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Original Article

Associated Factors Influencing Snack Consumption Among Female Adolescents in Saveh, Iran: An Application of the BASNEF Model

Zahra Saboohi[1]*, PhD; Fateme Gudarzi[2], PhD; Zahra Jalili[3], PhD

[1]Department of Health Services, School of Public Health, Iran University of Medical Sciences, Tehran, Iran
[2]Department of Curriculum Studies, Faculty of Psychology and Educational Sciences, Allameh Tabatabai University, Tehran, Iran
[3]Department of Health Education and Promotion, Science and Research Branch, Islamic Azad University, Tehran, Iran

Corresponding author:* Zahra Saboohi, PhD; Iran University of Medical Sciences, Hemat Highway, next to Milad Tower, Tehran, Iran. **Tel: +98-9128556058; **Email:** saboohizahra2020@gmail.com

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Abstract

Background: Adolescents, especially girls, often consume unhealthy snacks, affecting their health. This study applied the BASNEF model to identify factors influencing healthy and unhealthy snack consumption among female adolescents in Saveh, Iran.

Methods: In the spring of 2020, 395 high school students in Saveh, Iran, who were selected by multi-stage sampling method, participated in this cross-sectional survey. A validated three-part questionnaire encompassing demographic data, snack consumption habits, and BASNEF model constructs was used to gather data. SPSS (version 20.0) was used for the analyses, including descriptive and inferential statistics.

Results: The BASNEF model explained 27% of the variance in healthy snack consumption behaviors and 21% in unhealthy snack consumption behaviors. Among the variables in the BASNEF model, enabling factors (B=0.230, P<0.001) emerged as the most substantial contributors to healthy snack consumption, emphasizing the significance of accessible resources and supportive environments. In contrast, subjective norms (B=0.216, P<0.001) were the most influential for unhealthy snack consumption, reflecting the impact of social pressure and perceived expectations from peers or family members. These findings underscored the role of both structural factors and social influences in shaping adolescents' snack choices.

Conclusions: The BASNEF model partially explained snack consumption behaviors among adolescents. The findings highlighted the need for tailored educational interventions that address enabling factors to promote healthy snacks and target social norms to reduce unhealthy snack consumption, ultimately fostering better dietary habits in this population.

Keywords: Snack, Adolescent, BASNEF model

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1. Introduction

During adolescence, psychological traits like independence, self-consciousness, and cognitive flexibility change significantly, and height and weight develop quickly (1, 2). Adolescent growth and development depend heavily on healthy eating habits and nutritional status. On the other hand, poor eating habits can raise the chance of developing obesity and other long-term conditions (3). Any food consumed between main meals is considered a snack, contributing significantly to students' caloric consumption. Environmental factors, behaviors, emotions, opinions, and those of significant others all impact how many snacks they eat at school (4). Notably, there were noteworthy correlations discovered between teenage girls' depression ratings and snack eating (5). Furthermore, studies on meal patterns have shown that snacks are becoming more common, and their negative impacts on diet have been validated because of their high energy density and low nutritious content (6). Since it can significantly influence their future health, it is imperative to comprehend the connection between schoolchildren's eating habits, snacks, and health (3).

Snacking between meals is common among adolescents (7, 8). Healthy snacking can enhance adolescents' overall nutritional quality and help them fulfill requirements for consuming essential food groups, like fruit (9). However, teenagers frequently snack on energy-dense snacks and sugar-sweetened beverages, which leads to low nutritional intake and a high prevalence of overweight/obesity (8, 10, 11). Unhealthy snacking among students has been shown in studies conducted around the globe. For example, a study conducted in Poland revealed that the most prevalent unhealthy snack among students was potato chips (12).

Furthermore, candy, carbonated beverages, sweet drinks, and high-salt snacks were the most popular snacks among American teenagers (13). According to studies, children and teenagers in Iran also consume unhealthy snacks (14, 15). Candy (30.8 and 33.2%), fizzy drinks (21.5 and 27.2%), cheese puffs, and potato chips (20.3% and 25.8%) were the most common unhealthy snacks in both urban and rural areas of Iran, according to a thorough analysis (4).

