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## GYNAECOLOGY

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# Menstrual Patterns among Upper Secondary School Students, Khon Kaen, Thailand

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### ABSTRACT

**Objective:** To determine the prevalence of abnormal menstrual bleeding and effects of menstrual bleeding on academic and daily life among upper secondary students in Khon Kaen, Thailand.

**Material and Method:** 339 Secondary school students were randomly selected and asked to complete an anonymous questionnaire. The questionnaire included data on demographics, menstrual patterns, impact of menstruation on academics and daily life and any related menstrual symptoms.

**Results:** We surveyed 339 students between 15 and 19 years of age. Mean age of menarche was  $12.3 \pm 1.1$ . Majority of students (75%) had regular menstrual cycles while 25% had irregular menstrual cycles. Four patterns of menstrual irregularity predominated: metrorrhagia, polymenorrhea, menorrhagia or hypermenorrhea and oligomenorrhea (37.6 %, 35.3%, 17.7% and 9.4%, respectively). Menstrual irregularity affected activity such as poor studying concentration (48.2%) and limit sport activities (42.3%). False negative perception of abnormal menstruation was 17.9%. The two most common sources of consultation were mothers (90.5%) and internet and social media (22.7%).

**Conclusion:** Abnormal menstrual bleeding is common in menstrual disorders. Metrorrhagia and polymenorrhea are also high prevalence. Academic and daily life activities are affected by menstrual irregularity. Consequently, health promotion programs in secondary school should be provided for improving their menstrual health.

**Keywords:** Menstrual pattern, adolescent, secondary school students

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## Introduction

Adolescence is a period of rapid physical and

mental growth and development. Menstruation indicates commencement of the reproductive years. It

can be a frightening new experience. Thai adolescents may have incorrect perceptions and attitudes regarding menstruation which might affect their behavior and self-care during irregular menstruation<sup>(1)</sup>. For example, menstrual state accounts for up to 17% of school absenteeism; albeit the majority had dysmenorrhea and only some of them had abnormal uterine bleeding (AUB)<sup>(1)</sup>. In Hong Kong Chinese girls 66.9% of adolescents thought that they were experiencing regular menstruation, they were in fact having an irregular one. Thus, only 17.9% of adolescents correctly identified a menorrhagia<sup>(2)</sup>: of these, 33% reported the bleeding affected their daily life; 12.1% that it was the cause of absenteeism and only 6.4% went to see a doctor<sup>(2)</sup>. Clearly, then, many adolescents cannot differentiate between normal and abnormal menstruation and therefore they do not know how to care for themselves appropriately.

AUB is a common gynecological problem, especially among teenagers; 95% of which is caused by anovulation without any pathology. Regular ovulation occurs when the hypothalamic-pituitary-ovarian axis (HPO axis) is completely developed for 18-24 months after menarche<sup>(3,4)</sup>. Other causes of AUB include coagulopathy, pelvic infection, endocrinological disease and tumor<sup>(4)</sup>. The reported prevalence of AUB is between 22.7 and 38%<sup>(5-8)</sup>. In the only report on Thai teenagers, the prevalence was 27%<sup>(1)</sup>.

In adolescents, AUB refers to an interval cycle >35 or <24 days. Hypermenorrhea indicates that the amount of bleeding in each cycle is >80 mL or it lasts >7 days<sup>(9)</sup>. Most Thai teenagers had their first menstruation sometime between 12 and 14 years of age (average, 12.7)<sup>(1,10,11)</sup>. The average menstrual duration was 6.8 days and the interval was 26-30 days (mean, 34.1 days)<sup>(1)</sup>.

In Thailand, few studies have addressed the prevalence of AUB in adolescents or the details of menstrual patterns. Dramatic changes in the lives of modern Thai adolescents include food, medicine consumption, risky health behaviors, stress in learning, and daily life. Consequently, we set out (a) to study the prevalence of AUB among Thai students, (b) to determine the effect of AUB in Thai adolescents on

their daily life and school attendance.

## Material and Method

The study was approved by the Khon Kaen University Ethics Committee in Human Research. It was a descriptive study among upper secondary Thai female students in 3 schools from different areas in Khon Kaen, Thailand. They were selected by cluster random sampling. They included Khon Kaen University Demonstration School, a school inside the municipality, and another one outside the municipality. In each school, 4 classes were selected by convenient sampling. All schools granted permission after administrators reviewed the study protocols and objectives. Only students already experiencing menses were asked to participate. Respondents experiencing amenorrhea as pregnant were excluded. All the participants and their parents/guardians were informed about the study procedures and asked to sign a consent/assent form. (Respondents were not forced to participate.) Data were collected using a questionnaire and respondents were not asked to fill in their names.

