

A Literature Review on the Impact of Lifestyle Factors on Menstrual Cycle and Its Effects

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ABSTRACT:

The reproductive system of a female, unlike men, shows regular cyclic changes that teleologically may be regarded as periodic preparation for pregnancy and fertilization.⁽¹⁾

OBJECTIVE:

The purpose of this study is to explain and analyse the various lifestyle factors that produce impact on the menstrual cycle of adolescent girls. This review of literature was done based on empirical studies established between the year 2015 – 2020, related to lifestyle factors were assessed for correlation with menstrual problems experienced by the female students. Prevalence of each different menstrual abnormality were analysed and discussed.

METHOD USED:

The literature review article search was conducted in databases like Pub Med, Research gate, Google scholar and web of science based on the Study on Lifestyle Factors associated with Menstrual irregularities Articles in languages other than English were excluded. Additional articles were retrieved from references list of selected manuscripts. English papers published strictly from 2015 – 2020 were collected and analysed. Title, abstract, full text and methodology were assessed to determine the feasibility of the study.

RESULTS:

Of the collected literatures, Lifestyle Factors like Stress, Obesity, BMI, High intake of junk food, lack of physical activity, Alcohol consumption and smoking were found to be most frequently causing Menstrual irregularities like dysmenorrhea and premenstrual symptoms.

CONCLUSION:

The current study concluded that menstrual disorders were significantly associated with increase in BMI, consumption of junk food and lack of physical exercise. Healthy Dietary habits and Regular exercise should be adopted to prevent menstrual abnormalities.

MENSTRUAL CYCLE AND DISORDERS:

I. INTRODUCTION:

The period of time between puberty and maturity is known as adolescence. The menarche is one of the symptoms of puberty and is consequently significant in the lives of adolescent girls.⁽²⁾ Menstruation is the regular discharge of mucosal tissue through the vagina from the uterus' inner lining.⁽³⁾

MENSTRUAL CYCLE:

Leading up to the menstrual flow, a number of changes occur in the female reproductive organs.⁽⁴⁾ An organ called the uterus, also known as the womb, creates a lining where a tiny female egg cell is prepared. If the egg is not fertilized, pregnancy will not occur, and the uterine lining will shed.⁽⁵⁾ The menstrual cycle, often known as the menstrual period, lasts for approximately 28–4 days and is characterized by normal vaginal flow.⁽³⁾ The menopause typically occurs at around age 51; however periods can begin as early as age 11 or 14.⁽⁵⁾

ANATOMY AND PHYSIOLOGY OF MENSTRUAL CYCLE:

The female reproductive system provides several functions. The ovaries produce the egg cells, called the ova or oocytes, which are 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 hormones of the reproductive cycle. In addition, the female reproductive system produces female sex hormones that maintains the reproductive cycle. If no pregnancy occurs, the uterus, or womb, sheds its lining. The menstrual blood is partly blood and partly tissue from inside the uterus. It passes out of the body through the vagina. Periods usually start between age 11 and 14 and continue until

menopause at about age 51.
They usually last from three to five days.⁽⁶⁾

PHASES OF MENSTRUAL CYCLE:

- Follicular phase (From day 1 to 13)
- Ovulation phase (Day 14)
- Luteal phase (From day 15 to 28)⁽⁷⁾

1. FOLLICULAR PHASE (FROM 1 - 13 DAYS)

The follicular phase, starts on the first day of a period. It is simultaneous with the menstrual phase. Hypothalamus signals the pituitary gland to release follicle stimulating hormone (FSH).FSH stimulates the ovaries to create several small sacs called follicles, each contain an immature egg. As the follicle matures, the body releases extra oestrogen. This stimulates the uterine lining to thicken.⁽⁸⁾

2. OVULATION PHASE (DAY 14)

The ovulation phase starts when rising oestrogen levels signal the pituitary gland to release luteinizing hormone. LH stimulates the process of the ovary releasing a mature egg. This process is called ovulation. During ovulation, the mature egg travels from the ovary, down the fallopian tube, and into the uterus. The egg can survive for about 24 hours before it needs to be fertilized. If it does not become fertilized during that time, the egg will dissolve.⁽⁸⁾

