

# The Level of Knowledge and Behavior of Adolescent Male and Female Students in Turkey on the Matter of Reproductive Health

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**Abstract** In this research, the objective is to determine the level of knowledge, the sources of information and the behavior of adolescent male and female students in Turkey on the matter of reproductive health. The sample is comprised of 600 students randomly chosen from four different elementary schools. The survey form was used for data collection. In analyzing the data, we calculated averages and performed Chi-square tests. We determined that 82.3% of the students are aware of the changes in their own bodies, and 69.2% of them have knowledge about the place and the functions of their reproductive organs. We found established that 55.2% of the students have knowledge about puberty prior to this phase, and girls attain this knowledge mostly (78.2%) through their mothers, whereas boys (25.4%) attain it from the media. We found significant differences between boys and girls, including the following: the level of disturbance caused by puberty symptoms, the individuals informed about the symptoms, the feelings and the style of dress in puberty, and situations such as being happy or unhappy about the symptoms differ according to the sex of the student. These findings are statistically significant ( $p < 0.00$ ). It is observed that the perception of puberty symptoms is different for boys and girls, and

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the girls are more open to communicate with their mothers, while the boys are more open to communicate with their friends.

**Keywords** Puberty · Sex · Early adolescence · Reproductive health · The behavior of adolescents · Turkey

Puberty is a transition period between childhood and adulthood, including the processes of rapid growth, development and maturation in terms of physical, psychological, biochemical and social conditions [1–7]. The World Health Organization (WHO) defines puberty as a period between the ages of 10 and 19 [8]. It is also known that one out of every five people throughout the world is an adolescent (Sexual Health/Reproductive Health (SH/RH, 2005), and the majority of these adolescents (87%) live in developing countries [7]. Youth throughout the world are exposed to many risk factors, especially in countries where sexual activity starts at an early age [10].

According to the statistics of Turkish Population and Health Research Data 2008 (TNSA 2008), 27% of the population in Turkey consists of young individuals under the age of 15. The juveniles in the group are those age 10–14 years, including females who constitute 9% of the total population and males who constitute 9.4% of the total population [11]. The 6th, 7th, and 8th grades, which form the second phase of basic education in Turkey, are the transition period between childhood and puberty. These grades differ from the others because they include the first years of puberty, and hence they become a transition period. The physiological changes experienced in this period draw the adolescent's attention to his or her changing and developing body [1].

Other sources use different classification schemes for the different stages of puberty. In general, the periods above are widely accepted. Early puberty is the period where sexual hormones are secreted in males and females, and as the sex-specific effects of these hormones appear, growth and development accelerates rapidly. This period lasts 2–3 years, starting with the appearance of the first secondary sexual characteristics and continuing with the formation of adult identity. The average age at which puberty begins is 10 (with a range of 8–13) for girls and 12 (with a range of 9–14) for boys. The development of breasts in girls and the increase in the volume of testicles in boys are accepted as the earliest symptoms of puberty [4, 5, 12–14].

The first supervisors of the sexual education of children are parents. In addition to providing information, parents have an important role in their children's sexual development, including the formation of attitudes and the values about sexuality and the reduction of risky behaviors [15]. However, in Turkey, sexuality is still seen as a taboo due to socio-cultural factors, and education, services and research on sexuality are limited. Sexual education is expected to start in the family, but this is difficult because the parents who are supposed to provide the education do not have enough information themselves on the matter [15, 16].

The confusion and anxiety adolescents have during early puberty due to the rapid physical changes coupled with their inability to adapt to these changes can cause sudden changes in their behavior and reactions towards the people in their environment [4–6, 15, 17, 18].

Medical professionals, especially nurses, have an important responsibility to support adolescents' health and well-being during this developmental period. It should be remembered that as more adolescents go through this process in a healthy manner, the

healthier the adult population will become. Therefore, this research aims to determine the knowledge and behavior of adolescents in early puberty.

