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To Study the Effect of Dietary Habits on Premenstrual Syndromes, Menstrual Disorders and Practices Related To Menstruation among College Going Girls

Shaifali Pathak

Food and Nutrition Department, IMSN College, University of Rajasthan, Pilani, Rajasthan, India

Abstract: **The present investigation was carried out on 40 college going unmarried girls between the age group of 18-21 years having menstrual disorders in Pilani town of District Jhunjhunu to study the effect of dietary habits on premenstrual syndromes, menstrual disorders and practices related to menstruation among college going girls. Results indicate that majority of respondents reported restriction and taboos associated with menstrual period and dietary habits. Common disorders of menstruation among respondents were dysmenorrhoea, menorrhagia, irregular menstruation, hypomenorrhoea, lecomenorrhoea. Menstrual syndromes experienced were headache, abdominal pain, acne, loss of appetite, cramps, body ache and fever by the respondents. High fat and low fibre diet was reported which resulted in menstrual problems among them. There were differences in the appetite during premenstrual and postmenstrual phases. Increased appetite was seen at the premenstrual phase and low intake of fibre, vitamin A, vitamin C, calcium and iron showed adverse effects on health of the respondents during premenstrual phase.**

Keywords: **Adolescents, menstrual disorders, practices, dietary habits, nutrition.**

I. INTRODUCTION

Adolescence is one of the most challenging period in human development. The uniform growth of childhood is suddenly altered by a rapid increase in the growth rate. These sudden changes create special nutritional need, because of the dramatic increase in physical growth and also due to change in life style and food habits **(Ghattergi and Deo, 2013)**. During the whole period of adolescence, menarche is the most important event in the life of an adolescent girl, occurring between the age of 12 to 15 years and it marks the beginning of a multitude of physiological and psychological changes in the lives of the adolescent girls **(Nagar and Aimol, 2010)**. For a regular menstrual cycle, the median age of menarche is 12.77 years. The length of menstrual cycle is highly variable. Normal menstrual cycles are characterised by a cycle length of 28 days (±7 days), duration of flow of 4 days (±2 days) **(Dangal, 2005).**

Menstrual Disorders

Menstrual problems include missing a period, change in the length of the cycle, changes in the flow, colour, or consistency of menstrual blood, and extreme pain or other menstrual symptoms. Studies have found that 60-92 of adolescents suffer from dysmenorrhoea, nausea, vomiting, headache, fatigue, low back pain, thigh pain, and diarrhoea) **(Rowland and Frey, 2010)**.

Premenstrual Syndrome

PMS is related to changes in the body's hormones. As hormone levels rise and fall during a woman's menstrual cycle, they can affect the way she feels, both emotionally and physically. It is a condition that occurs during the premenstrual phase

(before the period) of the menstrual cycle. The cause is unclear but theories include: abnormal hormone levels, other biochemical abnormalities, inappropriate diet, nutrient deficiencies, physiological factors or a combination of many factors **(Cross et al, 2001)**.

Nutritional Factors in Menstruation

Diet is the corner stone in the prevention of menstrual disorder. Good eating habits need to be adopted early because improper dietary practices can also trigger underlying menstrual disorders. PMS symptoms may be relieved by avoiding caffeine, sugar, salt, white flour, red meat, dairy, butter, monosodium glutamate, fried foods, and processed foods during the two weeks prior to menstruation. Some researchers have found that excess estrogen plays a role in PMS syndrome, too and that shifting balance of the diet away from fatty foods and towards high fibre plant food is helpful **(Barnard, 2013).**

Myths and Taboos Regarding Menstruation

A menstrual taboo is any social taboo concerned with menstruation. In some societies it involves menstruation being perceived as unclean or embarrassing, extending of menstruation both in public and in private. Many traditional consider menstruation ritually unclean. Major restrictions which were imposed on adolescent girls during menstruation were eating sour foods, going out with friends and visiting religious places . These restrictions were imposed by their mothers; due to these restrictions and superstitions most of the adolescent girls felt annoyed **(Manhas and Sharma, 2012)**.

Singh and Paul, 2007 also reported restrictions in daily activities such as not being allowed to take bath, change clothes, comb hair and enter holy places. Apart from these, dietary restrictions (taboo on consumption of food like rice, curd, milk, lassi, potato, onion, sugarcane etc.) during the period were also imposed.

