

“ASSOCIATION BETWEEN SEVERITY OF PAIN AND BODY MASS INDEX IN PRIMARY DYSMENORRHEA AMONG ADOLESCENT FEMALES”

Dr Rima Musale,

Associate Professor, Department of Physiotherapy,

Tilak Maharashtra Vidyapeeth, Pune 37.

Kirti R Pawar

Fourth Year Student,

Department of Physiotherapy, Tilak Maharashtra Vidyapeeth Pune 37.

ABSTRACT

- **Background:** The term ‘dysmenorrhea’ comes from the Greek meaning ‘difficult monthly flow’ and it is used to describe pain associated with menstruation. The condition may be primary or secondary Dysmenorrhea is a gynaecological disorder also known as menalgia, which is characterized by lower abdominal pain which may irradiate to the thighs and top and bottom of the spine. It is an existing mainstream gynecological problem which habitually affects females irrespective of their age or ethnicity. It is commonly associated with nausea, headache, fatigue and diarrhea. Pain usually starts the day before or in the first menstrual cycle day and disappears at the end of the menstruation. These women have increased uterine tone and high-amplitude contractions during menstruation leading to reduced uterine blood flow, all is due to increased endometrial prostaglandin production. The topic generates little interest among doctors, which shouldn’t be the case because dysmenorrhoea is common explanation for absenteeism and reduced quality of life.
- **Aim:** To study the association between severity of pain in Primary Dysmenorrhea and body mass index among adolescent females.
- **Material and Methods:** Permission was taken from the institutional ethical committee of Tilak Maharashtra Vidyapeeth, Department of Physiotherapy, Pune. Sample was selected randomly on the basis of inclusion and exclusion

criteria..Pre-treatment assessment of intensity pain was taken by using Visual Analogue scale, Multidimensional Scoring System respectively.

- **Results:** Data was analyzed and the correlation between Body Mass Index and Visual Analogue scale shows poor negative correlation and the correlation between Body Mass Index and State Trait Anxiety Questionnaire shows Strong Positive Correlation
- **Conclusion:** The prevalence of dysmenorrhea in adolescent girls is very high, resulting in disruption of their social and personal activities. Our study established a poor Negative correlation between dysmenorrhea and Body MassIndex.

Keywords:(Primary Dysmenorrhea ,Body Mass Index, Visual Analogue Scale, Multidimensional scoring system, State Trait Anxiety Questionnaire)

INTRODUCTION

Adolescence is a transition period from childhood to adulthood and a period of Physical and psychological preparation for safe motherhood. This transition with many physiological changes is Especially stressful for adolescent girls, with the onset of menarche frequently related to dysmenorrhea.⁽¹⁾

The term 'dysmenorrhea' comes from the Greek meaning 'difficult monthly flow' and it is used to describe pain associated with menstruation. The condition may be primary or secondary.⁽²⁾

Menarche is that the first cycle, and therefore the mean age of menarche varies from population to population and for many girls it's found to be between 10 and 16 years.⁽³⁾ Menstrual pain usually starts each day before the menorrhea and tends to cease after one or two days of menstruation. Its also refered to as dysmenorrhea. Women get menstrual pain thanks to the discharge of prostaglandins from the uterine lining which contracts the uterus resulting in spasm and causing pain⁽⁴⁾.

Dysmenorrhea may be a gynecological disorder also refered to as menalgia, which is characterized by lower abdominal pain which can irradiate to the thighs and top and bottom of the spine. its an existing mainstream gynecologic problem which habitually affects females regardless of their age or ethnicity.⁽⁵⁾ It is usually related to nausea, headache, fatigue and diarrhea. Pain usually starts the day before or within the first cycle day and disappears at the top of the menstruation.⁽⁶⁾

The Danger factors for dysmenorrhea include menstrual factors for dysmenorrhea, parity, diet, exercises, smoking and psychological factors.⁽⁷⁾

These womens have increased uterine tone and high-amplitude contractions during menstruation leading to reduced uterine blood flow, all is due to increased endometrial prostaglandin production. The topic generates little interest among doctors, which shouldn't be the case because dysmenorrhoea is common explanation for absenteeism and reduced quality of life.⁽⁵⁾

Dysmenorrhea are often classified as: 1) Primary or Spasmodic dysmenorrhea and 2) dysmenorrhea. Primary Dysmenorrhea is defined as painful menses within the absence of any pelvic pathology. dysmenorrhea is painful menses secondary to underlying organic diseases of pelvic organs.

