Assess the Relationship between Dysmenorrhea and Body Mass Index among Adolescent Girls in Selected Schools at Lucknow

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Abstract: _Objectives_: **1)** _To assess the body mass index among adolescent girls suffering from dysmenorrhea in selected schools at Lucknow._ **2)** _To assess the intensity of dysmenorrhea among adolescent girls._ **3)** _To find out the association between intensity of dysmenorrhea and body mass index among adolescent girls._ _Methodology_: _A descriptive study to assess the relationship between dysmenorrhea and body mass index among adolescent girls in selected schools of Lucknow. Total 85 adolescent girls who had attained menarche and having dysmenorrhea of the age group of 12 – 19 years, studying in Army Public School, Lal Bahadur Shastri Marg, Sardar Patel Marg, Nehru Marg Lucknow. Were selected by using purposive sampling technique Non experimental quantitative survey approach in which structured questionnaire was used for assessing the socio demographic data, assessment of body mass index and nutritional status, assessment of menstrual history multiple choice questions based on age of menarche, duration, cycle, family history of dysmenorrhea, pain and assessment of intensity of dysmenorrhea (walidd score).Descriptive and inferential statistics was used for the analysis of the tabulated data._ _Results_: _Out of 85 respondents maximum subjects belong to the age group of >13yrs-15yrs i.e. 36% and 18% belong to the group of >15yrs-17yrs. Study conducted among 85 adolescent girls who experienced dysmenorrhea The study revealed that out of 85 samples studied 11(12.9%) were under nourished, 61 (71%) had normal BMI ,7(8.3%) were overweight and 6 (7.8%) were found to be obese The dysmenorrhea was assessed using WALIDD Score and study revealed that out of 85 samples studied 32 (37.2%) had mild dysmenorrhea, 36 (42.3%) had moderate dysmenorrhea and 17 (20.5%) had severe dysmenorrhea There is a Significant association between BMI and Dysmenorrhea as the Calculated Value (X^2 =48.892) is greater than the Tabulated Value (12.59) and also the p-value (7.837e-09) is lesser than 0.05 at 95% Confidence Level with df as 6._ _Conclusion_:_The high prevalence of dysmenorrhea in our study population clearly denotes that dysmenorrhea is a significant public health problem among young adolescent girls. Since there was relationship between Dysmenorrhea and body mass index, the prevalence of dysmenorrhea reveals that some kind of education among adolescent school and college girls becomes necessary to cope with dysmenorrhea and lead a better productive life._

Keywords: dysmenorrhea, adolescents, body mass index

1. Introduction

World Health Organization (WHO) defines ―Adolescence‖ as the time period between ten and nineteen years of life characterized by critical physical and psychological changes leading to adult hood.[3] This age group requires adequate nutrition, education, counselling, and guidance to ensure their development into healthy adults. Adolescence is a transitional stage of physical and mental human development that occurs between childhood and adulthood.

Menstruation is one of the most important changes occurring during adolescent years. It occurs once in a month as a regular rhythmic period and remains as a normal physiological phenomenon from menarche to menopause.[3] Menstrual disorders are frequent among adolescent girls as they are closely coupled with the processes involved in the pubertal development of females. Dysmenorrhea refers to a cyclical lower abdominal or pelvic pain which may radiate to the back or to the thighs, occurring during menstruation. The actual word dysmenorrhea is derived from the Greek words, ―dys‖ meaning difficult, ―meno‖ meaning month, and ―rrhea‖ meaning flow. Primary dysmenorrhea usually presents during adolescence. It is unusual for symptoms to start within the first six months after menarche. Obesity can increase estrogen production, which is associated with body weight and body fat. The role of adipose tissue in controlling the balance of sex hormones is very important. The adipose tissue stores a variety of lipids that can metabolize steroids, including androgens. The prostaglandin production rate is increased after the endometrial stimulation by estrogen and progesterone. Therefore, it is hypothesized that overweight and obesity by increasing the production of prostaglandins may possibly contribute to the etiology of dysmenorrhea4.

