BANDIRMA ONYEDİ EYLÜL ÜNİVERSİTESİ SAĞLIK BİLİMLERİ VE ARAŞTIRMALARI DERGİSİ
BANU Journal of Health Science and Research

Özgün Araştırma / Original Research

Hedonic Eating Scale for Adolescents (HES-A): Development, Factor Structure, Validity and Reliability for Adolescents*
Adolesanlar için Hedonik Yeme Ölçeği (AHYÖ): Adolesanlar için Geliştirilmesi, Faktör Yapısı, Geçerlik ve Güvenilirliği

Buse ÇEVİKER [1] iD   **Hande ÖNGÜN YILMAZ** [2] iD   **Duygu AYDIN HAKLI** [3] iD

[1]MSc. Dietitian, Bursa

[2]Assoc. Prof., Bandırma Onyedi Eylül University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Balıkesir

[3]Assis. Prof., Istanbul Arel University Faculty of Medicine, Department of Basic Medical Sciences, Department of Biostatistics, İstanbul

Sorumlu yazar / Corresponding author

Hande ÖNGÜN YILMAZ

handeongunyilmaz@gmail.com

ABSTRACT

Aim: Due to the need for a measurement tool that can be used to detect hedonic eating in adolescence, the aim of this research is to develop the Hedonic Eating Scale for Adolescents and examine its factor structure, validity, and reliability.

Material and Method: After Hedonic Eating Scale for Adolescents was created, the research was conducted with the participation of 324 volunteer adolescents. Information form, Hedonic Eating Scale for Adolescents, the Yale Food Addiction Scale, and the Turkish Palatable Eating Motives Scale were used as data collection tools.

Results: As a result of the Explanatory Factor Analysis, Hedonic Eating Scale for Adolescents items were collected under two factors as "Eating Pleasure" and "Controlled Eating". Confirmatory Factor Analysis results showed that the fit indices were at an acceptable level. Cronbach's alpha value of Hedonic Eating Scale for Adolescents is 0.943. The moderate positive correlations between Hedonic Eating Scale for Adolescents and the Yale Food Addiction Scale, and the Turkish Palatable Eating Motives Scale (r=0.474 and r=0.540; p<0.001, respectively) supported concurrent validity.

Conclusion: This research indicates that Hedonic Eating Scale for Adolescents is an acceptable, valid, and reliable scale that can be used in future studies to determine the hedonic eating status of adolescents.

Keywords: Adolescent, Factor analysis, Hedonic eating, Scale development

ÖZET

Amaç: Adolesan dönemde hedonik yemenin saptanması amacıyla kullanılabilecek bir ölçme aracına gereksinim olması nedeniyle bu araştırmada, Adolesanlar için Hedonik Yeme Ölçeği'nin geliştirilerek faktör yapısının, geçerlilik ve güvenilirliğinin incelenmesi amaçlanmıştır.

Gereç ve Yöntem: Adolesanlar için Hedonik Yeme Ölçeği oluşturulduktan sonra araştırma 324 gönüllü adolesanın katılımıyla gerçekleştirilmiştir. Veri toplama aracı olarak bilgi formu, Adolesanlar için Hedonik Yeme Ölçeği, Yale Yeme Bağımlılığı Ölçeği, Lezzetli Yeme Motivasyonları Ölçeği kullanılmıştır.

Bulgular: Açıklayıcı Faktör Analizi sonucunda Adolesanlar için Hedonik Yeme Ölçeği, "Yeme Hazzı" ve "Kontrollü Yeme" olmak üzere iki faktörde toplanmıştır. Doğrulayıcı Faktör Analizi sonuçları uyum indekslerinin kabul edilebilir düzeyde olduğunu göstermiştir. Adolesanlar için Hedonik Yeme Ölçeği'nin Cronbach alfa değeri 0.943 'tür. Adolesanlar için Hedonik Yeme Ölçeği ile Yale Yeme Bağımlılığı Ölçeği ve Lezzetli Yeme Motivasyonları Ölçeği arasındaki orta düzeyde pozitif ilişkiler (sırasıyla r=0.474 ve r=0.540; p<0.001) eş zamanlı geçerliği desteklemiştir.

