptoms or the strategies used to cope with them could affect academic performance. Understanding the specific factors contributing to this impact while symptoms persist is crucial. These findings imply the need for program responses at universities to improve the well-being of students by implementing measures, including providing comprehensive information about menstruation, which could be supplemented by initiatives such as providing mental health services and stress management programs, providing resources for physical health, establishing peer support networks, and conducting awareness campaigns.

In the current study, more students knew about dysmenorrhea (42.7%) than PMS (19.2%), and the main source of information was their families. Additionally, the students reported that the individuals they primarily consulted on their gynecological concerns were their mothers, friends, and sisters. Only a few students mentioned junior high school, high school, and university as sources of information and consultation. A systematic review reported that, outside medical consultations, the most common sources of information about menstrual symptoms were family (62.4%), friends (51.4%), and teachers/lecturers [35]. As in other countries, family members, especially mothers, may play an important role as resources for consultation and information for Vietnamese students. However, this result highlights the need to strengthen information services from junior high school and above and pay more attention to enhancing awareness about menstruation, especially PMS. Education on the management of menstruation, especially pain, deserves attention in schools.

A systematic review of data from low-, middle-, and high-income countries has shown that over half of young women practice self-care using both pharmaceutical and non-pharmaceutical methods for the treatment of dysmenorrhea [35]. The current study demonstrated a similar result, with half of the respondents reporting using a pain-relieving method, while over half of the respondents reported not using pain relief because the pain was bearable. Only a few students (6.3%) reported that they did not know what to do. The most common pain-relieving methods used were warming with hot water or blankets, followed by rest and painkillers. A systematic review reported that rest was the most commonly used non-pharmacological intervention, followed by heating, herbal medicine, herbal teas, and exercise [35]. A study among Chinese college students reported coping strategies, such as reducing physical activity (94.6%), keeping warm (84.6%), and other similar methods [21]. Another study among Romanian medical students showed that a hot liquid pack on the abdomen was the most popular method, followed by sleeping [23], which is very similar to the results of the current study. However, menstrual pain may occur due to secondary dysmenorrhea, such as endometriosis; therefore, menstrual education might be needed for students to understand their own menstruation and receive the appropriate treatment.

This study has several limitations. First, as this study was a cross-sectional survey, causal relationships could not be clarified. Second, the participants were nursing students recruited from only one university, who may possess varying levels of knowledge regarding menstruation compared to general females in their age group, which may limit the generalizability of the findings. Third, the use of a self-administered questionnaire may introduce recall bias and subjectivity into the data collection process.

## 5. Conclusions

We found that a high proportion of female university students in Vietnam had menstrual-related symptoms, especially pain-related symptoms, in the pre- and intra-menstrual phases. Menstruation-related symptoms were associated with all types of stress, including academic and career stress, health-related stress, economic stress, and peer stress. These results contribute significantly to our understanding of menstrual health among Vietnamese university students. These findings imply the need to strengthen support systems for university students, especially providing proper information about menstruation and implementing strategies to manage stress.

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**Institutional Review Board Statement:** The study was conducted in accordance with the guidelines of the Declaration of Helsinki and was approved by the Ethics Committee of Tokushima University Hospital (Approval No. 4332 on 27 March 2023) and the Ethics Council in Biomedical Research of Thai Binh University of Medicine and Pharmacy (Approval No. 926 on 7 September 2023).

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study by checking the button to agree to participate in the survey on the first page of the web survey before starting to answer.

**Data Availability Statement:** The data presented in this study are not publicly available because of privacy restrictions.

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