3. LUTEAL PHASE (FROM 15 – 28 DAYS)

During the luteal phase, the follicle morphs into a mass of cells called the corpus luteum which releases progesterone, essential for thickening of uterus and ready for a fertilized egg to implant. If the egg does not become fertilized during ovulation, the corpus luteum will dissolve into the body. Both oestrogen and progesterone levels will drop, which marks the beginning of the menstrual phase.⁽⁸⁾

LIFESTYLE FACTORS AFFECTING MENSTRUAL CYCLE:

The lifestyle pattern of any individual can produce impact on the menstrual cycle.

- OBESITY AND BMI
- INTAKE OF JUNK FOOD
- STRESS
- SMOKING AND ALCOHOL
- LACK OF PHYSICAL ACTIVITY

OBESITY AND BODY MASS INDEX:

Obesity and high body mass index (BMI) are known to be risks for an ovulation and infertility. Gaining or losing a significant amount of weight, dieting, changes in exercise routines, travel, illness, or other disruptions in a woman's daily routine can have an impact on her menstrual cycle with increased incidences of oligomenorrhea or amenorrhea. In particular, obese women undergo perturbations of the 'hypothalamic pituitary ovarian axis', and frequently suffer of menstrual dysfunction leading to anovulation and infertility.⁽⁹⁾⁽³⁾

INTAKE OF JUNK FOOD:

Junk foods are rich in saturated fatty acids interferes with the metabolism of progesterone in the luteal phase of regular menstrual cycle and leads to premenstrual symptoms. Junk foods being deficient in micronutrients like vitamin B6, calcium, magnesium and potassium, might also be responsible for very severe menstrual irregularities.⁽¹⁰⁾

STRESS:

The most prevalent menstrual problems (dysmenorrhea and premenstrual symptoms) are strongly associated with stress.⁽¹⁰⁾ Stress causes activation of the hypothalamic-pituitary-adrenal (HPA) axis which inhibits hypothalamic-pituitary-gonadal (HPG) axis. In addition, over secretion of corticotrophin-releasing hormone (CRH), vasopressin, and endogenous opioid peptides further complicates the derangements.⁽³⁾⁽¹¹⁾

SMOKING AND ALCOHOL:

Alcohol can stop or cause irregular menstrual cycles because it increases levels of oestrogen and testosterone, and sometimes the LH. This causes a hormonal imbalance that affects normal physiology of menstruation. Drinking alcohol can also increase androgen levels during the follicular phase and oestrogen in the ovulation phase. Since alcohol is also act as blood thinner, heavy drinking may lead to a heavier period.⁽¹²⁾ Smoking-related behaviour may also disturb hormonal changes of the menstrual cycle. It increases the risk of developing PMS. The chemicals in cigarettes may disrupt the endocrine system and cause menstrual dysfunction, reduced ovarian reserve and fertility, or earlier menopause.⁽¹³⁾

LACK OF PHYSICAL ACTIVITY:

Daily physical activity helps in maintaining ideal body weight, with rise in insulin sensitivity, increases BMR and stimulates endorphins which in turn help in regularization of menstrual cycle, improvement in PCOD and hypothyroidism and reduction in PMS. Low levels of physical activity have the strongest association with irregular periods. Women who are both obese and sedentary have a higher prevalence of irregular periods compared with normal weight women who exercise moderately. Excess adipose tissue may affect levels of androgens and oestrogens which ultimately disturbs the menstrual cycle⁽¹⁰⁾

MENSTRUAL DISORDERS:

There are several types of menstrual disorders. Problems can range from heavy, painful periods to no periods at all.

Dysmenorrhea (Painful Cramps): It is severe, frequent cramping during menstruation. Pain occurs in the lower abdomen and thighs.⁽¹⁴⁾

Menorrhagia (Heavy Bleeding): Menorrhagia is the medical term for significantly heavier periods. Menstrual flow lasts longer and is heavier than normal. Clot formation is common. Menorrhagia is often accompanied by dysmenorrhea because passing large clots can cause painful cramping.