The content validity of the questionnaire was investigated by two experts. It was then piloted on 30 students (i.e., using same inclusion criteria but not included in the study). The questionnaire was divided into 3 sections: (1) demographics, menarche age at menarche, underlying disease (e.g., diabetes mellitus, hypothyroid, hyperthyroid, bleeding disorders). (2) perception of menstrual irregularities, menstrual patterns (interval, duration, pads/day, interval of abnormal bleeding) and related menstrual symptoms; and, (3) impact of menstruation on daily activities (discomfort, avoid physical exercise or outdoor activity, absent from school, poor concentration) and consulted vis-à-vis menstrual problems.

The details of menstrual history included in the questionnaire were: cyclicity (cycle length, duration, amount of flow); dysmenorrhea or related symptoms; and pattern (regular: 24-35 days vs. irregular <24 or >35 days). The following definitions were used<sup>(9)</sup>:

- Oligomenorrhea: Infrequent menses, intervals >35 days
- Polymenorrhea: Frequent menses,

intervals <24 days

- Metrorrhagia: Menses at irregular intervals
- Menorrhagia or Hypermenorrhea:

Abnormally long or heavy menses, lasting >7 days or involving blood loss >80 mL.

The data were analyzed by using STATA/IC 10.0. Descriptive statistics were used to determine mean age, mean age at menarche, prevalence of menstrual irregularity, menstrual patterns and related menstrual symptoms, activities affected by menstruation, by using mean value, number, and percentage.

## Results

Of the 369 questionnaires distributed 339 were returned. Thirty students failed to report their age, age of menarche, body weight, underlying disease(s) and menstrual pattern, so 92.1% of questionnaires were complete and analyzed. The mean age, mean age at menarche and BMI were 16.8 years, 12.3 years and 20.2 kg/m<sup>2</sup> respectively.

The prevalence of menstrual irregularities was 25% (85/339) and the ranks were metrorrhagia

(37.6%), polymenorrhea (35.3%), menorrhagia or hypermenorrhea (17.7%) and oligomenorrhea (9.4%) respectively. A majority of students (218) perceived their menstrual pattern as normal; while in fact 39 (17.9%) were abnormal (false negative). By contrast, of the 121 who thought their menstrual pattern was abnormal, for 75 (61.9%) it was in fact normal (false positive) (Table 1).

Dysmenorrhea was the most frequently reported symptom (86.1%). More than half of students complained of PMS symptoms including: irritability (82.0%), fatigue (56.3%), breast tenderness (50.9%), anxiety (41.9%) and headache (33.0%) (Table 2).

The impact of menstrual irregularity on daily life activities is presented in Table 3. It manifested as poor classroom concentration (48.2%) and limited participation in sport activities (42.3%). It had little affect on participation in school activities (8.2 %).

Mothers were the most commonly consulted person regarding menstrual problems (90.5%) while the least consulted person was the health teacher (0.8%) (Table 4).

**Table 1.** Student's perception on their menstrual pattern

Perception	Menstrual pattern		Total N (%)
	Abnormal N	Normal N	
Abnormal	46	75	121
Normal	39	179	218
Total	85	254	339

False negative 17.9%

Accuracy 66.4%

**Table 2.** Associated symptoms during menstruation among upper secondary students

Symptoms	N	%
Dysmenorrhea	292	86.1
Irritability	278	82.0
Feeling tired	191	56.3
Breast tenderness	172	50.9
Anxiety	142	41.9

**Table 2.** Associated symptoms during menstruation among upper secondary students (Cont.)

Symptoms	N	%
Headache	112	33.0
Depression	89	26.3
Fever	76	22.4
Nausea/Vomiting	31	9.1

\*Multiple responses

**Table 3.** Impact of menstrual irregularity on academic and daily life

Activity	N	%
Poor classroom concentration	41/85	48.2
Limited sport activities	36/85	42.3
Limit social activities	23/85	27.6
School absenteeism	7/85	8.2