The uterine pain is mentioned to the cutaneous distribution of lower abdominal wall in ahead, groin, upper and medial aspects of thighs at the knees, posteriorly to the sacral area and buttocks while that from the cervix to the lower sacral area.⁽⁷⁾

Secondary dysmenorrhea is related to associated with some structural abnormality or pathology (e.g. a fibroid, endometriosis or infection).

The incidence of primary dysmenorrheal of sufficient magnitude with incapacitation is about 15-20% with the arrival of oral contraceptives and non-steroidal anti-inflammatory drugs, there is marked relief of the symptom⁽⁸⁾.

Body Mass Index or quetelet index may be a statistical measure which compares a person's height and weight. Due to its simple calculation, BMI is that most generally used diagnostic tool to spot obesity problems within a population. BMI is defined because the individual's bodyweight divided by the square of his height.⁽¹⁰⁾

BMI does not take into account many factors like frame size, muscularity, fat, bone, cartilage, etc Despite this, BMI can be calculated quickly and without expensive instruments. Hence it has been used by the WHO as the standard for recording obesity statistics for recording obesity statistics since 1980s. The WHO considers BMI < 18.5 as underweight and may indicate malnutrition, an eating disorder, or other health problems while a BMI > 25 is considered overweight. Normal BMI ranges from 18.5 to 25. Severely underweight is BMI < 16.5. Obese Class 1 is BMI between 30 and 35, Obese Class 2 is BMI between 35 and 40, and Obese Class 3 is BMI > 40⁽¹⁰⁾

Material and Methodology

Participants; 100 females with primary dysmenorrhea.

Inclusion Criteria:

- Subjects with primary Dysmenorrhea
- Females between the age group of 18-25 years
- Nulliparous females
- Women with regular menstrual cycle of 28 to 30 days

Exclusion Criteria:

- Secondary Dysmenorrhea.
- Irregular menstrual cycle/PCOS.
- Women not willing to participate.
- Women taking medications for dysmenorrhea.

OUTCOME Measures:

- Visual Analog Scale (VAS)
[ICC=0.99,95% CI 0.989 to 0.992]
- State-trait Anxiety Questionnaire
[ICC= 0.39 TO 0.89]

RESULTS

Age group	No. Of Participants
18-19	61
20-22	27
23-25	12

Table no.1: table showing the age distribution of the subjects

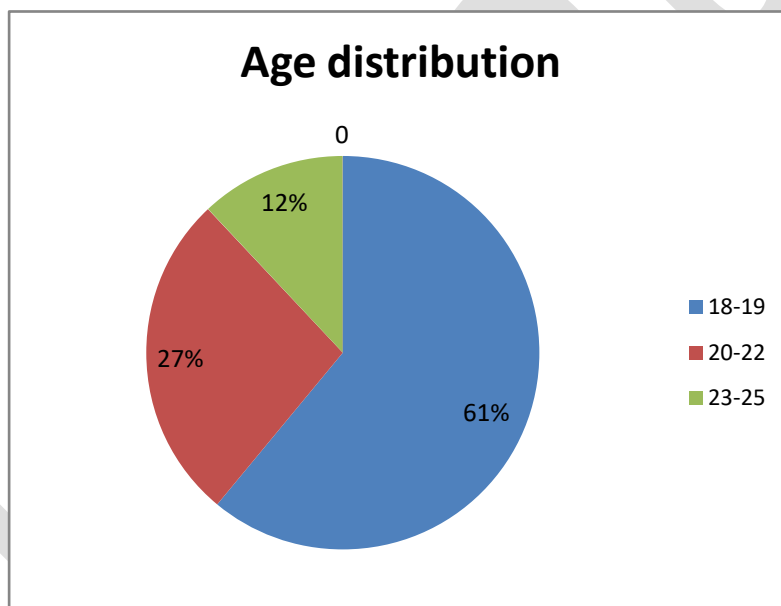


Figure 1: Pie Diagram showing percentage of the sample in various age groups.

