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Short Communication

Validation of a Turkish version of the food choice questionnaire

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ABSTRACT

The purpose of this study was to test the validity and reliability of the food choice questionnaire (FCQ) for Turkish consumers. A total of 963 voluntary consumers participated in this study. Confirmatory factor analysis (CFA) with a diagonally weighted least squares estimation method was used to assess the construct validity. Results showed that factor loadings were similar to the original FCQ. CFA results indicated an acceptable fit. Test-retest reliability was tested with intraclass correlation coefficient (ICC) and the ICC values ranged from 0.89 to 0.95. Results show that the Turkish version of FCQ was validated and it appears to be a reliable research instrument.

1. Introduction

Making healthier food choices would have positive effects on health. Unhealthy food consumption can lead to chronic non-communicable diseases like obesity, high blood pressure, diabetes, cardiovascular disease (CVD), stroke and certain cancers whereas choosing nutritious food like fruits and vegetables can reduce the probability of CVDs and some cancers (Willett et al., 2006). Determination of people's motives behind their food choices would help to develop better public health strategies and health promotion activities (Cannuscio, Hillier, Karpyn, & Glanz, 2014; Lyerly & Reeve, 2015; Miller & Cassady, 2012). Food choices include a complex interaction between non-sensory factors, including food-related expectations and attitudes, health claims, price, ethical concerns, mood and familiarity, and sensory factors such as appearance, taste, smell and texture characteristics. Food choices increasingly reflect people's personalities and lifestyles, emphasizing that different motives play a role in determining food choices (Honkanen & Frewer, 2009; Prescott, Young, O'Neill, Yau, & Stevens, 2002). In addition, the determination of potential food choice motives in different populations has great importance during the formation of press releases, product development, market promotion, health campaigns, healthy nutrition habits and more efficient public health policies (Januszewska, Pieniak, & Verbeke, 2011; Milosevic, Zezelj, Gorton, & Barjolle, 2012). The food choice questionnaire (FCQ) was developed by Steptoe, Pollard and Wardle in order to determine motives that affect consumers during the food choice process (Steptoe, Pollard, & Wardle, 1995).

The food choice questionnaire is composed of 36 items representing health and non-health characteristics of food, including subscales of health, mood (improve mood and cope with stress), convenience (ease of preparation and availability), sensory appearance (appearance, taste, smell and texture), natural content (no additives or artificial ingredients), price, weight control (low in calories and fat), familiarity and ethical concern (country of origin and environmentally friendly packaging). Each subscale includes 3–6 items. In the questionnaire, questions starting with "on a typical day" related to the food choices are asked to participants and it is requested that they evaluate them on a four-point scale. The validity and reliability of the instrument was established by the authors (Pollard, Steptoe, & Wardle, 1998). The authors concluded that "within western urban populations, the FCQ provides the opportunity to assess a broad range of factors perceived as relevant to food selection."

Since its introduction, the food choice questionnaire has been applied at both national, cross-cultural and cross-national levels and has been translated into many languages, including Finnish, Polish, Greek and Spanish (Ares & Gambaro, 2007; Chryssochoidis, Krystallis, & Perreas, 2007; Lindeman & Vaananen, 2000; Lockie, Lyons, Lawrence, & Mummery, 2002; Pollard et al., 1998; Prescott, Young, O'Neill, Yau, & Stevens, 2002). However, to the authors' knowledge there is not a validated questionnaire used to determine food choices in Turkey. The aim of

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this study was to provide validation by translating the food choice questionnaire into the Turkish language and applying it for the first time to the Turkish consumers.

2. Methods

2.1. Participants

A total of 963 people, including 448 males and 515 females between the ages of 18 and 64, participated in the study voluntarily in Ankara Turkey. Data were collected between May and June 2015. One thousand people were informed about the survey and 963 people accepted to participate in this study. Response rate was 96%. Food choice behavior is a complex process and mainly influenced by taste, convenience, cost of the food items and health status of the individuals (Shepherd, 1990). Because of doing own food shopping, taking medical treatment and having chronic illnesses may affect the decision process of food choice, the participants were included in the study if they did their own food shopping and had no medical treatment or chronic illnesses. Furthermore the volunteer participants did not receive any incentive for participation.

2.2. Questionnaire

The questionnaire included socio-demographic characteristics of the participants, such as gender, age, marital status, salary, residence and education. Self-reported body weight and height values were provided during the interview by the participants. BMI (kg/m^2) was calculated as body weight (kg) divided by height (m) squared. Participants were classified into four categories according to the WHO classification of BMI (WHO, 2010).

