Predicting Healthy Behaviors of Girl Adolescents based on Behavioral Intention Model

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Abstract

Puberty is most important stage of life with physical and psychological changes. Preparing adolescent girls for puberty should be planned based on their educational needs. This study was conducted to predict health behaviors of adolescent girls during puberty based on behavioral intention model. In this cross-sectional study, 200 high school girl students of Gonabad city were surveyed. Multistage cluster sampling was used to select the participants. A questionnaire was designed based on BIM used for data collection including demographic data, knowledge and attitude and subjective norms. Data were analyzed using statistical analysis ANOVA, Chi square, correlation coefficient, regression analysis and t test in SPSS software. The mean score was 56.23 ± 2.67 for knowledge and 63.25 ± 5.77 for attitude. Pearson's correlation coefficient showed a significant relationship between knowledge and attitude ($r = 0.477$). The analysis of subjective norms showed that most subjective norms were influenced by teachers (15.63%) at school and by mothers (67.18%) at home. We should pay special attention to three factors of knowledge, attitudes, and subjective norms to help girls perform health behaviors. Furthermore, health education about puberty should continue in high schools.

Introduction

In modern world, adolescence has a much higher value than other periods in human life. According to the 2006 census; 25.1% of Iran's population consists of adolescents aged 10-14 years old. This number adds up to 16 million people, of whom half are girls [1].

Many physical, psychological, social problems and unhealthy behaviors are rooted in adolescence [2]. The foundation of many youth health behaviors arises from childhood and adolescence [3]. Failed marriages, high risk pregnancies, deaths, unhealthy habits and behaviors arise from this time. Research shows that most smokers have experienced first cigarette at the time of puberty. Adolescence is a period between childhood and adulthood or 10-19 years old according to the World Health Organization [4]. Adolescents, the future builders of society, will manage future decades of the world; so, addressing adolescents' health is an investment for the future [5]. Half of the adolescents in the world do not have enough protection against AIDS and sexually

transmitted diseases and pregnancy and are subjected to unhealthy and unprotected sexual relationships, drug use, sexually transmitted diseases, carefree sexual relationships, early pregnancy, violence, education and school failure and personal health, nutrition, exercise, etc. [6]. According to the 1996 census in Iran, 4% of 10-14 year-old girls and 19% of 15-19 year-old girls were married. This means that about 23% of girls get married under 20 years of age and are at risk of early pregnancy and its consequences and, unfortunately, only 33% of them use contraceptive methods and one-third of these adolescents get pregnant in the first year of marriage. From a girl's view, menstruation is a sign of sexual maturity and becoming a woman. Since adolescent girls' reactions to menstruation may be widely general, it is critically important that their first experience of menstruation be as pleasant as possible. Many girls have a negative view toward menstruation or are indifferent to it. This attitude may be partly as the result of physical discomfort and the effect of hormones on mood, but apparently is largely due to negative attitudes of the society [7]. Several studies (Mohammadpour, Amirzadeh, Malak Afzali,Koffe et al) have emphasized adolescent girls' incomplete health information and increased concern in this field and also the vulnerability of girls against sexually transmitted diseases [8]. According to the charter of the World Health Organization (WHO), health is a personal and social value and one of the most important and obvious human rights and needs in view of various nations and schools of thought. To achieve health, all countries pay attention to different groups of society, among whom adolescent girls are of special importance [9].

Girls often want and need information about menstruation. In this regard, their information may be limited or incorrect [10]. As usually they obtain information from their peers and other people with little information. Considering numerous problems related to adolescent girls' ignorance about changes due to puberty and negative attitudes toward this period and also their inappropriate health behaviors and,

on the other hand, the fact that today's girls are future mothers, if this group of society does not have sufficient knowledge, suitable attitude and appropriate health behaviors, they would not be able to manage a healthy family and deliver informed children to the community [4]. In Iran, because of cultural and not religious reasons, most adolescents, especially girls, are deprived of correct and appropriate information on physical and emotional changes during puberty and perhaps they would have physical and mental problems in their family life due to obtaining information from ignorant and unsubstantiated sources [11].