## Methods

The sample for this study is comprised of male and female students from four elementary schools in district centers of Bakırköy and Zeytinburnu. The schools included in this research are Hamdi Akverdi and Cumhuriyet Elementary Schools in Bakırköy District and Maraşel Fevzi Çakmak and Zeytinburnu Elementary Schools in Zeytinburnu District. The subjects were chosen by a random sampling method from the 6th ( $n = 199$ ), 7th ( $n = 200$ ) and 8th ( $n = 201$ ) grades at these schools, four classes of samplings were taken from each school and 150 students were chosen from four different schools. The total sample of 600 students was comprised of 303 male students and 297 female students in these classes.

The data collection form included 28 questions developed by researchers based on the current knowledge on the subject. The data collection form used both multiple choice questions that allowed students to choose more than one option and open-ended questions. The data collection form also included items that captured socio-demographic characteristics, such as parents' education levels, type of family, students' living arrangements, and the number of siblings. Furthermore, questions on sex-specific changes, functions of the male and female reproductive organs, and sexual growth and development were included. Students' sources of information on the matter of puberty, individuals informed about the changes, behavior towards the changes, whether health education is given at schools, when and from whom students want to receive this education, the counseling services at schools and the age of menarche were also determined.

The data collection took place in May 2008. Before the research began, written permission was given by the Ministry of Education Istanbul Provincial Directorate of National Education.

Prior to the collection of data, the school administration was informed about the stages of the study in an effort to encourage cooperation. The data collection forms were distributed in the classrooms during class time as determined by the counseling service. The objective of the study was explained to the students, and we also explained that their personal information would be kept confidential, and all the data would only be used within the scope of the research study. Oral consent was obtained from the students who wished to participate in the survey. Afterwards, the data collection forms were handed out to students. None of the students refused to complete the data collection forms. Completion of each data collection form took approximately 20 min.

We used Statistical Program for the Social Sciences, version 12.0 (SPSS 12.0) for data analysis. In the evaluation of categorical data percentages, averages were calculated and Chi-square tests were performed.

## Results

We found that the average age of the students included in the research was  $13.2 \pm 0.94$  years (minimum 11, maximum 15), and 62.5% of the girls had reached menarche. The average age of girls whose menstrual cycles had started was  $12.3 \pm 0.82$  years (minimum 11, maximum 14).

In terms of parental education level, we found that 43.7% of the mothers were literate and primary school graduates, 26.8% were high school graduates, 13.7% were junior high school graduates, 10.7% were university graduates, and 5.2% were illiterate. Similar data on fathers' education level showed that 33.2% of the fathers were literate and primary school graduates, 29.0% were high school graduates, 19.3% were junior high school graduates, 17.3% were university graduates, and 1.2% were illiterate.

When the family structures were studied, we determined that 85.7% of the students lived with their nuclear families, 10.0% lived with extended families and 4.3% lived in divorced families. We established that 46.8% of the students included in the research had two siblings, 21.5% had three, 13.0% had four, 9.8% had one and 9.0% had five or more siblings. We established that 57.3% of the students had been living in Istanbul for more than 10 years, 39.7% for 5–10 years and 3.0% for less than 5 years.

The distribution of the knowledge of the adolescents on reproductive organs is shown in Table 1. We found that 82.3% of the students were aware of the changes in their bodies. Similarly, 69.2% knew the location of their reproductive organs. We found that 52.8% of the students knew the functions of the reproductive organs. A relatively large percentage of the students (92.2%) were aware of the pubertal changes in reproductive organs, and this percentage does not vary significantly by sex.

We found out that the differences between the two sexes about knowing the location of the reproductive organs ( $p < .051$ ) and knowing the functions of the reproductive organs ( $p < .008$ ) were statistically significant (Table 1).

The distribution of students' behavior and reactions to puberty symptoms are shown in Table 2. We established that 50.0% of the girls were uncomfortable with puberty

