

## ORIGINAL RESEARCH ARTICLE

### **MENSTRUAL CHARACTERISTICS AMONG FEMALE STUDENTS IN UNIVERSITY OF PORT HARCOURT AND IT'S RISK FACTORS**

#### **ABSTRACT**

**Background:** Menstruation is a normal phenomenon among women of reproductive age. This is defined as bleeding from the endometrium due to the shedding of the necrotic functional layer. Disorders that are usually linked with menstruation affect women from all parts of the world and it's increasingly becoming one of the major reasons for gynecological visits. **Material and method:** The study was a Cross-sectional study conducted in 2022, using a questionnaire which was administered to one hundred and forty female undergraduate students of the University of Port Harcourt. **Result:** The analysis shown that Menstrual disorders are prevalent among the female students as a result of a wide range of factors that contribute to the irregularity of menstrual patterns. The most common disorder these students experienced was premenstrual symptoms, followed by Heavy blood flow, Irregular menstrual cycle, longer menstrual cycle, Prolonged blood flow and dysmenorrhea. The other premenstrual symptom was headache, Acne, Body pains, Tender/Swollen breasts, Fatigue, Fever, Bloating, Nausea, Diarrhea and Frequent Urination. Disturbance in the menstrual cycle and menstrual symptoms are common. The result of this study would help enlighten females and physicians on the menstrual characteristics, some common disorders among female students, and the risk factors associated to the menstrual characteristics. **Conclusion:** The result of this study would help enlighten females and physicians on the menstrual characteristics, some common disorders among female students, and the risk factors associated to the menstrual characteristics.

#### **Introduction**

The Female Reproductive System provides several functions. The ovaries produce the egg cells, called the ova or oocytes. The oocytes are then transported to the fallopian tube where fertilization by a sperm may occur. The fertilized egg then moves to the uterus, where the uterine lining has thickened in response to the normal hormones of the reproductive cycle. Once in the uterus, the fertilized egg can implant into

thickened uterine lining and continue to develop. If implantation does not take place, the uterine lining is shed as menstrual flow. In addition, the female reproductive system produces female sex hormones that maintain the reproductive cycle. [1]. Menstruation is a woman's monthly bleeding, often called your "period." When females menstruate, their body discards the monthly build-up of the lining of your uterus (womb). Menstrual blood and tissue flow from your uterus through the small opening in your cervix

and pass out of your body through your vagina. During the monthly menstrual cycle, the uterus lining builds up to prepare for pregnancy. If you do not get pregnant, estrogen and progesterone hormone levels begin falling. Very low levels of estrogen and progesterone tell your body to begin menstruation. The term menstruation refers to the periodic shedding of the uterine lining. Many women call the days that they notice vaginal bleeding their “period,” “menstrual” or cycle. [2,3,4,5]

Disorders that are usually linked with menstruation affect women from all parts of the world and it’s increasingly becoming one of the major reasons for gynecological visits. They result from various individual, family, socioeconomic and environmental factors. [4,5,6].

During menopause, the female reproductive system gradually stops making the female hormones necessary for the reproductive cycle to work. At this point, menstrual cycles can become irregular and eventually stop. One year after menstrual cycles stop, the woman is considered to be menopausal. [7] Females of reproductive age (beginning anywhere from 11 to 16 years of age) experience cycles of hormonal activity that repeat at about one-month intervals. The menstrual cycle consists of cyclic changes in the female reproductive system which continues till menopause. Premenopausal women undergo an 1-2 average 400 menstrual cycles in their lifetime. The hallmark of the menstrual cycle is menstruation. [8]. It is known by many names – menses, period, or “that time of the

month. Counted from the first day of one period to the first day of the next, the average menstrual cycle is 28 days. Cycles may vary from 21 to 35 days. The duration of bleeding is between 2 to 8 days and the volume of blood loss is usually from 30 ml to 80ml. The average menstrual flow lasts for about 5 days, which accounts to approximately 67 months of menstrual bleeding over a lifetime [8]. Menstrual Characteristics are the physical features associated with menstruation like Duration of the flow for the cycle length, the volume of the flow and menstrual symptoms like headache, Diarrhoea, fatigue, menstrual pains, lack of appetite etc. Menstrual disorders are common among females of reproductive age and are a major cause of gynaecological referrals and can be defined as an abnormal condition with regards to a person’s menstrual cycle. These disorders vary according to the volume of the menses or the interval of the menses. [5]

