

# Elementary school teachers' behavioral intentions for healthy nutrition

Healthy  
nutrition

## Extending theory of planned behavior

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Huseyin Ates

*Ahi Evran Universitesi, Kirsehir, Turkey*

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### Abstract

**Purpose** – The purpose of this paper is to examine the effects of elementary school teachers' psychological factors on their behavioral intentions for healthy nutrition in their daily life within an extended version of the theory of planned behavior (TPB).

**Design/methodology/approach** – The design of the study is correlation study.

**Findings** – Constructs in the proposal model formed accounted for of variance of intentions and behaviors successfully. Considering the entire proposed model, while personal norm is the most influential factor on intention, self-identity is the most consistent effects on teachers' behavior. However, among the constructs of TPB, perceived behavioral control is the strongest influence on both intention and behavior.

**Originality/value** – In the literature, factors affecting healthy behaviors by using TPB focused on mainly children (8–10 year old) and adolescents (11–16 year old) all over the world. However, in some countries, several studies were conducted on adults (e.g. Astrøm and Rise, 2001; Brouwer and Mosack, 2015), to the best of our knowledge, while there is no study conducted on adults including teachers in Turkey. In addition, recently, two meta-analysis studies were published: Riebl *et al.* (2015) and Mcdermott *et al.* (2015). These studies suggested that future studies related to healthy nutrition in the scope of TPB should be continued to investigate.

**Keywords** Personal health, Nutrition, Obesity

**Paper type** Research paper

### Introduction

Overweight and obesity are always on the agenda of the world. For example, World Health Organization (2016) obtains data all over the world every year. According to data of World Health Organization (2016), 39 percent of women and 39 percent of men aged 18 and over were overweight. Similarly, in United Nations (UN) Summit hold in September 2015, 17 Sustainable Development Goals of the 2030 Agenda for sustainable development came into force (United Nations General Assembly, 2015). One of these goals is to ensure healthy lives and promote well-being for all at all ages some facts were explained related to healthy nutrition behaviors. According to these data:

- worldwide obesity has nearly tripled since 1975;
- in 2016, more than 1.9bn adults, 18 years and older, were overweight; of these over 650m were obese;
- most of the world's population lives in countries where overweight and obesity kills more people than underweight;
- 41 million children under the age of 5 were overweight or obese in 2016; and
- over 340m children and adolescents aged 5–19 were overweight or obese in 2016.

Additionally, some research reports also suggest that obesity may persist into adulthood stage and raise the risk of chronic illness including cardiovascular diseases, heart disease, increased blood pressure, type 2 diabetes, osteoporosis, the formation of many cancer types,



allergic diseases and dental caries, thus, this situation makes it a major public health concern (Smith and Rinderknecht, 2003; US Department of Health and Human Services, 2010). People, globally, consume less than the recommended amount of vegetables, fruits, low-fat milk products and whole grains (USDA, 2010). According to the data from the National Health and Nutrition Examination Survey (2013), adults consumed, on average, 11.3 percent of their total daily calories from fast food. Considering evaluation in terms of Turkey, according to the data of the European Statistics Institute (Eurostat), the population of Turkey is close to 80m and increase systematically (Eurostat, 2017) and among this population, 61 percent of men are overweight and 77 percent of women are overweight in Turkey (World Health Organization, 2016). Accordingly, due to the known relationship between obesity and dietary intake (Kumanyika *et al.*, 2002; McCrory *et al.*, 2002), providing healthy nutrition awareness in rising generations could gain favor in terms of decreasing the elevated prevalence of obesity (Fila and Smith, 2006). Before promoting healthy nutrition awareness, it is believed that firstly factors affecting behaviors should be determined. To achieve this, in this study, these factors are explained by testing TPB.

### Theoretical framework

Although it is difficult that every aspect of human behavior is clarified (Ajzen, 1991), concepts related to behavioral dispositions (e.g. attitude, behavioral intention, self-regulation, trait) can predict human behavior (Ajzen, 1988; Ajzen, 1991).

Predicting wide range of specific behaviors is explained with Ajzen and Madden (1986) theory of planned behavior (TPB) which is extension of Ajzen and Fishbein's (1980) original theory of reasoned action (TRA). TPB is one of the most popular social psychological models to understand and predict human behavior today (Ajzen, 2014). In this theory, the most important factor is individual's intention to perform applied behavior (Ajzen, 2002). It is presumed that intentions represent motivational factors influenced a behavior. Regarding the display of behavior, it is important that how much of an effort planned to exert and how hard individuals willed to try and, additionally, there is positive correlation between intention to take up with a behavior and performance (Ajzen, 1991). However, when volitional control was completed on behavior by individual, intentions completely predict behavior (Ajzen and Madden, 1986). While there are originally two factors affected individual's intention (subjective norm (SN) and attitude toward the behavior) in TRA, one more concept called perceived behavioral control was added to TPB (Ajzen and Driver, 1992; Tonglet *et al.*, 2004). The TPB deals with not only explaining human behavior but also the attitudes, SN and perceived behavior control premises that determine intentions and behaviors in final analysis, in order to explain human behavior (Ajzen, 1991).