**Table 1** Students' knowledge on the reproductive organs (n = 600)

Level of knowledge on reproductive organs	Female (n = 297)	Male (n = 303)	Total	$\chi^2$ , <i>p</i> , <i>df</i>
<i>Being aware of the changes in their bodies</i>				
Yes	235 (79.1)	259 (85.5)	494 (82.3)	$\chi^2 = 4.230$
No	14 (4.7)	9 (3.0)	23 (3.8)	<i>p</i> = .121
Partially	48 (6.2)	35 (11.6)	83 (13.9)	<i>df</i> :2
<i>Knowing the places of the reproductive organs</i>				
Yes	190 (64.0)	225 (74.3)	415 (69.2)	$\chi^2 = 23.878$
No	21 (7.1)	15 (5.0)	36 (6.0)	<i>p</i> = .051
Partially	74 (24.9)	52 (17.2)	126 (21.0)	<i>df</i> :4
Only female organs	12 (4.0)	2 (0.7)	14 (2.3)	
Only male organs	0 (0.0)	9 (3.0)	9 (1.5)	
<i>Knowing the functions of the reproductive organs</i>				
Yes	136 (45.8)	181 (59.7)	317 (52.8)	11.72
No	54 (18.2)	40 (13.2)	94 (15.7)	<i>p</i> = .008
Partially	98 (33.0)	75 (24.8)	173 (28.8)	<i>df</i> :4
Only female organs	9 (3.0)	1 (0.3)	10 (1.7)	
Only male organs	0 (0.0)	6 (2.0)	6 (1.0)	
<i>Being aware of the puberty symptoms</i>				
Yes	278 (93.6)	275 (90.8)	553 (92.2)	$\chi^2 = 1.680$
No	19 (6.4)	28 (9.2)	47 (7.8)	<i>p</i> = .195
				<i>df</i> :1

**Table 2** The distribution of the behavior and the reactions of the students to puberty symptoms

Reactions to the puberty symptoms	Female (n = 297)	Male (n = 303)	Total (N = 600)	$\chi^2$ , <i>p</i> , <i>df</i>
<i>Being disturbed by the puberty symptoms</i>				$\chi^2 = 60.454$
Yes	151 (50.8)	62 (20.5)	213 (35.5)	<i>p</i> = .000
No	146 (49.2)	241 (79.5)	387 (64.5)	<i>df</i> :1
<i>People informed about the puberty symptoms</i>				
Mother	246 (82.8)	66 (21.8)	312 (52.0)	$\chi^2 = 237.868$
Father	1 (0.3)	50 (16.5)	51 (8.5)	<i>p</i> = .000
Friend	18 (6.1)	95 (31.4)	113 (18.8)	<i>df</i> :4
Sibling	13 (4.4)	16 (5.3)	29 (4.8)	
Other (teacher, relative)	19 (6.4)	76 (25.1)	95 (15.8)	
<i>Feelings when the puberty symptoms occur</i>				
Hiding	18 (6.1)	26 (8.6)	44 (7.3)	$\chi^2 = 55.840$
Shame	81 (27.3)	27 (8.9)	108 (18.0)	<i>p</i> = .000
Fear	35 (11.8)	11 (3.6)	46 (7.7)	<i>df</i> :4
Confusion	84 (28.3)	114 (37.6)	198 (33.0)	
Other	79 (26.6)	125 (41.3)	204 (34.0)	
<i>Change of the dressing style in puberty</i>				$\chi^2 = 11.602$
Yes	212 (71.4)	176 (58.1)	388 (64.7)	<i>p</i> = .000
No	85 (28.6)	127 (41.9)	212 (35.3)	<i>df</i> :1
<i>Influence of puberty on friendship</i>				$\chi^2 = 1.282$
Yes	75 (25.3)	89 (29.4)	164 (27.3)	<i>p</i> = .258
No	222 (74.7)	214 (49.1)	436 (72.7)	<i>df</i> :1
<i>Puberty symptoms they are happy with</i>				$\chi^2 = 31.263$
Growth of breasts	17 (5.7)	13 (4.3)	30 (5.0)	<i>p</i> = .000
Hair growth	4 (1.3)	24 (7.9)	28 (4.7)	<i>df</i> :3
Increase in height	261 (87.9)	223 (73.6)	484 (80.7)	
Other (age, etc.)	15 (5.1)	43 (14.2)	58 (9.7)	
<i>Symptoms they are unhappy with</i>				$\chi^2 = 23.241$
Pimples	137 (46.1)	162 (53.2)	299 (49.8)	<i>p</i> = .000
Increase in weight	63 (21.2)	67 (22.1)	130 (21.7)	<i>df</i> :3
Hair growth	72 (24.2)	31 (10.2)	103 (17.2)	
Other	25 (8.4)	43 (14.2)	68 (11.3)	

symptoms, whereas this proportion among boys was 20.0%. We determined that girls mostly discuss their puberty symptoms with their mothers (82.8%), whereas boys mostly discuss symptoms with their friends (31.4%).

