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# Magnitude And Factors Associated With Menstrual Cycle Abnormalities Among Women Aged 20 - 30 Years

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## Introduction

Menstruation is the physiological process in which nonpregnant women experience the discharge of vaginal secretions, blood, and cervical mucus from the uterus[1]. The monthly menstrual cycle is an significant pointer of a woman's reproductive health since it is useful for gauging normal development and ruling out abnormalities[2]. The first menstrual period is known as menarche. The regular age of menarche in healthy, typically developing females is about 12.5 years old, however, it can happen anywhere from 10 to 16 years old. During a woman's reproductive years, she will continue to have monthly periods of bleeding that last an average of 28 days with a standard deviation of 7, except the four to six days that are associated with pregnancy and lactation. From time to time, there may be small differences. Period irregularities are prevalent among teenage girls due to adjusting to a new way of life. Period irregularities among women in their twenties and thirties, on the other hand, may be associated with serious health issues.

Any change from the typical menstrual cycle is considered abnormal. When women experience irregular menstrual cycles, they may experience dysmenorrhea, amenorrhoea, menorrhagia, hypomenorrhea, polymenorrhea, or oligomenorrhea. Period pain, sometimes known as dysmenorrhea, can be accompanied by severe cramping[3]. Primary amenorrhoea occurs when a woman does not begin menstruating by the age of fifteen, while secondary amenorrhoea occurs when a woman does not begin menstruating for at least three months after reaching menarche[4]. The inability to menstruate is a common occurrence before adolescence, during pregnancy, and menopause, but it develops a cause, for anxiety during this time. Medications, eating disorders, or an unhealthy obsession with exercise can lead to dangerously low body weight, which can trigger primary amenorrhoea. Ovarian issues or genetic abnormalities are other possible causes. Weight loss or gain, stress, sickness, or exercise can all impact oestrogen levels, which can lead to secondary amenorrhoea. Periods that are less than 21 days apart are referred to as polymenorrhea, whereas periods that are more than 35 days apart are called oligomenorrhea. Bleeding that consistently lasts more than eight days is called menorrhagia. Uterine bleeding can be very mild in volume, very brief, or both in cases of hypomenorrhea[5].

For women of childbearing age, menstrual cycle abnormalities are a leading cause of concern and stress in the gynaecological field[6]. With a prevalence of 30 to 70% worldwide, they are among the most common gynaecological disorders. Several studies found that 35.7% of Nepalese women and 64.2% of Indian women experienced menstrual irregularity [7,8]. Period irregularities can be caused by a multitude of variables, including hormonal impacts, insufficient physical activity, thyroid issues, and dietary choices.[9,10.] These elements have a significant impact on fertility, therefore it's crucial to learn how they influence ovulation and reproductive hormones.

Problems including osteoporosis, type 2 diabetes, and cardiovascular disease can manifest in later life if menstrual abnormalities aren't treated. Period problems caused people to cut back on their activities and skip work, but instead of getting medical care, most people tried risky self-medication[11]. It is unknown how persons experiencing menstrual problems seek aid or information, even though these problems are very frequent[12].

It is possible to lessen the prevalence of infertility and its complications, including congenital heart disease and osteoporosis, by detecting and treating menstrual irregularities early on. [13,14.] Unfortunately, our community has a limited grasp of the elements that impact menstrual cycles. This could be because there is a social taboo associated with discussing periods. Some people think it's too private to discuss in public, and others think it's a matter of personal choice. The results of this study could help in the development of programmes to enhance women's quality of life by illuminating the relationships between the many variables that influence menstrual cycles.

## REVIEW OF LITERATURE

**Prevalence of menstrual cycle disorders**: Worldwide menstrual irregularity was reported by 35.7% of Nepalese women and 64.2% of Indian women.6, 7. According to research by U.C. Igbokwe and Y.O. John-Akinola, 90.4% of respondents suffered from some kind of menstruation disease. while just 28.3% had sought treatment for periods15. Jyoti Taneja, Sunita K. Yadav, and Priya Bhardwaj discovered that 29.1% of women had irregular menstrual cycles.[16.]

**Menstrual cycle disorders in reproductive age group women**: Periodic blood loss typically lasts for 4.28 days, with a standard deviation of 1.092.[17.]

Karthik Balajee Laksham, Ramya Selvaraj, and Sitanshu Sekhar Kar found that the prevalence of dysmenorrhea was 45% and that of menorrhagia was 17% .[18.] The study's authors—Abayneh Birlie Zeru, Enguday Demeke Gebeyaw, and Esubalew Tesfahun Ayele—found that 32.6% of the individuals had irregular menstrual periods.[19.]

**Effect of Sociodemographic factors on menstrual disorders** : Asian participants' menstrual periods are 1.6 days longer and Hispanic participants' menstrual cycles are 0.7 days longer than white non-Hispanic participants' cycles.[22.] Kapil Amgain, Prativa Subedi, Gopal Kumar Yadav, Sujana Neupane, Sitaram Khadka, and Shubha Devi Sapkota 21.67% of the participants were classified as underweight (<18.5 kg/m2), while 19.58% were classified as overweight (≥23 kg/m2) or obese (≥25 kg/m). Variations in menstrual cycle duration, irregular bleeding during periods, and overweight and obese body mass index were linked to irregular menstrual cycles.[23.] Rowland, Andrew ; S.Baird, Donna Day; Long, Stuart Wegienka, Ganesa; Harlow, Siobán D.; Alavanja, Michael; Sandler, Dale P discovered that menstruation beyond the age of 14, depression, and a higher body mass index were associated with a higher occurrence of long and irregular cycles, while older age was associated with a lower prevalence. Compared to the reference group (BMI of 22–23), the adjusted chances of lengthy cycles rose with increasing BMI, reaching 5.4 among women with a BMI of 35 or higher.[24.]