Knowledge and Practices among Girls Regarding Menstruation

Adolescent girls constitute a vulnerable group not only with respect to their status but also in relation to health. Menstruation is regarded as unclean or dirty in Indian society. Another study reported that menstruation is fundamental phenomenon among adolescent girls. It is essential to emphasize personal hygiene during this period. Personal hygiene was not good among slum adolescent girls **(Kendre and Ghattergi, 2013).** Many studies have revealed that most of the adolescent girls had incomplete and inaccurate information about the menstrual physiology and hygiene. It also revealed that mothers, television, friends, teachers, and relatives were the main sources which provided information on menstruation to the adolescent girls **(Thakre et al., 2011)**.

II. OBJECTIVES

1. To assess the dietary pattern of respondents during pre and post menstrual period.
2. To identify the premenstrual symptoms and menstrual disorders.
3. To assess the menstrual practices and restrictions among respondents during menstruation.

III. METHODOLOGY

Locale of the Study

The study aimed at investigating the menstrual abnormalities and dietary intake among adolescent girls. So, keeping in mind the easy accessibility and convenience, Pilani town from District Jhunjhunu was selected purposively as the locale for the present study.

Moreover, no such study on this aspect has ever been educated in this area. Purposive sampling may involve the study of the entire population of some limited group or of a subject of a population.

Sampling Procedure

The study encompasses the survey research design for studying dietary intake and menstrual problems among adolescent girls. The term survey is applied for the technique of investigation by a phenomena or systematic gathering of data from population by applying personal contact and interview, when adequate information about a certain problems is not available in records, files and other sources.

Selection of respondents

For the study an exhaustive list of all the girls who attained menarche was prepared. Out of this list, 40 unmarried girls in the age group of 18-21 years suffering from PMS and menstrual disorders were selected purposively for the study. Entire study group was chosen from similar economic status and age range. Availability and willingness of the subjects to cooperate particularly during the course of study was considered while selecting and recording the information required for the study.

Construction of Interview Schedule and Collection of Information

A well structured interview schedule was prepared for data collection. A pilot study was conducted for a period of two weeks on ten subjects to verify practicability of the interview schedule and remove any flaws and ambiguities. Based on the responses obtained from pre testing and difficulties faced, modifications were made to make it more functional and then it was used to collect the funal information. It includes general information of the respondents, anthropometric measurement, specific information (information about menstruation, PMS, age at menarche) and biochemical assessment.

Subjective Assessment of Premenstrual Syndromes and Menstrual Disorders

I. PMS

The modified Pre Menstrual Tension Syndrome (PMTS) Index developed by Steiner et al., 1980 was used for subjective assessment of premenstrual syndrome and menstrual disorders. The symptoms assessed as per PMTS Index were, headache, abdominal pain, bloating, fever, smell (in vagina), nausea, vomiting, tenderness of breast, fatigue/ weakness, depression, anger, irritability, anxiety, confusion and mood swings.

II. Selected Menstrual Disorders

In this study, it refers to problems such as dysmenorrhoea, menorrhagia, polymenorrhoea, oligomenorrhoea, and hypomenorrhea, which were assessed on the basis of frequencies and percentages.

Data Collection

The data were collected using personal interview method by paying repeated visits to the study area and responses were obtained to meet the objectives. The responses were obtained by interviewing the selected respondents.

Statistical Analysis

For the purpose of analysis and interpretation of results different statistical tools were employed and the quantitative data were tabulated and quantified according to the standards laid down to draw meaningful inferences **(Snedecor and Cochran, 1967).**

Statistical tools applied were frequency and percentage, mean, standard deviation, t- test.

IV. RESULTS AND DISCUSSIONS

4.1 General Information of the Respondents

Majority of respondents were between 18-19 years of age and belonged to nuclear family and all the respondents were Hindu. 65.00 percent of the respondents were having small family size i.e., upto 5 members. Most of them were undergraduates and father of 56.00 percent respondents were educated only upto matric and their household income was found to be between 20,000- 30,000 Rs. per month. Mean haemoglobin of the subjects was 8.5g/dl, which was lower than the normal (>12g/dl) levels.

