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Little by Little, Often Eating: Turkish Adaptation, Validity and Reliability Study of the Grazing Questionnaire

Az Az Sık Sık Yeme: Otlanma Tarzı Yeme Ölçeği'nin Türkçeye Uyarlanması, Geçerlik ve Güvenirlik Çalışması

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ABSTRACT

Research indicates a close association between grazing, classified as disordered eating, and both obesity and eating disorders. This study aims to adapt the Grazing Questionnaire into Turkish. The research encompassed exploratory (N= 181) and confirmatory (N= 180) factor analyses with a sample of 361 community-based participants aged 18 to 30. Principal component analysis revealed a two-factor structure (uncontrollability, grazing behaviors) explaining 63.40% of the total variance, with eigenvalues surpassing 1. The Cronbach's alpha coefficient stood at .86. In assessing construct validity, the Grazing Questionnaire exhibited meaningful correlations with the Binge Eating Scale (r= .60, p< .01), body mass index (r= .23, p< .01), and subscales of the Leahy Emotional Schema Scale. Discriminant validity, evaluated through independent samples t-test analysis, showcased significant distinctions between groups with an eating disorder diagnosis or psychological support and those without such diagnoses or support in terms of grazing behaviors. These findings affirm that the Turkish version of the Grazing Questionnaire serves as a valid and reliable tool for evaluating individuals' grazing behaviors and the feeling of loss of control during eating within a community-based sample. Moreover, the scale's structure aligns closely with its original form. Psychologists and psychiatrists can employ the the Grazing Questionnaire as an effective measurement tool to assess and identify distinctive features associated with eating behaviors.

Keywords: Grazing, binge eating, disordered eating, eating disorders

ÖZ

Bozulmuş yeme davranışları arasında kabul edilen otlanma tarzı yemenin, obezite ve yeme bozuklukları ile yakından ilişkili olduğu bilinmektedir. Bu çalışmanın amacı Otlanma Tarzı Yeme Ölçeğinin Türkçe formunun psikometrik özelliklerinin incelenmesidir. Ölçeğin açımlayıcı (N= 181) ve doğrulayıcı (N= 180) faktör analizleri 18-30 yaş aralığında olan toplum temelli toplam 361 katılımcıdan elde edilen verilerle gerçekleştirilmiştir. Otlanma Tarzı Yeme Ölçeğinin faktör yapısını belirlemek için temel bileşenler analizinden yararlanılmış ve özdeğeri 1'in üzerinde olan, toplam varyansın %63.40'ını açıklayan iki faktörlü yapıya (kontrol edilemezlik, otlanma davranışları) ulaşılmıştır. Ölçeğin iç tutarlılık katsayısı ,86'dır. Bileşen geçerliği kapsamında Otlanma Tarzı Yeme Ölçeğinin, Tıkınırcasına Yeme Ölçeği (r= .60, p< .01), beden kitle indeksi (r= .23, p< .01) ve Leahy Duygusal Şema Ölçeğinin alt boyutları ile kabul edilebilir ilişkiler gösterdiği saptanmıştır. Ayırıcı geçerliğini belirlemek amacıyla gerçekleştirilen bağımsız gruplar t-testi analizine göre yeme bozukluğu tanısı olan veya psikolojik destek alan grup ile herhangi bir yeme bozukluğu tanısı olmayan ve psikolojik destek almayan grup otlanma tarzı yeme bakımından anlamlı olarak farklılık göstermektedir. Elde edilen sonuçlar, Otlanma Tarzı Yeme Ölçeğinin Türkçe formunun toplum temelli örneklemde bireylerin otlanma davranışlarını ve yeme edinimi esnasındaki kontrol kaybı hissini değerlendirmede geçerli ve güvenilir bir ölçüm aracı olduğunu ortaya koymaktadır. Ulaşılan yapı ölçeğin orijinal formuyla büyük oranda tutarlılık göstermektedir. Psikolog ve psikiyatristler tarafından değerlendirme ve ayırıcı özellikleri belirleme amacıyla başvurulabilecek bir ölçüm aracı olarak Otlanma Tarzı Yeme Ölçeğinden faydalanılabileceği düşünülmektedir.

Anahtar sözcükler: Otlanma tarzı yeme, tıkınırcasına yeme, bozulmuş yeme, yeme bozuklukları

Introduction

There are limitations in the conceptualization of disordered eating literature (Aloi et al. 2017), despite the increasing number of studies about disordered eating every passing day (Elliston et al 2017). Disordered eating

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is a problem that negatively impact an individual's life and functionality (Thomas et al. 2009, Wade et al. 2012), reduces quality of life (Fairweather-Schmidt andWade 2015), can lead to mortality, and causing high rates of suicide (Crow et al. 2012). Disordered eating has variety a lot of eating patterns such as binge eating (Darby et al. 2007, Turan et al. 2015), emotional eating (Kaplan and Kaplan 1957), restrictive eating (Herman and Mack 1975), night eating (Colles et al. 2007, Dönmez 2022) and grazing (Saunders 2004, Lane and Szabo 2013). Even though eating patterns (e.g., grazing) are not explicitly included in Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5; APA 2013) and the International Classification of Diseases, 11th edition (ICD-11; WHO 2018), importance of eating patterns is emphasized in the literatüre (Spirou et al. 2013). For instance, according to ICD-11, it is recommended to assess disordered eating patterns such as grazing and emotional eating in individuals with obesity ho don't meet the criteria for binge eating disorder.

