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ORIGINAL ARTICLE

Investigating the Predictive Power of the Theory of Planned Behavior on the Behavioral Intention of Healthy Eating in Adolescents

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Abstract: *Background: Adolescence is a complex and sensitive period, and learning nutritional concepts during this period is very important. The purpose of the present study is to determine the predictive power of the theory of planned behavior on the behavioral intention of healthy eating in adolescents. Methods: 400 first-grade female students of Bandar Anzali participated in this descriptive-correlational study. Among the first secondary schools of this city, two schools were randomly selected and sampled by census method. The data collection tool was the healthy eating behavior questionnaire based on the theory of planned behavior, which included two sections of demographic information and the constructs of the theory of planned behavior, which were checked and confirmed with the content validity ratio, content validity index, and alpha coefficient. Data were analyzed using SPSS version 22 software. Results: Linear regression analysis showed that a total of 34% of the variance of healthy eating behavior intention is predicted by the constructs of perceived behavioral control and attitude. Conclusion: Considering the high predictive power of the theory of planned behavior in the field of healthy eating behavior, educational interventions based on it and centered on predictive structures are suggested.*

Keywords: *theory of planned behavior, healthy eating, adolescents*

INTRODUCTION

Non-communicable diseases (such as cardiovascular diseases, diabetes, cancer, high blood pressure, obesity, etc.) are the main cause of death worldwide [1]. Due to the increase in the death rate caused by these diseases, especially in developing countries, the World Health Organization (WHO) declared non-communicable diseases among the health priorities in developing countries two decades ago [2]. Iran, as an example of a middle-income country, accounted for 83.5% of all deaths and 78.1% of the total disease burden in 2019 due to non-communicable diseases [3-5].

The role of nutrition as the main cause of these diseases has been proven correctly [6]. In this regard, especially, the unhealthy eating behavior of teenagers is worrying [7]. Rapid growth, and changes in body composition, physiology, and endocrine system accelerate nutritional needs and increase the risk of malnutrition in this group [8]. Adolescents have more decision-making power and independence than children and are heavily influenced by friends, people around them, the environment, and various advertisements, and they turn to foods with an attractive and seductive appearance but lacking in nutritional value, many ready-made foods and snacks are among these materials [9]. Most of them do not consume enough fruits and vegetables, instead, they consume high-fat, energy-rich, and nutrient-poor foods [10].

According to the 2019 GSHS (Global School-based Student Health Survey), almost half of the countries reported that 10-30% of students aged 13-15 did not eat any fruit, a quarter reported that 10-30% of students did not eat any vegetables, and almost 70% of countries reported that at least half of their students eat junk food on a weekly basis and all countries have found that one in five students consumes carbonated drinks at least once a day [11].

Among Iranian teenagers, high consumption of junk foods and unhealthy snacks, not eating breakfast, and low consumption of fruits, vegetables, whole grains, and dairy products have been commonly reported [12] and this will cause them to develop chronic diseases in the future, especially girls who are considered as the future mothers and their eating behavior and learning nutritional concepts affect their own health and that of their children and families [13,14].

Modifying eating habits and behaviors during childhood and adolescence can prevent the occurrence of many non-communicable diseases in adulthood [15]. On the other hand, the future of any country depends on how it takes care of its children and teenagers. If action is taken to meet their health needs, the possibility that the adults of that society will have a healthy and valuable life pattern in the future will increase [16]. On the other hand, the future of any country depends on how it takes care of its children and teenagers. If action is taken to meet their health needs, the possibility that the adults of that society will have a healthy and valuable life pattern in the future will increase [17].

Studies show that the most effective educational programs are based on theory-based approaches that are rooted in behavior change patterns, and the "theory of planned behavior" is one of the well-known ones [18]. According to this theory, attitude, subjective norms, and perceived behavioral control affect the intention to perform a behavior [19]. A person's attitude is a favorable or unfavorable evaluation of behavior formed through past experiences.

Subjective norms refer to the social pressures perceived by the person who agrees or disagrees with the behavior and the media, family, and friends play a role in it. Finally, perceived behavioral control is a person's belief about how easy or difficult it is to perform a certain behavior [20]. According to the explanations provided, the present study was conducted with the aim of determining the predictive power of the theory of planned behavior on the behavioral intention of healthy eating in adolescents.

