Correlation Between Body Mass Index and Menarche among High School Students

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Abstract

Background: The present study aimed to correlate the age at onset of menarche and Body Mass Index (BMI) among high school students in Kerala. ***Objectives:*** To assess the age at onset and menarche among high school students. To assess and correlate age at onset of menarche and BMI among high school students. ***Materials & Methods:*** Quantitative approach with a cross-sectional retrospective study conducted among 200 high school girls students based on purposive sampling technique. Height, Weight, and BMI were calculated based on standard protocol and structured baseline proforma was completed including age of attainment of menarche among selected high school students through random selection. ***Results:*** The present study shows that most of the students prefer mixed dietary patterns (86%). Most of the mothers had attained their menarche at 13 years (67%). Most of the samples attained menarche at 14 years of age (40.50%). The correlation coefficient between BMI and age of attainment of menarche was -0.18. ***Conclusion:*** It is a moderately negative correlation since it lies between -1 and 0. The study concluded that there is no correlation found between age at the onset of menarche and BMI, also no association between age at the onset of menarche and BMI.

Keywords: Age and menarche; Body Mass Index; High school students

Introduction

The menstrual cycle is a regular occurrence that takes place during a woman's reproductive years and involves anatomical, functional, and hormonal changes in the reproductive system. Menarche, a cyclical event, marks the beginning of a female's active reproductive life, which ends with the onset of menopause. Reduced levels of estrogen and progesterone, particularly progesterone after the monthly ovarian cycle, and the effect of gonadotrophins via hypothalamus-pituitary activity are the causes of menstruation [1].

Menses' is caused by the reduction of sex hormone and Lipo-Lutin, particularly Lipo-Lutin at the tip of the monthly female internal reproductive organ cycle, and is influenced by the gonadotrophins through the hypothalamic-pituitary activity.

Menarche is a crucial milestone within the development of feminine adolescents not like alternative time of life changes that square measure gradual and continuous start could be a distinct event with a abrupt and dramatic onset. It's thought of a definite benchmark for sexual maturation. It's additionally thought of as associate indicator of quality of life of a population since a variety of biological and socio-economic factors influence [2].

The common age at the start ranges from twelve–fifteen years among totally different populations. It is a sensitive marker of varied population indices together with diet patterns, socioeconomic standing, geographical location, and environmental conditions. High BMI (obesity) in childhood has been connected to the danger of early onset of pubescence and menarche. This has been known because of the factor within the decline within the onset of pubescence and eventually menarche in industrial nations and other regions with nutritionary and socioeconomic statuses [3].

Need for the Study

Early onset of menarche is the starting of menstruation before the age of 12 or less than or equal to 10. Estrogen and testosterone in a child's body cause this type of precocious puberty. Early puberty can have positive and negative outcomes. early menstruation may be associated with lower self-esteem control and better attention.

Women who experience menarche before 12 years of age have a 23% higher role of developing breast cancer than those who first menstruate at 15 years of age. Girls who experienced early menarche are significantly more often associated with overweight or obesity [4].

The frequency of childhood obesity, early menarche and puberty, and racial and ethnic variations in how BMI affects young women's reproductive characteristics worldwide all call for ongoing assessment [5].

Statement of the problem

A study to assess the age at onset of menarche and BMI among high school students in a selected high school, Kannur district, Kerala.

Objectives of the study

- To assess the age at onset and menarche among high school students.
- To assess the BMI among high school students.
- To correlate age at onset of menarche and BMI among high school students.
- To associate age at the onset of menarche and BMI with selected demographic variables.

Hypotheses

H_0: There is no significant relationship between age at onset of menarche and BMI.

H_1: There is a significant association between age at onset of menarche and BMI.

Materials and Methods

This study was based on a quantitative approach with the design of a cross-sectional retrospective study among high school girls students in the Kannur district of Kerala state. The girls' students studying in 8th, 9th, and 10th standard were recruited for the study based on the purposive sampling technique.