Grazing is reported to assume an important role in the development and maintenance of eating disorders, and it overlaps with binge eating at certain aspects. (Segura-Garcia et al. 2017). Among the criteria suggested for grazing are the repeated consumption of small amount of food, the unplanned nature of this eating acquisition, and its occurence is independent of hunger or satiety (Conceição et al. 2014a). There are empirical studies on grazing in international literature (Lane and Szabo 2013, Nicolau et al. 2015, Heriseanu et al. 2019a). In the national literature, grazing addressed in a review (Beşenek and Hocaoğlu 2021) and in an empirical study in which addressed eating behaviors in obese individuals (Ortaköylü 2020). Due to the stated limitations in the conceptual framework and clinical application, understanding eating disorders to identify not only the unique components that distinguish grazing from other disordered eating attitudes, but also to determine its behavioral indicators and comprehend its psychological processes can be useful.

In grazing, which is like binge eating in that it results in overeating, diverges from binge eating in the fact that overeating occurs in small amounts of food that are consumed throughout the day (Saunders 2001). In other words, as a result of consuming small amounts of food repeatedly over extended periods, the individual ends up consuming a greater overall quantity and engages in overeating (Carter and Jansen, 2012). Regardless of the amount consumed, the individual's perceived overeating and perceived loss of control are considered as important determinants for grazing (Saunders 2004).

Lane and Szabo (2013) conducted a study in which they developed a measurement tool to assess grazing, leading to the first empirical definition of grazing. According to this, grazing is characterized by unplanned, repetitive, and consistently consuming small amount and a sense of loss of control. In other words, the behavior of eating small amounts frequently with an accompanying feeling of loss of control is referred to as grazing. However, it is observed that some researchers (Reslan et al. 2014) don't consider the sense of loss of control as a criterion of grazing. According to Conceição et al. (2014a), the least consensual subdimension of grazing is the sense of loss of control, due to conflicting findings.

Conceição and colleagues (2014a) proposed a standardized definition and two subtypes for grazing. Accordingly, grazing is defined as (a) the unplanned, repetitive eating of amounts less than that can be considered a meal, regardless of hunger or satiety, (b) repetitive eating occurs more than twice in three time periods of the day or throughout the day (morning, afternoon, evening), (c) grazing has two subtypes: compulsive and non-compulsive. In the compulsive subtype, an individual is unable to resist eating, and the desire to continue eating is dominant, whereas in the non-compulsive type, repetitive unconscious eating is at the forefront rather than the experience of loss of control (Conceição et al. 2014a). Despite having similar characteristics, more frequent grazing behavior and disordered eating, higher levels of anxiety and depression symptoms are observed in the compulsive type compared to the non-compulsive subtype (Goodpaster et al. 2016). Grazing is encountered in various populations, including eating disorders (Heriseanu et al. 2017), obesity (Micanti et al. 2017), university students (Lane and Szabo 2013), children (Conceição et al. 2021) and non-clinical populations (Conceição et al. 2017a). In addition to studies reporting the prevalence of grazing in the community population as 48.24% (Heriseanu et al. 2019a), and 23.32% (Heriseanu et al. 2017), there are indications that the prevalence of this eating behavior in the community has reached up to 81% during the coronavirus pandemic (Ramalho et al. 2022). In addition, grazing is also commonly encountered in clinical samples (Teodoro et al. 2021). For instance, the prevalence rates in obese individuals range from 16.6% (Conceição et al. 2014b) to 46.6% (Kofman et al. 2010). Beyond its prevalence, grazing is also known to play a role in problems such as lower level of weight loss (Colles et al. 2008) and weight regain (Kofman et al. 2010). The grazing pattern is highly associated with BED (Mitchell et al. 2015, Goodpaster et al. 2016) and this eating pattern is also commonly found in bulimia nervosa (Masheb et al. 2011). In the meta-analysis conducted by Heriseanu and colleagues (2017), the prevalence of grazing was found to be 68% for BED, 58% for bulimia nervosa, and 34% for anorexia nervosa, respectively. Although grazing-style eating is reported to be more common in women than men (Aloi et al. 2017, Bonder et

al. 2018, Reas et al. 2019), there are also studies that didn't find significant differences between genders (Masheb et al. 2013, Nicolau et al. 2015).

Individuals who are grazing experience more emotional problems such as lack of pleasure, hopelessness, and shyness. Despite the frequency of negative emotions, they report fewer positive emotions (Goodpaster et al. 2016). Considering that problems like these are the main features of mood disorders (APA 2013), the association between grazing and depressive symptoms (Aloi et al. 2017) becomes expected. In other words, individuals who exhibit grazing behavior more frequently show higher levels of depressive symptoms (Colles et al. 2008). Low self-esteem (Goodpaster et al. 2016) can be a risk factor, as well as cognitive triggers of grazing, such as distinguishing between good food and bad food related to the diet, labeling oneself as bad when consuming non-diet food, and constantly having intrusive thoughts about food (Saunders 2004).

Recognizing the significance of identifying grazing behaviors linked with obesity and eating disorders is vital for understanding individuals' eating habits comprehensively (Saunders 2004). Within existing literature, various measurement tools have been developed to assess and explore this behavior. For instance, Conceição and colleagues (2017b) devised a tool that distinguishes between compulsive and non-compulsive subtypes of grazing. Conversely, a brief two-item tool by Heriseanu et al. (2019b) evaluates grazing frequency and the perceived loss of control associated with it.

Among these tools is the Grazing Questionnaire, formulated by Lane and Szabo (2013), which encompasses cognitive and behavioral aspects of grazing. This questionnaire has been frequently utilized in studies focusing on binge eating (Lane and Szabo 2013) and obesity (Spirou et al. 2022) based on the available literature. Notably, the questionnaire was adapted to Italian culture (Aloi et al. 2017) and its psychometric properties were explored in a sample of obese individuals (Spirou et al. 2022). Amid uncertainties surrounding whether grazing behavior constitutes a problematic eating pattern warranting clinical attention within the spectrum of disordered eating (Reas et al. 2019), it seems valuable to investigate and evaluate this pattern within the Turkish population. Consequently, developing a valid and reliable measurement tool specifically addressing grazing behavior is poised to facilitate further research to address this gap. Hence, the current study aims to conduct a reliability and validity assessment of The Grazing Questionnaire within a Turkish sample.