Attitude toward the behavior is that what degree an individual has an evaluation of the behavior in terms of favorable or unfavorable (Ajzen, 1991). Attitude, like personality traits, is a hypothetical structure that must be subtracted from measurable responses that direct observation cannot reach and considering nature of work, these responses should reflect positive or negative assessments of the attitude object (Ajzen, 2005). In SN, people are asked that the ideas of people who are important to him/her about behavior should be done or not by him/her (Ajzen and Fishbein, 1980). Perceived behavioral control is individuals' perception about how behavior is performed in terms of easiness and difficulty (Ajzen and Madden, 1986). Madden *et al.* (1992) stated that the perceived behavioral control of the individual on behavior may be higher when necessary resources and opportunities are available. Additionally, if the perceived behavioral control on the behavior is high, intention to perform individual's behavior also increases. Consequently, "the more favorable the attitude and subjective norm with respect to a behavior, and the greater the perceived behavioral control, the stronger should be an individual's intention to perform the behavior under consideration" (Ajzen, 1991).

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### *Proposed model of the study*

In present study, testing TPB in explaining antecedents of teachers' healthy nutrition behaviors by adding more variables including personal norms and self-identity was carried out. Although TPB explain human behaviors successfully, Ajzen (1991, p. 199) stated that this model is open, if additional variables predict intentions or behaviors with the following sentence:

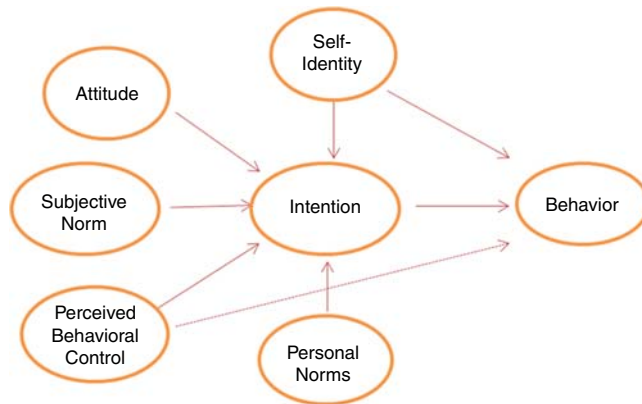
The theory of planned behaviour is, in principle, open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behaviour after the theory's current variables have been taken into account.

Accordingly, in the study, two additional variables were added to constructs of TPB. Self-identity is one of these additional constructs in this proposed model. Sherwood (1965) defined self-identity as "a person's perception of himself" (p. 66). In fact, self-identity concept appeared with social identity theory (SIT) (Stryker and Harris, 1986; Tajfel and Turner, 1986) and reflects how much he or she views themselves at the extent to which one meets the criteria for a particular social role (Conner and Armitage, 1998). SIT suggests that identities and behaviors are accompanied by a stronger perceived harmony between identity and particular behavior, associated with a stronger intent to act this behavior and at the same time making behavioral performance more likely (Kendzierski and Porter, 1990). The unique contribution of this research is to integrate inter-group perceptions, a key element of the SIT, into the TPB model. In order to contribute prediction of behavioral intentions, self-identity works differently apart from attitudes and showed in the study of Biddle *et al.* (1987) and Charng *et al.* (1988). Evidence of the influence of self-identity on behavior which is independent of behavioral intentions is provided by Granberg and Holmberg (1990). Many studies also proved that if self-identity is combined with TPB, it would be more powerful predictor (Fielding *et al.*, 2008; Robinson and Smith' 2002). Another component is personal norm. In norm-activation theory, Schwartz (1977) defines personal norms as their own expectation based on internalized values. Personal norms reflect commitment to internalized values and experience a sense of personal obligation to enter a certain behavior (Schwartz, 1977). When behavior is activated, personal norms affect it (Harland *et al.*, 1999). Activation occurs when someone is aware of the consequences of behaving for someone else's well-being and someone has at least some responsibility for these outcomes (Harland *et al.*, 1999). When these conditions are met, it is assumed that personal norms are put into action and lead to a sense of personal obligation to guide behavior (Schwartz and Howard, 1984). However, when the literature is reviewed, it is seen that relationship between personal norm and human behavior occurs indirectly. Because, before the behavioral intentions are formulated, the personal liability feeling that arises from norm activation can be neutralized (Harland *et al.*, 1999).

