Scale Development Study: Hedonistic Eating Scale

Ölçek Geliştirme Çalışması: Hedonistik Yeme Ölçeği

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ABSTRACT

Aim: Obesity is a condition where genetic, behavioral and environmental factors are found together. The study was performed in order to develop the "Hedonistic Eating Scale (HES)" for the determination of the hedonistic eating habits levels of individuals with obesity.

Methods: The study was performed with a methodological design. The study was carried out in Gaziantep University Hospital's obesity outpatient clinic between April and June 2018. Context, structural, criterion validity and internal con-sistency reliability and test-retest validity-reliability analysis were performed. The sta-tistical meaningfulness level in all tests was determined as p<0.05.

Results: As a result of context validity, factor analysis and item analysis, a 15 item scale with one component was obtained. In the scale, the variance amount explained by the one component was on good level (68.02%). The fact that all of the Cronbach alpha, Spearman-Brown and Guttman internal consistency coefficient of the scale are above 0.70. When the test retest reliability coefficients of the whole scale were examined, the scale was found to present consistent results in different applications and the scale was found to be reliable with regard to the constancy coefficient.

Conclusion: The "Hedonistic Eating Scale (HES)", which was just added to litera-ture, is a valid and reliable tool that can be used to evaluate hedonistic eating habits levels in individuals with obesity.

Key Words: Scale Development,Hedonistic,Eating,Validity

ÖZ

Amaç: Obezite genetik, davranışsal ve çevresel faktörlerin bir arada yer aldığı bir durumdur. Bu çalışmada, obez bireylerde hedonistik yeme alışkanlığı düzeylerinin belirlenmesi için "Hedonistik Yeme Ölçeği (HES)"nin geliştirilmesi amaçlandı.

Yöntem: Bu çalışma metodolojik bir tasarım ile gerçekleştirildi. Çalışma, Nisan-Haziran 2018 tarihleri arasında Gaziantep Üniversitesi Hastanesi Obezite Polikliniğinde yürütüldü. Geçerlik ve güvenirlik çalışmasına yönelik yapılan istatistiksel analizler; kapsam geçerliği, yapı geçerliği (faktör analizi), madde analizi, iç tutarlılık analizi (Cronbach Alfa), iki yarı test güvenirliği, zamana göre değişmezlik analizidir. Tüm testlerde istatistiksel anlamlılık değeri p<0.05 olarak belirlendi.

Bulgular: Kapsam geçerliği, faktör analizi ve madde analizi sonucunda tek bileşenli (tek boyutlu) 15 maddeli ölçek elde edildi. Ölçekte, bu tek alt boyut tarafından açıkla-nan varyans miktarı iyi seviyedeydi (%68.02). Ölçeğin tümü ve alt boyutları için Cron-bach alfa, Spearman-Brown ve Guttman iç tutarlılık katsayılarının 0.70'in üzerinde olması, ölçeğin 15 maddelik son halinin, birbirleri ile yüksek ilişki gösteren ve birbirleri ile tutarlı olan maddelerden oluştuğunu ve güvenilir olduğunu göstermektedir.

Sonuç: Literatüre yeni kazandırılan "Hedonistik Yeme Ölçeği (HES)", obez bireylerde hedonistik yeme alışkanlığı düzeyini değerlendirmek için kullanılabilecek geçerli ve güvenilir bir araçtır.

Anahtar kelimeler: Ölçek Geliştirme, Hedonistik, Yeme, Geçerlilik

INTRODUCTION

Advances in science and technology and in economic development lead to a reduction in health problems related to malnutrition while also causing problems related to excessive nutrition and excessive energy intake [1]. According to the Turkish obesity profile study, the total prevalence of obesity was 34.3%, 16.9% in males and 48.4% in females [2]. In parallel with the world, obesity is also an important public health problem in our country. Excess weight and obesity ranks fifth in global mortality risks [1].

