



MENSTRUAL CYCLE: BASIC BIOLOGY, LIFESTYLE FACTORS, DIET AND MENTAL HEALTH

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ABSTRACT

Background: Menstrual cycle describes the female reproductive system. It is a cyclic endocrine regulated change that occurs in females, over 28 days during the reproductive life. Studies have shown that, Upto 80% of women report having symptoms before 1 or 2 weeks prior to menstruation. Common symptoms are acne, tender breast, feeling tired, irritability, bloating and mood swings.

Objectives: The study is carried out with the aim -to evaluate the types of menstrual disorders, average age of menarche, dietary lifestyle of adolescent girls, impact of physical activity, diet prior and during the menstrual flow and irregular periods. The ultimate goal of the study is to provide awareness on the menstrual hygiene and health, and impact of menstrual cycle on mental health.

Methods: A community based cross sectional study was carried out among 195 adolescent girls living at Hanuman Nagar, near TKR college, Karmanghat, Hyderabad. An E-questionnaire was shared to the target group and the data collected was later converted to charts and figures.

Results: Oligomenorrhea amongst adolescents has become prevalent due to various reasons i.e., acquiring sedentary lifestyle pattern with change in eating behaviour, less or no physical activity, frequent consumption of junk foods etc.

Conclusion: The studies have shown that, Environmental factors including Socio-economic factors, good nutrition and access to Preventive health care may influence progression of Puberty. The target group were counselled and educated to follow a good balanced diet; maintain menstrual hygiene and create awareness on menstrual related problems and impact of physical activity in day-to-day life.

Keywords: Menarche, Dietary patterns, Oligomenorrhea, Physical activity, Counselling.

INTRODUCTION

Menstruation is a normal physiological phase in women which starts during adolescence and continues till late 50's. It is a fundamental physiological phenomenon of a Normal Sexual and Reproductive function. A Regular Menstrual cycle is an important indicator of a healthy reproductive system. The Normal length of a healthy women's menstrual

cycle is 28 to 30 days. Females have their first period when they reach Puberty. Puberty usually happens between the age of 12 to 15. The first period is called Menarche. Menstruation lasts till woman reaches late 50's. The last Period is called Menopause. Menstrual abnormalities are common in adolescence due to stressful and unhealthy dietary patterns. The major abnormalities associated with menstrual cycle are Menstrual irregularities, Premenstrual Syndrome, dysmenorrhea. (Deligeoroglou E, et al,2006) (Creatsas G. et al. 2012)

Dysmenorrhea is the term that refers to the pain perceived during menstruation. (Cakir M et al 2007) Junk foods are rich in saturated fatty acids and Dysmenorrhea is quite common among girls who consume junk food too often which affects the metabolism of progesterone. (Fujiwara T, et al 2009). The adolescent girls regularly skip breakfast to appear lean which is an unhealthy practise. Breakfast is an important meal of the day as it provides major nutrients (Carbohydrates, protein and fat) Ex: Breakfast foods like Idli, dosa, upma, khichdi etc are the good sources of the proximate principles. A combination of cereal and a pulse (Idli, dosa, rice and dal) are of high biological value. Physical activity also plays an important role in managing menstrual cycle. The study (Randhawa JK, et al 2016) clearly indicates that dysmenorrhea is affected by the physical activity along with dietary habits and another study supports it by proving the positive effect of lowered risk of dysmenorrhea among the physically active persons.

Adolescent girls generally have the common symptoms like mood swings and approximately 50-80% women report mood swings mainly during the pre-menstrual phase. (Halbreich U, et al 1986), (Logue CM, et al 1986), (Pearlstein T et al 1998), (Wittchen H -U et al 2002). The pre-menstrual phase has been associated with anxiety, sadness, headache, fatigue etc. which can be categorised to negative physiological and physical symptoms (Angst J et al 2001), (Asso D et al 1997), (Bloch M et al 1997), (Logue CM et al 1986). The most common pre-menstrual changes include acne, fatigue, bloating, insomnia, muscle aches, cravings for sweet or salt, irritability, fluid retention, sadness etc. (Bloch M et al 1997), (Chrisler JC et al 2002), (Freeman EW 2003).