According the current proposed structural model (Figure 1):

- attitude, SN, perceived behavioral control and personal norms influence their healthy nutrition behaviors indirectly through their intentions; and
- their self-identities influence their behaviors directly and influences indirectly through intentions.

With this study, since the topic of healthy nutrition is global and the subject of healthy nutrition is taught in the lesson of science, mathematics, life science, physical education and Turkish language in Turkey, it is believed that this study can be useful to reveal situation of these teachers' self-reported expressions related to healthy nutrition. Accordingly, the study was conducted with teachers who taught this subject in their lessons. Before teaching this subject to students, first determining situation of



**Figure 1.**  
Proposed structural  
model

teachers could be better since because of a belief that quality of education is proportional to the quality of teachers (Şişman, 2017). The teaching profession is not only a job but also a respected place in society in Turkey, as well as setting students an example. Therefore, in order to be a good teacher, it is necessary to have some competencies required by this profession (Ercan, 2000).

#### *Healthy nutrition in curriculums in Turkey*

In curriculums published in 2018 in Turkey, concepts about healthy nutrition in the lessons of science, mathematics, life science, physical education and Turkish language are involved. According to objectives of educational programs in Turkey, all studies carried out through education and training programs aim at achieving the some objectives in a complementary manner at different education levels. In one of these objectives, it is aimed to support the healthy development of physical, mental and emotional areas by considering the individual development processes of the students. Especially, science curriculum, among them, place great importance to this topic (Ministry of National Education, 2018a). In all the grade level between 3rd and 8th, this topic is emphasized. However, a limited number of examples are presented in section. For example, while in the unit of “Journey to the World of all living creatures” in 3rd grade, gaining awareness of healthy living is aimed, in the unit of “Our foods” in 4rd grade, it is aimed to create awareness about the nutritional varieties, healthy and balanced nutrition, the harms of smoking and alcohol use and the benefits of healthy nutrition. In addition, in this unit:

- (1) students discuss the importance of freshness and naturalness of foods for a healthy life based on research data: concepts such as frozen foods, packaged foods, expiration date are emphasized;
- (2) the attention of the students is drawn to the issue of food cleansing;
- (3) students associate human health with balanced nutrition;
- (4) the relationship between obesity and nutrition habits is emphasized;
- (5) attention is paid to avoiding food waste;
- (6) students take responsibility for reducing smoking in its immediate vicinity; and
- (7) it is expected that people around students will be warned that smoking is harmful to health.

In 5th grade, in the unit of “Relation between Human and Nature,” negative effects of environmental pollution on human health are mentioned. In the 6th grade, the unit of “Health of Systems” aimed that:

- (1) the harms of unconscious drug use are highlighted;
- (2) the effects of harmful habits such as alcohol and cigarettes on human health are mentioned; and
- (3) the green crescent emphasis is made in the fight against alcohol and cigarettes.

In the lesson of mathematics, healthy nutrition and obesity are also involved in the lesson objectives (Ministry of National Education, 2018b). During the implementation of Turkish Language Teaching Program, eight themes are planned for each class level. “Health and Sports” is one of these themes (Ministry of National Education, 2018c). Additionally, in 1st, 2nd and 3rd grade level in elementary schools in Turkey, to enable students to gain a healthy lifestyle within the framework of the Life Science Course Curriculum, which aims to provide basic knowledge, skills and values in the axis of individual, society and nature is aimed by “classroom teacher” (Ministry of National Education, 2018d). Life Science Course Curriculum has a number of basic life skills including “Health Protection”. In the 1st grade, students recognize the precautions to be taken to protect the health, in the 2nd grade; students realize the effects of the consumption of fruits and vegetables suitable for the season on human health. In the 3rd grade, the need for a balanced diet is emphasized for healthy growth. It also draws attention to health problems, such as obesity, diabetes, celiac and food allergy. Lastly, in the lesson of physical education, teachers consider some subjects. For example, it is aimed that they give an active and healthy life habit to students. In the subject area of “Active and Healthy Life,” the importance of healthy nutrition is emphasized (Ministry of National Education, 2018e). From this point of view mentioned in terms of curriculums, in this study teachers are our focus point.

