

## Effect of Education Based on the Theory of Planned Behavior on Health Promoting Behaviors in 12-14-Year-Old Girls

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### Abstract

**Background:** Adolescence is one of the most important and valuable times in every person's life. Therefore, creating a way to adopt and maintain healthy behaviors, education and health interventions seem to be necessary. The present study was aimed to investigate the effect of planned theory-based education on health promoting behaviors in adolescent girls aged 12-14 years in selected schools in Tehran, Iran.

**Materials and Methods:** A quasi-experimental study (n=80) was conducted on female students (first course of secondary education) in Tehran's schools in 2016. Sample size was estimated based on the mean comparison formula of the two groups. The data gathering tool included health promoting behaviors questionnaire and demographic questionnaire. In the intervention group (n=40), the training (three one-hour sessions) was conducted by the researcher through lecture, question and answer and group discussion. Before intervention and two months after the intervention, the intervention group and the control group (n=40) completed the questionnaires twice in a two-month interval.

**Results:** The results of independent t-test showed no significant difference in mean and standard deviation of scores of attitude, subjective norms, perceived behavior, behavioral intention and behavior before intervention in the two groups ( $p > 0.05$ ). Independent t-test result showed a significant difference in mean and standard deviation of scores of attitudes, subjective norms and perceived behavior after the intervention ( $p < 0.05$ ).

**Conclusion:** The results showed that education based on the theory of planned behavior improved health promoting behaviors of adolescent girls. Therefore, it is recommended that schools use theory-based educational programs to increase the health promoting behaviors of adolescent girls.

**Key Words:** Adolescent, Attitude, Girls, Theory of Planned Behavior.

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## 1- INTRODUCTION

Adolescence is one of the critical developmental stages, transition, change, and the peak of vulnerability (1). Adolescence is the beginning of physical, psychological and social changes and one of the most important and most valuable stages of life of each person (2). The statistics show that the largest generation of adolescents in terms of number is related to the present age. Nearly half of the world's population is made up of people under the age of 25 and one fifth of the world's population is in the age range of 10-19, 85% of whom live in developing countries (3). Across the globe, adolescence is recognized as one of the stages with relative health. Therefore, it is noteworthy that in many parts of the world, these needs are not met adequately, and a wide range of juvenile health issues has been forgotten (4, 5).

One fifth of the world's population is in the age range of 10-19 years old, 85% of whom live in developing countries (3), and more than 500 million adolescent girls live in developing countries. The health of these girls has special value for cultural and social reasons. Investing in the health of this age group due to the dual role of girls in the health of the community and the health of future generations is one of the main paths for achieving the Millennium Development Goals (6). On the other hand, one of the key determinants of health is health promoting behaviors, which is known as the underlying cause of the absence of many diseases, and health promotion and disease prevention are directly related to these behaviors (7). ) Health promotion includes behaviors that a person has, adequate nutrition, regular exercise, avoidance of destructive behaviors and drugs, protection against accidents, timely diagnosis of symptoms in the physical aspect, emotional control, emotions and thoughts and coping with stress and various problems. In

psychological aspect, independence, adaptation and improving interpersonal relationships in the social dimension are dealt with (8). Promoting health means facilitating the use of individual capabilities, improving the quality of life, increasing the productivity and using the health related capabilities (9). Therefore, to create a way to adopt and maintain healthy behaviors, health education and intervention is necessary. Theories and models should be considered in the design, implementation and evaluation of health education programs (10). The theory-based health education interventions have a significant impact on the development, promotion and continuing activities (11). However, it has now become clear that the value of health education programs is measured by their effectiveness, and this effectiveness is significantly dependent on the correct use of health education theories (12, 13). On the other hand, most health problems are closely related to human behavior. Behavioral theories and patterns can be used to understand how to prevent health problems (30).

The theory of planned behavior is one of the theories of behavior change that is used to predict and understand behavior (14). In fact, behavior or behavioral intention is influenced by factors outside the control of the individual (environment, social and cultural factors) (15, 16). This theory states that attitude toward behavior, the subjective norm about behavior and the control of perceived behavior are the 3 main constitutive elements determining the intention to change behavior (17, 18). The results of the study by Raiyat et al. (2012) showed that the nutritional and physical activities of boys is more favorable than girls. Overall, the behaviors related to the promotion of adolescent health are moderate; therefore, the provision of health and education services in counseling adolescents and their families should be given priority (19).

Considering that adolescent girls are mothers of the next generation, they play a pivotal role in the family, thus promoting and maintaining their health is in fact the promotion of the health of families and, ultimately, the community of tomorrow. Due to the importance of this issue, this study was conducted to investigate the effect of education based on the theory of planned behavior on the health promoting behaviors of adolescent girls aged 12-14 years in selected schools in Tehran, Iran.