**Effect of food habits on menstrual disorders** : When comparing vegetarian and non-vegetarian women, researchers Jasjit Kaur Randhawa, Kapila Mahajan, Manbir Kaur, and Arti Gupta discovered that, with the exception of dysmenorrhea, the prevalence of menstrual disorders was higher among vegetarians. Menorrhagia was more common in women who did not eat salad every day, while oligomenorrhea was more common in women who did not eat fruits every day. The majority of respondents (93%), who reported eating junk food, also reported experiencing menstrual troubles, suggesting a substantial association between the two.[25.] Kapil Amgain, Sujana Neupane found that menstrual problems occurred more frequently in those who did not follow a vegetarian diet compared to those who did. over nine in ten women suffer from menstrual cramps, and over two-thirds of those women report eating fast food during their period. Meal skipping practices were significantly associated with menstrual troubles. The same holds true for the participants' eating habits; 75 percent had great ones, whereas 22.9% had terrible ones. The unhealthy eating behaviour was significantly connected with the menstrual cycle. Dysmenorrhea was more severe in participants whose diets did not include vegetables.[26.]

**Factors affecting menstrual disorders** : A shorter menstrual period is a hallmark of physically active women.[27.] Research conducted by Abayneh Birlie Zeru, Enguday Demeke Gebeyaw, and Esubalew Tesfahun Ayele found a significant link between irregular menstrual cycles and factors such as anaemia, alcohol intake, short sleep duration (<5 hours), stress perception, iodine deficiency condition, and underweight.[28.] High stress (PSS>20) was associated with an increased risk of menstrual cycle changes (0R=1.636, 95% CI 1.051-2.547, p=0.029) and dysmenorrhea (p=0.037), according to research by Emmanuel Ansong, Samuel Kofi Arhin, Yaoyao Cai, Xinxin Xu, and Xueqing Wu.[29.] Research conducted by Risa Mitsuhashi, Akemi Sawai, Kosuke Kiyohara, Hitoshi Shiraki, and Yoshio Nakata found that a body mass index (BMI) below 18.5 kg/m2 (OR: 1.89; 95% CI: 1.01-3.54) and smoking (OR: 1.94; 95% CI: 1.08-3.47) were two factors that were associated with the severity of PD. Smoking (OR: 1.86; 95% CI: 1.31-2.66) and a body mass index (BMI) less than 18.5 kg/m2 were associated with a higher prevalence of premenstrual syndrome and mild vs. severe PD, respectively.[30.]

**Effect of covid 19 on menstrual disorders:** As a result of the stress caused by the pandemic, more women reported abnormalities in menstrual cycle length, increased bleeding, and period pain.[31.] Half or more of the participants (56.9% and 54.2%, respectively) believed that COVID-19 infection may affect the quantity of blood loss during the cycle and the number of days between the two consecutive periods, according to the study by Al-Najjar MAA, Al-Alwany RR, Al-Rshoud FM, Abu-Farha RK, and Zawiah M.[24.]

## AIMS AND OBJECTIVES

- To estimate the magnitude of menstrual cycle irregularities
- to identify the menstrual irregularities and related risk factors among women aged 20 - 30 years.

## Materials And Methods

a. **Type of study**: observational study
b. **Study design**: This project is proposed to be done as a cross-sectional study to assess the magnitude and factors associated with menstrual cycle irregularities among women aged 20 - 30 years.
c. **Study population** : women between the age group of 20 - 30 years
d. **Study site** : urban setting
e. **Duration of study** : two months
f. **Sample size** : a sample size of 300 subjects

g. **Selection criteria**:

**Step 1 : selection of ward**

10 wards were selected in our selected urban area by lottery method.

**Step 2 :** number of participants from each ward

From each ward, 30 participant samples were collected

**Step 3** : selection of participants from each ward

All the women falling under the age group 20 to 30 years of age living in the selected ward on the day of sample collection fitting to fixed criteria.

Inclusion criteria:

All the women between the age 20 - 30 years

All the cooperative women who are willing to participate and who have given their informed consent.

Exclusion criteria:

Women who are not willing to participate and did not give their informed consent. Women who are pregnant or lactating.

Those who were on treatment for menstrual problems. Women with primary amenorrhea.

Women with a known history of hysterectomy.

h. **Data collection, procedure and instruments used**: After getting an informed consent from the participants, they were asked to fill up a semi structured questionnaire built to meet the study's aims based on the variables. Sociodemographic information, menstrual-related questions, lifestyle and behavioral questions, gynecological history inquiries, and anthropometric measurements are all included in the questionnaire. The eating habit/behavior was assessed by using the Healthy Eating Assessment Tool (HEAT), designated by the Government of Southwest Territory, which consists of ten questions. Each question was scored according to the HEAT and based on the scores, the participant's eating patterns would be considered:

- Excellent: 40-50
- Good: 30-39
- Fair: 20-29
- Needs improvement: 10-19

i. **Quality control** : quality was maintained throughout the study regarding the data collection and management.

j. **Confidentiality**: particulars and details of all the participants were kept confidential throughout and after the study. Only a summary of the details was used for declaring results.

k. **Statistical tools**: Data collected was entered into a Microsoft excel sheet and analyzed using IBM SPSS 23. Data was presented in tables, figures and graphs wherever necessary. Quantitative data was presented in the form of mean and standard deviations while qualitative data was presented in the form of percentages. Appropriate statistical tools were employed in the data analysis and variables were summarized as frequency and percentage.

l. **Ethical considerations**: The proposal was submitted to our college Ethics committee and prior consent of the ethics committee was taken before proceeding with the study. The procedures adopted for the study don't have any methods that are likely to cause any pathology to the subjects. Written informed consents were obtained from the participants before the start of the study. Steps were taken to protect the ethical values of the community and our profession.

**Observations And Results**

This is an observational and cross-sectional study conducted on women aged 20-30 years, living in an urban region to study the magnitude and factors affecting menstrual cycle disorders.

A total of 320 women participated in the study of which 20 were not considered due to incomplete forms and improper marking of answers due to shortage of time. According to fixed criteria, 300 valid responses are taken and analyzed.

**Sociodemographic data**:

Table 1 represents the socio demographic data of the study participants. The Mean age of the study group was 23±2.7. Majority of the participants were aged 21 (25.33%).