Body mass index or quetelet index is a statistical measure which compares a person‘s height and weight. Due to its ease of calculation, BMI is the most widely used diagnostic tool to identify obesity problems within a population. BMI is defined as the individual‘s bodyweight divided by height meter squared.

Aim:
To assess the relationship between dysmenorrhea and body mass index among adolescent girls in selected schools at Lucknow.

Objectives
1) To assess the body mass index among adolescent girls suffering from dysmenorrhea in selected schools at Lucknow
2) To assess the intensity of dysmenorrhea among adolescent girls.
3) To find out the association between intensity of dysmenorrhea and body mass index among adolescent girls.

2. Methodology

A descriptive, cross-sectional, non-experimental and quantitative study. Total eighty-five adolescent girls having dysmenorrhea were selected by using purposive sampling technique, studying in Army Public School, Lal Bahadur Shastri Marg, Sardar Patel Marg, Nehru Marg. In this study data has been collected by using a web based self-administered structured questionnaire and the calculation of body mass index was done by the data provided by the participants in the form of measurement of height and weight. The tool consists of four sections including socio-demographic data, assessment of body mass index and nutritional status, menstrual history, intensity of dysmenorrhea (WaLIDD Score) The data was analyzed using both descriptive and analytical statistical methods. Web based informed consent was also taken from the parents or guardian and assent taken from subjects.

3. Discussion

The study revealed that out of 85 samples studied 11(12.9%) were under nourished, 61 (71%) had normal BMI, 7(8.3%) were overweight and 6 (7.8%) were found to be obese which is supported by the cross sectional descriptive study conducted by Beena Sachen and Ashutosh Singh that revealed that overall prevalence of undernourishment was found to be 17% and 11% respectively in urban and rural areas of Lucknow and overall prevalence of overweight was found to be 5.4% and 3.9% (BMI >85th percentile according to NCHS-CDC reference) among urban and rural school going adolescent girls, respectively. According to the study there is significance between the Body Mass Index and Dysmenorrhea as the p-value is 7.837e-09 which is < 0.05 at 95% confidence internal.

Table 1: Distribution of subjects based on BMI

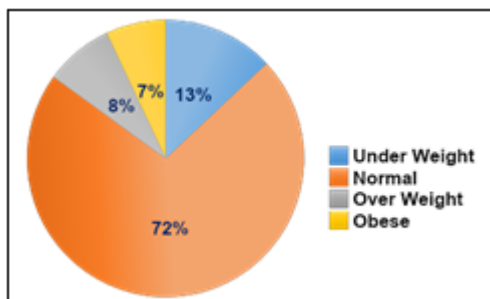| S. No.	BMI	n=85	
		Frequency	Percentage
1	Under Weight	11	13%
2	Normal	61	72%
3	Over Weight	7	8%
4	Obese	6	7%
	TOTAL	85	100%

Figure 1: Distribution of subjects based on BMI

The dysmenorrhea was assessed using WALIDD Score and study revealed that out of 85 samples studied 32 (37.2%) had mild dysmenorrhea, 36 (42.3%) had moderate dysmenorrhea and 17 (20.5%) had severe dysmenorrhea which is supported by the study conducted by the Saveeta University in feb 2020 revealed the prevalence was estimated to be 70.4% out of which 9.5% of girls had severe dysmenorrhea while 24.6 and 36.5% experienced moderate and mild dysmenorrhea respectively.
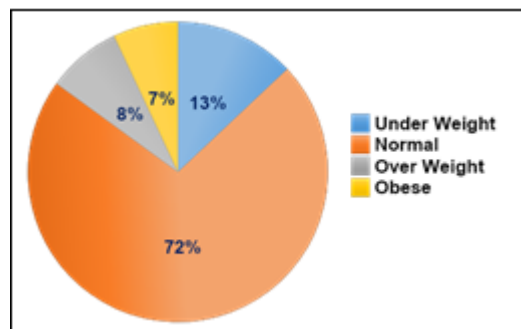