\*Multiple responses

**Table 4.** Problem-sharing during menstrual irregularity

Menstrual problems discussed with	N	%
Mother	307	90.5
Friend	118	34.8
Internet and social media Searching	77	22.7
Doctor	36	10.7
Pharmacy	10	2.9
Boy friend	5	1.4
Teacher	3	0.8

\*Multiple responses

## Discussion

Organic gynecological pathologies are rare during adolescence, but menstrual disorders are common and a potential cause of psycho-social problems for the adolescent herself as well as for her parents. Body weight and nutrition both play an important role in pubertal development, and critical body fat mass affects the onset of menarche. Menarche, moreover, is occurring at a younger age all over the world because of improved nutrition and higher body weights<sup>(12-14)</sup>. The age of menarche is typically between 12 and 13 years. We found menarche averaged at 12.3±1 years as in most other recent studies<sup>(1,6,8,10,15,16)</sup>

but somewhat lower than in a minority of studies where it was between 13.1-13.7<sup>(17,18)</sup>. The difference may be due to location which would in turn affect nutritional status and body weight.

Most adolescents in our study, as in previous studies<sup>(1,6,8,19)</sup>, had regular menstrual cycles (75%) while a minority (25%) experienced irregular menstruation. The common patterns of menstrual irregularity included metrorrhagia, polymenorrhea, menorrhagia or hypermenorrhea and oligomenorrhea (37.6%, 35.3%, 17.7% and 9.4%, respectively). Metrorrhagia and polymenorrhea are explained by anovulatory cycle, commonly found during adolescence<sup>(20)</sup>. Thus, a

relatively high prevalence of menstrual disturbances was found among our subjects, but still lower than the 29.7% and 32.8% reported by Zegeye et al. and Pitangui<sup>(18,19)</sup>. The prevalence of menorrhagia or hypermenorrhea in our study was 17.7%, which was somewhat less than the 21.2% reported from Brazil<sup>(18)</sup>. On the other hand 4.7% of students in this study with severe AUB used more than 5 pads/day perhaps because (a) AUB in adolescents caused by gynecopathologies was less than the higher age (b) the prevalence of hematological or other underlying diseases among our adolescents was low.

False positive (thinking an abnormal period was normal) accounted for 61.9% of surveyed students perception of their menses. False negative (17.9% thinking their period was normal, when it was abnormal) is a more serious situation since it results in delayed diagnosis. Students need guidance on how to judge normal vs. abnormal menses and on when to seek medical advice.

We also surveyed associated symptoms. Dysmenorrhea (86.1%) and some symptoms of premenstrual symptom (PMS) had a relatively high prevalence (26.3-82%) over against cycle irregularity (25%). The severity of dysmenorrhea and PMS were, nonetheless, not evaluated. Dysmenorrhea has a high prevalence and negatively affects menstruation among 20% to 90% adolescence all over the world<sup>(21)</sup>. Dysmenorrhea was as high as 72% in another study among secondary school students in our province (62% moderate vs. 25% severe)<sup>(22)</sup>. In another study of Thai adolescents, dysmenorrhea was even higher (84.9%)<sup>(23)</sup>.

PMS includes a cluster of symptoms occurring in a cyclic fashion from 1 to 2 weeks prior to menses and disappearing within a few days of the onset of menses. PMS is characterized by a variety of physical and psychological problems; affecting as many as 75 to 90% of women in reproductive age (24,25). As in a Malaysian study (75%)<sup>(26)</sup>, more than half of our students complained one of a PMS symptom, including irritability (82%), fatigue (56.3%), anxiety (41.8%), breast tenderness (50.8%) and/or headache (33%). The epidemiology of PMS among adolescents is difficult to

assess because of conflicting definitions of the syndrome<sup>(27)</sup>. Although our study was not designed to assess the prevalence of PMS, a high percentage of some PMS symptoms was revealed, as found in some other studies<sup>(24,25)</sup>. Focused studies on PMS in adolescence in Thailand are needed.

Half of students with menstrual irregularity in our study had poor classroom concentration and some did not attend sports or participate in daily life activities as much as the group without irregularities. Mothers were the most important source of knowledge regarding menarche and menstrual problems. Student knowledge, therefore, mostly depended upon the experience and education of the mother. Other sources of information were friends, the Internet and social media. Only a few students received advice from a health teacher or medical practitioner. One quarter of our respondents were diagnosed as having menstrual irregularity, but 17.9% were false negative as the girls did not know what symptoms indicated irregularity. A discreet educational campaign is needed to raise awareness.