The study was conducted for the period of one month in January 2023 in selected Government schools of Kannur district. After obtaining institutional permission, 200 girls students selected through purposive sampling were assessed with baseline data of the age at onset of menarche and BMI through semi-structured interviews. Data collection was done through structured baseline proforma including mothers' history developed by the investigator and validated by the experts. The collected data was analyzed using descriptive and inferential statistics based on the objectives and hypothesis of the study.
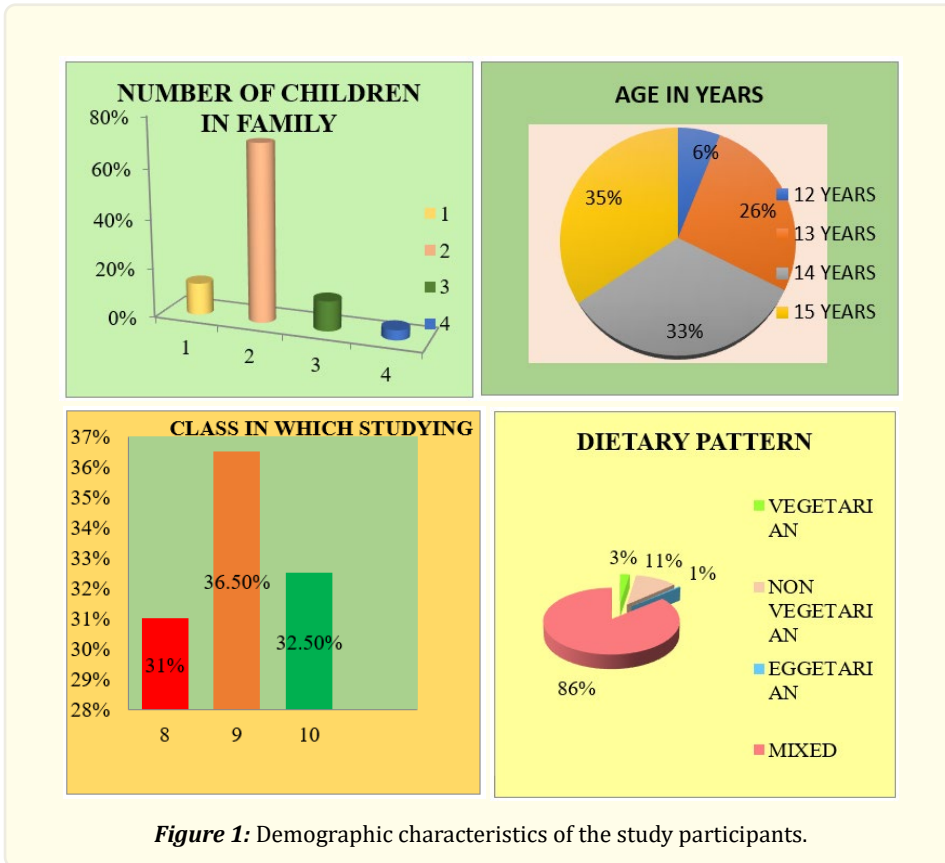
Inclusion Criteria

Girl's students studying in government high schools and attained with menarche, who are willing to participate in the study.

Exclusion Criteria

Girls with non-attainment of menarche with other menstrual issues.

Results of the Study

Figure 1: Demographic characteristics of the study participants.

The above Figure depicts that 71% of the samples have 2 children in the family, 13% of the samples have 1 child in the family, 12% of the families have 3 children in the family and 4% of the samples have 4 children in the family. 15 years constituted 35% and 33% constituted 14 years of age.

About dietary patterns, 86% of the samples had mixed dietary patterns, 11% of the samples were non-vegetarian, 3 % of the samples were vegetarian and 1% were eggetarian. Most of the students 36.5% study in 9th standard.