The failure of educational programs to promote healthy behaviors can be attributed, in part, to the neglect of psychosocial models and behavior-influencing elements as distinct conceptual frameworks in educational programming (16). By predicting the key aspects of healthy snacking behavior using the beliefs, attitudes, subjective norms, and enabling factors (BASNEF) model, we hope to close the gap. Programs that modify behaviors are studied using this concept. It also establishes standards, societal pressures, attitudes toward a habit, and the essential elements that help people engage in healthy activities. Fishbein's hypothesis about attitude structures, behavioral intention, subjective norms, and enabling elements, including: time, expenditure, and behavior skill, forms the basis of the BASNEF model (17). Although the best indicator of behavior is a person's desire to engage in it, attitudes and subjective standards can change behavioral intention, which in turn affects behavior performance (18). This trend has been identified in some previous studies (19, 20).

The primary aim of this study was to explore the determinants of healthy snacking behavior among Iranian adolescent girls using the BASNEF model. Specifically, this study sought to identify the key factors influencing snacking behavior, including attitudes, subjective norms, enabling factors, and behavioral intention. This study also aimed to provide insights into how the BASNEF model can be applied to promote healthy snacking behaviors in this population and improve educational interventions to enhance adolescent nutrition.

2. Methods

This cross-sectional, descriptive-analytical study was conducted in the spring of 2020 on 420 female high school students in the Iranian capital, Saveh, Iran.

After carefully accounting for a 10% dropout rate, 420 people were finally included in the study. A thorough multistage sampling procedure was used to choose the study participants. At first, Saveh was separated into two separate districts: the core and outer districts. An extensive list of secondary schools in Saveh Education Department was later obtained. Twelve female schools were randomly selected from each district, yielding 24 high schools. The study samples (422 female students) were then chosen using a straightforward random sampling technique and included in the study in proportion to the number of students enrolled in different grades of 7th, 8th, and 9th. The female students in grades 1, 2, and 3 who had not previously dealt with mental or cognitive issues were included in the study. Every participant gave their written consent to take part in the study. Incomplete questions on the questionnaire led the participants being excluded from the study. The age range of the participants varied from 12 to 15 years old. As a result, all study participants provided written student assent and written parental informed consent forms.

2.1. Study Tools

The questionnaire used in this study was developed based on a systematic literature review and validated tools from previous studies (16, 18). Questions were adapted to align with the constructs of the BASNEF model and tailored to the target population of high school female students. A panel of ten Nutrition, Psychology, and Health Education specialists evaluated the content validity using the Content Validity Index (CVI=0.58) and Content Validity Ratio (CVR=0.87). A pilot test with 50 students assessed reliability. The Cronbach's alpha coefficients for the different parts ranged from 0.73 to 0.84, suggesting acceptable internal consistency.

The first section of the questionnaire focused on demographic data, including the mother's occupation, BMI, and parents' educational attainment. The second section was created using the BASNEF model elements. These constructs included behavioral intentions (9 questions) with a 5-point Likert scale, enabling factors (11 questions) with a three-point scale of "yes" (score 2), "somewhat" (score 1), and "no" (score 0), and attitudes (10 questions) with a 5-point Likert scale that ranged from "strongly agree" with a score of 5 to "strongly disagree" with a score of 1. In previous

studies, the Cronbach's alpha coefficient was used to assess the reliability of the questionnaire and values ranging from 0.71 to 0.89 were determined for each section. Also, the content validity of this questionnaire was confirmed by the content validity ratio (0.87) and content validity index (0.85).

The study focused on snack behavior, a significant aspect of adolescent dietary habits, particularly in high school-aged individuals in Iran. The study examined a variety of snacks, including homemade bites, nuts, dates, raisins, dried biscuits, dried fruit, and fruits and vegetables, which were categorized as healthy snacks. Unhealthy snacks included crisps, cheese puffs, industrial juices, soft drinks, sausage rolls, pastilles and candies, and stamps and plums. The frequency of snack consumption was recorded using a pre-designed table, with the number of snack times ranging from 0 to 7 times a week.