Behavior study models are important in evaluating people's perspectives on health behaviors, and behavioral intention model is one of the best models used in relation to attitudes and behaviors of puberty. According to studies, this model is established based on the theory of reasoned action. According to the assumptions of this theory, people should make their own behavioral decisions based on reasonable available information, and also pay attention to the consequences of their performance before making a decision [12]. According to this model, behavioral intention is the most important determinant of individual's behavior, and intention to perform a behavior is a combination of attitude toward a behavior and subjective norms. Attitude toward a behavior includes individual's ideas and evaluation of the outcomes of a behavior and subjective norms include normative beliefs and incentive for obedience [13]. This study used behavioral intention model to predict the performance of health behaviors by adolescent girls and their role in taking care of their health as well as the next generation.

Method
This cross-sectional study was conducted on adolescent girls in Gonabad. According to previous studies, the number of participants was estimated 200 people by statistical formulas and p=0.15 with confidence interval 95% and z=1.96 and accuracy of 1.0; sampling

was conducted by cluster random method. At first stage, several high schools were randomly selected among public schools in Gonabad. Then participants were selected from the first to third grade students and information was collected through questionnaires after coordination with Education Officials of Gonabad and high school principals. The questionnaire's face and content validity were confirmed by library studies and experts' opinions and its reliability was evaluated by test-retest. Also the questionnaire was confirmed in terms of ethical considerations. The questionnaire included 6 items on demographic characteristics, 20 on knowledge with 4 items scored 1 and 0, respectively for true and false answers, and 9 on attitude using 6-point Likert scale from strongly agree to strongly disagree and another part including items on subjective norms and incentive for obedience. The data collected were analyzed in SPSS version 16 using descriptive and inferential tests such as ANOVA, chi-square, regression analysis, t-test, and correlation coefficient at significance level of 0.05.

Result

In terms of demographic characteristics, 13.2% of girls were 14 years old, 31.25% were 15 years old, 40.62% were 16 years old and 15.1% were 17 years old. In terms of parents' education, 8.9% of mothers were illiterate and 36.5% had primary education, 5.7% of fathers were illiterate and 22.4% had primary education. Half of the mothers were housewives and 39.1% of fathers were self-employed and the rest had other jobs; 19.3% of girls were trained in the last six months and 79.7% were untrained. The mean knowledge score of participants was 56.3 from the total score of 100 and the mean attitude score was 34.29 from the total score of 54. T-test indicated that there was a significant relationship between age and knowledge. Analysis of variance also showed a relationship between age and attitude. There was a significant relationship between grade and knowledge and attitude, but there was no significant relationship between age and evaluated results (Table 1).

Table 1 *Frequency distribution of demographic variables in participants*

Frequency Variable		Number	Percentage	Significance
Age	14	25	13.02	** 0.001
	15	60	31.25	
	16	78	40.62	
	17	29	15.1	
Grade	First	59	30.72	* 0.001
	Second	64	33.33	
	Third	69	35.94	
Mother's education	Illiterate	17	8.85	* 0.4
	Primary school	70	36.46	
	Middle school	38	19.8	
	High school	41	21.35	
	College	26	13.54	
Father's education	Illiterate	11	5.7	* 0.54
	Primary school	43	22.4	
	Middle school	39	20.32	
	High school	57	29.7	
	College	42	21.88	

* The result of ANOVA test

** The result of t-test

In terms of subjective norms (references whose opinions were more important for adolescent girls), parents (67.18%) and teachers (15.63%)

Table 2 *Frequency distribution of subjective norms and incentive for obedience on the puberty in the target group*

Frequency Variable		Percentage	Significance
Subjective norms	Teacher	15.63	* 0.25
	Parents	67.18	
	Friends	10.43	
	Sister	3.64	
	Brother	3.12	
Incentive for obedience	Teacher	11.45	* 0.009
	Mother	47	
	Father	27	
	Friends	5.75	
	Sister	6.8	
	Brother	1.6	
Attitude	Positive	38	** 0.001
	Negative	154	
Knowledge	Poor	43	** 0.001
	Medium	89	
	Good	60	

