

# FACTORS ASSOCIATED WITH EARLY ONSET OF MENARCHE AMONG ADOLESCENT GIRLS OF SELECTED SCHOOLS AT BAGALKOT- DESCRIPTIVE CASE-CONTROL STUDY

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## Abstract

**Background of the study:** Menarche is called the first menstrual period; it is a fundamental episode in the progress of teenage female adolescent at the age of puberty. Regardless of other juvenile changes that are steady and uninterrupted. It is a different event with an unexpected beginning. The moment of menarche is a significant determinant of populace size, propagative performance, and different constant outcomes such as reproductive organs cancers and furthermore, it is a vital factor in wellbeing setting up. Genetic factors May affect the menarche, i.e. race, ecological circumstances, nourishment, bodily action, geographic place, city or village home, health condition, emotional factors.

**Objectives of the study:** 1) To assess the factors associated with early onset of menarche in case and control group among adolescent girls. 2) To find out the association between factors associated with early onset of menarche in the case control and group among adolescent girls with their selected socio demographic variables.

**Materials and Methods:** A descriptive case - control study was conducted selected school of Bagalkot, Karnataka. The data was collected form Adolescent girls studying in selected schools during the study period, Sample will be selected by Disproportional stratified Sampling technique by using a self report method with structure questionnaire about factors associated with early onset of menarche.

**Outcome:** An illustrations of 200 (98 cases and 102 controls) subjects were integrated in the learning. Findings shows that Mode of delivery, Weight, Play outdoor games, Prefers reading book, Sleep pattern, Reads news paper every day, Age, studying class, type of family, Education of mother, Source of information, were significantly associated with early onset of menarche among adolescent girls.

**Conclusion:** By focusing over connected things with early menarche, the investigator identifies factors associated with early beginning of menarche between adolescent girls. It helps to defeat this difficulty and further investigation study is essential with huge range sampling and awake the factors associated with early menarche.

Keyword: Adolescent Girls, Associated Factors, Menarche, Body Mass Index, Pregnancy

## INTRODUCTION

In girls, the initial menstrual period is known as menarche, it indicates the commencement of the capability to procreate and it is related with the development of secondary sexual features. Menarche is vital significant landmark in girl's life. The most important cycles tend to be an ovulatory and differ broadly in length. They are regularly effortless and happen with no caution. Menarche occur among the ages of 10 and 16 years.<sup>1</sup> Menarche is an significant highlight in the progress of a female teenager

with a altered standard for sexual maturation.<sup>2</sup> The primary menstrual phase is called menarche which is a very important occasion in the development of female adolescents' puberty. In spite of other pubertal changes that are steady and uninterrupted, menarche is a different occasion with a unexpected beginning. The timing of menarche is an important determinant of size of populace, reproductive routine, and other chronic outcomes such as neoplasm of the reproductive organs furthermore, it is an significant feature in health planning Menarche is exaggerated

by hereditary factors, race, ecological circumstances, nourishment, physical activity, geographic place, city or village house, health grade, emotional factors, blindness, body mass index (BMI), family dimension, socioeconomic position, parental educational stage, profession of parents, loss of parents, teen sexual abuse, physical stress, tea utilization, and submissive smoking.<sup>3</sup> premature menarche is connected in the company of physical and psychosocial inconvenience such as fear/sadness, stuff use, and suicidal activities in young people. It can also reason to premature fusion of the epiphyseal development plates; hence, the adolescent final adult height may be shorter than her possible heritable height.<sup>4</sup>

Early menarche has been connected with earlier time at initial sexual intercourse (3–7). Single probable mechanism in which early menarche may result in earlier age at first sexual intercourse is that girls who experience menarche at younger ages may appear older, have older friends, and be more likely to engage in unsafe behaviours like missing school, smoking, and drinking (8–11). The younger the age at first menstrual period and first sexual intercourse, the longer the interval young girl will potentially use at possibility risk of pregnancy.<sup>5</sup> In Puberty, adolescents have to face an evolution period in which physiological development occurs. Premature pubertal development could be associated with advanced risks of deprived health. The purpose of this study was to examine risk behaviours, physical and psychological determinants connected with early menarche (<11years)<sup>6</sup>. An early age of menarche has been linked with numerous health problems such as breast cancer; Collaborative Group on Hormonal Factors in Breast Cancer, and cardiovascular disease. Further, both early and late Age of menarche may be connected with difficult pregnancy outcomes such as spontaneous abortions; and ectopic pregnancies.<sup>7</sup>