Sonuç: Bu araştırma, Adolesanlar için Hedonik Yeme Ölçeği'nin adolesanların hedonik yeme durumlarının belirlenmesi için gelecekteki araştırmalarda kullanılabilecek kabul edilebilir, geçerli ve güvenilir bir ölçek olduğunu göstermektedir.

Anahtar Kelimeler: Adolesan, Faktör analizi, Hedonik yeme, Ölçek geliştirme

INTRODUCTION

Hunger; It is a complex process involving many metabolic and motivational factors, involving food-seeking and feeding actions (Yang, Liu, & Williams, 2015). People have an instinctive motivation to consume food to eliminate hunger (Lau, Cota, Cristino, & Borgland, 2017). Food intake and hunger are basically regulated through two different processes, homeostatic and hedonic. Hedonic hunger is defined as a psychological state associated with reward mechanisms characterized by an increase in appetite and a tendency to consume delicious food in line with the pleasure obtained from food, although there is no physiological need (Monteleone et al., 2013; Cushing et al., 2014; Aliasghari, Yaghin, & Mahdavi, 2019; Mason, Dunton, Gearhardt, & Leventhal, 2020). Hedonic eating; is governed by the neuroendocrine systems associated with the reward mechanism, in fasting and satiety metabolism (Monteleone et al., 2012; Burgess, Turan, Lokken, Morse, & Boggiano, 2014; Boggiano et al., 2015). It has been reported that hedonic eating is associated with an increased response to delicious foods in brain regions (Burger, Sanders, & Gilbert, 2016). Hedonic eating leads to negative health consequences such as unhealthy snacking, binge eating, eating without hunger, and obesity. Therefore, it is a key psychological reflection associated with eating disorders and obesity (Mason et al., 2020).

Nutritional behavior, shaped by environmental factors, is no longer a need today; It has turned into unconscious food consumption, emotional eating, and hedonic eating (Berthoud, 2011; Lau et al., 2017). The availability and widespread consumption of energy-dense foods and emotional fluctuations bring hedonic hunger along (Burgess et al., 2014).

Adolescence is an important period in which eating behaviors are affected by environmental factors, emotional state is at the forefront, and eating disorders, obesity, and eating habits in adulthood are laid (Bozkurt & Yıldıran, 2022). Due to the ongoing brain changes and development in adolescence, the reward impulse is high and the impulse control is low. For this reason, it is thought that hedonic eating in adolescence may be an important risk factor for obesity and maladaptive eating behaviors. Despite this situation, there are not enough studies in the literature investigating hedonic eating and related factors in adolescents. A better understanding of the determinants of hedonic eating in adolescents may enable us to focus on treatments aimed at preventing eating disorders and obesity during this critical period (Casey, Jones, & Hare, 2008; Mason et al., 2020).

As far as we know, there are two scales developed in recent years to determine hedonic hunger and its' affecting factors. The first of these scales is "The Power of Food Scale (PFS)", which has also been adapted into Turkish (Lowe et al., 2009; Ulker, Ayyildiz, & Yildiran, 2021). The second is the "Hedonistic Eating Scale" developed in Turkish by Atik, Neşe, & Yüce, (2019). In addition, although it does not directly detect hedonistic eating, there is a Palatable Eating Motives Scale (PEMS), which was developed to determine the reasons why individuals consume delicious foods and beverages (Boggiano, 2016), and has a Turkish version (And et al., 2018).

Scales developed to date have been developed to detect hedonic eating in adult samples, and there is no scale that can be used in the adolescent age group. On these grounds, the aim of the planned research was to develop the Hedonic Eating Scale for Adolescents (HES-A) and examine its factor structure, validity, and reliability. In accordance with this purpose, the hypotheses of the research are that the factor structure of the HES-A is formed and that it is suitable for the designed structure, that the fit indices are at an acceptable level, that the internal consistency coefficient is acceptably high, and that there is a positive correlation between the HES-A and the YFAS and T-PEMS.

MATERIAL and METHOD

Research Type

This research is a methodological study.

Place and Time

The research was carried out at three private schools (X, XX, and XXX Colleges) in Bursa, Turkey, between February 2021 and December 2021.