Method

Sample

Since binge eating symptoms peak between the ages of 20-29 (de França et al. 2014, Bertoli et al. 2016) and that the onset of eating disorders at the clinical level is pointed to the end of adolescence and early young adulthood (Solmi et al. 2022), the sample of the study consisted of individuals between the ages of 18-30. The current study had cross-sectional research design and the participants were reached by using convenience sampling method. The exclusion criteria were (a) being younger than 18 years of age or older than 30 years of age, (b) providing incorrect answers to the control questions. A total of 382 individuals volunteered to participate. No psychological interview was conducted with the participants, and information on the presence of an eating disorder diagnosis, psychiatric medication use, psychological support or dietitian support was obtained through the demographic information form. Considering the exclusion criteria, 21 participants were excluded from the study due to providing incorrect answers to the control questions. Accordingly, the analyses were conducted with 361 participants in the community-based sample.

In the current sample, there were 260 female (72%), 100 male (27.7%) and 1 other participant (%.3). The age range was 18-30 years (M = 25.73, SD = 2.75), 198 of the participants were single (54.8%), 51 were married (14.1%), 15 were engaged (4.2%), and 97 of the participants reported their relationship status as flirting (26.9%). In terms of the most recent level of education, 1 participant graduated from secondary school (%.3), 46 participants graduated from high school (12.7%), 230 participants (63.7%) graduated from bachelors degree, and 84 participants (23.3%) graduated from postgraduate degrees. In addition to these sociodemographic variables, body mass index (BMI) scores of the participants were calculated based on the data obtained regarding height and weight. Accordingly, the average body mass index (BMI) score of the participants was 23.8 (SD = 4.30). Considering the BMI categories defined by the World Health Organization (WHO 2004), 226 of the participants were normal (62.6%), 84 were overweight (23.3%), 30 were obese (8.3%) and 21 were underweight (5.8%). Detailed sociodemographic information about the sample of the study is provided in Table 1.

Table 1. Sociodemographic characteristics of the participants		
Variables	**n**	**%**
Gender		
Female	260	72
Male	100	27.7
Other	1	.3
Education Level		
Secondary School	1	.3
High School	46	12.7
Undergraduate	230	63.7
Postgraduate	84	23.3
Employment Status		
Working	230	63.2
Not Working	131	36.8
Occupation Level		
Officer	13	3.6
Laborer	20	5.5
Self-employment	7	1.9
Professional Occupation	162	44.9
Other	28	7.8
Socioeconomic Status		
Lower	97	26.9
Middle	248	68.7
Higher	13	3.6
Other	3	.8
Relationship Status		
Married	51	14.1
Single	198	54.8
Flirting	97	26.9
Engaged	15	4.2
Body Mass Index		
Underweight	21	5.8
Normal	226	62.6
Overweight	84	23.3
Obese	30	8.3
Nutrition and Eating Disorder Diagnosis		
Yes	18	5
No	343	95
Use of Psychiatric Medication		
Yes	33	9.1
No	328	90.9
Receiving Psychological Support		
Yes	37	10.2
No	324	89.8
Dietitian Support		
Yes	25	6.9
No	336	93.1

Procedure

To facilitate the adaptation of the original English Grazing Questionnaire (Lane and Szabo, 2013) into Turkish and assess its psychometric properties, the initial step involved contacting Marianna Szabo, one of the scale's developers, via email to obtain permission for the adaptation. Ensuring linguistic equivalence of the scale items followed the translation-retranslation method (Brislin et al., 1973). Two doctoral level psychological counselors independently translated the items into Turkish. Subsequently, the researchers compared these translations, identifying discrepancies and favoring translations that were clear and easily understandable. Upon establishing suitable item translations, the items were retranslated into the original language by the researchers. A comparison between the retranslated items and the original form confirmed the scale's linguistic validity as appropriate.

After the necessary ethical committee approval from the Ethics Committee of Izmir Bakırçay University (Date: 08.04.2022, Decision: 557 Research Number: 537), the data collection process was started. The data were collected online, based on voluntary participation, and anonymously. Participants were reached through Google forms and this online survey link was shared via social media platforms such as WhatsApp, Twitter, Instagram with an "invitation to the study" message. Before reaching the participants, the online forms were tested, and electronically examined by the researchers. In the study, it was made mandatory to fill in each question, so that there were no unanswered questions. Participants were not provided with the option to go back and change their answer in the scale set during the response process. The scale set consisting of 134-questions, is presented in 8 screens and takes approximately 25 minutes to complete. No reward or payment was given to individuals for their participation. In order to prevent a person from participating more than once, the scale set was limited to one response, and a cookie control was implemented for this purpose.

Measures

Demographic Information Form

Information on sociodemographic characteristics such as age, gender, educational level and socioeconomic status, employment, and relationship status were obtained through a form consisting of 11 questions created by the researchers. Additionally, characteristics related to participants such as whether the participants had any diagnosis in the category of nutrition and eating disorders, whether they were taking psychiatric medication, and whether they were currently receiving psychological support or dietitian support were also evaluated through this form.

Body Mass Index

Body mass index (weight [kg] / height [m2]) scores of the participants were calculated. Categories were established based on the classification provided by the World Health Organization, using the scores obtained from height and weight measurements (World Health Organization 2004). Accordingly, a body mass index score below 18.5 is underweight, 18.5-24.9 is normal, 25-29.9 is overweight, and 30 and above is obese.