## 2- MATERIALS AND METHODS

### 2-1. Study design and population

The present study was a semi-experimental study on female students (first course of secondary education) in public schools in Tehran in 2016. The sample size was calculated based on the following formula (mean comparison formula of the two groups), and 40 people were assigned in each group:

$$n \geq 2 \frac{(z_{\alpha/2} + z_{\beta})^2 \sigma^2}{(\mu_1 - \mu_2)^2}$$

Where,  $1-\beta=0.90$ ,  $\alpha=0.05 \rightarrow Z_{\alpha/2}=1.96$ ,  $\beta=0.10 \rightarrow Z_{\beta}=1.28$ ,  $(\mu_1 - \mu_2) / \sigma = 2/3 = 0.70$ .

Two of Tehran's schools in the same geo-economic conditions that had better cooperation to implement the intervention were selected, and then one school was randomly selected as the intervention group and the other school was assigned as the control group.

### 2-2. Inclusion and exclusion criteria

The inclusion criteria included parents' and students' willingness to participate in the study, female students aged 12 to 14 years old, lack of previous education on stress control and exclusion criteria included not participating in all educational sessions in the present study.

### 2-3. Ethical Considerations

This paper was the result of a research project approved by Shahid Beheshti University of Medical Sciences with the code of ethics IR.SBMU.PHNM.1395.452. Thereby the cooperation of students, parents and staff of selected schools and the Ministry of Education are appreciated.

### 2-4. Data Collection Tool

The questionnaire used to survey demographic data included 6 questions: age, mother and father's education, mother and father's occupation and family's economic position. The health promoting behaviors questionnaire (including 75 questions) was made by the researcher and was based on the theory of planned behavior structure including attitudes, subjective norms, perceived behavior, behavioral intention, and behavior. The attitude included 28 questions, subjective norms: 12 questions, perceived behavior: 19 questions, behavioral intention: 8 questions and behavior: 8 questions with 5 point Likert scale (1-5). The minimum total score of the questionnaire was 75 and the maximum score was 327. Higher scores indicate better health-promoting behaviors. Validity of the questionnaire was verified using content validity method by ten professors and experts. The reliability of this questionnaire was confirmed by a test-retest method on 30 people with ICC for model and function components which was confirmed by 95% confidence.

### 2-5. Intervention

After obtaining the necessary permissions, the researcher attended the sampling site. After self-introduction and a brief description of the goals of the study, if the students and their parents wished to participate in the study, the demographic questionnaire and the health promoting behaviors' questionnaire were completed by the students. The intervention group was then invited to attend classes. The training sessions consisted of three one-

hour sessions by the (trained) researcher with a one-week interval through lecture, question and answer method, and group discussion. At the end of the training sessions, the three training sessions were summarized and educational pamphlets were provided to the control group students. Then, two months after training,

both groups of intervention and control completed the questionnaires. After completing the final evaluation for the control group, they were provided with training class including the same contents as the intervention group and the educational pamphlets were provided to them (**Table.1**).

**Table1:** Table of Contents.

Time	Content	Place of presentation
First session Monday at 9am second session	Training in physical activity Stress	School classroom, equipped with video and projector for PowerPoint presentations
Next week, Monday at 9am	Management training and coping strategies	Class of school, equipped with video and projector for PowerPoint presentations
Two weeks later, on Monday at 9am	Review the contents of the two sessions before and answer the students' questions	Class of school, equipped with video recorder and projector for PowerPoint presentations

### 2-6. Data Analysis

In this study, SPSS software version 24.0 was used for data analysis and descriptive statistic tests and mean central indices were used to describe the variables of the research and independent t-test was used for comparing the means in the intervention and control groups. P-value less than 0.05 was statistically significant.

### 3- RESULTS

The findings of this study showed that the mean and standard deviation of age in intervention group, control group and all

female students were  $13.62 \pm 0.83$ ,  $12.67 \pm 0.72$  and  $13.15 \pm 0.91$  years. Other characteristics of the female students studied are listed in **Table.2**. The results of independent t-test showed no significant difference in mean and standard deviation of scores of attitude, subjective norms, perceived behavior, behavioral intention and behavior before intervention in the two groups ( $p > 0.05$ ). Independent t-test showed a significant difference in mean and standard deviation of scores of attitudes, subjective norms and perceived behavior ( $p < 0.05$ ) (**Table.3**).

**Table-2:** Baseline characteristics of the girl students in the study.

Baseline Characteristics of Research Units		Intervention group	Control group
		Number (%)	Number (%)
Mother's education	Reading and writing	1 (2.5)	1 (2.5)
	Elementary	14 (35)	5 (12.5)
	Secondary school	22 (55)	13 (32.5)
	Academic	3 (7)	21 (52.5)
	Total	40 (100)	40 (100)
Mother's job	Housewife	27 (67.5)	29 (72.5)
	Employed	7 (17.5)	8 (20)
	Working at home	5 (12.5)	2 (5)
	Others	1 (2.5)	1 (2.5)
	Total	40 (100)	40 (100)
Father's education	Reading and writing	5 (12.5)	2 (5)

	Elementary	15 (37.5)	1 (2.5)
	Secondary school	15 (37.5)	20 (50)
	Academic	5 (12.5)	17 (42.5)
	Total	40 (100)	40 (100)
Father's job	Manual worker	3 (7.5)	7 (17.5)
	Employee	9 (22.5)	11 (27.5)
	Self-employed	25 (62.5)	19 (47.5)
	Retired	3 (7.5)	3 (7.5)
	Total	40 (100)	40 (100)
The economic situation	Less than enough	2 (5)	22 (55)
	Enough	18 (45)	15 (37.5)
	More than enough	20 (50)	3 (7.5)
	Total	40 (100)	40 (100)

**Table-3:** Comparison of mean of the dimensions of the theory of planned behavior in the two groups of intervention and control after the intervention.

