

## Original Article

# Fish Consumption in a Sample of People in Bandar Abbas, Iran: Application of the Theory of Planned Behavior

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## Abstract

**Background:** This study aimed to apply the conceptual framework of the theory of planned behavior (TPB) to explain fish consumption in a sample of people who lived in Bandar Abbas, Iran. We investigated the role of three traditional constructs of TPB that included attitude, social norms, and perceived behavioral control in an effort to characterize the intention to consume fish as well as the behavioral trends that characterize fish consumption.

**Methods:** Data were derived from a cross-sectional sample of 321 subjects. Alpha coefficient correlation and linear regression analysis were applied to test the relationships between constructs. The predictors of fish consumption frequency were also evaluated.

**Results:** Multiple regression analysis revealed that attitude, subjective norms, and perceived behavioral control significantly predicted intention to eat fish ( $R^2 = 0.54$ ,  $F = 128.4$ ,  $P < 0.001$ ). Multiple regression analysis for the intention to eat fish and perceived behavioral control revealed that both factors significantly predicted fish consumption frequency ( $R^2 = 0.58$ ,  $F = 223.1$ ,  $P < 0.001$ ).

**Conclusion:** The results indicated that the models fit well with the data. Attitude, subjective norms, and perceived behavioral control all had significant positive impacts on behavioral intention. Moreover, both intention and perceived behavioral control could be used to predict the frequency of fish consumption.

**Keywords:** Fish consumption, Iran, prediction, theory of planned behavior

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## Introduction

Aside from the fact that regular consumption of fish is an important part of a healthy diet,<sup>1</sup> the actual rate of fish consumption in Iran is still far below that recommended by food and nutrition authorities (eating at least two servings of fish per week). However, the low frequency of fish consumption in our country could be due to different barriers. It has been argued that certain barriers such as lack of stability in supply, variation in quality, and insufficient fish product development to meet consumer needs could prevent consumers from eating fish regularly.<sup>2</sup> Although there are no real data regarding the barriers to fish consumption in Iran, it seems that Iranian people may not be interested in consuming fish because of the negative perceived behavioral control due to difficulty in buying, preparing and cooking fish, in addition to the belief that it is expensive, and negative attitudes toward fish consumption, such as unpleasant fish properties that include the presence of bones and unpleasant odor.<sup>3</sup>

Studies that explain the factors influencing health behaviors have become a key area of research within health psychology. A major task for researchers in the domain of food psychology is to explain food consumption behavior. Among the many theories designed for such purposes, the theory of planned behavior (TPB)<sup>4</sup> has ob-

tained wide application in several domains of eating behavior, including the behavior of healthy food consumption.<sup>5-7</sup>

Constructs of the TPB include attitude, subjective norms, and perceived behavioral control (PBC). A person's attitude towards a specific behavior is the result of their beliefs about the consequences of that behavior. Subjective norms measure an individual's belief about what significant others want them to do and the motivation to comply with those recommendations. PBC is the individual's beliefs about the amount of control they have to successfully complete the behavior. Intention can be predicted from the three main psychosocial factors (attitude, subject norms, and PBC) related to that behavior. In addition, PBC is assumed to influence behavior directly.<sup>4</sup>

Many studies have determined the predictive power of the TPB in connection to many health behaviors.<sup>8-10</sup> A meta-analysis study found that attitudes and subjective norms could explain 33% – 50% of the variance,<sup>11</sup> whereas added perceived behavioral control showed a further improvement of 5% – 12% of final variance.<sup>11</sup>

Previous studies indicated that all TPB constructs including favorable attitude, high subjective norms and high PBC had a positive impact on the decision to consume fish.<sup>6,12</sup> Furthermore, these studies have revealed that both intention and perceived behavioral control could influence the frequency of fish consumption. Earlier studies had shown that residence on an island is a significant predictor of fish consumption, indicating that fish consumption frequency of once a week or more is higher among those who reside in coastal regions.<sup>2,13</sup> Therefore, it would be more likely for people living in a coastal region of Iran such as Bandar Abbas to enjoy greater accessibility to fish (at lower prices) and to have a more positive attitude toward fish consumption. However, to the best of our knowledge there are no data regarding fish consumption and

