

Educating Mothers and Girls about Knowledge and Practices toward Puberty Hygiene in Tabriz, Iran: A Randomized Controlled Clinical Trial

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Abstract

Background: Puberty and changes resulting from it are one of the most important events of everybody's life. Mothers play a central role in raising the level of knowledge, managing family health and improving hygienic behaviors of their daughters.

Objectives: The current study aimed to compare the effects of educating mothers and their daughters on the knowledge and practices toward puberty hygiene in adolescent girls in Tabriz, Iran, 2014.

Patients and Methods: This randomized controlled trial was conducted on 364 adolescent students of 12 randomly selected high schools who had experienced menstruation. The students were first matched by the practice scores they received in the pretest and then divided randomly and equally into three groups: educating the mothers, educating the girls, and the non-intervention group. The questionnaires regarding knowledge and practices in the pre- and post-intervention stages (with an interval of two months between them) were completed. The general linear model, in which the baseline values were controlled, was employed to compare the scores of the three groups after the intervention.

Results: There were no significant differences between the three groups concerning the scores received on knowledge and practice prior to the intervention ($P > 0.05$). After the intervention, by controlling the scores received before the intervention, the mean score on knowledge in the two groups of educating the mothers (adjusted difference: 0.7; confidence interval (CI) 95%: 0.0 - 1.3) and educating the girls (0.8; 0.2 - 1.5) were significantly higher compared to those of the control group. With respect to improvement in the scores received on practice, no significant differences were found between the three groups.

Conclusions: Results of the current study indicate that it is possible to use the method of educating the mothers and transferring knowledge from them to their daughters as a substitute for direct education of the girls in order to raise the level of their knowledge on puberty hygiene.

Keywords: Adolescent Girls, Knowledge, Practice, Puberty Hygiene

1. Background

Puberty is a significant event of human growth and maturation; it is associated with marked physiological and psychological changes (1). According to the Statistical Center of Iran, more than 20% of the population (approximately 75 million) consists of 10- to 19-year-old adolescents (2). In this period, many adolescents are affected by some health threatening behaviors such as excess food consumption and physical inactivity (3). Unfortunately, most of the girls do not have accurate and enough information regarding puberty and its related healthy behaviors (4). Therefore, knowledge on the natural trend of puberty and its problems and challenges can help with successfully passing through adolescence and into adulthood and fertility (5).

Based on the studies in Iran, most adolescent girls do not have sufficient knowledge on menstrual hygiene, have unpleasant feelings regarding the puberty phenomenon and the occurrence of the first menstrual period; hence, it is necessary to provide education for them (6, 7).

Puberty hygiene includes following principles and taking actions that result in maintenance and improvement of physical, mental, and emotional health during and following this period and requires education more than anything else (8). Studies related to menstrual hygiene conducted in Iran (9-11) show that the level of knowledge of Iranian girls about puberty health, and their health behaviors are far below the expected levels (9), probably because parents do not correctly transfer the related knowledge to their daughters and this in turn results from insufficient knowledge and low levels of education of the par-

ents and lack of correct and close relationships between parents and adolescents (12).

Unfortunately, myths, irrational beliefs, and cultural taboos form barriers for adolescent reproductive health. Some studies in the developing countries proposed that reproductive health educational programs should be considered as the best route to meet adolescent knowledge needs (13, 14).

Complications and problems of the puberty period are easily preventable; and hygiene education that employs various methods to correct the existing knowledge, form new ideas and approaches, teach correct behaviors and hygienic methods of living is one of the fundamental and successful strategies to improve health (11). Therefore, education must be carried out to impart knowledge on physical, mental and social questions of the puberty period based on family, school and public education (15). The family, as the first social unit, plays the most important role in educating adolescents and transferring information and hygienic behaviors to them. Although each family member may have a role in teaching puberty health to adolescents, the mother plays the most prominent role in this regard and most adolescents learn hygienic behaviors from their mothers (16, 17). Research shows that, in most cases, mothers are the source of knowledge for girls (17-19) and the most reliable channel for information transfer on puberty hygiene (19). Also, girls in puberty need to receive detailed and sufficient information about the body and maintaining health. However, studies on menstrual hygiene among Iranian adolescent girls are scarce; the impact of girls' education by mothers has not been evaluated and novelty of this work is regarding the effects of educating mothers on knowledge and practice in girls and on comparison of this education with direct education of girls.