Population and Sample

The research was carried out with 324 volunteer adolescents aged 10-19, who are middle school and high school students at three private schools in Bursa, Turkey. The population of the study consisted of 785 adolescents, 91 from X College, 251 from XX College, and 443 from XXX

College, respectively. In the research, stratified sampling method was used according to the number of students in the schools. When the total number of adolescents studying in three schools (785) is taken as the universe, it was calculated that the sample of the research should be at least 259 people using the stratified simple random sampling method and 95% confidence interval, 5% margin of error using the "Raosoft Sample Size Calculator" program. With a stratum proportion of 259/785 = 0.329, the minimum sample size to be taken from the schools was calculated as 29, 83, and 146, respectively. In the research, 37 middle and high school students from X College, 104 from XX College, and 183 from XXX College volunteered to participate. The research was conducted with 324 volunteer adolescents who accepted the research. The criteria for inclusion in the research were determined as not having any chronic, metabolic or psychiatric diseases, not applying medical nutrition therapy, being between the ages of 10-19, and volunteering to participate in the research.

Research Process

Participants and their parents were informed about the purpose of the research via text messages and e-mail channels, and after the online parent consent form sent to the parents was approved, they were asked to fill in the online questionnaires under the supervision of the parents.

Deveolpment of the Hedonic Eating Scale for Adolescents (HES-A):

A comprehensive literature review on hedonic eating was first conducted by the researchers to create the items of the HES-A, which was developed to determine the hedonic eating status of adolescents. As a result of the literature review, a 70-item question pool was created that aims to measure hedonic hunger directly and indirectly. The pool of questions was evaluated by 2 experts in the field of nutrition and dietetics in terms of the suitability of the items. As a result of the evaluation, the scale was reduced to 36 questions. The 36-item version of the scale was evaluated by 9 experts in the field of nutrition and dietetics for content and appearance validity, the suitability of the items was scored, and content validity rates (CVR) were calculated. Since there were 9 experts who gave their opinions, the criterion for the inclusion of the scale questions in the research is that the calculated CVR values are above 0.75 (Ayre & Scally, 2014). 10 items that did not meet this criterion were removed from the scale and the

26-item version of HES-A was formed.

Data Collection Tools

The data of the research were collected with the information form developed by the researchers, Hedonic Eating Scale for Adolescents (HES-A), Yale Food Addiction Scale (YFAS), and Palatable Eating Motives Scale (T-PEMS).

Information Form: The information form developed by the researchers consists of questions containing age, gender, body weight and height information.

Hedonic Eating Scale for Adolescents (HES-A): The HES-A, developed as a measurement tool aimed at determining the hedonic eating status of individuals in the adolescent period, is a six-point Likert type created from the options "I definitely do not agree" to "I definitely agree". The items are evaluated on a scale of 1 to 6, based on the options "I definitely do not agree" to "I definitely agree". The items 6, 10, 17, 18, 19, and 22 of the scale are reverse scored because they contain negative statements about hedonic hunger. The total score that can be obtained from the scale is between 23 and 138. As the score of the scale increases, hedonic eating behavior increases. The Cronbach's alpha value of the scale is 0.943.

Yale Food Addiction Scale (YFAS): The scale was planned by Gearhardt, Corbin, & Brownell, (2009) in order to determine food addiction by converting seven symptoms of substance addiction into food addiction in DSM-IV. The Turkish validity and reliability study of the scale was conducted by Bayraktar, Erkman, & Kurtulus, (2012). The mixed scale consists of 27 items. The first 25 questions are likert type, and the 26th and 27th questions are partial-choice and open-ended questions that try to make sense of eating habits. The scale has two scoring methods. At least one of the symptoms must be present in order to meet the criteria for food addiction. In order to be diagnosed with food addiction, 3 or more of 7 diagnostic criteria must be met and clinical signs must be present in the last year. The Cronbach's alpha coefficient of the original scale is 0.90 (Gearhardt et al., 2009), while the Cronbach's alpha coefficient of the Turkish version is 0.93. (Bayraktar et al., 2012). For the sample of this research, the Cronbach's alpha value is 0.946.