Some studies were found to relate menstrual characteristics to the age of menarche [9,10,11,12]

A cross sectional study conducted to determine the age at menarche and patterns of menstruation among school adolescent girls in district Wardha, Central India by Dambhare *et al.*, [9] showed that majority (56.15%) experienced dysmenorrhoea and (56.16%) had premenstrual syndrome. Dysmenorrhea and premenstrual symptoms were perceived as most distressing symptoms leading to school absenteeism. The most common premenstrual symptom was headache 26.74%. Absenteeism from

the school 13.9% was the effect of menstruation related problems on their daily routine. [9].

Adienbo and Erigbali, [11] in their study of adolescent girls in indigenous population in Niger Delta Region, Nigeria observed that subjects with high age at menarche and long cycle length are more likely to experience dysmenorrhoea during menstruation.

A Nigeria study to determine the menstrual characteristics of Women in Kumana Chiefdom, Kuru Local Government Area of Kaduna State, Nigeria by Tanko *et al.*, [12] showed a high percentage of women in this study population had an average menarche age of 15.58 years and experienced regular menstruation, with a duration of 4-5 days menstrual flow and low prevalence of dysmenorrhea. Thus, indicating high reproductive success. [12].

Besides, previous research has related menstrual characteristics and their associated risk factors [13,14].

Nwankwo *et al.*, [13] revealed that the mean age of menarche for adolescent school girls in Enugu, Nigeria was  $12.7 \pm 1.3$  years. The prevalence of menstrual disorders was 69.4% and dysmenorrhea, premenstrual dysphoric disorder, and short menstrual cycles were the commonest disorder. Being older, later age of menarche, and being domiciled in the boarding house were significantly associated with menstrual disorders ( $P < 0.05$ ). Dysmenorrhea was responsible for the greatest number of schools absences [13].

Bae *et al.*, [14] investigated the modifiable risk factors of menstrual cycle irregularity and premature menopause, as well as their individual and combined effects among adult women in Korea. Their study demonstrated that modifiable risk factors, such as smoking, obesity, and stress, were significantly associated with menstrual cycle irregularity. Lifetime smoking also correlated with early menopause. This suggested that healthier lifestyle practices, including, cessation of smoking, weight control, and stress management, were important factors in improving the reproductive health of women throughout life. [14].

Amelia *et al.*, [15] recorded that short cycle length, early age at menarche, and heavy menstrual bleeds were associated with reduced fecundability. Karout *et al.*, [16] noted that non-vegetarian diet, eating at fast food, meal skipping habit, and poor eating habit significantly associated with menstrual problems.

Until now, no previous study has addressed the menstrual patterns among female students in University of Port Harcourt. Hence, this present study aims to ascertain the menstrual characteristics and the menstrual problems together with their associated risk factors among Female students in University of Port Harcourt.

## **MATERIAL AND METHOD**

The study was a Cross-sectional study conducted in 2022, using a questionnaire which was administered to one hundred and forty female undergraduate students of the University of Port Harcourt. The questionnaire was designed to entail the socio-demographic characteristics of the respondents (Age, Educational Level, Weight, Height) and their menstrual pattern (Age of Menarche age, Menstrual Cycle, Volume of Blood Flow, Menstrual Regularity), Lifestyle patterns, History of dysmenorrhea, other Menstrual symptoms and Associated Risk factors.

## RESULTS

About 12.9% of the population are underweight, 20% are Overweight, 12% are obese, and 39.3% of the population have the normal BMI. Within the population, the frequency of females within the age of 23-

24 years is the highest and about 74.3% of the population experienced the onset of the menstruation within the age of 9-14 years. The average age of menarche from this study is 13years.