In the literature, factors affecting healthy behaviors by using TPB focused on mainly children (8–10 year old) and adolescents (11–16 year old) all over the world (e.g. Backman *et al.*, 2002; Bazillier *et al.*, 2011; Chan and Tsang, 2011; Dennison and Shepherd, 1995; Diaz *et al.*, 2009; Fila and Smith, 2006; Grønhøj *et al.*, 2013; Hewitt and Stephens, 2007). However, in some countries, several studies were conducted on adults (e.g. Astøsm and Rise, 2001; Brouwer and Mosack, 2015), to the best of our knowledge, while there is no study conducted on adults including teachers in Turkey. In addition, recently, two meta-analysis studies were published: Riebl *et al.* (2015) and McDermott *et al.* (2015). These studies suggested that future studies related to healthy nutrition in the scope of TPB should be continued to investigate. Accordingly, from this point of view, it is believed that this study makes great contributions to the literature.

#### *Purpose and research questions*

The purpose of the study is to determine factors affecting healthy nutrition behaviors of teachers who are from different departments in different faculties and compare their situations using the extended TPB. Four research questions are examined to obtain findings for the purpose of study:

- RQ1. What are descriptive findings obtained from constructs of structured model?
- RQ2. In what ways are teachers’ attitudes toward healthy nutrition, SNs, perceived behavioral control, self-identity and personal norms are related to their behavioral intentions for healthy nutrition?

- RQ3. In what ways are teachers' perceived behavioral controls, behavioral intentions for healthy nutrition and self-identities are related to their healthy nutrition behavior?
- RQ4. Is there any significance difference with regards to gender, department, and residential area?

## Method

### *Design of the study*

Design of the study is correlation study which is among quantitative research methods. The correlation study is applied to variables without any intervention to reveal the relationship between at least two variables (Tabachnick and Fidell, 2007). In this study, since factors affecting healthy nutrition behaviors of teachers are examined in the framework of TPB, it is necessary to use correlation study.

### *Sample and procedures*

The sample of the study was determined with convenience sampling method. During determining sample, teachers in Kırşehir (a city) in Turkey was tried to select due to some limitations such as travel, economy and time. The study was conducted in Kırşehir with a population of 234.529 people according to address-based population registration system conducted census by Turkish Statistical Institute (2017). A total of 279 teachers (182 females and 97 male, mean age: 35.4) who are from five different departments including science teacher, physical education teacher, mathematics teacher, classroom teacher and Turkish language teacher involving 22–60 year old were involved in the study. Teachers' average Body Mass Index (BMI) provided by the Centers for Disease Control and Prevention (2011) (equation = weight (kg)/height<sup>2</sup> (m)) was 24.60, SD = 4.62) with males having a slightly higher average BMI (25.96, SD = 4.96) than females (22.04, SD = 4.24).

Each individual was asked to report their gender, BMI, department and residential area they live. More detail information related to demographic profile of sample is given in Table I.

Demographic profile	Number	%
<i>Gender</i>		
Male	97	65
Female	182	35
<i>Department</i>		
Classroom teacher	62	22.22
Science education teacher	55	19.71
Physical education teacher	38	13.62
Mathematics teacher	60	21.51
Turkish language teacher	64	22.94
<i>Residential area</i>		
Urban	200	71.68
Rural	79	28.31
Total	279	100
<i>Body mass index (M = 24.60)</i>		
Male	25.96	
Female	22.04	

**Table I.**  
Demographic profile  
of sample

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### *Data collection tools*

The questionnaire items related to constructs of TPB (attitude, SN, perceived behavioral control and intention) were based on studies of Ajzen and Fishbein (1980), Ajzen (2002) who provided the sample questions, used and modified as appropriate. Besides, to extend the TPB, some variables were added from related literature and previous applications of the theory (e.g. Bamberg *et al.*, 2003; Bilim, 2015; Sparks and Shepherd, 1992; Stern, 2000).

### *Demographic questionnaire*

Several questions were prepared to obtain information teachers' background to learn characteristics of them deeply. Consequently, gender, age, department and area of hometown, were obtained by using this questionnaire. Cronbach's  $\alpha$  value for whole questionnaire is 0.93.

### *Constructs of theory of planned behavior (TPB)*

*Attitudes.* There are 12 items measured attitudes toward healthy behavior in the five-point Likert type scale ranging from 1 to 5. Sample items include "For me, healthy eating is good/bad; useful/harmful; cheap/expensive." Cronbach's  $\alpha = 0.86$ .