Majority of the participants were unmarried (88%) and rest were married (12%). Most of the participants were Hindu (81.7%) followed by Christians (9.7%), muslims (7.6%) and atheists (1%). Most of them went to university (56.6%) while the others completed secondary education (43.4%). Most of them were students (59.3%), followed by non government employees (21.7%) self employees (11.7%), housewives (4.3%), government employees (2.3%) and unemployed (0.7%). Majority of the participants annual family income was 1-3 lakhs per annum (16.7%) and 8.2-11 lakhs per annum (16.7%) followed by 11.6-22 lakhs per annum (16%) and 5.5-8 lakhs per annum (16%), 3.1-5 lakhs per
annum (14%), <1 lakh per annum (13.3%) and >22 lakhs per annum (7.3%). Approximately half of the participants (55%) fall under the normal bmi category.

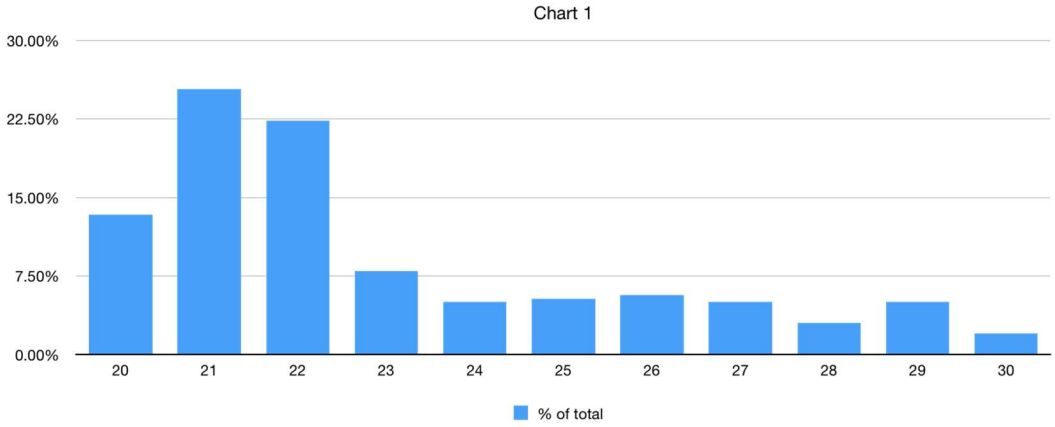
**RESULT:**

**Table 1: distribution of demographic data**

| Demographic variables | Category | counts | % of total |
|---|---|---|---|
| Age | 20 | 40 | 13.33% |
| | 21 | 76 | 25.33% |
| | 22 | 67 | 22.33% |
| | 23 | 24 | 8.00% |
| | 24 | 15 | 5.00% |
| | 25 | 16 | 5.33% |
| | 26 | 17 | 5.67% |
| | 27 | 15 | 5.00% |
| | 28 | 9 | 3.00% |
| | 29 | 15 | 5.00% |
| | 30 | 6 | 2.00% |
| Marital status | Married Unmarried | 36<br>264 | 12%<br>88% |
| Income | <1 lpa | 40 | 13.3% |
| | 1-3 lpa | 50 | 16.7% |
| | 3.1- 5 lpa | 42 | 14% |
| | 5.5- 8 lpa | 48 | 16% |
| | 8.2- 11 lpa | 50 | 16.7% |
| | 11.6- 22 lpa | 48 | 16% |
| | >22 lpa | 22 | 7.3% |
| Religion | Hindu | 245 | 81.7% |
| | Muslim | 23 | 7.6% |
| | Christian | 29 | 9.7% |
| | Atheist | 3 | 1% |
| Education | secondary school | 130 | 43.4% |
| | Completed | | |
| | University | 170 | 56.6% |
| | Completed | | |
| Occupation | govt employee | 8 | 2.3% |
| | Non govt employee | 65 | 21.7% |
| | Housewife | 13 | 4.3% |
| | Self employed | 35 | 11.7% |

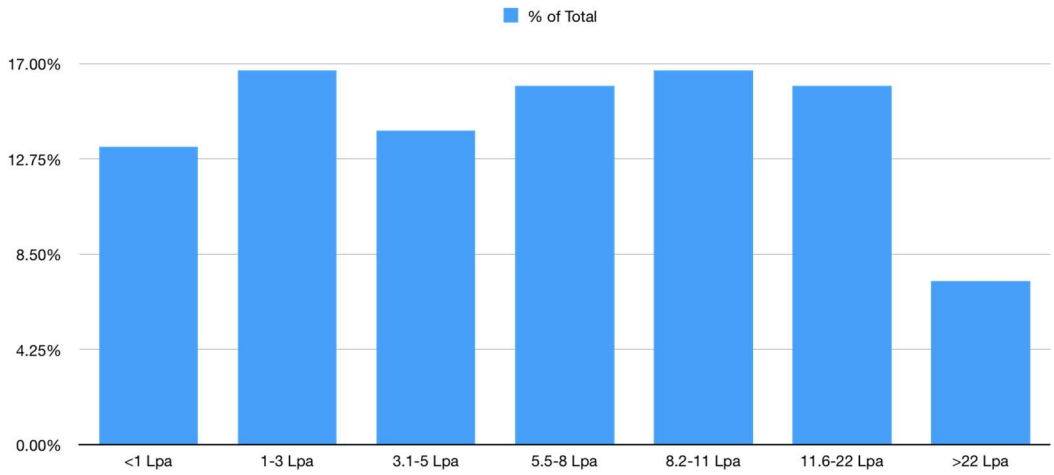
| | | | |
|---|---|---|---|
| | Student | 178 | 59.3% |
| | Unemployed | 2 | 0.7% |
| BMI | Underweight | 30 | 10% |
| | Normal | 165 | 55% |
| | Overweight | 80 | 26.7% |
| | Obese | 25 | 8.3% |

