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Research Article

The effect of nutrition education program based on Theory of Reasoned Action on consumption of foods of content of iron at high school girls Ahvaz city in Year 2016

Fatemeh Isvandi[1,2], Ghodratollah Shakerinejad[3*], Maria Cheraghi[4,5] and Kambiz Ahmadiangalli[6]

[1]Student in Health education, Department of Health education and promotion, school of health, Ahvaz Jundishapur University of medical sciences.
[2]Social Determinant of Health Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
[3]Associate professor, ACECR-Khuzestan,Health education research department, Ahvaz, Iran. (correspondence Author)
[4]Associate professor, Social Determinant of Health Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
[5]Department of public health, Health School, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
[6]Associate professor, Social Determinant of Health Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

ABSTRACT

Background: One of the most common public health problems in developed as well as developing countries is iron deficiency anemia. We aimed to investigate the effect of nutritional education based on the model of rational action on food intake of iron in girls' high school student in2016-2017.

Methods:It was a semi-experimental study which has done on 120 girls students of high schoolin two groups as experimental and case groups. We were selected two school by simple random sampling, and from each school 60 students were selected randomly.

The data collected through a questionnaire that included demographic information and questions the logic operation framework. All subjects had field up the questionnaire before and eight weeks after intervention by the students.Data were entered into SPSS version 22. I'm using the Wilcoxon and Whitney were analyzed statistical tests. The level of significant was less than 0.05

Results: The finding has shown that here is a significant differences between mean scores structural model of attitudes toward the behavior, subjective norms, intention and behavior. ($P < 0.0001$) .

Conclusion:The results showed that the educational program for the prevention of iron deficiency anemia was effective on the model of reasoned action

Keywords:Model of reasoned action, anemia, students, Ahvaz

INTRODUCTION:

Attention of researchers and planners today is the remarkable spread of chronic diseases across all countries and changing the epidemiological pattern of disease in middle ages and the tendency towards chronic diseases (1).

Anemia is a condition in which the hemoglobin in red blood cells and then gas transmission powerare reduced. Anemia appears as a result of poor nutrition and lack of materials such as iron, copper, folic acid and vitamin B12. However,

bleeding, diarrhea and genetic diseases may be considered as other factors. However, in many cases, anemia appears especially during school days due to poor nutrition and lack of an i**ron-rich** diet (3).

According to the World Health Organization, iron deficiency anemia is the most common nutritional deficiency in the world and more than two billion people, one-third of all population of the world, are suffering from it (2 and 4). Anemia is one of the main problems in a society, especially among students, which may lead to some problems at the present or future and some serious consequences in a society (3).

Iron deficiency anemia decreases the work efficiency and it has a significant effect on the social and economic development (5).

Spreading iron deficiency anemia among the students in industrial countries is nine percent and in nonindustrial countries is 53 percent. Undoubtedly, the most common reason of anemia in the third world countries is iron deficiency anemia so that 75 percent of anemia is due to iron deficiency (6).

Anemia destroys concentration in teenage girls and decreases their physical strength and educational success and also increases the risk of infection (7).

Food habits are formed in childhood and continue until adulthood. In this regard, parents play an important role in forming the initial characteristic of their children (8).

The school environment is considered as a model affecting the students' nutrition behaviors (9).

Since, food is one of the most basic humans' needs, one of the health education's aspect should be nutrition and health of food (10).

Applying theories and models of behavioral changes increases the possibility of educational interventions impact and helps us to recognize the person and the environment around him/her. Therefore, theories and models of behavioral changes have a significant role in planning and assessing comprehensive programs (11).

Among all the models whose aims are to predict and understand the healthy behaviors, theTheory of Reasoned Action has been successful (12). This theory is the most common accepted approach in the field of choosing food (13).

A great number of studies on students have shown that receiving education has been effective on improving their nutrition behavior. For instance, Nader Esmaiil Nasab and his colleagues (2014) in his study showed that interventions which are more effective than therapeutic interventions such as educating nutrition to students and their families, could be applied simultaneously to take a significant step for not only a symptomatic treatment but also for a basic management to solve this widespread problem (14). Moreover, the study conducted by Mostafa Vahidiyan and his colleagues (2014) on the effect of educational pamphlets and lectures on feeding behavior, knowledge and attitude in male students studying in the third level of a guidance school, showed that both educational methods led to increasing the level of knowledge, attitude and behavior in them but it was more significant in the group of lectures. Generally, its results showed the positive effects of a health education program on increasing knowledge, attitude, and behavior in students. Therefore, applying this method is necessary to improve the feeding behaviors by considering the educational program (15).

Since, the educational nutrition program of consuming iron-rich foods on students of Ahvaz city had not been conducted based on the Reasoned Action model, this research aimed to investigate "the effect ofnutrition educationprogram basedon Theory of Reasoned Actionon consumption of iron-rich foods among high school femalegirls in Ahvaz city in2016".

