

Turkish Adaptation of the Mind-Eat Scale in Adults: A Validity and Reliability Study

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Research Article

Keywords: Mind-Eat Scale, Mindfulness, Mindful eating, Validity and reliability

Posted Date: June 2nd, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-9835806/v1>

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Additional Declarations: No competing interests reported.

Abstract

Background

Mindful eating has emerged as an important construct in promoting healthy eating behaviours and preventing obesity-related conditions. Although various scales are available, there is a need for a culturally adapted, multidimensional, and concise tool for the Turkish population. The aim of this study was to adapt the Mind-Eat Scale into Turkish and evaluate its validity and reliability in a Turkish adult population.

Methods

This cross-sectional validity and reliability study was conducted between June and September 2025 with 301 adults (59.8% female, median age 24.0 years) in Antalya, Türkiye. The Turkish adaptation followed standard translation and back-translation procedures. Face-to-face interviews were used to collect the data. The original Mind-Eat Scale, consists of 24 items, is answered using a 5-point Likert scale. Construct validity was evaluated through confirmatory factor analysis, while reliability was assessed using Cronbach's alpha, composite reliability and test–retest analysis. Convergent validity was examined through correlations with the Mindful Eating Inventory (MEI).

Results

Confirmatory factor analysis supported the original six-factor structure, and fit indices indicated good model fit ($\chi^2/df = 1.93$, CFI = 0.92, RMSEA = 0.056, SRMR = 0.059). The Mind-Eat Scale-TR (MES-TR) factor loadings ranged from 0.41 to 0.89. The Cronbach's alpha coefficient for internal consistency ranged from 0.77 to 0.85 across subscales, with an overall value of 0.75. The results showed high test-retest reliability coefficients ($r = 0.73$ to 0.84), and no significant differences were observed between pre- and re-test scores ($p > 0.05$). A robust positive correlation was found between the MES-TR and MEI ($r = 0.684$, $p < 0.001$).

Conclusions

The Turkish version of the MES is a valid and reliable multidimensional instrument for assessing mindful eating behaviours in adults.

INTRODUCTION

As obesity continues to rise worldwide due to unhealthy eating habits and sedentary lifestyles, it has become a significant health risk (1). A key factor contributing to this situation is an eating behaviour known as “mindless eating”, which refers to the lack of conscious awareness during food consumption and is often triggered by stress-related emotional states and excessive eating episodes (2–4).

In recent years, mindfulness-based interventions have emerged as an increasingly prominent approach in the treatment of obesity, particularly in the fields of nutrition, psychology, and public health, aiming to regulate obesogenic eating behaviours (2, 5, 6). Although the concept of mindfulness is rooted in Buddhist teachings, mindful eating has been derived from the broader concept of mindfulness defined by Jon Kabat-Zinn in the late 1970s. It is essentially defined as the application of mindfulness practice to cognitions, emotions, physical sensations, and behaviours related to eating (1, 7, 8).

Mindful eating is highly effective in making conscious food choices, distinguishing between physical and psychological hunger and satiety cues, reducing the desire to eat and the frequency of eating triggered by external factors, avoiding distractions while eating, and developing a non-judgmental acceptance of food (7, 8). This concept involves being aware of the act of eating and understanding the physical and emotional effects of food on the senses (9). Thus, mindful eating is considered an approach that promotes healthy eating behaviours and body weight management (7). Recently, researchers have emphasized that increasing mindful eating could be a beneficial strategy for optimizing health and preventing certain diseases. It has also been reported that mindful eating plays a significant role in the treatment of various health problems, including eating disorders, obesity, diabetes, and depression (10, 11). Based on this, various psychometric scales have been developed to assess mindful eating, such as the Mindful Eating Questionnaire (12), Mindful Eating Scale (13), Mindful Eating Behaviour Scale (14), Expanded Mindful Eating Scale (15), Mindful Eating Inventory (16), Four Facet Mindful Eating Scale (17), and Mindful Eating Scale (Mind-Eat Scale) (18). Of these scales, the Four Facet Mindful Eating Scale (19), Expanded Mindful Eating Scale (20), Mindful Eating Inventory (21), Mindful Eating Questionnaire (22), and Mindful Eating Questionnaire-18 (23) have been adapted into Turkish, and validity and reliability studies have been conducted.

The Mind-Eat Scale (MES), the most recently developed instrument for assessing mindful eating, was established within the NutriNet-Santé cohort of approximately 3,102 participants. It is a valid and reliable measurement tool comprising 24 items that assess six distinct subdimensions and is suitable for use in the general population (18). Although there are several scales that have been adapted for the Turkish population with established validity and reliability, there remains a need for new screening tools that can be used in national-level epidemiological studies, as tools that assess mindful eating across multiple subdimensions, are shorter compared to other scales, and have a culturally adaptable structure. The aim of this study was to adapt the Mind-Eat Scale into Turkish and to examine its validity and reliability in the general population, thereby addressing existing gaps in the literature.