The Grazing Questionnaire (GQ)

The scale developed by Lane and Szabo (2013) to assess grazing and consists of a total of 8 items, is in a 5-point Likert type (0= "Never", 4= "Always"). Five items of the scale comprise the grazing behavior subscale (e.g., "Do you find yourself constantly eating little by little or slowly?") and three items comprise the uncontrollability subscale (e.g., "Do you ever feel that you cannot stop snacking between meals?"). Higher scores on the scale indicate more severe grazing. The highest score that can be obtained from the scale is 32 while the lowest score is 0. In the exploratory factor analysis applied in the study in which the scale was developed, two factors explaining 64.50% of the total variance were obtained, and the internal consistency coefficient of the scale was found to be .82. The test-retest reliability values ranged between .62 and .71 ($p < .01$). Researchers (Lane and Szabo 2013) examined the validity of the scale by investigating its relation with maladaptive eating behaviors such as binge eating ($r = .67$, $p < .001$), emotional eating ($r = .51$, $p < .001$), chaotic eating ($r = .48$, $p < .001$) and night eating ($r = .39$, $p < .001$). Within the scope of the current study, the adaptation to Turkish, and reliability and validity study of The Grazing Questionnaire was conducted.

Binge Eating Scale (BES)

It was developed by Gormally and colleagues (1982) to identify binge eating. The scale consists of 16 items in total, with 8 items addressing emotions and cognitions related to binge eating (e.g., guilt, loss of control) and the other 8 items assessing binge eating behaviors (e.g., eating rapidly). Despite its two-factor structures, the scale is generally used as a single factor (Duarte et al. 2015). Indeed, in the Turkish adaptation study conducted by Tosyali and Harma (2021), a single-factor structure was obtained as well. The items consist of four statements ranging from normal eating to pathological eating, with only items 6th and 16th containing three statements. Scoring ranges from 0 to 3. High scores indicate that the severity level of binge eating is also high. The internal consistency coefficient of the scale was calculated as .85 in the original study (Gormally et al. 1982) and .83 in the Turkish adaptation study (Tosyali and Harma 2021). In the current study, the internal consistency coefficient was found to be .91.

Leahy Emotional Schemas Scale (LESS)

The scale developed by Leahy (2002) to assess beliefs about emotions and coping strategies with emotions consists of 50 items and includes 14 sub-dimensions. These sub-dimensions are listed as follows: validation,

uncontrollability, weakness against emotions, comprehensibility, avoidance from emotions, demand for rationality, acceptance of feelings, rumination, dissimilarity, denial of emotions, duration, consensus, seeing emotions as harmful and guilt. The response category of the scale is a 6-point Likert-type (1= "Not at all valid for me", 6= "Very valid for me") and items 5, 10, 12, 29, 33 and 50 are reverse scored due to their indication of functional/dysfunctional attitudes. Since the attitudes in each sub-dimension are not functional, a total score is not obtained from the scale, and the scores in the sub-dimensions are taken into account. The Turkish adaptation study of the scale was conducted by Yavuz and colleagues (2011), and the overall internal consistency coefficient of the entire scale was found to be .86. In terms of test-retest reliability in terms of sub-dimensions ranged from .31 (duration) to .70 (comprehensibility). In the current study, the overall scale internal consistency coefficient was calculated as .77. The internal consistency coefficients for ranged from .35 (guilt) to .85 (uncontrollability).

Control Question

To enhance the accuracy of the collected data and control the reliability of the participants' responses, a two-item control questions were created by the researchers (e.g., "This is an attention item. Please mark 5 (strongly agree) if you have read this item."; "Please mark 3 (disagree) on this item to show that your attention isn't distracted."). Participants who didn't provide the desired response to these items with a 5-point Likert-type response category (1= "Strongly disagree", 5= "Strongly agree") were excluded from the sample.

Statistical Analysis

Statistical analyses were calculated using SPSS (Statistical Package for Social Sciences) version 22. Confirmatory Factor Analysis was conducted using AMOS (Analysis of Moment Structures) version 22. According to the findings of the power analysis using G-Power (version 3.1.9.7), it was determined that, 115 people were needed for an analysis with $\alpha = 0.05$ and 95% power when conducting Pearson correlation analysis. According to the same program, in order to apply independent samples t-test, for $\alpha = 0.05$ and 95% power in the medium effect size, the sample should be formed with 176 people in total, at least 88 in each group. The overall sample size and the number of individuals in the groups in this study were higher than the findings from the G-Power analysis. In the adaptation study of The Grazing Questionnaire, initially, normality tests and skewness/ kurtosis analysis were conducted to determine whether the variables exhibited a normal distribution. Exploratory factor analysis was applied to determine whether the factor structure of The Grazing Questionnaire was consistent with the original scale. Confirmatory Factor Analysis was conducted to examine the goodness of fit levels of the factors obtained through this analysis. The reliability value was determined by calculating Cronbach's alpha coefficients and using the split-half technique. In this context, item-total correlations of the scale were also taken into consideration. Component validity was tested by applying Pearson Correlation Analysis with the data obtained from the Binge Eating Scale (BES), Leahy Emotional Schema Scale (LESS) and body mass index scores of the participants. Discriminant validity was evaluated by examining whether there were differences in grazing scores between two groups: one group with "a diagnosed with an eating disorder", "using psychiatric medication", "receiving psychological support or dietitian support", and another group "not diagnosed with any eating disorder", "not using psychiatric medication", "not receiving psychological support or dietitian support" using independent samples t-test analysis

Results

Exploratory Factor Analysis

In order to understand the factor structure of The Grazing Questionnaire (GQ) and to determine its conformity to the factor structure of the original scale, exploratory factor analysis (EFA) was conducted on 8 items using Varimax rotation with the data obtained from 181 participants. The suitability of the data for factor analysis was tested by conducting the Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett's Sphericity Test. According to Büyüköztürk (2002), in order for the data to be suitable for factor analysis, the KMO coefficient should be greater than .60 and the Bartlett's Sphericity Test value should be statistically significant. In line with these analyses, The Kaiser-Meyer-Olkin (KMO) sampling adequacy measure (.82) and Bartlett's Sphericity Test ($x2= 606.777$, $df= 28$, $p= .00$) showed that the data obtained were suitable for Principal Component Analysis (PCA).