2. Objectives

The puberty period and its effect on the future of girls are important, so is imparting information on menstrual hygiene through educating girls and mothers. The current study aimed to compare the effects of teaching puberty health on different aspects of menstrual hygiene to mothers and to girls on the knowledge and practice in girls studying in secondary schools.

3. Patients and Methods

It was a randomized, controlled clinical trial. Out of 107 secondary schools for girls, (67 state schools and 40 private schools counting out exceptional children's schools) covered by the offices of education in all regions of Tabriz,

Iran, 12 schools (eight state and four private schools) were selected using the simple random sampling method. One-third of the grades seven and eight students in each school were randomly selected using a table of random digits.

Student inclusion criteria were experiencing menstrual bleeding for more than three months, not taking part in similar research, age 11 - 14 years and living with their real mother. Student exclusion criteria were withdrawal from participating in the study and incompleteness of the questionnaire. Written informed consent was obtained from the girls. The researcher wrote down their telephone numbers, spoke to their parents by phone and explained the goals and methods of the research to them and received their oral consent. Three hundred-sixty-four girls in grades seven and eight from the state and private secondary schools of Tabriz (2014) were randomly enrolled to the study. The cluster sampling method was employed both in the initial selection of the girls and their allocation into three groups; the mothers' consent was also obtained. An assistant, who was not involved in the study, performed the randomization by using a random number table. Identically sealed envelopes were used for allocation concealment with serial numbers from 1 to 364; even the investigators were blind to these allocations.

The girls completed questionnaires on demography, knowledge, and practice. The mean scores related to the practice of the students in all 12 selected schools were determined. Based on the scores that students received in the pretest on their practice in each school, these 12 schools were divided into four groups each of three (each group consisting of two state and one private schools). Finally, each school in each group was randomly allocated to one of the groups of educating the mothers, educating the girls or the non-intervention group. This stage of the dividing the schools was based on the scores the girls received on their practice and not randomly. The reason was intention to divide schools into the three groups commensurate with the scores the girls received on their practice as much as possible.

Based on the results of the study conducted by Alizadeh Charandabi (20), and considering $m_1 = 55.5$ (mean score of knowledge), $m_2 = 66.5$ (assuming a 15% increase in total score of knowledge), $SD_1 = 12.5$, $SD_2 = 10.0$, $\alpha = 0.05$ and power = 95%, the sample size was calculated as 50 student for each group and considering the possibility of 10% loss, 55 subjects were estimated for each group. Finally, taking the effects of the cluster allocation into account (design effect = 2), the final number of students taking part in the research rose to 110.

3.1. Data Collection

The questionnaires used in the studies conducted by Mohammad Alizadeh et al. were employed to complete the required information (20, 21). Content and face validity re-determined by asking the opinions of 11 members of the faculty of Tabriz University of Medical Sciences.

Previously in another study, content validity index (CVI) of the questionnaire was determined according to three criteria of relevancy, clarity and simplicity. CVI was 0.88 for knowledge, and 0.89 for practice questionnaire. Reliability, determined by internal consistency (Cronbach's α coefficient), were 0.82 and 0.72 for knowledge, and 0.88 and 0.84 for practice questionnaire in pre- and post-tests respectively (20, 21). Names were not written on the questionnaires to keep the information secret.