METHODS

Study Design

Prior to beginning the study, permission for the adaptation of the scale was obtained via email on March 9, 2025, from Marion Van Beekum, one of the authors who developed the scale. The standard translation and back-translation method proposed by Prieto was used during the scale adaptation process (24). To ensure linguistic validity, the scale was translated into Turkish by five expert faculty members from the Department of Nutrition and Dietetics and the Department of Translation and Interpreting. The researchers compared these five translations, evaluating them for consistency and semantic integrity, and reached a consensus on appropriate phrasing to create a single Turkish version. The Turkish version of the scale was then back-translated into English by three faculty members and two translators who had not seen the original scale. These translations were compared with the original scale, and it was determined that some expressions in items 13 and 14 were not entirely consistent. It was observed that the original phrase "without reluctance" in the scale was translated as "without hesitation", and "appreciate the taste of food" was translated as "enjoy the taste of food" in the back-translation. In this regard, after consulting with the scale's owner and identifying more appropriate Turkish phrases in line with Van Beekum's recommendations, the final version of the scale was developed.

Following the translation process, eight faculty members from the Department of Nutrition and Dietetics were asked to review the scale and evaluate it using the Davis technique to assess content validity and linguistic and semantic clarity (25). Based on expert opinions, the item-level content validity indices were found to be above 0.88, and the scale-level

content validity index was 0.99. These results indicate that the content validity of the scale is quite high and at an acceptable level.

Participants

This methodological study to assess the validity and reliability of the Mind-Eat Scale-TR was conducted between June and September 2025 among adults aged 18–65 years, residing in Antalya, Türkiye. In accordance with the recommendation of 5–10 participants per item for factor analysis (26), a total of 315 individuals were included in the study via convenience sampling. After 14 participants were identified as outliers, the data from 301 participants were analysed. The exclusion criteria included adults diagnosed with eating disorders or chronic illnesses requiring special diets, as well as those with any conditions that hindered communication, and those who submitted incomplete questionnaires. Potential participants for the investigation were approached in public parks in Antalya. To prevent recall bias and to assess temporal stability, the same scale was administered again one month later to 88 participants whose contact information had been collected.

Data Collection

The data for this study were collected using a questionnaire consisting of three sections. The first section consisted of items to elicit sociodemographic characteristics, the second section included the MES, and the final section included the Mindful Eating Inventory (MEI). Additionally, participants' body weight and height were measured, and body mass index (BMI) was calculated using the standard formula [weight (kg)/height (m²)] and classified according to World Health Organization criteria (27).

Mind-Eat Scale

The Mind-Eat Scale, developed by Van Beekun et al. to assess mindful eating, consists of 24 items in six subdimensions: Awareness (items 1, 14, 18, 23), Non-reactivity (items 2, 5, 8, 20), Openness (items 6, 9, 13, 21), Gratitude (items 3, 11, 16, 24), Non-judgment (items 4, 10, 17, 22), and Hunger/Satiety (items 7, 12, 15, 19) (18). The responses to each item are scored on a 5-point Likert scale as follows: “never” or “almost never” is scored as 1 point, “rarely” as 2 points, “sometimes” as 3 points, “often” as 4 points, and “always” or “almost always” as 5 points. Items 2, 4, 5, 8, 10, 17, 20, and 22 on the scale are reverse-scored. The scale score and subscale scores are calculated as the average of the total of the scores of all items. The scores range from 1 to 5, with higher scores indicating a higher level of mindful eating (18).

Mindful Eating Inventory (MEI)

The Mindful Eating Inventory was developed by Peitz et al. (16) to assess mindful eating behaviours and attitudes, with validity and reliability in Turkish established by Bozkurt (21). The Turkish version of the scale consists of 28 items and 7 subfactors. On a 6-point Likert-type scale, each item is scored on a scale of 1 to 6, with reverse scoring applied to 12 items (4, 8, 9, 10, 11, 14, 16, 20, 21, 22, 23, 28). The total scale score is calculated by taking the average of the item scores for all subscales. Higher scores on the scale indicate increased food awareness (21).

Statistical Analysis

To determine the content validity of the Turkish version of the scale, opinions were obtained from eight experts. As a result of evaluations conducted using the Davis technique, content validity indices were determined at the item and scale levels (25). During the analysis process, the suitability of the dataset was first assessed for outliers. Z-scores were examined to identify univariate outliers, and it was observed that all values fell within the range of -3 to + 3 (28, 29). Mahalanobis distance values were calculated to identify multivariate outliers (30).

Mardia's multivariate skewness and kurtosis tests were applied to assess the normality of the dataset (31). The results indicated that the distribution was not normal ($\chi^2_{\text{skew}} = 125.12$, $p < 0.001$, $\chi^2_{\text{kurt}} = 31.12$, $p < 0.001$). Therefore, the Robust Maximum Likelihood (MLR) method was used in confirmatory factor analysis (CFA), as it provides more reliable estimates when parametric assumptions are violated (32).