Amenorrhea (Absence of Menstruation):

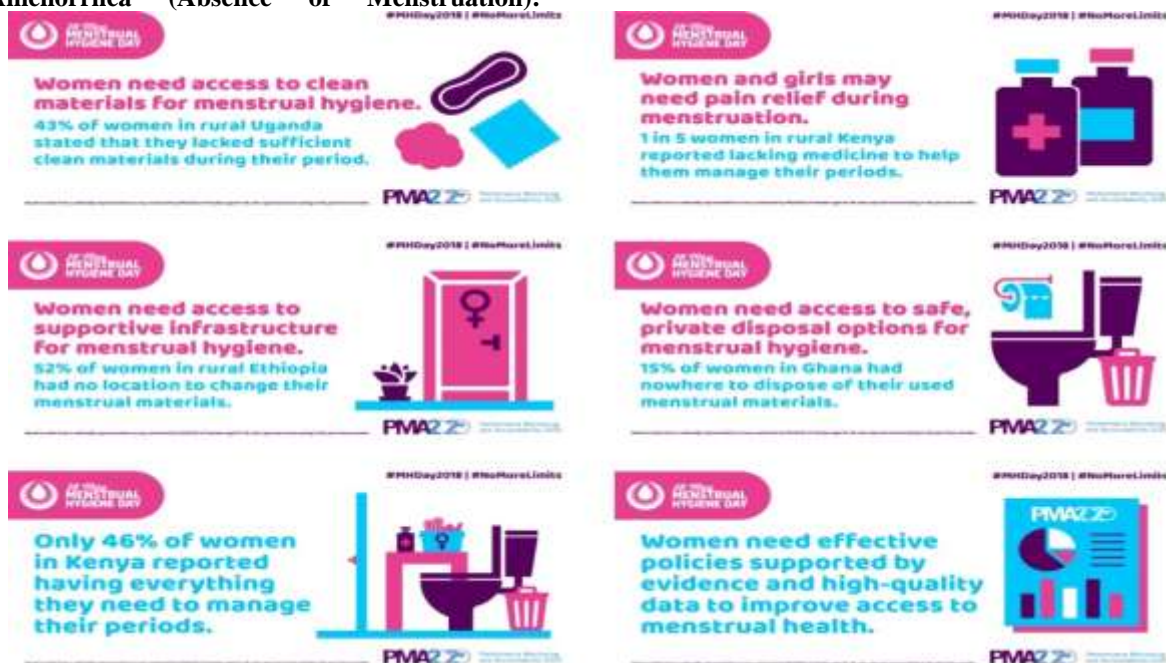
Amenorrhea is the absence of a monthly period. Women normally do not menstruate before puberty, during pregnancy, and after menopause. If amenorrhea happens at other times, it may be the symptom of a treatable medical condition.

Oligomenorrhea (Infrequent Menstruation): It is a condition in which menstrual cycles are infrequent, occurring more than 35 days apart. It is very common in early adolescence and may indicate a medical problem. Light or scanty flow is also common in the first years after menarche and before menopause.

Premenstrual Syndrome (PMS): Premenstrual syndrome (PMS) is a set of physical, emotional, and behavioural symptoms that occur during the last week of the luteal phase (a week before menstruation) in most cycles.⁽¹⁴⁾

MENSTRUAL HYGIENE:

Menstrual hygiene is basically dealing with the days during periods, cleanly and applying safe practice from using sanitary pads to regular change and cleaning the area.⁽³⁾ Fig.1.1 depicts the ways for maintaining hygiene during menstruation. Poor menstrual hygiene can pose serious health risks, like reproductive and urinary tract infections which can result in future infertility and birth complications.⁽¹⁵⁾⁽³⁾



(FIG: 1.1)

MANAGEMENT OF MENSTRUAL HYGIENE:

Choose your method of sanitation: there are a number of ways including the use of sanitary napkins, tampons and menstrual cups to stay clean.

Change regularly: Menstrual blood - once it has left the body - gets contaminated with the body's innate organisms and can lead to conditions like urinary tract infection, vaginal infections and skin rashes. The standard time to change a sanitary pad is once every six hours.