The section on knowledge included 15 questions with four possible answers for each one. One point was given to each correct answer and a zero for a wrong answer or for an unanswered question. The questions were on physical hygiene such as understanding puberty changes and the female reproductive system, nutrition during the puberty period, physical activity and rest, skin hygiene, menstrual hygiene and mental hygiene during puberty.

The section assessing practice of the girls included 32 items on physical hygiene such as menstruation, nutrition, sports, physical activity and on mental health. In fact, based on the selected checklist, the students themselves reported their practice because direct observation of the practice related to puberty hygiene in students was not possible. Each item was answered based on the 4-point Likert scale (never, sometimes, often and always) that received scores of 1 to 4, respectively. Six items were scored inversely.

The coding method composed of the number of the school, the secondary school grade, the classroom number and the student number in the classroom list was used to allow linking the pre- and post-test data.

3.2. Intervention

Schools that were allocated to teaching the mothers sent invitations to them through their daughters to attend a class at the school. The researcher gave a lecture on puberty hygiene for half an hour using material in a booklet. Each mother was then given one copy of the booklet together with two pamphlets.

In schools that were allocated to teaching the students, the educational package was delivered to each selected student; no intervention took place in the schools that formed the control group.

The content of the booklet called "How do I reach puberty?" was selected under the supervision of the Iranian women health promotion institute as expressive and brief

questions and answers on puberty hygiene of the girls on the subjects of menstruation hygiene, nutrition, sports and psyche. The ministry of health and medical education provided the researcher with sufficient copies of the booklet. The contents of the pamphlets were prepared through reviewing the texts and confirming by professors and research team members with respect to the requirements of girls in this age group and the training shortage of the booklet.

In all three groups, the girls themselves completed the section of the questionnaire containing questions on knowledge and practice of the students again two months after the start of the intervention, and the group without intervention received the booklet. The intervention took place for two months from 22 November to 21 January. At the beginning, 364 students were selected for the study; though 37 of them were omitted because of withdrawal (Figure 1).

3.3. Data Analysis

SPSS ver. 13 was used for data analysis. The data for the qualitative and quantitative variables together with the means (standard deviations) and the number of items were reported. Normality of the quantitative data was confirmed using skewness and kurtosis; also all variables had normal distribution. One-way ANOVA, Chi-square and Chi-squared tests for trend were employed to examine homogeneity of the groups with respect to socio-demographic characteristics and one-way ANOVA was used to compare knowledge and practice scores between the groups in the pre-intervention stage. The general linear model was used to determine differences between the groups after the intervention by adjusting the baseline values and the variables of economic status, father's occupation, and the preferred person to provide the information. The significance level was $P < 0.05$.

4. Results

There were no significant differences among the students in the three groups regarding socio-demographic characteristics except for the variables of economic status, the father's occupation, and the person preferred to provide the information. Mean (SD) age of participants was 12.0 (3.6). Out of the 364 subjects 47% were in the seventh grade and 52% is the eighth grade. The educational level of 40% of the students' parents was under high school diploma, more than 50% of the girls had experienced their first menstruation less than a year earlier and a feeling of shame and embarrassment was the dominant feeling among the girls at the time of the first menstruation. Most