## NEED FOR THE STUDY

Menarche is the onset of first menstruation in life time, it may occur any time between 10 and 16 years, the peak time being 13 years. The endometrium which proliferates due to stimulation of ovarian estrogen sheds when the level (of estrogen) drops and visible bleeding occurs. The first period is usually anovular and ovulation may be irregular for a variable period following menarche. The menses may be irregular and short to start with and it may take about 2years for regular ovulation occur.<sup>8</sup> In India 1/5th of total population is Adolescents (10-19 years). Among girls, this is a special period which signifies the transition from girlhood to womanhood and is marked with the beginning of menarche.<sup>9</sup> The standard age of menarche as per the studies is 12.77years. Numerous studies have reported age at puberty and Menarche' to have declined in developed countries and the decline has also been noted in developing countries.<sup>10</sup> before time beginning of menarche is one of the mainly essential factor for breast cancer and other linked health complications. Prevalence of age at menarche among school girls age10–12 years among the selected girls, 187 (48.45%) already reached menarche, and 199 (51.55%) girls did not get menarche. The percentage of menarcheal girls was 25%, 41.0%, and 58.3% by their age 10, 11, and 12 respectively current way of life changes may have the vital factors for early age at menarche of the studied girls in Bangladesh.<sup>13</sup>

As it is evident from the above stated recent statistical facts and it is clear that there is a need to conduct a study on factors related with early beginning of menarche among adolescents. Hence, student researcher has planned to investigate the present study.

## OBJECTIVES

1. To assess the factors associated with early onset of menarche in case and control group among adolescent girls.
2. To determine the factors associated with early onset of menarche by comparing the factors in case and control groups
3. To determine the association between early onset of menarche among adolescent girls with their selected socio demographic variables

## Hypotheses:

**H<sub>1</sub>:** There is a significant difference in the factors influencing for early onset of menarche in cases and control,

**H<sub>2</sub>:** There is significant association between early onset of menarche in cases-controls with their selected socio-demographic variables among adolescent girls.

## METHODOLOGY:

**Source of Data:** The data was collected from adolescent girls studying in selected school at Bagalkote. **Research Design:** A Descriptive Case- Control Design was used to conduct present Study Setting: S.B Patil High school and Anjuman urdu school ,Bagalkot. **Sample:** Adolescent girls studying in 7th,8th, and 9<sup>th</sup> standard in S.B Patil High school and Anjuman urdu school at Bagalkot. **CRITERIA FOR SELECTION OF SAMPLE:** **Cases:** Age group below 13 years adolescent girls those who are willing to participate. Adolescent girls attained menarche. **Controls:** Age group 13 and above years adolescent girls those who are willing to participate, adolescent girls not attained menarche. **Sampling Technique:** Disproportional Stratified Random sampling technique was used to select the samples in the present study. **Sample size:** Sample Size was 200 Adolescent girls. (98 cases and 102 controls) **Estimated sample size:** Total sample size is 200 **Method of data collection:** Self-report method was used to collect the data. **Tools for data collection:** A semi structured questionnaire was used to collect the data of factors associated with early onset of menarche. Structured questionnaires were used for collection of socio-demographic characteristics of the adolescent girls. **Testing of the Tool:** **Content Validity:** Content validity of the tool established by obtaining the suggestion from the experts. The tool was validated by 2 experts, Dr. Nagarathna kuntoji professor and Dr. Keerti Associated professor from the department of OBG.SNMC and HSK Hospital Bagalkote, Karnataka. Minor modifications were made on the basis of their suggestions. After consulting guide the final tool was reframed. **Pretesting of the Tool:** Modified instrument was administered to 20 Adolescent girls. Minor modifications were in wording of some of the questions based on the needs of the subjects otherwise no such difficulty was faced by adolescent girls in understanding the questions. **Reliability of the Tool: Pilot Study:** The pilot study was conducted between 01/11/2023 and 04/11/2023 to determine the feasibility of the study and study was found to be feasible. **Data collection procedure: Phase I:** Official authorization was taken from the principal of B.V.V.S. Sajjalashree Institute of Nursing Science Bagalkote, Headmasters of S B Patil High school and Anjuman urdu School Bagalkot to obtain the information. **Phase II:** Adolescent girls were selected on the base of inclusion and exclusion criteria and eligible subjects were included in the study. **Phase III:** Printed consent was taken from the adolescent girls. **Phase IV:** Customized questionnaire was administered to the adolescent girls to assess the factors associated with early onset of menarche. Around 30-35 adolescent girls were interviewed per day to collect the data.