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**Table 1.** Sample demographics

Variables	N	%
<b>Sex</b>		
Male	119	37.1
Female	202	62.9
<b>Education</b>		
Illiterate	61	19.0
Primary	76	23.7
Secondary	76	23.7
High school	83	25.8
University	25	7.8
<b>Fish consumption frequency</b>		
Daily	0	0
Several times per week	14	4.4
Weekly	165	51.4
Several times per month	77	24.0
Monthly	38	11.8
Less than monthly	21	6.5
Never	6	1.9

**Table 2.** Correlation between TPB constructs and fish consumption frequency.

Constructs	Intention to eat fish	Fish consumption frequency
Attitude	0.62*	0.67*
Subjective norms	0.54*	0.67*
Behavioral control	0.58*	0.66*
Intention to eat fish	<b>1.00</b>	0.64*

\* Correlation is significant at a level of 0.01.

related factors in connection with this behavior in Bandar Abbas, Iran.

The aim of this study was to investigate behavior related to fish consumption in Bandar Abbas using the TPB as a conceptual framework. This study aimed to examine the influence of attitudes, subjective norms and PBC on intention and fish consumption frequency among this target population.

## Materials and Methods

This cross-sectional study was carried out in Bandar Abbas, a city in the south of Iran. Using a multi-stage sampling method, a random sample of 330 individuals was selected. First, 22 clusters were selected in different areas of the city and 15 samples (houses) were selected in each cluster. In each cluster, the interviewers referred to the first house and then referred to the sixth house, and so on. Thus, every other fifth house was recruited until 15 subjects were obtained from each of the clusters. In each house, one of the parents who were at home at the time of sampling was selected. If both parents were at home at the time of sampling, one was selected randomly. If no parent was at home or both of them were not willing to take part in the research, the interviewers proceeded to the next house. Face-to-face interviews were used to collect data.

In total, 330 subjects were recruited (15 subjects in each cluster). Among these subjects, nine questionnaires were filled out incompletely. The final sample size was 321 questionnaires (response rate: 97.2%).

### Measures

A self-administered questionnaire that included demographic characteristics and a questionnaire based on TPB constructs were developed for this study. Demographic characteristics included age, gender and level of education. The questionnaire was designed to measure TPB (attitude, subjective norms, perceived behavioral control, intention and fish consumption frequency) con-

structs. Questionnaire items were developed based on a review of the related literature.<sup>12</sup> In addition, 15 individuals were interviewed to elicit their perspectives concerning fish consumption. The findings from these interviews, as well as those from related literature, were used to develop items for the questionnaire. Items were measured on a Likert scale that ranged from 1 (strongly disagree) to 5 (strongly agree). To avoid halo effects, some statements related to the TPB were reverse-scaled.

A pilot study was performed on ten individuals who met the inclusion criteria for the study to establish content validity vis-à-vis the intended target population. The subjects who took part in the pilot study were asked to respond to questions about the relevancy, simplicity and clarity of each item. Finally, a few items were re-phrased to enhance the clarity of understanding. In addition, the questionnaire was reviewed by ten health education and nutrition specialists who were experienced in research regarding health behavior. Their considerations were then applied to the questionnaire. To test reliability, internal consistency was assessed using Cronbach's alpha coefficient. An alpha equal to or greater than 0.70 was considered satisfactory.

#### Attitude toward frequency of fish consumption

The final questionnaire format included nine items that measured attitude toward the frequency of fish consumption. For example, 'Eating fish is nutritious.' The scale scores ranged from 9 to 45. Cronbach's alpha for attitude scale items was 0.77.

#### Subjective norms

Ten items were used to measure subjective norms. An example of such an item is, "My family thinks that I should eat/buy fish." The scale scores ranged from 10 to 50, while Cronbach's alpha for the subjective norms scale was 0.87.

#### Perceived behavioral control

Twelve items were used to measure perceived behavioral control. For instance, one such item was, "Fish is difficult to prepare". The

**Table 3.** Linear regression of intentions and TPB constructs, as well as fish consumption frequency and TPB constructs.