Graph 1 : age distribution



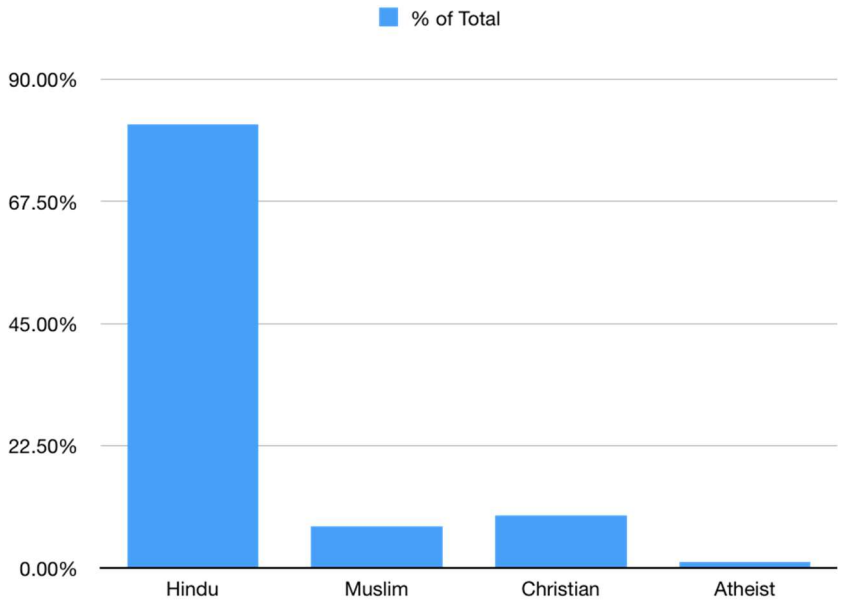

| Age | % of total |
|---|---|
| 20 | 13.33% |
| 21 | 25.33% |
| 22 | 22.33% |
| 23 | 8.00% |
| 24 | 5.00% |
| 25 | 5.33% |
| 26 | 5.67% |
| 27 | 5.00% |
| 28 | 3.00% |
| 29 | 5.00% |
| 30 | 2.00% |

**Graph 2 : Family income distribution**



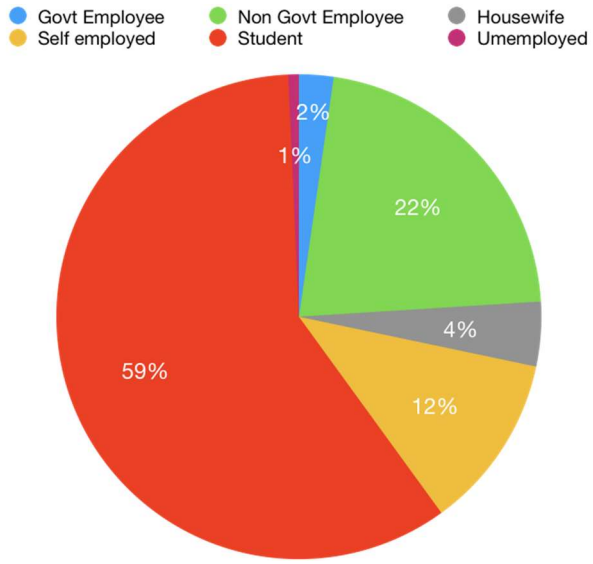

| Income | % of Total |
|---|---|
| <1 Lpa | 13.30% |
| 1-3 Lpa | 16.70% |
| 3.1-5 Lpa | 14.00% |
| 5.5-8 Lpa | 16.00% |
| 8.2-11 Lpa | 16.70% |
| 11.6-22 Lpa | 16.00% |
| >22 Lpa | 7.30% |

**Graph 3: religion distribution**



| Religion | % o Total |
|---|---|
| Hindu | 81.70% |
| Muslim | 7.60% |
| Christian | 9.70% |
| Atheist | 1.00% |

**Pie chart 1 : distribution of occupation**




| Occupation | % of Total |
|---|---|
| Govt Employee | 2.30% |
| Non Govt Employee | 21.70% |
| Housewife | 4.30% |
| Self employed | 11.70% |
| Student | 59.30% |
| Umemployed | 0.70% |

**Menstrual cycle disorders** :

table 2 shows the menstrual history of the participants. 80.3% of the applicants had a cycle length of 24-38 days while 10.7% had a cycle of <24 days and 9% had a sequence of
>38 days. Majority of the participants had regular cycles (84.7%) while the others had irregular cycles (15.3%). 9.7% of the participants had intermenstrual bleeding. While 89.7% of the participants had <8 days of blood flow, 10.3% had blood flow of >8 days. Majority of the participants had normal blood flow (79.3%) followed by heavy blood flow (13.7%) and light blood flow (7%). 70% of the participants experienced dysmenorrhea.

**Table 2: menstrual characteristics**

| Menstrual disorders | classification | Counts | % of total |
|---|---|---|---|
| length of cycle | 24-38 days<br><24 days<br>>38 days | 241<br>32<br>27 | 80.3%<br>10.7%<br>9% |
| regularity of cycle | irregular Regular | 46<br>254 | 15.3%<br>84.7% |
| inter menstrual bleeding | yes No | 29<br>271 | 9.7%<br>90.3% |
| no of days of blood flow | <8 days<br>>8 days | 269<br>31 | 89.7%<br>10.3% |
| amount of menstrual blood flow | heavy Light Normal | 41<br>21<br>238 | 13.7%<br>7%<br>79.3% |
| dysmenorrhea | no Yes | 90<br>210 | 30%<br>70% |

**Food habits** :
Table 3 shows the eating habits of the respondents, which was measured using the Healthy Eating Assessment Tool (HEAT). Most of the participants fall under the good health benefit zone (65%), while the others fall under the fair health benefit zone (34%) and excellent health benefit zone (1%).