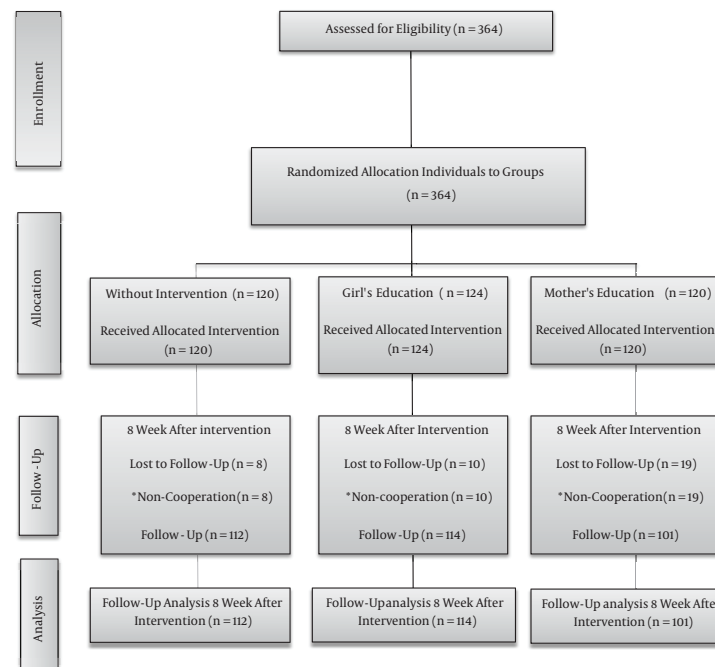


Figure 1. Flowchart of the Study

of the students reported their previous level of knowledge on puberty hygiene as average and about two-thirds of the girls (69% and 64.5%, respectively) said their mothers were the main and preferred provider of the information (Table 1).

The three groups were not significantly different in their scores on knowledge and practice prior to the intervention ($P > 0.05$). The mean score on knowledge after intervention was significantly higher in the group of educating the mothers (adjusted difference: 0.7; confidence interval (CI) 95%: 0.0 - 1.3) and the group of educating the girls (0.8; 0.2 - 1.5) (while controlling for the scores prior to the intervention) compared to the control group. However, no significant differences were observed between the two intervention groups (Table 2 and Figure 2). There were no significant differences with respect to the rise in the scores on practice between the group of educating the mothers, the group of educating the girls, and the control group (Table 3 and Figure 3).

5. Discussion

The current study was conducted to compare the effects of educating mothers and their daughters on the knowledge and practice related to puberty hygiene in adolescent girls in Tabriz. The obtained results showed that

both educating the mothers and educating the girls were effective in raising the level of girls' knowledge on puberty hygiene, but had no effect on upgrading practice in the girls.

Authors found no studies that compared the effects of educating the mothers and educating their daughters on the girls' knowledge and practice regarding puberty hygiene. Results of the current study indicated that educating the mothers, transfer of information from the mothers to their daughters and educating the girls directly, significantly raised the scores the girls received on their knowledge. The study by Maleki et al. on the effects of teaching puberty hygiene to the mothers by qualified people on hygienic practice of the girls found that educating the mothers raised the scores their daughters received on knowledge (22). Agha Yousefi et al. in Fashafooyeh, Iran (23); Moodi et al. in Birjand, Iran (11) and Dasgupta et al. in India (24) also showed that direct education of girls improved the knowledge scores regarding puberty hygiene.

The current study results showed that although the mean score on practice after the intervention exhibited a greater increase in the groups that received education compared to the control group, there were no statistically significant differences among none of the study groups. Maleki et al. found that educating the mothers through educational sessions resulted in a relative improvement in

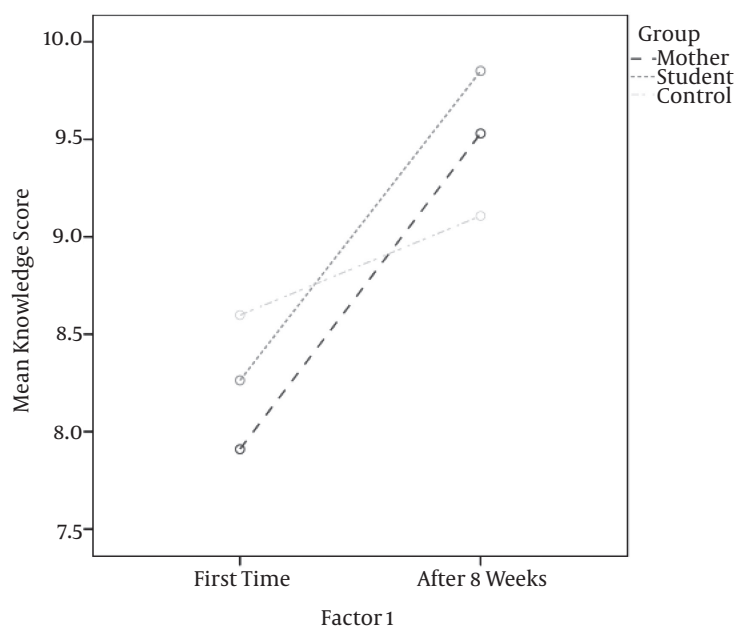
Table 2. The Mean Knowledge Score in the Intervention and Control Groups

