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BRIEF REPORT

The Turkish Palatable Eating Motives Scale (T-PEMS): utility in predicting binge-eating eating and obesity risk in university students

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Introduction

Highly palatable foods and drinks (PFs) tend to be high in fat, high in sugar, and calorie-dense while lacking in nutrient quality. Habitual consumption of these foods, especially in the absence of hunger or metabolic need, contributes to obesity and is characteristic of binge-type eating disorders [1, 2]. The Palatable Eating Motives Scale (PEMS) identifies Social, Coping, Reward Enhancement, and Conformity motives for eating PFs. In studies conducted in American university students, more frequent intake of PFs for Coping is consistently associated with higher current BMI, weight gain over time [3], body dissatisfaction, and, along with higher Conformity and Reward Enhancement scores, with more severe binge-eating [4, 5].

However, little is known about the motives for eating PFs in more collectivistic societies where obesity and eating disorders are also a problem [6, 7]. Turkey is unique in that it ranks midway between other collectivistic countries and the USA in "indulgence," defined as the degree to which one attempts to control desires and urges [8]. Cultural differences are known to affect food choice and food consumption patterns [9] as well as broader constructs that can influence eating behavior, including cultural differences in cognitive styles, self-concept, definitions of well-being, and meaning of social interactions [8, 10].

Therefore, the purpose of this study was to administer a Turkish-translated version of the PEMS (abbreviated here "T-PEMS") to Turkish university students and to determine the value of this scale to predict risk of developing eating disorders and obesity. University students from Istanbul, Turkey, completed the T-PEMS along with the Bulimic Investigatory Test, Edinburgh (BITE) and Yale Food Addiction Scale (YFAS). These instruments were chosen for their assessment of maladaptive eating patterns and because Turkish translations of the surveys were available. The results bode well for the T-PEMS to help shape eating behavior toward healthier outcomes in more collectivistic cultures.

Methods

Participants

A total of 296 undergraduate students, 43% female, from universities in Istanbul, Turkey, aged 18–25 years (21.9 years; SD = 2.0) with a mean body mass index (BMI) of 22.6; SD = 3.3, participated in this study. BMI was obtained from self-reported height and weight. The Bahçeşehir University Research Ethics Board approved the study.

Questionnaires

Participants completed the following: The Turkish Palatable Eating Motives Scale (T-PEMS) which was translated from the PEMS-revised [11] into Turkish by an independent professional translator and a Turkish native speaker and then back-translated to English by a Turkish psychologist

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fluent in English. It differed from the PEMS only in slightly different response descriptors and inclusion of culture–typical PFs in the instructions. The PEMS yields four subscales or "motives" for consuming PFs: Social, Coping, Reward Enhancement, and Conformity (see Table 1 for items). The Turkish Bulimic Investigatory Test, Edinburgh Symptom Scale (BITE-SS) screens for binge-eating and bulimia nervosa and probes preoccupation with dieting and gaining weight, urge to eat, and emotional and behavioral features of binge-eating [12, 13]. It had good internal reliability in the study sample ($\alpha = 0.83$). Scores are categorized as Low (0–9; no binge-eating), Medium (10–19; unusual eating

Table 1 Items, factor loadings, internal consistency, and means for the Turkish Palatable Eating Motives Scale (T-PEMS)