Descriptive statistics (mean, standard deviation, skewness, and kurtosis) were calculated for each item. Internal consistency reliability was assessed using Cronbach's alpha and Composite Reliability (CR) coefficients. Convergent validity was examined by correlating the MES-TR scores with the MEI. Test-retest reliability was assessed through administration of the scale twice to 88 participants one month apart and calculating correlation coefficients and paired t-tests (33, 34). The study's flowchart is shown in Fig. 1.

RESULTS

The study participants comprised 59.8% females and 40.2% males with a median age of 24 (IQR: 13.50) years. Most participants (83.7%) had a bachelor's or postgraduate degree ($p = 0.421$). When occupational status was assessed, the majority of participants were students (43.2%), and a significantly higher rate of males than females were employed as manual workers ($p = 0.002$). Smoking (35.6% for females vs. 52.1% for males) and alcohol consumption (35.0% for females vs. 59.5% for males) were significantly more common in males than in females ($p = 0.006$ and $p < 0.001$, respectively). Body weight, height, and BMI values were significantly higher in males than in females ($p < 0.001$) (Table 1).

Table 1
Descriptive characteristics of the participants

Descriptive characteristics of the participants							
Sociodemographic Characteristics	Female		Male		Total		p [*]
	(n = 180)		(n = 121)		(n = 301)		
	n	%	n	%	n	%	
Education Status	20	5.5	5	4.1	15	5.0	0.421
Primary/Secondary school	17	9.4	17	14.0	34	11.3	
High school	153	85.1	99	81.9	252	83.7	
Undergraduate/Graduate							
Occupational Status	80	44.4	50	41.3	130	43.2	0.002
Student	26	14.4	17	14.0	43	14.3	
Civil servant	32 ^a	17.8	10 ^b	8.3	42	14.0	
Worker	36	20.0	35	28.9	71	23.5	
Private	6	3.4	9	7.5	15	5.0	
Retired							
Chronic Disease Status	86	49.4	91	28.9	124	41.2	< 0.001
Yes	91	50.6	108	71.1	177	58.8	
No							
Smoking	64	35.6	63	52.1	127	42.2	0.006
Yes	116	64.4	58	47.9	174	57.8	
No							
Alcohol Use	63	35.0	72	59.5	135	44.9	< 0.001
Yes	117	65.0	49	40.5	166	55.1	
No							
Anthropometric measurements	Median (IQR)		Median (IQR)		Median (IQR)		p ^{**}
Age (year)	25.0 (15.00)		24.0 (11.50)		24.0 (13.50)		0.125
Body Weight (kg)	59.0 (16.98)		80.0 (16.50)		68.0 (23.48)		< 0.001
Height (cm)	164.0 (7.00)		179.0 (8.00)		168.0 (13.00)		< 0.001
BMI (kg/m ²)	21.8 (6.11)		25.1 (5.22)		23.4 (6.46)		< 0.001

*BMI: Body Mass Index. *Chi-square test, ^{a,b}Bonferroni multiple comparison test, **Mann-Whitney U test, $p < 0.05$.

The mean values of the items on the Mind-Eat Scale ranged from 2.59 to 3.92, indicating that participants generally demonstrated a moderate level of engagement with the scale items. The skewness values range from - 0.97 to 0.33, indicating that some items show slight negative skew while others show slight positive skew. Overall, the distribution suggests that participants tended to report relatively higher scores. The kurtosis values ranged from - 1.19 to 0.67.

The relatively low kurtosis values, particularly for items 4 (-1.19) and 16 (-1.13) indicate that the distribution in these items is more platykurtic (flatter) and that there are few outliers. In contrast, a positive kurtosis value (0.67) was observed for item 3, indicating that distribution tends to cluster around the mid-range scores (Table 2).

Table 2
Descriptive statistics for the Mind-Eat Scale-TR items

Number of Items	$\bar{X} \pm SD$	Min	Max	Kurtosis	Skewness
1	3.27 $\pm$ 1.21	1.00	5.00	-0.74	-0.42
2	3.04 $\pm$ 1.24	1.00	5.00	-0.99	-0.04
3	3.92 $\pm$ 1.01	1.00	5.00	0.67	-0.97
4	3.20 $\pm$ 1.37	1.00	5.00	-1.19	-0.13
5	3.15 $\pm$ 1.18	1.00	5.00	-0.88	-0.21
6	2.97 $\pm$ 1.25	1.00	5.00	-1.01	-0.01
7	3.38 $\pm$ 1.21	1.00	5.00	-0.76	-0.39
8	3.11 $\pm$ 1.17	1.00	5.00	-0.84	-0.19
9	2.70 $\pm$ 1.27	1.00	5.00	-0.98	0.26
10	3.56 $\pm$ 1.28	1.00	5.00	-0.90	-0.45
11	3.62 $\pm$ 1.16	1.00	5.00	-0.45	-0.61
12	3.32 $\pm$ 1.18	1.00	5.00	-0.59	-0.41
13	3.04 $\pm$ 1.24	1.00	5.00	-0.97	-0.07
14	3.02 $\pm$ 1.22	1.00	5.00	-0.95	-0.17
15	3.17 $\pm$ 1.15	1.00	5.00	-0.76	-0.13
16	2.66 $\pm$ 1.39	1.00	5.00	-1.13	0.33
17	3.07 $\pm$ 1.32	1.00	5.00	-1.13	-0.05
18	3.32 $\pm$ 1.11	1.00	5.00	-0.56	-0.35
19	3.42 $\pm$ 1.11	1.00	5.00	-0.34	-0.47
20	3.13 $\pm$ 1.08	1.00	5.00	-0.67	-0.13
21	3.39 $\pm$ 1.23	1.00	5.00	-0.71	-0.38
22	2.76 $\pm$ 1.27	1.00	5.00	-0.95	0.28
23	3.61 $\pm$ 1.05	1.00	5.00	-0.11	-0.59
24	2.59 $\pm$ 1.30	1.00	5.00	-1.02	0.32