Methodology:

It was a semi-experimental study which has done on 120 girl's students of high school in two groups as experimental and case groups. We were selected two school by simple random sampling, and from each school 60 students were selected randomly.The data collected through a questionnaire that included demographic information and questions the logic operation framework. According to a study conducted by Halimato et al (16) and by considering the sample size formula for a two-

group Pococke analytical study with the confidence interval of 95% and power of 90%, the sample size of 50 people was calculated for each group which increased to 60 people for each group due to a 20% loss. Therefore, in each group, there were 60 people and the whole sample size was 120 people. Betweentwo selected groups, one was considered as the control group and another as the intervention group. Among all students, those studying in the second grade of high school in the major of human sciences were entered to the study. Finally, for each class, 60 subjects were selected from the absent lists using the simple random sampling method.

The instruments used in this research included a researcher-made questionnaire consisted of four sections including demographic characteristics; 37 structural questions related to theory of Reasoned Action including 7 questions for attitude towards behavior, 18 questions for subjective norms including 6 questions for subjective norms of parents, 6 questions for friends, 6 questions for teacher, 6 questions for behavioral intention and 6 questions for behavior. In this questionnaire, the structures of the model were designed based on a five part Likert Scale from totally agree to totally disagree. In order to calculate the face and content validity of the questionnaire, it was given to ten experts of training health and nutrition and they confirmed the validity of the questionnaire. To calculate the reliability of the questionnaire, it was completed by 30 students (not from the participated groups in this study). To measure the internal consistency, Cronbach's alpha coefficient was used.

In this study, Cronbach's alpha was calculated as 0.74, which was acceptable. Moreover, CVI was calculated as 0.94 and CVR as 0.86.

The questionnaire was given to the subjects of both groups to complete it. Then, the subjects of the intervention group participated in an educational course includinglecture, group discussion, and role-playusing the Reasoned Action Model related to nutrition,anemia, and iron-rich foods. The questionnaire was completed again by both control and intervention groups after eight weeks. The data obtained from the questionnaires were entered to the SPSS software version 22.

To compare two groups, due to the abnormality, man withney test and nonparametric method were used. The significance level was considered as $P<0.05$. Moreover, to analyze the structures of Reasoned Action Model after and before the intervention, Wilcoxon test was also used.

Findings o study:

As you can see in Table 1, according to the data obtained, the education level of more than 75 percent of the subjects' fathers were above diploma and that of more than 64 percent of their mothers was under diploma. In addition, more than 68 percent of their fathers were self-employed and more than 96 percent of their mothers were housewife.

Therefore, based on chi-square test, there were no any significant differences between both groups in terms of demographic factors.

As it is shown in Table 2, before the educational intervention, no significant difference was observed between both groups in terms of the mean score of attitude towards behavior ($p=0.415$), subjective norms ($p=0.068$), behavioral intention ($p=0.068$) and the subjects' behavior ($p=0.588$). However, after the intervention, the statistical analysis showed that the intervention led to a significant difference in all the structures of the model in the intervention group ($p=0.001$).

DISCUSSION:

The present study is an interventional case-control study aimed to investigate the effect of education based on Reasoned Action Model on feeding behavior of consuming iron-rich foods to improve the feeding behavior in female students studying in the high schools in Ahvaz city. The results of this study showed that after the educational intervention, knowledge, attitude, and behavioral skills towards students' nutrition to prevent from iron deficiency anemia increased in the intervention group considerably, which showed the effect of the educational intervention. Finally, it was shown that the

educational intervention had an effect on improving the attitude, subjective norms, subjects' behavior and intention after the intervention, which meant that attitude, subjective norms, subjects' behavior and intention increased significantly after the educational intervention.

In the intervention group, the mean score of attitude towards behavior significantly increased, which is consistent withthe finding of the study conducted by ShakeriNegad et al. (17) entitled "Investigation of Anemia Resulted from Iron Deficiency in Female Students Studying in the Secondary School in Ahvaz City", that of the study of Mehrabiyan et al. (18) entitled "the Effect of Education based on BASNEF Model on Improving the Preventive Feeding Behavior from Iron Deficiency Anemia", and that of the study of Shepherd et al. (19) entitled "Feeding Awareness, Attitude towards Consuming Oils based on the Theory of Reasoned Action". However, this finding is not consistent with the finding of the study conducted by Fallahi et al. (20) and that of the study by Ivan Bagha et al. (2) in which the structure of attitude did not significantly change after the feeding education that was probable due to the different statistical populationand the type of research.