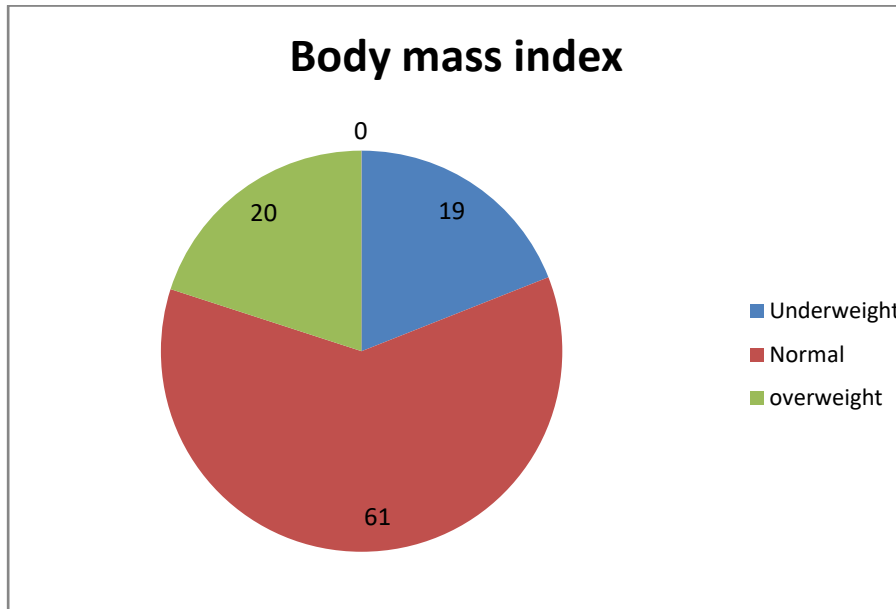
INTERPRETATION: Table 1 shows the number of participants from various age groups and Graph 1 shows Age distribution of 100 Samples in percentage. In our study the Maximum Number is 61% which is of age group between 18-19. Then 27% which is of age group between 20-22 and then 12% was in the age group between 23-25.

Mahratta

Table no 2 Showing the Body Mass Index of the Subjects

Body Mass Index	No. Of Participation
-----------------	----------------------

BMI < 18.5 (Underweight)	19
BMI = 18.5- 24.9 (Normal)	61
BMI > 25 (Overweight)	20



Graph no. 2: Pie diagram showing the distribution of Body Mass Index of the subjects.

INTERPRETATION: In our study the Pie diagram showing the distribution of Body Mass Index of subjects as there were 61 % subjects which shows Normal BMI, Underweight was 19% and the Overweight were 20%.

