

Effect of Educational Program on Milk Consumption based on the Theory of Planned Behavior among Girl Students

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Abstract

Background

An adequate level of calcium intake during growth years can extensively help to stabilize calcium level and increase bone density. However, calcium intake in female school-age students is low. This study aimed to determine effect of educational programs on milk consumption based on the theory of planned behavior among 7th grade girl students in Kashan city, Iran.

Materials and Methods: This study was interventional quasi-experimental research. 220 girl students (110 for interventional group and 110 for control group), were selected by simple random sampling from schools in Kashan city, Iran. The researcher-made questionnaire based on theory of planned behavior used for data collection. Interventional programs were performed using lectures, poster, and pamphlet. The questionnaire was completed by the students twice, before and two months after the implementation of educational program. Data were analyzed by SPSS version 20.0 using descriptive statistics and independent t-test.

Results: After the implementation of the educational programs, the rate of milk consumption at home significantly increased among the interventional group ($P < 0.05$). Also, there was a significantly increase in the mean scores of attitude ($P < 0.05$), subjective norms ($P < 0.05$), perceived behavioral control ($P < 0.05$), and intention of milk consumption ($P < 0.001$) in the interventional group.

Conclusion

Educational programs based on the theory of planned behavior led to an increase in the scores of attitude, subjective norm, perceived behavioral control, and milk consumption intention among girl students. Thus, educational interventions and programs should be designed and implemented based on the theories of health education.

Key Words: Behavior, Educational programs, Milk, Students.

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1- INTRODUCTION

Milk has always been one of the main dairy products throughout history (1). Inadequate and discontinuous consumption of milk and dairy products can cause many side effects at different stages of life. According to nutritionists, inadequate consumption of milk and its products has several important side effects including physical growth retardation especially in children and adolescents, bone and gum diseases, increased vulnerability to infectious diseases, vision problems, osteoporosis, short life, premature aging, neurological diseases, and sleep disorders (2). Adolescence is a period that the need for food increases and, also dietary habits and some anthropometric characteristics track to adulthood (3). Osteoporosis is a major health problem that is certainly associated with inadequate calcium intake during childhood and adolescence. An adequate level of calcium intake during growth years can extensively help to stabilize calcium level and increase bone density. Therefore, school-age is the best time to build bone mass and prevent bone fractures in the later stages of life (4). Also, children who had improper and insufficient diet in the first years of life, had lower Intelligence quotient (IQ), and were unable to do their homework in school (5). Girls consume milk less frequently than boys therefore girls have low rates of calcium intake (4). Garry et al., conducted a study and showed that only 10% of girls aged 9-17 years consumed the recommended daily amount of calcium (1,300 mg); in addition, the daily calcium intake of 2.3% of girls aged 9-12 years was less than the recommended level (4). Particularly, calcium intake in adolescents was found to be only 56% of the recommended nutrient intake, which was the lowest intake rate among all nutrients and the lowest ratio in terms of recommended nutrient intake compared to calcium intakes in other age groups (6).

Several studies in various countries all over the world have shown that a high percentage of adolescents in Bangladesh and other countries do not consume milk (7). Esfarjani et al., conducted a study entitled "Assessment of nutritional intake of adolescent girls in Saleh Abad, South of Tehran", they found that a very small percentage of studied subjects consumed milk daily (4). Adolescents account for 28.1% of the total population of the country. In addition, adolescent girls and young women account for 14% of the young population of country; they are physically, psychologically, and socially more vulnerable than boys (8). There has been some concern about the low prediction of dietary intake by psychosocial variables among children, since children do not always control the selection of what they eat (9).

Implementation of nutrition education program can have a huge impact on the promotion of milk consumption among students. Therefore, while planning for school-age children it is necessary to bear in mind that children of this age are more active and need special trainings on age-appropriate diet (10). Deciding to choose particular foods is a result of many psychosocial variables. To explain food-related behavior, numerous theories have been employed. One such theory, the Theory of Planned Behavior (TPB), states that attitudes, subjective norms surrounding the performance of the behavior, and perceived behavioral control predict the intention of an individual to perform a behavior. Attitudes are one's attitude towards performing the behavior, and are based on behavioral beliefs. Subjective norm describes the beliefs of a group of people an individual perceives as important and is weighted by the normative beliefs of the individual to conform to group. Perceived behavior control is a measurement of how difficult the individual perceives it to be to perform

the behavior, and can include several perspectives on why or to what extent the behavior is difficult (11, 12). Berg et al., conducted a study to evaluate the selection of milk and bread for feeding children based on the theory of planned behavior. The results showed that attitudes, subjective norms, and perceived behavioral control can be used to predict people's intention to eat this type of food groups (13). Moreover, according to a study by Bogers et al., perceived behavioral control was the strongest predictor of intention and behavior to choose the type of food to be consumed. In order to explain the dietary behaviors, the mentioned study recommends designing health education interventions based on the theory of planned behavior (14). Kothe et al., conducted a study to assess socio-cognitive factors affecting breakfast habits using the theory of planned behavior among university students. The results showed that changes in attitudes, subjective norms, and perceived behavioral control accounted for 12.9% of the variance in eating breakfast (15).

