A Study of Nutrition and Menstrual Health among the College Student of a Urban area in West Bengal

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Abstract

Background and objectives: *Health and nutritional status of a person is highly affected by the hygiene procedure. Menstrual hygiene is most important for positive reproductive health. The present study aims to describe the general health status, nutritional status and sanitary condition of college students.*

Method: *A cross-sectional study using a pretested questionnaire consisting of socio-economic status, menstrual pattern, information regarding present and past diseases, dietary pattern was conducted between Nov 2014 and April 2015 among female college students of A total of ninety nine college girls aged 18-23years were included for this study. Anthropometric parameters like weight, height, waist circumference (WC) and hip circumference (HC) were measured and body mass index (BMI) and waist hip ratio (WHR) were computed.*
Results: The mean age of the female students and BMI were 20.98±1.31years and 23.55±4.02 kg/m^2 respectively and that of WC and HC were 84.88±9.32 cm and 96.12±8.07 cm respectively. 64.6% students are suffering from central obesity. The prevalence of dysmenorrhoea, irregular menstruation and leucorrhoea are 51.50%, 17.20% and 16.20% respectively. It is found that obese students have higher risk of suffering from dysmenorrhoea ($\chi 2=3.239$; $P<0.05$; OR 2.716). Occupational stability ($\chi 2=3.728$; $P<0.05$; OR 3.475) and poor hygienic condition ($\chi 2=3.87$; $P<0.05$; OR 2.944) has greater impact on irregular menstruation and leucorrhoea.

Conclusion: *Dysmenorrhoea, irregular menstruation and leucorrhoea can be affected by obesity, occupational stability and poor hygienic condition. Obese patients have higher leptin level and the elevated adipose tissue/fat changes the normal fat utilization of the body and this may be responsible for hormonal changes in the body. These symptoms may be managed by proper dietary habit and good hygienic practice.*

Keywords: *body mass index, dysmenorrhoea, dysmenorrhoea, leucorrhoea*

1. INTRODUCTION

Malnutrition can result in reduced productivity, slow recovery from illnesses and increased susceptibility to infections in both men and women. Low body mass index (BMI), short stature, anaemia, or other micronutrient deficiencies, has a greater risk of obstructed labour, having a baby with a low birth weight, having adverse pregnancy outcomes, death due to postpartum haemorrhage, producing lower quality breast milk and illness for woman and her baby are the major indication of poor nutritional status of a woman.

Malnutrition is one of the most destructive problems worldwide and is closely linked with poverty. Especially During childhood and in reproductive years Indian women have a high mortality rates. The health of Indian women is intrinsically linked with their status in society and economic condition of the Reports from the Centers for Disease Control and Prevention (CDC) found that the rates of obesity, heart disease, and cancer have seen within the 18-24 year-old age group. These diseases found to the leading causes of death in the developing countries, are mostly diet-related and preventable. But in recent years the developing counties have also faced this situation. The most important time to develop healthy eating habits is at the college-level age but successful interventions to promote change in dietary habits at this age are difficult because most students do not physically experience the ill-health effects of a poor diet at this age, and therefore, have a low-perceived threat and susceptibility to these diseases .

Malnutrition is also related to the hygienic behavior of the person. Poor hygiene and inadequate self-care practices are major determinants of morbidity and other complications among this age. Poor personal hygiene and unsafe sanitary conditions leading to gynecological problems, dysmenorrheal, leucorrhoea and other problems such as diarrheal diseases, schistosomiasis, trachoma, ascariasis, trichuriasis, and hookworm disease Good hygiene practice such as regular tooth brushing, bathing, washing hand with soap, use of sanitary napkin, proper maintenance of food greatly influence the person health.

2. MATERIALS AND METHODS

Sample Collection

This is a cross-sectional descriptive study, carried out from November 2014-April 2015 with objectives to rule out the problems related to menstruation and malnutrition. Study was conducted in Barrackpore Rastraguru Surendranath College, North 24 Parganas. North 24 Parganas is 9 meters above sea-level. The study was performed on a total of 100 students who agreed to participate in the research.

Procedures

The data was collected by personal interviews on a pre-tested, semi-structured questionnaire. The confidentiality of information was assured and their verbal consent was taken before initiating the data collection. All subjects were told that participation in the investigation was strictly voluntary, and that the data collected would not be used for anything except for research study, and they were given the questionnaire and inventory to complete. The duration for completing the questionnaire and inventory was between 30 and 40 minutes per subject. The principal investigator met daily with the data collectors to ensure the quality of data collected.