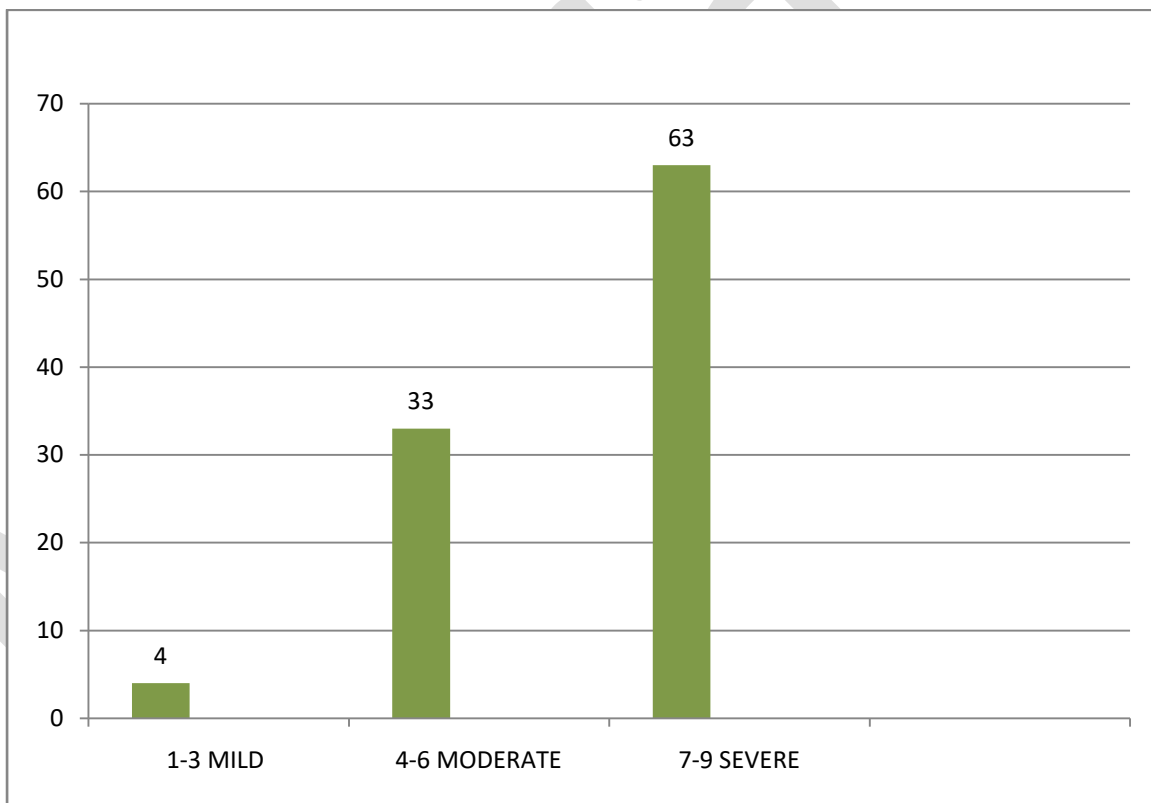
3. Visual Analogue Scale on Activity

Table no. 3: Showing Pain intensity by Visual Analogue scale on activity of subjects

VAS on activity	No. Of Participants
0 (No Pain)	0

1-3 (Mild Pain)	4
4-6 (Moderate Pain)	33
7-9 (Severe Pain)	63
10 (Worst Pain)	0

INTERPRETATION: Tabel no. 3 Graph no.3 Shows the intensity of Pain on Visual Analogue Scale of subjects. Which shows that 4% subjects have Mild Pain, Moderate distribution shows 33% subjects and severe distribution among 63% subjects



4. Table no. 4 shows the correlation between Body Mass Index and Visual Analogue Scale, Body Mass Index and State Trait Anxiety Questionnaire and Body Mass Index and Multi dimensional Scoring System.