Based on the items mentioned above, this study was designed to use the theory of planned behavior to assess milk consumption behavior and its related factors among students. Then, we designed, implemented, and evaluated a theory based education program to alter milk consumption behavior among students. This study aimed to determine effect of educational program on milk consumption based on the theory of planned behavior among 7th grade girl students in Kashan.

2- MATERIALS AND METHODS

2-1. Study design and population

This study was an interventional quasi-experimental research which was conducted on 7th grade girl students in middle school of Kashan city, Isfahan province, the Central of Iran.

2-2. Methods

To determine the study samples, first we used the list of schools available in School Health department in Health Deputy. Accordingly, a total of eight middle school were randomly selected from the center and suburb of Kashan city. Then, four schools were randomly selected as the intervention group and the four other schools were set as the control group.

In order to facilitate the researchers' access to students and to implement the educational program better without disrupting the weekly school curriculum, from every school only one grade (7th grade), and from every grade only one class was selected via simple random sampling method. The foreign students were excluded from this study. Accordingly, a total of 220 students were selected and classified into two groups of intervention (n=110), and control (n=110).

2-3. Measuring tools: validity and reliability

Data were collected using researcher-made questionnaire which was designed based on the constructs of the theory of planned behavior; it was consisted of two parts as follows:

The first part of the questionnaire was intended to collect demographic data including weight, height, father's educational level, mother's educational level, and school shift. **The second** part of the questionnaire was designed based on the theory of planned behavior. It included questions about attitude toward milk consumption (15 specific questions scored on an ordinal scale from 1 to 5, ranging from strongly agree to strongly disagree), subjective norms (12 specific questions scored on an ordinal scale from 1 to 3), perceived behavioral control over milk consumption (8 specific questions scored on an ordinal scale from 1 to 3), milk consumption intention (3 questions scored on an ordinal scale from 1 to 5), behavior

of consuming milk and its products at home (with two options of Yes and No), behavior of consuming milk and its products in school (with three options of always, sometimes, never). In order to assess the validity of the questionnaire, it was presented to several experts in the field of health education and nutrition; their views were collected and used to modify the questionnaire. Moreover, to determine the reliability of the questionnaire used in the study, we conducted a pilot survey (30 persons were selected from among the study population), and the Cronbach's alpha coefficient was calculated for different components of the questionnaire including attitude ($\alpha = 0.92$), subjective norms ($\alpha = 0.87$), perceived behavioral control ($\alpha = 0.82$), intention ($\alpha = 0.90$), and milk consumption behavior ($\alpha = 0.85$). It should be noted that a tape measure and a weight scale were used for the measurement of height and weight of the participants.

2-4. Intervention

Pre-test was carried out in the two interventional and control groups using the questionnaire which was designed based on the theory of planned behavior. Then, we prepared the educational content based on educational needs identified in the pre-test; the content was consistent with the constructs of the theory of planned behavior. Educational programs were performed using lectures, poster about importance and benefits of milk consumption, and pamphlets about the type of healthy foods and benefit of eating milk. Considering the characteristics of the target group and the constructs of the study, number and duration of educational sessions was specified. The program content was presented for the interventional group through speech and group discussion during four sessions, each lasting 40 min. All educational sessions were held in the conference halls of the respective schools by nutritionists

and health education specialists. The educational sessions' topics are as follows.

- First session: having a discussion about the importance of healthy eating.
- Second session: to debate about the important of milk consumption and the benefits of eating milk.
- Third session: talk over about the ability to choose healthy foods such as milk by students. Fourth session: perception and belief about the pressures of friends, peers, and teachers on milk consumption and belief in the importance of opinion of parents and family about eating milk, also cognition and encouragement to follow the proper pattern of eating milk.

In case of subjective norm, keeping in mind the impact by the family and parents on behavior of milk consumption in the students, an educational session was held for parents. Two months after the intervention, the questionnaire was completed again by the two interventional and control groups.

2-5. Ethical consideration

The aim of the project was explained before the start of the study and the target group were ensured about the confidentiality of their data. The participants were enrolled into the study only after obtaining fully informed consent. Moreover, we made coordination with school authorities and parents.

