
Effect of Dietary Habits and Socio-economic Status on Menstrual Disorders among Young Females

Jasjit Kaur Randhawa^{1,*}, Kapila Mahajan¹, Manbir Kaur², Arti Gupta¹

¹Department of Zoology, Khalsa College, Amritsar, India

²Department of Mathematics, Khalsa College for Women, Amritsar, India

Email address:

jaskrandhawa@gmail.com (J. K. Randhawa), kthukral1983@yahoo.co.in (K. Mahajan),

manbirkaur.231@gmail.com (M. Kaur), artigupta0892@gmail.com (A. Gupta)

*Corresponding author

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Abstract: Menstruation is very important phase of reproductive cycle which involves many hormonal changes. Hormone production is known to be affected by diet. Poor nutrition in female diet can affect menstrual cycle and lead to menstrual disorders and pre-menstrual syndrome (PMS). A cross-sectional study was undertaken to analyze the association of dietary habits and socio-economic status with menstrual disorders among the college going and young working females of Amritsar, Punjab, India during the month of Jan-March 2013. Students who did not attain menarche; were suffering from any chronic health condition or using any medicines for long duration (more than a month) were excluded from the study. A total of 100 females were selected, among 300 surveyed, for this study and each student was given a questionnaire to complete. Majority of the females (87%) belong to middle socio-economic status, having higher prevalence of menstrual disorders due to sedentary lifestyle and western dietary habits. Greater prevalence of menstrual disorders was observed in vegetarian women as compared to non-vegetarian women except for dysmenorrhea. Prevalence of menorrhagia was higher (56.25% vs. 32.69%) in women not taking salad daily while percentages of menorrhagia (44.68% vs. 43.40%) as well as oligomenorrhea (46.81% vs. 45.28%) were found higher in women not eating fruits daily. 93% respondents took junk food and a positive association was observed between consumption of junk food and menstrual disorders.

Keywords: Menstrual Disorders, Nutritional Status, Menorrhagia, Dysmenorrhea, Oligomenorrhea, Pre-menstrual Syndrome

1. Introduction

Nutrition is the intake of balanced diet required for maintaining good health. Nutritive foods enable us to grow well and enjoy good health. On the other hand, poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity. The normal menstrual cycle in females represents the complex interplay of hormones such as estrogen and progesterone. In a healthy woman, the menstrual cycle averages 28 days in length; with a normal range of 21–35 days.

The mechanisms responsible for possible differences in the

menstrual cycle include energy imbalances associated with body weight disturbances or exercise, psychosocial and cognitive factors, and components of the diet—acting singly or in combination. Although a variety of lifestyle and medical factors can affect menstruation, a poor diet is a potential cause for hormonal changes in menstrual cycle leading to menstrual disorders.

Pre-menstrual syndrome (PMS) represents set of symptoms which include physical, psychological and behavioral changes characterized by mood swings, headache, bloating, stress, anxiety, and backache. These symptoms can be worsened by consumption of caffeine, salt, sugar, alcohol and foods high in fat. Irregularity in cycle may also result from lack of proper nutrition or diets high in carbohydrates.

Whereas heavy bleeding is mainly concerned with low progesterone level and it is generally common in those women who are anemic. It can be reduced by taking multivitamins and through certain foods such as meat, poultry and fish.

Eating a healthy diet is known to have a variety of health benefits and should be recommended to virtually all women. Dietary changes can promote regular periods. Literature reviewed revealed that non-vegetarian diet help in maintaining fairly consistent levels of estradiol and progesterone which resulted in regular menstrual cycles whereas vegetarian diet lead to considerable reductions in estradiol and progesterone. Increased fruit, vegetable and water consumption can also regulate the menstrual cycle and reduce symptoms of PMS.

2. Materials and Methods

The present research work intends to study the association of dietary habits and socioeconomic status with menstrual disorders among the college going and young working females of Amritsar city, Punjab, India during the month of Jan-March 2013.