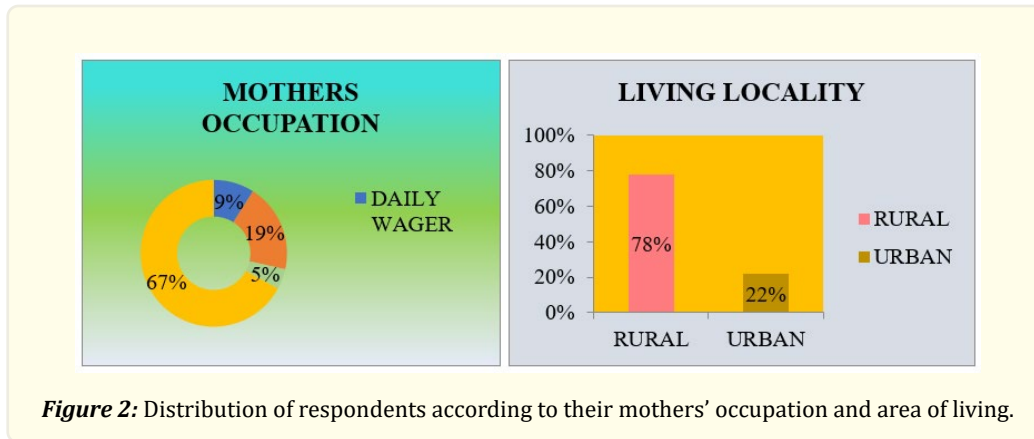*Figure 2:* Distribution of respondents according to their mothers' occupation and area of living.

Figure 3 shows that most of the sample (67%) were housewives, 20% of the samples were employed, 9% of the samples were daily wagers and 5% were self-employed. Majority of the (78.50%) samples were living in rural locality and 21.50% of the samples were living in urban locality.
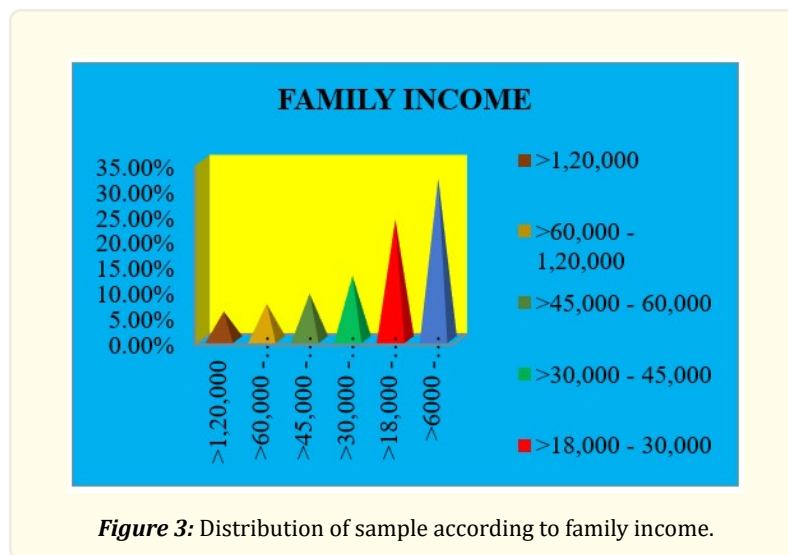

Figure 3: Distribution of sample according to family income.

Figure 3 shows that 5.50% of samples have>120,000 family income, 7% of samples have >60,000 -1, 20,000 family income, 9% of samples have>45,000–60,000 family income, 12.50% of samples have>30,000 – 45000 family income, 23.50% samples have >18,000 – 30,000 family income, 31.50% samples have >6,000–18,000 family income, 11% samples have >6,000 family income.

