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Original Article

Relationship between Body Mass Index and Menstrual Irregularities among the Adolescents

Abstract:

Introduction: Menstruation, an important part of female reproductive cycle but Menstrual Irregularities in adolescent girls may affect normal life of adolescent and young adult women. The studies reported that high proportion of adolescence suffering from Menstrual Irregularities and these have been associated with Body Mass Index (BMI).

Objectives: The objective of the study was to assess the relationship between Body Mass Index and Menstrual Irregularities among the adolescents of selected schools of Dhulikhel Municipality, Nepal.

Methods and Materials: Quantitative descriptive correlational study was conducted among 253 adolescents using stratified proportionate random sampling technique. Data were collected by Self administered Questionnaire. For data analysis SPSS version 16 was used for descriptive as well as inferential statistics.

Results: The results showed, out of the 253 adolescent girls, 155(61.3%) of the respondents belonged to normal weight distribution, 58(22.9%) were under weight and 40 (15.8%) were overweight. The mean age of menarche is 13.14 ± 1.173 SD. The most common menstrual problem was dysmenorrhea (78.6%) followed by irregular menstrual cycle (38.7%). There is association between the BMI and irregular menstrual cycle (p=0.024), oligomenorrhea (p=0.027), polymenorrhea (p=0.006) and hypomenorrhea (p=0.01). There is no association between the BMI and metrorrhagia (p=0.147), secondary amenorrhea (p=0.369), dysmenorrhea (p=0.362) and menorrhagia (p=0.422).

Conclusion: Almost half of the adolescents had abnormal BMI. The most common menstrual problem was dysmenorrhea followed by irregular menstrual cycle. BMI plays a very important role to regulate menstrual cycle.

Key Words: Body Mass Index, Menstrual Irregularities, Adolescents, Nepal, Descriptive study.

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Introduction

Adolescence is transitional stage of physical and psychological human development that generally occurs during the period from puberty to legal adulthood.[1] It is the time when there is sudden changes in their body and the changes bring along problems with them. The most challenging problems are related to menstruation; in girls.[2] Menstrual cycle is a determinant of women's health. Disorders in cycle or its irregularities are a major gynecological problem among female adults, especially adolescent and a major source of anxiety to them and their family.[3]

According to WHO the BMI of age group 12 to 17 years old has raised from 5.7% on 2009 to 11.1% on 2011 around the world have had profound impact on female reproductive health.[3]

A cross sectional study conducted on prevalence of menstrual irregularities among 401 adolescent girls aged 12 – 18. Data showed that , the mean age at menarche of young girls was found to be 12.92 ± 1.41 years The menstrual flow, was found to be normal in three hundred and five (76%) of the girls, while it was scanty in twenty eight (7%) and heavy in sixty eight (17%) of the girls. Dysmenorrhea was present in two hundred and forty nine (62%) girls.[4]

A cross sectional study on Relationship of Menstrual Irregularities to BMI and nutritional status in adolescent girls", 75.51% girls with BMI 14-24.9 had a normal menstrual pattern. All sixteen girls with a BMI of 25 – 29.9 kg/m2 had infrequent cycles. A statistically significant relationship was observed between BMI and menstrual pattern.[4]

Severe and prolonged menstrual irregularities requires exploration and treatment, it may herald an incipient or pre-existing endocrinopathy, future fertility is also reduced but may be improved by preventive measures and therapy in adolescence. Identification of abnormal menstrual patterns through adolescence may permit early identification of potential health concerns for adulthood. It is, therefore, necessary to clarify what factors are associated with menstrual irregularities in order to assist in improving their quality of life.

The purpose of the study is to assess the Body Mass Index and determine the prevalence of Menstrual Irregularities among the adolescents of selected schools of Dhulikhel Municipality, Nepal. The study is also to assess the relationship between Body Mass Index and Menstrual Irregularities among the adolescents.

Methodology

This descriptive correlational study was done among 253 adolescents studying in different higher secondary school of Dhulikhel municipality, Nepal in 2014. Structured questionnaire related to demographic proforma, assessment of Body Mass Index and menstrual pattern were developed by the researcher. Validity of the instrument was established by thoroughly reviewing of the literature, consulting expertise and discussion with colleagues. Reliability test was done among 20 adolescents by using Spilt half method (r =0.80). The instrument was translated into Nepali language and pre-tested on 25 adolescents. The study used Stratified proportionate random sampling technique. The strata were chosen on the basis of different classes. Then from each stratum, the required sample size was chosen by the Lottery method. All the students were subjected to anthropometric measurements that were weight and height by using the weighing machine and measuring tape. Data was gathered by questioning technique. The collected data were reviewed daily for completeness and accuracy. For data analysis SPSS version 16 was used for descriptive as well as inferential statistics.