Palatable Eating Motives Scale (T-PEMS): It is a 20-item scale developed by Burgess et al., (2014) to determine the reasons why individuals consume delicious foods and beverages. The

Turkish validity and reliability study of the T-PEMS scale was conducted by And et al., (2018). T-PEMS, which is evaluated with a 5-point Likert scale, includes 4 sub-factors: socialization, coping, reward development and adaptation motivations. The total score that can be obtained from the scale varies between 19 and 95. As the score obtained from the scale without a cut-off score increases, it is interpreted as an increase in the motivation to consume delicious foods (Boggiano, 2016). The Cronbach alpha coefficient of the sub-factors of the Turkish version ranges from 0.81 to 0.90 (And et al., 2018). For the sample of this research, the Cronbach alpha value is 0.954.

Ethical Consideration

Ethical approval was obtained from the İstanbul Okan University Ethics Committee (Date: 13.01.2021, and No: 131/9) in accordance with the Helsinki Declaration. Permission was obtained from the schools where the research was conducted. The research was carried out with adolescents who volunteered to participate in the research following the approval of the ethics committee and institutional permissions. Parent consent form was obtained from the families of the participants.

Data Analysis

IBM SPSS v24.0 and IBM SPSS AMOS v20.0 (IBM SPSS Inc., Chicago, IL, USA) package programs were used for statistical analysis. Scale scores were calculated and the normal distribution of the scores was examined with the Kolmogorov Smirnov test. The content validity of the HES-A was evaluated with the Content Validity Ratio (CVR) and the construct validity with Explanatory Factor Analysis (EFA). The Scree Plot graph showing the scattering of the eigenvalues was examined for the factor structure of the scale. In order to determine the distribution of the questions to the factors in the two-factor structure, the factor number was analyzed by varimax rotation as 2, and the distribution of the questions and factor loads were examined. Confirmatory Factor Analysis (CFA) was applied to test the accuracy of the structure revealed by EFA. Reliability levels of the scale were evaluated with Cronbach's alpha coefficient. Pearson Correlation Analysis was applied to examine the relationships of the scales with each other. All statistical analyzes were performed using $p < 0.05$.

RESULTS

A total of 324 adolescents, 147 (45.37%) boys and 177 (54.63%) girls, with a mean age of 15.1 ± 2.09 years, participated in the research. The mean body mass index (BMI) of adolescents is 21.54 ± 31.75 (M=21.80 ± 0.24; F=21.33 ± 0.25) kg/m2, and according to BMI Z-score classification by age, 2.47% (n=8) are obese, 17.60% (n=57) are overweight, 60.49% (n=196) are normal, 13.58% (n=44) are underweight, and 5.86% (n=19) are very underweight.

It has been concluded that the scale is suitable for factor analysis because the Kaiser-Meyer-Olkin (KMO) value is 0.926 and Bartlett's Sphericity Test statistic is significant (χ^2= 5989.72; p<0.001) (Table 1).

Factor Structure

Table 1. Factor Analysis of the Hedonic Eating Scale for Adolescents (HES-A)

| Items	Eating Pleasure (Factor 1)	Controlled Eating (Factor 2)
I-1	0.808	
I-2	0.779	
I-3	0.658	
I-4	0.677	
I-5	0.783	
I-6		0.658
I-7		0.526
I-8	0.716	
I-9	0.784	
I-10		0.730
I-11	0.843	
I-12	0.782	
I-13	0.835	
I-14	0.575	
I-15	0.768	
I-16	0.765	
I-17		0.793
I-18		0.623
I-19		0.773
I-20	0.777	
I-21	0.755	
I-22		0.720
I-23		0.556
Explained Variance	43.75	13.38
Cronbach's Alfa	0.951	0.849
Kaiser-Meyer-Olkin (KMO) test	0.926	
Bartlett test	5989.72 ; p<0.001	

Factor Structure

After conducting factor analysis on the 26-item version of the HES-A, three items with low factor loadings were removed from the scale. The Scree Plot graph, which shows the distribution of eigenvalues, was examined to determine the factor structure of the final scale consisting of 23 items, and it was decided that the scale had a two-factor structure. Analysis was conducted using the Varimax rotation method to determine the distribution and factor loadings of the items. Factor 1, named "Eating Pleasure", consists of 15 items with factor loadings ranging from 0.575 to 0.843 and explains 43.75% of the total variance. Factor 2, named "Controlled Eating", consists of 8 items with factor loadings ranging from 0.526 to 0.793 and explains 13.38% of the total variance. The analysis results for the factors of the HES-A are given in Table 1.