Diet plays an important role in maintaining the health status of a person, especially amongst the adolescents. (Fujiwara T et al 2009)

The adolescents undergo various changes like physical, physiological, psychological and emotional. Secretion of hormones and regulation of menstrual cycle also begins during adolescence. This poses an increased allowances of most of the nutrients like energy, protein, calcium, iron etc. Therefore, the adolescents should be provided with foods rich in all the nutrients. (Anand K et al 1999)

The diet, physical work and mental stress directly or indirectly influences the female reproductive system. Low GI diet, limiting simple carbohydrates and sugars in the diet can help keep insulin levels in balance and may prevent inflammation but there isn't yet strong evidence that one diet is best for everyone. (Barbieri RL et al 2014), (González F 2012), (Kiddy DS et al 1992).

A study of university students in 2018 at Spain reported that eating vegetarian diets such as fruits and vegetables can correspond to fewer cramps. Leafy vegetables such as kale and spinach can boost iron levels and are also rich in magnesium. Nuts are packed with essential nutrients and are great to munch on keeping in mind that they are high in calories so don't go overboard with them. However, Processed and salted foods should be avoided as they cause bloating due to high salt content. A recent study suggests diets rich in omega-3 fatty acids such as fish, calcium and vitamin D, and low in animal fats, salt and caffeine may reduce the risk of troublesome PMS symptoms. Avoiding salt can help reduce fluid retention, abdominal bloating, breast swelling and pain. High caffeine intake can cause irritability, poor sleep and menstrual cramps.

Menstrual cramps or PMS urges many people to use hormonal contraceptives, such as the pill or the hormonal IUD, to relieve the pain associated with it. The synthetic hormones in these methods block ovulation, and or prevent the

typical growth and shedding of the uterine wall. This reduces or eliminates the associated build-up of prostaglandins, muscle contractions and cramps. (Mannix LK et al 2008) Studies show clear links between inactivity and many diseases or illnesses, many types of cancers including Hodgkin's lymphoma. (Kushi et al 2006) It may be no surprise, then, that being inactive significantly shortens life expectancy. (Lee, I., et al 2012)

Materials and Methods

Study area, design and sample size:

A community based cross sectional study was carried out among 195 adolescent girls living at Hanuman Nagar, near TKR college, Karmanghat, Hyderabad. An attempt was made to collect the data through the questionnaire.

Sampling methodology and duration of the study:

Adolescent and adult women were randomly selected from the target area and were given a questionnaire. The data was then converted into charts, bar graphs and pie diagrams. The content of the questionnaire — General information on menstruation, dietary information and information on menstrual irregularities, impact of lifestyle factors and physical activity.

Education:

The samples were educated to have a Healthy and balanced diet and they were educated about the importance of menstrual hygiene and dietary patterns. Awareness was created to have a well-balanced diet by consuming foods rich in Protein, vitamin C, iron and calcium. The importance of physical activity was also explained.

Results and Discussion

Fig 1- Out of 195 adolescent girls 40% of girls report regular periods and 10% of girls complain about having irregular periods. 5% of adolescent girls are suffering from PCOD/PCOS.

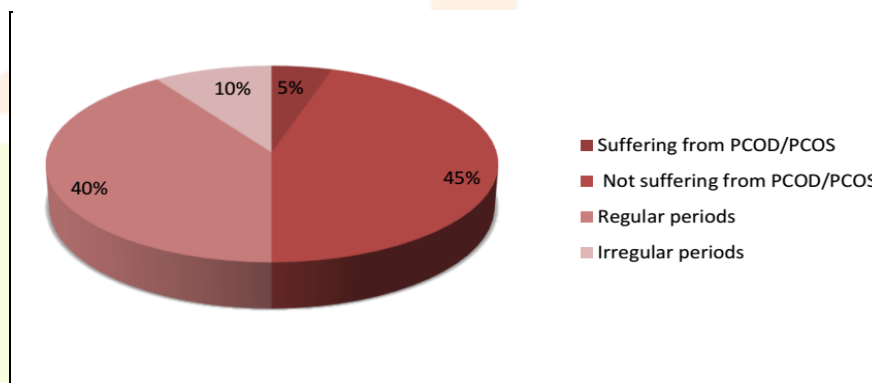


Fig 1: Menstrual cycle

Conclusion: Adolescent girls commonly complain of Oligomenorrhea and there are multiple aetiologies for Menstrual irregularities. Current evidence supports a close relation between the degree of cycle irregularities and the grade of endocrine disorders. (Strowitzki T, et al 2010), (Xu XH, et al 2009), (Xu X et al 2012).