2-6. Inclusion and exclusion criteria

The inclusion criteria were only female students in 7th grade in middle schools that were enrolled into the study and giving an informed written consent. The exclusion criteria was student being absent for more than two sessions during training, and students who questionnaires filled out incompletely.

2-7. Data Analyses

Data were analyzed by SPSS version 20.0 through descriptive statistics and independent t-test was used to comparing the mean scores of constructs of the theory of planned behavior and milk consumption before and after the educational program in interventional and control groups at 0.05 significant levels.

3- RESULTS

The results of this study showed that the majority of students in the interventional group (77.27%, n=85), and control group (73.64%, n=81), went to school in the morning shift. There was no statistically significant differences between the interventional and control groups before the education in father's educational level (P=0.67), mother's educational level (P=0.87), school shift (P=0.42), mean height, weight, body mass index (P>0.05), and consumption of milk and its products at home (P=0.15).

As shown in **Table.1**, independent t-test showed no statistically significant difference between interventional and control groups before the educational program in the mean scores of attitude (P=0.84), subjective norms (P=0.26), perceived behavioral control (P=0.94), and intention of milk consumption (P=0.41).

Based on the results of independent t-test presented in **Table.2**, after the educational programs, there was a statistically significant difference between interventional and control groups in the mean scores of attitude, subjective norms, perceived behavioral control, and intention

of milk consumption (P< 0.001). Based on the results shown in **Table.3**, before the educational programs, the majority of students in the interventional group (91.8%), and control group (96.4%) consumed milk and its products at home. There was no significant difference between interventional and control groups in milk consumption at home (P=0.15). In addition, before the educational programs, 50.9% of students in the interventional group and 40.9% of students in the control group did not consumed the milk provided in schools. On the other hand, 15.5% of students in the interventional group, and 14.5% of students in the control group reported that they always consumed the milk provided in the school. So that, there was no significant difference between interventional and control groups (P=0.23). As the results of **Table.4** shows, after the educational programs, the majority of students in the interventional group (98.2%), and control group (90.9%) consumed milk and its products at home. Consequently, there was a significant difference between interventional and control groups in milk consumption at home (P=0.01). In addition, after the educational program, 50.9% of students in the interventional group, and 33.6% of students in the control group reported that they did not consumed the milk provided in schools at all. On the other hand, 14.5% of students in the interventional group, and 20.9% of students in the control group, reported that they always consumed the milk provided in the school. So that, there was a significant difference between interventional and control groups (P=0.03).

Table-1: Comparing interventional and control groups in mean of scores of constructs of the theory of planned behavior before the educational program

Constructs	Interventional group	Control group	P-value
	Mean ± SD	Mean ± SD	
Attitude	58.69 ± 7.59	58.49 ± 7.61	t = 0.195 P = 0.84
Subjective norms	33.73 ± 4.10	33.13 ± 3.78	t = 1.127 P = 0.26

Perceived behavioural control	18.51 ± 2.54	18.48 ± 2.90	t = 0.074 P = 0.94
Intention	10.15 ± 3.15	9.80 ± 3.06	t = 0.823 P = 0.41

SD: Standard Deviation.

Table-2: Comparing interventional and control groups in the mean of scores of constructs of the theory of planned behavior after the educational program

Constructs	Interventional group	Control group	P-value
	Mean ± SD	Mean ± SD	
Attitude	65.55 ± 5.71	57.76 ± 7.64	t=8.56 p<0.001
Subjective norms	35.97 ± 1.54	32.54 ± 4.26	t=7.94 p<0.001
Perceived behavioural control	19.50 ± 2.38	17.95 ± 2.58	t=4.60 p<0.001
Intention	12.54 ± 2.76	9.14 ± 3.18	t=8.46 p<0.001

Table-3: The frequency of milk consumption at home and in schools in interventional and control groups before the educational programs

Variables		Interventional group	Control group	P-value
		Frequency (%)	Frequency (%)	
Consumption of milk at home	Yes	101 (91.8)	106 (96.4)	0.15
	No	9 (8.2)	4 (3.6)	
Consumption of milk in school	Always	17 (15.5)	16 (14.5)	0.23
	Sometimes	37 (33.6)	49 (44.5)	
	Never	56 (50.9)	45 (40.1)	

Table-4: The frequency of milk consumption at home and in schools in interventional and control groups after the educational programs

Variables		Interventional group	Control group	P-value
		Frequency (%)	Frequency (%)	
Consumption of milk at home	Yes	108 (98.2)	100(90.9)	0.01
	No	2 (1.8)	10 (9.1)	
Consumption of milk in school	Always	16 (14.5)	23 (20.9)	0.03
	Sometimes	38 (34.5)	50 (45.5)	
	Never	56 (50.9)	37 (33.6)	