Variables	Group	Before intervention	After intervention	P-value*
		Mean ± SD	Mean ± SD	
Attitude	Intervention	67.02±15.59	71.35± 13.40	0.0001
	Control	64.35±10.77	64.20±11.30	0.35
	P-value**	0.375	0.012	
Subjective norms	Intervention	33.85±9.74	35.00±11.21	0.001
	Control	33.15± 11.13	33.20± 10.90	0.22
	P-value**	0.35	0.05	
Perceived behaviors	Intervention	53.07± 10.75	68.27±7.83	0.023
	Control	50.30±9.40	50.45±9.33	0.98
	P-value**	0.22	0.001	
Behavioral intention	Intervention	4.55±1.81	5.32±1.16	0.001
	Control	5.22±1.25	5.05±1.28	0.455
	P-value**	0.32	0.06	
Behavior	Intervention	10.67±1.16	12.4±1.51	0.0001
	Control	10.95± 1.28	10.35±1.09	0.523
	P-value**	0.318	0.0001	

\*Paired t-test, \*\*Independent t-test.

#### 4- DISCUSSION

The purpose of this study was to investigate the effect of education based on the theory of planned behavior on health promotion behaviors in adolescent girls aged 12-14 years in selected schools in Tehran, Iran. The results of this study showed that the mean score of attitude of

students in intervention group toward health promotion behaviors increased significantly after training intervention. These changes indicate the effectiveness of the curriculum implemented to enhance students' positive attitude towards addressing health promotion behaviors. In a study by Shakeri Nejad et al. (2017)

aimed to determine the effect of health education based on the theory of planned behavior on increasing physical activity of 163 high school female students, the results showed that the mean score of attitude toward physical activity of students in the intervention group increased significantly after intervention (20). In addition, the results of the study by Solhi et al. (2012) based on the theory of planned behavior on students' physical activity showed that post-intervention mean of attitude was significantly different in the two groups of control and intervention (21). These results are consistent with the results of present study. In fact, after direct experience of a behavior, positive beliefs about the consequences of the behavior are reinforced and influence its continuation as motivation (22). Attitude has a significant effect on the performance and participation of individuals. A weak attitude is a deterrent to start and engage in an activity or behavior (23). If the outcome of a behavior is evaluated positively, people will have a positive attitude toward it (24).

The results of this study showed that the mean scores of subjective norms of students in intervention group on health promotion behaviors increased significantly after the intervention. These results are consistent with the results of various studies that examine the effect of education on the theory of planned behavior in students and adolescents, such as the study by Shakerinejad et al. (2017), Solhi et al. (2012), Mohammadi et al. (2013), Astorm et al., and Alami et al. (2019) (20, 21, 25-27). The subjective norms of individuals are influenced by different people in society, and are formed by two factors of normative beliefs and the motivation to follow. Training and obtaining information for those who are important to an individual would increase the probability of the behavior to be confirmed by them (28). Therefore,

increasing the subjective norms of health promoting behaviors can be explained based on the theory of planned behavior. The results of this study showed that the average score of perceived behavior of students in intervention group on health promoting behaviors was significant after educational intervention, which is consistent with the studies by Shakeri Nejad et al. (2017), Yarmohammadi et al. (2011), Baji et al. (2017), and Matlabi et al. (2018) (20, 29-31). It seems that discussion and education about physical and psychological outcomes of physical activity, facilitators, barriers and prohibitions to conduct the perceived behavior, suggesting solutions to overcome these problems and motivating them in this regard can have a great impact. Since most health problems are closely related to human behavior, behavioral theories and patterns can be used to understand how to prevent health problems (32).

#### **4-1. Study Limitations**

One of the limitations of the present study was that the effect of training on long-term behavioral change and maintaining it was not measured. Other limitations of the present study are the small sample size and the study of female students. It is also suggested that more studies be conducted with a longer track to investigate the effect of time on behavior change.

#### **5- CONCLUSION**

The results showed that education based on the theory of planned behavior improves the health-promoting behaviors of adolescent girls. Results showed mean and standard deviation of scores of attitude, subjective norms, and perceived behavior were significantly increased. Therefore, it is recommended that theory-based educational programs be used to increase the health-promoting behaviors of adolescent girls.

**6- CONFLICT OF INTEREST:** None.

### 7- ACKNOWLEDGMENT

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