



Classification of Dysmenorrhea among Students at Ubon Ratchathani Rajabhat University, Thailand According to the Māhaachortàrat Scripture

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ABSTRACT

Dysmenorrhea (menstrual pain) is a discomfort occurring in the pelvis. It may be severe and has an impact not just on individuals, but also on families, societies, and the economy. According to Māhaachortàrat scripture, menstrual blood is caused by four life elements: earth (tart din; in Thai), water (tart nam; in Thai), wind (tart lom; in Thai), and fire (tart fai; in Thai). The present study was aimed at investigating the characteristics of menstruation (menstrual blood based on the four life elements) and classifying the behaviors based on the levels of menstrual pain according to the Māhaachortàrat scripture. A total of 400 female students from Ubon Ratchathani Rajabhat University, Ubon Ratchathani, Thailand were recruited to complete questionnaires. The data obtained were processed using mathematical formulas. The results showed that the water element accounted for 70.7% in terms of manifested menstrual symptoms, followed by the wind, earth, and fire elements, in that order. Self-management behaviors ranked as "sometimes" with personal hygiene being the greatest practice, which also ranked as "sometimes". The level of dysmenorrhea was described as "moderate," with 28% of respondents reporting moderate pain. There was no difference in comparing self-management behaviors when dysmenorrhea occurred based on the levels of menstrual pain. The earth element tended to have a lower level of pain than the water, fire, and wind elements based on the levels of menstrual pain. The findings of this study can be used to develop a menstrual pain treatment model based on the science of Thai traditional medicine.

Keywords: Four life elements, Māhaachortàrat scripture, Menstrual blood, Self-management behavior.

Introduction

Dysmenorrhea, often known as menstrual pain, is a type of pelvic discomfort that is commonly described as cramps in the pelvis. This pain is caused by prostaglandins, which are released into the lining of the uterus. Higher levels of prostaglandins can trigger muscles in the uterus to contract and constrict, leading to more severe menstrual cramps. Breast engorgement, pelvic cramps, nausea, vomiting, exhaustion, headaches, flatulence, and diarrhea are also typical symptoms. Mental conditions that are associated with dysmenorrhea include frustration, depression, isolation, aggression, and mood unpredictability. These symptoms generally last 48-72 hours during each cycle. Dysmenorrhea has been reported as a reason for students missing school. About 10-21.1% of females with menstrual pain experience symptoms that are so severe that they have to be absent from school. They are discouraged from joining activities. Their focus is reduced, resulting in lower academic performance. In Thailand, it was discovered that 18.2-21.1% of university students missed school during their menstrual periods, with their concentration on school lessons decreasing by 62.6% and their academic performance falling by 1.8%.¹ Dysmenorrhea can be treated and alleviated in a variety of ways in modern medicine, some of which include pain-relieving drugs like Paracetamol, hormone therapy

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(contraceptive), and surgeries. In Thai traditional medicine, one way of relieving pain is massage, which can be administered once a month, 3-5 days ahead of menstruation, and divided into two rounds. The massage was found to be statistically significant ($p = 0.00$) in reducing menstrual discomfort. Other means of treating and alleviating menstrual pain include acupuncture, hot compression at specific areas, nutritional treatment, and nerve electric stimulation through the skin.² Pelvic pains, low back discomfort, headaches, and frustration are symptoms that appear in association with menstruation in certain groups of girls at puberty. Whatever symptoms occur, according to Māhaachortàrat, a Thai traditional medical literature, they will recur every month when menstruation occurs. The term for this is "usual negative blood impact." However, if the symptoms differ from those that normally occur during menstruation, it is referred to as "unusual negative blood impact."³ The pain may be so severe that it can cause work suspension or absence from school. It has an impact not just on individuals, but also on families, societies, and the economy. According to Māhaachortàrat scripture, menstrual blood is caused by four life elements: earth (tart din; in Thai), water (tart nam; in Thai), wind (tart lom; in Thai), and fire (tart fai; in Thai), which distinguish the characteristics and symptoms of menstruation, as well as result in different symptoms during menstruation. The information gathered from research on menstrual pain can be used to provide knowledge and develop models for treating menstrual discomfort following the science of Thai traditional medicine. The goal is to lower pain levels, reduce drug use, and improve quality of life.

The present study was conducted to investigate the characteristics of menstruation (menstrual blood based on the four life elements) and categorize the behaviors based on the levels of menstrual pain according to the Māhaachortàrat scripture.