**Table 3: healthy eating assessment score**

| Health benefit zone | Counts | % of total |
|---|---|---|
| Good | 195 | 65% |
| Fair | 102 | 34% |
| Excellent | 3 | 1% |

**Risk factors associated with menstrual cycle disorders**:

About 11.7% of the participants had a first degree family history of irregular menstrual cycles. only 9.7% had a history of usage of contraceptives. Majority of the participants had no known medical conditions (93.3%) while a few members had self reported hypothyroidism (5.5%). Only 51 participants reported known gynecological problems out of which pcos is reported by majority (84.3%) followed by fibroid (5.9%), Menorrhagia (3.9%), bacterial vaginosis (2%), Adenomyosis (2%) and PMDD (2%). Most of the participants had a sleep duration of 6-8 hours (71.7%) while 23% had a sleep duration of <6 hours and 5.3% had a sleep duration of > 8 hours. About half of the participants (45.3%) reported mild stress in their daily lives. Most of the participants (83.3%) didn't smoke or drink Alcohol. While 41% had a sedentary lifestyle, 40% of the participants exercised for at least 1-3 days per week. About 33.3% had a previous history of covid infection. None of the participants had a previous history of STDs.

**Table 4 : risk factors**

| Risk factors | Category | counts | % of tota |
|---|---|---|---|
| history of menstrual | None | 228 | 76% |
| irregularities in family | Mother | 35 | 11.7% |
| | Aunts | 20 | 6.7% |
| | First cousins | 17 | 5.7% |
| history of contraceptives | No | 271 | 90.3% |
| usage | Yes | 29 | 9.7% |
| history of medical conditions | Asthma | 1 | 0.3% |
| | Hypertension | 1 | 0.3% |
| | Diabetes | 1 | 0.3% |
| | Hypothyroid | 16 | 5.5% |
| | Tuberculosis | 1 | 0.3% |

| | | | |
|---|---|---|---|
| | None | 280 | 93.3% |
| history of gynaecological | Adenomyosis | 1 | 2% |
| | Bacterial vaginosis | | |
| | Fibroid | 1 | 2% |
| | Menorrhagia | 3 | 5.9% |
| | Pmdd | 2 | 3.9% |
| | Pcos | 1 | 2% |
| | | 43 | 84.3% |
| duration of sleep at night | 6-8 hrs | 215 | 71.7% |
| | <6 hrs | 69 | 23% |
| | >8 hrs | 16 | 5.3% |
| perceived stress levels | High | 48 | 16% |
| | Moderate | 95 | 31.7% |
| | Mild | 136 | 45.3% |
| | None | 21 | 7% |
| habits | Alchohol only | 26 | 8.6% |
| | Smoking only | 5 | 1.7% |
| | Both Alchohol and | 19 | 6.3% |
| | Smoking | | |
| | None | 250 | 83.3% |
| physical activity | Sedentary | 123 | 41% |
| | 1-3 days / week | 120 | 40% |
| | 4-5 days / week | 21 | 7% |
| | Everyday | 36 | 12% |
| history of covid infection | No | 200 | 66.7% |
| | Yes | 100 | 33.3% |

**Table 5: Physical activity vs regularity of periods**

| Regularity | 1-3 days a week | 4-5 days a week | Everyday | Sedentary | Total | P Value |
|---|---|---|---|---|---|---|
| Irregular (> 10 days) | 12 | 6 | 4 | 24 | 46 | 0.055 |
| Regular (< 10 Days) | 108 | 115 | 32 | 99 | 254 | |
| Total | 120 | 21 | 36 | 123 | 300 | |

P =/< 0.05 is statistically significant

Table 5 shows the comparison of physical activity with the regularity of periods. Among the participants with irregular cycles 24% were sedentary, 12% exercised for 1-3 days per week, 6% exercised for 4-5 days per week and 4% exercised every day of the week.
Statistically significant association was found between physical activity and orderliness of periods.

**Table 6: duration of sleep vs regularity of periods**

| Regularity | 6-8 | <6 Hrs | >8 Hrs | Total | P Value |
|---|---|---|---|---|---|
| Irregular (> 10 days) | 30 | 12 | 4 | 46 | 0.429 |
| Regular (< 10 Days) | 185 | 57 | 12 | 254 | |
| Total | 215 | 68 | 16 | 300 | |

P =/< 0.05 is statistically significant

Table 6 shows the comparison between duration of sleep and regularity of periods. Among the participants with irregular periods, 30% had a sleep duration of 6-8 hours, 12% had a duration of <6 hours and 4% had a sleep duration of >8 hours. No statistically significant association was found between duration of sleep and regularity of periods.**Table 7: age at menarche vs regularity of periods**

| Regularity | 14-16 | 8-13 | <8 Years | >16 years | Total | P Value |
|---|---|---|---|---|---|---|
| Irregular (> 10 days) | 14 | 30 | 0 | 2 | 46 | 0.211 |
| Regular (< 10 Days) | 70 | 179 | 3 | 2 | 254 | |
| Total | 84 | 209 | 3 | 4 | 300 | |

P =/< 0.05 is statistically significant

Table 7 shows the comparison between age at menarche and regularity of periods. No statistically significant association was found between age at menarche and regularity of periods.

**Table 8 : history of gynecological problems vs regularity of periods**

| Regularity | Adenomyosis | Bacterial vaginosis | Fibroid | Mennorhagia | PMDD | PCOS | Total | P Value |
|---|---|---|---|---|---|---|---|---|
| Irregular (> 10 days) | 0 | 0 | 0 | 1 | 1 | | 22 | |
| Regular (< 10 Days) | 1 | 1 | 3 | 1 | 0 | | 29 | 0.375 |
| Total | 1 | 1 | 3 | 2 | 1 | | 51 | |

P =/< 0.05 is statistically significant

Table 8 shows the comparison of history of gynecological problems with regularity of periods. 20% of participants with pcos had irregular periods while 23% of participants with pcos had regular periods. No statistically significant connotation was found between history of gynecological problems and regularity of periods.**Table 9: bmi vs regularity of periods**

| Regularity | 1 | 2 | 3 | 4 | Total | P Value |
|---|---|---|---|---|---|---|
| Irregular (> 10 days) | 5 | 23 | 12 | 6 | 46 | 0.628 |
| Regular (< 10 Days) | 25 | 142 | 68 | 19 | 254 | |
| Total | 30 | 165 | 80 | 25 | 300 | |

P =/< 0.05 is statistically significant

Table 9 shows the comparison of bmi with the regularity of periods. No significant association was found between bmi and regularity of periods.