Validity

Confirmatory Factor Analysis (CFA)

The fit indices obtained for the HES-A through confirmatory factor analysis (CFA) are acceptable, with $\chi2/sd = 3.809$, RMSEA = 0.093, CFI = 0.877, GFI = 0.816, and AGFI = 0.769. The CFA path diagram for the HES-A is presented in Figure 1.
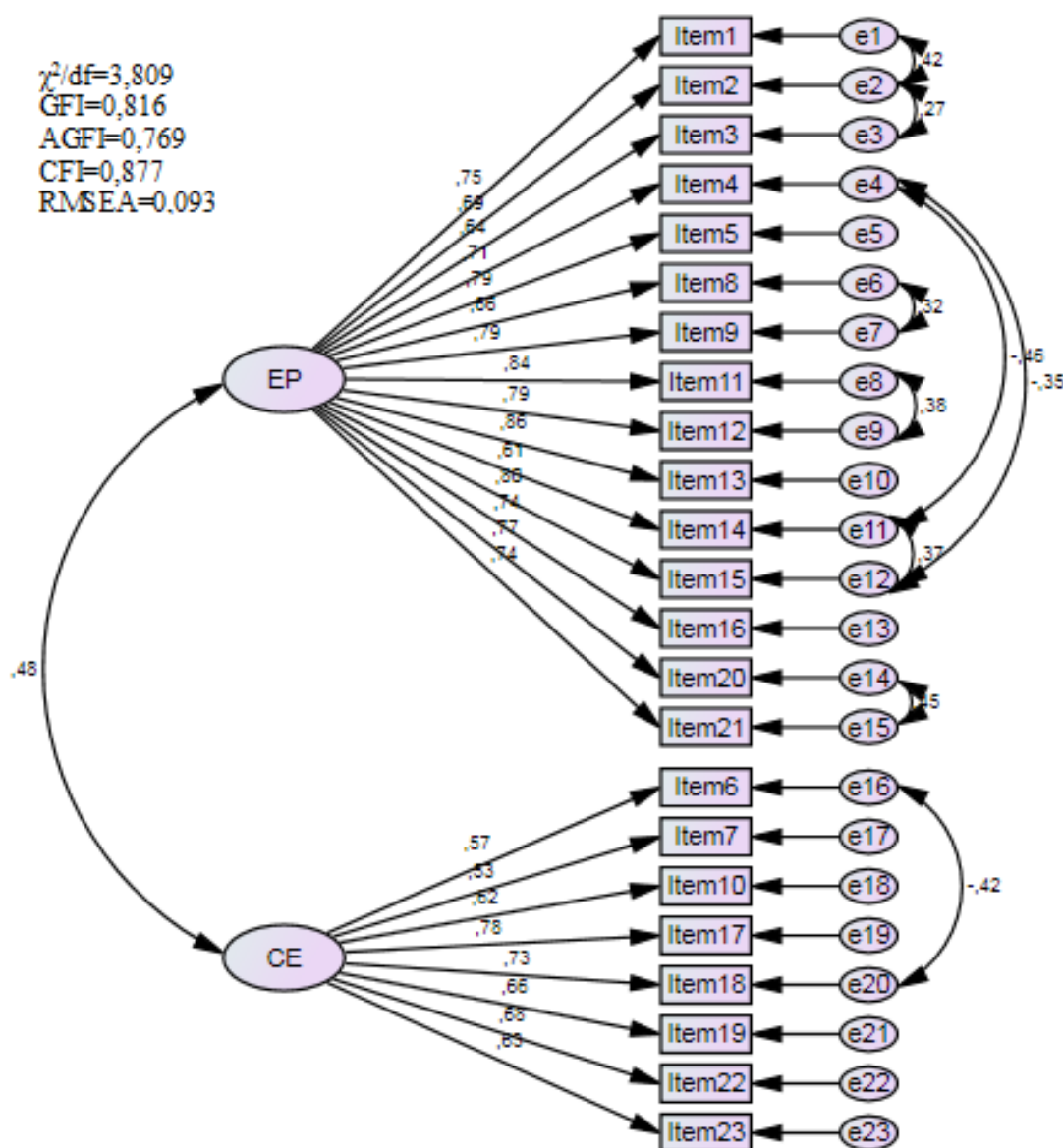
Note. $\chi2$ = Chi-Square test value; df= degrees of freedom; GFI= Goodness of fit index; AGFI= Adjusted Goodness of fit index; CFI = Comperative fit index; RMSEA = Root mean square error of approximation.