2.1. Data Collection

The design of the study was cross sectional in nature. All subjects were invited to answer the questionnaire, which dealt with anthropometric data, socio-economic data, menstrual history, and dietary habits. The questionnaire was self-administered, semi-structured and prepared in local and English languages. Students who did not attain menarche, who are suffering from any chronic health condition and are using any medicines for long duration (more than a month) were excluded from the study. A total of 100 college going and young working females were chosen for this study and each student was given a questionnaire to complete. In the previous study, authors have revealed prevalence of menstrual disorders as well as their association with obesity [1]. In the present study, participants were classified into upper, middle or lower socioeconomic groups on the basis of Kuppaswamy's Socio-economic Status Scale [2]. For dietary details, questionnaires include questions regarding daily

fruits, salad, milk, egg and junk food consumption, vegetarian and non-vegetarian diet.

2.2. Statistical Analysis

Prevalence of each menstrual abnormality was calculated and expressed as percentages. A relationship among dietary habits, socioeconomic status and menstrual disorders was separately assessed using Pearson's correlation coefficient. Statistical analysis was done using SPSS16 Software and p value <0.05 was considered as statistically significant.

3. Results and Discussion

In the present study, age of the women selected for study was between 17-33 years with a mean of 22.7 years. Data on percentage of dietary habits and menstrual disorders were shown in Table 1. Non-vegetarian dietary pattern and daily salad consumption was noticed to an extent of 52 percent. Women with daily fruits and milk consumption were 53 percent and 54 percent respectively. Self-reported prevalence of egg and junk food consumption were 62 percent and 93 percent respectively. Majority of the females (83.00%) belong to middle socioeconomic status while only 13.00% belong to lower socio-economic status.

3.1. Vegetarian and Non-vegetarian Diet

In the present study, prevalence of menstrual disorders was increased in vegetarian women as compared to non-vegetarian women except for dysmenorrhea. According to Barr [3], three general mechanisms contributing menstrual disturbances between vegetarians and non-vegetarians include energy imbalances associated with body-weight disturbances or exercise, psychosocial and cognitive factors, and dietary components. Literature reviewed revealed that strictly vegetarian diet may lead to deficiencies of vit. B12, calcium, iron, zinc etc. whereas vegetarian diet including with dairy products and vitamin-mineral supplements reduced the risk of nutritional deficiencies and growth impairment. According to Sharma *et al.* [4] the hemoglobin levels of non-vegetarianism were high in obese women than vegetarian.

Table 1. Percentages of menstrual disorders with respect to various dietary habits.

Menstrual Disorder	Non veg		Salad		Fruits		Milk		Egg		Junk food	
	Yes (n=52)	No (n=48)	Yes (n=52)	No (n=48)	Yes (n=53)	No (n=47)	Yes (n=54)	No (n=46)	Yes (n=62)	No (n=38)	Yes (n=93)	No (n=07)
Dysmenorrhea	34.62	77.08	73.08	62.50	67.92	68.09	64.81	71.74	62.90	74.36	68.82	57.14
Menorrhagia	19.23	41.67	32.69	56.25	43.40	44.68	50.00	36.96	46.77	38.46	46.24	14.29
Metorrhagia	9.62	12.50	15.38	6.25	13.21	8.51	11.11	10.87	9.68	12.82	10.75	14.29
Oligomenorrhea	21.15	45.83	51.92	39.58	45.28	46.81	38.89	54.35	43.55	48.72	44.09	71.43

3.2. Fruits and Salad

Prevalence of menorrhagia was observed to be higher in women not taking salad daily while percentages of menorrhagia as well as oligomenorrhea were found higher in

women not eating fruits daily. Fruits and vegetables are rich sources of antioxidants, including vitamins C and E, carotenoids and flavonoids, as well as numerous other phytochemicals. Both of these are low calorie food help in maintaining healthy body weight. Fewer intakes of fruits and vegetables may lead to obesity and oxidative stress

implicated in menstrual problems and infertility [5, 6].