**Table 10: food habits vs regularity of periods**

| Regularity | good | fair | excellent | Total | P Value |
|---|---|---|---|---|---|
| Irregular (> 10 days) | 30 | 16 | 0 | 46 | 0.758 |
| Regular (< 10 Days) | 165 | 86 | 3 | 254 | |
| Total | 195 | 102 | 3 | 300 | |

P =/< 0.05 is statistically significant

Table 10 shows the comparison of food habits with regularity of periods. No significant association was found between eating habits and regularity of periods.

**SOCIODEMOGRAPHIC DATA:**

**TABLE 1-** The average participant was 23 years old, with a standard deviation of 2.7 years. This indicates a relatively young study population, with the most frequent age being 21 (25.33%). This focus on younger women might be due to the higher prevalence of menstrual irregularities during early reproductive years. The majority of participants (88%) were unmarried. This could be due to the chosen age range or the recruitment strategy. Interestingly, Hinduism was the most common religion (81.7%), followed by Christianity (9.7%) and Islam (7.6%). It's important to consider if this religious distribution reflects the demographics of the area where the study was conducted, as it might influence cultural attitudes towards menstruation. Over half of the participants (56.6%) had attained university degrees, suggesting a well-educated sample. The remaining participants (43.4%) completed secondary school only. The dominant occupation was student (59.3%), which aligns with the younger age range and higher proportion of unmarried women. Other notable occupations included non-government employees (21.7%) and housewives (4.3%). Family income distribution appeared fairly even across the provided brackets. The most common income ranges were 1-3 lakhs and 8.2-11 lakhs per annum (both 16.7%). This suggests a diverse socioeconomic background among participants. In terms of BMI, approximately half (55%) of the participants fell within the normal weight range. The presence of overweight (26.7%) and underweight (10%) individuals highlights the importance of considering BMI about menstrual health, as both extremes can potentially influence menstrual regularity.

**MENSTRUAL CYCLE DISORDERS:**

**TABLE 2** offers a comprehensive window into the menstrual experiences of the 300 participants in the study on menstrual health and lifestyle. By examining these details, researchers can gain valuable insights into the prevalence of various menstrual characteristics and identify potential areas for further exploration. The data on cycle length paints a nuanced picture. While the majority (80.3%) reported cycles falling within the typical 24–38 day range defined by ACOG, a significant portion deviated from this norm. A closer look reveals the presence of 10.7% of participants experiencing frequent menstruation highlights a potential area of concern. Factors like hormonal imbalances or uterine fibroids could be contributing to this and might warrant investigation. The 9% experiencing infrequent periods could be due to infrequent ovulation or conditions like polycystic ovary syndrome (PCOS). This finding suggests the importance of considering underlying causes for women with irregular or prolonged cycles.

A substantial majority (84.7%) reported regular cycles, suggesting predictability and potentially less menstrual-related disruption in their lives. However, the presence of 15.3% with irregular cycles highlights a need for further exploration. Irregular cycles can be caused by various factors such as stress, hormonal fluctuations, or certain medications. Understanding the root causes can help women manage their menstrual health more effectively. Nearly 10% (9.7%) of the participants reported intermenstrual bleeding, which is bleeding that occurs outside of the regular menstrual period. This finding underscores the importance of including questions about intermenstrual bleeding in future studies, as it can be a sign of underlying conditions like uterine polyps or endometriosis. If left unaddressed, it can impact quality of life and needs to be evaluated by a healthcare professional.

The data on blood flow duration and heaviness provides valuable insights. Vast majority (89.7%) experienced blood flow lasting less than 8 days, which falls within the expected range. However, 10.3% had blood flow exceeding 8 days. This could be a sign of conditions like fibroids or adenomyosis and might require further medical evaluation. The distribution of blood flow heaviness reveals a dominant group (79.3%) with normal flow. However, a significant portion (13.7%) reported experiencing heavy flow, which can significantly impact daily activities and quality of life. Heavy bleeding can be associated with conditions like uterine fibroids or von Willebrand disease, and women experiencing this should be encouraged to seek medical advice. It's important to acknowledge that a smaller group (7%) reported light flow. While less common, unusually light periods could also indicate hormonal imbalances and warrant consultation with a healthcare professional. The finding that 70% of participants experienced dysmenorrhea underscores the prevalence of painful periods.

**FOOD HABITS:**

**TABLE 3** delves into the dietary habits of the study participants, assessed using the Healthy Eating Assessment Tool (HEAT). By analysing these scores, researchers gain valuable insights into the overall quality of the participants' diets and identify areas for potential improvement.

**The HEAT Score Distribution:**

The data reveals that a majority of participants (65%) fall within the "Good" health benefit zone according to the HEAT score. This suggests that their diets incorporate many healthy aspects but might still have room for improvement. Here's a breakdown of the possible interpretations- Good Health Benefit Zone (65%): Diets in this category likely include a foundation of fruits, vegetables, and whole grains, but might contain occasional processed foods or could benefit from increased variety in healthy choices. Fair Health Benefit Zone (34%): These participants' diets likely deviate more from optimal dietary recommendations. They might incorporate more processed foods, sugary drinks, or unhealthy fats. Excellent Health Benefit Zone (1%): A very small percentage of participants scored in this zone, suggesting exceptionally healthy eating patterns that consistently adhere to dietary guidelines. While the prevalence of "Good" scores is encouraging, the presence of participants in the "Fair" zone (34%) highlights the need for potential dietary interventions.

**RISK FACTORS ASSOCIATED WITH MENSTRUAL CYCLE DISORDERS**:

**TABLE 4-** A relatively low percentage (11.7%) reported a family history of irregular periods, suggesting genetics might not be a significant factor for the majority. Only 9.7% reported using contraceptives. Future studies should consider representativeness of the population regarding contraceptive use and its potential influence on menstrual experiences. The vast majority (93.3%) reported no known medical conditions. However, 5.5% reported

hypothyroidism, which can sometimes impact menstrual regularity. Investigating this association within the study data could be informative. Only 51 participants (17%) reported having known gynaecological problems. This suggests that most participants did not have pre-existing menstrual health concerns. Among those with gynaecological issues, Polycystic Ovary Syndrome (PCOS) was the most prevalent (84.3%). This finding necessitates considering PCOS as a potential factor influencing menstrual health in this study population. Other conditions identified include fibroids, menorrhagia, bacterial vaginosis, adenomyosis, and PMDD.