### Limitations

The study focused on Upper Secondary School Students and the observations may not be generalizable to the overall adolescent population. 2. The use of self-reported information based on memory may be subject to recall bias, which is an inherent weakness of retrospective and cross-sectional studies. Further prospective studies should, therefore, be performed with a larger sample size, various locations, and risk factors of menstrual irregularity

### Conclusions

Abnormal menstrual bleeding is common among menstrual disorders in Thai Secondary School Students and pronounced impacted on academic and daily activities. Common patterns of menstrual bleeding include metrorrhagia and polymenorrhea. Health promotion programs in secondary school are, consequently, needed to improve actual and perceived menstrual health. Dysmenorrhea and PMS should be the focus of future studies as these were the most prevalent of menstrual related symptoms.

## Declarations

The authors have no competing interests. The authors participated in the design and prosecution of the study, as well the data collection and analysis. The authors have read and agree to the final submitted version. This manuscript has not been presented or submitted elsewhere for publication.

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## ลักษณะประจำเดือนในนักเรียนมัธยมปลาย จังหวัดขอนแก่นประเทศไทย

ธัชชัย กมลมนูโชติ , ศรีนารี แก้วฤดี, สุกรีย์ สุนทรภา, โฉมพิลาศ จงสมชัย, บัณฑิต ชุมวรฐายี,  
ธีระยุทธ เต็มธนะกิจไพศาล

**วัตถุประสงค์:** เพื่อศึกษาความชุกและลักษณะรูปแบบประจำเดือนผิดปกติ ผลกระทบต่อการเรียนและการใช้ชีวิตประจำวันในวัยรุ่นกลุ่มนักเรียนมัธยมปลายจังหวัดขอนแก่น

**วัสดุและวิธีการ:** เป็นวิจัยเชิงพรรณนา สุ่มเลือกนักเรียนมัธยมปลายจังหวัดขอนแก่น ทั้งหมด 339 คน และให้ตอบแบบสอบถามเกี่ยวกับข้อมูลพื้นฐานทั่วไป เช่น อายุ อายุที่เริ่มมีประจำเดือน น้ำหนัก ลักษณะประจำเดือน ผลกระทบของการมีประจำเดือนผิดปกติต่อการเรียนและการใช้ชีวิตประจำวัน

**ผลการศึกษา:** มีอาสาสมัครเข้าร่วมวิจัย 339 คน มีอายุระหว่าง 15-19 ปี ส่วนใหญ่มีรูปแบบประจำเดือนปกติ 254 คน (75%) รูปแบบประจำเดือนผิดปกติ 85 คน (25%) โดยมีเลือดออกผิดปกติระหว่างรอบประจำเดือน 32 คน (ร้อยละ 37.6) รอบประจำเดือนน้อยกว่า 24 วัน 30 คน (ร้อยละ 35.3) มีประจำเดือนออกมากหรือออกนานกว่า 7 วัน 15 คน (ร้อยละ 17.7) มีลักษณะรอบประจำเดือนมากกว่า 35 วัน 8 คน (ร้อยละ 9.4) มีนักเรียนร้อยละ 17.9 ที่คิดว่าประจำเดือนปกติแต่ความจริงมีประจำเดือนผิดปกติ การมีประจำเดือนผิดปกติมีผลให้ขาดสมาธิในการเรียน 41 คน (ร้อยละ 48.2) มีผลต่อการออกกำลังกายทำให้ออกกำลังกายลดลง 36 คน (ร้อยละ 42.3) อาสาสมัครส่วนใหญ่ปรึกษาหาความรู้เรื่องประจำเดือนกับแม่ (ร้อยละ 90.5) หนังสือและอินเทอร์เน็ต (ร้อยละ 22.7)

**สรุป:** ประจำเดือนผิดปกติเป็นปัญหาที่พบได้บ่อยโดยลักษณะที่พบได้บ่อยที่สุดคือ เลือดออกผิดปกติระหว่างรอบประจำเดือน และรอบประจำเดือนน้อยกว่า 24 วัน การมีประจำเดือนผิดปกติมีผลต่อการเรียนและการใช้ชีวิตประจำวัน ควรมีการส่งเสริมการให้ความรู้เรื่องประจำเดือนในนักเรียนมัธยมปลายให้มากขึ้น