Figure 2: Distribution of subjects based on BMI

Table 2: Assessment of body mass index with dysmenorrheal

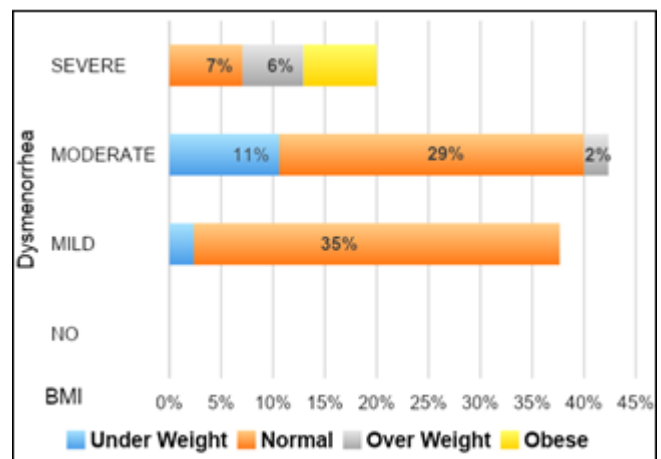| S. No.	BMI	DYSMENORRHEA									
		No		Mild		Moderate		Severe		Total	
		f	%	f	%	f	%	f	%	f	%
1	Under Weight	0	0%	2	2%	9	11 %	0	0%	11	13%
2	Normal	0	0%	30	35%	25	29%	6	7%	61	72%
3	Over Weight	0	0%	0	0%	2	2%	5	6%	7	8%
4	Obese	0	0%	0	0%	0	0%	6	7%	6	7%
	Total	0	0%	32	38%	36	42%	17	20%	85	100%

Figure 3: Distribution of subjects based on BMI & dysmenorrhea

The data presented in table - 3 represents that there is a **significant** association between BMI and dysmenorrhea as the calculated value ($x^2 = 48.892$) is greater than the tabulated value (12.59) and also the p-value (**7.837e-09**) is lesser than 0.05 at 95% confidence level with df as 6. Hence, we **reject the null hypothesis** stating that there is **dependency** between BMI and dysmenorrhea classifications.

BMI	Dysmenorrhea					df	Tab Value & X²	p-value	Remarks
	N	M	Mo	S	Total				
Under Weight	0	2	9	0	11	6	12.59 48.892	7.837e-09	Significant
Normal	0	30	25	6	61				
Over Weight	0	0	2	5	7				
Obese	0	0	0	6	6				
Total	0	32	36	17	85				

Dysmenorrhea Status	n=85
N – Normal	df: degree of freedom
M – Mild	Tab Value: As per Chi-square Table
Mo – Moderate	X^2: Calculated Value.
S – Severe	p-value: probability value
Null Hypothesis: There is no dependency between the variables Alternative Hypothesis: There is dependency between the variables	

A longitudinal study by ju *et al*. States that a u-shaped association between dysmenorrhea and bmi, revealing increased prevalence in both underweight and overweight females[2]. However, there was no increased association of the same in the under weight female students. But association was more significant for high BMI as compared to underweight population. These results are in accordance with those of Chauhan et al (2012) 4, Rupavani et al (2013)13 and Hong ju et al (2015)14 but differ from Khodakarami b et al (2015)9 who found the frequency and severity of dysmenorrhea to be higher in the normal-weight group than other subjects whereas Margaret and dash (2016)15 in their study could not elicit any association of BMI with dysmenorrhea.

4. Conclusion

The present study was conducted to assess the relationship between dysmenorrhea and body mass index among adolescent girls in selected schools at Lucknow. The statistical analysis of this study showed that there was a significant correlation between BMI and dysmenorrheal. The high prevalence of dysmenorrhea in our study population clearly denotes that dysmenorrhea is a significant public health problem among young adolescent girls. Since there was relationship between Dysmenorrhea and body mass index, the prevalence of dysmenorrhea reveals that some kind of education among adolescent school and college girls becomes necessary to cope with dysmenorrhea and lead a better productive life.

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