In this study, about the subjective norms which were considered as the effective structure in this study, it can be mentioned that the nutritional choices were strongly influenced by the subjects' peers, parents and teachers and also nutritional attitude and beliefs were important factors to predict the nutritional function and behavior. The mean score of the subjective norms in the intervention group increased significantly after the invention in this study, which is consistent with the study conducted by Karami et al (21) entitled "Improving the Feeding Behaviors in Students in High Schools in Ahvaz City: Application of Theory of Reasoned Action" and the study of Didarlooer al. (22) entitled "the Effective Factors on Self-Care Behavior in Diabetic Women Referred to the Diabetes Clinic in Khoy City based on the Improved Theory of Reasoned Action" and the study by White et al (23) entitled "Predicting Consuming Foods with Saturated Fats in Type Two Diabetic People and Cardiovascular Diseases." However, it is not consistent with the finding of the study by Hazaveiiet al. (24) entitled "the Role of Planning in Theory of Planned Behavior", which can be due to low impact of the educational course.

Intentions overcome motivational factors affecting one behavior. They are signs to show us how stubborn people get satisfied to attempt and how much attempt they plan to do a behavior. As a general rule, more you are intended to do a behavior, more possibility there is for doing that behavior. The behavioral intention can indicate that the desired behavior is under voluntary control and the issue that the person can decide to do or not to do that behavior (25).

In this study, after the intervention, intention significantly increased in the intervention group, which is consistent with the study conducted by Sadat Asadi et al.(26) entitled "the Impact of Educational Intervention based on the Theory of Reasoned Action in the Childbirth Method for Elective Caesarean Section in Pregnant Women", the study by Khni Jeihooni et al. (27) entitled "The Effectiveness of the Ducational Program based on the Theoryof Reasoned Action to Reduce the Rate of Cesarean Sections in Pregnant Women in the City of Fasa" and the study by Norman et al. (28) which was conducted abroad. However, it is not consistent with the study of Hazaveii et al. (24) and its reason can be the low effectiveness of the educational course.

In this study, in the intervention group, there was a significant increase in behavior after the intervention. This finding is consistent with that of the study conducted by Sadeghi Far et al. (29) and the study by Mazloomi et al. (30) and the studies conducted aboard such as the study of Maiti et al. (31). However, it was inconsistent with that of the study by Wei et al. (32) entitled "Feeding Knowledge, Attitude and Taiwanese Children in Elementary Schools" whose reason could be because of differences in various areas and type of area impact on the students' knowledge and attitude which finally led to some differences between type and doing a behavior.

CONCLUSION:

Planning based on Theory of Reasoned Action has a positive impact on all necessary aspects of feeding behavior and the factors of attitude, subjective norms, intention, and behavior increase the effectiveness of the educational course. Due to the significant increase in attitude in the case group compared to the control group, it seems that the subjective norms and intention have a significant role in behavior and function.

In this research, the researcher could reach considerable results in improving the feeding behaviors especially in consuming iron-rich foods in teenage girls. All-time presence of female students at school at the best conditions of learning is a good opportunity that leads to increasing the effectiveness offeeding educational programs. Therefore, it is suggested that appropriate educational programs are provided by the schools to prevent from common diseases such as iron deficiency anemia and bringing them to the educational system of the country.

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Table 1: Distribution of absolute and percentage frequencyof demographic variables and the level of significance in both intervention and control groups

Group Demographic		Intervention Number (percent)	Control Number (percent)	The level significant of Chi square
Father's education	Under diploma	(49.1) 30	(24.5)15	0.009
	Above diploma	(50.8) 31	(75.4) 46	
Mother's education	Under diploma	(64.4) 38	(45.7) 27	0.099
	Above diploma	(35.5) 21	(54.2) 32	
Father's job	Clerk	(31.1) 19	(45.9) 28	0.092
	Self-employed	(68.8) 42	(54.09) 33	
Mother's job	Housewife	(96.5) 57	(98.2) 58	0.429
	Clerk	(3.3) 2	(1.6) 1	

Table 2: Comparing the average structures of the Theory of Reasoned Actionin the case and control groups before and after the test

Group Structure		Intervention M±SD	Control M±SD	The level of significant
Attitude	Before	29.1148±3.18380	29.6102±3.21643	0.514
	After	33.2295±2.58453	29.5263±3.85961	0.001
	The effect of education	0.001	0.861	
Subjective norms	Before	71.8689±8.87783	75.1525±7.63796	0.068
	After	80.0667±6.16680	75.1607±8.19263	0.001
	The effect of education	0.001	0.904	
Intention	Before	23.63393±4.54985	23.8136±4.09994	0.068
	After	28.2459±7.54245	24.1017±4.64125	0.001
	The effect of education	0.001	0.454	
Behavior	Before	14.5902±3.94705	14.3276±4.42238	0.588
	After	18.0164±3.59857	15.2034±3.85415	0.001
	The effect of education	0.001	0.150	

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