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Socio-Demographic Determinants of Age at Menarche among Female Students: A Study of Khulna University in Bangladesh

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Abstract
Age of menarche is an important indicator of sexual maturation which depends much on various social, environmental, and hereditary factors. Menarche age is also an indicator of health status of a population. Therefore the importance of approaching menarcheis evident as literature reagardingmenarche in Bangladesh is hardly found.This cross sectional study aims to determine the socio-demographic determinants of age at menarche from social, economic, and demographic aspects.This study used recall method to obtainmenarcheal age and body sizein a group of 289 students at the Khulna University of Bangladesh. Responses about socio-demographic characteristics, and physical activity were gathered by respondents' self-administered questionnaire.Additionally, the study examined pearson's chi-square and bivariate correlation between age at menarche and social, economic, and demographic factorsthat set out that age. Mean age at menarche (± SD) was 12.84 ± 1.25. Thechi-square test found that age at menarche was positively associatedwith mother's education, monthly family income, monthly amount of health expenditure, height and weight during age at menarche, maternal age at menarche, gynecological problem, maternal use of hormonal contraceptives. But birth weight, health status, monthly amount of health expenditure were not statistically significant with menarcheal age.The findings of the study recommendedrespondents to increase their knowledge about the proper management of menarche through self-effort and to consult doctors of nearest clinic or medical center, and the responsible departments of governmento initiate effective training program on menarche management.

Keywords: Socio-demographicdeterminants,age at Menarche,socio-economic and reproductive status.

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I. Introduction

Reproductive capacity of girls begins from menarchesignifyingseveralpubertal changes (Karapanou & Papadimitriou, 2010). Basically, the interaction between genetic and environmental factors determines the early time of menarche (Karapanou & Papadimitriou, 2010).There are significant influences of early reproductive characteristics such menarcheal age on later health outcomes of girls (Barsom, Dillaway, Koch, Ostrowski, & Mansfield, 2008). It is seen thatadolescent with a taller, heavier greater body fat mass tended to reach menarche at younger age (S. Chowdhury et al., 2000).Hossain, Islam, Aik, Zaman, and Lestrel (2010) have investigated age at menarche of university students in Bangladesh.They gathered information from female residential students at the University of Rajshahi, Bangladesh and have discovered that heavier female students arrive at menarche sooner than slender ones.Additionally, they have discovered that early menarche has been related with home area at puberty, religion and mother's schooling.

Normally, age at menarche demonstrates the time that shows total pre-juvenile openness of young girls to either unfavorable climate, for example, food insecurity or well-to-do everyday environments(Belachew et al., 2011). Beginning stage of menarche might be a marker for regenerative wellness or, at any rate, a marker for the beginning of childbearing years(Riley, Huffman, & Chowdhury, 1989) with some health challenges as well.

A decent number of exploratory works have been carried out with age at menarche on an overall premise. Karapanou and Papadimitriou (2010)have detailed elite of elements which are related with age at menarche.Wronka and Pawlińska-Chmara (2005)proposed that financial, social and demographic variables might be significant indicators for age at menarche. Experts demonstrated that age at menarche is related with stature, weight, body mass index (BMI) and menstruation disturbance(Bharati & Bharati, 1998).Frisch and Revelle (1970)showed that age at menarche may be identified with attainment of appropriate weight for reproduction instead of suitable skeletal status.Okasha, McCarron, Smith, and McEwen (2001) found that the nature of the relationship between menarcheal age and adult anthropometric measures may be important in understanding the significance of the impacts of menarcheal age on illness in later life. There arealso adverse consequences for teenage girls who are unprepared and uninformed about menarche.

Again, they experienced confusion and ambivalence toward menstruation and sexuality and exhibit negative self-image and emotional reactions to menarche (Joan & Zittel, 1998). Though people across cultures have become relatively frank and open in their attitudes toward sexual matters, some are still uncomfortable talking about menstruation and regard it as taboo (McGrory, 1990).Researchers also noted that menstruation is surrounded by stereotypes, taboos, and folklore, and they argued that the understanding of menstruationshould also attend to menstrual beliefs within a specific cultural context (Chandra & Chaturvedi, 1992).