Conceptual Framework

The purpose of the study was to look at the characteristics of menstruation (menstrual blood based on the four life elements) among students at Ubon Ratchathani Rajabhat University, Mueang Ubon Ratchathani District, Ubon Ratchathani, Thailand in line with Māhaachortàrat scripture. According to Thai traditional medicine, the Institute of Thai Traditional Medicine, Ministry of Public Health,⁴ menstrual blood is derived from four elements, namely the earth (tart din; in Thai(, water) tart nam; in Thai(, wind) tart lom; in Thai(, and fire) tart fai; in Thai(. In developing a conceptual framework (Figure 1), the researcher looked into Proctor and Farquhar's menstrual pain,⁵ Eryilmaz and Ozemir,⁶ Zegeye *et al.*⁷ French,⁸ Davis and Costa's self-management of pain,⁹ and the study of pain levels by Frampton and Hughes-Webb,¹⁰ McGuire,¹¹ Smeltzer *et al.*,¹² were also consulted.

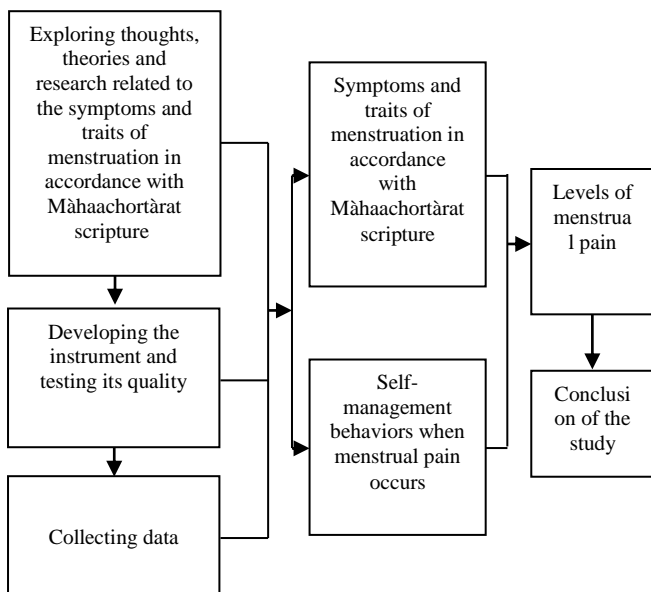


Figure1 : Conceptual framework of the study.

Materials and Methods

Research instrument

The instrument adopted in the research was a questionnaire developed by Perai and Aranyaphak,¹³ as well as Butsriphum.¹⁴ It was divided into four sections. The first section included personal information and factors that influence menstrual pain. This section was designed as a checklist, with each respondent having only one option to pick from. The second section contained manifested symptoms associated with menstruation (menstrual blood based on the four life elements) following Māhaachortàrat scripture. This part consisted of a four-point rating scale: always, often, occasionally, and never. Information on self-management methods when menstruation pain occurs occupied the third section. This section had a five-point rating scale: always, frequently, occasionally, rarely, and never. The final section was a three-month evaluation of menstrual pain intensity.

Quality testing of the instrument

The questionnaire was presented to five certified individuals who evaluated its quality and content validity. The IOC index of each item was tested at no less than 0.5 in terms of congruence, ensuring the content's validity. The overall IOC index was 0.867. To ensure reliability, a try-out was undertaken with a group of university students who were not part of the study's sample but shared many of the same traits as the study's participants. The try-out group consisted of 40 Udonrthani Rajabhat University students. The average confidence level of 0.70 or above was accepted using Cronbach's alpha coefficient approach.¹⁵ The overall coefficient of the questionnaire was 0.831.

Ethical approval

The Ethics Committee on Human Research at Ubon Ratchathani Rajabhat University approved the rights protection documents for the study population following the Declaration of Helsinki and ICH GCP. The research project number HE 631013 and certificate number 001/2564 were issued on January 28, 2021.

Study population

The population of the present research comprised 9,031 female undergraduate students from Ubon Ratchathani Rajabhat University, Ubon Ratchathani, Thailand. The study sample included 400 female undergraduate students (first year to the fourth year) from regular programs at Ubon Ratchathani Rajabhat University, Ubon Ratchathani, Thailand.

Collection of sample

The sample was obtained through multi-stage sampling. Female students with a normal menstrual cycle of 28 to 35 days, physical firmness, and willingness to complete a questionnaire were the criteria for acquiring the sample. Secondary menstruation, congenital illnesses such as diabetes, blood pressure greater than 140/90 mmHg, fainting, palpitation, headache, nausea, vomiting, and undergoing surgery within one month were all criteria for exclusion from the study.