A two-factor structure with an eigenvalue above 1 and explaining 63.40% of the variance was obtained as a result of the analysis. It was found that item 4 (Would you describe the way you generally eat as unplanned and repetitious (i.e. eating between planned meals and snacks?) loaded on both factors with similar factor loadings.

While Büyüköztürk (2002) recommends excluding overlapping items from the analysis because they may cause distortion in the factor structure by being associated with many factors simultaneously, the removal of these items in the process may result in a deficiency in the structure of the measured concept (Erkuş 2016). Additionally, the multidimensional nature of the overlapping item may be ignored (McDonald 1985). In addition, in the original form of the scale, the relevant item was loaded on the "grazing behaviors" factor. Therefore, it was decided to include item 4 in the factor of grazing behaviors in line with the original form of the scale and to ensure multidimensionality, although it showed overlapping characteristics. As seen in Table 2, eight items were found to have high and significant factor loadings.

Table 2. Sub-factors and factor loadings by items according to exploratory factor analysis

Items	**Factor 1 Uncontrollability Variance = %48.67**	**Factor 2 Grazing Behaviors Variance= %14.73**
Item 8	.90	
Item 7	.77	.38
Item 6	.75	
Item 3	.58	.37
Item 1		.82
Item 2		.81
Item 5		.65
Item 4	.51	.56

Extraction Method: Principal Component Analysis, Rotation Method: Varimax with Kaiser Normalization, Rotation converged in 3 iterations.

The first factor, with an eigenvalue of 3.89 and explaining 48.67% of the variance, was labeled as "uncontrollability". The second factor, with an eigenvalue of 1.18 and explaining 14.73% of the variance, was labeled as "grazing behaviors". When the item factor loadings across the scale are examined, it is seen that the factor loadings range between .56 and .90. This result indicates that the structure obtained is largely consistent with the original form of the scale. A statistically significant positive relationship was identified between the sub-dimensions of GQ, namely uncontrollability and grazing behaviors ($r= .62$, $p< .001$).

Confirmatory Factor Analysis

Confirmatory Factor Analysis (CFA) was conducted with the data obtained from 180 participants in order to determine whether the relationship between the factors and variables was sufficient level in the 2-factor structure achieved through EFA. The values obtained from CFA using the AMOS 22.0 Package Program show the goodness of fit levels of the data. In scale development and adaptation studies, the goodness of fit values frequently addressed include the Chi-Square Test (CMIN/DF), Goodness of Fit Index (GFI), Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA) (Kline 2005, Byrne 2016). Considering the threshold values recommended for the goodness of fit level of the CFA model, it is seen that CMIN/DF value below 2 is considered as good fit (Tabachnick and Fidell 2007), while a value between 2 and 3 is considered acceptable (Schermelleh-Engel et al. 2003). According to Rigdon (1996), values of Root Mean Residual (RMR) and RMSEA that are less than 0.08 indicate that the model demonstrates a good level of fit. Among the recommendations, the values for GFI (Shevlin and Miles 1998) and CFI (Bentler and Bonett 1980) typically have a threshold of .90 as an acceptable level and .95 is the perfect fit.

Table 3. Goodness of fit values obtained from confirmatory factor analysis

Model	**CMIN/DF**	**GFI**	**CFI**	**NFI**	**RMSEA**	**RMR**
Model 1 (raw data)	3.422	.91	.93	.91	.12	.11
Model 2 (e7-e8 modification)	2.742	.94	.95	.93	.10	.08
Model 3 (e1-e2 modification)	2.329	.95	.97	.94	.07	.06

The results of the Confirmatory Factor Analysis were as follows: $\chi 2/df = 3.422$, GFI = .91, CFI = .93, NFI = .91, RMSEA = .12 and RMR = .11. According to the results, although the 2-factor model demonstrated good fit, since it is acceptable for $\chi 2/df$ to be between 2 and 3 values (Schermelleh-Engel et al. 2003), modifications were made to improve the level of fit, and covariances were created between the error variances of the same factor. In this context, two modifications were performed. After the modification, $\chi 2/df$ was determined to be 2.329. Indeed, the fact that this value is close to 2 indicates that the model demonstrates a good fit (Tabachnick and Fidell 2007). Other goodness of fit indicators were GFI = .95, CFI = .97, NFI = .94, RMSEA = .07 and RMR = .06. The goodness of fit values of the model are presented in Table 3. The diagram of the two-factor structure of The Grazing Questionnaire (GQ) examined through CFA is provided in Figure 1.