4- DISCUSSION

The aim of this study was to determine the effect of educational programs on milk consumption based on the theory of planned behavior among 7th grade girl students. According to the results of the present study, the implemented educational programs resulted in a significant difference in students' score of attitude. In line with our findings, other

studies also showed the effect of education on attitude (16-18). Furthermore, educational programs significantly increased the mean score of subjective norms affecting milk consumption in the interventional group. The effects of subjective norms on behavior change has been proved in other studies, including Zhang et al.' study on nutrition in American adolescents (19),

MohammadiZeidi and Pakpour's study on breakfast and healthy snacks among students (17), and Gheysvandi et al.'s study on milk consumption and dairy products among female students (16). On the other hand, in a study by Peyman and Nasehnezhad, education programs had little impact on subjective norms; this finding was attributed to the role of individuals that were important for students (20). In Zhang et al.'s study (19), reported the effect of subjective norms on behavior change in boys, while it had no effect on girls. Their finding is not in line with the results of our study. This difference may be due to the difference in the nature of the two studies. According to the mentioned study, the most important barriers to healthy eating were lack of proper access to healthy foods as well as the taste of food. Although these factors might have been effective in our study, but they were not considered and analyzed in this study. Horst et al.'s study showed that subjective norms and role modeling parents and peers had a significant relationship with the consumption of snacks and beverages in adolescents (21).

In a study by Cheng et al. in Hong Kong which was conducted on adolescents aged 10 to 14 years, the value which parents attributed to breakfast was identified as a predictor of reduced level of breakfast skipping among children and adolescents (22). Several different studies put an emphasis on the important role of family and peer groups on changes in dietary behaviors (23-25). As a result, future interventions must investigate the role of key people, including peer groups, and utilize them to facilitate education among the subjects. The results of the present study showed that after the educational programs there was a significant increase in the mean score of perceived behavioral control in the interventional group. Various studies on nutritional education, including studies by Ickes and Sharma

(26), Lautenschlager and Smith (27), Fila and Smith (28), and MohammadiManesh et al. (29), highlighted the role of perceived behavioral control on intentions and behaviors associated with dietary habits. The results of Niknami et al.'s study (30) showed that an increase in perceived behavioral control had an impact on the realization of health behaviors. Perceived behavioral control is affected by the control beliefs and perceived ability to perform the behavior. When people believe that they do not have the resources or facilities to perform a behavior, probably they will not have a strong intention to perform the behavior even if they have a positive attitude toward a behavior or even if they believe other people who are important to them are also in favor of that behavior (subjective norms). Perceived behavioral control, both directly and indirectly, could affect the intention and consequently influence behavior (11). So, it seems that the use of an education program to strengthen students' perceived behavior control could help to promote the consumption of milk and dairy products among them. Based on the results of this study, two months after educational programs the intention was significantly increased in the interventional group. It is consistent with the results of studies by MohammadiZeidi and Pakpour (17), and Gheysvandi et al. (16).

Intention is one of the elements of the theory of planned behavior. Zhang et al. (19), found no relationship between this factor and healthy eating behavior; on the contrary, other factors were found to be more important. Obviously, the stronger the intention to do something, the higher is the chance to do it. It can be true only when people have the right to do something. In most cases, there are at least some degrees of non-motivational factors which are involved in performing a task such as the level of access to opportunities and resources (time, money, and

cooperation by others) (31). In this study, education had a significant impact on increasing the mean score intention of milk consumption. The role of these factors is not clearly expressed in other studies, but those who have explained the theory of planned behavior have emphasized that a person can complete a task only when he/she has an intention to perform a task and simultaneously has access to opportunities and resources (31). Based on the results of this study, a considerable number of students in both groups consumed milk at home before attending educational program; however, this number was significantly different in the interventional group as compared with the control group in milk consumption at home and in school. The findings of a study by Eilat-Adar et al., showed that after the education, the consumption of breakfast was increase by 51-65% (32). The results of Matvienko's study showed that after the implementation of an educational interventional program, the selection of healthy snacks among children was increased by 25.7% (33). Therefore in this study, educational programs had a significant impact on increasing milk consumption.

5- CONCLUSION

The results of this study suggested that the education, designed based on the theory of planned behavior, affected the attitude, subjective norms, and intention of milk consumption. It seems that the use of behavior theories in the educational programs, can lead to beneficial results. On the other hand, the results of this study showed no change in milk consumption in schools which might be due to different factors other than the attitude and intention, such as the quality and taste of milk. Considering the controversies that exist in some studies, it is recommended to use this method, not only for assessing adolescent boys and girls, but also in other different age groups.

6- CONFLICT OF INTEREST: None.

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