*Subjective norm.* SN scale consisting of four items ranging from 1 = absolutely disagree, 5 = strongly agree was adapted in accordance with the purpose of this study. Sample items include "Most people that are important to me think that I should eat healthy foods." Cronbach's  $\alpha = 0.91$

*Perceived behavioral control.* Perceived behavioral control scale consisting of eight items ranging from 1 = absolutely disagree, 5 = strongly agree was adapted in accordance with the purpose of this study. Sample items include "If I want, I can easily eat healthy foods." Cronbach's  $\alpha = 0.72$ ."

*Behavior.* This scale consisting of 1 items (1 = never, 5 = always) in the five-point Likert scale was adapted in accordance with the purpose of this study. Sample items include "How often do you eat healthy?"

*Intention.* Intention scale developed by Ajzen (2002) and Bilim (2015) consisting of nine items (1 = strongly disagree, 5 = strongly agree) in the five-point Likert scale was adapted in accordance with the purpose of this study. Sample items include "I will try to eat healthy foods for the next 2 weeks on a regular basis." Cronbach's  $\alpha = 0.93$ .

### *Additional variables*

*Personal norms.* Personal norm scale consisting of four items ranging from 1 = absolutely disagree, 5 = strongly agree was adapted in accordance with the purpose of this study. Sample items include "I feel guilty if I do not eat healthy foods." Cronbach's  $\alpha = 0.84$ .

*Self-Identity.* This scale consisting of three items ranging from 1 = absolutely disagree, 5 = strongly agree was adapted in accordance with the purpose of this study. Sample items include "I think of myself as someone who is eating healthy." Cronbach's  $\alpha = 0.92$ .

### *Data collection*

The data were collected in 2017–2018 fall semester. Before starting to collect data, the necessary permissions from the authorities to conduct the research and the ethical permission from Ethical Committee were obtained. Before the administration of the questionnaires, all participants were given and signed a consent form confirming that they volunteer to participate this study. All the questionnaires were administered by the author to be sure about consistency of procedure of data collection. In order to avoid confusion, health foods (e.g. fruit and vegetables) and un-healthy foods (e.g. fried

chicken, hamburgers, sweets, coke, pizza, fish and chips) are defined before they started to read items. The questionnaires took around 30 min to complete and all the applications were completed at elementary schools.

*Data analysis*

In order to provide aims of the study, five data analysis method was used: descriptive analysis, Pearson moment correlation, one-way MANOVA, two-way MANOVA and multiple regression analysis. Some assumptions including normality, linearity, homoscedasticity, independence of residuals, sample size, multicollinearity and singularity, outliers (Pallant, 2007) were set and the preliminary analyses revealed that there is no violation of assumptions. Among them, even if all the steps about setting assumptions are not involved here, sample size is checked with two different ways. Since at least 105 subjects are needed per seven predictors for a reliable equation (Stevens, 1996) and the formula for calculating sample size requirements is provided successfully ( $279 > 50 + 8m$  (where  $m =$  number of independent variables  $= 7$ )) (Tabachnick and Fidell, 2007), it can be said that this assumption is set successfully. In addition, there are some threats to internal validity in correlational research works such as testing, instrumentation, location, mortality and subject characteristics (Fraenkel *et al.*, 2012). These threats were prevented or minimized their effects by standardizing the conditions that study is conducted. By performing exploratory factor analysis of questionnaires, construct validity was tried to provide with two steps: factor extraction and factor rotation (Green and Salkind, 2005). Results of the principal component analysis which is the most commonly used approach for factor extraction and factor rotation (Pallant, 2007) showed that since factor loadings are between 0.50 and 0.86, construct validity was provided (Nunnally, 1978).

**Findings**

The findings section consists of two parts. First, findings related to descriptive analysis were involved and then, findings related to testing TPB were involved.

*Descriptive statistics*

Some descriptive analyses were performed so as to provide preliminary insights into the nature of teachers' responses. Minimum, maximum, mean and standard deviation values are presented in Table II, which indicates the descriptive analyses of each construct examined in the scale. The mean score for these variables ranged from 3.00 for behavior to 4.34 for SN.

*Correlation between intention and behavior and TPB constructs*

Pearson moment correlation coefficient was calculated to see relationship between intention and behavior and TPB constructs. Results of the study showed that all of the TPB constructs and additional constructs including attitude, SN, perceived behavioral control,

**Table II.**  
Minimum, maximum, mean and standard deviation values for scales

Constructs	Min.	Max.	Mean	SD
Behavior	1.00	5.00	3.00	1.097
Self-identity	1.00	5.00	3.32	1.071
Personal norm	1.00	5.00	3.53	1.033
Intention	1.00	5.00	3.54	0.983
Perceived behavioral control	1.00	5.00	3.64	0.678
Attitude	1.00	5.00	3.97	0.738
Subjective norm	1.00	5.00	4.34	0.862



self-identity and personal norm are significantly and positively related to intention and behavior (Table III).