2.2. Data Analysis

The statistical software SPSS version 20.0 was used for all analysis. In addition to independent t and $\chi 2$ tests, descriptive statistics techniques were employed, including frequencies, mean and standard deviations. Multiple regressions were used for additional analysis.

The survey was distributed to the students following consultation with the education office officials and schools in the city. The self-reporting technique was employed to collect participant replies, and the researcher gave the required justifications for each question. The questionnaire did not include the participants' names; other information was kept private and exclusively used for this study. Notably, out of the 433 students randomly selected based on the sample size, 420 students took part in the study while only 13 students did not complete the questionnaire (the response rate was roughly 97%) or did not participate due to their parents' dissatisfaction.

3. Results

A total number of 422 students were selected and enlisted for the study; however, 12 cases were

Table 1: Demographic characteristics of the participants

Variables		Group	Sex		P value
			Male (85) N (%)	Female (214) N (%)	
Body weight status	Underweight (less than 18.5)	36 (9.11)	23 (12.84)	15 (6.94)	0.07
	Normal (between 18.5 and 24.9)	196 (49.62)	89 (47.48)	107 (49.53)	0.09
	Overweight (Between 25 and 29.9)	82 (20.75)	35 (19.55)	47 (21.75)	0.07
	Obese (more than 29.9)	81 (20.50)	32 (17.87)	49 (22.68)	0.06
Mother's education level	Illiterate	26 (15.40)	14 (6.68)	12 (5.68)	0.26
	Diploma and under-diploma	172 (44.10)	68 (37.98)	104 (48.73)	0.06
	Bachelor	145 (20.70)	78 (43.57)	67 (31.02)	0.09
	Master	45 (15.40)	12 (6.70)	31 (14.35)	0.06
	PhD	7 (4.30)	4 (2.91)	2 (1.67)	0.08
Father's education level	Illiterate	19 (10.00)	11 (6.14)	8 (4.67)	0.07
	Diploma and under-diploma	189 (37.10)	95 (53.07)	102 (29.72)	0.31
	Bachelor	97 (25.80)	47 (26.25)	50 (18.37)	0.29
	Master	77 (20.10)	23 (12.84)	54 (14.36)	0.05
	PhD	5 (7.00)	3 (1.67)	2 (4.34)	0.12
Father's job	Worker	185 (2.30)	88 (49.16)	97 (44.90)	0.23
	Employee	116 (40.80)	49 (27.37)	67 (31.06)	0.09
	Unemployed	13 (9.00)	5 (2.79)	8 (3.71)	0.17
	Free job	81 (44.80)	37 (20.67)	44 (20.39)	0.14
Mother's job	Worker	68 (2.00)	30 (16.75)	38 (17.59)	0.19
	Employee	29 (22.40)	11 (6.14)	18 (8.06)	0.09
	Housewife	256 (32.10)	119 (66.48)	137(63.41)	0.29
	Free job	42 (41.10)	19 (10.61)	23 (10.65)	0.18
Family monthly income	Good	89 (12.40)	41 (22.90)	48 (22.24)	0.13
	Medium	196 (16.70)	89 (49.72)	107 (49.53)	0.15
	Weak	110 (9.40)	49 (27.37)	61 (28.21)	0.22
Total			179(45.31)	216(54.69)	0.09

eliminated for not returning the questionnaires, and 15 participants were eliminated because their questionnaires were not completed. Data from 395 students—of whom 45.31% were male and 54.69% were female—were subjected to statistical analysis. All of the students were 14.10±2.30 years old on average. Of the participants, 51% were put into different weight groups, and 49% were classified as having an average weight (Table 1).

The mean score for the variables within the study's theoretical framework in Table 2 showed no discernible differences between male and female students (P > 0.05). Analysis of correlation Pearson's correlation matrix (Table 3) indicated that good and harmful snacking behaviors were substantially correlated with every BASNEF model variable. Subjective norms showed the most significant positive link with healthy snacking behavior (r=0.423, P<0.001), whereas behavioral intention showed the strongest negative correlation with unhealthy snacking behavior (r=−0.375, P<0.001).

