



# Choice of Healthy Methods for Cooking by Rural Females of Chabahar, Iran: An Application of the Theory of Planned Behavior

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## Abstract

**Background:** Poor dietary behaviors contribute to morbidity and mortality. A sizeable percentage of chronic diseases is related to unhealthy eating habits. Family is a prominent element of the social environment where dietary behaviors are enacted and learned and mothers play a crucial role in children's nutrition. Regarding this important role, identifying the factors affecting the choice of healthy cooking methods by females can be helpful in future planning to increase the choice of healthy cooking methods.

**Methods:** The current cross sectional study investigated 230 native females of Chabahar, Iran, within the age range of 12 to 75 years. Participants were selected via multistage sampling by native assistants. Data were gathered with a valid and reliable researcher-made questionnaire consisting of knowledge and Theory of Planned Behavior (TPB) constructs (attitudes, subjective norms, perceived behavioral control (PBC), and intention) as well as demographic characteristics. The Pearson correlations and stepwise regression were employed to analyze the data with IBM SPSS software version 16.

**Results:** Results of the Pearson correlations showed that subjective norms were correlated with choice of healthy cooking methods. There was also significant association between attitudes, subjective norms, PBC, and intention. Stepwise regression showed that subjective norms significantly predicted behavior and PBC significantly predicted intention.

**Conclusions:** A broad and community based educational program which improves PBC and subjective norms of rural females, is necessary to have rural and Baluch females increase choice of healthy methods for cooking.

**Keywords:** Healthy Cooking, Theory of Planned Behavior, Female, Chabahar City

## 1. Background

Poor dietary behaviors contribute to morbidity and mortality all over the world. Heart disease, cancer, and stroke are the top 3 leading causes of death in the United States and a sizeable percentage of such diseases are related to unhealthy eating habits (1, 2). According to the report of the centers for disease control and prevention (CDC), poor diet and insufficient physical activity contribute to almost 300,000 deaths per year (2).

It is known that healthy eating habits can protect body against major diseases and subsequently can decrease overall mortality in females by 11%. Healthy food choice and consumption of foods with fewer calories are 2 important steps to prevent obesity and coronary heart disease, stroke, and cancer. It is true that genetics can play a role in obesity, yet this problem ultimately results from the food choices. Prevention efforts should focus on the behavioral and environmental factors therefore identification of such factors

is of great importance (1).

Family is a prominent element of the social environment where dietary behaviors are enacted and learned (3). Knowledge of females about healthy cooking and food storage methods is the basis to provide healthy food including preparation, making, and storage, which influence proper nutrition. Therefore, informing social groups especially females about issues related to food health and healthy nutrition behaviors including healthy cooking methods, have an important place in the health service. In the majority of households, females are responsible for food preparation and cooking; hence, the higher the level of their awareness of health issues, the better the levels of family nutrition health can be (4).

TPB is extensively used to understand a variety of behaviors (5-11) including healthy eating (7, 12-16). According to the TPB, the main determinant of behavior is the intention to do that. Attitudes towards the behavior (instrumental and affective evaluations of the behavior), subjective

norms (perceived social pressure from significant other to perform the behavior), and perceived behavioral control (PBC) (whether performance of the behavior is easy or difficult and under one's control or not) (6, 12, 13, 16, 17) determine the intention. The TPB is considered as a good model to understand the nutritional behaviors (12).

Since researches in the field of choice of healthy cooking methods are rare and none of them applied the TPB and based on the important role of mothers in children's nutrition, the current study aimed at employing the TPB to understand the choice of healthy methods for cooking by rural females in Chabahar, Iran.

## 2. Methods

The current cross sectional study mainly aimed at determining the predictors of healthy cooking behavior and intention. The study was conducted from 15 January to 25 March, 2015.

To determine the required sample size, the formula  $n = 50 + 10 \times P$  was used. The sample size was totally 230 subjects. Participants were recruited via multistage sampling by native adolescent females recruited from 2 high schools located in the rural area of Chabahar named Tiss and Ramin.