3.3. Milk

The results of the present study revealed that percentages of dysmenorrhea and oligomenorrhea were higher in females not taking milk daily as compared to females consuming regular milk. Milk and milk products are good source of calcium also directly affect obesity and insulin-resistance, two factors which themselves act as the causes of hormonal imbalance in women leading to various menstrual and reproductive problems [7]. In a case-control study carried out in Al-Zahra hospital of the city of Tabriz, it was observed that the intake amounts of Ca, Mg, D vitamin, dairy, fruits and nuts and seeds were remarkably low among the women with

Polycystic ovary syndrome [8]. Pereira et al. [9] found an inverse relationship between consuming more than 4 units of dairy products per day and metabolic syndrome in the females.

3.4. Egg

In the present study, prevalence of menstrual disorders i.e. dysmenorrhea, metrorrhagia and oligomenorrhea was higher in women on strictly vegetarian diet not including egg. Inadequate intake of protein can often affect the menstrual cycle. Optimum protein intake in the form of plant proteins like soybean, legumes and pulses; and animal protein like milk, fish, egg, meat etc. should be followed for healthy menstrual flow.

Table 2. Pearson's correlation analysis of menstrual disorders with confounding factors.

Menstrual Disorders		Veg/Non Veg	Salad	Fruits	Milk	Egg	Junk food	*SES
Dysmenorrhea	r	-0.187	0.113	-0.002	-0.074	-0.109	0.064	-0.082
	p	0.062	0.262	0.986	0.464	0.280	0.528	0.416
Menorrhagia	r	0.045	-0.237	-0.013	0.131	0.089	0.164	-0.189
	p	0.655	0.018	0.899	0.194	0.377	0.103	0.050
Metrorrhagia	r	-0.046	0.146	0.075	0.004	-0.047	-0.029	-0.011
	p	0.649	0.148	0.459	0.970	0.646	0.776	0.913
Oligomenorrhea	r	0.003	0.124	-0.015	-0.155	-0.044	-0.140	0.204
	p	0.975	0.220	0.880	0.125	0.667	0.165	0.042

r- Correlation coefficient, p- significance level

*SES- Socio-economic status

3.5. Junk Food

In the study we noticed that 93.00% respondents took junk food and association was observed between consumption of junk food and menstrual disorders. In a study by Rupavani *et al.* [10], Junk foods being deficient in micronutrients like vitamin B6, calcium, magnesium and potassium might be responsible for triggering premenstrual symptoms. Another study by Nirmala *et al.* [11] reported a significant association between irregular menstrual cycles, abnormal flow, dysmenorrhea and PMS with frequent consumption of junk food. As per Fujiwara *et al.* [12] Frequency of fast food intake was significantly associated with dysmenorrhea. According to Lakshmi [13], decreasing the intake of junk foods and promoting healthy eating habits should be emphasized to improve menstrual health of young college students.

3.6. Socio-economic Status

Lower socio-economic status was found to be associated with greater disease severity, greater morbidity, higher mortality and higher barriers to access to more advanced medical services in the previous studies [14-16]. However, as in the present study the prevalence of menstrual disorders was more in females with middle socio-economic status due to sedentary lifestyle and consumption of junk food as compared to low socio-economic status.

On Pearson's correlation analysis, significant negative association of menorrhagia was observed with salad

consumption and socioeconomic status, while positive association was observed between oligomenorrhea and socioeconomic status. The association with socioeconomic status was conflicting may be due to more consumption of junk food, sedentary lifestyle and unawareness about nutritious diet in individuals with high socioeconomic status.

4. Conclusion

Menstrual disorders like dysmenorrhea, menorrhagia, metrorrhagia, oligomenorrhea and premenstrual syndrome were very common among young females of middle socio-economic status as compared to low socio-economic status. Dietary habits like salad consumption, fruits intake, vegetarian/non vegetarian preferences etc. were observed to be influencing the prevalence of metabolic disorder. Based on the findings of this study, it can be concluded that healthy dietary pattern and socio-economic status are positive contributors to menstrual disorders. This provides additional evidence that a regular menstruation phenomenon is affected by the dietary quality and the nutritional status of the females.

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