Result

Figure 1: Pie graph showing the percentage distribution of the Adolescents according to their BMI n=253

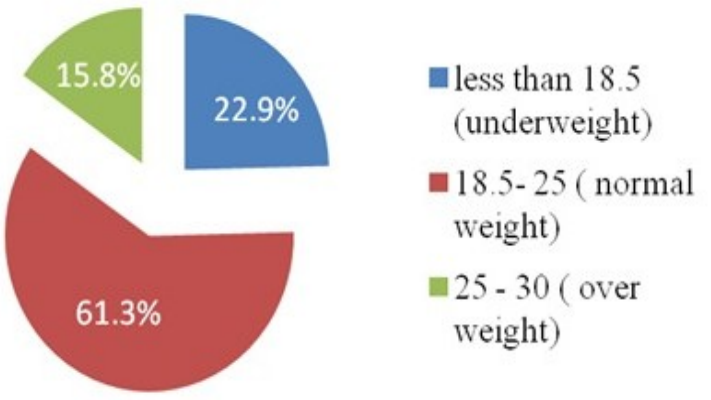

Fig. 1 shows that 61.3% of the respondents belonged to normal weight distribution, 22.9% were under weight and 15.8% were overweight.

Figure 2: Bar graph showing the percentage distribution of the Adolescents according to their Age of menarche n=253

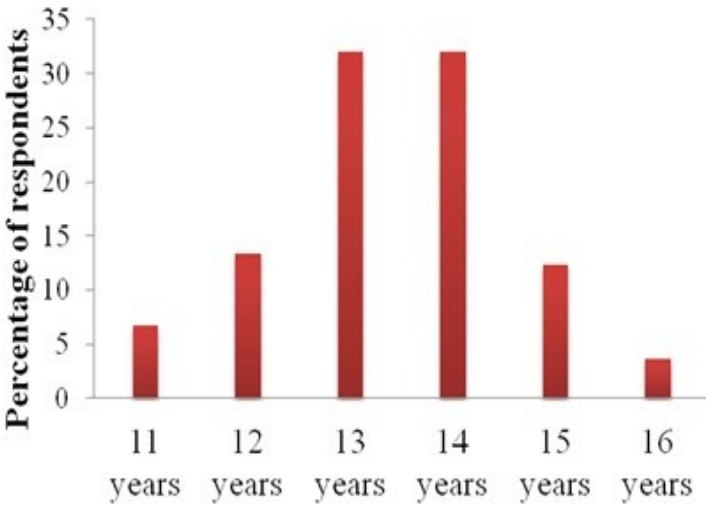

Fig. 2 shows that equal percentage i.e. 32% of the respondents has age of menarche 13 and 14 years old. The mean age of menarche is 13.14 ± 1.173 SD.

Table 1: Frequency & percentage distribution of the Adolescents according to their Menstrual Irregularities n = 253

SN	Variables	f	%
1	**Average days of menstrual cycle**		
	less than 21 days	18	7.1
	21 - 35 days	155	61.3
	more than 35 days	17	6.7
	Irregular	63	24.9
2	**Missed menstruation since 3 months**		
	Yes	2	0.8
	No	251	99.2
3	**Experience of very light menstruation**		
	Yes	11	4.3
	No	242	95.7
4	**No. of very light menstruation per year (n=11)**		
	9 times	6	54.5
	8 times	2	18.2
	6 times	2	18.2
	4 times	1	9.1
5	**Amount of bleeding**		
	Scanty	13	5.1
	Moderate	196	77.5
	Heavy	44	17.4
6	**Average days of blood flow**		
	Less than 2 days	38	15.0
	3 - 7 days	204	80.6
	More than 8 days	11	4.3
7	**Bleeding in between periods**		
	Yes	11	4.3
	No	242	95.7
8	**Frequency of bleeding in between periods (n=11)**		
	Usually	2	18.2
	Sometimes	9	81.8
9	**Experience of pain during menstruation**		
	Yes	198	78.3
	No	55	21.7
10	**Severity of the pain during menstruation (n=198)**		
	Mild dysmenorrhea	152	76.8
	Moderate dysmenorrhea	42	21.2
	Severe dysmenorrhea	4	2.0

Table 1 illustrate that most of the respondents (61.3%) has the menstrual cycle of 21-35 days. Majority of the respondents (99.2%) has not missed their periods since 3 months. Majority (95.7%) do not have experienced very light menstruation per year, while 4.3% have experienced very light menstruation per year, out of these respondents (54.5%) have had menstruation up to 9 times per year. Majority (77.5%) of the respondents had moderate amount of bleeding during menstruation. Majority of respondents (80.6%) has blood flow for 3 – 7 days. Out of 253 respondents 4.3% has bleeding in between periods and out of these respondents 81.8% has sometimes bleeding in between periods. Majority 78.3% have pain during menstruation. Out of these respondents 76.8% has mild dysmenorrhea.