The level of disturbance due to puberty symptoms, the individuals informed about the symptoms, the feelings and the dressing style in puberty and situations such as being happy or unhappy about the symptoms differ according to the sex of the student, and these differences are statistically significant ( $p < .00$ ) (Table 2).

Knowledge and sources of information related to puberty are shown in Table 3. We found that many students (62.8%) want to be informed on matters related to sexual and reproductive health (SH and RH), and the percentage of the boys and girls who have this desire are 67.0% and 58.6%, respectively. Both groups want to be informed primarily by

**Table 3** The distribution of knowledge related to puberty and students' sources of information on SH/RH (n = 600)

Knowledge related to puberty	Female (n = 297) n (%)	Male (n = 303) n (%)	Total n (%)	$\chi^2$ , p, df
<i>The source of information on puberty</i>				
Mother	232 (78.1)	48 (15.8)	280 (46.7)	$\chi^2 = 244.904$ $p = .000$ $df:5$
Father	3 (1.0)	63 (20.8)	66 (11.0)	
Sibling	7 (2.4)	9 (3.0)	16 (2.7)	
Friend	19 (6.4)	68 (22.4)	87 (14.5)	
Teacher	14 (4.7)	38 (12.5)	52 (8.7)	
Newspaper/TV/Magazine	22 (7.4)	77 (25.4)	99 (16.5)	
<i>Request of information on SH/RH</i>				
Yes	174 (58.6)	203 (67.0)	377 (62.8)	$\chi^2 = 4.543$ $p = .033$
No	123 (41.4)	100 (33.0)	223 (37.2)	$df:1$
<i>Preferred resource on SH/RH</i>				
Mother	117 (39.4)	27 (8.9)	144 (24.0)	$\chi^2 = 51.982$ $p = .000$ $df:7$
Father	1 (0.3)	37 (12.2)	38 (6.3)	
Sibling	4 (1.3)	6 (2.0)	10 (1.7)	
Friend	10 (3.4)	25 (8.3)	35 (5.8)	
Teacher	5 (1.7)	21 (6.9)	26 (4.3)	
Newspaper/TV/Magazine	9 (3.0)	35 (11.6)	44 (7.3)	
Doctor	123 (41.4)	79 (26.1)	202 (33.7)	
Nurse	28 (9.4)	73 (24.1)	101 (16.8)	
<i>Preferred time to be informed on SH/RH</i>				
Prior to puberty symptoms	214 (72.1)	150 (49.5)	364 (60.7)	$\chi^2 = 31.973$ $p = .000$
After puberty symptoms	56 (18.9)	102 (33.7)	158 (26.3)	
When the symptoms first appear	27 (9.1)	51 (16.8)	78 (13.0)	$df:2$

doctors: 41.4% of girls and 33.7% of boys reported preferring to receive information on SH and RH from physicians. We determined that most of the students (60.7%) wanted this information prior to the onset of puberty symptoms. The differences between boys and girls in their preferred sources and timing of the information are statistically significant ( $p < .00$ ) (Table 3).

We established that most of the students (55.2%) had knowledge on the subject prior to the onset of puberty, and this percentage did not vary significantly by sex ( $p = .871$ ). Additionally, most students (77.2%) did not report receiving counseling on puberty from their schools' counseling services ( $p = .818$ ). We found existence of health lesson at school 91.7%, ( $p = .344$ ) and when asked "who gives health education at school?" most of said medical personnel outside of school 51.5%, ( $p = .250$ ).

## Discussion

The most distinctive feature of early puberty is the rate of growth and development (RH/SH, 2005). In terms of physical and sexual development, puberty is the developmental period where differences between the sexes become most obvious [5, 14].

The average age of the students in the sample was  $13.2 \pm 0.94$  years (minimum 11, maximum 15), and the sample is comprised of students in early puberty. It is important that young adolescents' needs be determined and understood to help them adapt to physical and developmental changes as well as to develop strategies to help them avoid having problems adjusting to pubertal changes.

