Research Article

Application of the Theory of Planned Behavior to predict low-nutrient junk food consumption among male students

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Abstract

Background: Students are highly tended to consume junk foods. This study aimed to predict the consumption of low-nutrient junk foods based on the constructs of the Theory of Planned Behavior among male students across Chenaran city in 2015.

Methods: This descriptive-analytic study incorporated 143 eighth-grade students who were selected via simple randomization method. They completed the relevant questionnaire. The data were analyzed in SPSS (version 18) using one-way analysis of variance, regression analysis, and Pearson correlation test. Significance level was 0.05.

Results: The junk foods most frequently consumed comprised of chocolate, cake, and fizzy drinks. Results indicated that subjective norms and perceived behavioral control could predict 9 percent of changes in low-nutrient junk food consumption. From among the constructs of the theory of planned behavior, attitude, subjective norms, and perceived behavioral control are able to predict 16 percent of behavioral intention changes.

Conclusions: Given the tendency of students towards the consumption of low-nutrient junk foods, administration of theory-based educational interventions such as the theory of planned behavior seems necessary.

Keywords: Theory of Planned Behavior; Junk food; Students

1. Introduction

One of the nutritional problems among adolescents is excessive use of low-nutrient junk foods, which are mainly characterized to be of low nutritional value and high levels of energy due to salt or sugar. Junk foods are estimated to account for 40 percent of the daily energy intake in Iranian students (**1**). The consequences of excessive consumption of these foods in children such as obesity, tooth decay and chronic diseases have been well established (**2**).Nutritional problems stand as the root for several major chronic diseases in both the developed and developing countries. Changes in lifestyle among which the dietary factors, play an important role in the prevalence or incidence of obesity and other risk factors for non-communicable diseases (**3**).

A nationwide survey in Iran showed that 51 percent of children used some type of junk foods, industrial juices, carbonated drinks, candies and chocolates since a week prior to the survey. Another study in 23 cities across Iran indicated poor nutritional habits among 6- to 18-year-old students (**4**).It goes without saying that human behavior is a reflection of various factors and that health education as the canon of health activities and programs requires knowledge of behavior and contributors to behavioral modification as well as replacement of poor behaviors with proper ones; this highlights the role of models and theories in health behavior education (**5**).

Corina introduced the theory of planned behavior (TPB) in 2000 as a comprehensive and rational model to explain why people change their health-related behaviors (**6**). TPB

in terms of food choices stands as a prominent theory (**1**), which was initially introduced by Ajzen and Fishbein (**7**). It is a model of socio-cognitive expected value that considers intention as the main determinant of behavior (**8**), proposing that three factors impact behavioral intention (**2**). These include attitude, subjective norms, and perceived behavioral control. One's belief in and evaluation of the outcome of a certain behavior are conducive to the formation of his/her attitude. Subjective norms are influenced by perceptions about the judgment of others as well as the motivation to meet their expectations. Perceived behavioral control represents a degree of an individual's perception concerning to what degree (non) performance of a certain behavior follows his/her control. Overall, TPB can explain about 40% of the relationship between intention and health behavior (**9**).

In addition to the main constructs of TPB, several empirical studies have considered other variables contributory to food intake. Among these variables is previous behavior which is usually a strong predictor of intention and behavior (**10**). The aim of this study was to explore the predictors of low nutrient junk food consumption among eighth-grade students in Chenran city using TPB as well as the additional variable of previous behavior.

2. Methods

This cross-sectional study incorporated 143 eighth-grade male students in Chenaran in February and March 2015. Inclusion criteria consisted of being in the eighth grade in boys' school and tendency to participate in the study. Exclusion criterion included provision of flawed questionnaire.

The sample size was determined as 143 following a similar study (**11**).Based on multi-stage cluster sampling; two high schools were randomly selected from among all high schools in the city. Afterwards, the required number of participants from every class was selected randomly from the attendance list. Approvals were already obtained from the education department of the city and the students. Thereafter, the questionnaires were completed by the students.

The questionnaire used in this study consisted of four parts. The first part covered demographic characteristics, i.e., age, weight, height, number of family members, education level and occupation of parents, and the amount of pocket money per week. The second part held items related to knowledge about junk foods with low nutritional value (e.g., Consumption of these foods leads to overweight and obesity.). At the beginning, the students were explained about the meaning and type of junk foods including chocolate, falafel, cheese puffs, fizzy drinks, crisps, caramel cream, sweets, biscuits, gummies, cake, ice drink, and factory-made fruit juice. To assess knowledge, there were nine (true/false/I don't know) items where a correct answer was scored 1, and other options were scored 0. Score range of knowledge was from 0 to 9. The third section of the questionnaire assessed the frequency of junk food consumption on a weekly scale (from *I never use* to *I use more than once a week*). The forth section directly assessed TPB constructs. There were 9 items on attitude (e.g., the foods are delicious), 2 items on behavioral intention (e.g., Next month, I'm going to cut on these junk foods), 4 items on subjective norms (e.g., My parents believe that I can have these foods.), and 4 items on perceived behavioral control (e.g., I'm sure if I intend, I can cut on these foods.).