Figure 1. Confirmatory Factor Analysis Roadmap of the Hedonic Eating Scale for Adolescents (HES-A)

Concurrent Validity

Table 2 shows the relationships between HES-A and YFAS and T-PEMS. There was a moderate positive correlation between HES-A and YFAS (r=0.428; p<0.01) as well as T-PEMS (r=0.552; p<0.01). There was a strong positive correlation between YFAS and T-PEMS (r=0.682; p<0.01).

Table 2. The relationship of the Hedonic Eating Scale for Adolescents (HES-A) and its sub-factors with the Yale Food Addiction Scale (YFAS) and the Palatable Eating Motives Scale (T-PEMS) (n=324)

	x̄ ± SD	HES-A	EP	CE	YFAS	T-PEMS
HES-A	45.03 ± 18.58	1				
EP	30.20 ±14.49	0.940[*]	1			
CE	14.83 ± 7.00	0.708[*]	0.425[*]	1		
YFAS	3.16 ± 1.91	0.428[*]	0.489[*]	0.125[*]	1	
T-PEMS	25.69 ± 16.79	0.552[*]	0.600[*]	0.221[*]	0.682[*]	1

Pearson Correlation Analysis, [*]: p<0.01
HES-A: Hedonic Eating Scale for Adolescents; EP: Eating Pleasure; CE: Controlled Eating;
YFAS: Yale Food Addiction Scale; T-PEMS: Palatable Eating Motives Scale

Reliability

The Cronbach's alpha values calculated to determine the level of internal consistency in the reliability analysis of the HES-A were found to be 0.951 for the "Eating Pleasure" sub-factor, 0.849 for the "Controlled Eating" sub-factor, and 0.943 for the HES-A overall. Since the Cronbach's alpha values of HES-A and its sub-factors are in the range of 0.80 to 1.00, it can be said that the scale is highly reliable.

DISCUSSION

The adolescent period, is a risky period for the development of eating disorders, obesity, and negative eating behaviors. During adolescence, when appetite is different and motivation to reach delicious foods is increased, factors such as social interaction, independent decision making, less time spent at home, and increased consumption of food outside the home make it easier to access high-energy, high-fat, sugar and salt-containing delicious, rewarding and satisfying foods (Mason et al., 2020; Bozkurt & Yıldıran, 2022). It is clear that there is a need for a measurement tool for the detection and evaluation of hedonic eating in adolescence, which is important in terms of the development and prevention of hedonic eating, which is expressed as the state of increased appetite in relation to the expectation of enjoying delicious foods even if physiologically not hungry.

Previous scales developed for the detection and evaluation of hedonic eating (Lowe et al., 2009; Burgess et al., 2014; Boggiano, 2016; And et al., 2018; Atik et al., 2019; Ulker et al., 2021) are designed for adult samples and there is no measurement tool available for adolescents. For this reason, the aim of the conducted research was to develop the "Hedonic Eating Scale for Adolescents (HES-A)" as the first and only scale for determining the hedonic eating status of adolescents and to prove its validity and reliability, and introduce a new scale to the literature. Data supporting the validity and reliability of the HES-A were obtained in line with the hypotheses of the research.

HES-A was developed by researchers in a six-point Likert scale format following a comprehensive literature review on hedonic eating. The HES-A, which consists of a total of 23 items, was created through a multi-stage process that involved both quantitative and qualitative methods. EFA analysis was applied to the scale, revealing a two-factor structure, with Factor 1 named "Eating Pleasure" comprising 15 items related to the pleasure of eating, and Factor 2 named "Controlled Eating" comprising eight items related to healthy eating and food control. The Eating Pleasure sub-factor and the Controlled Eating sub-factor explained 43.75% and 13.38% of the total variance, respectively, while the HES-A explained 57.14% of the total variance. The two-factor structure identified by EFA was confirmed by CFA analysis. According to the CFA results, all fit indices were found to be at an acceptable level.