The factor loadings, residual variances, and coefficients of determination (R^2) for each item on the scale are presented in Table 3. The factor loadings for the Mind-Eat Scale-TR were found to range from 0.41 to 0.89. These values indicate that the items adequately represent the factors to which they belong. In particular, the high factor loadings of items 11 (0.89), 7 (0.87), 17 (0.86), and 21 (0.83) indicate that these items strongly reflect the constructs they represent. The relatively low factor loadings of items 24 (0.41) and 15 (0.47) show that these items have a more limited explanatory

power compared to the other items. When the coefficients of determination (R^2) were reported for the items, the values ranged from 0.17 (24) to 0.79 (11). The highest coefficient of determination was observed for item 11 (0.79), and the lowest for item 24 (0.17).

Table 3
Factor structure of the Mind-Eat Scale-TR

Dimensions	Number of Items	Factor Loading	Residual Variance	R^2
Non-reactivity	2	0.59	0.65	0.35
	5	0.75	0.44	0.56
	8	0.65	0.58	0.42
	20	0.78	0.39	0.61
Awareness	1	0.72	0.48	0.52
	14	0.79	0.38	0.62
	18	0.76	0.42	0.58
	23	0.64	0.59	0.41
Openness	6	0.77	0.41	0.59
	9	0.69	0.52	0.48
	13	0.80	0.36	0.64
	21	0.83	0.31	0.69
Gratitude	3	0.75	0.44	0.56
	11	0.89	0.21	0.79
	16	0.53	0.72	0.28
	24	0.41	0.83	0.17
Non-judgment	4	0.79	0.38	0.62
	10	0.55	0.70	0.30
	17	0.86	0.26	0.74
	22	0.70	0.51	0.49
Hunger/Satiety	7	0.87	0.24	0.76
	12	0.84	0.29	0.71
	15	0.47	0.78	0.22
	19	0.68	0.54	0.46
* R^2 ; coefficients of determination				

The six-factor model compliance diagram for the Mind-Eat Scale-TR is presented in Fig. 2, and the CFA fit indices are given in Table 4. The chi-square value of the Mind-Eat Scale-TR model was statistically significant ($\chi^2(236) = 455.78, p < 0.05$), as expected due to the sensitivity of the chi-square test to sample size. However, the χ^2/sd ratio was 1.93,

indicating a good model fit (Tabachnick & Fidell, 2013). Examination of the other fit indices showed that the Comparative Fit Index (CFI) was 0.92, the Standardized Root Mean Square Residual (SRMR) was 0.059, and the Root Mean Square Error of Approximation (RMSEA) was 0.056 (90% CI: 0.048–0.063).

Table 4
Confirmatory factor analysis fit indices for the Mind-Eat Scale-TR

Fit index*	Good Fit Criterion	Acceptable Fit Criterion	Observed Value
χ^2/sd	$0.0 \leq \chi^2/sd \leq 2.5$	$2.5 < \chi^2/sd \leq 5$	1.93
RMSEA	$0.00 \leq RMSEA \leq 0.05$	$0.05 < RMSEA \leq 0.08$	0.056
SRMR	$0.00 \leq SRMR \leq 0.05$	$0.05 < SRMR \leq 0.10$	0.059
CFI	$0.95 \leq CFI \leq 1.00$	$0.90 \leq CFI < 0.95$	0.92
*CFI: Comparative Fit Index; RMSEA: Root Mean Square Error of Approximation; SRMR: Standardized Root Mean Square Residual. References (34, 35)			

The reliability coefficients of the Mind-Eat Scale-TR and its subscales are presented in Table 5. The Cronbach's α for the subscales ranged from 0.77 to 0.85, while the CR values ranged from 0.75 to 0.86. The highest internal consistency coefficient was observed in the Openness subscale ($\alpha = 0.85$; CR = 0.86), while the lowest value was found in the Gratitude subscale ($\alpha = 0.77$; CR = 0.75). The Cronbach's alpha values for the other subscales were determined as follows: Awareness ($\alpha = 0.82$), Non-judgment ($\alpha = 0.81$), Hunger/Satiety ($\alpha = 0.80$), and Non-reactivity ($\alpha = 0.78$). The overall reliability coefficient of the scale was $\alpha = 0.75$, and the composite reliability value was determined to be 0.77.