The constructs were scored on a five-point Likert rating scale (strongly agree, agree, no comment, disagree, strongly disagree). Score range for attitude was between 9 and 45, for behavioral intention between 2 and 10, for subjective norms from 4 to 20, and for perceived behavioral control from 4 to 20. The questionnaire was designed on the basis of the study objectives and with due consideration of the existing papers and theses (5, 6, 15). Content validity was ensured via face validity as well as quantitative methods of content validity ratio (CVR) and content validity index (CVI). First, to determine the CVR, 10 experts in health education assessed each item based on a three-point scale (necessary; useful but not necessary; it is not necessary).Based on Lawche's table, items whose CVR values were greater than 62% were considered significant and thus retained (p <0.05). Moreover, items whose CVI based on content validity index of Walts and Bausell were greater than 0.7 were considered acceptable and the rest were removed (**12**). To determine the reliability of the questionnaire, a pilot study was conducted on 11 students, and internal consistency was calculated with Cronbach's alpha as α=0.74.

The collected data were analyzed in SPSS version 18. Pearson test was used to determine the relationship between the mean score of TPB constructs, quantitative demographic variables, and mean consumption of low-

nutrient junk foods. One-way analysis of variance was used to ddetermine the significant relationship between mean consumption junk food and qualitative demographic variables. The regression analysis (backward method) was applied to predict the behavior and intention of low-nutrient fast food consumption. It should be noted that in linear regression analysis using the backward method, the constructs whose significance coefficients were between 0.05 and 0.1 were retained in the model in order to obtain the optimal model for prediction of behavior response and intention variables.

3. Results

Results of this study showed that the number of family members of students was 5.39±1.70 on average, and their mean age was 14.17±0.83 years. The mean body mass index was 19.89±4.83 and they watched television for 2.74±0.95 hours on average. According table 1, 18.9% of mothers and 11.2% of fathers were illiterate. 54.6% of mothers and 60.2% of fathers were below high school diploma. 20.3% of mothers and 18.2% of fathers were diploma and 5.6% of mothers and 7.7% of fathers were above high school diploma. 91.6% of mothers were housewife and 0.07% of fathers were unemployed. 16.8% of students did not have pocket money and 27.3%of students have more of 3000 tomans weekly pocket money.

One-way analysis of variance showed no significant difference between mean scores of low-nutrient junk foods and qualitative variables of mother's education (p=0.509), father's education (p=0.422), father's occupation (p=0.208), mother's occupation (p=0.459) and pocket money (p=0.234).

Table 2 reports the Frequency and Percentage of low-nutrient junk food consumption among students. The findings of this table show that the junk foods most frequently used by students comprised of chocolates, cakes and fizzy drinks.

In Table 3, pair wise Pearson correlation coefficients between each two constructs of TPB are displayed. The

data in this table show negative correlation between junk food consumption behavior and any of the TPB constructs, although the associations between intention, subjective norms, and perceived behavioral control constructs and the behavior of junk food consumption is significant. In addition, there was a significant positive correlation between behavioral intention and both subjective norms and perceived behavioral control.

To predict consumption behavior, inverse linear regression model was used. Table 3 shows the results of the linear regression test between consumption intention and behavior based on TPB. The results from the table indicate that subjective norms and perceived behavioral control are significant predictors of low-nutrient junk food consumption behavior, accounting for 9% of its change. Other constructs were no significantly predictive in the linear regression model. On the other hand, attitude, subjective norms, and perceived behavioral control are also meaningful predictors of behavioral intention, which in total can explain 16 percent of variations in low-nutrientjunk food intention.

Table 1: Demographic characteristics of the participating students in percentage

Variables	Father (Percentage)	Mother (Percentage)
Education:		
Illiterate	11.2	18.9
Elementary	29.4	35.7
Secondary/High school dropout	30.8	18.9
High school diploma	18.2	20.3
Associate/Bachelor	5.6	3.5
Master's or above	2.1	2.1
Occupation:		
House wife	-	91.6
Unemployed	0.07	-
Worker	32.9	3.5
Employee	11.9	2.1
Self-employed	44.8	1.4
Weekly pocket money (Tomans):		Percentage
No pocket money		16.8
□1000		13.3
1000-2000		27.3
2000-3000		13.3
> 3000		27.3

Table 2: Frequency and percentage of low-nutrient junk foods consumed by students on a daily basis