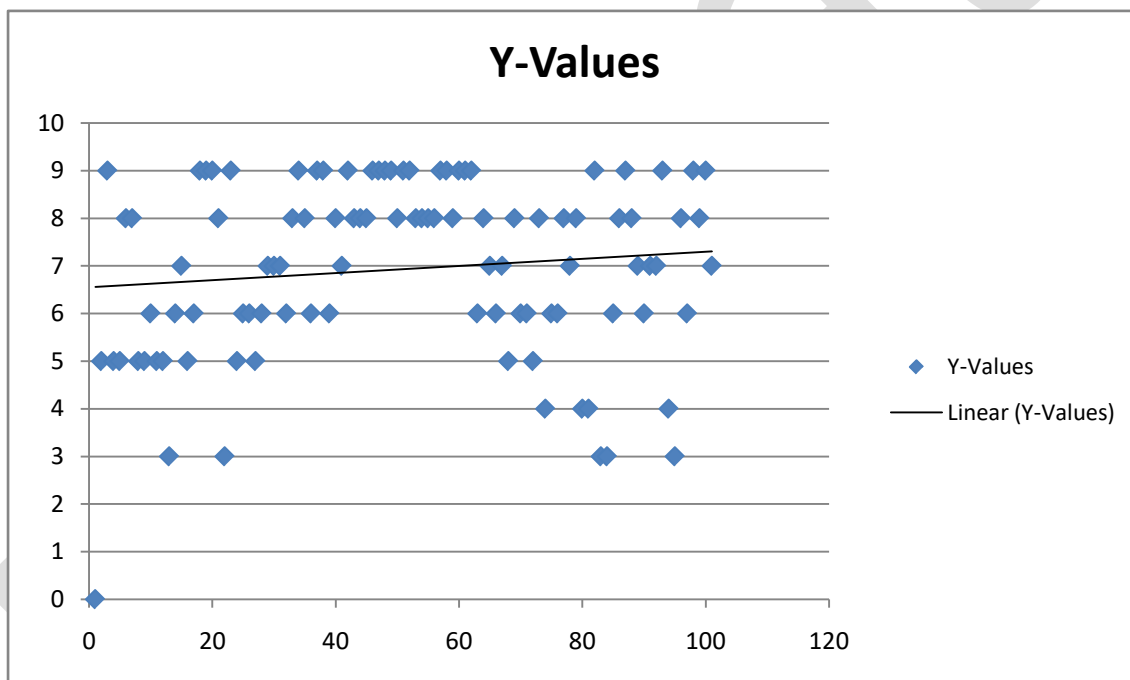
	Visual Analogue Scale	State Trait Anxiety Questionnaire	Multi-dimensional scoring system
Body mass index			
r value	-0.01908	0.155227	0.084214
p value	0.03	0.04	0.03

e			
---	--	--	--

INTERPRETATION: Table no. 4 shows the correlation between Body Mass Index and Visual Analogue Scale which shows poor negative correlation ($r = -0.01908$) ($p = 0.03$), correlation between Body Mass Index and State Trait Anxiety Questionnaire which shows the strong positive correlation ($r = 0.155227$) ($p = 0.04$) and correlation between Body Mass Index and Multi-dimensional scoring system which shows poor positive correlation

($r = 0.084214$) ($p = 0.03$)