Table 5
Descriptive statistics and reliability coefficients for the Mind-Eat Scale-TR and sub-dimension

Dimension/Scale	Min	Max	$\bar{X} \pm SD$	Alpha	CR	MEI
Non-reactivity	1.00	5.00	3.11 ± 0.91	0.78	0.79	0.39
Awareness	1.00	5.00	3.30 ± 0.92	0.82	0.82	0.38
Openness	1.00	5.00	3.02 ± 1.04	0.85	0.86	0.27
Gratitude	1.00	5.00	3.20 ± 0.94	0.77	0.75	0.42
Non-judgment	1.00	5.00	3.15 ± 1.04	0.81	0.82	0.26
Hunger/Satiety	1.00	5.00	3.32 ± 0.92	0.80	0.82	0.63
Mind-Eat Scale Total	1.92	4.67	3.18 ± 0.47	0.75	0.77	0.68
*CR: Composite Reliability, MEI: Mindful Eating Inventory						

In terms of construct validity, a strong and statistically significant positive correlation was found between the MES-TR and its subscales and the MEI, for which validity and reliability had previously been established in Turkish ($r = 0.684$, $p < 0.001$) (Table 6). When examining the relationships between subscale scores and the MEI, a strong positive correlation was found for the Hunger/Satiety dimension ($r = 0.632$, $p < 0.001$), a moderate positive correlation for Non-reactivity ($r = 0.392$, $p < 0.001$), Awareness ($r = 0.381$, $p < 0.001$), and Gratitude ($r = 0.373$, $p < 0.001$) dimensions, and a weak but significant positive relationship with the Non-judgment dimension ($r = 0.161$, $p < 0.001$). No statistically significant relationship was seen between Openness ($r = 0.107$, $p > 0.05$) and MEI.

Table 6

Correlations between the total and subscale scores of Mind-Eat Scale-TR and the Mindful Eating Inventory

		MES-TR	Non-reactivity	Awareness	Openness	Gratitude	Non-judgement	Hunger/Satiety	MEI
MES-TR	r	-							
	p	-							
Non-reactivity	r	.361**	-						
	p	.000	-						
Awareness	r	.541**	-.196**	-					
	p	.000	.001	-					
Openness	r	.518**	-.186**	.294**	-				
	p	.000	.001	.000	-				
Gratitude	r	.507**	-.113*	.419**	.279**	-			
	p	.000	.050	.000	.000	-			
Non-judgement	r	.294**	.300**	-.218**	-.084	-.321**	-		
	p	.000	.000	.000	.148	.000	-		
Hunger/Satiety	r	.716**	.296**	.330**	.147*	.265**	.109	-	
	p	.000	.000	.000	.011	.000	.058	-	
MEI	r	.684**	.392**	.381**	.107	.373**	.161**	.632**	-
	p	.000	.000	.000	.063	.000	.005	.000	-

MES-TR: Mind-Eat Scale- Turkish, MEI: Mindful Eating Inventory. Pearson correlation coefficients are reported. * $p < 0.05$, ** $p < 0.01$.

The MES-TR was administered to the same group of participants at two different times to assess test-retest reliability. According to the analysis results, test-retest reliability coefficients were high ($r = 0.73$ to 0.84) and no statistically significant difference was found between the pre- and re-test mean values in any subscales ($p > 0.05$) (Table 7).

Table 7
Test-retest reliability of Mind-Eat Scale-TR and Subscales

Parameter	Pre-Test	Re-Test	df	t	p	r
	$\bar{X} \pm SD$	$\bar{X} \pm SD$				
Non-reactivity	3.12 ± 0.94	3.16 ± 0.94	88	0.78	.439	.81
Awareness	3.41 ± 0.85	3.43 ± 0.71	88	0.23	.816	.74
Openness	2.96 ± 1.12	3.00 ± 0.98	88	0.50	.621	.79
Gratitude	3.19 ± 0.95	3.16 ± 1.02	88	0.27	.790	.73
Non-judgment	3.00 ± 1.07	2.95 ± 1.06	88	0.81	.420	.77
Hunger/Satiety	3.39 ± 0.83	3.40 ± 0.91	88	0.09	.928	.77
Mind-Eat Scale Total	3.18 ± 0.49	3.18 ± 0.47	88	0.29	.773	.84
*df: degrees of freedom; t: t-value; r: correlation coefficient. $p < 0.05$						

DISCUSSION

The Mind-Eat Scale was developed by Van Beekun et al. (18) to assess mindful eating behaviour from a multidimensional perspective. This study was conducted to adapt the Mind-Eat Scale into Turkish and to examine its validity and reliability in the Turkish population. The findings indicate that the Turkish version of the scale is a valid and reliable measurement tool for assessing mindful eating behaviours.