Various studies have shown that in Turkey, the average age of menarche is 12.5 years [4]. In the research done in Nigeria by Şule et al. [19] the average age at which the menstrual cycle began was 12.8 years. The average age of the girls who had reached menarche in our sample was  $12.3 \pm 0.82$  years, which is consistent with other research.

When the level of RH knowledge of the adolescents included in the sample is considered, it is established that most (92.2%) are aware of the changes associated with puberty, and most know the location (69.2%) and functions (52.8%) of their reproductive organs. Although the differences are not statistically significant, these percentages are higher among boys than among girls (Table 1). This result might be related to the traditional ways girls are raised and the restrictions to which they are exposed compared with boys. In Turkish society, sex is still seen as a taboo topic, and it cannot be openly discussed [18].

In our study, we found that adolescents' reactions to puberty symptoms are mostly confusion (33.0%) and embarrassment (18.0%). Erbil et al. [15] found similar feelings associated with the first menstrual cycle, including fear (39.6%) and embarrassment (37.0%). We determined that girls are more uncomfortable about puberty symptoms than boys, and this difference is statistically significant ( $p < .05$ ) (Table 2).

There is a societal benefit to families informing their children about sex and sharing their basic values with them. As children undergo the transition to adulthood, they develop values related to sex [9]. It is seen as most suitable that mother inform daughter and father inform son about sexual identity. However, we found that adolescents of both sexes mostly prefer to talk to their mothers. Adolescents who cannot talk to their parents about sex comfortably and who do not receive sexual education at schools might receive wrong information from untrustworthy sources [18, 20, 21].

We determined that in terms of sharing between mother and child about the changes in puberty, there is a difference between girls and boys (82.8% and 21.8%, respectively). The percentage of boys who discuss the changes in puberty with their mothers is low compared with the percentage of girls (16.5%). However, we found that there is almost no sharing between fathers and daughters (0.3%), and boys mostly (31.4%) prefer to share with their friends (Table 2). The people with whom students share their puberty symptoms differ according to the sex of the student, and this difference is statistically significant ( $p < .00$ ).

Erbil et al. [15] established that 60.8% of mothers inform their daughters about sexual matters; however, 65.6% of these mothers never talked to their own mothers (i.e., the previous generation) about sex. Previous studies have found that 70.3% of the information given by mothers is about menstruation, and 49.5% of the information is about anatomical differences between men and women. The results of the research done by Bulut et al. [21] show that the subjects about which adolescents talk to their mothers primarily are menstruation (78.4%) and choice of spouse (71.3%). Sixty-eight percent of conversations were about physical changes in puberty [11]. Our findings on the person with whom the changes in puberty are discussed (i.e., the mother) are consistent with these studies.

Our findings show that after the onset of puberty symptoms, many adolescents change their dressing styles (64.7%), and this change is especially obvious among girls (71.4%). It is possible that the male–female difference in change in dressing style is that puberty starts

earlier for girls, and changes such as breast development are especially noticeable from outside.

The increase in height is typically experienced at age 11–12 years for girls and 13–15 years for boys. In this period, an adolescent's height becomes 80.0% of the height he or she will reach as an adult. This rapid change is one of the most obvious aspects of puberty [4, 14].

Our research established that the puberty symptom that makes adolescents most happy is an increase in height (80.7%). However, the puberty symptom that makes adolescents most unhappy is formation of pimples (49.8%). In early puberty, adolescents' most significant preoccupation is their bodies, and they try to adapt to and deal with the rapid physical changes [7]. Their unhappiness might be explained by the fact that they pay too much attention to their bodies and appearances in this period. The difference in perception between the sexes to these changes in puberty is statistically significant ( $p < .05$ ) (Table 2).

That more than half of the students (55.2%) had knowledge on puberty prior to this period and that girls got this information mostly from their mothers (78.2%) and boys got it mostly from the media (25.4%) is remarkable because it shows the most important difference between the sexes (Table 3). Eroğlu et al. [20] determined that young girls receive information on sex mostly from their friends and mothers, whereas boys receive it mostly from their friends and fathers.