Menarche is a critical occasion for getting sorted out adolescent girls' mental self-view and sexual recognizable proof(Koff, Rierdan, & Silverstone, 1978).Moreover, adolescent girls frequently receive knowledge about period from their mother, school, fellows, and advertisements of sanitary products (Koff & Rierdan, 1995). However, these sources of information tend to emphasize physiological and practical aspects of the menstrual cycle and introduce menstruation as a hygiene crisis that should be hidden from others. Little is dealt with women's emotional needs and anxieties about menarche and menstruation (Whisnant & Zegans, 1975).

It is also the time when some deasease may have potential spaces to affect a person e.g. breast cancer (Kelsey, 1993),pelvic inflammatory disease and spontaneous abortion (Helm, Münster, & Schmidt, 1996) and ischemic heart disease (Cooper et al., 1999). At the same time, postponed menarche may too influence the conceptive capacity with risks towards unpredictable periods and low pinnacle bone mass(Anai, Miyazaki, Tomiyasu, & Matsuo, 2001).

Therefore it is evident that the age at beginning of the menstrual cycle (menarcheal age) is a significant period in life of a an adolescent girls. Additionally it a significant pointer for potentials and illnesses even like breast cancer (Kelsey, 1993). And thus the present study has been designed to find out the factors affecting age at menarcheincorporating the female residentialstudents of Khulna University, Bangladesh.

II. Methods and Materials

A cross sectional study was carried out between June to November 2019 among two residential ladies' halls of Khulna University, Bangladesh. These two hallsaccommodate a total population of about 1170. The female residential halls were purposively selected for this study as the field area. All students attending undergraduate and post graduate with symptoms of menarche were enrolled through purposive sampling. The study sample was 289 out of a study population of 1170. A semi-structured questionnaire was used in the sudy as the questionnaire which was piloted among 20 students. The respondents were toself-administe the questionnaire. Before that, the respondents were given instructions by the idata collectors on questionnaire fill upskills. The respondents were also informed about the the research ethics and the objectives of the study.The questionnaire contained the following key variables: age of the respondents, age at menarche, marital status of respondents,religion, family size, family type, occupation of father and mother, family income, educational status of respondents, educational statusof mother and father.

The menarcheal age and body size of respondents were determined using the recall method. Participants who responded positively were asked to recall the exact year and month of menarche. Various probesand local tools were used for recalling the year and month of menarche, such as grades attended when menstruating, different social and national events, local event calendars, and personal events. The research team informed the hall authority of khulna university that allowedand permitted to contact the students as well their parents for the queries. The respondents' parents were also informed about the study. The respondents were also required toprovide a written consent before participating in the interview. Data were analyzed using SPSS statistical program version 17 (SPSS Corp. Texas, USA). Association between age at menarche and social, economic, and demographic status were explored using chi-square tests and and bivariate correlation.