According to Table III, while there is a small correlation between behavior and SN, medium correlation between behavior and attitude, perceived behavioral control and intention was obtained and there are large correlation between behavior and self-identity and personal norm. Considering intention, there is a large correlation with self-identity and personal norm, while medium correlation was obtained in terms of behavior, attitude and perceived behavioral control and small correlation was obtained in terms of SN (Cohen, 1988).

*Differences in terms of departments, gender and residential area*

One-way MANOVA was used in order to test for differences in departments with respect to TPB constructs. Results of the analysis showed that statistically significant differences were found in teachers' mean scores in terms of departments (Wilks'  $l=0.69$ ,  $F(10, 256)=1.67$ ,  $p=0.001$ ). However, the eta squared statistic showed a small effect size ( $\eta^2=0.05$ ) (Cohen, 1988). These values indicate that 5 percent of the multivariate variances of the dependent variables were accounted for by departments. Considering descriptive results, it was showed that the highest mean value belongs to science teachers ( $M=4.19$ ), while the lowest mean values are involved in Turkish language teachers ( $M=3.39$ ). Means of TPB constructs with respect to departments are indicated in Table IV.

Two-way MANOVA was used in order to test for differences in gender and residential area with respect to TPB constructs. However, results of the analysis showed that there is no statistically significant differences in teachers' mean scores in terms of gender (Wilks'  $l=0.025$ ,  $F(1, 259)=1.105$ ,  $p=0.360$ ) and residential area (Wilks'  $l=0.015$ ,  $F(3, 259)=0.652$ ,  $p=0.881$ ).

	Behavior	Attitude	Subjective norm	Perceived behavioral control	Intention	Self-identity	Personal norm
Behavior	1	-	-	-	-	-	-
Attitude	0.475**	1	-	-	-	-	-
Subjective norm	0.123*	0.229**	1	-	-	-	-
Perceived behavioral control	0.466**	0.458**	0.139**	1	-	-	-
Intention	0.477**	0.469**	0.153**	0.456**	1	-	-
Self-identity	0.669**	0.517**	0.116*	0.506**	0.606**	1	-
Personal norm	0.501**	0.521**	0.178**	0.452**	0.646**	0.648**	1

Notes: \*,\*\*Correlation is significant at 0.05 and 0.01 levels (two-tailed), respectively

**Table III.**  
Bivariate correlations between intention and behavior and TPB constructs

Department/Variable	B	A	SN	PBC	I	SI	PN	Mean
Physical education teacher	2.92	3.84	4.36	3.41	3.25	3.13	3.53	3.49
Classroom teacher	3.06	3.96	3.95	3.88	3.54	3.35	3.52	3.61
Mathematics teacher	2.89	3.80	4.33	3.61	3.27	3.04	3.19	3.45
Turkish language teacher	2.60	3.84	4.16	3.41	3.24	3.13	3.36	3.39
Science teacher	3.71	4.56	4.59	4.31	4.01	4.06	4.07	4.19

Notes: B, behavior; A, attitude; SN, subjective norm; PBC, perceived behavioral control; I, intention; SI, self-identity; PN, personal norm

**Table IV.**  
Means of TPB constructs with respect to departments

*Factors affecting behavioral intentions for healthy nutrition*

A multiple regression analysis was conducted to evaluate how accurately teachers' attitudes toward healthy nutrition, SNs, perceived behavioral control, self-identity and personal norms are related to their healthy nutrition intentions. The preliminary analyses revealed that there is no violation of assumptions normality, linearity and homoscedasticity. The combination of the predictor variables was significantly related to the healthy nutrition intentions ( $F(3, 246) = 71.32, p < 0.0005$ ). The sample multiple correlation coefficient was 0.50, indicating that approximately 50 percent of the variance of the healthy nutrition intentions can be accounted for by the model which consist of attitudes toward healthy nutrition, SNs, perceived behavioral control, self-identity and personal norms (Table V).

Considering each variable, the multiple regression results suggested that while personal norm ( $\beta = 0.38, p = 0.000$ ), self-identity ( $\beta = 0.26, p = 0.000$ ) and perceived behavioral control ( $\beta = 0.11, p = 0.012$ ) significantly related to intention, attitude ( $\beta = 0.08, p = 0.089$ ) and SNs ( $\beta = 0.02, p = 0.584$ ) are no significantly related to healthy nutrition intention (Table VI).

