



Comparison between pamphlets and SMS on patterns of breakfast and between meal based on the health belief model among girl students of high schools in Sheiban city during academic year 2015-2016

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Abstract: Nutrition has a direct role in creating, maintaining and improving of health. Breakfast is considered as one of the main meals and snacks as a major part of energy and nutrients supplier for children. This study aim to comparison between pamphlets and SMS instruction on breakfast and snack food consumption pattern based on the Health Belief Model among girls in high schools of Sheiban City. This intervention study involved three groups that were conducted by the two intervention groups and a control group among 300 female high school students. To determine the samples, three schools of girls and from each school 100 students were selected using random sampling method. The tools of data collection were a questionnaire which validated by a panel of experts and test-retest reliability and Cronbach's alpha calculation. Educational intervention was distribution of pamphlets and texting to the pamphlet and SMS groups, respectively. The statistical analysis of variance and covariance of collected data were performed by SPSS software version 22. The results were significant at level of $P \leq 0.05$. Comparing the two control and tested groups showed that mean score of Health Belief Model (susceptibility, severity, benefits, barriers, self-efficacy and cues to action) as well as breakfast and snack food consumption behavior scores of students significantly increased after the educational intervention in the intervention group compared to the control, but the education effects in both groups were similar. Education based on Health Belief Model by SMS and pamphlets was effective on breakfast and snack consumption behavior. There was no significant difference between educational effects of two methods.

Key words: Pamphlets; SMS; health belief model; breakfast; snack food

Introduction

Paying attention to growth and development of school age children through consistent and ongoing health support and good nutrition represents an effective investment on students' future health [1]. Social-economic development in a society has a direct relation to the people's nutrition in every society. In each social-economic system, nutritional programs should be seriously considered by the officials and its goals intended in all national development plans [2]. The factors related to eating habits during adolescence are included healthy eating at school [3], parents' nutritional pattern [4], and different tastes [5]. In our country like many other developing countries, the number of people suffering from non-communicable diseases and their risky factors are

increasing [6]. The effect of nutrition, especially in first years of life on individual's abilities is well known. Especially the effect of nutrition on brain functions in school age children [7]. Nutritional problems in school age children lead to poor growth, tooth decay, weight gain, and long-term health problems such as heart disease, cancer, and diabetes [8, 9]. The results show that many of Iranian people are suffering from deficient of nutrients such as iron, iodine, calcium, and vitamins, and also dairy consumption is one-third of developed countries [10, 11]. Breakfast plays an important role to provide nutritional needs and increase mental performance [12]. Moreover, healthy and appropriate nutrition leads to educational development and increase the efficiency and national productivity. It not only

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affects the physical growth but also influences mental growth and behavior of children [13]. Eating breakfast due to increasing metabolism in the morning is very important for a child who is ready to go to school [13]. One of the main reasons for not eating or low quality of breakfast is lack of a proper nutritional education [14]. The studies show that the students who eat breakfast are aware of necessity of eating breakfast [15]. Using different educational methods can have a positive effect on increasing the level of their awareness and finally improves their nutritional behavior [16]. Between meals is also an important part of the energy and nutrients needed for children [17]. Eating between meals during the day reinforces and improves memory and increases children's energy and performance [18]. In recent years, the children and teenagers in our society have been interested in high-calorie and non-nutritive foods instead of traditional dishes and healthy between meals. The studies show that the nutritional misconducts have been very common in Iran [19]. Food pattern at school depends greatly on parents tastes and also the friends and teachers [20]. Awareness of the nutritional condition of students will lead to better planning in the education sector and health policy [21]. School-based educational nutritive programs have been known as effective ways to establish positive attitudes toward nutrition and improve dietary habits helpful information on relationships between nutrition and diseases [22]. Health Belief Model focuses on motivation, personal past experiences and changes on beliefs which lead to changes of behaviors [23]. The appropriate knowledge and skills related to nutrition lead the students to choose healthy foods and consequently improve their health [24]. This research is aimed to study the effect of two educational tools, pamphlet and SMS on breakfast patterns and between meals of school age children, using the framework of the theoretical Health Belief Model.