MATERIALS AND METHODS

This is a descriptive-correlational study, which was conducted in 2022. The research population was 400 first-grade high school girls in Bandar Anzali. From among the first high school girls in this city, two schools were randomly selected and sampled by census method. Inclusion criteria included: students' willingness to participate in research, lack of a special diet and not suffering from chronic diseases, and exclusion criteria were unwillingness to participate and continued cooperation by students.

The study was initiated with the permission of the ethics committee of Iran University of Medical Sciences and the necessary coordination with the education organization of Bandar Anzali city, the principals and officials of the relevant schools, and the informed consent of the students. The data collection tool was the healthy eating behavior questionnaire based on the theory of planned behavior [21].

This questionnaire includes two sections of demographic information and constructs of the theory of planned behavior. The first part of this questionnaire included 8 items related to demographic characteristics, including student age, height, weight, parent's education, parent's occupation, and household size. The second part or constructs of the theory of planned behavior consists of 32 items, and the third part, or food behavior part includes 7 items, based on the 5-point Likert scale each item, as (strongly disagree, disagree, no idea, agree, strongly agree) with a minimum and maximum score of 1 to 5. The second part of the questionnaire includes attitudes toward behavior with 12 items with an achievable score range of 12 to 60, 13 items for subjective norm with an achievable score range of 13 to 65, perceived behavioral control with 7 items with an achievable score range of 7 to 35, behavioral intention with 6 items with an achievable score range of 6 to 30. In the present study, due to the limitation of answer options for items in the questionnaire, which were 4-point Likert, the questionnaire was re-validated and reliable.

To assess the validity, content validity was used, so that the questionnaire was given to 10 health and nutrition experts, and its validity was confirmed with a content validity ratio (CVR) of 0.81 and a content validity index (CVI) of 0.8. To assess the reliability, Cronbach's alpha test method was used. For this purpose, a questionnaire was given to 20 female high school students. Cronbach's alpha coefficient was 0.85 for the attitude construct, 0.75 for the subjective norm construct, and 0.71 for the perceived behavioral control construct, 0.76 for the behavioral intention construct. Data analysis was done by SPSS software version 24.

RESULTS

In this study, the mean age of students was 14.9 ± 0.78 years. Their mean height and weight were 159.7 ±10.7 and 54.7± 1.4, respectively, and the household size was 4.1 ± 0.8. In terms of employment, the highest frequency was for fathers (45%) as self-employment and 86% of mothers were housewives. In terms of education, 42% of fathers and 45% of mothers were at the level of high school and high school diploma, each of which with the highest percentage of frequency. The mean, standard deviation, and range of obtainable scores for each construct of the theory of planned behavior in the studied students can be seen in Table 1.

Table 1: Mean, standard deviation, and range of obtainable scores for each of the constructs of the theory of planned behavior in the studied students

Variable	Mean ± SD‣	Rang of attainable score
attitude	40 ± 6.21	12-60
subjective norms	38.9 ± 6.44	13-65
perceived behavioral control	24.06 ± 6.44	7-35
behavioral intention	25.47 ± 9.21	6-30

‣*Standard Deviation*

Table 2 shows the results of Pearson correlation between the constructs of the theory of planned behavior that there is a direct and significant correlation between all constructs (attitude, subjective norm, and perceived behavioral control) with the intention of eating behavior (P<0.001). The construct of perceived behavioral control has the highest correlation with the intention of eating behavior (r=0.302).

The linear regression analysis in Table 3 showed that a total of 34% of the variance of the intention of healthy eating behavior in the studied students is predicted by the constructs of perceived behavioral control and attitude, and perceived behavioral control is the strongest construct related to the intention of eating behavior in this study.