**ETHICAL CONSIDERATION:**

Ethical approval certificate was taken from Institutional ethical committee of B.V.V.S. Sajjalashree Institute of Nursing Sciences Bagalkote. Written consent was obtained from every participant.

**DATA MANAGEMENT AND STATISTICAL ANALYSIS:**

Obtained information was managed by using MS Excel – 2007. Arithmetical information gathered from the subjects was structured and summarized with the help of descriptive statistics like frequency, percentage, mean, Standard deviation. A simple portion was done for all applicable variables studied. The Proportions of the relevant associated factors were compared with socio-demographic variables. Significant will be ascertained by using Chi square test with significance of 0.05.

**Result;** Shows that the percentage wise distribution of samples according to Age at menarche. There were 49% of girls were less than 13 years consider cases and 51% of girls were more than 13 years consider as control group of the present study.

**Table no 1: Distribution of Cases and controls according to their demographic data.** N=98+102=200

Si No.	Socio demographic factors	Characters	Cases (N1-98)		Control (N2-102)	
			Freq	%	Freq	%
1	Age	11 years	3	3.06%	-	-
		12 years	29	29.5%	1	0.9%
		13 years	28	28.5%	10	9.8%
		14 years	25	25.5%	40	39.2%
		15 years	12	12.2%	43	42.1%
2	Study class	6 <sup>th</sup>	33	33.6%	2	1.9%
		7 <sup>th</sup>	19	19.3%	2	1.9%
		8 <sup>th</sup>	19	19.3%	34	33.3%
		9 <sup>th</sup>	27	27.5%	64	62.7%
3	Place of Residence	Urban	30	30.6	37	36.2%
		Rural	68	69.3	65	63.7%
4	Monthly Income	Below 10,000	55	56.1%	73	71.5%
		10-15,000	27	27.5%	20	19.6%
		15-20,000	11	11.2%	6	5.8%
		20 Above	5	5.1%	7	6.8%
5	Religion	Hindu	49	50%	47	46%
		Muslim	31	31.6%	32	31.3%
		Christian	11	11.2%	15	14.7%
		Others	7	7.1	8	7.8
6	Type of family	Nuclear	52	53%	79	77.4%
		Joint	46	46.9%	23	22.5%
7	Education of father	Non-formal	16	16.3%	12	11.7%
		Primary	43	43.8%	55	53.9%
		Secondary	22	22.4%	28	27.4%
		Above secondary	17	17.3%	7	6.8%
8	Education of mother	Non-formal	11	11.2%	14	13.7%
		Primary	43	43.88%	66	64.7%
		Secondary	35	35.7%	15	14.7%
		Above secondary	9	9.1%	7	6.8%
9	Source of information about early onset of menarche.	Yes	48	48.9%	69	67.6%
		No	50	51%	33	32.3%