The data collection tool was a questionnaire. Research variables were the constructs of the TPB including attitudes, PBC, subjective norms, intention, and behavior as well as knowledge, and demographic characteristics including age, weight, height, body mass index (BMI), job, current level of education, household population, number of children, having outdoor job, and monthly income. Sampling method as well as validity and reliability tests of the questionnaire were presented in details in an earlier report (18).

The Guttman scale was used to measure the TPB constructs by selecting 1 of the 3 options namely 3 = agree, 2 = neutral, and 1 = disagree.

Knowledge was measured via 2 four-option questions and correct answer got 1 score, while false answers or "I don't know" got 0 score. Past behavior, which was self-reported, was measured via 4 questions, the first question asked how often the participant prepared food using specified methods (frying, steaming, poaching, and barbecuing) and had 5 options: for frying, never = 4 scores, once a week = 3, two or three times a week = 2, four to six times a week = 1, and daily = 0. Whereas for the rest of the methods including steaming, poaching, and barbecuing the answer "never = 0 score, once a week = 1, two or three times a week = 2, four to six times a week = 3, and daily = 4.

Intention to choose healthy cooking methods was assessed using the question "I intend to reduce preparing

foods using frying method next month.", and "I intend to increase preparing foods using steaming up method next month." (agree-disagree).

Attitudes towards the choice of healthy cooking methods were measured using the mean of 4 questions including "steamed or poached foods are tasteless for me" and "in my opinion fried and fatty foods are more nutritious". "Preparing low fat and steamed foods is difficult for me". "In my opinion, fried and fatty foods are harmful for my health" (agree-disagree).

Subjective norms were measured using the mean of 3 items including "My family and friends want me to reduce fried foods intake and increase preparing steamed, poached, and barbecued foods." (agree-disagree). "My family and friends always eat steamed, poached, and barbecued foods and rarely eat fried foods." (agree-disagree) and "totally how much do you care about what your family and friends think about reducing fried food preparing by you." (I care so much -I don't care at all).

PBC was measured with 2 items including "If I want I can reduce fried and fatty foods intake next month." and "If I want I can increase steamed and poached foods intake next month." (agree-disagree).

### 2.1. Data Evaluation and Analysis

Bivariate correlation was conducted to determine associations between all variables of the study. Then, multiple linear stepwise regression analysis was conducted to determine the significant determinants of the variables on choice of healthy methods for cooking. The significance level was considered 0.05. Chi-square test was employed to analyze the qualitative data.

The items were coded in a way that the higher scores indicated the more favorable of each variable. In order to avoid missing data, in addition to the advice and training assistants to fill the questionnaires completely, questionnaires with more than three blank items, which corresponds to more than 10% missing data, were removed from the study.

All the procedures were approved by Zahedan University of Medical Sciences, Zahedan, Iran. The ethical approval code was IR.ZAUMS.REC.1392.6029. The objectives of the study were explained to the subjects and the informed consent was obtained from participants and assistants (by filing a written consent). All of the subjects were assured of the confidentiality of the information in the questionnaires and were told that they were free to withdraw from the study at any time. The assistants were motivated by some rewards.

### 3. Results

Descriptive statistics of the demographic variables showed that most of the participants (84%) in the current study were less than 35 years. Only 15.3% of participants had academic education. BMI of most of the participants (75.4%) were in the normal or thin range ( $BMI < 25$ ). Household population of most of the participants (64.7%) was more than 4. However, most of them did not have more than 1 child. According to the self-report of the participants, their monthly income was mostly (57.7%) less than \$252. Most of them had husband (67.8%) and did not have outdoor job (86.5%). Frequency and percentage of answers to question on the choice of healthy cooking methods are shown in Table 1.

All of the participants prepared fried foods at least once a week (Table 1). Most of the participants prepared fried foods 2 - 3 times a week or more (74.3%). Most of the participants did not prepare poached foods during the week or prepared it only once a week (66.1%). Most of the participants did not prepare steamed foods during the week or prepared it only once a week (68.3%). Most of the participants did not prepare barbecued foods during the week or prepared it only once a week (53%). As it is shown in Table 1, for steaming, poaching, and barbecuing methods the most repeated answer was once a week. While for frying method the most repeated answer was 2 - 3 times a week.