Table 2: Correlation between the constructs of the theory of planned behavior

Variable	Attitude	Subjective norms	Perceived behavioral control	Behavioral intention
attitude	1			
subjective norms	0.191	1		
perceived behavioral control	0.276	0.145	1	
behavioral intention	0.182	0.255	0.302	1

Table 3: Predicting the behavioral intention of healthy eating based on the theory of planned behavior in the studied students

Model		B	Std. Error	Beta	sig
1	(Constant)	5.231	3.424	_	0.127
	attitude	0.157	0.070	0.113	0.024
	subjective norms	0.119	0.085	0.088	0.163
	perceived behavioral control	0.371	0.103	0.230	0.000

a. Dependent Variable: Intention of food behavior; b. R2 = 0.34

DISCUSSION

The present study was conducted with the aim of determining the predictive power of the theory of planned behavior on the behavioral intention of healthy eating in adolescents. The result of the study shows that a total of 34% of the variance of healthy eating behavior intention in the studied students is predicted by the constructs of perceived behavioral control and attitude, and perceived behavioral control is the first and strongest construct related to behavioral intention, which is consistent with studies predicting healthy eating in Danish adolescents [22] and the results of the study by Seo et al in Seoul, which implies a significant relationship between behavioral intention and perceived behavioral control construct [23]. It is also consistent with the findings by Yarmohammadi et al. [24] and Dunn et al. [25] on junk food consumption based on the theory of planned behavior. However, it is not consistent with the findings of Ickes et al. [26] on beverage consumption and the findings of Gholami et al. [27] on fruit and vegetable consumption. Perceived behavioral control may not predict behavior when a person has little information or the resources available to the person change and when new elements such as eating habits are added to the situation [28, 29].

The second construct predicting the intention of healthy eating behavior in this study is the attitude, which is consistent with the results of the study by Mousavi et al. [30] concerning beverage consumption and the study by Gronhoj et al. [22] regarding the prediction of healthy eating behavior and the study by Mamun et al. [31] on the determinants of healthy eating. Attitude shows an individual's general feeling about the desirability or undesirability of something, and sometimes people's attitude during life as well as sufficient awareness and knowledge, which is a prerequisite for attitude change, leads to the intention of performing the desired behavior in the future [27]. Therefore, the attitude that originates from feelings and internal factors can affect his eating behavior by increasing his information and experiences concerning nutrition.

In this study, the subjective norm is not a predictor of eating behavior intention, which is similar to the finding by Ismawati

et al. [32] on the application of the theory of planned behavior in the intention of healthy eating in Malaysia and the study of Brouwer et al. [33] related to healthy eating behavior prediction and finding by Dehdari et al. [34] regarding the consumption of unhealthy foods. However, it is inconsistent with the findings of Khorasani et al. [35] on unhealthy food consumption and White et al. [36] regarding intention to consume low-fat food. The reason for this inconsistency can be the difference in the gender of the participants, in the study of Dehdari et al. [34], as in the present study, the target group is girls, and in the study of Khorasani et al. [35], boys are the target group. On the other hand, diverse food cultures and customs in Iran and other countries of the world can be the reason for the discrepancy of these studies. The diversity and complexities of health behaviors in different groups and in different conditions can lead to the necessity of planning to use the appropriate theories and structures to achieve success in interventions in health education and health promotion.

CONCLUSIONS

Perceived behavioral control and attitude are among the factors predicting on the behavioral intention of healthy eating in the studied students. The research limitation in the present study was the use of self-reporting, and it is necessary to carry out educational interventions based on the "theory of planned behavior" with emphasis on the two predictive constructs mentioned.

Conflicts of interest and sources of funding

The personal interests of the authors were not related to the results of this research. The authors declare that they have no competing interests. This study did not receive any grant from funding agencies.

Authors' contribution

All authors were responsible for the study. EA, MM, and TD were accountable for the study Conceptualization and led the writing of the paper. BI conducted the Literature review and assisted in writing the paper. MM and OS performed the Statistical analysis, assisted in interpreting the data, and wrote the paper. OS, FSI, and EA assisted with the interpretation of the results and drafting of programmatic Implications. FB and MM were responsible for data collection and coordination of the study. TD co-led the conceptualization, supervised all aspects of writing the paper, and provided extensive comments on the manuscript. All the authors have read and approved the final manuscript.

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Ethics approval and consent to participate

This article is taken from the approved research project of Iran University of Medical Sciences with ethics code number: 1401.886 IR.IUMS.REC. Informed consent was obtained from all individual participants included in the study before conducting.

Consent to publish

All participants consented verbally to the publication of the interview data.

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