4.2 Dietary Profile of the Respondents

In this section, percentage distribution of the respondents on the basis of their dietary habits has been incorporated. Most of the subjects (90.00%) were vegetarian and 60.00 percent were not taking regular meals and skipped one meal in a day, mainly breakfast. Half of the respondents (50.00%) specified their reason for skipping meals as unhealthy condition during menses.

Most of the respondents (65.00%) added special food in their diet during menses; these foods were milk, buttermilk and curd, pulses etc. Majority of respondents (80.00%) had avoided some food in the diet during menses like pickles, sour food, dry fruits and fried foods.

4.3 Food Consumption Pattern during Premenstrual and Postmenstrual Period

Cereal intake was 80.23 percent, fruits 47.33 percent, pulses 66.16 percent, glv's 69.40 percent, roots and tubers 75.60 percent, other vegetables 64.93 percent, milk and milk products 61.22 percent, meat and poultry 54.00 percent, fats and oils 75.33 percent and 79.66 percent sugar and jaggery in the premenstrual period.

Postmenstrual, cereal intake was 74.88 percent, fruits 56.83 percent, pulses 62.00 percent, glv's 65.04 percent, roots and tubers 64.00 percent, other vegetables 56.40 percent, milk and milk products 72.05 percent, meat and poultry 40.33 percent, fats and oils 64.86 percent and sugar and jaggery 66.67 percent. Frequent milk consumption was associated with lower risk of PMS; respondents consuming 4 serving or more per day of any type of milk (skimmed and low fat) had less symptoms of PMS as compared to 1 serving/day **Johnson et al., (2008).**

In a study conducted by **Dalvit, (2011)** revealed that there was some suggestion of significantly increased carbohydrate consumption premenstrually and reduction in carbohydrate intake at ovulation. Similarly, **Gallant et al., (2007)** observed that both control and PMS subjects increased their carbohydrate intake postmenstrually, but consumed more calories premenstrually. According to **Hill and Blundell, (2009)** 12.00 percent energy increase was mainly due to rise in the number of high carbohydrate and high intake of fatty snacks.

4.4 Nutrient Intake

The average daily energy intake by respondents was 80.42 percent during premenstrual phase and (75.16%) during postmenstrual phase. Protein was 78.00 percent and 64.16 percent premenstrual and postmenstrual respectively. Average daily fat intake was 81.68 percent in premenstrual and 62.28 percent postmenstrual.

While calcium intake was 74.86 percent and 61.78 percent, iron 55.57 and 55.47 percent, vitamin A 60.00 and 62.00 percent of RDA during premenstrual period and postmenstrual period respectively. Vitamin C intake was 66.25 percent and 77.50 percent during pre and post menstrual period and fiber was 24.49 and 36.31 percent respectively.

Similar suggestions were revealed by **Wurtman et al., (2002), Dalvit, (2011), Davidsen et al., (2007). Dye and Blundell, (2007)** reported that increase in appetite and /or food cravings were considered characteristics of PMS. They further revealed a positive relationship between calorie intake and severity of PMS symptoms. Women who reported more symptoms recorded higher caloric intake.

Rowland and Frey, (2010) revealed that PMS symptoms might be relieved by avoiding butter, fried foods, processed foods during the two weeks prior to menstruation. **Penland and Johnson, (2009)** found that increasing calcium intake reduced mood swings, concentration and behaviour symptoms generally ($p<or = 0.05$) and reduced pain during the menstrual phase of the cycle ($p=0.034$). A report by **PCRM** the more the fibre in the diet, the better the natural "oestrogen disposal system" works. Main emphasis on plant based foods means that there was more fibre in the diet.

4.5 Daily Mean Nutrient Intake of Respondents during Pre and Post Menstrual Phase

The recorded values of different nutrients when compared with recommended values it were found that the intake of protein, fat, calcium, vitamin A and fiber were highly significant lower than that of recommended nutrient intake. In contrast to the above nutrients, the intake of energy and vitamin C were found to be significantly lower than that of recommended values. On the other hand no significant correlation was found between recorded and recommended intake of iron.

Penland and Johnson, (2009) found that increasing calcium intake reduced mood swings, concentration and behaviour symptoms generally ($p<or = 0.05$) and reduced pain during the menstrual phase of the cycle ($p=0.034$). Similar results were reported by **Chung, 2010** also revealed that women consumed more total calories (+160kcal/day, $p<0.05$) and more grams of protein (+6-8g/day, $p=0.01$) during the luteal phase and ovulation as compared during the follicular phase. A higher percentage of energy was consumed as carbohydrate during the follicular phase.