According to the results of the current study, most of the participants (57.2%) did not know that frying vegetables destroys its vitamins also most of the participants (67.4%) did not know that the healthiest cooking method is steaming. Only 35.4% of the participants disagreed that preparing steamed food is difficult for them. Only 32.6% of the participants disagreed that steamed and poached food taste bad for them. Around 20% of the participants agreed that in their opinion, fried and fatty foods are more nutritious, and 31% of the participants agreed that in their opinion, fried and fatty foods are harmful for health.

Generally, scores were found for attitudes, PBC, subjective norms, intention, and knowledge around midscale. Mean and standard deviation for variables of the TPB are shown in Table 2.

Results of the Pearson correlations for TPB constructs is shown in Table 3.

Among demographic characteristics, having outdoor job was significantly correlated with PBC ( $R = 0.141$  sig = 0.05); therefore, participants who had outdoor jobs had higher PBC toward choice of healthy cooking methods.

Monthly income was significantly correlated with attitudes ( $R = 0.160$  sig = 0.05); therefore, participants with more income had better attitudes toward choosing

healthy cooking methods. Other demographic variables including age, BMI, number of family members, number of children, level of education, and marital status were not associated with behavior, knowledge, or other constructs of the TPB.

Stepwise regression showed that among dependent variables including attitudes, PBC, knowledge, perceived barriers, subjective norms, and intention, only subjective norms ( $R^2 = 0.023$ ) predicted approximately 2.3% of behavior. However, in respect with intention, among dependent variables including attitudes, PBC, knowledge, perceived barriers, and subjective norms, only PBC ( $R^2 = 0.178$ ) predicted approximately 18% of the variance.

### 4. Discussion

The study population was relatively young, with low educational level, and low monthly income. They mostly had little number of children and were living in extended families. In addition, most of them were married and housewives. In general, choice of healthy cooking methods in this population was around midscale.

Results of demographic data analysis showed that participants with outdoor jobs had higher PBC toward choice of healthy cooking methods. Maybe its due to higher self-confidence of such females and also maybe they felt they had stronger economic power that affected their family nutrition. Study by Adams et al., in United Kingdom also showed that females or males with the main responsibility for shopping and preparing food in households also had more skill and confidence with food preparation (19).

Results of the current study showed that subjective norms were only correlated and also the only direct predictor of choice of healthy cooking methods. In line with the current study, some other studies reported that subjective norms was one of the significant predictors of behavior (15, 16, 20), while others reported that subjective norms did not predict behavior directly (14). The differences between the study populations may result it. Since rural people of Chabahar are mainly Baluch and have a traditional and coherent society, they tend to obey other people's opinions and advice instead of their own will. Living in extended families is another feature of such societies, which suggests the possibility that the significant others such as mother-in-laws or other older members of the family set nutritional rules, and they decide on the way of cooking and determine the kind of food that should be prepared.

Also, results of the current study showed that intention, knowledge, attitudes neither correlated nor predicted choice of healthy cooking methods. The current study finding was in contrast with the hypothesis of TPB

**Table 1.** Frequency of Answers to the Questions on the Choice of Healthy Cooking Methods

Cooking Method	Never	Once a Week	2 - 3 Times a Week	4 - 6 Times a Week	Daily
Frying	0 (0%)	59 (25.7%)	84 (36.5%)	41 (17.8%)	46 (20%)
Poaching	40 (17.4%)	112 (48.7%)	50 (21.7%)	19 (8.3%)	9 (3.9%)
Steaming	68 (29.6%)	89 (38.7%)	37 (16.1%)	24 (10.4%)	12 (5.2%)
Barbecuing	33 (14.3%)	89 (38.7%)	62 (27%)	27 (11.7%)	19 (8.3%)

**Table 2.** Mean and Standard Deviation for TPB Variables

Variable	Mean (%)	Standard Deviation
Knowledge	0.75 (37%)	0.72
Intention	2.37(59%)	1.14
Subjective norms	3.19 (53%)	1.49
Attitudes	2.67 (66%)	1.15
PBC	2.59 (64%)	1.2
Cooking method	5.84 (41%)	2.60
Perceived barriers	2.05(51%)	1.19