**Table 1: Description of Socio demographic variables:** the percentage wise distribution of samples according to the age of the girls. In case group 29.5% girls were in age group 12years, In control group 43% of girls were in age group of 15 years.distribution of samples according to the studying class of the girls. In case group 33.6% girls were in class 6<sup>th</sup>, In control 62.7% of girls were in age group of 9<sup>th</sup> year. distribution of samples according to the place of residence of the girls. In case

group 69.3% girls were in rural, in control 63.7% girls were in rural, samples according to family monthly income. In cases, 56.1% had family monthly income below Rs 10000, In controls there were 71.5% family had monthly income Below Rs 10000, distribution of subjects based on their religion. In cases, 50% of girls are comes under religion of Hindu, In controls, 46% of girls are Hindus, samples according to the type of family of the girls. In case group 53 % girls were belongs to nuclear family, in control group 77.4 % girls were belongs to nuclear family,subjects based on their father education. In cases, 43.8% had primary education, In controls, 53.7% had primary education, percentage wise distribution of subjects based on their mother education. In cases, 11.2 had non-formal education, 43.88% had primary education, In control, 64.7% had primary education,

Table 2 shows the Percentage wise distributions of cases and control according to their physical factors.

**Table No: 2. Percentage wise distributions of cases and control according to their physical factors.**

Physical factor	Characteristics	Cases		Control	
		Freq	%	freq	%
Mode of delivery	Normal	28	28.5	36	35.2
	Cesarean	14	14.2	4	3.9
	Don't know	56	57.1	62	60.7
Height in cm	Less than 140cm	23	23.4	16	15.6
	140-150cm	31	31.6	31	30.39
	150-160cm	14	14.2	43	42.1
Girls weight	160cm and above	3	3.06	12	11.76
	less than 40kg	62	63.2	61	59.8
	40 - 50kg	17	17.3	34	33.3
	50 - 60kg	15	15.3	4	3.9
Frequent exercise	60 kg and above	4	4.08	3	2.9
	Yes	45	45.9	43	42.1
On any medications	No	53	54	59	57.8
	Yes	6	6.1	4	3.9
Childhood illness	No	92	93.8	98	96.07
	Yes	13	13.2	11	10.7
Practice dance	No	85	86.7	91	89.2
	Yes	42	42.8	35	34.3
Play outdoor games	No	56	57.1	67	65.6
	Yes	90	91.8	82	80.3
Ride bicycle	No	8	8.1	20	19.6
	Yes	80	81.6	72	70.5
Prefers reading book	No	18	18.3	30	29.4
	Yes	76	77.5	93	91.1
Sleep pattern before menarche	No	22	22.4	9	8.8
	<6 hours	19	19.3	37	36.2
	>6 hours	79	80.6	65	63.7

**Table No: 3. Percentage wise distributions of cases and control according to their Environmental factor.**

S. No	Environmental factor	Characteristics	Cases		Control	
			freq	%	Freq	%
1	Read news paper everyday	Yes	21	21.4	39	38.2
		No	77	78.5	63	61.7
2	Attend sexual awareness programme	Yes	59	60.2	61	59.8
		No	39	39.7	41	40.1
3	Migrated by other place	Yes	17	17.3	14	13.7
		No	81	82.6	88	86.2
4	Watch TV everyday	Yes	73	74.4	71	69.6
		No	25	25.5	31	30.3
5	Daily use internet	Yes	74	75.5	71	69.6
		No	24	24.4	31	30.3
6	Use of mobile everyday	Yes	65	66.3	65	63.7
		No	33	33.6	37	36.2

**Table No4: Percentage wise distributions of cases and control according to their family factor.**

S No	Family factor	Characteristics	cases		Control	
			Freq	%	Freq	%
1	No of family members	less than 10	80	81.6	93	91.1
		11 to 20	15	15.3	7	6.8
		21 to 30	3	3	1	0.9
2	Staying with parents	Yes	91	92.8	94	92.1
		No	7	7.1	8	7.8
3	Parents separated	Yes	19	19.3	24	23.5
		No	79	80.6	78	76.4
4	Have any elder sister	Yes	32	32.6	39	38.2
		No	66	67.3	63	61.7
5	Who is more concern	Father	17	17.3	24	23.5
		Mother	20	20.4	13	12.7
		Both	61	62.2	65	63.7