Materials and Methods

This interventional study, was conducted on three girl secondary school students in Sheiban city in academic year 2015/2016. Three schools were chosen using random cluster sampling. One school was chosen as the pamphlet test group, and one as the SMS test group and the last as the control group based on the simple random sampling. Ninety students were intended as sample size with accuracy of 95% based on previous studies [25]. However, sample size was increased to 100 for each group. To gather data a questionnaire was developed by researchers. Questionnaire built-up three parts; in the first part of the questionnaire participants were asked to answer 8 demographic and general information questions. The second part included 51 questions related to Health Belief Model structures. Questionnaire of health belief

model structures was set as Likert five-option questions from definitely disagree to definitely agree. For Health Belief Model structures included perceived susceptibility 8 questions and perceived severity 7 questions, perceived benefits 9 questions, perceived barriers 14 questions, cues to action 6 and self-efficacy 7 questions were intended. In the third part of the questionnaire participants were asked to answer 4 behavioral questions. For quantification of the validities, the questionnaire was sent to the experts of Nutrition and Health Education. Based to their comments the Content Validity Ratio (CVR) and the Content Validity Index (CVI) was verified. For questionnaire reliability verification, a pilot stage was performed on 30 students, which they were excluded in original study. Reliability of different parts of the questionnaire was calculated after data collection using Chronbach's alpha. Cronbach's alpha coefficient for HBM instrument, perceived susceptibility (100%), perceived severity (95%), perceived benefits (93%), perceived barriers (100%), cues to action (100%), self-efficacy and behavioral (100%). Pretest was conducted for test and control groups after confirming the validity and reliability of the questionnaire. After the initial analysis of data, the educational needs of subjects were determined and educational content for intervention was prepared based on the pretest data analysis, educational objectives and Health Believe Model Structures. The educational program were conducted for the test group1 in form of pamphlet and in test group 2 in form of short messages (SMS). Two months after the educational intervention, posttest was carried out simultaneously in both test and control groups. The data were analyzed using SPSS-22 and through statistical tests, one-way ANOVA and the independent t-test, the paired t-test. Significance level was considered $P < 0.05$.

Results

Pretest of demographic factors among control and test groups are shown in Table 1. According to the findings, the level of education and jobs of parents considered for matching groups based on Chi-square test show no significant difference in terms of these demographic factors. Before intervention we found significant differences among groups in term of the structures of the perceived sensitivity, perceived benefits, and perceived barriers. No significant difference was found among the structures of the severity of the perceived action, cues to action, self-efficacy as well as the behavior before intervention, but this difference became significant after intervention (Table 2). However, there were significant differences between pamphlet and SMS groups before the education program but after intervention and analyzing using Tukey Test the differentiation was not significant. The paired-T test showed that before and after

running the educational program, there was a significant difference between the pamphlet and the SMS Group ($p = 0.001$). However, no significant difference was observed in the control group ($p = 0.274$). The results show that before and after the educational intervention, no significant difference was seen in the students in terms of the average score of the perceived severity ($p = 0.263$), but after running the educational program, a significant difference was seen among the groups under the study ($p = 0.001$). Moreover, paired-t test showed that before and after intervention, there was a significant

difference in the pamphlet and the SMS groups ($p = 0.001$), but was not significant in the control group ($p = 0.533$). Before the intervention, there was a significant difference among students in terms of the mean score in perceived sensitivity ($p = 0.003$) and perceived benefits ($P = 0.001$). Also after running the educational program, the differences were ($p = 0.001$). paired-t- test showed that before and after running the educational program, there was a significant difference in the pamphlet and the SMS groups ($p = 0.001$). However, there was no significant difference in the control group.