**Table 3.** Bivariate Correlations Between the Psychosocial Variables

Variable		1	2	3	4	5	6
1. Behavior	R	1					
	Sig						
2. Intention	R	0.00	1				
	Sig	0.89					
3. Knowledge	R	0.08	0.17*	1			
	Sig	0.24	0.01				
4. PBC	R	-0.01	0.42*	0.2*	1		
	Sig	0.83	0.00	0.00			
5. Subjective norms	R	0.15*	0.28*	0.17*	0.42*	1	
	Sig	0.02	0.00	0.01	0.00		
6. Attitudes	R	-0.01	0.16*	0.09	0.25*	0.20	1
	sig	0.83	0.02	0.16	0.00	0.00	

that claims intention is the most immediate determinant of human behavior. Also, a large body of studies reported that intention was a direct predictor of behavior (15, 20, 21); yet several recent lines of researches suggested that intentional control of behavior may be more limited than the TPB assumes (13). For example, results of the study by Bruijn et al., showed that intention was a non-significant predictor in the high habit group, but was a significant predictor of behavior in the low and medium habit groups (13). Also, the results of the study conducted by Fila

and Smith found no relationship between intention and healthy eating behavior in females and males (22). Therefore, it should be considered that intention is a potential behavior that can be converted to actual behavior and in this process, perceived barriers and limitations engaged in behavior should be removed and enabling factors should be provided (21).

#### 4.1. Conclusion

Based on the results of the current study, to have the rural and Baluch females cook with healthy methods, it is necessary to focus on comprehensive and community based educational programs involving all members of society. Also, the prominent role of the subjective norms and PBC should not be ignored. Educational interventions to address such factors are necessary.

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#### Footnotes

**Authors' Contribution:** Study design: Rabea Aghatabay; data collection and analysis: Rabea Aghatabay; manuscript writing: Rabea Aghatabay.