III. Result Discussion

Table: 1 Socio-demographic information of the respondents

Age	**Frequency**	**Percent**	
18-20	56	19.4	
21-23	187	64.7	**Mean 21.81**
23 <	46	15.9	**&**
Total	289	100.0	**Std. 1.58**
Educational status of the respondents	**Frequency**	**Percent**	
Honors 1st year	51	17.6	
Honors 2nd year	80	27.7	
Honors 3rd year	69	23.9	
Honors 4th year	62	21.5	
Masters	27	9.3	
Total	289	100.0	
Religious affiliation	**Frequency**	**Percent**	
Islam	213	73.7	
Sanatan	76	26.3	
Total	289	100.0	
Age at menarche	**Frequency**	**Percent**	
Early (9-11)	32	11.1	**Mean 12.84**
Normal (12-14)	236	81.7	&
Late (15-17)	21	7.3	**Std. 1.258**
Total	289	100.0	
Class of starting menses	**Frequency**	**Percent**	
4-6	26	9.0	**Mean 7.05**
6-8	244	84.4	**&**
9-10	19	6.6	**Std. 1.09**
Total	289	100.0	
Number of siblings	**Frequency**	**Percent**	
0	12	4.2	**Mean 2.43**
1-3	228	78.9	&
4-6	49	17.0	**Std. 1.174**
Total	289	100.0	
Order of birth	**Frequency**	**Percent**	
1	129	44.6	**Mean 1.90**
2-3	140	48.4	&
4-5	20	6.9	**Std. 1.01**
Total	289	100.0	
Fathers' education	**Frequency**	**Percent**	
PSC	9	3.1	
SSC	34	11.8	**Mean 14.41**
HSC	52	18.0	&
Honors	113	39.1	**Std. 3.45**
Masters	81	28.0	
Total	289	100.0	
Fathers' occupation	**Frequency**	**Percent**	
Service holder	120	41.5	
Business	106	36.7	
Others	63	21.8	
Total	289	100.0	
Mothers' education	**Frequency**	**Percent**	
PSC	13	4.5	
SSC	84	29.1	**Mean 12.36**
HSC	91	31.5	&
Honors	60	20.8	**Std. 3.54**
Maters	41	14.2	

Total	289	100.0	
Mothers' occupation	**Frequency**	**Percent**	
Working	84	29.1	
Non-working	205	70.9	
Total	289	100.0	
Monthly family income	**Frequency**	**Percent**	
≥20000	77	26.6	
20001-40000	139	48.1	**Mean 34366.78**
40001-60000	54	18.7	&
60001-80000	16	5.5	**Std. 17848.62**
80001-100000	3	1.0	
Total	289	100.0	
Monthly family health expenditure	**Frequency**	**Percent**	
< 10000	281	97.2	**Mean 3819.03**
10001-20000	7	2.4	&
20001-30000	1	.3	**Std. 3357.24**
Total	289	100.0	
Involved in regular physical activity	**Frequency**	**Percent**	
Yes	102	35.3	
No	187	64.7	
Total	289	100.0	
Additional nutrient intake in childhood	**Frequency**	**Percent**	
Yes	169	58.5	
No	120	41.5	
Total	289	100.0	

The table 1 represents socio-demographic information of the respondents. The findings revealed thatmost (64.7 %) of the students belong to the age group 22-23 years and their mean age were 21.81±1.58 years. It was noticeable that81.7 % of the respondents belong to normal (12-14 years) age at menarche while mean menarcheal age of female students at Khulna University was 12.84 ± 1.25 years,which was less than the value of 12.88 years found in 1979 for Bangladeshifemales by (Ogata, 1979). Another study after two decades found that themean menarcheal age of Bangladeshi females was 13.00±0.98 years(Chowdhury, Huffman, & Curlin, 1977).The study also revealed that only 11.1 percent of the students' age at menarche was early (9-11 years) and 7.3 percent students' age at menarche was late (15-17 years).

Similarly, Malitha et al. (2020) identified early age at menarche 10-12 years in their study based on the girls of Rajshahi district, Bangladesh. Tayebi, Yazdznpanahi, Yektatalab, Akbarzadeh, and Zare (2018) showed in their study that early age at menarche was 9-10 years, normal age at menarche was 12-13 years and late age at menarche was 15yaers. Again, Wilson, Derraik, Rowe, Hofman, and Cutfield (2015) found that early age at menarche was ≤11 years, normal age at menarche was >12 years and late age at menarche was ≥14 years. However, it was found that most (73.7 percent) of the female students were Muslim and only 26.3 percent students were Hindu. A study by Hossain et al. (2010). found that female Muslim studentstended to reach menarche earlier than Hindu students. A similar result was found byA. A. Chowdhury et al. (1977). The study showed that larger number (84.4 %) of the students' menarche started in class 6-8. But only 6.6 percent students' menarche started in class 9-10. The average class of starting their menses was 7±1.09. Whereas, Surana et al. (2020) found that the average class of starting menarche in India was class 9-10.