Wash yourself regularly: This practice tends to beat bad odour from the vaginal region. So, it is important to wash your vagina and labia with clean warm water well before changing into a new pad. Using of soap should be avoided.

Discard your used sanitary product properly: It is essential to discard your used napkins or tampons properly because they are capable of spreading infections, will smell very foul. It is advised not to flush the pad or tampon down the toilet since they are capable of forming a block and can cause the toilet to back up. More importantly it is imperative that you wash your hands well after you discard your used napkin since you are likely to touch the used portion of the pad or tampon while discarding it.⁽¹⁶⁾

MENSTRUAL AWARENESS:

Menstrual awareness among adolescent female is very much essential to prevent from diseases.

A survey in Bangladesh found that only 6 % of schools provide education on health and hygiene, and only 36 % of girls had prior knowledge about menstruation before their first period (World Bank 2017c).⁽¹⁷⁾ Krishna Bahadur Raut et.al, study revealed that awareness regarding menstrual hygiene was present among the girl students, but practice for proper menstrual hygiene was low compared to studies done in similar settings.⁽¹⁸⁾

Hence, to raise the awareness among female adolescents and public, a German based NGO initiated an idea of **MENSTRUAL HYGIENE DAY**. This day is celebrated globally on **May 28**, with the goal to advocate for the integration of menstrual hygiene management into global, national and local policies and programs.

DEMOGRAPHIC STUDIES:

This study aims at analysing the **Impact of lifestyle factors on menstrual cycle among adolescent girls**.

Various Literatures have been collected from the search databases. The demographic studies shows that among the literature collected, the mean age of the adolescent girls was found to be 20-25 years. BMI value observed in most of the researches was found to be at the normal range. The sample size of the studies varies. Of the articles collected, Very few articles involve the larger population of about 3779, 15477 and 12707. But most of the studies were conducted among the population of about 200 to 600.

Collected research databases were mostly conducted among the students especially who are under Medical and Health education. But very few Studies involved general population of adolescent girls that includes working women and households. The participants of different studies were from both urban and rural areas, but mostly observed menstrual irregularities were among rural participants. A cross-sectional study methodology provided with structured Questionnaire that consists of questions about menstrual history and others was most common method adopted in every research. Articles in languages other than English were excluded. Additional articles were retrieved from references list of selected manuscripts.

II. DISCUSSION:

This review article is a qualitative literature assessment that aims at analyzing the factors that produce impact on the menstrual cycle of adolescents and causes menstrual abnormalities. PubMed, Research gate, Google scholar and web of science electronic databases were searched for studies. English papers published strictly from 2015 – 2020 were collected.

OBESITY AND BMI:

In a study conducted by Sreelakshmi U et al shows that increase in BMI was significantly associated with dysmenorrhoea.⁽¹⁹⁾ In a survey conducted among women aged 19 reported that only 1% of participants with normal BMI and 25% of obese people have irregularities in menstruation.⁽²⁰⁾ A questionnaire based study conducted on 2019 reported that 90% students with normal BMI have regular periods where as 87% of overweight & obese students have irregular periods.⁽²¹⁾

INTAKE OF JUNK FOOD:

91.6% of students having Junk food with MSG have menstrual problem where as 88.6% of students having food without MSG have regular periods. (21) A cross sectional prospective study conducted on 2018-2019 also reported the significant association with dysmenorrhea by consuming junk food on regular basis (19) .A study at Garwal demonstrated that about 70% of the students had Menstrual irregularities who had unhealthy foods habits.(22)

DIETARY BEHAVIOURS also had a significant role on menstrual irregularities. A study at Pondicherry established that about 30% of students were under diet and thus experienced menstrual abnormalities like Dysmenorrhea and PMS. (23) Attempting to lose weight is significantly associated with an increase in irregular menstruation and dysmenorrhea.