5 Graph shows the Correlation between Body Mass Index And Visual Analogue Scale

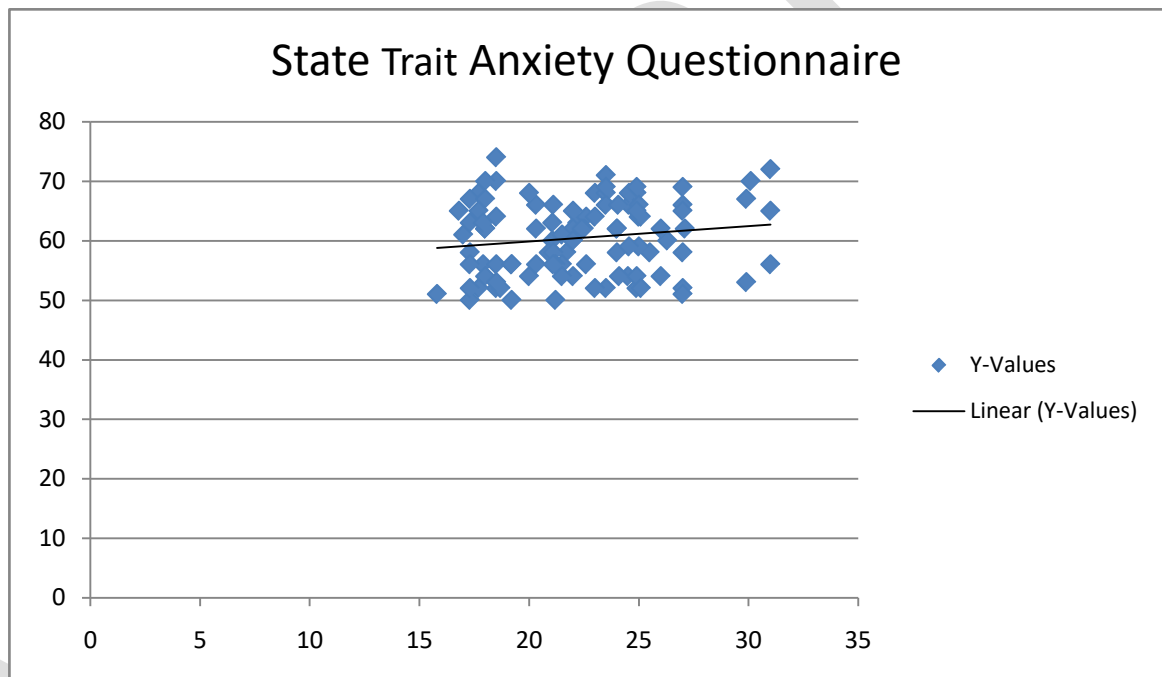


INTERPRETATION: Graph no 4 shows the Poor Negative Correlation between Body Mass Index and Visual Analogue scale.

r value= (-0.01908)

p value= 0.03

Figure no. 6 : Graph shows the correlation between Body Mass Index and STATE TRAIT ANXIETY QUESTIONNAIRE



INTERPRETATION: Graph shows the Correlation between Body Mass Index and state trait Anxiety Questionnaire which shows Strong Positive Correlation between Body Mass Index and State trait Anxiety Questionnaire

$$r= (0.155227)$$

$$p=0.04$$

DISCUSSION

The prevalence of dysmenorrhea decreases with increasing age: prevalence is highest within the 20 to 24-year-old age bracket and reduces progressively thereafter.⁽¹⁵⁾

Primary dysmenorrhea usually begins within the primary six months after menarche, once the ovulatory cycles are established. The causes of dysmenorrhea are strong uterine contractions which are usually stimulated by increased production of the prostaglandin by the liner of the uterus (endometrium).⁽⁶⁾

Primary dysmenorrhea may be a common disorder among young women, and uterine ischemia plays a crucial role in pelvic pain. Asymmetric dimethylarginine (ADMA) is accepted as a stronger marker of endothelial dysfunction.⁽²⁶⁾

Our study aims to establish the relationship between dysmenorrhea and Body Mass Index. In our study, the frequency of dysmenorrhea in overweight/ obese weight group was lower compared to other groups. In our study we found dysmenorrhea to be very high ie,63%. In our study, subjects were 100 of which 61 which is the maximum number of subjects was normal weight group, while underweight was 19 which was the minimum number of subjects and overweight/ obese was 20 in number. And the pain grading was as the maximum number of subjects was having severe pain.

Prostaglandins can also cause headache, nausea, vomiting and diarrhea. Hormonal and endocrine imbalance, uterine contractions, uterine bleeding, cervical obstruction and psychological factors are also involved in the pathophysiology of primary dysmenorrhea⁽⁵⁾

Severe dysmenorrheic pain is said to a reduced QoL in women with dysmenorehea, compared with their own pain- free follicular phase and compared with controls. Therefore,monthly dysmenorrheic pain negatively impacts QoL, specifically during menstruation.

The present study was undertaken to see the Association between severity of pain in primary dysmenorrhea and Body Mass Index among Adolescent females of age group 18-25 years. Total sampel size was 100 out of 100 BMI<18.5 ie, Underweight was 19, BMI=18.5 to 25 ie, Normal was 61, BMI >25 ie, overweight was 20 Majority of the girls in our Study were found to have Normal BMI indicating good Nutritional Status among our Adolescents.

We observed in our study that there is 45 % severe impact on activity on daily living. Which corroborates the study of svanberg and svanberg and ulmstemma⁽⁷⁾ Dysmenorrhea had its impact on the daily activities of girls leading to school absenteeism and inability to pursue routine activities and hobbies, who observed that 9% miss school and 25% limit normal activities due to Dysmenorrhea.

In our study it shows poor indirect correlation between Body Mass Index and Visual Analogue Scale as Body Mass Index. In my Study population it is shown that there is poor negative correlation between Body Mass Index and Visual Analogue Scale. Which shows R value= - 0.01908 and P value = 0.03

The study of hirata et al⁽¹⁸⁾, who found the frequency of dysmenorrhea to be greatest within the underweight group. Similarly, the study by Tangchai et al⁽¹⁹⁾ found low Body Mass Index to be significantly related to dysmenorrhea.