Preparation of the questionnaires

The questionnaire, prepared with reference to previous studies. This was formulated to cover areas such as understanding of symptoms of premenstrual, symptoms during the menstruation and biological variation affected them.

Back ground information about the respondents include: age, education, religion, weight, height, waist circumference, hip circumference, waist to hip ratio, blood pressure, pulse rate, Hb, socioeconomic status, father's and mother's occupation, number of total family members, number of earning members in family, dietary habits, physical exercise and family history of menstrual problems. Questions related to menstruation, menarcheal age, elucidated variation in menstrual patterns like regularity of cycle, length of cycle, duration of bleeding period, blood loss per cycle, (in this study abnormal menstruation was defined as subject with length of cycle is <20 or >35 days; duration of flow <2 or >7 days and loss of blood per cycle >100ml), history of dysmenorrhea, pre-menstrual symptom and absenteeism from college. They were advised not to write their name on the questionnaire and were told that, there responses would remain confidential. A normal menstrual cycle lasts from 21 to 35 days; with 2 to 6 days of flow and average blood loose 20 to 60 ml. In this study dysmenorrhea was defined as having painful menstruation during the previous three months.

3. RESULTS

3.1 Anthropometric variables

The mean±SD of age, weight and height of the student the study group is 20.98±1.31 year (95% CI 20.71-21.24), 55.79±7.72 kg (95% CI 54.24-57.35) and 154.45±7.99 cm (95% CI 152.84-156.06) respectively. BMI of the studied women ranged between 22.74-24.36 kg/m^2 the mean±SD being 23.55±4.02 kg/m2. The NC, CF, MUAC, WC and HC were 31.34±2.15 cm, 34.71±4.89 cm, 25.98±3.20cm, 84.88±9.32 cm and 96.12±8.07 cm respectively. The WHR was 0.88±0.06. Systolic blood pressure (SBP), diastolic blood pressure (DBP), pulse and haemoglobin (Hb) of the participants is 119.4±8.83 (mmHg), 79.64±7.10 (mmHg), 74.84±6.72 (per min), 12.19±9.67 (per 100 dl) respectively.

Nutrients intake:

The mean±SD of second class protein and first class protein of the student the study group is 44.96±8.89 gm and 23.35±11.65 gm. The total protein is 68.32±15.29 gm ranging from 65.23-71.40 gm. The mean±SD of fat, carbohydrate, energy is 45.12±43.52 gm, 344.43±46.88 gm, and 1984.33±187.18 kcal. The Calcium, Phosphorus and iron intake is 667.19±369.97 gm (95% CI 592.63-741.76), 23.74±12.05 gm (95% CI 1224.10-1352.39), and 1288.25±318.28 gm (95% CI 21.31-26.17) respectively. The vitamin A, thiamine, riboflavin, niacin, folic acid, vitamin C is 135.73±92.75 mg (95% CI 1052.74-1627.17), 1.42±.31mg (95% CI 117.04-154.42), 85±.26 mg (95% CI .79-.90), 16.72±3.06 mg(95% CI 16.10-17.33), 143.63±50.97 mg (95% CI133.35-153.90), 1339.96±1425.07 mg (95% CI 1.36-1.49) respectively. The copper, zinc, and cyanocobalamin is 1.68±0.46 µg, 3.80±9.78 µg, and 6.87±1.30µg respectively.

Socio-economical status

31.3% students are in upper socio- economical group (26,000-29,000). 18.2%, 17.2%, 21.2%, 12.10% students are belonging to upper middle (16,000-25,000), lower middle (11,000-15,000), upper lower (5,000-10,000), lower (<5,000) socio-economical status respectively. (Table 3)

Body Mass Index (BMI) and waist to hip ratio: According the BMI a large no of student about 64.6% (n=9) students are normal weight, 9.1% (n=9) students are under weight and 26.3% (n=26) students are overweight. According to WHR about 26.3% students are normal and 64.6% students are obese.

Table 1: Comparative prevalence of CED (%) of women's of different zones & states of India with the present study (IIPS and Macro International, 2007)

Eco-Zones of India	States	CED (%)	Overall CED (%)
Northern	Punjab	18.9	29.05
	Utarkhand	30.0	
	Haryana	31.3	
	Uttar Pradesh	36.0	
North-Eastern	Assam	36.5	36.50
Central	Madhya Pradesh	41.7	42.55
	Chattisgarh	43.4	

Eastern	West Bengal	39.1	42.15
	Orissa	41.4	
	Jharkhand	43.0	
	Bihar	45.1	
Western	Maharastra	36.2	36.40
	Gujarat	36.3	
	Rajasthan	36.7	
Southern	Kerela	18.0	28.85
	Tamil Nadu	28.4	
	Andhra Pradesh	33.5	
	Karnatka	35.5	
India			35.60
Eastern (Present Study)	West Bengal (24 Pargana)	9.10	