4.6 Anthropometric Measurement

During percent investigation Results clearly depict that mean weight of the subjects was lower than the reference weight i.e., 55kg which might be due to their dietary inadequacy and peers tendency towards physical consciousness. Height of an individual can be used as a criterion of chronic malnutrition as it is less fluctuating than weight. Results revealed that mean BMI of the subjects was 18.40. It was observed that 23 subjects were in the category of underweight BMI. Results also depict that 12 subjects were normal and 5 subjects were overweight out of 40 subjects.

4.7 Physical Activities during Menstruation

In this section, percentage distribution of the respondents on the basis of their physical activity has been incorporated and result revealed that almost half of the college going girls 52.50 percent were taking rest and did not participate in daily home activities during their first day of menstruation and did not do any outside activity. Majority of respondents (62.50%) did not come to college on the first day of their menstruation.

4.8 Specific Information of Respondents Regarding Menstruation

Results revealed that 67.50 percent experienced menarche for the first time between the age of 12-13 years and reported their duration of menstruation between 0 to 5 days. 65.00 percent were having their menstrual cycle length between 21 to 35 days. While 52.50 percent subjects reported normal bleeding during their menstruation.

4.9 Subjective Assessment of Menstrual Syndrome and Menstrual Disorders among Respondents

This section deals with menstrual syndrome and menstrual disorders among respondents.

4.9.1 Menstrual Syndromes

Majority of the respondents (95.00%) faced abdominal pain before menstrual and 85.00 percent during menstrual period. 50.00 percent respondents were suffering from bloating in menstrual phase, 80.00 percent from acne during premenstrual phase (fig.1). 85.00 percent reported no loss of appetite during premenstrual period while 82.50 percent reported this problem in menstrual phase. 77.50 percent suffered from nausea, vomiting and cramps in pelvic or uterus part during premenstrual period.