Figure 4: Distribution of sample according to their participation in play.
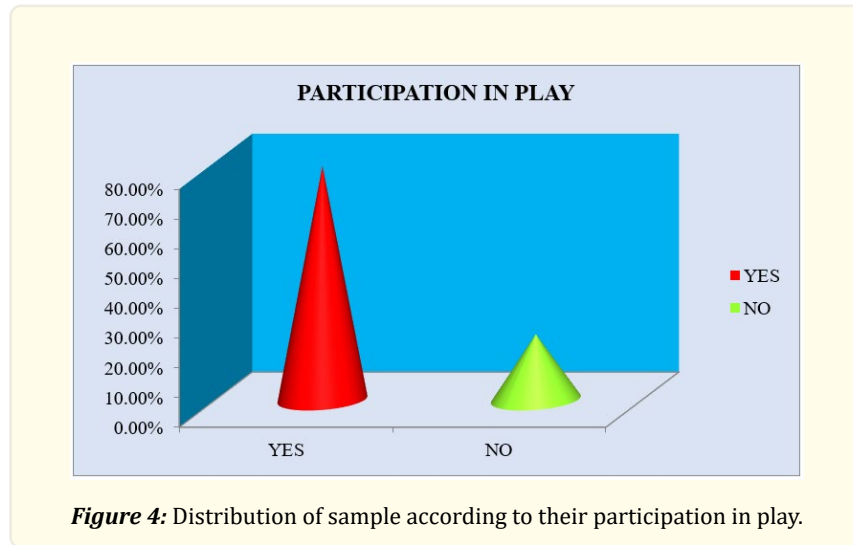
It shows that the majority (78.50%) of the samples have participated in play, 21.50% of samples have not participated in the play.

Figure 5: Distribution of mothers according to their age of onset Menarche.
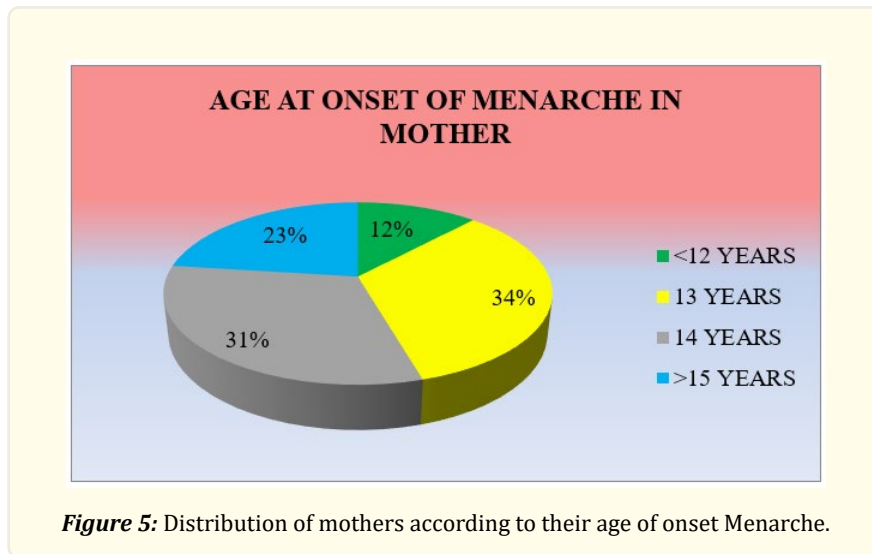
Age of onset of menarche of mothers, 34% of samples had age at onset of menarche in mothers at 13 years, where 31% of samples had age at onset of menarche in mothers at 14 years, 23% of samples had age at onset of menarche at >15 years, where 12% of samples has age at onset of menarche at <12 years.
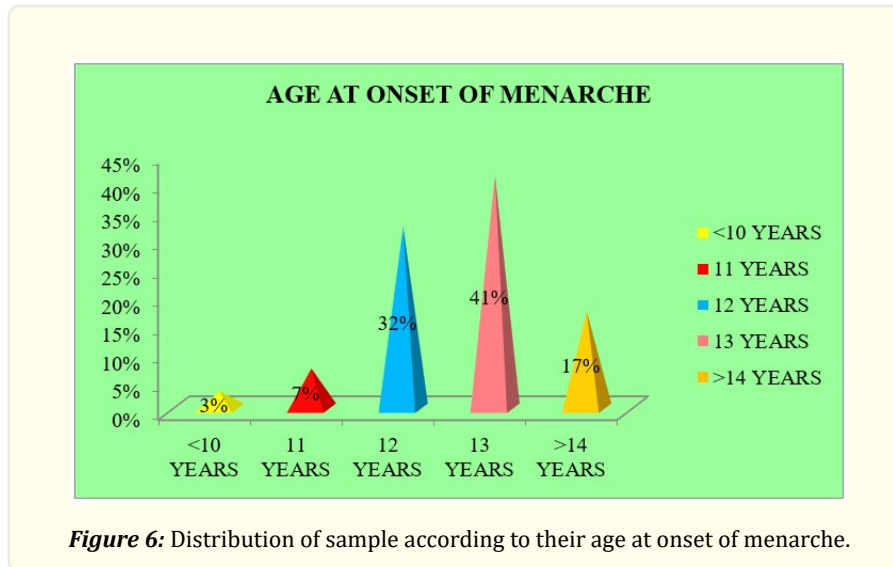
Figure 6: Distribution of sample according to their age at onset of menarche.