Anaemia, Painful menstruation, Regularity, leucorrhoea, Etching problem:

- In this study it is seen that about 35.40% (n=35) students have mild anaemia, 24.20% (n=24) have moderate anaemia, and 40.4 % (n=40) are non anaemic.
- 51.50% (n=51) students have painful menstruation, 82.8% (n=82) have regular menstruation and 17.2% (n=17) have irregular menstruation.
- About 83.8% (n=83) students have leucorrhoea and 53.5% (n= 53) patients have etching problem.

Dysmenorrhoea

This table shows that the obese students have 2.716 times higher risk of suffering from menstrual pain (dysmenorrhoea). It may be due to the obese patients have high leptin level and the elevated adipose tissue/fat change the normal fat utilisation of the body and this also responsible for hormonal changes in the body.

It is also found that anaemic patients have higher risk of dysmenorrhoea. It also shows that malnourished subjects and obese subjects have 1.419, and 1.523 times higher risk of suffering from menstrual pain (dysmenorrhoea).

Regularity:

This table shows that the obese students have 1.455 times higher risk of suffering from irregular menstruation. It is also found that anaemic patients have higher risk of irregularity. It also shows that malnourished subjects and obese subjects have 0.552 and 1.020 time higher risk of suffering from irregular menstruation

Leucorrhoea:

This table shows that the obese students have 1.833 times higher risk of suffering from leucorrhoea. It is also found that anaemic patients have higher risk of leucorrhoea. It also shows that malnourished subjects and obese subjects have 0.355 and 0.727 times higher risk of suffering from leucorrhoea.

4. DISCUSSION

Malnutrition is one of the most devastating problems worldwide and is inextricably linked with poverty (Rouse, 2003). The scale of under nutrition has also been studied among other populations and age groups, such as pregnant and lactating women. The problems arise from cultural, political and economic realities that must be addressed in tandem. Malnutrition among women has long been recognized as a serious problem in India, but national-level data on levels and causes of malnutrition have been scarce (IIPS, 2007).

India is one of the few countries in the world where women and men have nearly the same life expectancy at birth. The fact that the typical female advantage in life expectancy is not seen in India suggests there are systematic problems with women's health. Indian women have high mortality rates, particularly during childhood and in their reproductive years. The health of Indian women is intrinsically linked to their status in society (Mandal et al., 2011).

Malnutrition in women can result in reduced productivity, slow recovery from illnesses, increased susceptibility to infections, and a heightened risk of adverse pregnancy outcomes. A woman's nutritional status has important implications for her health as well as the health of her children. A woman with poor nutritional status, as indicated by a low body mass index (BMI), short stature, anaemia, or other micronutrient deficiencies, has a greater risk of obstructed labour, having a baby with a low birth weight, having adverse pregnancy outcomes, producing lower quality breast milk, death due to postpartum haemorrhage, and illness for herself and her baby (Rouse, 2003).

Women's height can be used to identify women at risk of having a difficult delivery, since small stature is often related to small pelvic size. The risk of having a baby with a low birth weight is also higher for mothers who are short (Rouse, 2003).

Women are generally vulnerable to undernutrition especially during pregnancy and lactation where the food and nutrient requirements are more during that period. The demographic consequences of the lower status in women has formed expression in various forms such as female infanticide, higher death rate for women compared to men, lower sex ratio, lower literacy rate in female, lower level of employment of women in the nonagricultural sector as compared to men etc (Mandal et al., 2011).

Recent study (NFHS-III, 2007) has reported the prevalence of chronic energy deficiency (CED) of different states of India. Comparative statement of the prevalence of CED and undernutrition based on body mass index (BMI, kg/m2) of adult women of 18 states of 6 different zones of India along with the present study revealed considerable state wise differences (Table 9). This showed that the female student of this region was in better condition while comparing the other region of India. But the prevalence of overweight in this group

was 26.3%. This indicate that the population is suffering from double burden of malnutrition both under and overnutrition. The overall prevalence of malnutrition was 35.4% which is much higher in any population.

This study also indicated that 59.60% of the participants were suffering from anaemia. This is an alarming situation and any community. The gynecological disorders included in this study were dysmenorrhoea (51.50%), cyclical irregularities (17.2%) and leucorrhoea (83.8%). This study found that the main responsible factors for these disorders were obesity, family income and poor hygienic condition of the participants.

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