The data showed thatmore than two-third (78.9 %) of the students had 1-3 brothers or sisters. And 48.4 students had second or third orders of birth among their brothers or sisters. Data revealed that 41.5 percent occupation of their father was govt. or non govt. service and 36.7 percent were businessmen. Besides, it was found that 39.1 percent students' father had completed graduation and only 3.1 percent students' father had completed Primary School Certificaes. The mean of their fathers' year of schooling was 14.41±3.45that indicated Honors level. On the other hand, mothers' education is an influencing factor for age at menarche of the female students. Here data showed that 31.5 percent year of schooling of their mother was HSC level and only 4.5 percent year of schooling of their mother was PSC level. The mean of the year of schooling of their mother was 12.36±3.54 that indicated HSC level.

Findings showed that 70.9 % of the students' mother was the housewives. A study demonstratedby Hossain *et al*.(2010). Found that mother's educational level and occupation had a significant influence on their daughter's age at menarche. However, a similar study conducted on female university students in Portugal (Padez, 2003) found no association between a girl's age at menarche and her parents' educational level and occupation.In this study, notable number (48.1%)of the students' monthly household income was 20001 to 40000 BDT. And only 1 percent students' monthly household income was 80001 to 100000 BDT. The average of their monthly family income was 34366.78±17848.62 BDT.

It was surprising that 97.2 % of the students' household monthly health expenditure was < 10000BDT and the average of their household health expenditure was 3819.03±3357.24. It was found that significant number (64.7 %) of the students was not involved in regular physical activity. Moreover, more than half (58.5 percent) of the students had additional nutrientsupliments and food (minerals, vitamins supliments and horlicks, complan) intake in childhood.

Table 2: Reproductive information of the respondents

Variables	Frequency (%)	Statistics Mean & Std.
Birth Weight (in kg)		
Low	42 (14.5)	
Normal	217 (75.1)	
High	30 (10.4)	
Health Status		
Good	85 (29.4)	
Normal	170 (58.8)	
Low	34 (11.8)	
Height during Age at Menarche (Feet)		
3.00-3.11	6 (2.1)	
4.00-4.11	185 (64.0)	**4.4 & 0.5**
5.00-5.11	98 (33.9)	
Duration of Breast Feeding (in year)		
Less than 2 years	90 (31.1)	
2 - 3	187 (64.7)	**1.94 & 0.75**
More than 3 years	12 (4.2)	
Weight during Age at Menarche (kg)		
20-32	16 (5.5)	**40.93 & 5.62**
33-45	224 (77.5)	
45 <	49 (17.0)	
Maternal Age at Menarche (in year)		
≤ 10	1 (0.3)	
11-13	120 (41.5)	**13.73 & 1.396**
14-16	168 (58.1)	
Body Mass Index (BMI)		
Underweight (≤ 18.4)	78 (27.0)	
Normal (18.5 – 24.9)	177 (61.2)	
Overweight (25.0-29.9)	30 (10.4)	**20.53 & 3.63**
Obese (30.0-39.9)	3 (1.0)	
Very obese (40.0 ≤)	1 (0.3)	
Gynecological Problems		
Yes	57 (19.7)	
No	232 (80.3)	
Maternal Use of Hormonal Contraceptives		
Yes	82 (28.4)	
No	207 (71.6)	
Experience of Smoking		
Yes	17 (5.9)	
No	272 (94.1)	

The above table represents reproductive information of the respondents. Data revealed that most (75.1 2 %) of the female students had normal birth weight. On the other hand, only 14.5 percent and 10.4 percent

students had the low and high birth weight. Besides, more than half (58.8 2 %) of the students' health status was normal. On the other hand, 29.4 percent and 11.8 percent students had good and low health status. Again, data revealed that a large portion (64.0 2 %) of the students was 4.00-4.11 feet long during age at menarche, on the other hand, only 2.1 percent student students' height was 3.00-3.11 feet. And their average height during age at menarche was 4.4±0.5.