Obesity is a condition where genetic, behavioral and environmental factors are involved together [3]. Saper and his colleagues (2002) defined that eating behavior was regulated by two different systems, homostatics and hedonics [4]. Hedonism is an opinion of philosophy that claims that the meaning of life is pleasure and enjoyment. According to this view, consumption of delicious foods as a result of pleasure increases the desire to eat. The increase in food consumption in relation to the increasing prevalence of obesity worldwide is associated not only with energy needs or hunger but also with the intake of food [5]. Therefore, it is important to establish a balanced relationship between the modern obesity lifestyle and nutritional consumption.

When the literature was examined, even though scales that measure eating habits in various fields were found [5-8], a measurement tool specifically designed to determine the general level of hedonistic eating habits could not be found. For this reason, we decided to develop the "Hedonistic Eating Scale (HES)".

METHODS

The study was performed in order to develop the "Hedonistic Eating Scale (HES)" for the determination of hedonistic eating habit levels of individuals with obesity. It was of methodological design performed in Gaziantep University Hospital's obesity outpatient clinic between April and June 2018. The universe of the study consisted of all individuals presenting with obesity diseases at the outpatient clinic. In order to develop a meaningful and reliable measurement tool, the number of patients the scale was applied to had to be at least five times the item number of the scale [9], and it has been suggested that 5 to 10 people for every scale item should be included [10]. The sample consisted of 270 patients who agreed to take part in the study and who met the inclusion criteria. Criteria for inclusion were: being diagnosed medically with obesity at least 3 months previously, having no communication issues, being able to answer all of the questions and agreeing to participate.

The study was conducted in order to answer the following research questions:

Is the "Hedonistic Eating Scale (HES)" a valid scale in determining the hedonistic eating habit level?

Is the "Hedonistic Eating Scale (HES)" a reliable scale in determining the hedonistic eating habit level?

Data for the study was collected using the "Hedonistic Eating Scale (HES)". The "Hedonistic Eating Scale (HES)" was developed in order to measure the hedonistic eating habit levels of individuals with obesity. In obese individuals, psychological and behavioral factors accelerate the development of obesity with a vicious cycle and make the healing process difficult. It is important for these individuals to take a multi-factor approach in the treatment process and determine the cause of the problem. Knowing the hedonistic eating habits of obesity patients can guide treatment, care, education and counseling planning. Thus, we decided to develop this scale.

In the development process of the Hedonistic Eating Scale, firstly, scale questions were prepared according to the literature and the experiences of the researchers. Subsequently, an item pool study was performed for the Hedonistic Eating Scale. Forty item pools were created. The questions prepared were presented to the opinions of a Turkish language expert.

The Hedonistic Eating Scale is a 5 way likert type scale. Scaling is done by scoring 1= I Don't agree at all, 2= I don't agree, 3=Indecisive, 4=I agree and 5= I totally agree. The negative items on the scale are items 7, 8, 11, 16, 18, 27, 29, 33, 38 and 39. Negative terms are scored as 1=5, 2= 4, 3=3, 4=2, 5=1. When calculating scale scores, the scale total score is taken and the scale score is

obtained by dividing this score by the number of items. The hedonistic eating habit increases with increasing scale scores.

After necessary permissions and approvals were obtained the study was initiated in the relevant hospital. Patients were first explained the aim, application style and expectations related to the study and then included in the study. The study data were collected by the researchers through face-to-face interviews with the patients. The data collection process took 15 to 20 minutes for each individual. The test retest application was performed with a twenty day interval.

Data evaluation was performed using the SPSS (Statistical Package for Social Science) version 21.0 program. Validity and reliability analysis used include;

Context Validity: A context validity test was performed in order to determine whether the Hedonistic Eating Scale (HES) was appropriate for the characteristic to be measured, whether the measurement was made according to the rules and whether the measurement data reflected the characteristic to be measured. For context validity the 40 item draft scale was presented to the views of 10 experts who was nurse instructors and scale development specialists. Through the Expert Evaluation Form, the experts were asked to state their views on each item as "appropriate", "partially appropriate" or "not appropriate" and make suggestions.