The hormones that impact menstruation are oestrogen and which are imbalanced by many factors like lifestyle factors, dietary needs, strenuous exercise (sports), stress as well as mental health.

A number of disorders are also linked to irregular menstruation like PCOD/PCOS. It is a common endocrine and a metabolic disorder which effects up to 12% of women of reproductive age. (Ma YM et al 2010) Diet, exercise and behavioural changes can have a big impact in preventing and managing PCOS. (Asemi Z et al 2015).

Fig 2-The graph explains dysmenorrhoea and the frequency of consumption of analgesic during the menstrual flow. The symptoms include Back pain, pelvic pain frequency, mood swings, anxiety and difficulty in sleep.

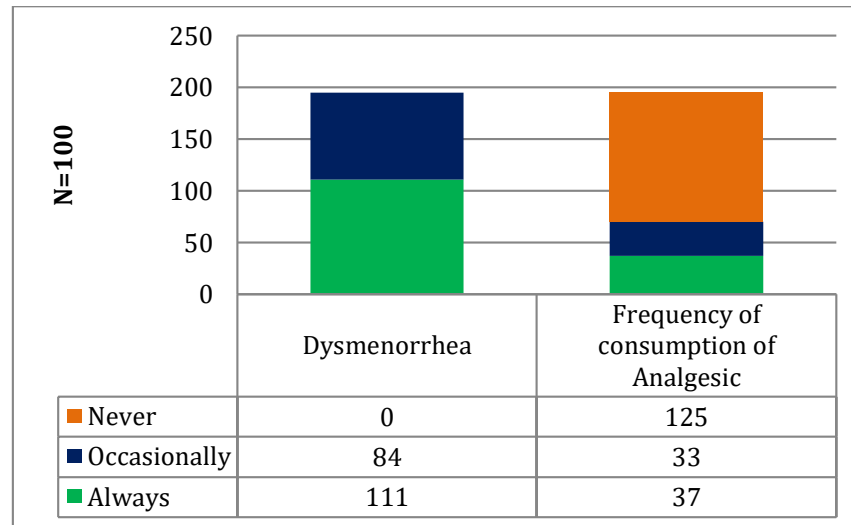


Fig 2: Frequency of Dysmenorrhea & consumption of analgesic

Conclusion: Menstruation occurs with some degree of discomfort, pain and menstrual cramps. Prostaglandins are the compounds released from the lining of the uterus as it prepares to be shed. They are a necessary part of the process but when produced in excess, causes cramps and pain. The cramps can be either bearable or quite painful or severe. (ncbi, 2019) The pain levels definitely affect the normal daily activity for 1-3 days and is experienced by 1 in 10 women. Almost all women suffer from any problem associated with menstrual cycle like missing a period, delayed period, a change in the colour, a change in the length of the cycle etc and the symptoms associated are bloating, nausea, vomiting, body aches, cramps in the abdominal region, cramps in the legs, irritability, breast tenderness, mood swings etc. Anti-inflammatory painkillers are an effective way to get relief from period pain. (Marjoribanks J et al 2015) NSAIDs (non-steroidal anti-inflammatory drugs), like ibuprofen, inhibit the production of prostaglandins and inflammation. Other types of over-the counter painkillers may reduce pain, but tend to be less effective for treating menstrual cramps.(ncbi 2019)

Fig 3- The bar graph threw a light on the consumption of healthy and junk food which can have a huge effect on a healthy as well as regular menstrual cycle. Out of 195 adolescent girls, majority of them prefer to have a healthy diet like consuming fruits and vegetables, dry fruits frequently. This graph also reveals consumption of fast food and bakery items occasionally but not regularly.