Findings showed that most (64.7 2 %) of the students' duration of breast feeding was 2-3 years. And only 4.2 percent students' duration of breast feeding was more than 3 years. The mean of duration of their breast feeding was 1.94±0.75. It was found that 77.5 % of the students had 33-45 kg weight during their age at menarche and their average weight during their age at menarche was 40.93±5.62. Data revealed that more than half (58.1 %) of the students' maternal age at menarche was 14-16 years and their average maternal age at menarche was 13.73±1.396. Moreover in this study, 61.2 % students was found to have normal BMI. And finally, 27 percent students had underweight besides this 10.4 percent students had Overweight but only 0.3 percent students were very obese. The study followed BMI index criteria that Surana et al. (2020) showed in their study.

Findings of the study show that, the average BMI of the students was 20.53±3.63.Besides, a large portion (80.3 %) of the students had no gynecological problem (heavy periods or abnormal bleeding, pelvic pain, uterine fibroids, endometriosis, vaginal discharge) and most (71.6 %) of the students' mother didn't use hormonal contraceptives. Almost all (94.1 %) of the students were found to be non-smokers whereas only 5.9 students used to smoke. Among the students who used to smoke were mostly (80 %) passive smokers and only 20 percent students were the active ones.

Socio-demographic Status

Age at Menarche and its Covariates (Chi-Square Test)

Independent Variables	Age at Menarche			X^2	*P* value
	Early 9-11	Normal 12-14	Late 15-17		
Number of Siblings					
No sibling	2 (18.2)	9 (81.8)	0 (0.0)		
1-2	22 (13.8)	127 (79.9)	10 (6.3)	5.425[a]	.246
3-4	8 (6.7)	100 (84.0)	11 (9.2)		
Mother's Education					
PSC	0 (0.0)	13 (100.0)	0 (0.0)		
SSC	16 (19.0)	56 (66.7)	12 (14.3)		
HSC	7 (7.7)	83 (91.2)	1 (1.1)	30.870[a]	.000[**]
Honors	1 (1.7)	54 (90.0)	5 (8.3)		
Masters	8 (19.5)	30 (73.2)	3 (7.3)		
Monthly Family Income					
≤ 20000	9 (11.7)	60 (77.9)	8 (10.4)		
20001-40000	11 (7.9)	120 (86.3)	8 (10.1)		
40001-60000	9 (16.7)	42 (77.8)	3 (5.6)	15.485[a]	.05[*]
60001 80000	1 (6.3)	13 (81.3)	2 (12.5)		
80001-100000	2 (66.7)	1 (33.33)	0 (0.0)		
Family's monthly amount of Health Expenditure					
≤ 10000	28 (10.0)	233 (82.9)	20 (7.1)		
10001-20000	4 (57.1)	2 (28.6)	1 (14.3)	16.908[a]	.002[**]
20001-30000	0 (0.0)	1 (100.0)	0 (0.0)		

*P ≤ 0.05; **P ≤ 0.01, Fishers exact test reported (expected cell less than 5), a=chi-square value, b= Fisher exact test value.

The table represents the relationship between the socio-demographic status of female students and age at menarche. The findings of chi-square tests identified that mother's education, monthly family income, monthly amount of health expenditure all were statistically associated with their age at menarche (p<.01&<.05). On the contrary, number of siblings was not significantly associated with age at menarche of the students.Data also revealed that the students who had 20001 to 40000 BDT monthly family income, among them the notable number (86.3%) of the students age at menarche were normal. Besides this, it was found that the students who had ≤ 10000BDTmonthly amount of health expenditureamong them the significant number (82.9%) of the students age at menarche were also normal. The students' mother who hadPSC level of education among all them age at menarche was normal.