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#### References

- Vidourek RA, King KA. Effectiveness of nutrition programs in increasing healthy eating behaviors among low income women. *Calif J Health Promot.* 2008;**6**(1):57-72.
- Blom Hoffman J, Kelleher C, Power TJ, Leff SS. Promoting healthy food consumption among young children, evaluation of a multi component nutrition education program. *J Sch Psychol.* 2004;**42**(1):45-60. doi: [10.1016/j.jsp.2003.08.004](https://doi.org/10.1016/j.jsp.2003.08.004).
- Pearson N, Biddle SJ, Gorely T. Family correlates of fruit and vegetable consumption in children and adolescents: a systematic review. *Public Health Nutr.* 2009;**12**(2):267-83. doi: [10.1017/S1368898008002589](https://doi.org/10.1017/S1368898008002589). [PubMed: [18559129](https://pubmed.ncbi.nlm.nih.gov/18559129/)].
- Hajikazemi E, Alizadeh M, Javadi F, Mahmoodi M. Evaluation of knowledge of women from home catering methods. *Iran J Nurs.* 2008;**14**(29).
- Godin G, Kok G. The theory of planned behavior: a review of its applications to health related behaviors. *Am J Health Promot.* 1996;**11**(2):87-98. [PubMed: [10163601](https://pubmed.ncbi.nlm.nih.gov/10163601/)].
- Saber F, Shahnazi H, Sharifirad G. Evaluation of constructs of theory of planned behavior about physical activity of student of Nain University. *J Health Sys Res.* 2012;**9**(9):1014-21.
- Dehdari T, Manafi F, Saki A. Prediction of milk consumption among Iranian pregnant women: application of the theory of planned behavior. *Iran Red Crescent Med J.* 2013;**15**(5):440-1. doi: [10.5812/ircmj.1912](https://doi.org/10.5812/ircmj.1912). [PubMed: [24349736](https://pubmed.ncbi.nlm.nih.gov/24349736/)].
- Hardeman W, Johnston M, Johnston D, Bonetti D, Wareham N, Kinmonth AL. Application of the theory of planned behaviour in behaviour change interventions, a systematic review. *Psychol Health.* 2002;**17**(2):123-58. doi: [10.1080/088704402900136444](https://doi.org/10.1080/088704402900136444).
- Tabibi Z, Hashemian S. Social cognitive determinants of illegal speedy driving behavior applying the theory of planned behavior. *Psychosoc Res.* 2012;**3**(10):61-80.
- Shakerinejad G, Heidarnia A, Motlagh M, Karami K, Niknami S, Montazeri A. Improving continuity of consumption of pills to prevent pregnancy application of theory of planned behavior. *Payesh.* 2012;**12**(4):375.
- Barati M, Allahverdipoor H, Moini B, Farhadinasab A, Mahjoob H. Effectiveness of education based on theory of planned behavior in preventing MDMA abuse in collage students. *Med J Tabriz Med Sci Univ.* 2010;**33**(3):20-9.
- De Bruijn GJ. Understanding college students fruit consumption. Integrating habit strength in the theory of planned behaviour. *Appetite.* 2010;**54**(1):16-22. doi: [10.1016/j.appet.2009.08.007](https://doi.org/10.1016/j.appet.2009.08.007). [PubMed: [19712718](https://pubmed.ncbi.nlm.nih.gov/19712718/)].
- De Bruijn GJ, Kremers SPJ, De Vet E, De Nooijer J, Van Mechelen W, Brug J. Does habit strength moderate the intention behaviour relationship in the theory of planned behaviour? the case of fruit consumption. *Psychol Health.* 2007;**22**(8):899-916. doi: [10.1080/14768320601176113](https://doi.org/10.1080/14768320601176113).
- Lien N, Lytle LA, Komro KA. Applying theory of planned behavior to fruit and vegetable consumption of young adolescents. *Am J Health Promot.* 2002;**16**(4):189-97. [PubMed: [11913324](https://pubmed.ncbi.nlm.nih.gov/11913324/)].
- Yarmohammadi P, Sharifirad G, Azadbakht L, Sharifabad MM, Hasan-zadeh A. Evaluation of predictors of Esfahan high school students behavior about fast food intake using the theory of planned behavior; (in Persian). *Health Sys Res.* 2011;**7**(4):135-54.
- Yarmohammadi P, Sharifirad G, Azadbakht L, Pirzade A, Yarmohammadi P. Evaluation of predictors of fruits and vegetables consumption in high school students of esfahan applying the theory of planned behavior. *Health Sys Res.* 2012;**1392**:1595-604.
- Yulianti FS, Syahlani SP, Haryadi FT. The application of planned behavior theory to predict the consumption of processed body shaping milk. *Media Peternakan.* 2012;**35**(2):140-4. doi: [10.5398/med-pet.2012.35.2.140](https://doi.org/10.5398/med-pet.2012.35.2.140).
- Aghatabay R, Zareban I, Shahrakipoor M, Montazerifar F. Application of planned behaviour theory to predict salt consumption in the rural women of chabahar. *Health Educ Health Promot.* 2015;**23**:3-15.
- Adams J, Goffe L, Adamson AJ, Halligan J, O'Brien N, Purves R, et al. Prevalence and socio-demographic correlates of cooking skills in UK adults: cross-sectional analysis of data from the UK National Diet and Nutrition Survey. *Int J Behav Nutr Phys Act.* 2015;**12**:99. doi: [10.1186/s12966-015-0261-x](https://doi.org/10.1186/s12966-015-0261-x). [PubMed: [26242297](https://pubmed.ncbi.nlm.nih.gov/26242297/)].
- Yekaninejad M, Akaberi A, Hajiagha AP. Factors associated with physical activity in adolescents in Qazvin an application of the theory of planned behavior. *J N Khorasan Univ Med Sci.* 2012;**4**(3):457. doi: [10.18869/acadpub.jnkums.4.3.449](https://doi.org/10.18869/acadpub.jnkums.4.3.449).
- Dehdari T, Kharghanimoghaddam M, Mansuri T, Saki E. Evaluation of daily consumption of fruit in campus students and predictors of this based on constructs of theory of planned behavior. *Razi J Med Sci.* 2013;**20**(106):10-9.
- Fila SA, Smith C. Applying the Theory of Planned Behavior to healthy eating behaviors in urban Native American youth. *Int J Behav Nutr Phys Act.* 2006;**3**:11. doi: [10.1186/1479-5868-3-11](https://doi.org/10.1186/1479-5868-3-11). [PubMed: [16734903](https://pubmed.ncbi.nlm.nih.gov/16734903/)].