

# Irregular Menstrual Periods as a Result of Poor Diet and Physical Activity: A Review

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## **Abstract**

Irregular menstrual periods are a major concern among women of reproductive age, and lifestyle patterns such as poor diet and inadequate physical activity have emerged as significant contributors. This review synthesizes findings from current literature to understand how diet quality, nutrient deficiencies, sedentary behavior, and over-exercise influence menstrual cycle regularity. Evidence indicates that these lifestyle factors disturb the hypothalamic–pituitary–ovarian (HPO) axis, alter metabolic pathways, and disrupt hormonal balance. The review concludes that improving dietary intake and maintaining moderate physical activity can significantly enhance menstrual health.

## **1. Introduction**

The menstrual cycle is regulated by the HPO axis, which is highly sensitive to metabolic and lifestyle changes. Increasingly, young women report menstrual irregularities associated with imbalanced diet, nutrient deficiencies, and low or excessive physical activity. Understanding these associations is essential for effective prevention and management strategies.

## **2. Review of Literature**

### **2.1 Influence of Diet on Menstrual Regularity**

Poor dietary habits have a clear impact on menstrual health. Diets rich in processed foods, sugars, and unhealthy fats contribute to hormonal imbalance and insulin resistance, which are linked to irregular menstruation<sup>1</sup>. Undernutrition or severe caloric restriction suppresses gonadotropin-releasing hormone (GnRH), disrupting ovulation and menstrual regularity<sup>2</sup>.

Micronutrient deficiencies—especially vitamin D, calcium, iron, and omega-3 fatty acids— have been associated with dysmenorrhea and cycle disturbances<sup>3</sup>. Balanced dietary patterns such as the Mediterranean diet are consistently correlated with improved menstrual regularity<sup>4</sup>.

### **2.2 Physical Activity and Menstrual Health**

Both insufficient and excessive physical activity affect menstrual rhythm. Sedentary behavior contributes to obesity, inflammation, and insulin resistance, leading to oligomenorrhea and increased risk of PCOS<sup>5</sup>. On the other hand, very high-intensity exercise reduces energy availability and estrogen production, often resulting in hypothalamic amenorrhea<sup>6</sup>. Moderate physical activity promotes hormonal equilibrium and reduces stress-induced menstrual disturbances<sup>7</sup>.

### **2.3 Combined Effects of Diet and Physical Activity**

Lifestyle factors interact in complex ways. Poor diet in combination with inactivity increases the likelihood

of metabolic syndrome, which interferes with normal hormonal cycles<sup>8</sup>. Low energy availability—even in women with normal BMI—significantly increases the risk of anovulation<sup>9</sup>. Interventions that improve both dietary intake and physical activity have been shown to restore menstrual regularity in many cases<sup>10</sup>.

### 3. Methods and Methodology

**3.1 Data Sources:** Databases searched: PubMed, Scopus, Google Scholar, Web of Science, and ScienceDirect.

**3.2 Search Strategy:** Keywords included: irregular menstruation, menstrual disorders, diet quality, nutrition and menstrual cycles, sedentary lifestyle, physical activity, HPO axis, amenorrhea, oligomenorrhea.

**3.3 Inclusion Criteria:**

- Articles from 2000–2024
- Peer-reviewed studies
- Human studies involving women aged 13–45
- Research evaluating diet or physical activity in relation to menstrual irregularities

**3.4 Exclusion Criteria:**

- Case reports and editorials
- Studies unrelated to lifestyle factors
- Studies focusing on congenital or purely pathological menstrual disorders

**3.5 Analysis:** Data were extracted, categorized thematically, and synthesized to identify patterns in how lifestyle factors influence menstrual irregularities.

### 4. Discussion

The reviewed evidence strongly supports the assertion that poor diet and inadequate physical activity play a major role in menstrual disturbances. Nutritional imbalance affects metabolic function, ovarian steroidogenesis, and HPO axis signaling. Energy deficiency—whether caused by under-eating or excessive exercise—is a well-recognized mechanism behind hypothalamic amenorrhea<sup>11</sup>. Sedentary lifestyle amplifies insulin resistance and inflammatory pathways, both strongly associated with PCOS and irregular menstrual cycles<sup>12</sup>. Conversely, moderate exercise supports endocrine function, reduces cortisol levels, and stabilizes menstrual rhythm.

The interaction between diet and physical activity is particularly influential. Women who combine balanced nutrition with consistent moderate activity experience improved menstrual regularity. The literature emphasizes that addressing both lifestyle components simultaneously yields better outcomes than targeting diet or activity alone.

### 5. Conclusion

Dietary habits and physical activity are powerful determinants of menstrual cycle health. Poor nutrition, micronutrient deficiencies, sedentary behavior, and excessive exercise all disrupt hormonal balance and impair menstrual functioning. Strengthening diet quality and engaging in moderate physical activity are effective, non-invasive strategies to improve menstrual regularity. Future studies should explore long-term effects of lifestyle interventions, especially in adolescents and young adults.

**Review of Indian Female Menstrual Health (Figures & Data) Figure 1. Prevalence estimates among Indian females**

The following chart illustrates the approximate prevalence of key health indicators among Indian women based on the pooled data from the review.

Health Indicator	Approximate Prevalence	Data Source / Context
Vitamin D deficiency	80%	Adult women (Ref <sup>14, 17, 21</sup> )
Menstrual irregularities	62%	Study estimates (Ref <sup>2, 19, 23</sup> )
Anemia	59%	WRA, NFHS-5 (Ref <sup>1, 5, 9</sup> )
Physical inactivity	50%	Women (Ref <sup>10, 15, 22</sup> )
PCOS	10%	Pooled prevalence India (Ref <sup>8, 13, 20, 24</sup> )

**Figure 2. Relative distribution of selected indicators**

This breakdown compares the relative visual share of the health burdens discussed in the review.

Indicator	Relative Share
Vitamin D deficiency	30.8%
Menstrual irregularities	23.8%
Anemia	22.7%
Physical inactivity	19.2%
PCOS	3.5%

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