Reproductive Status

Age at Menarche and its Covariates (Chi-Square Test)

Independent Variables	Age at Menarche			Test Statistics	*P* value
	Early 9-11	Normal 12-14	Late 15-17		
Birth Weight					
Low	7 (16.7)	29 (69.0)	6 (14.3)		
Normal	23 (10.6)	179 (82.5)	15 (6.9)	8.159[a]	.086
High	2 (6.7)	28 (93.3)	0 (0.0)		
Health Status					
Good	11 (12.9)	69 (81.2)	5 (5.9)		
Normal	14 (8.2)	144 (84.7)	12 (7.1)	6.478[a]	.166
Low	7 (20.6)	23 (67.6)	4 (11.8)		
Height during Age at Menarche					
3.00-3.11	0 (0.0)	3 (50.0)	3 (50.0)		
4.00-4.11	25 (13.5)	151 (81.6)	9 (4.9)	20.855[a]	.000[**]
5.00-5.11	7 (7.1)	82 (83.7)	9 (9.2)		
Weight during Age at Menarche					
20-32	4 (25.0)	8 (50.0)	4 (25.0)		
33-45	23 (10.3)	189 (84.4)	12 (5.4)	13.789[a]	.008[**]
45 <	5 (10.20	39 (79.6)	5 (10.2)		
Maternal Age at Menarche					
≤ 10	0 (0.0)	0 (0.0)	1 (100.0)		
11-13	16 (13.3)	98 (81.7)	6 (5.0)	14.796[a]	.005[**]
14-16	16 (9.5)	138 (82.1)	14 (8.3)		
Gynecological Problem					
Yes	12 (21.1)	40 (70.2)	5 (8.8)		
No	20 (8.6)	196 (84.5)	16 (6.9)	7.755[a]	.021[*]
Maternal Use of Hormonal Contraceptives					
Yes	15 (18.3)	62 (75.6)	5 (6.1)		
No	17 (8.2)	174 (84.1)	16 (7.7)	6.118[a]	.047[*]

*P ≤ 0.05; **P ≤ 0.01, Fishers exact test reported (expected cell less than 5), a=chi-square value, b= Fisher exact test value.

The table represents the relationship between the reproductive status and age at menarche of the students. The findings of chi-square tests identified that students' height and weight during age at menarche, maternal age at menarche, gynecological problem, maternal use of hormonal contraceptives were significantly associated with their age at menarche (p<.01&<.05). But birth weight and health status were not statistically significant with age at menarche of the students.

The findings revealed that the respondentshaving normal birth weight had high percentage of age at menarche (82.5 %). An itwas normal than who had the low and high birth weight. Data also reveal that the respondents who had normal health status, their high rate of age at menarche (**84.7 %)**was normal than who had the good andlowhealth status.Besides, it was found that the respondents who had4.00-4.11 feet height during their age at menarche, 151 (maximum) of the respondents belongs tonormal age at menarche groupthan who had 3.00-3.11 and 5.00-5.11 feet height. The respondents having weight of 33-45 kgduring their age at menarche189 (maximum) of the respondents belongs to normal age at menarche group than who were of20-32and 45<kg. Regarding maternalmenarchial age, the study found that responden's mother having 14 to 16 years of menarchial age, a significant number (138) belong to normal age at menarche group than who had ≤ 10 and 11-13 years of maternal menarchial age. It was also found that, respondents who do not have any gynecological problems, a notable number (196) experienced their menarch at normal (12-14 years) age.Furthermore, respondents who do not use no hormonal therapy among them number 174 (maximum) had their menarch at normal (12-14 years) age.

Bivariate Correlation

Bivariate Co-relation between Dependent and Independent Variables

Variables	*Correlations*									
	1	2	3	4	5	6	7	8	9	10
1. Age at Menarche of the Respondents										
2. Number of Siblings	.092									
3. Order of Birth of the Respondents	.036	.482**								
4. Mothers' Education of the Respondents	-.020	-.195**	-.092							
5. Monthly Family Income of the Respondents	-.103	-.128*	-.095	.567**						
6. Monthly Amount of Health Expenditure	-.148*	-.111	.034	.227**	.443**					
7. Height during Age at Menarche	.019	-.101	-.051	.003	-.105	-.106				
8. Duration of Breast Feeding	.084	-.059	-.024	-.104	-.085	-.078	.013			
9. Weight during Age at Menarche	-.012	-.090	-.095	.079	-.010	-.093	.330**	.036		
10. Maternal Age at Menarche	-.012	-.149*	-.039	.204**	.010	.103	.048	-.078	.027	
11. Body Mass Index (BMI)	-.005	.050	.046	.271**	.189**	.036	-.192**	-.076	.376**	.154**