Among the population, 47.1% of the females experienced heavy flow of blood during menstruation, 28.6% of the females have menstrual cycle interval of less than 28 days, 60.7% have menstrual cycle interval between 28-32 days, and 5.7% have menstrual cycle interval of more than 32 days. 26.4% have irregular menstrual cycle, 32.1% have regular blood flow, and 41.4% experience both regular and irregular menstrual cycle. It also shows the menstrual symptoms of the participants in the study are Acne/Pimples, Painful period (dysmenorrhea), Body pains, Tender and swollen breasts, Fatigue, Fever, Bloating, Nausea.

| Variable          |              | F            | (%)          |
|-------------------|--------------|--------------|--------------|
| BMI               | Normal       | 55           | 39.3         |
|                   | Underweight  | 18           | 12.9         |
|                   | Overweight   | 28           | 20.0         |
|                   | Obesity      | 17           | 12.1         |
|                   | Nil          | 22           | 15.7         |
|                   | <b>Total</b> | <b>140</b>   | <b>100.0</b> |
| Age Range (years) | <21          | 22           | 15.7         |
|                   | 21-22        | 34           | 24.3         |
|                   | 23-24        | 49           | 35.0         |
|                   | 25-26        | 25           | 17.9         |
|                   | 27-28        | 9            | 6.4          |
|                   | 29-30        | 1            | 0.7          |
|                   |              | <b>Total</b> | <b>140</b>   |

|                         |              |            |              |
|-------------------------|--------------|------------|--------------|
| Age of Menarche (years) | 9-10         | 9          | 6.4          |
|                         | 11-12        | 39         | 27.9         |
|                         | 13-14        | 56         | 40.0         |
|                         | 15-16        | 22         | 15.7         |
|                         | 17-18        | 12         | 8.6          |
|                         | Nil          | 2          | 1.4          |
|                         | <b>Total</b> | <b>140</b> | <b>100.0</b> |

Table 1- Descriptive Statistics of Demographic characteristics and Menstrual characteristics of Women

| Variable                      |              | F          | (%)          |
|-------------------------------|--------------|------------|--------------|
| Volume of Flow                | Heavy        | 66         | 47.1         |
|                               | Light        | 74         | 52.9         |
|                               | <b>Total</b> | <b>140</b> | <b>100.0</b> |
| Menstrual Cycle Interval      | < 28 days    | 40         | 28.6         |
|                               | 28-32 days   | 85         | 60.7         |
|                               | >32 days     | 8          | 5.7          |
|                               | Nil          | 7          | 5.0          |
|                               | <b>Total</b> | <b>140</b> | <b>100.0</b> |
| Regularity of Menstrual Cycle | Irregular    | 37         | 26.4         |
|                               | Regular      | 45         | 32.1         |
|                               | Sometimes    | 58         | 41.4         |
|                               | <b>Total</b> | <b>140</b> | <b>100.0</b> |

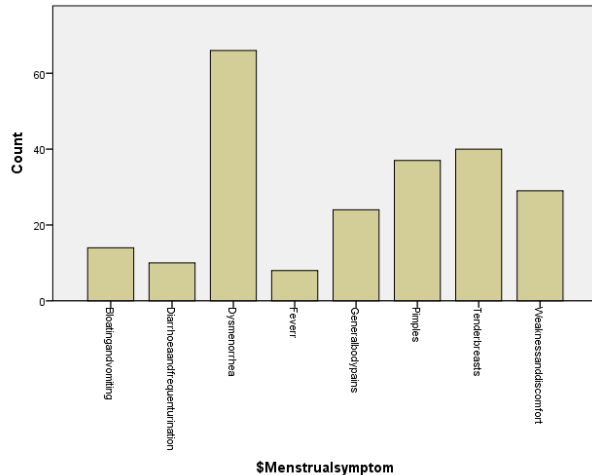


Fig 1 – Menstrual symptom experienced by population

The Figure showed that the most frequent menstrual symptom is Dysmenorrhea (Painful period).

### Relationship between Age, Age of menarche, and BMI with the Menstrual Interval

We endeavored to establish the relationship of the various factors with Menstrual cycle interval and found out age of menarche was also significantly associated to the menstrual cycle interval ( $p = 0.011$ ). Although other

factors like age and BMI did not show significant associations. This relationship as shown in table 2

### Relationship between Age, Age of menarche, and BMI with Volume of Blood Flow

We attempted to establish the relationship of the various factors with Volume of blood flow and found out Age, Age of Menarche and was not significantly associated to the Volume of Blood Flow. This relationship as shown in table 3