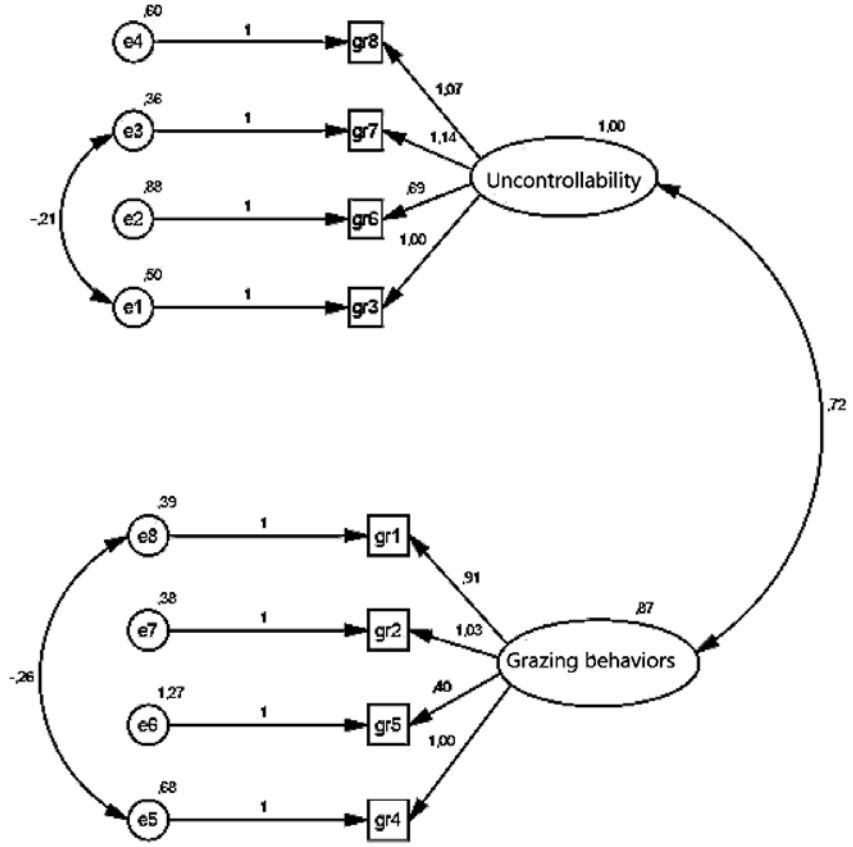

Figure 1. Diagram of the two-factor model tested through confirmatory factor analysis for The Grazing Questionnaire

Reliability Indicators

Cronbach's alpha coefficients (Kuder Richardson KR-20 for dichotomous data) were examined to determine the internal consistency of The Grazing Questionnaire. Accordingly, the internal consistency coefficient of the entire scale was found as .86. Additionally, the internal consistency coefficient of the uncontrollability sub-dimension was calculated as .83, and the grazing behaviors sub-dimension as .75. Considering the related values, it can be stated that the entire scale and sub-factors have a sufficient level of reliability. On the other hand, it was determined that the item-total correlations of the scale consisting of two factors ranged between .32 and .73. The central tendency indicators such as the means and standard deviation values of the items constituting GQ, corrected item-total correlations, and reliability values when an item is removed are presented in Table 4.

Another analysis carried out to test the reliability of the GQ is the split-half reliability method, in which the scale items are divided into two halves and the relationships between these two halves are examined (Schmitt 1996). With this analysis, it was determined whether the data exhibit random error. In this context, it was determined that the Sperman-Brown split-half correlation value was found to be .89 and the Guttman split-half value was determined to be .88.

Convergent Validity

When the correlations between the total score of the GQ and the BES were analyzed, a statistically significant and positive relationship was found (r= .60, p< .01). When the subscales of the GQ were evaluated, it was determined that the uncontrollability subscale (r= .67, p< .01) and the grazing behavior subscale (r= .39, p< .01) had a significant positive relationship with the BES. Similarly, a statistically significant positive correlation was found between the total score of the GQ and body mass index (r= .23, p<.01). When the subscales of the GQ and body mass index were examined; while the uncontrollability subscale (r= .30, p< .01) showed a statistically significant positive relationship with body mass index, no statistically significant relationship was found

between the grazing behavior subscale and body mass index. In the subsequent stage, the analysis was conducted separately for male and female participants to see correlational relationships based on gender differences. Accordingly, although a strong correlation was observed between the total score of the GQ and the BES in female participants (r= .63, p< .001) and male participants (r= .47, p< .001), an equally strong relationship was found between body mass index and the GQ for both genders (r= .26, p< .001).

Finally, the correlation between the sub-factors of emotional schemas and the total score of grazing style eating was examined. Accordingly, there are significant positive relationships between the total score of GQ and uncontrollability of emotions (r= .26, p< .001), weakness again emotions (r= .30, p< .001), demand for rationality (r= .13, p< .01), rumination (r= .29, p< .001), dissimilarity (r= .20, p< .001), seeing emotions as harmful (r= .27, p< .001) and guilt (r= .23, p< .001). On the other hand, grazing has a significant negative relationship with comprehensibility (r= -.24, p< .001).

Table 4. Descriptive statistics and reliability analysis of The Grazing Quesitonnaire

	$\bar{X}$	SD	Adjusted Item-Total Correlation	When item deleted α	Internal Consistency Coefficient
Grazing Behaviors					.75
1. Do you 'graze' between meals (i.e., repeatedly eating small quantities of food?)	2.40	1.09	.58	.84	
2. Do you eat more or less continuously throughout the day or during extended parts of the day (e.g., all afternoon)?)	1.94	1.22	.66	.83	
4. Would you describe the way you generally eat as unplanned and repetitious (i.e. eating between planned meals and snacks)?	1.86	1.26	.66	.83	
5. Do you find yourself picking at or nibbling food continuously?	1.57	1.19	.32	.87	
Uncontrollability					.83
3. Do you find yourself taking extra helpings or picking at extra food once you've finished your main meal?	1.67	1.21	.63	.83	
6. Have you ever felt that you were unable to stop 'grazing'?	1.48	1.98	.49	.85	
7. Have you ever felt that you were unable to stop 'grazing'?	1.56	1.30	.73	.83	
8. Do you have a feeling that you have lost control over your eating while 'grazing'?	1.54	1.32	.70	.82	

Discriminant Validity

To test the discriminant validity of the GQ, an independent samples t-test analysis was conducted between group 1 (N= 85) who had a diagnosis or receiving support, and group 2 (N= 276) who were without a diagnosis or not receiving support. According to the obtained results, there was a statistically significant difference in grazing scores between group 1, and group 2, t(359)= 3.28, p<.01. Participants in group 1 (M = 16.14, SD = 6.91) showed significantly higher level of grazing than participants in group 2 (M = 13.37, SD = 6.80). These results indicated that the GQ reveals differences between individuals in terms of grazing style eating.