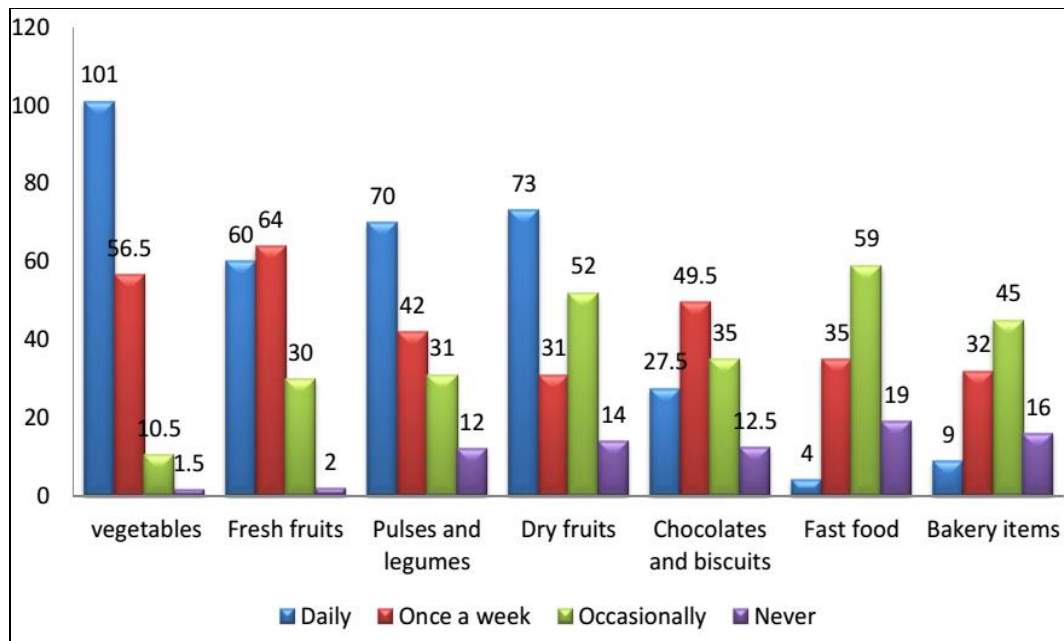


Fig 3: Frequency of consumption of Healthy and junk food

Conclusion:

Diet plays the primary and important role in the functioning of all the organs. It also plays a significant role in maintaining the reproductive function, while menstruation affects the need of micronutrients like iron. There will definitely be a dip in the iron levels since the cycle reoccurs every month. If this loss is not restored through the consumption of iron rich food, the person could suffer from Iron deficiency anaemia. Most women of reproductive ages are suffering from anaemia because of their diet being iron deficient. The common symptoms associated with anaemia are fatigue, pale skin and eyes, spooning of nails, dizziness etc. The adolescents are also influenced by various factors which includes commercial advertisements, friends etc due to which they consume unhealthy snacks too often. These unhealthy snacks can be termed as JUNK FOOD since they are high in energy, salt, sugar and fat. They also reduce the appetite toward healthy food i.e., home cooked food. (Kant AK et al 1994) Thus, dietary modification is necessary amongst those who regularly consume food outside the house. Consumption of foods prepared at home like Rice/phulka with dal/vegetable curry and an egg with curds or buttermilk will help meet the requirements of all the nutrients since this is called BALANCED DIET. A study reveals that children who consume fast food regularly are found to develop menarche in early ages (Isgin-Atici K et al 2018). The modern and busy schedule is forcing the population to go for fast foods or ready to eat foods, influencing the food habits. (Pramanik P et al 2014) The consumption of caffeine, fast foods, other beverages are increasing on one hand and on the other hand, the prevalence of menstrual and reproductive problems are increasing too. Adolescent girls generally skip 1 or more meals to maintain a lean body being ignorant of the fact that they are deprived of various nutrients. Breakfast is an important meal of the day and is usually skipped by adolescents. Having a small and frequent meals including the 5 food groups is necessary to combat malnutrition.

Fig 4- The below diagram indicates that nearly half of the subjects are physically inactive.