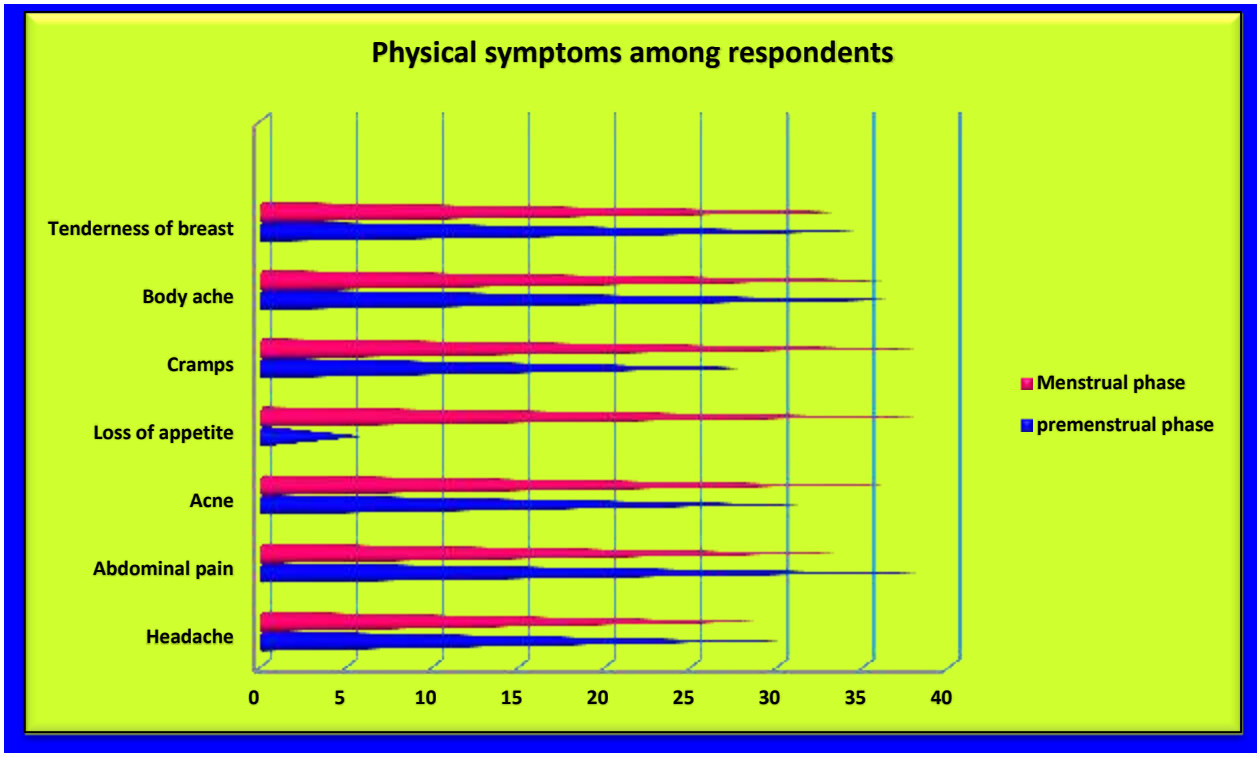

Fig. No. 1: Physical symptoms among respondents

Half of them suffered from bodyache, fever, smell (in vagina) and tenderness of breast. While 95.00 percent subjects suffered from weakness in during premenstrual phase, 90.00 percent from depression, anxiety, mood swings and confusion.

Similar findings were reported by **Nagar and Aimol, (2010) and Manhas and Sharma, (2013)**; that various problems of girls during menstruation were pain in abdomen (97.00%), backache (89.00%) was found to be highest followed by weakness/ tiredness (82.00%), bodyache (55.00%), pain in thighs/ legs (44.00%) and headache (31.00%). A study conducted by **Gupta et al., (2004)** reported that half (50.00%) of the sample girls were found irritable during periods, depression was also seen in about 28.50 percent girls. It can be interpreted from the above data that the respondents

suffered from the PMS moderately or severely similar results was reported by **Chandran, (2007), Tangchai, (2004) and Cross et al., (2001).**

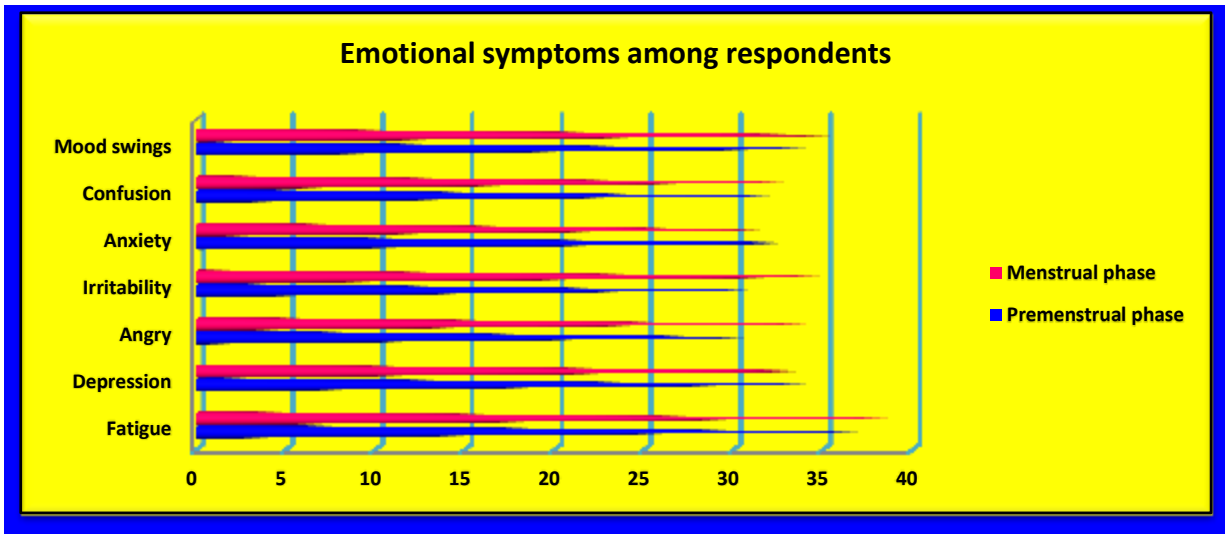

Fig. No. 2: Emotional symptoms among respondents

Table: Severity Index Score of respondents

Category	Score	Respondents (n=40)
Low	<20	04 (10.00)
Medium	20 - 40	20 (50.00)
High	40 – 60	16 (40.00)

(Figures in parentheses indicate percentages)

According to the Severity Index Score from the table 12, data reveal that 10.00 percent of respondents had low severity symptoms, 50.00 percent of them had medium severity symptoms and 40.00 percent showed high severity symptoms.