knowledge Score	Before Intervention			After Intervention		
	Mean (SD)	N	P Value ^a	Mean (SD)	N	P Value ^b
Mother's education	7.9 (2.0)	120	0.118	9.5 (1.7)	101	< 0.00
Girl's education	8.2 (2.0)	124	0.118	9.8 (1.8)	114	< 0.00
Without intervention	8.5 (2.5)	120	0.118	9.1 (2.4)	112	< 0.00
Comparison between the groups	MD (95% CI)		P Value^a	MD (95% CI)		P Value^b
Mother's education vs. control	-0.5 (-1.1 - 0.0)		0.039	0.7 (0.0 to 1.3)		0.026
Girl's education vs. control	-0.3 (-0.8 - 0.2)		0.252	0.8 (0.2 to 1.5)		0.002
Mother's vs. girl's education	-0.2 (-0.8 - 0.2)		0.347	-0.1 (-0.8 - 0.4)		0.859

Abbreviations: Mean (SD), Mean (standard deviation); MD (95% CI), mean difference (CI95%).

^aOn-way ANOVA test.

^bANCOVA test.

**Figure 2.** The Mean Knowledge Score of Three Groups at the Beginning and the End of Study

the practice of their daughters regarding puberty hygiene (22). Reference can also be made to researches that studied the positive effects of teaching puberty hygiene through giving lectures on raising the scores students received in their practice (10). One possible reason why the practice of students who participated in the study did not change seems to be that (despite the increased level of knowledge of girls in both groups that received education) they still believed in, and followed, their previous hygienic practice. Another possible reason was that educational programs of longer duration and of greater continuity were required

both for mothers girls to change these beliefs and habits and that a short-term cross-sectional educational program was not very effective in changing behaviors. Other possible reasons that can be mentioned are the mothers' insistence of their incorrect beliefs and habits concerning puberty hygiene and menstruation and their opposition to information contradicting their own being transferred to their daughters which can result from the formation of incorrect beliefs and opinions when they were adolescents themselves.

The current study results showed that about 93% of the

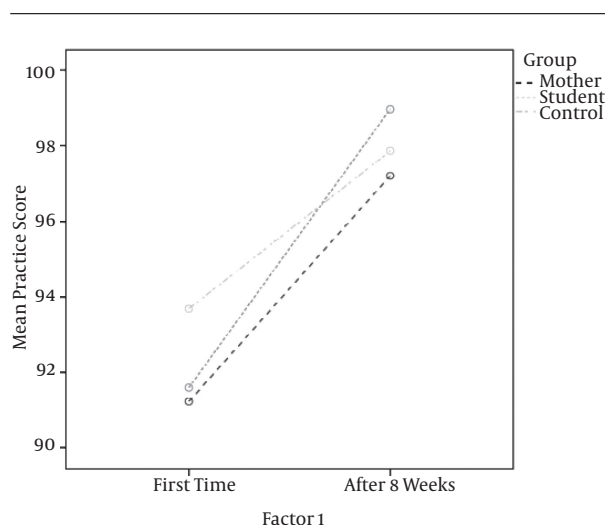
Table 3. The Mean Practice Score in the Intervention and Control Groups