Table 1: Pretest demographic results for tests and control groups

Group	Demographic	Test group 1 (pamphlet)		Test group2 (SMS)		Control group		The significance level of the chi-square test
		number	percent	number	percent	number	percent	
Father's Education	diploma/under academic	85	91.4%	89	94.8%	85	94.3%	0.171
		8	8.6%	5	5.2%	2	2.2%	
Mother's Education	diploma/under academic	93	98.8%	94	90%	89	100%	0.376
		1	1.2%	0	0	0	0	
Fether's job	Civil Staff	24	24.4%	33	35.1%	17	19.1%	0.146
	Self-employed	63	68.1%	49	51.11%	53	13.1%	
	Unemployed	4	4.4%	8	8.5%	7	7.9%	
Mother's job	housewife	89	95.7%	92	97.9%	88	97.8%	0.27
	employed	4	4.3%	2	2.1%	2	2.2%	

Table 2: Comparison between the mean scores of HBM constructs and behavior in tests and control groups before and after intervention.

Group		(pamphlet)	(message)	Control	The significance level
Structure		Test 1 M±SD	Test 2 M±SD	M±SD	
Perceived Sensitivity	before	28.5±4.59	26.54±3.63	28.07±4.22	*0.003
	after	30.2±4.27	29.1±4.24	27.5±4.45	**0.001
	The effect of education	1.63	2.56	0.52	
Perceived Severity	before	38.76±5.86	35.79±6.11	38.76±5.08	*0.263
	after	29.90±5.88	30.29±5.36	26.3±7.38	**0.001
	The effect of education	8.86	5.5	12.73	
Perceived benefits	before	38.76±5.86	35.79±6.11	38.76±5.0	**0.001
	after	42.67±4.44	42.10±4.40	37.51±6.77	**0.001
	The effect of education	3.71	6.31	1.25	
Perceived barriers	before	43.09±8.15	36.81±7.76	39.1±8.74	*0.001
	after	47.3±10.97	47.07±9.31	21.43±5.25	**0.001
	The effect of education	4.21	10.89	2.14	
Cues to action	before	20.41±4.6	20.39±4.5	20.7±5.14	*0.883
	after	24.36±4.35	24.63±4.69	21.43±5.25	**0.001
	The effect of education	3.95	4.24	0.73	
Self-efficacy	before	25.75±5.75	23.88±5.89	25.60±6.34	*0.063
	after	30.39±4.63	29.62±5.43	25.16±6.42	**0.001
	The effect of education	4.64	5.74	0.44	
behavior	before	37.47±13.15	34.51±14.98	37.06±16.2	*0.337
	after	46.83±12.69	45.70±15.05	24.66±17.2	**0.001
	The effect of education	9.36	11.19	2.4	

*ANOVA

**ANCOVA

Table 3: Pairwise comparison of mean scores of the Structures of the HBM in groups after the Educational Intervention Using Tukey Post Hoc Test

Pair wise comparison of the groups (the average score of the perceived sensitivity)		The significant level of Tukey test
Control Group	Pamphlet group	0.001
	SMS Group	0.001
Pamphlet Group	Control group	0.001
	SMS Group	0.492
SMS Group	Control group	0.001
	Pamphlet group	0.492
Comparing the average score of perceived severity		
Control Group	Pamphlet group	0.001
	SMS Group	0.001
Pamphlet Group	Control group	0.001
	SMS Group	0.667
SMS Group	Control group	0.001
	Pamphlet group	0.667
Comparison the average score of the perceived benefits		
Control Group	Pamphlet group	0.001
	SMS Group	0.001
Pamphlet Group	Control group	0.001
	SMS Group	0.497
SMS Group	Control group	0.001
	Pamphlet group	0.497
Comparison the average score of the perceived barriers		
Control Group	Pamphlet group	0.002
	SMS Group	0.001
Pamphlet Group	Control group	0.002
	SMS Group	0.073
SMS Group	Control group	0.001
	Pamphlet group	0.073
Comparison the average score of self-efficacy		
Control Group	Pamphlet group	0.001
	SMS Group	0.001
Pamphlet Group	Control group	0.001
	SMS Group	0.348
SMS Group	Control group	0.001
	Pamphlet group	0.348
Comparison the average score of Cues to action		
Control Group	Pamphlet group	0.001
	SMS Group	0.001
Pamphlet Group	Control group	0.001
	SMS Group	0.697
SMS Group	Control group	0.001
	Pamphlet group	0.697
Comparing the average score of behavior		
Control Group	Pamphlet group	0.001
	SMS Group	0.001
Pamphlet Group	Control group	0.001
	SMS Group	0.607
SMS Group	Control group	0.001
	Pamphlet group	0.607