Factor Analysis: Factor analysis, which was performed to determine structure validity, is essentially grouping a number of variables under a title. The factor load of each term should be >40 in factor analysis [11]. The sufficiency of the sample is decided by checking the Kaiser-Meyer-Olkin (KMO) value. KMO values are evaluated as perfect when between 0.90 and 1.00, very good between 0.80 and 0.89, good between 0.70 and 0.79, medium between 0.60 and 0.69, weak between 0.50 and 0.59 and unacceptable under 0.50 [12]. Bartlett's test is said to show whether the items in a scale are appropriate for factor analysis.9 In single component scales, the stated variance rate is expected to be at least 30%, while this number is higher in multi component scales [10].

Item Analysis: The aim in this method, which is also known as item reliability, is to evaluate the contributions of each item to the scale and to determine how related each item is to the whole of the scale. In item selection, the level of item total score correlations is an important criterion. The item total score correlation coefficient is accepted as at least 0.25. Items between 0.30 and 0.40 are stated to be "good" while items above 0.40 are stated to be discriminative on a "very good" level and thus, reliable. The reliabilities of items increase with increasing correlation coefficients [13].

Internal consistency analysis (Cronbach Alpha): In order to examine internal consistency between test scores, Cronbach Alpha reliability was calculated in the case of scale items having three or more answers. The reliability coefficient being 0.70 or above is sufficient for the reliability of test scores [10].

Split half test reliability: "Spearman-Brown correlation value and the Guttman Split-Half value". Reliability determination processes performed by splitting data collected by a measurement tool into two pieces of equal value and comparing the scores in these halves are called split half reliability tests. The more consistent the scores obtained from these two halves, the more reliable the measurement tool is [14].

Time constancy analysis: Test retest reliability analysis performed in order to demonstrate time constancy is applying the same scale under the same conditions to the same group with a certain time interval and checking the relationship between the measurements through the Pearson moments multiplication correlation coefficient method. In this test, it is suggested to have at least two and at most six weeks between the first and second test and to perform the test with at least 30 people. The obtained coefficient is accepted as the constancy indicator of the scale scores and is expected to be at least 0.70 [15].

Ethical Aspect: In the progression of the study, scientific principles as well as the ethical principles of the Helsinki Declaration were held. In this context, the principles of informed consent, autonomy, secrecy and the protection of secrecy, fairness and no harm were taken into consideration. Necessary written permissions from the necessary

institutions were obtained. In order to conduct the study, written permission and approval of the Ethics Committee were received. Ethics Committee approval (Osmaniye Korkut Ata University Scientific Research and publication ethics committee, 27.02.2018-2018/3/2) was received. Before the application, patients were explained the aim, plan and benefits of the study. Informed consent was obtained from the patients.

RESULTS

Validity Analysis

The validity of the scale was evaluated using the content (scope) validity and structure validity.

For the validity of the scale, necessary corrections were made in accordance with the recommendations of the Turkish language expert's opinion.

Context Validity: The views of 10 experts were obtained for the context validity of the scale. Through the Expert Evaluation Form, the experts were asked to state their views on each item as "appropriate", "partially appropriate" or "not appropriate" and make suggestions. In the evaluation of the answers from the experts, the Context Validity Rates (CVR) for each item were calculated with the Lawshe technique, and these were compared to the Minimum Context Validity Rates. CVR=the number of experts who found the item necessary / (the total number of experts/2)-1). After the calculation, the scope validity ratio of no matter remained below 0.62. As a result, we continued to work with a draft scale of 40 items. Additionally, some items were corrected according to expert views.

Structure validity

The Kaiser Meyer Olkin (KMO) value of the scale was found to be 0.936 and its Barlett test result was 4216.885 (p<0.000).

In exploratory factor analysis, the eigenvalue was taken as 1.00, and one sub-component was determined. The plot regarding factor eigenvalue can be seen in Figure 1.