Practice Score	Before Intervention			After Intervention		
	Mean (SD) ^a	N	P Value ^a	Mean (SD)	N	P Value ^b
Mother's education	91.3 (10.2)	120	0.128	97.2 (11.3)	101	0.283
Girl's education	91.7 (9.9)	124	0.128	91.0 (13.4)	114	0.283
Without intervention	93.7 (9.8)	120	0.128	97.8 (10.5)	112	0.283
Comparison between the groups	MD (95% CI)		P Value^a	MD (95% CI)		P Value^b
Mother's education vs. control	-2.4 (-5.5 - 0.6)		0.164	-0.6 (-3.0 - 4.3)		0.966
Girl's education vs. control	-2.0 (-5.56 - 1.0)		0.307	2.3 (-1.2 - 5.8)		0.320
Mother's vs. girl's education	-0.4 (-3.5 to 2.6)		0.982	-1.6 (-5.4 - 2.1)		0.640

Abbreviations: Mean (SD), Mean (standard deviation); MD (95% CI), mean difference (CI95%).

^aOn-way ANOVA test.

^bANCOVA test.

**Figure 3.** The Mean Practice Score of the Three Groups at the Beginning and the End of Study

girls reported they had prior knowledge, but more than half of them considered their knowledge average, which indicated their insufficient knowledge and incorrect practice regarding puberty hygiene. This could result from the unsuitable source of information they had, considering that most of them mentioned their mothers as the most preferred source of information acquisition. Mothers' lack of knowledge and correct information, or insufficient attention to questions related to puberty could be among the reasons for the lack of sufficient knowledge and the incorrect practice of these adolescents. This agrees with the studies conducted by Haque et al. (25) and Koff et al. (26) that showed a direct relationship between the initial information of the girls (and its sufficiency) and suitable knowl-

edge and practice; most girls had also low levels of knowledge and poor practice regarding puberty hygiene and observing hygiene issues.

Knowledge, beliefs and attitudes of mothers have important effects on the knowledge and practice of their daughters. Therefore, it is suggested that health programs at schools, besides emphasizing the education of students, should educate mothers and correct their attitudes through employing effective educational methods and continuous follow up by suitable educational programs.

Results of the current study indicate that the most frequent feeling the girls had at the time of their first menstruation was shame and embarrassment. This conforms to the results of the studies by Marvan and Alcalá-Herrera (27) and Golchin et al. (7) indicating that the negative feelings girls had at their first menstruation included shame, embarrassment, fear and anxiety. The current study findings indicate the necessity to raise the level of knowledge in families and increase the attention mothers pay to establishing friendly relationship with their daughters. Therefore, it is suggested that strengthening suitable relationships between mothers and their adolescent daughters and removing obstacles such as shame and embarrassment regarding questions related to puberty should be included in educational programs of parents, especially the programs designed for mothers. Moreover, it is proposed that teaching menstruation physiology and hygiene questions should be started at schools before the age of 13. Appropriate health education, evidence-based policies and parental and social support, help to implement effective interventions (28, 29).

One of the strengths of the current study was generalizability of the results due to random selection used in

all stages. The study findings need to be considered in light of several limitations including the short duration, insufficient frequency of holding the educational sessions and lack of educational sessions following the intervention. Therefore, it is suggested that more frequently and persistent studies be conducted on this subject and after the interventions, educational sessions be held for the participants as questions and answers to reply any questions they may have.

Based on results of the study, it is suggested that mothers participate in the teaching of puberty hygiene to their daughters to raise the level of knowledge their daughters have. However, this research could not prove that educating the girls on puberty hygiene had positive effects on their practice. Therefore, considering the short duration of the study and the lack of follow up after the intervention, it is recommended to conduct studies with longer duration to determine the effects of education on the practice of girls regarding puberty hygiene. Since the effects of education among different age groups may affect the results, it is recommended to consider wider groups of students.