*Factors influencing healthy nutrition behavior*

A multiple regression analysis was conducted to evaluate how accurately teachers' perceived behavioral control, healthy nutrition intentions and self-identities are related to their healthy nutrition behavior. The preliminary analyses revealed that there is no violation of assumptions normality, linearity and homoscedasticity. The combination of the predictor variables was significantly related to the healthy nutrition behavior ( $F(3, 246) = 112.92, p < 0.0005$ ). The sample multiple correlation coefficient was 0.47, indicating that approximately 47 percent of the variance of the healthy nutrition behavior can be accounted for by the model which consist of perceived behavioral control, healthy nutrition intentions and self-identities (Table VII).

**Table V.**  
Statistical results related to how much of the healthy nutrition intention is explained by the model

Model	df	F	p	R <sup>2</sup>
Regression	3	71.32	0.000	0.50
Residual	246			
Total	249			

**Table VI.**  
Variables which unique contribute to explaining the intentions

Model	$\beta$	p
Attitude	0.081	0.089
Subjective norm	0.021	0.584
Perceived behavioral	0.114	0.012
Control self-identity	0.256	0.000
Personal norm	0.383	0.000

**Table VII.**  
Statistical results related to how much of the healthy nutrition behavior is explained by the model

Model	df	F	p	R <sup>2</sup>
Regression	3	112.92	0.000	0.47
Residual	246			
Total	249			

Considering each variable, the multiple regression analysis results suggested that while self-identity ( $\beta=0.54, p=0.000$ ) and perceived behavioral control ( $\beta=0.16, p=0.001$ ) are significantly related to healthy nutrition behavior, intention ( $\beta=0.08, p=0.113$ ) is not significantly related to healthy nutrition behavior (Table VIII).

### Conclusion and discussion

The purpose of the study was to determine factors affecting behavioral intentions for healthy nutrition and healthy nutrition behaviors of teachers who live in Kırşehir (a city) in Turkey and compare their situations using the extended TPB. In addition to theory constructs, self-identity and personal norm were included to the model based on suggestions given by researchers.

Proposed model in the study explained the theory successfully because the TPB model accounted for 50 and 47 percent of the variance in intention and behavior, respectively. Personal norm, self-identity and perceived behavioral control had a positive impact on teachers' behavioral intentions for healthy nutrition, while self-identity and perceived behavioral control are significantly related to healthy nutrition behavior. Therefore, personal norm toward teachers' beliefs about healthy nutrition, the identity beliefs of healthy nutrition-oriented individuals and perceived ease of engaging in healthy nutrition toward healthy nutrition were the most important factors in predicting teachers' intentions toward healthy nutrition. If additional variables are excluded, in the present study, while perceived behavioral control and attitude are strongest antecedents of behavioral intentions for healthy nutrition; SN has less influence on them. These findings were supported by previous studies about healthy nutrition (e.g. Armitage and Conner, 1999; Astøsm and Rise, 2001; Dennison and Shepherd, 1995; Fila and Smith, 2006; Godin and Kok, 1996; Raats *et al.*, 1995). In addition, these results partly support previous research works in terms of the importance of perceived behavioral control (e.g. Bazillier *et al.*, 2011; Beaulieu and Godin, 2011; Chan and Tsang, 2011; Dennison and Shepherd, 1995; Fila and Smith, 2006; Grønhøj *et al.*, 2013; Kida and Åstrøm, 1998; Mullan *et al.*, 2013; Seo *et al.*, 2011; Sharifirad *et al.*, 2013). At the same time, perceived behavioral control is the most important factors affecting teachers' healthy nutrition behaviors. These results were also supported by several studies (e.g. Gummesson *et al.*, 1997; Lien *et al.*, 2002). This situation is also indicated in the TPB model mentioned that perceived behavioral control can influence directly both intention and behavior (Ajzen, 1991). However, even though TPB was obtained to be predictive of antecedents affecting behavioral intentions for healthy nutrition and healthy nutrition behaviors of teachers independently, no direct association between intention and behavior was found. Similar findings were obtained by several studies (e.g. Fila and Smith, 2006).