The CFA results demonstrated that, consistent with the original scale, the six-factor structure was preserved, consisting of Awareness, Non-reactivity, Openness, Gratitude, Non-judgment, and Hunger/Satiety with a total of 24 items (18). When the CFA fit indices were examined ($\chi^2/df = 1.93$, CFI = 0.92, RMSEA = 0.056, SRMR = 0.059), the scale demonstrated acceptable to good fit based on CFI value specified in the literature (≥ 0.95 good, ≥ 0.90 acceptable). The model was also seen to demonstrate acceptable fit based on the SRMR (≤ 0.08 good) and RMSEA (≤ 0.05 good, ≤ 0.08 acceptable) values (36, 37). These results confirmed the model and support the construct validity of the scale. Although the chi-square value was statistically significant, this result is expected given the sensitivity of the chi-square statistic to sample size.

When the factor loadings of the items in the scale were examined, they were found to range between 0.41 and 0.89, similar to the factor loadings in the original scale (ranging from 0.45 to 0.91) (18). The fact that the factor loadings of all the scale items are > 0.30 indicates that the factor structure is statistically acceptable and that each item has a significant relationship with its own subscale (34, 35). The high factor loadings of items 11 (0.89), 7 (0.87), 17 (0.86), and 21 (0.83) on the scale indicate that these items strongly reflect the constructs they represent. However, the fact that items 24 (0.41) and 15 (0.47) have lower factor loadings compared to the other items suggests that this may be related to the items in the Gratitude subscale assessing more abstract cognitive processes. Hulbert-Williams et al. (13) noted that low factor loadings on some items in scales may stem from participants interpreting the behaviour differently or from concerns about social desirability. The coefficients of determination (R^2) for the items in the scale ranged from 0.17 to 0.79. In general, R^2 values > 0.50 are considered strong, values in the 0.30–0.50 range are considered moderate, and values < 0.30 are considered weak (38). The fact that the R^2 values for the majority of items on the scale are > 0.50 supports that the factor structure is generally consistent, meaningful, and psychometrically adequate.

When the internal consistency reliability coefficients of the scale were evaluated, the MES-TR ($\alpha = 0.75$) and all of its subscales exceeded the recommended value of $\alpha \geq 0.70$ for adaptation studies, indicating that the scale has adequate and good reliability (33, 38). The high internal consistency coefficients, particularly in the Hunger/Satiety ($\alpha = 0.80$), Non-judgment ($\alpha = 0.81$), Awareness ($\alpha = 0.82$), and Openness ($\alpha = 0.85$) subscales, indicate that these dimensions are measured consistently within the Turkish population. The lower internal consistency coefficients for Gratitude ($\alpha = 0.77$) and Non-reactivity ($\alpha = 0.78$), while remaining within acceptable limits, were noted to be an expected outcome for cross-cultural adaptation studies and may stem from individual differences (15, 38). These results show that the scale has adequate internal consistency at both the subscale and overall levels. The internal consistency coefficients show that the Turkish version of the scale exhibits similar psychometric properties to the original scale, is a reliable measurement tool, and that the subscales consistently reflect the overall structure of the scale (18, 34, 39). These results indicate that the Mind-Eat Scale functions similarly across different cultures and that the Turkish adaptation can be reliably used in comprehensive research examining the behavioural and nutrition-based relationships of the scale.

The test-retest reliability analyses conducted also revealed the temporal stability of the scale, and when the correlation coefficients between the two measurements were interpreted according to Cohen's classification, a strong relationship ($r > 0.70$) was observed (40). These results indicate that the Turkish version of the Mind-Eat Scale provides consistent and stable measurements over time, both on the overall scale and across all subscales, thereby demonstrating a high level of test-retest reliability (33, 34).

As part of the of scale validity analysis, the relationship between the Turkish version of the Mind-Eat Scale and the Mindful Eating Inventory, which had previously undergone validity and reliability testing in Turkish, was examined, and a strong positive correlation was determined between the two scales ($r = 0.684$, $p < 0.001$). Similarly, a strong positive correlation was seen between the Hunger/Satiety subscale and the MEI ($r = 0.632$, $p < 0.001$). This result is consistent with the presence of behavioural processes based on the perception of hunger and satiety signals on both scales. In contrast, the weakest correlations were observed in the subdimensions of Non-judgment ($r = 0.161$, $p < 0.001$) and Openness ($r = 0.107$, $p > 0.05$). These data are consistent with the results of previous studies demonstrating that similar dimensions are more susceptible to cross-cultural variation (21). The positive correlation coefficients show that the Mind-Eat Scale shares the same conceptual structure with the Mindful Eating Inventory and that content validity is established (34, 41). These results support the conclusion that the Turkish version of the MES is a psychometrically adequate measurement tool in terms of both reliability and validity.

LIMITATIONS AND STRENGTHS

The study also had certain limitations. The cross-sectional design of the study and limitation to the province of Antalya restricts the generalisability of the findings as they have limited representativeness across different cultural, socioeconomic, and geographic regions. Therefore, it would be beneficial to conduct future studies using samples with different geographic and sociocultural characteristics. Another limitation of the study was that the sample consisted predominantly of young adults, with low participation from the elderly population.