For concurrent validity, YFAS (Bayraktar et al., 2012) and T-PEMS (And et al., 2018), which measure similar tendencies to hedonic eating,

were used. The moderate level of positive relationship between HES-A and YFAS and T-PEMS indicates that HES-A has concurrent validity.

The Cronbach's alpha values calculated for the reliability analysis were found to be 0.951 for the Eating Pleasure sub-factor, 0.849 for the Controlled Eating sub-factor, and 0.943 for the total HES-A. These values indicate that the scale and its sub-factors have very high reliability. The Cronbach's alpha values calculated for scales used in adult samples to determine hedonic eating and related factors were reported as 0.968 for the Hedonistic Eating Scale (Atik et al., 2019), 0.922 for the PFS (Ulker et al., 2021), and between 0.81 and 0.90 for the sub-factors of T-PEMS (And et al., 2018). The internal consistency value obtained in this research (0.943) shows that HES-A is a reliable measurement tool for determining the hedonic eating status in adolescents.

The development of HES-A as the first and only scale for evaluating hedonic eating in adolescents and its validity and reliability being demonstrated in a large sample group are the strong aspects of the research. It is believed that this research will enable the examination of hedonic eating and related factors in adolescents more comprehensively in future studies.

Limitation

The data of the research was collected through self-report online during the COVID-19 pandemic constitutes the important limitations of the research.

CONCLUSION

The adolescent period, characterized by a prominent emotional state, high reward impulse, and low impulse control, is an important period for the development of hedonic eating, which is a significant risk factor for obesity and maladaptive eating behaviors. In the existing literature, there is no measurement tool that can be used to identify hedonic eating in adolescents. This research demonstrates that HES-A is an acceptable, valid, and reliable measurement tool for Turkish adolescents. This research is important in terms of introducing the first and only measuring instrument for determining adolescents' hedonic eating status in the literature.

It is recommended to use HES-A which has been developed in this study as a screening tool to determine hedonic eating status in adolescents.

Thus, with nutrition interventions aimed at preventing the development of obesity and maladaptive eating behaviors in adolescents with a tendency for hedonic eating, it is possible to prevent negative health outcomes. Since dietary habits acquired during adolescence affect lifelong health, the use of HES-A in early life interventions can reduce nutrition-related chronic diseases in the community, especially obesity.

REFERENCES

Aliasghari, F., Yaghin, N. L., Mahdavi, R. (2019). Relationship between hedonic hunger and serum levels of insulin, leptin and BDNF in the Iranian population. *Physiology & Behavior, 199*, 84-87. doi: 10.1016/j.physbeh.2018.11.013

And, A., Sylvester, M. D., Turan, B., Uysal Irak, D., Ray, M. K., Boggiano, M. M. (2018). The Turkish Palatable Eating Motives Scale (T-PEMS): utility in predicting binge-eating eating and obesity risk in university students. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, *23*, 527-531. doi: 10.1007/s40519-017-0383-z.

Atik, D., Neşe, A., Yüce, U. Ö. (2019). Scale development study: hedonistic eating scale. *Acta Medica Alanya*, *3*(2), 147-53. doi: 10.30565/medalanya.545200

Ayre, C., Scally, A. J. (2014). Critical values for Lawshe's content validity ratio: revisiting the original methods of calculation. *Measurement and Evaluation in Counseling and Development*, *47*(1), 79-86. doi: 10.1177/0748175613513808

Bayraktar, F., Erkman, F., Kurtulus, E. (2012).

Adaptation study of Yale food addiction Scale. *Psychiatry and Clinical Psychopharmacology*, *22*(1), 38.

Berthoud, H. R. (2011). Metabolic and hedonic drives in the neural control of appetite: who is the boss? *Current Opinion in Neurobiology*, *21*(6), 888-896. doi: 10.1016/j.conb.2011.09.004

Boggiano, M. M. (2016). Palatable Eating Motives Scale in a college population: Distribution of scores and scores associated with greater BMI and binge-eating. *Eating Behaviors*, *21*, 95-98. doi: 10.1016/j.eatbeh.2016.01.001.