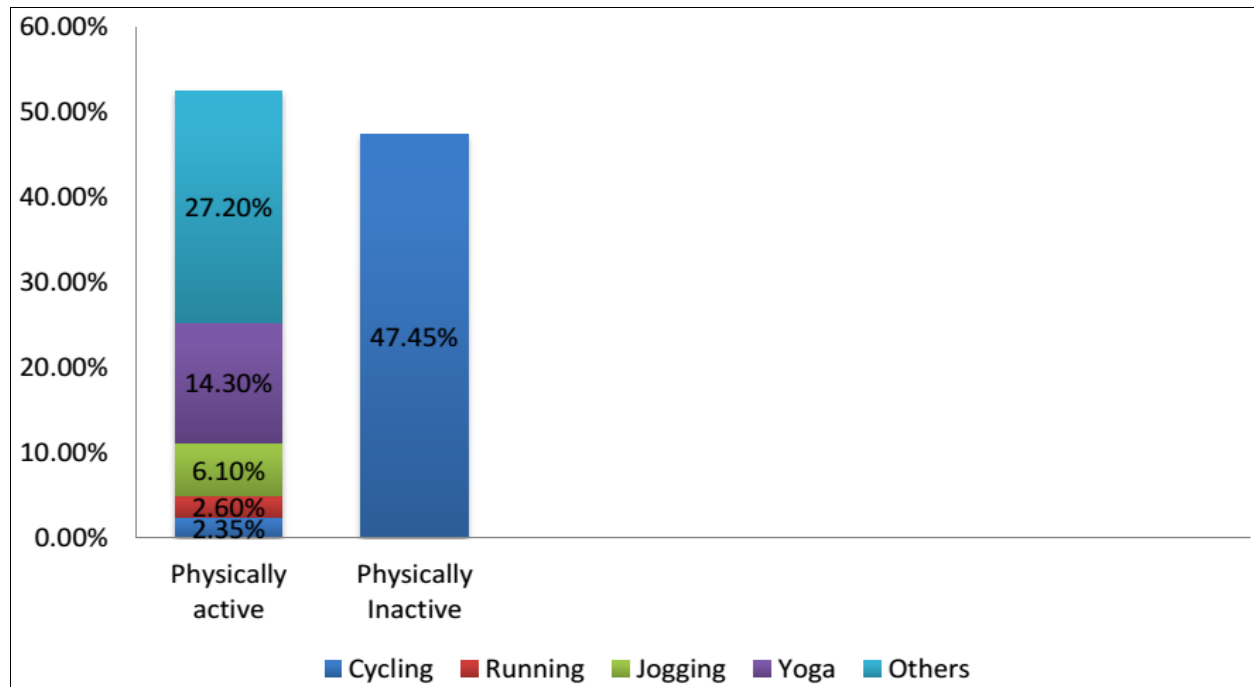


Fig 5: Physical activity

Conclusion: Children tend to be less physically active as they enter into adolescence especially girls after they reach puberty. (Beech et al 2003), (Kimm et al 2002). As early as 10 years of age, girls begin to become more sedentary, their activity levels dropping by as much as 83% as they transition through adolescence. (Wolf et al 1993) This makes the adolescent girls to gain more weight thus, they grow into Overweight and obese adults. Also, hormones can be blamed which makes them gain weight easily once they reach menarche. Generally, they are engaged in physical activity only during the games/sports hour at School or college. (Kimm et al 2002) This drop in physical activity will greatly affect the weight management, since obese teenager turns into obese adults (Gordon-Larsen et al 2004), (Pate et al 1996) with an increased risk of developing serious health conditions like hypertension, diabetes, stroke etc. Studies show clear links between inactivity and many types of serious conditions like cancer of breast, colon, blood, connective tissues, kidney etc. (Kushi et al 2006), (Lee et al 2012). It may be no surprise, then, that being inactive significantly shortens life expectancy (Lee et al 2012).

Discussion

From the data collected, it can be concluded that the modern lifestyle such as sedentary activity pattern with changes in food habits affect the menstrual cycle and symptoms associated with it. Hence, it is very important to educate adolescents about eating right, promoting the importance of regular physical activity, menstrual hygiene to improve menstrual health. It is necessary to maintain menstrual health to prevent many reproductive problems in future like infertility, PCOD etc.

Parents play a major role in promoting the eating habits of children. Thus, educating parents about healthy pattern of lifestyle, consuming home cooked meals along with children every day, consuming at least 2 servings of fruits and vegetables, reduction in consuming foods rich in fat or junk food, adapting to cooking techniques which help in retaining nutrients like pressure cooking rice, choosing curries over fries etc. The subjects were educated to consume Vitamin C rich foods such as guava, melons, lemons (Citrus fruits) along with the meal since, these foods enhance the absorption of Iron. They were counselled to be engaged in physical activity for at least 30 minutes daily.

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