**Table No5: Percentage wise distributions of cases and control according to their Nutritional factor.**

S NO	Nutritional factor	Characters tics	Cases		Control	
			freq	%	freq	%
1	Eat fruits on most day	Yes	80	81.6	78	76.4
		No	18	18.3	24	23.5
2	Eat vegetables on most day	Yes	90	91.8	90	88.2
		No	8	8.1	12	11.7
3	Consume milk product	Yes	69	70.4	74	72.5
		No	29	29.5	28	27.4
4	Eat fast food	Yes	73	74.4	80	78.4
		No	25	25.5	22	21.5
5	Skip dinner 3times/week	Yes	26	26.5	38	37.2
		No	72	73.4	64	62.7
6	Eat sweets most of day	Yes	71	72.4	79	77.4
		No	27	27.5	23	22.5
7	Diet	Vegetarian	22	22.4	24	23.5
		Non vegetarian	76	77.5	78	76.4

**Table no 6. Association between Physical factors and early onset of menarche.**

S NO	Physical factor	DF	Chi-value	Table value	Remark
1	Mode of delivery	2	6.28	5.9	Significance
2	Height in cm	3	6.68	7.81	NS
3	Girls weight	3	12.24	7.81	Significance
4	Frequent exercise	1	0.28	3.84	NS

5	On any medications	1	0.15	3.84	NS
6	Childhood illness	1	0.29	3.84	NS
7	Practice dance	1	0.01	3.84	NS
8	Play outdoor games	1	5.4	3.84	Significant
9	Ride bicycle	1	3.34	3.84	NS
10	Prefers reading book	1	7.08	3.84	Significance
11	Sleep pattern	1	7.06	3.84	Significance

Chi- square was calculated to find out the association between Physical factors and girls where the Chi- square calculated value is less than table value for **Height in cm, Frequent exercise, On any medications, Childhood illness, Practice dance, Ride bicycle**, so there is no significant association found between above characteristics. **Mode of delivery, Girl's weight, Play outdoor games, Prefers reading book, Sleep pattern:** for these Calculated value is more than the table value which shows that there is significant association between these socio demographic variable of girls with early onset of menarche. (Table No 3-6)

**Table no 7. Association between environmental factors and early onset of menarche.**

S NO	Environmental factor	DF	Chi-value	Table value	Remark
1	Read news paper everyday	1	6.72	3.84	significance
2	Attend sexual awareness programme	1	0.03	3.84	NS
3	Migrated by other place	1	0.5	3.84	NS
4	Watch TV everyday	1	2.9	3.84	NS
5	Daily use internet	1	0.8	3.84	NS
6	Use of mobile everyday	1	0.14	3.84	NS

Chi- square was calculated to find out the association between Environmental factors and girls where the Chi- square calculated value is less than table value for **Attend sexual awareness programme, Migrated by other place, Watch TV every day, Daily use internet, Use of mobile every day**, so there is no significant association found between above characteristics. **Read news paper every day:** Calculated value is 6.72 (T. value 3.84) more than the table value which shows that there is significant association between girls who Read news paper every day with early onset of menarche among girls. (Table No 7)

**Table no 8. Association between family factor and early onset of menarche.**

S NO	Family factor	DF	Chi-value	Table value	Remark
1	No of family members	2	3.89	5.99	NS
2	Staying with parents	1	0.03	3.84	NS
3	Parents separated	1	0.5	3.84	NS
4	Have any elder sister	1	0.47	3.84	NS
5	Who is more concern	1	2.8	3.84	NS

Chi- square was calculated to find out the association between family factors of girls and early onset of menarche where the Chi- square calculated value is less than table value for **No of family members, Staying with parents, Parents separated, Have any elder sister**, so there is no significant association found between above characteristics. (Table No 8)

**Table no 9. Association between Nutritional factor and early onset of menarche.**

S NO	Nutritional Factor	DF	Chi-value	Table value	Remark
1	Eat fruits on most day	1	0.8	3.84	NS
2	Eat vegetables on most day	1	0.7	3.84	NS
3	Consume milk product	1	0.11	3.84	NS
4	Eat fast food	1	0.43	3.84	NS
5	Skip dinner 3times/week	1	2.64	3.84	NS
6	Eats sweets most of day	1	0.66	3.84	NS
7	Diet	1	0.03	3.84	NS