Items	Social	Coping	Reward	Conformity
3. Bu yiyecek ve içecekleri tüketiyorum çünkü bir partide eğlenmeme yardımcı oluyorlar (I consume these foods/drinks because it helps me to enjoy a party)	0.76			
11. Bu yiyecek ve içecekleri sosyal birleşmeleri/ toplantıları daha keyifli hale getirdikleri için tüketiyorum (I consume these foods/drinks because it makes social gatherings more fun)	0.80			
14. Bu yiyecek ve içecekleri parti ve kutlamaları daha güzel hale getirdiği için tüketiyorum (I consume these foods/drinks because it improves parties and celebrations)	0.86			
16. Bu yiyecek ve içecekleri arkadaşlarım veya ailem ile özel günlerde kutlama yapmak için tüketiyorum (I consume these foods/drinks to celebrate a special occasion with friends or family)	0.73			
1. Kaygılarımı unutmak için bu yiyecek ve içecekleri tüketiyorum (I consume these foods/drinks to forget my worries)		0.85		
4. Bu yiyecek ve içecekleri tüketiyorum çünkü depresif ve sinirli zamanlarımda yardımcı oluyorlar (I consume these foods/drinks because it helps me when I feel depressed or nervous)		0.85		
6. Bu yiyecek ve içecekleri kötü bir ruh halindeyken neşelenmek için tüketiyorum (I consume these foods/drinks to cheer up when I am in a bad mood)		0.84		
15. Bu yiyecek ve içecekleri stresimi azaltmaya yardımcı oldukları için tüketiyorum (I consume these foods/drinks because it helps to lower my stress)		0.83		
17. Bu yiyecek ve içecekleri sorunlarımı unutmak için tüketiyorum (I consume these foods/drinks to forget about my problems)		0.83		
7. Bu yiyecek ve içecekleri tüketiyorum çünkü bu hissi seviyorum (I consume these foods/drinks because I like the feeling)			0.82	
9. Bu yiyecek ve içecekleri tüketiyorum çünkü heyecan vericiler (I consume these foods/drinks because it is exciting)			0.70	
10. Bu yiyecek ve içecekleri verdikleri yüksek haz için tüketiyorum (I consume these foods/drinks to get "high-like" feelings)			0.85	
13. Bu yiyecek ve içecekleri bana hoş bir hissiyat verdikleri için tüketiyorum (I consume these foods/drinks because it gives me a pleasant feeling)			0.83	
18. Bu yiyecek ve içecekleri tüketiyorum çünkü eğlenceliler (I consume these foods/drinks because it is fun)			0.75	
2. Bu yiyecek ve içecekleri tüketiyorum çünkü ailem ve arkadaşlarım bunları yememi/içmemi istiyorlar (I consume these foods/drinks because my friends or family want me to eat these foods/drinks)				0.70
5. Bu yiyecek ve içecekleri sosyal/ girişken olabilmek için tüketiyorum (I consume these foods/drinks to be sociable)				0.76
8. Bu yiyecek ve içecekleri, etrafımdakiler bunları yemiyorum içmiyorum diye benimle dalga geçmesin, alay etmesinler diye tüketiyorum (I consume these foods/drinks so that others will not kid or tease me about *not* eating or drinking them)				0.83
12. Bu yiyecek ve içecekleri sevdiğim gruplara uyum sağlayabilmek için tüketiyorum (I consume these foods/drinks to fit in with a group I like)				0.71
19. Bu yiyecek ve içecekleri başkaları tarafından beğenilmek için tüketiyorum (I consume these foods/drinks to be liked by others)				0.79
20. Bu yiyecek ve içecekleri dışlanmış hissetmemek için tüketiyorum (I consume these food/drinks so I will not feel left out)				0.85
Eigenvalue	1.51	7.21	1.11	3.39
Cronbach's α	0.81	0.90	0.86	0.86
Mean sample score[a] (SD)	3.08 (0.9)	2.57 (1.0)	3.28 (0.9)	1.63 (0.8)

[a]Items are scored 1 to 5 and averaged for the motive mean

patterns but no binge-eating), and High (≥20; very disordered eating patterns and high chance of clinical binge-eating). The Turkish Yale Food Addiction Scale (YFAS) assesses the degree to which food is experienced like a substance of abuse [14, 15]. It too had good internal reliability in this study sample ($\alpha = 0.85$).

Statistical analyses

Principal component analysis (PCA) with direct oblimin rotation explored the factor structure of the T-PEMS with eigenvalues >1 suggesting the number of factors. Confirmatory factor analysis (CFA) using maximum likelihood estimation assessed the fit of the translated factors with the original four-factor model. Cronbach's alpha assessed item internal consistency (Table 1). Linear regressions assessed associations between the T-PEMS motives as predictors of binge-eating (BITE-SS scores; Table 2) and of BMI. ANCOVA tested for significance of a BITE-SS × Coping interaction on BMI.

Results

Factor structure and reliability of the Turkish Palatable Eating Motives Scale (T-PEMS)

PCA yielded four factors from the translated items. Items with factor loading >0.40 were retained (presented in Table 1). CFA indicated acceptable-to-good fit of the factors to the data X^2 ($df = 164$, $N = 296$) = 306.88, $p < 0.001$; RMSEA = 0.054 (90% CI 0.045, 0.064); CFI = 0.95; TLI = 0.95. Items compromising the four factors (motives) were the same as in the original and revised PEMS [11, 16], with the exception of item #5, "I consume these foods/drinks to be more sociable." This item originally factored into the Social motive, but in the T-PEMS factored best into the Conformity motive. Hence, for all results, scores on the Social motive reflect the mean of four items and on the Conformity motive the mean of six items (Table 1).

T-PEMS motives as predictors of BITE-SS scores

As shown in Table 2, consuming PFs more frequently for Conformity and Coping predicted greater BITE-SS scores independent of demographics, the other T-PEMS motives, BMI, and YFAS scores. YFAS scores were not associated with BITE-SS scores in a model that included BMI (Table 2) or in a model that did not include BMI ($\beta = 0.05$, $t = 0.87$, $p = 0.39$; not shown).

T-PEMS motives as predictors of BMI

Coping ($\beta = 0.16$, $t = 2.02$, $p = 0.045$) and male sex ($\beta = 0.23$, $t = 3.95$, $p = 0.000$) predicted greater BMI, when also regressed by demographics and other T-PEMS motives (not shown). The association between Coping and BMI was unchanged with YFAS scores in the model ($\beta = 0.16$, $t = 2.00$, $p = 0.047$). YFAS scores did not predict BMI. There was also a Coping × BITE-SS interaction on BMI such that participants with greater binge-eating risk had a higher BMI but only if also high in Coping (Coping scores 3–5, range of the highest tertile for this sample; $p = 0.04$).