Majority (71.7%) reported a sleep duration of 6-8 hours, considered optimal for adults. However, a significant portion (23%) slept for less than 6 hours, and a smaller group (5.3%) slept for more than 8 hours. Nearly half (45.3%) reported experiencing mild stress in their daily lives. Stress is known to potentially impact menstrual regularity and symptom severity.

The vast majority (83.3%) didn't smoke or drink alcohol, suggesting a generally healthy lifestyle among most participants regarding substance use. While 41% had a sedentary lifestyle, a significant number (40%) exercised for at least 1-3 days per week. Investigating the association between physical activity levels and menstrual health outcomes could be valuable. One-third (33.3%) reported a previous history of COVID-19 infection. None of the participants reported a history of STDs. While this is positive, considering the sample population's representativeness of the broader community is important when interpreting this finding.

**TABLE 5** explores the relationship between self-reported physical activity and menstrual regularity in the study population. A statistically significant association was identified, warranting further investigation into this potential link. A clear trend emerges when examining physical activity levels among participants with irregular cycles. Sedentary behaviour is the most prevalent (24%), followed by progressively lower proportions engaging in exercise 1-3 days/week (12%), 4-5 days/week (6%), and daily (4%).

This table **(TABLE 6)** examines whether sleep duration is linked to menstrual regularity. Among participants with irregular periods, the most common sleep duration fell within the recommended range of 6-8 hours (30%). The remaining participants were split between those sleeping less than 6 hours (12%) and those sleeping more than 8 hours (4% - specific ranges could be mentioned if provided in the table). Importantly, the analysis did not reveal a clear link between sleep duration and menstrual regularity.

**TABLE 7** delves into the potential connection between age at menarche (first period) and menstrual regularity in the study population. The analysis did not reveal a statistically significant association between the age at which participants experienced menarche and their current menstrual regularity. This finding suggests that the age at menarche might not be a major predictor of menstrual regularity in this study group. Participants who started their periods earlier or later than the average age might still experience regular cycles.

**TABLE 8** explores the potential link between a history of gynaecological problems and menstrual regularity in the study population. The data reveals an interesting distribution among participants with Polycystic Ovary Syndrome (PCOS). While 20% reported experiencing irregular periods, a surprisingly high proportion (23%) reported having regular cycles. This finding suggests that PCOS doesn't necessarily guarantee irregular periods. Importantly, the statistical analysis did not reveal a significant association between having any gynaecological problem (including PCOS and other conditions mentioned earlier) and menstrual regularity.

**TABLE 9** explores the possibility of a correlation between the study population's Body Mass Index (BMI) and the regularity of their menstrual cycles. Results showed no statistically significant correlation between participants' body mass index and the frequency of their periods.

**TABLE 10** shows the comparison of food habits with regularity of periods. No significant association was found between eating habits and regularity of periods.

**Discussion**

This is an observational and cross sectional study conducted in women aged 20-30 years to study the magnitude and factors affecting menstrual cycle abnormalities. The Mean age of the study group was 23±2.7. The present study showed that Majority of the participants were unmarried (88%) and the rest were married (12%). Most of them went to university (56.6%) while the others completed secondary education (43.4%). Most of the participants were students (59.3%). Majority of the participants annual family income was 1-3 lakhs per annum (16.7%) and 8.2-11 lakhs per annum (16.7%). Research by Karthik Balajee Laksham, Ramya Selvaraj, and Sitanshu Sekhar Kar found that the majority of the participants were unemployed, had no formal education, and were homemakers (63%).[18.]

Participant body mass index (BMI) distributions were as follows: normal (55%), overweight (26.7%), underweight (10%), and obese (8.3%). Additionally, there was no correlation between bmi and period regularity that was deemed statistically significant. Kapil Amgain, Prativa Subedi, Gopal Kumar Yadav, Sujana Neupane, Sitaram Khadka, and Shubha Devi Sapkota discovered that twenty-one point six percent of the participants were underweight (<18.5 kg/m2), whereas fifteen point five percent were overweight (≥23 kg/m2) or obese (≥25 kg/m2). Variations in menstrual cycle duration, irregular bleeding during periods, and overweight and obese body mass index were linked to irregular menstrual cycles.[23.]

Researchers Karthik Balajee Laksham, Ramya Selvaraj, and Sitanshu Sekhar Kar discovered that seventeen percent of women experience menorrhagia, whereas forty-five percent experience dysmenorrhea.[18.] While the majority of participants maintained fairly normal menstrual length, flow duration, and regularity, Emmanuel Ansong, Samuel Kofi Arhin, Yaoyao Cai, Xinxin Xu, and Xueqing Wu discovered that dysmenorrhea (16.38%) and abnormal amount (17.97%) were common.[29.] While the majority of participants had cycles ranging from 24 to 38 days, 10.7% had cycles shorter than 24 days and 9% had cycles longer than 38 days. Though nearly 90% of the subjects had blood flow for less than 8 days, a small percentage had blood flow for more than 8 days. Blood flow was considered normal for the vast majority of subjects (79.3%), with 13.7% reporting heavy blood flow and 7% reporting light blood flow. Dysmenorrhea was reported by 30% of the individuals.

Kapil Amgain and Sujana Neupane discovered that whereas 22.9% of the subjects exhibited bad eating habits, 75% exhibited favourable ones. There was a strong correlation between menstruation issues and unhealthy eating habits.[23.] The current investigation could not find any statistically significant correlation between dietary patterns and menstrual cycle regularity.

One third of the women surveyed by Abayneh Birlie Zeru, Enguday Demeke Gebeyaw, and Esubalew Tesfahun Ayele had menstrual cycle irregularities.

There was a notable correlation between menstrual irregularity, underweight, alcohol consumption, sleep duration (<5 hours), and anaemia.[19.] Yet, 15.3% of the women in this study had menstrual cycle irregularities. There was no statistically significant correlation between period regularity and factors such as sleep length, alcohol consumption, smoking, body mass index.