According to multiple regression analysis, 27% of the variation in healthy snacking behavior could be explained by the BASNEF model. The importance of favorable attitudes and easily accessible resources in promoting healthy snack choices is demonstrated by the significant contributions of attitude (B=0.149, P<0.001) and enabling factors (B=0.230, P<0.001) among the linked components (Table 4).

For unhealthy snacking behavior, the regression model accounted for 21% of the variance (P < 0.001). The predictors include attitude (B=-0.094, P=0.04), behavioral intention (B=-0.129, P<0.001), and subjective norms (B=-0.216, P<0.001) (Table 5).

Table 2: The mean score of constructs of the BASNEF model among high school students in terms of sex

Variable	Group	Sex		P value
		Male	Female	
	M±SD	M±SD	M±SD	
Attitude	28.30±3.94	26.42±4.08	29.06±3.90	0.05
Subjective norm	32.15±13.10	31.69±3.51	32.93±3.96	0.65
Enabling factor	16.13±36.52	15.61±3.80	16.75±3.14	0.30
Behavioral intention	27.96±6.19	28.21±6.86	27.86±5.92	0.66
Healthy snacking behavior	9.70±3.91	9.97±2.58	9.57±1.61	0.43
Unhealthy snacking behavior	7.70±3.91	8.89±1.91	7.30±1.89	0.07

SD: Standard Deviation

Table 3: Pearson's correlation matrix for the research variables (n=395)

Variables	Healthy snacking behavior	Unhealthy snacking behavior
Attitude	0.289 **	-0.095*
Subjective norm	0.423**	-0.312**
Enabling factor	0.288**	-0.263**
Behavioral intention	0.356**	-0.375**

**P < 0.01, *P < 0.05

Table 4: The results of multiple regression analysis of healthy snacking behavior based on BASNEF model

Variables	B	β	t	P value
Attitude	0.149	0.340	6.292	<0.001
Subjective norm	0.001	0.002	0.038	0.970
Enabling factor	0.230	0.318	5.726	<0.001
Behavioral intention	0.068	0.029	0.441	0.659

Table 5: The results of multiple regression analysis of unhealthy snacking behavior based on BASNEF model

Variables	B	β	t	P value
Attitude	-0.094	-0.127	-2.061	0.040
Subjective norm	-0.216	-0.095	-1.456	<0.001
Enabling factor	-0.003	-0.010	-0.161	0.872
Behavioral intention	-0.129	-0.205	-2.967	<0.001

4. Discussion

The present study aimed to explore the associations between the BASNEF model constructs and snack consumption behaviors among adolescents. The findings revealed that the model accounted for 26% of the variance in healthy snack consumption behavior, with constructs such as attitude and enabling factors playing notable roles. Similarly, the model explained 21% of the variance in unhealthy snack consumption behavior, with significant contributions from attitude, social norms, and intention.

Attitude was identified as a critical factor for adolescents' healthy snacking behavior. This aligned with prior studies (21-23), which highlighted the role of attitude in shaping dietary behaviors. Attitudes reflect an individual's perception of the desirability or undesirability of an action, influencing behavioral intentions. While attitudes shaped by emotional and cognitive experiences are associated with healthier eating habits, it is essential to recognize the cross-sectional nature of this study, which limits causal interpretations.

Enabling factors also emerged as significantly associated with healthy snack consumption. These findings were consistent with prior research, such as the survey of Bîlbîie and colleagues in Romania (24), which highlighted the impact of resource availability on dietary behavior. For example, reducing the cost of healthier snack options could positively influence consumption patterns. However, further longitudinal studies are necessary to examine how changes in enabling factors translate into sustained behavior change.

Social norms showed a strong association with unhealthy snack consumption. This finding aligned with previous studies (24-26) and highlighted the influence of family, peers, and school environments on adolescents' dietary behaviors. Notably, peer influence appeared to be a critical factor, underscoring the need for interventions targeting peer groups. The cross-sectional design precludes determining whether social norms directly lead to unhealthy snack consumption or whether shared behaviors reinforce norms within peer groups.