Variables	R <sup>2</sup>	B	SE	Beta	P
<b>Intention</b>	<b>0.54</b>				
Constant		-1.23	0.81		0.13
Attitude		0.20	0.02	0.42	0.000*
Subjective norms		0.06	0.02	0.12	0.01*
Behavioral control		0.08	0.02	0.28	0.000*
<b>Fish consumption frequency</b>	<b>0.65</b>				
Constant		-2.55	0.31		0.000*
Attitude		0.04	0.01	0.17	0.000*
Subjective norms		0.05	0.01	0.29	0.000*
Behavioral control		0.02	0.007	0.13	0.008*
Intention		0.15	0.02	0.34	0.000*
<b>Fish consumption frequency</b>	<b>0.58</b>				
Constant		-0.79	0.24		0.002*
Intention		0.21	0.02	0.49	0.000*
Behavioral control		0.05	0.006	0.34	0.000*

\*significant

**Table 4.** Comparison of TPB constructs among males and females as related to fish consumption\*.

Sub-scales	Score range	Male (n=119) Mean (SD)	Female (n=202) Mean (SD)	t	P
Attitude	9–45	37.2 (5.4)	37.1 (4.1)	0.27	0.78
Subjective norms	10–50	45.1 (5.5)	45.4 (5.4)	-0.48	0.62
Behavioral control	12–60	45.4 (7.6)	48.2 (7.8)	3.21	0.001**
Intention	3–15	13.0 (2.5)	13.2 (2.3)	-0.89	0.37

\*Independent t-test; \*\*Significant.

scale scores ranged from 12 to 60; Cronbach's alpha of perceived behavioral control was 0.82.

#### Intention

Three items were used to measure intention. As an example, one such item was, "I am planning to eat fish in the next 2 weeks". The scale scores ranged from 3 to 15. The highest score indicated the best condition. Cronbach's alpha for these intention items was 0.88.

#### Behavior

Behavior was measured as a self-reported construct. One item was used to measure behavior: 'How frequently do you eat fish?'. This item was measured on a Likert scale that ranged from 1 (never) to 7 (daily).

Data were collected through self-administrated questionnaires. Following clear instructions and the explanation of the aim of the study, the questionnaires were given to the subjects, who were assured about the confidentiality of the data. This research was reviewed by Hormozgan University of Medical Sciences and no Institutional Review Board Approval (IRB) was necessary.

#### Data analysis

Data were analyzed using SPSS 17;  $P < 0.05$  was pre-set as the point of statistical significance. All reverse-scaled statements of the questionnaire were recorded in the same direction. Hence, in TPB constructs, a high score meant a positive attitude, high subjective norms, high degree of perceived behavioral control, and stronger intention to eat fish. Multiple regression analyses were used to predict TPB constructs (attitude, subjective norms and perceived behavioral control) for intention and fish consumption frequency. In this study data analysis were performed without including cluster effects.

## Results

The subjects' mean age was 43.7 years (SD = 14.1); the majority were female (62.9%), and 7.8% were university educated. Of all subjects, 55.8% reported that they ate fish at least once a week (Table 1). Attitude, subjective norms, and perceived behavioral control each had a positive significant correlation with intention to eat fish and fish consumption frequency. Intention to eat fish had a positive significant correlation with fish consumption frequency (Table 2).

Multiple regression analyses revealed that attitude, subjective norms and perceived behavioral control significantly predicted intention to eat fish ( $R^2 = 0.54$ ,  $F = 128.4$ ,  $P < 0.001$ ). Multiple regression analyses revealed that all of the TPB constructs that included attitude, subjective norms, perceived behavioral control, and intention to eat fish significantly predicted fish consumption frequency ( $R^2 = 0.65$ ,  $F = 150.1$ ,  $P < 0.001$ ). The contribution of intention to the prediction of fish consumption frequency was greater than the contribution of attitude, subjective norms and perceived behavioral control (Table 3).