In addition, two constructs including self-identity and personal norm were added to the proposal model in the study. In the present study, self-identity and personal norm significantly explained of the variance of both behavioral intentions for healthy nutrition and healthy nutrition behavior directly or indirectly. Similarly, studies which include both self-identity and personal norm obtained positive results in several studies related to healthy nutrition (e.g. Anderson and Cychosz, 1995; Anderson *et al.*, 1998; Armitage and Conner, 1999; Astøsm and Rise, 2001; Cardinal and Cardinal, 1997;

Model	$\beta$	$p$
Perceived behavioral control	0.16	0.000
Self-identity	0.54	0.001
Intention	0.08	0.113

**Table VIII.**  
Variables which  
unique contribute  
to explaining  
the behaviors

Contrada and Ashmore, 1999; Fekadu and Kraft, 2001; Kendzierski and Costello, 2004; Sparks and Guthrie, 1998; Sparks *et al.*, 1995; Storer *et al.*, 1997; Strachan *et al.*, 2005). For example, in some studies which investigate behavioral intentions for healthy nutrition and healthy nutrition behavior of people who are concerned about their diet (e.g. Sparks *et al.*, 1995), identity as a health conscious individual (e.g. Armitage and Conner, 1999) and someone who eats healthy foods (Astøsm and Rise, 2001), self-identity accounted for of the variance of them successfully. In a study conducted by Kendzierski and Costello (2004), researchers stated that consumers who identify themselves as healthy-eater consumed more fiber and less total fat than consumers who identify themselves as non-healthy-eater. Similar findings were obtained by Strachan and Brawley (2009) and Brouwer and Mosack (2015). In their study, it was revealed that if individuals view themselves as healthy-eater, they tend to behave healthy nutrition.

In the present study, it was showed that statistically significant differences were found in teachers' mean scores in terms of departments and the highest mean value belongs to "Science Teachers," while the lowest mean values are involved in "Turkish Language Teachers." In addition, the mean scores related to healthy nutrition of other teachers from high to low belong to classroom teachers, physical education teachers and mathematics teachers, respectively. This result can be interpreted as that since the number of objectives and subjects related to healthy nutrition with all grade level in the lesson of science and life science curriculum is higher than other discipline areas, it could be possible that there is a relationship between obtained results from teachers and importance given to this topic in the curriculum. However, there is no significance difference in terms of gender for both intention and behavior. Although, excluding a few studies (e.g. Berg *et al.*, 2000), females are generally observed to have significantly greater intention than males in the previous studies (e.g. Backman *et al.*, 2002; Bazillier *et al.*, 2011; Chan and Tsang, 2011; de Bruijn *et al.*, 2005; Diaz *et al.*, 2009; Grønhoj *et al.*, 2013; Hewitt and Stephens, 2007), in some studies, in relation to diet behaviors, differences with respect to gender are not significant (e.g. Backman *et al.*, 2002; Bazillier *et al.*, 2011; Berg *et al.*, 2000; Seo *et al.*, 2011). For example, in a meta-analysis study conducted by McDermott *et al.* (2015), researchers obtained that there is no evidence that relationship was moderated by individuals' gender. One more results obtained in the scope of this study are that no significant difference was obtained in terms of TBP constructs. Although some of teachers live in rural area and some of them live in urban area, there are several reasons why no significance was found on result. First, teachers generally start to work in the schools affiliated to the Ministry of National Education in rural areas as a beginning after graduation from university according to results of Public Personnel Selection Examination which is compulsory if they want to work at this type of schools (Ministry of National Education, 2002). Then, after gained some experience (for the last several years, teachers have to work two years contractual and four years compulsory after they assigned to first place of duty), teachers assign to urban areas if they provide the necessary conditions. Accordingly, it can be stated that this result obtained is possible since all the teachers actualize the same conditions in Turkey. One more reason could be that since individuals should graduate from faculty of education where located in urban areas in order to be teacher, it can be said that this findings can be possible.

Findings obtained in the present study are interesting and could be useful to design better health interventions so as to encourage healthy nutrition in teachers and the results show that an extended TPB provides a good estimate of the healthy nutritional intentions of teachers and therefore can be used to design interventions (Bazillier *et al.*, 2011). One more important result in the study is that the PBC is a very important antecedent of behavioral intentions for healthy nutrition and healthy nutrition behavior for teachers.

Even though sample diversity and construct type in the proposal model are tried to be broad in scope, this study has several limitations. The first is that the measurement of constructs related to healthy nutrition was carried out by self-report. Teachers may have reported excessive or inconsistent healthy nutrition behavior due to inaccurate memory or social willingness (for example, it could be possible that teachers may have stated that they behave in healthy way since they know what they should). For this reason, in the future, the shortage of applying self-report data using different research patterns and data collection methods can be addressed by researchers. Even though, in several studies, a number of demographics characteristics such as age, BMI, family situation, income, education level and consuming fruits and vegetables, etc., have an influence on individuals' behavioral intentions for healthy nutrition or healthy nutrition behaviors, in the present study, wide-ranging investigation was not done.

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#### Corresponding author

Huseyin Ates can be contacted at: [huseyinates\\_38@hotmail.com](mailto:huseyinates_38@hotmail.com)

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