When the plot regarding factor (sub-component) was examined, a breaking point could be seen in the one factor and a rapid decline is seen in the plot after this point. For this reason, the number of

factors in the scale was limited to one. The variance rates explained by the component of the scale as a result of factor analysis are given in Table 1.

The variance rate explained by the first factor with an eigenvalue of 10.20 was 68.02. The total variance explained was 68.02 (Table 1).
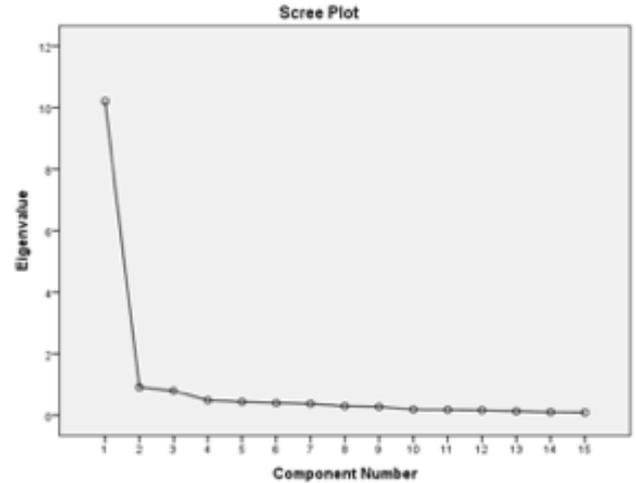

Figure 1. Plot regarding the sub components of the Hedonistic Eating Scale (HES)

Table 1. The variance rates explained by the sub components of the scale

	Initial eigenvalues		
Components	Total	Variance(%)	Cumulative (%)
1. component	10.20	68.02	68.02

When the first results of the exploratory factor analysis were examined, the factor load values of 18 items were beneath 0.40. The other 22 items were collected in one component (m1, m2, m3, m5, m6, m7 m8, m9, m10, m11, m14, m16, m17, m19, m27, m27 m28, m30, m31, m33, m38, m39). As a result of the analysis, the Hedonistic Eating Scale, which consists of one component and 22 items, was formed (Table 2).

The factor loads of the items in the one component varied between 0.412 and 0.907 (Table 2).

Reliability Analysis

In order to evaluate the reliability of the scale, item analysis, Cronbach Alpha coefficient, Spearman-Brown, Guttman and test-retest correlations were used in this study.

Item analysis, Cronbach Alpha, Spearman-Brown,

Guttman Internal Consistency Coefficients: When the item total score correlations of the 22 items were examined for the reliability study of the Hedonistic Eating Scale, the correlation coefficients of 15 items were seen to vary between r=0.698 and r=0.866, and the items were found to have a positive and statistically advanced relationship (p<0.001). The remaining 7 items (m16, m17, m19, m27, m28, m38, m39) were found to have correlation coefficients beneath 0.25, despite statistically meaningful reliability coefficients, and were removed from the scale (Table 3).

Table 2. Factor Loads Of The Hedonistic Eating Scale (n:270)

Item No	1. component	Item No	1. component
I. 1	,830	I. 21	*
I. 2	,812	I. 22	*
I. 3	,842	I. 23	*
I. 4	*	I. 24	,782
I. 5	,837	I. 25	*
I. 6	,832	I. 26	*
I. 7	,907	I. 27	,501
I. 8	,874	I. 28	,520
I. 9	,860	I. 29	*
I. 10	,834	I. 30	,757
I. 11	,861	I. 31	,822
I. 12	*	I. 32	*
I. 13	*	I. 33	,808
I. 14	,691	I. 34	*
I. 15	*	I. 35	*
I. 16	,432	I. 36	*
I. 17	,456	I. 37	*
I. 18	*	I. 38	,422
I. 19	,478	I. 39	,412
I. 20	*	I. 40	*

The Cronbach Alpha internal consistency coefficient of the scale was 0.968. The Spearman-Brown and Guttman internal consistency coefficients of the scale, found by splitting the scale into two halves, were 0.953 and 0.948, respectively (Table 3).