4.9.2 Menstrual Disorders

Common disorders of menstruation among college girls were dysmenorrhoea, menorrhagia, leucorrhoea, irregular menstruation and scanty menstruation followed by (75.00%), (15.00%), (05.00%), (05.00%) (Fig.3). Similar contentions were reported by **Yavangi et al., (2013)** it was reported that 11.30 percent, 30.00 percent and 16.30 percent had abnormal menstrual pattern three months before, during and three months after ramajan, respectively.

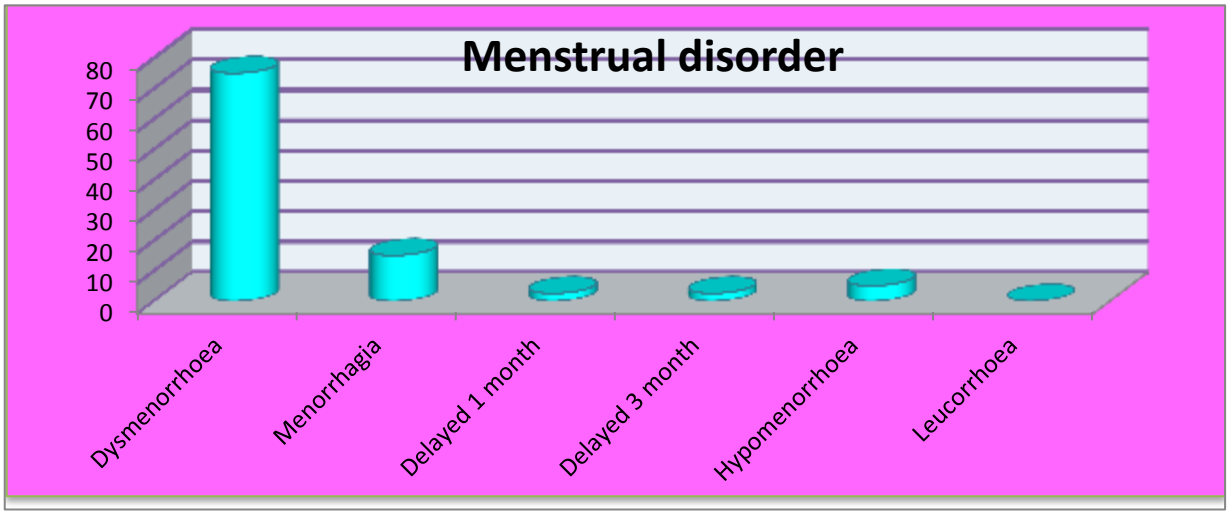

Fig. No. 3: Menstrual Disorders

In another study by **Esimai and Esan, (2010)** that dysmenorrhoea was reported in 242 (60.50%) students, 05.00 to 17.00 percent were having irregular cycle. **Derman et al., (2004)** also reported that 61.40 percent adolescent girls had dysmenorrhoea and half of the girls, 49.50 percent had mild, 37.10 percent had moderate and 13.40 percent had sever PMS. The most common symptom of PMS was anger (87.60%) and anxiety (87.60%) similar results observed by **Aggarwal and aggarwal, (2010) and Chan et al., (2009).**

4.10 Menstrual Practices and Restriction

Menstruation is regarded as unclean or dirty in Indian society. Although it is a natural process, is linked with several misconceptions and practices which sometimes results into adverse health outcomes. This section gives information about menstrual practices and restrictions among subjects.