While the study of Hong Ju, Mark Jones, Gita Mishra⁽²⁶⁾ in their study ‘ A U-Shaped Relationship between Body Mass Index and Dysmenorrhea: A Longitudinal Study’ concluded that there is U-shaped association was revealed between dysmenorrhea and BMI, revealing a better risk of dysmenorrhea for both underweight and obese women. Maintaining a healthy weight over time could also be important for women to possess pain-free periods.

On the other hand, jalili et al. In their study reported a significant relationship between Body Mass Index and dysmenorrhea. However dysmenorrhea was not significantly associated with height, weight, age of menarche, menstrual regularity or severity of bleeding during each menstrual period .⁽²⁰⁾

In our study to check the correlation of Anxiety with Body Mass Index we used State Trait Anxiety Questionnaire to find out Anxiety in subjects with primary dysmenorrhea. State Trait Anxiety Questionnaire there were 20 questions to be asked to subjects with primary dysmenorrhea. The higher the score more the Anxiety.

In our study there's poor positive significant correlation between Body Mass Index and State Trait Anxiety Questionnaire which shows positive correlation that is R

vale is 0.155227 and P value is 0.04 our study supports the study of Gulsah Balik MD and colleagues⁽²¹⁾ in their study 'Is there a relationship between Mood disorders and dysmenorrhea' Concluded That Adolescent girls with dysmenorrhea have an greater risk of depression and anxiety. These are significant results in emphasizing the important of a multidisciplinary approach to dysmenorrhea.

Also, the study of Lorah D. Dorn and colleagues⁽²²⁾ in their study ' Menstrual symptoms in Adolescent girls: Association with smoking, depressive symptoms, and anxiety' concluded that this study smoking/anxiety are related to menstrual symptoms, which impact of depressive symptoms/ anxiety on menstrual symptoms is stronger in never smokers. The dynamic and complex nature of mood, smoking and dysmenorrhea can't be disentangled without longitudinal analyses. Efforts to scale back menstrual symptoms should begin at a young gynaecological age and include consideration of mood and smoking status.

To check the severity of pain in dysmenorrhea we used the Multidimensional Scoring System there is significant Strong positive correlation between Body Mass Index and Multidimensional Scoring System ie R value is 0.084214 and P value is 0.03

our study supports the study of Dipti Mohapatra et. al ⁽²³⁾ in their study 'A Study of Relation between Body Mass Index and Dysmenorrhea and its Impact on Daily Activities of Medical students' concluded that direct correlation between low BMI and dysmenorrhea in adolescents reflecting their poor dietary intake. The study of Alaettin unsal et al in their study ' Prevalence of dysmenorrhea and its effect on quality of life among a gaggle of female university students' found a high prevalence of dysmenorrhea(72.7%) reported among female students.

Dysmenorrhea has negative effect on health- related quality of life it is a leading explanation for school absenteeism. Dysmenorrhea is a crucial public health problem. The study of stella lacovides and colleague in their study ' Reduced quality of life when experiencing menstrual pain in women with primary dysmenorrhea' severe dysmenorrheic pain is related a reduced quality of life in women with dysmenorrhea, compared with their own pain- free follicular phase and compared with controls. Therefore, monthly dysmenorrheic pain negatively impacts quality of life, specifically during menstruation.

Conclusion: The prevalence of dysmenorrhea in adolescent girls is very high, resulting in disruption of their social and personal activities. Our study established a poor Negative correlation between dysmenorrhea and Body Mass Index..

REFERENCES

1. Anice G.J. (2005).Effect of yoga therapy on dysmenorrheal in adolescent girls. Proceeding of international conference of health science on integrated health care towards global well being, Mahavidyapeetha Mysore. 25-35
2. Margaret Polden, Jill Mantle Physiotherapy in obstetrics and gynaecology 2nd edition 2004, common gynaecological conditions, page no.289
3. Desalegn Tegabu Zegeye (2009). Age at menarche and the menstrual pattern of secondary school adolscents in northwest Ethiopia. BMC women's health.
4. Varney's. text book of midwifery. All india publishers and distributor regd,4th edition,382-383.