Time Constancy Analysis

For the test retest reliability analysis of the 15 item Hedonistic Eating Scale, it was applied to 30 obese individuals with an interval of 20 days. A positive, strong and statistically advanced relationship between the scores of the two measurements was found (p<0.001).

DISCUSSION

Table 3. Item analysis results of the Hedonistic Eating Scale (n=270)

Item no	Item Total	Cronbach alpha if item deleted
I.1	,803	,965
I.2	,787	,966
I.3	,812	,965
I.5	,818	,965
I.6	,797	,966
I.7	,866	,965
I.8	,830	,965
I.9	,816	,965
I.10	,808	,965
I.11	,823	,965
I.14	,698	,967
I.16	*	*
I.17	*	*
I.19	*	*
I.24	,758	,966
I.27	*	*
I.28	*	*
I.30	,739	,966
I.31	,775	,966
I.33	,766	,966
I.38	*	*
I.39	*	*
Internal Consistency Coefficients	Cronbach alfa 0.968 Spearman-Brown* 0.953 Guttman* 0.948	

* p< 0.01   **p<0.001

When the literature was examined, there was no measurement tool to measure the level of hedonistic eating habits. however, there were some scales developed with regard to eating. These scales were; The Emotional Eating Scale (EES), developed by Arnow et al. (1995) was composed of three sub-dimensions. Tylka and Kroon Van Diest (2013) developed and validated the Intuitive Eating Scale-2 (IES-2). Developed by Timmerman (1999) Bange Eating scale. Latner et al. (2014) developed by The Loss of Control Over Eating Scale. Developed by Gearhardt et al. (2014) the Yale Food Addiction Scale is a measure that has been developed to identify those who are most likely to be exhibiting markers of substance dependence with the consumption of high fat/high sugar foods.

When considered as a social feature or personal

feature, it is important to focus on hedonistic eating habits in the development of obesity. we thought to develop this scale in order to contribute to the studies carried out in both society and obese individuals in a different way. The process of developing the hedonistic eating scale we developed is as follows;

Context Validity: The 40 item draft scale was presented to the views of 10 experts for context validity. According to the views stated by the experts regarding the items, the minimum value of the context validity rates of the items corresponded to 0.62 in the table formed by Veneziano and Hooper (1997). According to the Lawshe technique, items with lower than 0.62 CVR should be excluded from the scale. As a result, the scope validity ratio of no matter remained below 0.62.

Factor analysis: The remaining 40 item scale was applied to 270 obesity patients and factor analysis was performed. As a result of exploratory factor analysis, the factor load values of 18 items were beneath 0.40. The other 22 items were collected in one component.

Item analysis: For the reliability study of the Hedonistic Eating Scale, the item - total score correlations of the 15 items were examined and 7 items were removed from the scale because of correlation values beneath 0.25 and the 15 item Hedonistic Eating Scale was formed.

Internal consistency analysis: The fact that all of the Cronbach alpha, Spearman-Brown and Guttman internal consistency coefficients of the scale and all of its sub-components are above 0.70 shows that the final 15 item form of the scale is reliable and formed of items that are highly correlated and consistent.

Time constancy analysis: When the test retest reliability coefficients of the whole scale and its sub-components were examined, the scale was found to present consistent results in different applications and the scale was found to be reliable with regard to the constancy coefficient.

CONCLUSION

In conclusion, the final scale of 15 items measures the level of hedonistic eating habits. All items are rated normally. The score from the scale is between 15-75. The higher the score, the higher the level of hedonistic eating habits.

The Hedonistic Eating Scale, which was just added to the literature, is a valid and reliable tool that can be used to evaluate the level of hedonistic eating habits in individuals with obesity. We think that studies being performed to use and test this scale in wider sample groups and in samples with different chronic illnesses may contribute significantly to the literature.

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