Intention also showed a significant association with unhealthy snacking behaviors. This supports the foundational role of intention in the BASNEF model, as noted in previous studies (27, 28). Intention reflects the motivational factors behind the behavior. Yet, its relationship with actual behaviors may vary depending on external barriers or enablers. While the results suggested intention as a key intervention focus, longitudinal or experimental designs would be required to understand its predictive validity over time.

It is important to stress that the observed connections should not be regarded as causal relationships due to the cross-sectional design of this study. To investigate the causal pathways and temporal interactions between these characteristics and snacking behaviors, more studies using experimental or longitudinal methods are required. Furthermore, qualitative insights may help us better understand how context-specific factors, especially social and cultural dynamics, affect the food choices of adolescents.

4.1. Limitation

When evaluating the results, it is essential to consider the limitations of this study. First, Teenagers may not always provide accurate information about their snacking habits and the factors that influence them, as their self-reported data can be affected by biases, such as social desirability bias. Second, a longitudinal approach would offer a more thorough knowledge of how snacking patterns evolve, as the cross-sectional form of the study restricts the capacity to demonstrate causal links between the identified characteristics and snacking behaviors. Last but not least, while the study was conducted in Saveh, Iran, the results might not be applicable in other cultural or geographic contexts because social, environmental, and educational factors influencing teenage behavior may alter depending on the location.

5. Conclusion

This study highlighted the significant associations between the constructs of the BASNEF model and snack consumption behaviors among adolescents in Saveh, Iran. The findings underscored the importance of attitude and enabling factors in promoting healthy snack consumption and the role of social norms and intention in unhealthy snacking behaviors. While the cross-sectional nature of this study limits causal interpretations, the results suggested that

interventions targeting attitudes, social norms, and enabling factors could be effective strategies for promoting healthier dietary choices among adolescents. Future longitudinal and experimental studies are essential to better understand the causal relationships between these factors and to develop more effective interventions tailored to adolescents' unique cultural and social contexts. Additionally, exploring qualitative insights could further enrich our understanding of the factors influencing adolescent snacking behaviors.

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Authors' Contribution

Fatemeh Gudarzi: Contributed to the gathering and analysis of data; drafting the work and reviewing it critically for important intellectual content. Zahra Saboohi: Contributed to the design of the study; drafting the work and reviewing it critically for important intellectual content. Zahra Jalili: Contributed to the design of the study; drafting the work and reviewing it critically for important intellectual content. All authors have read and approved the final manuscript and agree to be accountable for all aspects of the work, such that the questions related to the accuracy or integrity of any part of the work.

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Ethical Approval

The ethics committee of the Islamic Azad University, Science and Research Branch of Tehran, Iran approved the research with the code of IR.IAU.TMU.REC.1398.153. Also, written informed consent was obtained from the participants.