Boggiano, M. M., Wenger, L. E., Turan, B., Tatum, M. M., Sylvester, M. D., Morgan, P. R., ... Burgess, E. E. (2015). Real-time sampling of reasons for hedonic food consumption: further validation of the Palatable Eating Motives Scale. *Frontiers in Psychology*, *6,* 744. doi: 10.3389/fpsyg.2015.00744

Bozkurt, O., Yıldıran, H. (2022). Çocuk ve adolesanlarda hedonik açlık ile obezite ilişkisi. *Gazi Sağlık Bilimleri Dergisi*, *7*(2), 103-110. doi:10.52881/gsbdergi.1034683

Burger, K. S., Sanders, A. J., Gilbert, J. R. (2016). Hedonic hunger is related to increased neural and perceptual responses to cues of palatable food and motivation to consume: evidence from 3 independent investigations. *The Journal of Nutrition*, *146*(9), 1807-1812. doi: 10.3945/jn.116.231431

Burgess, E. E., Turan, B., Lokken, K. L., Morse, A., Boggiano, M. M. (2014). Profiling motives behind hedonic eating. Preliminary validation of the Palatable Eating Motives Scale. *Appetite*, *72*, 66-72. doi: 10.1016/j.appet.2013.09.016

Casey, B.J., Jones, R.M., Hare, T.A. (2008) The adolescent brain. *Annals of the New York Academy of Sciences, 1124*, 111–126. doi: 10.1196/annals.1440.010.

Cushing, C. C., Benoit, S. C., Peugh, J. L., Reiter-Purtill, J., Inge, T. H., Zeller, M. H. (2014). Longitudinal trends in hedonic hunger after Roux-en-Y gastric bypass in adolescents. *Surgery for Obesity and Related Diseases*, *10*(1), 125-130. doi: 10.1016/j.soard.2013.05.009

Gearhardt, A. N., Corbin, W. R., Brownell, K. D. (2009). Preliminary validation of the Yale food addiction scale. *Appetite*, *52*(2), 430-436. doi:10.1016/j.appet.2008.12.003

Lau, B. K., Cota, D., Cristino, L., Borgland, S. L. (2017). Endocannabinoid modulation of homeostatic and non-homeostatic feeding circuits. *Neuropharmacology*, *124*, 38-51. doi: 10.1016/j.neuropharm.2017.05.033

Lowe, M. R., Butryn, M. L., Didie, E. R., Annunziato, R. A., Thomas, J. G., Crerand, C. E., ... Halford, J.

(2009). The Power of Food Scale. A new measure of the psychological influence of the food environment. *Appetite*, *53*(1), 114-118. doi: 10.1016/j.appet.2009.05.016

Mason, T. B., Dunton, G. F., Gearhardt, A. N., Leventhal, A. M. (2020). Emotional disorder symptoms, anhedonia, and negative urgency as predictors of hedonic hunger in adolescents. *Eating Behaviors*, *36*, 101343. doi: 10.1016/j.eatbeh.2019.101343

Monteleone, P., Piscitelli, F., Scognamiglio, P., Monteleone, A. M., Canestrelli, B., Di Marzo, V., … Maj, M. (2012). Hedonic eating is associated with increased peripheral levels of ghrelin and the endocannabinoid 2-arachidonoyl-glycerol in healthy humans: a pilot study. *The Journal of Clinical Endocrinology & Metabolism*, *97*(6), E917-E924. doi:10.1210/jc.2011-3018

Monteleone, P., Scognamiglio, P., Monteleone, A. M., Perillo, D., Canestrelli, B., Maj, M. (2013). Gastroenteric hormone responses to hedonic eating in healthy humans. *Psychoneuroendocrinology*, *38*(8), 1435-1441. doi:10.1016/j.psyneuen.2012.12.009

Ulker, I., Ayyildiz, F., Yildiran, H. (2021). Validation of the Turkish version of the power of food scale in adult population. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, *26*, 1179-1186. doi:10.1007/s40519-020-01019-x

Yang, D., Liu, T., Williams, K.W. (2015). Motivation to eat—AgRP neurons and homeostatic need. *Cell Metabolism*, *22*(1), 62-63. doi:10.1016/j.cmet.2015.06.018