$^{*}P \leq 0.05$; $^{**}P \leq 0.01$

To understand the relationship among socio-demographic factors, reproductive information and age at menarche, Pearson's r was computed. Data revealed that there was a significant negative co-relation between monthly amount of health expenditure (r=-.148*) and age at menarche of the students. Among the factors, number of siblings (r = .092) and order of birth (r = .036) of the respondents were positively related to the age at menarche. But mother's education (r = -.020), monthly family income (r = -.103) and monthly health expenditure (r = -.148) of the respondents had negative relation with age at menarche. Data also reveal that height during age at menarche ((r = .019) and duration of breast feeding (r = .084) of the respondent also positively related to age at menarche. Nevertheless, weight during age at menarche (r = -.012), maternal age at menarche (r = -.012) and BMI (r = -.005) had negatively related to age at menarche.

IV. Discussion

Barsom et al. (2008)found that there was a significant positive relationship between early reproductive characteristics and age at menarche of the girls. It looks consistent with the present study's findings whereby it was found that early reproductive characteristics such as height, weight, and maternal age at menarche, gynecological problem, maternal use of hormonal contraceptives were significantly evident with their age at menarche (p<.01&<.05).

Karapanou and Papadimitriou (2010) found that there was a significant relationship among genetic, environmental factors and age at menarche and this is also consistent with the findings of the present study. Similarly, the present study showed that gynecological problem and maternal use of hormonal contraceptives had a significant relationship with age at menarche (p<.01&<.05). Besides, The results represented thatdelayed menarche had an influence on the health status of girls (Anai et al., 2001). On the contrary, the present study revealed that delayed menarche had no significant influence on the health status of the girl students.

S. Chowdhury et al. (2000) and Bharati and Bharati (1998) found that there was a significant relation between height and weight and age at menarche of girls. This was fully consistent with the main result of the present study and present study showed that there was a significant relation between height (p=.000**), weight (p=.008**) and age at menarche of the girl students. Wronka and Pawlińska-Chmara (2005) suggested that socio-economic and demographic factors had an influence on age at menarche and this was consistent with the findings of the present study that showed mother's education, monthly family income, monthly amount of health expenditure all (p<.01&<.05) were significantly associated with age at menarche of girls.

Furthermore, Hossain et al. (2010) found that heavier students would reach menarche earlier than thinner female. On the other hand, present study showed the similar result that weight during age at menarche had a significant influence on the age at menarche of the girls. Frisch and Revelle (1970) revealed that appropriate weight reproduction was mostly dependent on the age at menarche and this result was also with the findings of the present study. Koff and Rierdan (1995) revealed that mother's education had a significant influence on age at menarche of girls. These findings also represented the findings of the present study which showed that some socio-economic factors and age at menarche were statically associated and among the socio-economic factors, mother's education was one of them. McGrory (1990) and Chandra and Chaturvedi (1992) found that religion had a significant influence on age at menarche of girls but present didn't find any influence religion on age at menarche of the girl students. The present shoed some dings which were sometimes consistent and inconsistent with other study. Because, age at menarche varies society to society by various factors.

V. Conclusion

The age at menarche of girls of any society is mostly dependent on some sociocultural, socio-economic and reproductive characteristics. Menarcheal age was positively associated with mother's education, monthly family income, monthly amount of health expenditure, height and weight during age at menarche, maternal age at menarche, gynecological problem, maternal use of hormonal contraceptives, but negatively associated with birth weight, health status, monthly amount of health expenditure.Thus, this study would help in the improvement of menarcheal management of females and their mothers. This study might benefit the students to understand better the factors that can affect their age at menarche. They may have the option to improve their insight about the appropriate administration of menarcheal age with the discoveries that are set up by this investigation. And this may turn into a redouble effectiveness only when the adolescent girls will strive to incease their knowedge regarding proper menarche management. The relevant divisions of governmrnt should also take measures to dissiminateinformation and inventory schemes as well as programs to address the issue.

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