Discussion

As a result of the exploratory factor analysis conducted to determine the factor structure of the scale, a 2-factor structure was reached, which was consistent with the original form. The factor structure was also consistent with the results of the study in which the scale was adapted to Italian culture (see Aloi et al. 2017). The first factor included cognitive appraisals related to perceived loss of control during eating (e.g., "Have you ever felt that you were unable to stop 'grazing'?"), while the second factor encompassed behavioral indicators of grazing, such as frequently eating (e.g., "Do you find yourself picking at or nibbling food continuously?"). In this regard, the factors obtained were labelled as "grazing behaviors" and "uncontrollability" both in the original form and the Italian form. In other words, the 2-factor structure in the original form of the scale was preserved for Turkish GQ, as well.

There are different approaches in the literature on whether grazing involves the experience of loss of control. For example, Reslan and colluagues (2014) didn't consider the feeling of loss of control as a component of grazing, whereas Saunders (2004) considered loss of control as a measure of grazing. Despite the ambiguities arising from different conceptualizations (Conceição et al. 2014a), the findings from the exploratory factor analysis suggested that the experience of loss of control is a factor of grazing. Furthermore, the uncontrollability factor contributed more to the total variance than the grazing behaviors factor, with an explanatory power of 48.67%. Therefore, the present study confirmed that the feeling of loss of control can be considered as a component of grazing. Nevertheless, due to conflicting approaches, it is considered that further studies involving different clinical and community-based samples are needed to determine the context in which the experience of loss of control will be grounded.

The findings suggest that grazing isn't only found in clinical samples such as binge eating (Masheb et al. 2011) or obesity (Mitchell et al. 2015), but also in healthy, young adults. Considering the studies in which The Grazing Questionnaire was used, it is observed that the scale provides reliable and valid results in individuals with obesity (Spirou et al. 2022), both in the original study (Lane and Szabo 2013) and in the Italian adaptation study (Aloi et al. 2017), the sample consisted of university students, and thus, grazing was examined in young adults who didn't show clinical features. Likewise, the current study was conducted in a community-based sample of young adults and the mean body mass index score of the participants was calculated as 23.80. Therefore, it was confirmed that grazing was observed in healthy, young individuals with a normal body mass index, and consistent results were obtained with the relevant literature. In line with this information, it is seen that the factor structure of the two-factor The Grazing Questionnaire was maintained in different samples.

Results showed that there were overlapping items (3, 4 and 7) loading on both factors oog the GQ. In exploratory factor analysis, it is expected that items loading on multiple factors should Show a difference of at least .10 between the two load values (Büyüköztürk 2002). There are also different approaches to this value. For instance, there are suggestions that there should be a difference value of .15 (Can 2016) or .20 (Seçer 2015) between the factor loadings in order to distinguish the overlapping item. In the current study, the difference values for overlapping items was calculated as .31 (item 3) and .39 (item 7). Considering the suggestions regarding the difference scores, the relevant items were not removed from the scale; instead, they were included in the factor to which they showed the highest loading. However, for item 4 (Would you describe the way you generally eat as unplanned and repetitious (i.e. eating between planned meals and snacks)?) it was found that its loading on both factors was not significant in that the loading was less than .10. Therefore, it was observed that the relevant item had a lower impact value in terms of providing a unique structure in grazing compared to the other items. Despite showing cross-loading, the item was not excluded from the scale to maintain the original factor structure and to preserve multidimensionality. Instead, considering the original factor structure, it was decided that item 4 would be remained in the grazing behavior factor.

The internal consistency reliability of The Grazing Questionnaire was examined using Cronbach's alpha coefficient and the split-half method. The Cronbach's alpha coefficients for internal consistency were found to be .83 for uncontrollability and .75 for grazing behaviors. This value was .86 for the whole the scale. The results obtained through the split-half method yielded Sperman-Brown correlation value of .89 and Guttman value of .88. When reviewing the relevant literature, it is observed that the reliability of a measurement tool is handled with values of .70 and above (Gliem and Gliem 2003). In line with the findings, it can be stated that The Grazing Questionnaire demonstrated a high level of internal consistency in the Turkish sample. These values were similar to the original form of the scale (Lane and Szabo 2013) and to the results of studies involving different cultures (e.g., Italian version; Aloi et al. 2017) and different samples (e.g., obese individuals; Spirou et al. 2022).

As expected, while there were moderately significant correlations between the BES, which measures a similar construct to grazing style eating (i.e., loss of control over-eating), and the total score and uncontrollability subscale scores of the GQ. However, there was a lower correlational relation between grazing behaviors and binge eating. The result suggested that the experience of loss of control is valid to both types of disordered eating, and at the behavioral level, grazing and binge eating are less similar. On the other hand, the relatively low-level association of the grazing behavior subscale with binge eating, despite being present to some extent, suggested that the shared feature in both types of disordered eating isn't only the loss of control over eating acquisition (Lane and Szabo 2013). Therefore, the results demonstrated the convergent validity of the GQ. Similarly, while a low-level relationship was found between body mass index and the total score and the uncontrollability subscale of the GQ, no significant relationship was found between grazing behavior and body mass index. Accordingly, as body mass index increases, both grazing and loss of control during eating occurred more frequently. This result is consistent with many studies in the literature (e.g., Conceiçao et al. 2017b,

Heriseanu et al. 2019a, Heriseanu et al. 2019b, Teodoro et al. 2021). In these studies, the association of body mass index with only grazing accompanied by loss of control supports that the loss of control component rather than grazing behaviors can be considered as a more important indicator in terms of eating psychopathology (Teodoro et al. 2021, Spirou et al. 2022).