Study method

The researchers collected primary data for this study, while secondary data were compiled from Thai traditional medical textbooks.^{3,4} The Academic Promotion and Registration Office was contacted to obtain the number and schedule of the undergraduate students to be recruited for the study so that a population that fits the requirements could be identified. The permission request letters were sent to the deans of 11 faculties. A multi-stage sampling procedure was used. The respondents were requested to fill out questionnaires, and the information obtained was then processed using mathematical formulas. According to the symptoms indicated in the Māhaachortàrat scripture, it was possible to classify menstrual pain groups (blood menstruation induced by a pile of four elements). The following is a formula for the calculation:

$$\text{Formula } P(E) = \frac{n(E)}{n(S)}$$

Where P(E): Menstrual pain syndrome probability (Menstrual blood is born from the four elemental piles)

n(E): Number of menstrual pain syndrome symptoms (as determined by the group's questionnaire)

n(S): The number of symptoms for each menstrual pain mentioned in the Māhaachortàrat scripture

The calculated values were used to identify which factor in the menstrual pain category was the most important. As a result, the sample group was assigned to that element to confirm the accuracy of the menstrual pain classification. The researcher then had the classification results double-checked by five Thai traditional medicine experts. Subsequently, the data were then used to examine the research findings, and a summary of the study was edited and published as a complete review.

Statistical analysis

Data were analyzed using the number, percentage, average and standard deviation, and F-test ANOVA (one-way analysis of variance) to test the hypotheses. Mean scores of more than two groups were compared. Each pair was tested, using LSD at a 0.05 statistical significance level.

Results and Discussion

According to personal information, 67.3% of Ubon Ratchathani Rajabhat University students who completed the surveys were under the age of 20. Among the study groups, 26.5% were students in the Faculty of Humanity and Social Sciences, 41.3% were second-year

students, and 91.0% were free of congenital disorders, while 5% had allergies and asthma. Menstrual pain was linked to several factors. Among the respondents, 54.3% were between the heights of 151 and 160 cm, 41.5% weighed less than 50 kg, whereas 63% had a BMI of 18.5-22.9. (firm). When they first had menstruation, 63% were between the ages of 13 and 15. Menstruation lasted 3-7 days for 95.8% of women in the current situation. A minimal amount of menstrual blood (fewer than 4 sanitary napkins per day) was found in 57.5% of women. Furthermore, 34.7% had inconsistent menstrual cycles. According to Māhaachortàrat scripture, 70.7% of the Ubon Ratchathani Rajabhat University students fell into the water element (tart nam; in Thai), 13.5% into the wind element (tart lom; in Thai), 9.3% into the earth element (tart din; in Thai), and 6.5% into the fire element (tart fai; in Thai), as illustrated in Table 1. The study by Krongyudh and Thoraphan showed that 23.2% of people with menstrual discomfort also had frequent or watery stools,¹⁶ which is consistent with the findings of this investigation. The majority of menstrual pain symptoms are caused by water element (tart nam; in Thai) imbalances, which can result in liquid defecation. The blood that was born from the stack of four elements was a malfunction of one of the elemental stacks, according to Thai traditional medicine philosophy. According to the theory of Thai traditional medicine, the blood that was born from the stack of four elements was a malfunction of one of the elemental stacks. As a result, irregular menstruation appears, based on the characteristics of the pile of elements,⁴ such as the above-mentioned symptoms of the water element (tart nam; in Thai). The nature of the menstruation will vary according to the nature of each element. Then there is a general imbalance that manifests as physical and mental problems. In terms of menstruation pain, the majority of the Ubon Ratchathani Rajabhat University students who filled out the surveys had moderate pain over the previous three months. They suffered from pain at a moderate level. They were

worried and did not get enough sleep. It became unbearable for 122 respondents (28%). Ninety-two respondents (23%) had a great level of pain; they were in excruciating discomfort. They could not sleep because they were worried. Eighty-nine people (22.3%) had a minimal or slight pain. They did, however, began to feel the discomfort to some extent. They were not too concerned and thought it was still bearable. The specifics are illustrated in Table 2. Apart from that, the overall self-management behaviors when menstrual pain occurred among the Ubon Ratchathani Rajabhat University students were rated as "sometimes", with a score of 2.76 ± 0.62 . When each factor was taken into account, personal hygiene ranked the highest with a level of "sometimes", having a score of 3.05 ± 0.79 . Food consumption came in second with a level of "sometimes", with a score of (2.93 ± 0.71) , while exercise had a level of "rarely", with a score of 2.32 ± 0.85 . The details are presented in Table 3. When menstruation pain occurred, self-management strategies were rated as "sometimes." Personal hygiene ranked first with the highest practice, showing that it was a key factor in healing, pain relief, and pain reduction. This was consistent with the research of Perai and Aranyaphak,¹³ who studied the prevalence of primary menstruation and self-management behaviors. According to the study, personal cleanliness and self-management behaviors among students can lower the severity of menstruation pain in terms of emotional and physical impact, as well as the impacts of monthly pain. Following Māhaachortàrat scripture, overall self-management behaviors when menstruation occurred and the food intake dimension were different, and the manifested symptoms of menstruation differed (menstrual blood based on the four life aspects). When menstruation occurred, the water element (tart nam; in Thai) showed lower self-management behaviors than the wind element (tart lom; in Thai). Therefore, individuals who fell into the water element (tart nam; in Thai) had less self-control during menstruation than those who fell into the wind element (tart lom; in Thai).