Table 2 Regression model of demographics and the Turkish Palatable Eating Motives Scale (T-PEMS) motives alone, and with BMI and YFAS scores as predictors of disordered eating (BITE-SS scores)

Independent variables	Dependent variable: BITE-SS scores					
	Without BMI and YFAS scores			With BMI and YFAS scores		
	β	*t*	*p*	*β*	*t*	*p*
Sex	−0.07	−1.28	0.20	−0.14	−2.60	0.01*
Age	0.06	1.05	0.30	0.03	0.65	0.52
T-PEMS						
Social	−0.04	−0.57	0.57	−0.02	−0.34	0.73
Coping	0.35	4.90	0.00***	0.30	4.36	0.00***
Reward enhancement	0.04	0.58	0.56	0.06	0.88	0.38
Conformity	0.14	2.42	0.02*	0.13	2.31	0.02*
BMI	–	–	–	0.29	5.68	0.00***
YFAS	–	–	–	0.05	0.89	0.38
R^2	0.20			0.29		

BMI body mass index, *YFAS* Yale Food Addiction Scale, *BITE-SS* Bulimic Investigatory Test, Edinburgh Symptom Scale

*$p < 0.05$; ***$p < 0.001$

Discussion

The T-PEMS Coping and Conformity motives proved useful in predicting binge-eating risk, and the Coping motive proved useful in predicting higher BMI, especially among those with greater eating disturbance. That this was not a patient sample and that BMIs were truncated in range attest to the sensitivity of the T-PEMS to predict eating disorder and obesity risk; it should be a valuable tool in patient populations.

The results revealed interesting differences to those conducted in similar US populations. For example, the item, "I consume these foods/drinks to be more sociable" factored into the Conformity vs. Social motive. An explanation is that in Turkey, and similar collectivistic cultures, inviting guests to meals is more than a social event. The abundance and variety of foods offered to guests is proportional to how much the guest is valued and respected. It is customary for the host to insist that their guest eat, and compliance relays mutual respect [17]. A better label for the T-PEMS Social motive may be "Celebration motive." Another interesting difference was that Turkish students ate PFs most frequently for Reward Enhancement, i.e., this motive had the highest mean score, while American students consistently eat PFs more frequently for Social motives. While seemingly at odds with collectivistic cultures that devalue hedonism, this may be explained by the fact that Turkey ranks higher than other collectivistic countries in indulgence [8]. Another difference was that while the Reward Enhancement motive predicted binge-eating among American university students [4], it did not in Turkish students. This may be due to use of the Binge-Eating Scale (BES) vs. the BITE-SS. Different eating disorder scales warrant investigation with the T-PEMS. On the other hand, an important but surprising similarity between this Turkish and previous American studies is that the Conformity motive was the least endorsed by university students. Surprising because collectivistic societies are more influenced by family and friends on food choices than are individualistic societies like the USA [9]. Hence, placing a greater value on group harmony over personal enjoyment, hallmarks of collectivism [8, 18], may not translate to eating PFs. Moreover, eating PFs for Conformity was problematic as it predicted greater BITE-SS scores. This too was found in American students when problem eating was measured with the BES and the Eating Disorder Examination Questionnaire [4, 5].

Limitations of the study include lack of concomitant testing of American students for direct cross-cultural comparisons, test–retest reliability within Turkish students, and lack of testing and controlling for psychological characteristics that may influence eating behavior such as state depression and anxiety. Future studies should include these, as well as longitudinal tests, to assess the predictive strength of the T-PEMS in developing clinical disorders. Nonetheless, this first study with the T-PEMS suggests it has good validity among young adults living in a more collectivistic culture than the USA. The scale can be used to not only predict but help prevent obesity and eating disorders which commonly develop in young adults and university students. In those already diagnosed with these conditions, the T-PEMS can improve treatment prognosis by personalizing the treatment approach. By identifying the patient's primary motive to eat PFs, clinicians can target the motive for change since it identifies the circumstances under which the patient is most vulnerable to eat PFs. This should also reduce the high relapse rates that plague obesity and eating disorder treatments. In non-patients, awareness of specific motives for eating PFs that are unrelated to hunger should help to promote healthier eating habits, coping strategies, and relations with friends and family.

Compliance with ethical standards

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Conflict of interest Ayşe And declares no conflict of interest. Maria Sylvester declares no conflict of interest. Bulent Turan declares no conflict of interest. Doruk Uysal Irak declares no conflict of interest. Mary Katherine Ray declares no conflict of interest. Mary Boggiano declares no conflict of interest.

Ethical approval All procedures performed were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the study.

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