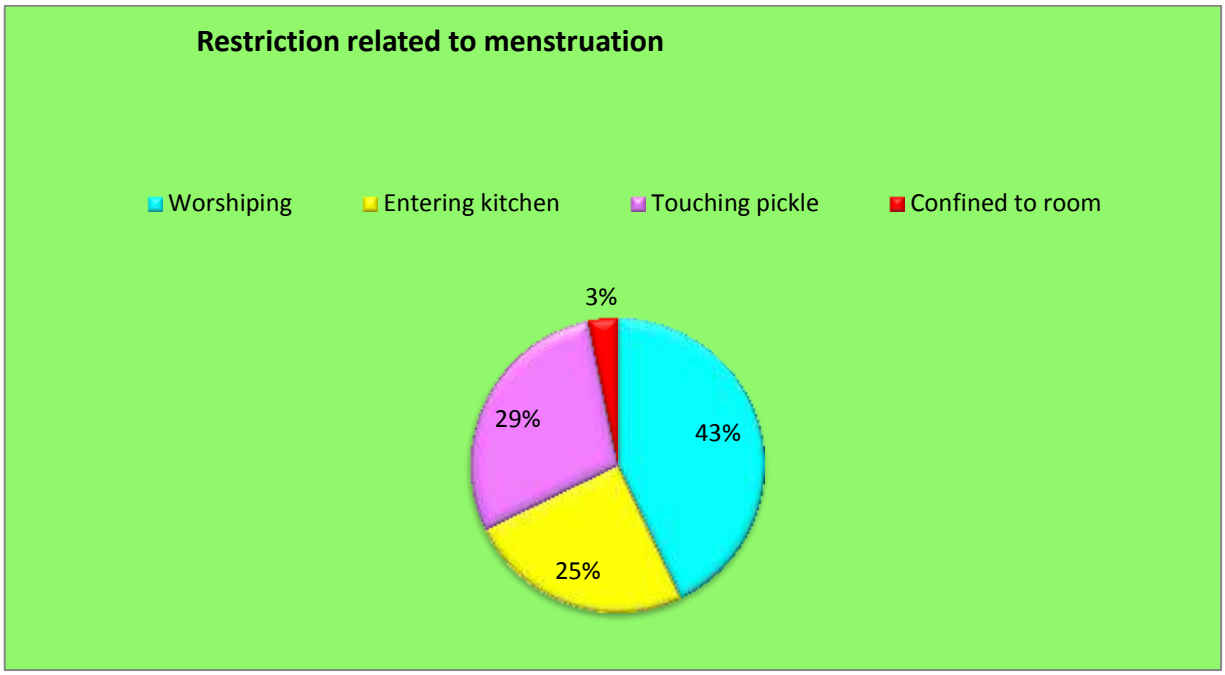

Fig. No. 4: Restriction Related To Menstruation

All the respondents reported beliefs and restrictions associated with menstruation. 72.50 percent were totally against the beliefs like restricted to being friendly with opposite sex, going out with friends, going to picnic and staying out at relative's home.

All the respondents were restricted from visiting religious place (67.50%) not allowed to touch pickle and entering the kitchen (58.00%). Majority (62.50%) were not allowed to eat sour food during menstruation. 75.80 percent respondents were not comfortable with these beliefs and felt annoyed because they were not informed about the significance of these beliefs. (Fig.4)

Mahnas and Sharma, (2012) reported that about 42.00 percent of the respondents were restricted for going out with friends, 34.00 percent were not allowed to go to picnics/ trips while remaining found restrictions for getting friendly with opposite sex. According to **Dasgupta and Sarkar, (2007)** 50.00 percent girls did not eat certain foods such as sour foods, banana, radish and palm during the menstrual period.20.56 percent had daily fast food habits in which 16.82 percent participants were dysmenorrhea positive.

All the respondents (100.00%) were restricted from religious place during the period of menstruation, 67.50 percent were not allowed to touch the pickle and entering the kitchen (58.00%) as they were informed by their mother that it is an unhygienic condition and if the girls touched the pickle during menstruation, the pickle will get spoilt and 07.50 percent reported confined to their rooms.