The results show that before and after the educational intervention, there was a significant difference among the groups under the study in terms of the average score of the perceived barriers ($p = 0.001$). analyzes using paired t-test showed that before and after running the educational program, there was a significant difference in the pamphlet and SMS groups ($p = 0.001$) but, in control group, there was not any significant differences ($p = 0.26$). In case of average score of self-efficacy, the results show that before the educational intervention, there was no significant difference among the students ($p = 0.63$), but after running the educational program, a significant difference was observed among them ($p = 0.001$). Paired t-test analyzes showed that before and after the educational program, there was a

significant difference in the Pamphlet and the SMS groups ($p = 0.001$). But not in control group ($p = 0.537$). The results also show that before the educational intervention, there was not any significant differences among the groups under the study in terms of the average score of Cues to action for eating breakfast and between meals ($p = 0.883$). But after intervention no significant differences were found among the groups ($p = 0.001$). Analyzes using paired t-test showed that before and after the educational program, there was a significant difference in the pamphlet and SMS groups ($p = 0.001$), but was not seen any significant differences in control group ($p = 0.194$). The results showed that before the educational intervention, there was not any significant differences among the groups of

students in terms of the average score of behavior of eating the breakfast and between meals ($p = 0.337$), but, after the educational program, the differences were significant ($p = 0.001$). findings obtained from the paired t-test showed that before and after running the educational program there were significant differences among pamphlet and SMS Groups ($p = 0.001$), but not in control group ($p = 0.129$). Pairwise comparison of average score of HBM structures and behavior in the students of all groups (Table 3) after the educational intervention and based on the Tukey post hoc test show that there were no significant differences between the mean score of HBM structures included perceived susceptibility ($p = 0.492$), perceived severity ($p = 0.667$), perceived benefits ($p = 0.497$), perceived barriers ($P = 0.073$), cues to action ($p = 0.697$) and self-efficacy ($p = 0.348$). Finally, the results showed that there were not statistically significant differences among both intervention groups in term of mean scores of the behavior ($p = 0.607$).

Discussion and Conclusion

This study was focused on effects of two educational tools included Pamphlet and SMS on the behavior of breakfast eating behavior and between meals in students of girl high schools of Sheiban city using the Health Belief Model. The results show that HBM based educational program can increase significantly some HBM structures including perceived susceptibility, perceived benefits, perceived barrier, cues to action and improving self-efficacy and our expected behavior (eating breakfast and between meal). These results are consistent with the findings of some studies [25, 26] that the main structures were changed significantly after the intervention. However, it is not consistent with some other studies [27] in which the structures of perceived benefits and perceived barriers were not significant after educational interventions. The results of this study show that mean score of perceived benefits after the intervention in test group significantly increased in comparison to control group. This means the test group perceived more benefits of doing eating breakfast and proper between meal. The results also show after intervention, the mean score of Self-efficacy in the test group compared to control group was significantly increased, this show effectiveness of our educational program, as Self-efficacy has considerable effect on health behaviors. Mean score of behavior in both test groups (Pamphlet and SMS) significantly increased comparing with control group, this means after intervention the test group had more intentional behavior to eating breakfast and proper between meal. This means that educational program based on HBM improved the nutritional behaviors as other studies also showed [25, 26, 29]. Based on the results of this study in term of behavior no

significant differences were seen between Pamphlet and SMS educational methods. The results of this study showed that the HBM is an effective model for improvement of eating breakfast and between meals among students, so it seems generalization of this kind of theory-based educational programs will be effective for nutritional programs. In addition, based on results of this study SMS and Pamphlet tools have similar effects on nutritional behavior, because of affordability of SMS we suggest using of this method in health educational interventions.

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