Chi- square was calculated to find out the association between Nutritional Factors and girls where the Chi- square calculated value is less than table value for **Eat fruits on most day, Eat vegetables on most day, Consume milk product, Eat fast food, Skip dinner 3times/week, Eats sweets most of day, Diet pattern**, so there is no significant association found between above characteristics. (Table No 9)

**Table no 10: Association between early onset of menarche with socio-demographic variable.**

S NO	Socio-demographic variable	DF	Chi-value	Table value	Remark
1	Age	3	63.5	7.8	Significant
2	Studying class	3	59.7	7.81	Significant
3	Place of Residence	3	0.77	7.81	NS
4	Monthly Income	3	6.4	7.81	NS
5	Religion	3	0.63	7.81	NS
6	Type of family	1	13.5	3.84	Significant
7	Education of father	3	7.3	7.8	NS
8	Education of mother	3	13.2	7.8	Significant
9	Source of information	1	7.1	3.84	Significant

Chi- square was calculated to find out the association between socio demographic factors of girls with early onset of menarche where the Chi- square calculated value is less than table value for **Place of Residence, Monthly Income, Religion, Education of father**, so there is no significant association found between above characteristics. **Age, Studying class, Type of family, Education of mother, Source of information**: for these Calculated value is more than the table value which shows that the there is significant association between these socio demographic variable of girls with early onset of menarche. (Table 10)

## DISCUSSION OF FINDINGS

The present case control descriptive study was conducted with the aim of find out association between factor affecting early onset of menarche among girls Study comprised sample of 200subjects selected using convenient sampling technique In present study collects data from girls regarding age of onset of menarche based on data girls who are developed early onset of

menarche below 13 years consider as cases and more than 13 years. Findings of the present study on shows that Chi- square was calculated to find out the association between Physical factors and girls where the Chi- square calculated value is less than table value for Height in cm, Frequent exercise, On any medications, Childhood illness, Practice dance, Ride bicycle, so there is no significant association found between above characteristics and for **Mode of delivery, weight, Play outdoor games, Prefers reading books, Sleep pattern**, found significant. Association between Environmental factors and girls where the Chi- square calculated value is less than table value for Attend sexual awareness programme, Migrated by other place, Watch TV every day, Daily use internet, Use of mobile every day, so there is no significant association found between above characteristics but for the characteristic of **Read the news paper 6.23(table value 3.84)** found significant association. For the association between family factors of girls and early onset of menarche where the Chi- square calculated value is less than table value for No of family members, Staying with parents, Parents separated, Have any elder sister, so there is no significant association found between above characteristics.

For the association between Nutritional Factors of girls where the Chi- square calculated value is less than table value for all characteristic Eat fruits on most day, Eat vegetables on most day, Consume milk product, Eat fast food, Skip dinner 3times/week, Eats sweets most of day, Diet pattern, so there is no significant association found between above characteristics. Chi- square was calculated to find out the association between socio demographic factors of girls with early onset of menarche where the Chi- square calculated value is less than table value for Place of Residence, Monthly Income, Religion, Education of father, so there is no significant association found between above characteristics. But for the **Age, Studying class, Type of family, Education of mother, Sours of information**, found significant. Present study was supported by the similar study was conducted by Dr Anusha Rashmi, Assistant Professor, Department of Community Medicine, K S Hegde Medical Academy, P.O Nityanandanagar, Deralakatte, Mangalore, Karnataka. life style, animal proteins etc are factors that influence menarche. Likewise a declining trend in age at menarche has been noticed over the past few years. This study was taken up with the objectives to study factors that are associated with menarche in study population. Hence a school-based cross-sectional study was conducted between January 2019 to April 2019 among children studying in Government and Private high school. for the same which showed the mean age of menstruation was 12.5 years. It was significantly influenced by milk intake ( $p < .05$ ). Mothers' age at menarche was also found to be significantly associated with their daughters' age at menarche. Conclusion was this study provides an insight into determining factors affecting age of menarche, focusing on dietary and maternal factors. Milk consumption was found to be an important factor.

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