Table 2: Association between BMI and Menstrual irregularities n=253

Variables	BMI of respondents (%)			p value
	< 18.5 (under weight)	18.5- 25 (normal weight)	25 - 30 (over weight)	
Presence of irregular menstrual cycle				
Yes	27.6	51	21.4	0.024*
No	20	67.7	12.3	
Presence of polymenorrhea				
Yes	50	27.5	22.2	0.006*
No	20.9	63.8	15.3	
Experience of very light menstruation				
Yes	54.5	27.3	18.2	0.027*
No	21.5	62.8	15.7	
Presence of hypo-menorrhea				
Yes	38.5	23.1	38.5	0.01*
No	22.1	63.3	14.6	
Presence of men-orrhagia				
Yes	29.5	59.1	11.4	0.422
No	21.5	61.7	16.7	
Missed menstrua-tion since 3 months				
Yes	0	50	50	0.369
No	23.1	61.4	15.5	
Bleeding in between periods				
Yes	0	72.7	27.3	0.147
No	24	60.7	15.3	
Experience of pain during menstrua-tion				
Yes	23.7	59.1	17.2	0.362
No	20	69.1	10.9	
Severity of pain during menstrua-tion (n=198)				
Mild dysmenorrhea	24.3	58.6	17.1	0.650
Moderate dysmenorrheal	19	61.9	19	
Severe dysmenorrhea	50	50	0	

Note: (*= Significant association)

Table 2 depict that BMI is significantly associated with irregular menstrual cycle, polymenorrhea, oligomenorrhea and hypomenorrhea while there is no statistically association between BMI and menorrhagia, secondary amenorrhea, metrorrhagia, dysmenorrhea and severity of dysmenorrhea.

Discussion

Out of the 253 adolescent girls, 61.3% of the respondents belonged to normal weight distribution, 22.9% were under weight and 15.8% were overweight. This is similar to the study by Deshpande H, Burute S.B, Dahiya P. in India, where maximum of 59% of girls presented with normal BMI. While 31.5% of girls had BMI of more than 25 and 9.5% girls were found to be underweight with BMI less than 18.[5]

In this study 32% of the respondents had age of menarche 13 and 14 years old, 13.40% had age of menarche 12 years, 12.30% at age of 15 years, 6.70% at age of 11 years and least i.e. 3.06% attained at age of 16years. The mean age of menarche is 13.14 years with standard deviation of 1.173 years. This study is almost similar with a study conducted to determine the prevalence and pattern of menstrual symptoms among 352 nursing students in Beirut, Lebanon, which reported age of menarche, was 14 years for 23.3% and the he mean menarche age was 13.2 (SD 1.4) years.[6]

In this study the prevalence of irregular menstrual cycle, polymenorhhea, oligomenorrhea, secondary amenorrhea and menorrhagia was 38.7%, 7.1%, 4.3%, 0.8% and 17.4 respectively, this is contrast to the study conducted in Beruit, Lebnon, where the prevalence of irregular menstrual cycle, polymenorhhea, oligomenorrhea, secondary amenorrhea and menorrhagia was 59.4%, 37.5%, 19.3%, 5.1% and 11.7% respectively.[6]

Hypomenorrhea was reported in 5.1% of the respondents, which is contrast to the study conducted by by Mohite RV, Mohite VR, Kumbhar SM, Ganganahalli P where the prevalence of hypomenorrhea is 59.56%. Where metrorrhagia was report in 27.39% of girls, in this study only 4.3% of respondents reported metrorrhagia.[7]

In this study 78.3% had dysmenorrhea, out of which 76.8% had mild dysmenorrhea, which contradicts with the study by Deshpande H in India, where out of total 200 girls, 46% girls presented with dysmenorrhea.[5]

BMI is significantly associated with irregular menstrual cycle, polymenorrhea, oligomenorrhea and hypomenorrhea while there is no statistically association between BMI and menorrhagia, secondary amenorrhea, metrorrhagia, dysmenorrhea and Severity of dysmenorrhea. This is in similar to the study in India, by Mohite RV, Mohite VR, Kumbhar SM, Ganganahalli P where there was statistical association existed between nutritional status of adolescent girls according to BMI and hypomenorrhea and there was no association between metrorrhagia, menorrhagia and secondary amenorhhea.[7]

Conclusion

The study showed that almost half of the adolescents had abnormal BMI i.e both under weight and overweight. More than half of the adolescents suffered from dysmenorrhea. Likewise, less than half of the adolescents had irregular menstrual cycle. There is association between the BMI and irregular menstrual cycle, oligomenorrhea, polymenorrhea and hypomenorrhea. BMI play a very important role for regulating menstrual cycle. So, adolescents have to take balance diet in order to maintain the normal BMI and regulate their menstrual cycle which is a determinant of women's health.

Recommendations

This study can be replicated in different setting with larger subjects. Almost half of the respondents had abnormal BMI i.e. both under weight and overweight so, further research in nutritional pattern in adolescents can be done.

Acknowledgement

First and foremost, I would like to acknowledge Institutional Review Committee (IRC), Kathmandu University School of Medical Science for giving permission to conduct the research in this subject. I am also thankful to the entire respondents without whom the research would not be successful. I am highly indebted to Mr. Kedar Manandhar (PhD Scholar, NTNU) for their statistically guidance. I am thankful to all those who have helped successfully to conduct this research.

Ethical Consideration

Verbal and written permission was obtained from institutional review committee of Kathmandu University Teaching Hospital, Dhulikhel before data collection. Verbal consent was taken from each respondent before administered questionnaire. We informed the participants they can withdraw from the study at any time without giving reason and without fear. The privacy and confidentiality of the subject was maintained throughout the study and thereafter.

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