SKIPPING OF MEAL is found to have negative effects on menstruation. Several researches reported associations between breakfast skipping and fatigue at noon cause increase in BMI with high prevalence of obesity that ultimately affects menstrual cycle. Dietary skipping behaviour significantly plays a major role in the occurrence of menstrual problems. The study at Nepal among the participants

who had skipped their meal often, about 84% had menstrual abnormalities.(21) This was also supported by reports of the study conducted by Priyanka Negi et.al, showed that about 71% had Dysmenorrhea and 47% had PMS, who skipped their meal especially Breakfast.(22)

STRESS:

A study conducted in Saudi Arabia which demonstrated that 80.9% of students had menstrual changes during an exam. (24) Moreover, a study conducted in China revealed that students who had high stress were correlated with menstrual irregularity. (25) When the stress level is high, the HPA axis activity is interrupted. Thus, women who are suffering from high stress may experience more irregularities in menstruation than those who are not under stress.(26) The results obtained from a study conducted among medical students revealed about 30% of the students had raised stress levels and an association was established between high stress levels and irregular menstrual cycle.(27) A cross sectional Study at Karimnagar exposes that dysmenorrhea and pre-menstrual syndrome are found to be highly prevalent in medical students.(28)

High levels of stress associated with medical education act as an added factor in these students also in a study conducted by Bae et al., 87.6% of stress relief participants are free from menstrual irregularities and 17% of people with stress have menstrual irregularities.(20)

ALCOHOL CONSUMPTION:

High alcohol intake has a significant role in menstrual irregularity. A cross-sectional study conducted among 620 students reported that 60% students consuming alcohol have menstrual irregularities.(26) This is also evidenced by a study conducted in China, those who drink regularly were more likely to report heavy periods compared with never drinkers.(27) In another study conducted among 604 students, 86% of the non-alcohol consuming students have regular periods. In a cross-sectional study conducted in 2019, 89% of people consuming alcohol has irregular periods (20)

SMOKING:

A study conducted by Jinju Bae et.al, showed the strong association of smoking with Menstruation. This study revealed that Lifetime is associated with the occurrence of early menopause.(20) This conclusion was also supported by the findings of the study at Korea demonstrated that menstrual irregularity in nondiabetic Korean women was closely associated with smoking. As per the records of this study, about 16.5% of 224 past smokers and 19.3% of 203 Current Smokers had menstrual irregularities. The prevalence of menstrual irregularity was significantly higher in middle-aged women, it was impacted by smoking.(30) In a cross-sectional study conducted among nursing students 71% of participants with smoking habits have irregular periods.(21)

PHYSICAL ACTIVITY:

A Cross-sectional survey conducted at Garwal established that about 55% had menstrual irregularities, who were limited to physical activities. About 63% of students were suffered from dysmenorrhea (22). Also Divya Sachin Gupta, et.al said that 94 % with limited physical activity causes dysmenorrhea and 78% with limited physical activity causes menorrhagia. (31). Shekhar Chauhan, et.al revealed that about 11.7% were limited to physical activity and thus suffered from menstrual disorders. A cross sectional study among students of Mallareddy college at Hyderabad revealed a strong association of limitation to physical activity with menses. This study reported

among 152 participants who are lack of physical activity, about 83% had Premenstrual symptoms and 69% had Dysmenorrhea⁽³²⁾. In a study conducted by Bae et al in rural area, among 601 participants, 588 of them had irregular periods.⁽²⁰⁾

III. CONCLUSION:

In this present study menstrual disorders were significantly associated with lifestyle factors like Stress, Obesity, and increase in BMI, consumption of junk food, Smoking, Alcohol consumption and lack of physical exercise.

Our study results showed the importance of healthier behavioural practices to maintain menstrual cycle regularity, especially when considering that Stress and changes in BMI may be associated with the occurrence of menstrual irregularities.

Early identification and interventions can resolve the menstrual disorders. Comprehensive education programs on lifestyle modifications like regular physical activities, promoting healthy eating habits, maintain a good sleep and reducing stress by activities like meditation and yoga should be emphasized to prevent menstrual abnormalities among female adolescents.

Spreading awareness by organizing educational events, Informational Pamphlets and boosting ideas on social media can help to fetch good knowledge about Menstruation among Students.

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