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Table 1. Socio-Demographic Characteristics of the Study Subjects in the Groups^a

Characteristics	Mother's Education (n = 120)	Girl's Education (n = 124)	Without Intervention (n = 120)	P Value
Age, y				
Student	13.0 (0.7)	13.1 (0.7)	13.1 (0.6)	0.866 ^b
Father	43.5 (4.8)	43.3 (7.1)	44.4 (5.5)	0.314 ^b
Mother	38.1 (4.7)	38.6 (5.1)	39.0 (5.7)	0.410 ^b
Mother's education				0.445 ^c
Illiterate	1 (0.9)	12 (9.7)	7 (5.8)	
Lower than diploma	42 (35.0)	72 (58.1)	42 (35.0)	
Diploma and higher than diploma	54 (46.2)	34 (27.4)	57 (47.5)	
Licentiate and higher than licentiate	18 (15.4)	6 (4.8)	14 (11.7)	
Father's education				0.841 ^c
Illiterate	-	7 (5.7)	5 (4.2)	
Lower than diploma	39 (33.1)	70 (57.4)	33 (27.5)	
Diploma and higher than diploma	54 (48.3)	34 (27.9)	58 (48.3)	
Licentiate and higher than licentiate	27 (22.9)	11 (9.0)	24 (20.0)	
Mothers' job				0.813 ^d
Housewife	98 (83.1)	110 (88.7)	101 (84.2)	
Employed	20 (16.9)	14 (11.3)	19 (15.8)	
Fathers' job				0.006 ^e
Worker	4 (3.4)	24 (20.3)	12 (10.4)	
Clerk; retired	44 (37.6)	31 (26.3)	42 (36.5)	
Shopkeeper	8 (6.8)	7 (5.9)	8 (7.0)	
Private sector	61 (52.1)	56 (47.5)	53 (46.1)	
Economic status				0.023 ^c
Weak	3 (2.6)	8 (6.5)	5 (4.2)	
Average	42 (35.9)	73 (58.9)	60 (50.0)	
Good	72 (61.1)	43 (34.7)	72 (61.5)	
Previous acquisition information				0.096 ^d
Yes	109 (94.0)	111 (93.3)	112 (94.1)	
No	7 (6.1)	8 (6.7)	7 (5.9)	
People lived with student				0.494 ^d
Both father and mother	112 (94/9)	113 (91/9)	113 (95/8)	
Living with stepfather and mother	2 (1/7)	2 (1/6)	-	
Only with mother	4 (3.4)	8 (6.5)	5 (4.2)	
Sufficiency of acquired information about puberty				0.494 ^c
Insufficient	12 (10.6)	8 (6.8)	6 (5.2)	
Moderate	58 (51.3)	79 (66.9)	81 (69.8)	
Sufficient	43 (38.1)	31 (26.3)	29 (25.0)	
Preferred source of information about puberty				< 0.001 ^e
Mother	92 (78.0)	64 (51.6)	80 (66.7)	

Sister , friends and peer group	14 (11.9)	29 (23.4)	27 (22.5)
Health educator and teacher	12 (10.2)	31 (25.0)	13 (10.8)
Feeling at onset of menarche			0.053 ^d
Fear and worry	26 (22.2)	23 (18.5)	32 (26.9)
Shame and embarrassment	32 (27.4)	52 (41.9)	36 (30.3)
Pride and happiness and enlargement	17 (14.5)	24 (19.4)	13 (10.9)
Anger	8 (6.8)	8 (6.5)	9 (7.6)
No special feeling	34 (29.1)	17 (13.7)	29 (24.4)
Age at menarche (each month)			0.722 ^d
> 12	41 (36.3)	42 (35.5)	43 (39.8)
12 - 24	55 (48.7)	53 (44.9)	51 (47.2)
24 <	17 (15.0)	23 (19.5)	14 (13.0)

^aValues are expressed as No. (%) except for age which is mean (SD).

^bOne-way ANOVA test.

^cChi-square trends test.

^dChi-square test.

^eFisher exact test.