### Relationship between Age, Age of Menarche, and BMI with Regularity of the Menstrual Cycle

We attempted to establish the relationship of the various factors with Regularity of Menstrual cycle and found out BMI was significantly associated to the regularity of menstrual cycle ( $p = 0.005$ ). Although other factors like Age and Age of Menarche did not show significant associations. This relationship as shown in table 4

Table 2 – Relationship between Length of Menstrual Cycle and Age, Age of menarche and BMI

|            |             | Length of Menstrual Cycle |           |          | P Value | $\chi^2$ |
|------------|-------------|---------------------------|-----------|----------|---------|----------|
|            |             | <28 days                  | 28-32days | >32 days |         |          |
| Age groups | Below 20-20 | 7                         | 12        | 1        | 0.655   | 7.735    |
|            | 21-22       | 11                        | 18        | 3        |         |          |
|            | 23-24       | 15                        | 29        | 2        |         |          |
|            | 25-26       | 5                         | 18        | 2        |         |          |
|            | 27-28       | 1                         | 8         | 0        |         |          |

|                               |             |    |    |   |       |        |
|-------------------------------|-------------|----|----|---|-------|--------|
|                               | 29-30       | 1  | 0  | 0 |       |        |
| <b>Age of menarche groups</b> | 9-10        | 7  | 2  | 0 | 0.011 | 19.918 |
|                               | 11-12       | 10 | 21 | 5 |       |        |
|                               | 17-18       | 1  | 11 | 0 |       |        |
| <b>BMI</b>                    | Underweight | 2  | 13 | 2 | 0.461 | 7.727  |
|                               | Healthy     | 17 | 35 | 3 |       |        |
|                               | Overweight  | 8  | 15 | 3 |       |        |
|                               | Obesity     | 7  | 10 | 0 |       |        |
|                               | NIL         | 6  | 12 | 0 |       |        |

Table 3 – Relationship between Volume of Blood flow and Age, Age of menarche and BMI

|                   |       | Volume of Blood flow |       | P-value | X <sup>2</sup> |
|-------------------|-------|----------------------|-------|---------|----------------|
|                   |       | Heavy                | Light |         |                |
| <b>Age groups</b> | <21   | 11                   | 11    | 0.886   | 1.727          |
|                   | 21-22 | 16                   | 18    |         |                |
|                   | 23-24 | 24                   | 25    |         |                |

|                               |             |    |    |       |       |
|-------------------------------|-------------|----|----|-------|-------|
|                               | 25-26       | 12 | 13 |       |       |
|                               | 27-28       | 3  | 6  |       |       |
|                               | >28         | 0  | 1  |       |       |
| <b>Age of menarche groups</b> | 9-10        | 5  | 4  | 0.253 | 5.352 |
|                               | 11-12       | 13 | 26 |       |       |
|                               | 13-14       | 31 | 25 |       |       |
|                               | 15-16       | 10 | 12 |       |       |
|                               | 17-18       | 7  | 5  |       |       |
| <b>BMI</b>                    | Underweight | 6  | 12 | 0.640 | 2.527 |
|                               | Healthy     | 26 | 29 |       |       |
|                               | Overweight  | 16 | 12 |       |       |
|                               | Obesity     | 8  | 9  |       |       |

Table 4 – Relationship between Regularity of Menstrual Cycle and Age, Age of menarche and BMI

|            |       | Regularity of Menstrual Cycle |           |           | P Value | X <sup>2</sup> |
|------------|-------|-------------------------------|-----------|-----------|---------|----------------|
|            |       | Regular                       | Sometimes | Irregular |         |                |
| <b>Age</b> | < 21  | 8                             | 6         | 8         | 0.447   | 9.930          |
|            | 21-22 | 7                             | 17        | 10        |         |                |
|            | 23-24 | 17                            | 21        | 11        |         |                |
|            | 25-26 | 11                            | 10        | 4         |         |                |

|                        |             |    |    |    |       |        |
|------------------------|-------------|----|----|----|-------|--------|
|                        | 27-28       | 2  | 4  | 3  |       |        |
|                        | 29-30       | 0  | 0  | 1  |       |        |
| <b>Age of menarche</b> | 9-10        | 1  | 6  | 0  | 0.151 | 12.000 |
|                        | 11-12       | 9  | 14 | 16 |       |        |
|                        | 13-14       | 23 | 22 | 11 |       |        |
|                        | 15-16       | 6  | 11 | 5  |       |        |
|                        | 17-18       | 6  | 4  | 2  |       |        |
|                        |             |    |    |    |       |        |
| <b>BMI</b>             | Underweight | 2  | 7  | 9  | 0.005 | 20.115 |
|                        | Healthy     | 21 | 27 | 7  |       |        |
|                        | Overweight  | 5  | 12 | 11 |       |        |
|                        | Obesity     | 6  | 8  | 3  |       |        |

## DISCUSSION

This was done to ascertain the menstrual characteristics, and associated risk factors among female students in University of Port Harcourt.