Table 1: Characteristics of menstrual pain (menstrual blood based on the four life elements) according to Māhaachortàrat scripture.

Categories	Characteristics of of menstruation	Symptoms	No. of people	%
The earth element (tart din; in Thai)	Sometimes, it is mucus. Sometimes, the blood is filled with urine and sticky like a medium-boiled egg. The menstrual blood is black, red, white, and yellow altogether with fishy a smell.	Strains occur at every joint, muscle, and bone. The blood does not flow smoothly, resulting in heat, pain, and flatulence inside the body, along with a stomachache.	37	9.3
The water element (tart nam; in Thai)	The blood released is concentrated. It has a fishy smell. Sometimes, the blood is clear. Other times, it is like a blaze of urine combined with egg yolks.	One may feel sick around five or six times a day. The blood is not smoothly released, resulting in a stomachache. Food intake is difficult.	283	70.7
The wind element (tart lom; in Thai)	The blood is clear dark brown, resembling <i>Carthamus tinctorius</i> L. (Dokkum; in Thai.)	The stomach becomes swollen with colicky pain, causing heat inside the body at certain periods. One may experience nausea and gastric pain. The blood does not flow smoothly. The pain is aggravated.	54	13.5
The fire element (tart fai; in Thai),	The blood released is infused with bubbles. The color is yellow like <i>Caesalpinia sappan</i> L. (Fang; in Thai) water with lime juice squeezed onto it.	The whole body is tense when the blood is released, causing heat in the vagina. It is hot like rubbing chilies on the skin. One may vomit and even become sick of food smells, thus being unable to consume any food and having alternating feelings of hot and cold with colicky pain.	26	6.5
Total			400	100

Table 2: Number, percentage, and level of menstrual pain over the past three months among the Ubon Ratchathani Rajabhat University students

Level of menstrual pain	Number(n=400)	Percentage (100)
Level 0 No Pain	23	5.8
Level 1- 2 Minimal/Slight Pain	45	11.3
Level 3- 4 Some Pain	89	22.3
Level 5- 6 Moderate Pain	112	28.0
Level 7- 8 Great Pain	92	23.0
Level 9- 10 Greatest Pain	39	9.8
Total	400	100.0

Butsriphum,¹⁴ investigated the prevalence, effects, and self-management strategies of Thai nurses with premenstrual syndrome (PMS). PMS is a frequent ailment among girls during puberty. Nutrition and diet were found to be some of the factors contributing to various symptoms of menstrual pain, according to the study. Self-management behaviors as a result of menstruation pain were compared and classified based on the severity of the pain. In other words, the self-management behaviors of Ubon Ratchathani Rajabhat University students with varying levels of menstrual pain were not different when menstruation occurred. The behaviors were nearly identical. These behaviors were similar and included exercise, food consumption, and personal hygiene, as seen in Table 4. The results are consistent with Dannely's theory.¹⁷ He opined that everyone sought to find a way to relieve pain by taking medication, exercising, or looking for other remedies when menstruation occurred.

Table 3: Mean and standard deviation of overall self-management behaviors when menstrual pain occurred among Ubon Ratchathani Rajabhat University students

Self-management behaviors when menstrual pain occurred	\bar{X}	S.D.	Level of practice	Ranking
Exercise	2.32	0.85	Rarely	3
Food Consumption	2.93	0.71	Sometimes	2
Personal hygiene	3.05	0.79	Sometimes	1
Total	2.76	0.62	Sometimes	

Table 4: Analysis of variance for self-management behaviors when menstrual pain occurred categorized by the levels of pain among Ubon Ratchathani Rajabhat University students

Self-Management behaviors when menstrual pain occurred	Source of variance	df	SS	MS	F	p
Exercise	Between Groups	5	4.267	.853	1.174	.321
	Within Groups	394	286.422	.727		
	Total	399	290.689			
Food Consumption	Between Groups	5	3.068	.614	1.218	.300
	Within Groups	394	198.482	.504		
	Total	399	201.551			
Personal Hygiene	Between Groups	5	2.322	.464	.743	.592
	Within Groups	394	246.255	.625		
	Total	399	248.577			
Overall	Between Groups	5	2.106	.421	1.087	.367
	Within Groups	394	152.668	.387		
	Total	399	154.774			

Table 5: Analysis of variance in manifested symptoms of menstruation (menstrual blood based on the four life elements) according to the Māhaachortārat scripture categorized by levels of pain.