The FCQ (Steptoe et al., 1995) comprised 36 items in 9 dimensions (health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity and ethical concern). Some researchers have used 5-point (1 = not at all important to 5 = extremely important) or 7-point (1 = not important at all to 7 = extremely important) Likert scales in recent studies (Dowd & Burke, 2013; Markovina et al., 2015; Milosevic et al., 2012; Pieniak, Verbeke, Vanhonacker, Guerrero, & Hersleth, 2009). The FCQ scale was scored as originally with a 4-point Likert scale (1 = not at all important to 4 = very important) in this study.

The questionnaire was translated from English to Turkish, and then back to English by expert scientists in the Nutritional Epidemiology field. The translation process followed the Brislin method (Brislin & Leibowitz, 1970). Two native Turkish speakers translated the FCQ to Turkish and two native English speakers translated the Turkish-FCQ to English. These translations were compared with the original FCQ by an expert committee experienced in food choice and nutrition and necessary corrections were made. The randomly selected 40 participants completed the food choice questionnaire (FCQ) at baseline and after 4 weeks to provide evidence of test–retest reliability.

2.3. Procedure

All volunteer participants who live around Altindag District of Ankara were informed about the purpose of the research and were asked to sign a consent form. After having agreed to participate in the study, they were asked to complete the questionnaire which lasted no >15 min. The first section of the questionnaire gathered socio-demographic information that was not included in the validation analyses. The second section consisted of 36 items of FCQ. All of the interviews were pencil and paper survey and conducted face to face by two trained dietitians.

2.4. Statistical analysis

Confirmatory factor analysis (CFA) with a diagonally weighted least squares estimation method was used to assess the construct validity of the Turkish version of the food choice questionnaire (FCQ). Model fit of the 9-factor structure was examined using χ^2/df, root mean square error of approximation (RMSEA), and two goodness of fit indices such as comparative fit index (CFI) and non-normed fit index (NNFI). The criteria for an acceptable model fit was identified as χ^2/df (degrees of freedom) $\leqslant 5$, CFI $\geqslant 0.90$, NNFI $\geqslant 0.90$, and RMSEA $\leqslant 0.06$, and also the good model fit was identified as χ^2/df $\leqslant 2$, CFI $\geqslant 0.95$ and NNFI $\geqslant 0.95$. RMSEA < 0.05 with an upper limit of the 90% confidence interval (CI) $\leqslant 0.08$ was considered as an acceptable model fit (Hooper, Coughlan, & Mullen, 2008; Hu & Bentler, 1999).

Internal consistency of the scale was evaluated using Cronbach's alpha. A criteria for Cronbach's alpha was selected as 0.70 (Field, 2009). Test-retest reliability was examined by intraclass correlation coefficient (ICC). ICC > 0.80 indicates excellent test-retest agreement.

2.5. Ethics

The study and its survey were approved by the ethical board of Hacettepe University (GO 15/114). All survey participants signed the consent form which included their agreement of participation to the study and of the use of anonymized data.

3. Results

Demographic characteristics of the participants are shown in Table 1. The participants' mean age was 25.4 (±9.8) years. 81.2% of participants were single, 76.2% were non-smoker, and 41.7% were single household. The average BMI of the male participants was 24.4 (±3.5), and the average BMI of the female participants was 21.9 (±3.5).

Food choice item statistics (mean, standard deviation and item-total correlations) of the participants according to the FCQ are shown in Table 2. According to FCQ scales, item 4 "Tastes good" elicited the highest mean: (3.63). Other items with highest score were item 29 "Keeps me healthy" (3.24); item 12 "Is good value

Table 1
Demographic characteristics of the study sample.

	Male	Female	Total
Age in years (SD)			
	27.3 ± 11.2	23.7 ± 8.1	25.4 ± 9.8
Marital status	n (%)	n (%)	n (%)
Married	116 (26)	65 (12.6)	181 (18.8)
Single	332 (74)	450 (87.4)	782 (81.2)
BMI			
Underweight	9 (2)	66 (12.9)	75 (7.8)
Normal weight	262 (59)	365 (71.3)	627 (65.6)
Overweight	147 (33.1)	69 (13.5)	216 (22.6)
Obesity	26 (5.9)	12 (2.3)	38 (3.9)
Resident			
Home with family	216 (48.9)	142 (27.8)	358 (37.6)
Home alone	23 (5.2)	5 (1)	28 (2.9)
Home with friends	69 (15.6)	96 (18.8)	165 (17.3)
Single household	134 (30.3)	268 (52.4)	402 (42.2)
Monthly salary			
0–1000 TL	65 (14.7)	110 (21.6)	175 (18.4)
1001–2000 TL	108 (24.4)	122 (24)	230 (24.2)
2001–3000 TL	148 (33.4)	153 (30.1)	301 (31.6)
3001–5000 TL	82 (18.5)	93 (18.3)	175 (18.4)
5000 ⩾ TL	40 (9)	31 (6.1)	71 (7.5)