Figure 6: explains that majority of the (41%) of the samples aged at the onset of menarche at 13 years, where (32%) of the samples aged at the onset of menarche at 12 years, 17% of the samples aged at the onset of menarche at >14 years, where 07% of samples has age at onset of menarche at 11years, where 3% of samples has age at onset of menarche at <10 years.

Variables	Correlation Coefficient	Inference
Age at onset of Menarche	-0.18	Negative Correlation
Body Mass Index		

Table 1: Correlation between age at onset of menarche and Body Mass Index. n = 200.

The data presented in Table 1 shows the correlation between age of at the onset of menarche and BMI. The correlation coefficient is -0.18. It is a moderately negative correlation since it lies between -1 and 0. Hence there is no correlation between age at the onset of menarche and BMI.

Variables	Body Mass Index			df	Chi-Square	Inference
Age at onset of Menarche	<18	18- 24.9	>24.9			
9	4	2	0	8	0.132	NS
11	7	8	0			
12	26	34	3			
13	34	50	2			
15	14	15	1			

Table 2: Chi-square value for age of Menarche and Body Mass Index. n=200.

Table 2 projects the chi-square calculation for the variables of the age of menarche and Body Mass Index. The calculated chi-square value 0.132 was not statistically significant at 0.05 level with all variables. Hence, The study concluded that there is no correlation found between age at the onset of menarche and BMI, also no association between age at the onset of menarche and BMI.

Nursing Implications

The nursing implication of the study could be discussed under nursing education, nursing practice, nursing administration and nursing research.

Nursing Education and Practice

Nursing is addressed into the requirement of the health care system for meeting the health needs of society. As a nurse educator, can educate adolescent girls regarding the importance of early menarche, menarcheal age, hormonal variations, BMI and pubertal changes. The student nurse can create motivation among the adolescent girls regarding alternative and complementary therapy.

Nursing administration

As nurse administrators, promote through providing adequate funds by half yearly and quarterly.

Nursing research

The essence of research is to build a body of knowledge in nursing. The study findings opened the opportunities for further research into the problem. As a nurse researchers can include the broader aspect of adolescent girls like increasing the sample size, simulation-based nursing etc.

Limitations

The limitations of the present study were:

1. The study is delimited to adolescent girls.
2. The study is conducted in selected high schools.
3. The sample size of the study was limited to 200 adolescent girls.

Recommendations

1. A similar study can be carried out on a larger sample.
2. A comparative study can be conducted to assess the age at onset of menarche and BMI among adolescents in urban and rural areas.
3. An orientation programme can be conducted to parents and teachers regarding age at onset menarche and BMI in adolescent girls and measures to prevent common problems seen during this period.
4. Awareness programme for adolescent girls regarding healthy eating habits and regular exercise.
5. Monitor the height, weight and BMI in every month.

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Conflict of interest

The authors declares that no conflict of interest.

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