Multiple regression analysis with intention to eat fish and perceived behavioral control revealed that both factors significantly predicted fish consumption frequency ( $R^2 = 0.58$ ,  $F = 223.1$ ,  $P < 0.001$ ). The contribution of intention to the prediction of fish consumption frequency was greater than the contribution of perceived behavioral control (Table 3).

## Discussion

This study used the theory of planned behavior<sup>4</sup> to explain intention to consume fish in a random sample of Iranian people who lived in Bandar Abbas. The theory of planned behavior provided a suitable framework for identifying the factors that influenced fish consumption behavior. The study showed that the subjects



who had more positive attitudes were more likely to intend to eat fish. Furthermore, intention to eat fish itself had a positive significant correlation with fish consumption frequency. This result was in line with that of a previous study conducted in Vietnam that revealed the attitude of the consumers to be the most important predictor of intention to consume fish.<sup>6</sup> This study indicated that subjects who perceived more subjective norms had a higher intention to eat fish as well as to report the frequency of their fish consumption. Consistent with this result, the previous study<sup>6</sup> also suggested that greater social pressure from peers, friends and family members resulted in a stronger intention to eat fish. However, the finding of our study has contrasted other studies that revealed social norms could not predict intention.<sup>14,15</sup> One reason for this inconsistency might be that in the present study we have applied a measure which strictly includes items related to family desires and expectations to measure the effect of social norms on intention to consume fish in Iran. In Iran, housewives are generally responsible for preparing meals for the entire family. There is also a tradition in most Iranian households regarding having three shared meals daily. Therefore, family members are encouraged to eat what the 'housewife' makes. This situation encourages the housewife to listen to the attitudes of her family members. This represents an application of the expectance-value approach that has been highlighted in a previous study.<sup>16</sup> However, in our study, personal feeling and moral obligation to accept the advice to consume fish were not assessed. In the present study, external social norms including government and food industry advertisements<sup>12</sup> were not measured. Therefore, in this study social pressure was measured strictly through items that examined the preferences of significant people such as close family members, friends and peers. Generally in Iran, and especially in small cities such as Bandar Abbas, aspects of the external environment such as government, food industry, and advertising are much less prominent in consumers' decisions regarding fish consumption. The people are reluctant to comply with the opinions expressed in industry advertising. Instead, it is argued that the consumers comply much more easily with referents of the internal social norm including their friends, peers, neighbors and religious leaders. This is related to the respect for social communication. Furthermore, Iranian consumers have a strong willingness to comply with the recommendations of experts like health professionals, doctors and nutritionists; hence, these referents could possibly exert social pressure.

According to the results of this study, the subjects who perceived more behavioral control had a higher intention to eat fish and also to report fish consumption frequency. This result is supported by a previous study in which perceived behavioral control had a significant positive impact on fish consumption frequency.<sup>12</sup> In our study, the high positive correlation between intention to eat fish and fish consumption frequency revealed that there were few participants with a high intention to eat fish and low actual fish consumption. However, aside from the effect of intention, perceived behavioral control has an additional positive effect on the frequency of fish consumption. As to our experience in Bandar Abbas as a coastal region, factors such as fish availability at a lower price, past experience of fish eating and food habits related to fish consumption contribute strongly to the decision to buy, prepare and eat fish. Of course, this impact does not hold for attitude and subjective norms, the effects of which are only mediated by behavioral control, as mentioned in the theory.

Despite the advantages of using the TPB framework in a Middle

Eastern country for the first time, there are a few limitations of this study. One of these limitations was that, in our study, no data were collected regarding the food habits of people residing in Bandar Abbas, although a previous study<sup>12</sup> has indicated that fish consumption is strongly habituated. Therefore, more extensive research will require qualitative studies considering the role of habit in decision-making regarding fish consumption. Thus, the data regarding fish consumption frequency that has been obtained in the present study may be biased. As reported by previous studies, socio-demographic characteristics such as gender, age, region, income and presence of children in the home could contribute to the explanation of fish consumption decisions.<sup>2,12,13</sup> We have not examined the impact of gender on fish consumption. However, more researches to assess all variables influencing fish consumption are guaranteed.

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