* The result of Chi-square test
** The result of correlation coefficient tes

ranked first and second, followed by friends, books, media and health professionals, respectively. In terms of reference individuals' effect or incentive for obedience, mothers with 47% and fathers with 27% ranked first and second, respectively (Table 2). Regression analysis was used to determine the variables affecting observing health issues during puberty; nutritional knowledge during puberty was the only predictive variable of health behaviors in adolescent girls (Table 3). The results in Table 1 show that there is a significant relationship between knowledge and grade and also between attitude and grade (P<0.001). The t-test also showed that there is a significant relationship between age and knowledge (P<0.001).

Chi-square test in the above table shows that there was no significant relationship between attitude and subjective norms, but there was a significant relationship between attitude and incentive for obedience (P=0.009). Also, the correlation coefficient showed a significant relationship between knowledge and attitude (P<0.001). The most subjective norms on health during puberty were parents with 67.18% and teachers were in the next rank and the highest incentive for obedience was related to mother with 47%, then father with 27% and then teacher with 11.45%.

Table 3 *Regression model of variables affecting observing health during puberty in participants*

dependent variable	Predictors	R2	Significance level	t-value	Standardized beta	Independent variables	
Behavior intention	Nutrition	0.041	0.390	-0.863	-0.086	General knowledge	
			0.277	-1.091	-0.103	Attitude	
			0.001	3.127	0.203	Nutrition	Knowledge
			0.995	0.006	-0.001	physical puberty	
			0.827	0.219	-0.020	Mental Health	
			0.211	1.257	0.116	Sexually transmitted diseases and AIDS	

Table 3 shows that nutritional knowledge during puberty is the only predictive variable of health behaviors in adolescent girls (P<0.001).

Discussion

In this study, there was a relationship between age and education and knowledge and attitude. The mean knowledge score was 56.23 ± 2.67

from the total score of 100, and the mean attitude score was 34.29 ± 5.77 from the total score of 54. Correlation coefficient showed a significant direct relationship between knowledge and attitude (r=0.477 and P<0.001). Also there was a significant relationship between knowledge and grade, i.e., knowledge was reduced by increasing grade and higher grade improved their attitude toward health behaviors during puberty suggesting that perhaps training during puberty was forgotten over time and training should be repeated regularly every year and for every grade.

Zabihi also noted that there was a significant relationship between students' knowledge and their level of education and attitude. Taklif (maturity) is the sweetest time in every girl's life which occurs simultaneously with the beginning of puberty. During this period, due to physical, emotional and social changes there is a need to raise adolescents' knowledge so that no danger threatens their health. In Iran, because of cultural and not religious reasons, most adolescents, especially girls, are deprived of correct and appropriate information on physical and emotional changes during puberty and perhaps they would have physical and mental problems in their family life due to obtaining information from ignorant and unsubstantiated sources. Girls' knowledge about observing health issues during puberty can have a significant impact on their performance and reduce many of their problems in the future [14].

In terms of education, 8.9% of mothers were illiterate, 36.5% had primary education and 5.7% of fathers were illiterate and 22.4% of them had primary education. Abdollahi noted that evaluation of parents' education level showed that parents' education played an important role in the ability to transfer knowledge to girls [15].

One-way ANOVA test showed a significant difference in knowledge and attitude based on the grade. Sadaghi Sabet et al. in a study titled "knowledge, attitude and health behaviors of girl's students during puberty" showed that the majority of subjects (65.3%) had moderate

knowledge and 49.3% of them had indifferent attitude toward health during puberty [11].