Despite these limitations, there were also important strengths. This study represents the first adaptation of the Mind-Eat Scale in a different cultural context. The psychometric properties of the Turkish version of the scale were found to be similar to those of the original scale, supporting the consistency of mindful eating behaviour across different cultures.

The study sample size meets the item-to-participant ratio recommended in the literature (26), and was sufficient for factor analysis. Comprehensive psychometric tests were applied in the study, and both construct validity and criterion

validity (convergent and discriminant validity) were evaluated. In addition, test-retest reliability analysis was conducted to assess the temporal consistency of the scale.

CONCLUSION

The Mind-Eat Scale has been successfully adapted into Turkish and has been found to be a valid and reliable measurement tool for the Turkish adult population. The scale comprehensively assesses mindful eating behaviour across six subscales: non-reactivity, awareness, openness, gratitude, non-judgment, and hunger/satiety, and can be used in both research and clinical practice (e.g., individuals diagnosed with eating disorders, obese patients). As this study represents the first cross-cultural adaptation of the scale, it makes a unique contribution to the international literature and establishes a foundation for future adaptations of the scale into other languages. The widespread use of the scale in research conducted in the fields of nutrition and health in Türkiye will also contribute to a better understanding of mindful eating behaviours and to enhancing the effectiveness of mindfulness-based nutritional interventions.

Abbreviations

BMI Body mass index

CFA Confirmatory factor analysis

CFI Comparative Fit Index

CR Composite Reliability

df Degrees of freedom

MEI Mindful Eating Inventory

MES Mind-Eat Scale

MES-TR Mind-Eat Scale – Turkish version

MLR Robust Maximum Likelihood

R² Coefficients of determination

RMSEA Root Mean Square Error of Approximation

SRMR Standardized Root Mean Square Residual

Declarations

Ethics approval and consent to participate

Approval for the study was granted by the Medical Scientific Research Ethics Committee of Akdeniz University (Approval No: TBAEK-509, dated: May 29, 2025). Written informed consent was obtained from all participants prior to the study, and all the study procedures were conducted in accordance with the principles of the Declaration of Helsinki.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Funding

This research has not received any fundings, grants, or other special financial support.

Author Contribution

Conceptualization and Methodology: HKA, EA, ZSB, EÇ, HBD, BG, BP; Data curation and investigation: HKA, EA, ZSB, EÇ, HBD, BG, BP; Formal analysis: HKA; Writing - original draft preparation: EA, ZSB, EÇ, HBD, BG, BP; Writing - review and editing: HKA.

Acknowledgements

We would like to thank all institutional staff, expert reviewers, and participants for their time and contribution to the study.

Data Availability

The data sets used during the present study can be obtained from the corresponding author on reasonable request.