Junk food	Chocolate	Cheese puffs	Falafel	Fizzy drinks	Crisps	Caramel Cream	Sweets	Biscuits	Gummy	Cake	Cheesecrunchies	Fruit juice	Ice drink
Frequency	77	30	9	48	27	15	25	47	14	65	31	32	33
Percentage	53.8	21	6.3	33.6	18.9	10.5	17.5	32.9	9.8	45.5	21.7	22.4	23.1

Table 3: Pairwise Pearson coefficients between the Theory of Planned Behavior constructs and junk food consumption

Component	Behavioral intention	Subjective norms	Attitude	Perceived behavioral control	Junk food consumption
	r	r	R	r	r
	P-value	P-value	P-value	P-value	P-value
Behavioral intention		0.15	0.22*	0.32*	0.20
		0.64	0.013	<0.001	0.017
Subjective norms			0.23*	-0.09	-0.25
			0.012	0.324	0.003
Attitude				0.101	-0.19*
				0.306	0.021
Perceived behavioral control					-0.15
					0.08
Junk food consumption					

*significant level is set at 0.05. r=Pearson correlation coefficient

Table 4: Results of linear regression between low-nutrient junk food consumption intention, junk food consumption behavior, and constructs of the theory of planned behavior

Variable	Regression significance test	Predictor	B	SE	Beta	P	R Square
junk food Consumption behavior	P=0.002	Intercept	8.28	1.08	-	<0.001	
		Subjective norms	-0.17	0.05	-0.26	0.002	0.09
		Perceived behavioral control	-0.11	0.06	-0.17	0.041	
Behavioral intention	P<0.001	Intercept	0.31	1.23	-	0.057	
		Attitude	0.06	0.03	0.16	0.057	
		Subjective norms	0.09	0.05	0.14	0.090	0.16
		Perceived behavioral control	0.21	0.05	0.32	<0.001	

4. Discussion

This study showed that the mean consumption of sweets, cakes and fizzy drinks among the students were more frequent than other junk foods. In Dehdari et al.'s study, which was conducted on female students in Kermanshah in 2011, the more frequently consumed junk foods comprised of chocolate, cheese puffs, falafel, and fizzy drinks (**12**). Rezakhani and colleagues showed that cakes and cookies accounted for 58.1 percent of all junk foods consumed and were the most widely used junk foods among students in Qazvin (**13**).

Kelishadiet al. reported that Iranian adolescents consumed sweets 10 times a week on average and various fatty and salty junk foods 4.9 times a week. Side-effects of too much junk food consumption such as obesity, tooth decay and chronic diseases in children and adolescents have been demonstrated (**1**). In Santich et al.'s study on American teenagers, the most consumed snacks consisted of all kinds of candy and fizzy drinks (**14**).Many studies have shown that consumption of unhealthy snacks among students is growing. In recent years, the prevalence of obesity associated with the consumption of fast foods and

sweet drinks among Iranian children has exceeded expectations, and the rate increases along with age. Therefore, students stand as a major target group for interventional planning and policy-making concerning overweight and obesity prevention and modified lifestyle (**15**).

The results of this study showed that the two constructs of subjective norms and perceived behavioral control can predict 9 percent of changes in low-nutrient junk food consumption. Moreover, attitude, subjective norm, and perceived behavior control were significant predictors of behavioral intention, which in total can explain 16 percent of consumption behavior changes. Dehdari et al. showed that from among the TPB constructs, it is only the perceived behavioral control that can predict change in behavioral intention (with 44 percent predictive power)and that attitude and subjective norms were not predictive of intention to use low-nutrient fast foods (**12**). The difference in the predictive power of the construct can be attributable to the gender and culture of participants, as the present study incorporated boys and was performed in Chenran in northeast of Iran, whereas Dehdari et al.'s study was conducted on girls and

Kermanshah in western Iran. In Barati et al.'s study on low-nutrient junk food consumption among primary school students in Arak in 2015, perceived behavioral control was able to predict 23% of behavior change (**16**).

The current study was limited as it failed to incorporate girls and other age groups. Therefore, the same is suggested to be fulfilled in future research. Another limitation of this study was self-report on the part of students.

5. Conclusion

Results showed that students will become less inclined to use low-nutrient junk foods in case they have more negative attitudes towards these foods, and their intentions, or pressures on them, to use low-nutrient junk foods is low. Furthermore, the greater the perceived behavioral control in students, the less likely they are to use low-nutrientjunk foods. Therefore, negative attitude towards these junk foods should be reinforced in practice via the media and educational interventions. A decrease in the students' intention and social pressures exerted on them to use the junk foods can also be very beneficial. Thereby, a greater level of perceived behavioral control can incur in the students against low-nutrientjunk foods.

6. Acknowledgements

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