Based on the expectancy-value theory, evaluation of the results is in fact individual's judgment of a behavior that he intends to perform. Chi-square test showed that there was no significant relationship between knowledge and evaluation of the results. The purpose of subjective norms in this study was to know reliable people who are effective in adolescents' intention in performing health and preventive behaviors, therefore, subjective norms and incentive for obedience were studied as two major factors influencing subjective norms. The analysis of questions on subjective norms suggested that most normative beliefs were affected by teachers (15.63%) at school and by parents (67.18%) and friends (10.43) at home. In terms of the effect of reference people or incentive for obedience, mothers with 47% and fathers with 27% were in the first and second place, respectively. Judi (2009) in his study titled "the effects of subjective norms on adolescents' intention to smoke" states that students believe their own and their friends' abstract norms are the same [17]. Adolescents choose friends whose attitudes are similar with their own [18]. Ahmadi et al. concluded that mothers are the most important source of information for girls about issues of puberty and menstruation and believed that their information is incomplete and insufficient in this case. More importantly, mothers thought they failed to establish a proper communication with their daughters and transfer information to them [19]. Entering high school, students had negative attitudes toward training of health behaviors. Adolescent girls do not share the problems of puberty with their mothers because of shame. Also, mothers or teachers may not let their daughters know the changes of puberty due to shame and considering puberty as an unpleasant subject. The results of Vlassoffa in India also showed that girls' information about changes of puberty is inappropriate believing that the role of preventive attitudes

is effective in the lack of knowledge [20]. Abdollahi, consistent with domestic and foreign studies, states that mothers are the most reliable channel of transferring information to their daughters on various fields of puberty health [15-21]. Therefore, strengthening the relationship between mothers and adolescent daughters and removing barriers such as shyness in expressing issues related to puberty and menstruation or mothers' indifference about health consequences should be considered in training programs of mothers [22].

Regression analysis test showed that nutritional knowledge during puberty was the only predictive variable of adolescent girls' health behaviors which decreased with increase of grade and age. Olfati writes that nutrition can be effective on students' academic achievement as an important factor in health.

In this study, 79% of girls were unaware of food sources of iron, 77% wrongly thought that some food such as pickles, fruits and vegetables should be avoided during menstruation, 87% did not know that in adolescence they need more energy than any other period, 11% did not know that breakfast is the most important meal, and 63% did not know that adolescents should use all five food groups [23]. Since the onset of puberty, girls are subjected to numerous physical and psychological problems such as malnutrition, iron deficiency, genital and urinary tract infections, sexually transmitted infections, premenstrual syndrome, abortion, pregnancy at an early age, childbirth, menopause, etc., which experience them for the first time. Today, obesity has dominated other adolescence chronic diseases [24]. Nutrition can affect students' academic achievement as an important factor in health [25]. In some communities, girls are victims of a host of false traditions so that their health, nutrition and education are given a lower value than boys, so, one of the goals of UNICEF is to support girls, which includes giving priority to girls' health and nutritional needs during adolescence [26].

There were some limitations in this study due to the nature of the subject, for example, it was difficult to convince Education authorities, so some questions were eliminated from the questionnaire. Some participants refused to answer questions because of shame, and if they did not answer most questions they were excluded from the study. Coordination with school officials and confidentiality of questionnaire information were ethical considerations of this study.

Conclusion

Nutrition was the only predictive variable of health behaviors during puberty that adolescent girls' nutritional knowledge should be raised, so training of health issues during puberty in high schools should also be continued with an emphasis on nutrition. In addition, the role of preventive attitudes which lead to lack of knowledge should attend to among adolescent girls when they enter high school. Mothers were considered as the most important channel of transferring information and reference people. To perform health behaviors by adolescent girls, special attention should be given to three factors of knowledge, attitude and subjective norms and to achieve accurate information about puberty period, mothers' knowledge, as the main source of information and girls preferred source of information, should be raised by methods such as holding regular training meetings by schools' health educators for girls and their mothers with cooperation of parents association and school officials. It is also recommended that further research be conducted to evaluate mothers' knowledge about health during puberty and the effects of mothers' training about puberty on girls' knowledge.

Contributions
Study design: H S
Data collection and analysis: H S, M M, M M
Manuscript preparation: H S

Conflict of interest
"The authors declare that they have no competing interests."

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