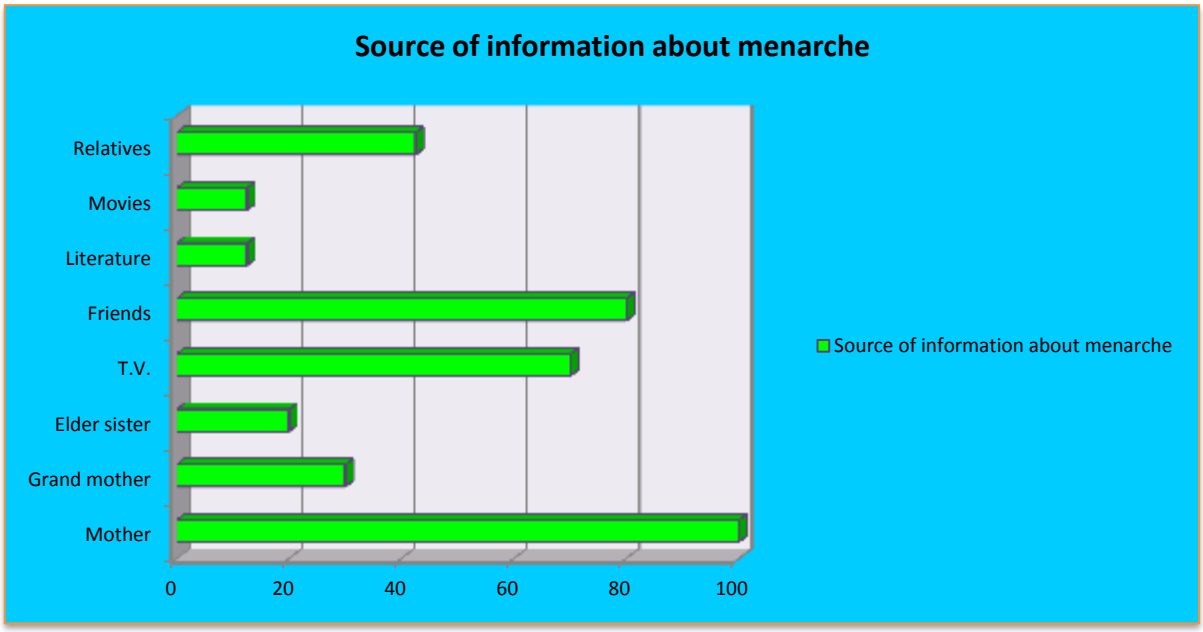

Fig. No. 5: Source of information about menarche

Fig. 5 provides the data regarding source of information. All the respondents said that most common source of information were their mother (100.00%) as well as from friends (80.00%), 70.00 percent from T.V., relatively a few in this group appeared to have an open channel of communication with relatives(42.50%), from grandmother (30.00%) ,movies (12.50%) and magazines (12.50%). About 65.30 percent agreed that it is a monthly process while other (35.00%) girls considered menstruation as unclean/ dirty/ bad blood.

V. CONCLUSION

The present study was conducted to determine the dietary intake and menstrual problems among adolescent girls from Pilani town, District Jhunjhunu. For this purpose a sample of 40 subjects between the age group of 18- 21 years who reported menstrual abnormalities (Premenstrual syndrome) were selected purposively.Mean haemoglobin level of the subjects was lower than the normal level. Majority of respondents reported restriction and taboos associated with menstrual period and dietary habits. Most of them reported addition of special foods in their diet during menses; these foods were milk, butter milk, curd and pulses etc. Majority of them avoided some food in the diet like pickles, sour food, dry fruits and fried foods during menses.

Almost half of the college going girls were taking rest and did not participate in daily home activities during their first day of menstruation and were not taking regular meals and skipped one meal in a day, mainly breakfast.

Common disorders of menstruation among respondents were dysmenorrhoea, menorrhagia, irregular menstruation, hypomenorrhoea, lecomenorrhoea. Major restrictions were: visiting religious place, to touch the pickle and entering in the kitchen during their periods. Menstrual syndromes experienced were headache, abdominal pain, acne, loss of appetite, cramps, body ache and fever by the respondents. Besides fatigue, depression, anger, irritability, anxiety and confusion.

High fat and low fibre diet was reported which resulted in menstrual problems among them. There were differences in the appetite during premenstrual and postmenstrual phases. Increased appetite was seen at the premenstrual phase and low intake of fibre, vitamin A, vitamin C, calcium and iron showed adverse effects on health of the respondents during premenstrual phase.

Recommendations:

- Eating a good breakfast can help girls overcome menstrual problems and infertility.
- Reducing stress, increasing exercise and making dietary changes around the time of menstruation can prevent PMS symptoms from worsening.

- Use of very low fat, vegetarian diet. It has very helpful effect on reducing menstrual pain, because of the diet's effect on hormones.
- Supplementation of calcium and magnesium can play a crucial role in prevention of PMS.
- Do not deliberately eat sweets, such as drinks, cake, brown sugar, candy, prevent blood sugar instability.
- Eat high fiber foods like fruits, vegetables, whole grains, such as whole wheat bread, brown rice, oats, as they help to increase the level of magnesium in blood during menstruation.

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