5. G. Tharani et.al; To compare the effects of stretching exercise versus aerobic dance in primary dysmenorrhea among collegiates. Drug Invention Today| Vol 10. Special Issue|1. 2018
6. Abbaspour Z. and Colleagues; The effect of exercise on Primary Dysmenorrhea. J Res Health Sci, Vol 6, No 1, pp. 26-31, 2006
7. Mindy Hightower; Effects of exercise participation on menstrual pain and symptoms. Aga Khan University, 9th October 2014
8. DC Dutta's textbook of Gynecology. The health science publisher 7th edition, 146.
9. ShahnazSharh-jerdy and Colleagues; Effects of stretching on primary dysmenorrhea in adolescent girls. Biomedical Human Kinetics , 4, 127-132, 2012
10. Madhubala Chauhan and Jyoti Kala, Relation Between Dysmenorrhea and Body Mass Index in Adolescents with Rural Versus Urban Variation 2012 Aug; 62(4):442-445.
11. Docanto MM, Ham S, Corbould A, Brown KA. Obesity- Associated Inflammatory Cytokines and Prostaglandin E2 Stimulate Glucose Uptake in Primary Human Adipose Stromal Cells. Journal of Interferon and Cytokine Research 2015;35(8) 600-605.
12. Omidvar S, Esmailzadeh S, Baradaran M, Basirat Z. Effect of fennel on pain intensity in dysmenorrhoea: A placebo- controlled trial. Ayu 2012; 33(2):311-313.
13. Hacker NF, Gambone JC, Hobel CJ. Hacker & Moore's Essentials of Obstetrics and Gynecology. 5th ed. Philadelphia: Sauders Elsevier;2009.
14. Renuka K, Jeyagowri S. Stretching Exercise Therapy and Primary Dysmenorrhea – Nursing Perspectives. IOSR J Nurs Heal Sci Ver III. 2015; 4: 2320-1940.
15. Dawood MY. Primary dysmenorrhea: advances in pathogenesis and management. Obstetrics & Gynecology. 2006 Aug 1;108(2):428-41
16. Svanberg L, Ulmstem U. The incidence of Primary dysmenorrhea in teenagers. Arch gynecol.1981;230:173-177.
17. Dr. Sachin M Paithankar, Dr. Deepak Hande; Effectiveness of pilates over conventional physiotherapeutic treatment in females with primary dysmenorrhea. IOSR Journal of Dental and Medical Science.
18. Hirata M, Kumabe K, Inove Y.(2002) Study of relation between frequency of menstrual pain and Bodyweight in females adolescents (artical in Japanese) Nippon Koshu Eisei Zasshi 49: 516-524.
19. Tangchai K, Titapant V, Boriboonhirunsarm D. Dysmenorrhea in Thai adolescents, prevalence, impact, and knowledge of treatment. J Med Assoc Thai. 2004;87: 569-573.

20. Jalili Z, Safi Zadeh H, Shams Poor N. Prevalence of primary dysmenorrhea in college students in Sirjan, Kerman. Payesh , Journal of the Iranian Institute for Health sciences Research 2004; 4 (1) : 61-67. (Persian).
21. Gulsah Balik M D and colleagues; is there a relationship between mood disorders and dysmenorrhea
22. Lorah D. Dorn and colleagues; Menstrual symptoms in adolescent girls: association with smoking, depressive symptoms and anxiety.
23. Dipti Mohapatra et al ; A study of relationship between Body Mass Index and dysmenorrhea and its impact on daily activities of medical students.
24. National Health Performance Authority. Health communities: Overweight and obesity rates in Australia , 2011-2012 (In focus). 2013 (cited 4 December 2014)
25. Nermin Akdemir et al; 'Increased Serum Asymmetric Dimethylarginine Levels in Primary Dysmenorrhea' Gynecol Obstet Invest.2010.

Mahratta