Andrew Rowland; Donna Day S. Blair; Stuart Long After the age of 14, menstruation is more likely to be long and irregular, according to Wegienka, Ganesa; Harlow, Siobán D.; Alavanja, Michael; and Sandler, Dale P.[24.] Contrary to expectations, the present research did not find a correlation between menarche age and menstrual regularity. The short duration of the trial (only two months) may account for these contradictory findings. Also, the operationalization of menstrual cycle anomalies and the age of the respondents may be contributing factors. The limitations of this study could be attributed to the fact that it relies on self-reported data, which can lead to recall bias and the possibility of under- or over-reporting of specific factors. This study also did not account for a plethora of other potential confounds. Additionally, there may have been some social desirability bias introduced by the self-administered data collection that was used.

**Conclusions**

Menstrual abnormalities are a common problem among young women of generative age. The study revealed prevalence of dysmenorrhea as 70% and irregular menstrual cycles as 15.3%. The magnitude of menstrual abnormalities is low compared to other studies in India, except for dysmenorrhea. There is a significant association between physical activity and regularity of periods. Whereas age of menarche, duration of sleep, history of gynecological problems, bmi, eating habits had no statistical significance with regularity of periods. The results observed in this study stress the importance of healthy lifestyle practices like including physical activity in daily lives.

Officials in charge of reproductive health should raise awareness about the dangers of sedentary lifestyles, encourage women to monitor their menstrual cycles regularly, and encourage them to seek immediate medical attention if they experience any abnormalities. To develop interventional techniques aimed at enhancing the health and well-being of students, more studies in diverse settings using different study designs and metrics are needed.

**Summary**

To determine the prevalence and causes of menstrual cycle anomalies, this observational and cross-sectional study surveyed women in the 20- to 30-year-old age bracket. A semi-structured questionnaire was developed to suit the study's aims based on the factors, and participants were invited to fill it out once their informed consent was obtained. We used a total of 300 legitimate replies for our analysis. The average age of the participants in the study was 23α2.7. Unmarried and with a college degree, the majority of them (56.6%)
(88%). Approximately half of the participants (55%) fall under the normal bmi category. 80.3% of the participants had a cycle length of 24-38 days. Majority of the participants had regular cycles (84.7%) while the others had irregular cycles (15.3%). 9.7% of the participants had intermenstrual bleeding. 10.3% had blood flow of >8 days. Majority of the participants had normal blood flow (79.3%) followed by heavy blood flow (13.7%) and light blood flow (7%). 70% of the participants experienced dysmenorrhea. A significant association is noted between physical activity and regularity of periods.

Therefore the results obtained from the current study may be used to devise better plans to educate and support the menstrual health of young women.

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**Questionnaire**

**Sociodemographic status:**

1. Name of the participant: _____
2. Address:_____ 3.Age:_____ 4.Height:_____
_____ 5.Weight: _____
6.Marital status: _____ 7.Religion:_____ 8.Education:_____
9.Occupation:
10.Income of the family :

**Pattern of menstrual cycle:**

1.Length of menstrual cycle : _____

( < 24 days/ 24–38 days/ > 38 days) 2.Regularity of onset: _____
(Regular (< 10 days) / Irregular (≥ 10 days) 3.Intermenstrual bleeding:
(Yes / No)

4. Blood flow duration : _____

( ≤ 8 days/ > 8 days)

5. Perception of menstrual blood: _____

(Light / Normal / Heavy)

6. Pain with menstruation: _____

(Yes / No)

7. Overall menstrual cycle : _____(Regular / Irregular)

**Healthy eating assessment :**

Over the past few weeks, average what you ate or drank and circle one answer for each of the questions below.

1. How would you rate your overall habits of eating healthy foods? (Poor/ fair/ good/ very good/ excellent)
2. How many times a day did you eat fast/fried food/or packaged snacks high in fat/salt/or sugar? ( >6 times/ 4-5 times/ 2-3 times/ 1 time/ <1 time)
3. How many servings (1 serving = 1/2 cup) of fresh, canned, frozen or dried fruit did you eat each day?
( <1 time/ 1 time/ 2-3 times/ 4-5 times/ >6 times)
4. How many servings of fresh, canned, frozen or dried vegetables did you eat each day? ( <1 time/ 1 time/ 2-3 times/ 4-5 times/ >6 times)
5. How many regular soda, sweet tea, juice, energy/sports drinks, sweetened-coffee or other sugar sweetened beverages did you drink each day?
(>6 times/ 4-5 times/ 2-3 times/ 1 time/ <1 time)
6. How many times a day did you eat regular (not low-fat) snack chips or crackers? (>6 times/ 4-5 times/ 2-3 times/ 1 time/ <1 time)
7. How many times a day did you eat sweet foods (not the low-fat kind) or desserts, like chocolate

or ice cream, and other sweets?
( >6 times/ 4-5 times/ 2-3 times/ 1 time/ <1 time)

8. How much margarine, butter, lard or muktuk/meat fat did you add to vegetables, bannock, potatoes, bread, corn or dried meat?( heaping amount/ a lot/ some/ very little/ none)

9. How many times a day did you eat dairy products (milk, unsweetened yogurt, low fat cheese)?(<1 time/ 1 time/ 2-3 times/ 4-5 times/ >6 times)

10. How many times a day did you eat meat/fish/beans? (Circle one number) (<1 time/ 1 time/ 2-3 times/ 4-5 times/ >6 times)

Factors associated with menstrual irregularity:

1.Age at menarche: _____

2. Menstrual irregularities in family members: _____ (Mother/ Aunts / First cousins)

3. history of medical conditions:_____ 3.History of contraceptive usage:_____ 4.History of gynecological problems: _____ _____ 5.History of std:

6.Perceived stress levels:

_____ _____

(No stress/ mild stress/ moderate stress/ high stress) 7.Sleep hours: _____

8. Alcohol consumption:_____

9. Smoking: _____

10. Physical activity: _____ (Sedentary / 1-3 days per week/ Everyday)

11.History of covid infection: _____