Individuals who are grazing report higher levels of depression and anxiety (Goodpaster et al. 2016, Micanti et al. 2017), and it is suggested that similar to binge eating, grazing is performed to regulate negative mood (Deaver et al. 2003). In line with this, in the current study, significant relationships were found between beliefs about functional and dysfunctional emotions and total grazing scores, uncontrollability and grazing behaviors. As expected, an increase in functional appraisals of emotions and coping strategies were associated with a decrease in the frequency of grazing, grazing behaviors, and loss of control, whereas dysfunctional handling of emotions was associated with higher levels of grazing symptoms, more grazing behaviors, and more frequent experiences of loss of control during eating episodes. Therefore, it is important to examine in detail whether grazing plays a regulatory role in the face of emotional experiences, like binge eating, and to determine the context in which it occurs.

As a result of the analysis conducted within the scope of discriminant validity, it was found that grazing was less common in individuals without a diagnosis of eating disorders, who don't receive psychological, psychiatric or dietitian support. Indeed, a systematic review conducted by Teodoro and colleagues (2021) concluded that grazing was more common in the clinical sample. However, it is acknowledged that there are limitations in evaluating this disordered eating in terms of diagnostic groups and problem areas. Therefore, it is believed that further advanced studies are needed in this regard.

Although the results of current study support that the Turkish version of The Grazing Questionnaire is a reliable and valid measurement tool, there are some limitations. The study's sample consisted of individuals aged 18-30, driven by factors such as the acceptance of emerging adulthood as the age of onset for eating disorders (Solmi et al. 2022) and the fact that binge eating is most common seen in the 20-29 age range (Bertoli et al. 2016). Since it was aimed to conduct an exploratory investigation into disordered eating behaviors, individuals under the age of 18 and over the age of 30 were excluded from the study. Therefore, including different age groups in future studies is considered beneficial for the generalizability of the scale and the findings obtained.

While the fact that the study was community-based is considered as a strength feature of the study in order to prevent similarities among the participants; examining the sample characteristics reveals a limitation in the predominantly female composition of the participants. In this regard, it is believed that examining into different sample groups will enhance the understanding of grazing. Another limitation regarding the sample of the study is associated with the groups created for the purpose of determine the discriminant validity. In the current study, group 1 consisted of participants who reported having an eating disorder diagnosis or receiving psychological, psychiatric or dietitian support. The fact that this group was formed based on self-report suggests that a clinical comparison was not conducted. Therefore, studies comparing a clinical group of individuals with eating disorders and a community-based group seem to be necessary to determine the discriminative power of the scale. It is believed that examining grazing in clinical groups in future studies will contribute to addressing this issue.

The inclusion of two control questions in the scale set and the exclusion of participants who did not provide the expected responses to the relevant items were useful in terms of preventing some shortcomings such as arbitrary responses to the items observed in the online data collection process. However, the use of self-report measurement tools can be considered as a limitation. To address this limitation, it may be recommended to use the ecological momentary assessment method in future studies. In this way, grazing-style eating behavior can be determined instantaneously and the factors that precede grazing can be determined. From a methodological perspective, the study is limited by not examining test-retest reliability. Addressing the consistency of the scale over time with the test-retest method may provide insight into potential variations in results over time.

Conclusion

Bringing The Grazing Questionnaire, which is frequently discussed in the international literature, into the national literature adds unique value to the study and provides a conceptual framework for grazing. The findings of the current study demonstrate that the Turkish version of The Grazing Questionnaire is a valid and reliable measurement tool for examining individuals' grazing behaviors and the sense of loss of control during the eating in a community-based sample. It is believed that psychologists and psychiatrists working in the field of disordered eating behavior can benefit from this scale as a reliable and valid measurement tool for grazing behavior. It can be utilized for pre-assessment and post-assessment, especially to identify the differentiating

characteristics in interventions for obesity and binge eating. The scale may also prove valuable in weight control studies and assessing response to treatment.

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Addendum. The Grazing Questionnaire (GQ) (Turkish version)

Lütfen yeme davranışınızı en iyi ifade eden seçeneği işaretleyiniz.					
	Asla 0	**Nadiren 1**	**Bazen 2**	**Çoğu Zaman 3**	**Her Zaman 4**
1. Öğünler arasında bir şeyler atıştırır mısınız (örn. tekrarlayan biçimde az miktarda yiyecek yemek gibi)?					
2. Gün boyunca veya günün geniş bir kısmında (örn. tüm öğleden sonra gibi) az veya çok miktarda sürekli bir şeyler yer misiniz?					
3. Ana yemeğinizi bitirdiğinizde kendinizi ekstra porsiyonlar alırken ya da ekstra yemek seçerken bulur musunuz?					
4. Genel olarak yemek yeme düzeninizi plansız ve tekrarlayıcı olarak (örn. planlanmış öğünlerin ve ara öğünlerin arasında yemek yeme gibi) değerlendirir misiniz?					
5. Kendinizi sürekli olarak az az ya da ağır ağır yemek yerken bulur musunuz?					
6. Hiç aç olmasanız bile yemek yemeye zorlanmış hisseder misiniz?					
7. Hiç öğünler arasında bir şeyler atıştırmayı durduramadığınızı hisseder misiniz?					
8. Öğünler arasında bir şeyler atıştırırken yeme davranışınızın kontrolünü kaybettiğinizi hisseder misiniz?					