The onset of menstruation is marked by menarche which is a very important indicator of sexual maturity in females. The mean age for the onset of menarche in this study is reported to be about 13 years, which is similar to the average age reported by Anikwe *et al.*, [11] but it is lower than the figure 15.58 years reported by Tanko *et al.*, [13]. In this survey, we also found statistically significant association between the age of menarche and menstrual cycle. Menstrual disorders can be also as a result of short or long length of menstrual cycle, and through our study, it is shown that early age of menarche can affect the length of

menstrual cycle, which can cause reduced reproductive success, which is similar to a study by Amelia *et al.*, [16] where short cycle length, early age at menarche, and heavy menstrual bleeds were associated with reduced fecundability.

In close to 80% females with normal ovulation, the estimated blood loss on average is ranging from light to heavy flow, cycle length of 21–33 days, Thus, indicating that the most females in this study population are likely to have high reproductive success in line with Tanko *et al.*, [13]. Few females in the population who suffered from polycystic ovarian syndrome had Heavy blood flow (Hypermenorrhea) in this study.

Approximately, 75% of the population have regular menstrual cycle, to slightly Irregular

cycle, where their menstrual cycle shift after some months and stay regular, until another shift, which confirms that Women's menstrual cycle are not perfectly regular. The remaining 25% experienced Irregular menstrual cycle, in which some of the women suffered from polycystic ovarian syndrome., which is characterized by Irregular menstrual cycle, longer menstrual cycle (Oligomenorrhea), or prolonged blood flow for more than 7-10 days. In this survey, we also found statistically significant association between the irregularity of menstrual cycle and BMI ( $P=0.007$ ), which confirms the study by Jinju et al; [15] that demonstrated that modifiable risk factors, such as smoking, obesity, and stress, were significantly associated with menstrual cycle irregularity.

Premenstrual menstrual symptoms (PMS) were ascribed the main menstrual disorder among the group. Dysmenorrhea accounted for 47.1% of the students respectively and it was reported to be the most frequent symptom in line with the findings of Dambhare *et al.*, [10], Adienbo and Erigbal, [12], and Nwankwo *et al.*, [14]. Other common menstrual symptom found in this study were Acne, Body pains, Tender/Swollen breasts, Fatigue, Fever, Bloating, Nausea, Diarrhea and Frequent Urination which is similar to other studies.

Unusually long menstrual cycle (oligomenorrhea), heavy menstrual flow (hypermenorrhea), metrorrhagia, unusually painful period (dysmenorrhea), and premenstrual syndrome (PMS) are among the type of menstrual disorders women suffer and the number one reason for

gynecologic visits. The reasons for irregularities in menstruation vary as Age of menarche and can occur due to a medical condition ranging from hormonal imbalances, pregnancy, malignancies, infections, diseases, trauma to the use of certain medications.

## CONCLUSION

Menstrual disorders are prevalent among the female students as a result of a wide range of factors that contribute to the irregularity of menstrual patterns. In the present study, the most common disorder these students experienced was premenstrual symptoms, followed by Heavy blood flow, Irregular menstrual cycle, longer menstrual cycle, Prolonged blood flow and dysmenorrhea. The other premenstrual symptom was headache, Acne, Body pains, Tender/Swollen breasts, Fatigue, Fever, Bloating, Nausea, Diarrhea and Frequent Urination. Disturbance in the menstrual cycle and menstrual symptoms are common. It is important to educate females who present to their primary care physicians and gynecologist with these symptoms and proffer appropriate management strategies to improve quality of life of the patients.

## Recommendation

There is a need to enlighten students in University of Port Harcourt on the importance of healthy lifestyles, and encourage the students to visit the physicians for regular physical and reproductive health check-up.

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