Bulut et al. [21] found that adolescents' sources of knowledge on puberty symptoms are friends (61.8%), books/magazines/newspapers (54.7%) and mothers (47.5%). In the same research, 55.4% of the students found the information they received from their mothers sufficient, 40.8% of them found it partially sufficient and 3.8% of them found it insufficient.

Although this result is consistent with our study on the resources of girls, it differs from our finding that mothers are at the top of the resource list.

One of the other important findings of the research is that health lessons are not given at schools (91.0%). This finding means that information on the changes in puberty does not get passed on to adolescents systematically and from the right sources, and this is a huge handicap. Accurate information given at schools through formal education is a valuable resource both for adolescents and for their future children. To protect public health, it is necessary to emphasize the importance of schools and place RH and SH subjects in the education curriculum according to the needs of the country [22].

Various methods to educate children on SH have been discussed. It is said that the method of disseminating SH information through different sources might reduce the influence of the education. Inviting a lecturer from outside the school is said to be the approach most favored by students, because students trust lecturers from outside and can share their feelings more easily. Teaching the subject as a separate course or unit is seen as the best approach to this application [9, 22]. No matter the delivery method, SH/RH should definitely become a part of formal education. Also, our study determined that RH education is sometimes given through guests from outside the school; however, this is a relatively rare occurrence.

Though a very small group of students ( $n = 34$ ) reported education on RH was given at school, students did report receiving information from their friends and counseling teacher (51.5%). This education does not reach the majority of the school and is limited to a small group. However, the percentage of the students who said they received individual counseling from the school's counseling service was low, which suggests that this service does not function efficiently at schools.



Biri et al. [23] have studied the knowledge level of adolescent girls related to sexual matters and found that 66.4% of the girls in their study did not receive education on sexual matters. However, the same research determined that 16.5% of the students having education at school do not find this education sufficient [8]. It is obvious that education on RH at schools is not much different or efficient at either medium or late puberty.

The need for education on RH is demonstrated by the fact that the majority of students in this study wanted to receive information on RH (62.8%) (Table 3). When asked about the source of information they would prefer, students of both sexes reported preferring to be informed by a doctor. In contrast, Eroğlu et al. [20] found that the percent of adolescents who receive education from medical personnel is very low (10.1%). It is also known that the percentage of adolescents using medical facilities is quite low compared with other age groups [5]. Therefore, when this subject becomes part of the education at schools, medical personnel's help should be solicited.

The finding that girls wanted to be informed on RH prior to puberty (72.1%) is meaningful because it shows that they want to be prepared beforehand (Table 3). Erbil et al. [15] found that 68.2% of mothers inform their daughters on the menstrual cycle before it begins. It is seen that the girls' preference and the time of the education are consistent, however only to a limited level. It is observed that boys also want to be informed on this matter prior to puberty (49.5%), but this percentage is low compared with girls.

## Conclusion and Recommendations

At the end of the study, it is seen that adolescents are aware of the changes in their bodies, girls discuss puberty symptoms mostly with their mothers, and boys discuss them mostly with their friends. It is also established that sufficient and systematic education on matters related to RH are not given at schools, students' reactions to puberty symptoms are shame and confusion, and they want to receive education on this matter prior to the onset of puberty.

The following recommendations are made, based on the findings of this study: a health course delivered in early puberty that will help adolescents get to know their own bodies and deal with the common problems during this period should be part of the formal education curriculum, and the person who will teach the lesson should be competent; education should be provided to the parents, especially mothers, on the matters of SH, changes in puberty and approaches to the adolescents; and students should be informed on matters of SH according to their age and needs gradually, comprehensively and through appropriate sources.

## Implications for School Health

Sexual education may be placed within health issues as an important part of modern education. For many Turkish people, talking about sexuality is still a taboo and premarital sex is forbidden for women. The role of school nurses in educating about puberty is to reach out to adolescents and parents who have a key role in communication with adolescents and to become part of the education on changes in puberty and strategies to deal with them. It should be remembered that a healthy adolescence is the first step towards a healthy adulthood.

## Human Subjects Approval Statement

This study was approved by the Ministry of Education Istanbul Provincial Directorate of National Education and school administration.

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