References

1. Bonnie RJ, Backes EP, Alegria M, Diaz A, Brindis CD. Fulfilling the promise of adolescence: realizing opportunity for all youth. J Adolesc Health. 2019;65(4):440-442. doi: 10.1016/j.jadohealth.2019.07.018. PubMed PMID: 31439468.
2. Kapur S. Adolescence: the stage of transition. Horizons of Holistic Education. 2015;2:233-250.
3. Yang C, Pan X, Zhao Y, Wang X, Wang Z, Ren X. Snacking behaviour and nutrients intake among 11-16 years-old students from two different boarding system schools. Heliyon. 2023;9(3):e14517. doi: 10.1016/j.heliyon.2023.e14517. PubMed PMID: 36967886; PubMed Central PMCID: PMC10034438.
4. Bastami F, Zamani-Alavijeh F, Mostafavi F. Factors behind healthy snack consumption at school among high-school students: a qualitative study. BMC Public Health. 2019;19(1):1342. doi: 10.1186/s12889-019-7656-6. PubMed PMID: 31640640; PubMed Central PMCID: PMC6805509.
5. Sangouni AA, Beigrezaei S, Akbarian S, Ghayour-Mobarhan M, Yuzbashian E, Salehi-Abargouei A, et al. Association between dietary behaviors and depression in adolescent girls. BMC Public Health. 2022;22(1):1169. doi: 10.1186/s12889-022-13584-0. PubMed PMID: 35690748; PubMed Central PMCID: PMC9188218.
6. Hoteit M, Mohsen H, Hanna-Wakim L, Sacre Y. Parent's food literacy and adolescents nutrition literacy influence household's food security and adolescent's malnutrition and anemia: Findings from a nationally representative cross-sectional study. Front Nutr. 2022;9:1053552. doi: 10.3389/fnut.2022.1053552. PubMed PMID: 36643976; PubMed Central PMCID: PMC9837989.
7. Taillie LS, Wang D, Popkin BM. Snacking is longitudinally associated with declines in body mass index z scores for overweight children, but increases for underweight children. J Nutr. 2016;146(6):1268-75. doi: 10.3945/jn.115.226803. PubMed PMID: 27146917; PubMed Central PMCID: PMC4926857.
8. Tripicchio GL, Kachurak A, Davey A, Bailey RL, Dabritz LJ, Fisher JO. Associations between snacking and weight status among adolescents 12–19 years in the United States. Nutrients. 2019;11(7):1486. doi: 10.3390/nu11071486. PubMed PMID: 31261906; PubMed Central PMCID: PMC6682988.
9. Llauradó E, Albar SA, Giralt M, Solà R, Evans CEL. The effect of snacking and eating frequency on dietary quality in British adolescents. Eur J Nutr. 2016;55(4):1789-97. doi: 10.1007/s00394-015-0997-8. PubMed PMID: 26212034.
10. Guo H, Phung D, Chu C. Sociodemographic, lifestyle, behavioral, and parental factors associated with sugar-sweetened beverage consumption in children in China. PLoS One. 2021;16(12):e0261199. doi: 10.1371/journal.pone.0261199. PubMed PMID:

34890424; PubMed Central PMCID: PMC8664181.
11. Liu D, Zhao L-Y, Yu D-M, Ju L-H, Zhang J, Wang J-Z, et al. Dietary patterns and association with obesity of children aged 6–17 years in medium and small cities in China: findings from the CNHS 2010–2012. Nutrients. 2018;11(1):3. doi: 10.3390/nu11010003. PubMed PMID: 30577428; PubMed Central PMCID: PMC6356437.
12. Weker H, Baranska M. Models of safe nutrition of children and adolescents as a basis for prevention of obesity. Med Wieku Rozwoj. 2011;15(3):288-97. PubMed PMID: 22006483.
13. Kant AK, Graubard BI. 40-year trends in meal and snack eating behaviors of American adults. J Acad Nutr Diet. 2015;115(1):50-63. doi: 10.1016/j.jand.2014.06.354. PubMed PMID: 25088521; PubMed Central PMCID: PMC4276433.
14. Feyzabadi VY, Mohammadi NK, Omidvar N, Karimi-Shahanjarini A, Nedjat S, Rashidian A. Factors associated with unhealthy snacks consumption among adolescents in Iran's schools. Int J Health Policy Manag. 2017;6(9):519-528. doi: 10.15171/ijhpm.2017.09. PubMed PMID: 28949464; PubMed Central PMCID: PMC5582438.
15. Omidvar N, Babashahi M, Abdollahi Z, Al-Jawaldeh A. Enabling food environment in kindergartens and schools in Iran for promoting healthy diet: Is it on the right track? Int J Environ Res Public Health. 2021;18(8):4114. doi: 10.3390/ijerph18084114. PubMed PMID: 33924728; PubMed Central PMCID: PMC8070383.
16. Jalili Z, Saboohi Z, Tavakoli R. Effect of training program on snack consumption in elementary school girls: application of the BASNEF model. Journal of Education and Community Health. 2021;8(1):3-9. doi: 10.52547/jech.8.1.3.
17. Momeni R, Hosseini Z, Aghamolaei T, Ghanbarnejad A. Determinants factors to Pap smear screening among married women in a city of South Iran: applying the BASNEF model. BMC womens Health. 2020;20(1):237. doi: 10.1186/s12905-020-01102-6. PubMed PMID: 33081778; PubMed Central PMCID: PMC7576855.
18. Bandehelahi K, Khoshravesh S, Barati M, Tapak L. Psychological and sociodemographic predictors of fertility intention among childbearing-aged women in Hamadan, West of Iran: An application of the BASNEF model. Korean J Fam Med. 2019;40(3):182-187. doi: 10.4082/kjfm.18.0008. PubMed PMID: 30636384; PubMed Central PMCID: PMC6536910.
19. Bayrami R, Didarloo A, Asadinejad A. Prediction of physical activity based on the BASNEF model constructs during preconception period among women referred to Uremia health centers. Hayat. 2020;26(1):105-117. Persian.
20. Hosseinzadeh M, Barzanjeh Atri S, Sahebihagh M, Asghari Jafarabadi M, Ebadi L. PREDICTIVE FACTORS FOR PARTICIPATION IN COLORECTAL CANCER SCREENING BASED ON BASNEF MODEL. Nursing and Midwifery Journal. 2021;19(7):581-590. doi: 10.52547/unmf.19.7.7. Persian.
21. Khani Jeihooni A, Jormand H, Saadat N, Hatami M, Abdul Manaf R, Afzali Harsini P. The application of the theory of planned behavior to nutritional behaviors related to cardiovascular disease among the women. BMC Cardiovasc Disord. 2021;21(1):589. doi: 10.1186/s12872-021-02399-3. PubMed PMID: 34876014; PubMed Central PMCID: PMC8650365.
22. Ashrafi E, Mansourian M, Azar FEF, Rahideh ST, Ezadi B, Osmani F. Investigation of factors related to healthy eating behavior based on the developed theory of planned behavior in adolescents. J Educ Health Promot. 2023;12(1):274. doi: 10.4103/jehp.jehp_904_22. PubMed PMID: 37849886; PubMed Central PMCID: PMC10578556.
23. Farid MS, Cavicchi A, Rahman MM, Barua S, Ethen DZ, Happy FA, et al. Assessment of marketing mix associated with consumer's purchase intention of dairy products in Bangladesh: Application of an extended theory of planned behavior. Heliyon. 2023;9(6):e16657. doi: 10.1016/j.heliyon.2023.e16657. PubMed PMID: 37303522; PubMed Central PMCID: PMC10250725.
24. Bîlbîie A, Druică E, Dumitrescu R, Aducovschi D, Sakizlian R, Sakizlian M. Determinants of fast-food consumption in romania: An application of the theory of planned behavior. Foods. 2021;10(8):1877. doi: 10.3390/foods10081877. PubMed PMID: 34441653; PubMed Central PMCID: PMC8391296.
25. Bélanger M, Dugas C, Perron J, St-Yves A, Rancourt-Bouchard M, Weisnagel SJ, Robitaille J. Intention to adopt a healthy diet among women with and without a history of gestational diabetes: Constructs and beliefs from the theory of planned behavior. Prev Med Rep. 2023;35:102328. doi: 10.1016/j.pmedr.2023.102328. PubMed PMID: 37559949; PubMed Central PMCID: PMC10407815.
26. van der Velde LA, van Dijk WW, Numans ME, Kiefte-de Jong JC. Extending the theory of planned behavior for explaining dietary quality: the role of financial scarcity and food insecurity status. J Nutr Educ Behav. 2022;54(7):636-646. doi: 10.1016/j.

jneb.2022.02.019. PubMed PMID: 35644785.
27. Goldani Moghaddam F, Salmani F, Hoseinzadeh Chahkandak F, Norozi E. Is the Theory of Planned Behavior a good model for predicting salt consumption behavior in pregnant women? A structural equation modeling approach. J Educ Health Promot. 2023;12(1):197. doi: 10.4103/jehp.jehp_983_22. PubMed PMID: 37545990; PubMed Central PMCID: PMC10402779.
28. Didarloo A, Khalili S, Aghapour AA, Moghaddam-Tabrizi F, Mousavi SM. Determining intention, fast food consumption and their related factors among university students by using a behavior change theory. BMC Public Health. 2022;22(1):314. doi: 10.1186/s12889-022-12696-x. PubMed PMID: 35168595; PubMed Central PMCID: PMC8845370.