	Source of variance	df	SS	MS	F	p
Menstrual pain	Between Groups	3	30.069	10.023	5.848 [‡]	.001
	Within Groups	396	678.721	1.714		
	Total	399	708.790			

‡ A statistical significance level of 0.05

Table 6: A pairwise comparison of symptoms classified by pain level

Categories	\bar{X}	S.D.	The earth element (tart din; in Thai)	The water element (tart nam; in Thai)	The fire element (tart fai; in Thai)	The wind element (tart lom; in Thai)
The earth element (tart din; in Thai)	3.08	1.38	-	-0.79 [‡]	-1.30 [‡]	-0.61 [‡]
The water element (tart nam; in Thai)	3.87	1.30		-	-0.51	0.18
The fire element (tart fai; in Thai)	4.38	1.23			-	0.69 [‡]
The wind element (tart lom; in Thai)	3.69	1.31				-

‡ A statistical significance level of 0.05

When manifested symptoms of menstruation (menstrual blood based on the four life elements) were compared and categorized by levels of pain following Māhaachortārat scripture, it was discovered that the manifested symptoms of menstruation were different and the levels of menstrual pain were different at a statistical significance level of 0.05, as shown in Table 5. Aside from that, there were distinctions between each pair of manifested symptoms as measured by pain levels. The earth element (tart din; in Thai) was distinct from the elements of water (tart nam; in Thai), fire (tart fai; in Thai), and wind (tart lom; in Thai). At a statistical significance level of 0.05, the fire element (tart fai; in Thai) had a different amount of discomfort than the wind element (tart lom; in Thai), as illustrated in Table 6. Dysmenorrhea was lower in the earth element (tart din; in Thai) than in the water (tart nam; in Thai), fire (tart fai; in Thai), and wind (tart lom; in Thai) elements. The fire element had a higher level of pain than the earth (tart din; in Thai), water (tart nam; in Thai), and wind (tart lom; in Thai) elements.

According to the comparison of manifested symptoms of menstruation classified by the levels of menstrual pain, the earth element (tart din; in Thai) had a lower level of dysmenorrhea than the water (tart nam; in Thai), fire (tart fai; in Thai), and wind (tart lom; in Thai) elements. Apart from that, the fire element (tart fai; in Thai) experienced more menstruation pain than the wind (tart lom; in Thai) element. These results are consistent with the concepts of the Healing Arts Division, Department of Health Service Support,³ which found that Māhaachortārat scripture recorded the “usual negative blood impact” caused by the four life elements.

Menstrual blood was obtained purely from the elements and was considered intermittent, indicating that it occurred when the human bodies were out of balance owing to a variety of factors, including food consumption, seasonal changes, weather, changes in living conditions, and emotions. The typical negative blood impact occurred only before menstruation. It would stop after menstruation. Therefore, the appearance of menstrual blood and symptoms derived from the four elements were different, with varying levels of pain based on the four elements of an individual. This is consistent with the findings of Kamuttachat,¹⁸ who studied menstrual pain (usual negative blood impact) and found that menstrual pain occurred at the highest level on the tendons, followed by the bones, heart, joints, and skin.

Conclusion

Most of the symptoms among students at Ubon Ratchathani Rajabhat University were characteristic of the water (tart nam; in Thai) element, according to the Māhaachortārat scripture. Menstrual pain differs for each person depending on their elemental pile, which consists of the earth (tart din; in Thai), water (tart nam; in Thai), wind (tart lom; in Thai), and fire (tart fai; in Thai), as well as self-management behaviors such as exercise, food consumption, and personal hygiene when menstrual pain is not different. The findings of this study could be used to design a treatment model for dysmenorrhea based on the science of Thai traditional medicine. Reduced medication use and improved quality of life are two methods to lessen the severity of dysmenorrhea.

Conflict of Interest

The authors declare no conflict of interest.

Authors' Declaration

The authors hereby declare that the work presented in this article is original and that any liability for claims relating to the content of this article will be borne by them.

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