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Figures

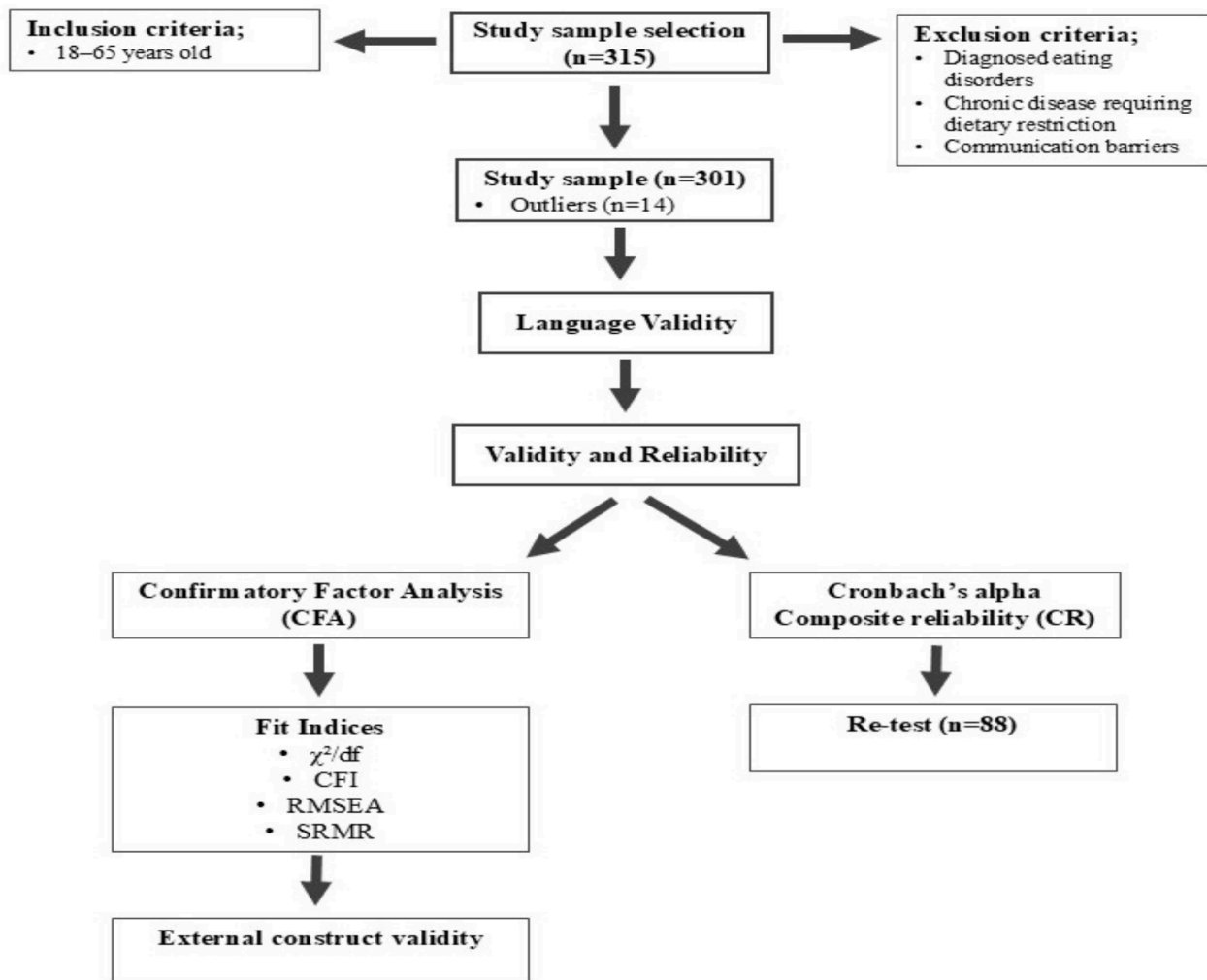


Figure 1

Flow Diagram of Participant Selection and Validation Procedures

*CFI; Comparative Fit Index, RMSEA; Root Mean Square Error of Approximation SRMR; Standardized Root Mean Square Residual

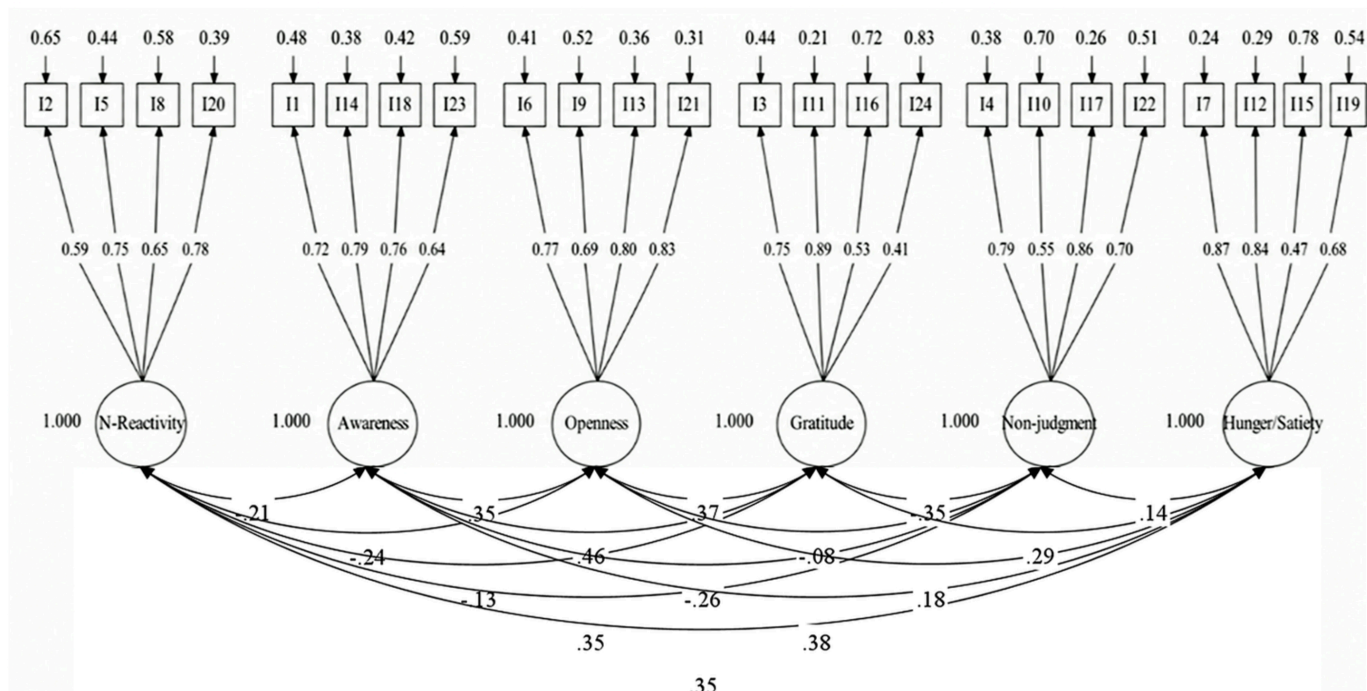


Figure 2

Confirmatory factor analysis of the Mind-Eat Scale-TR and six-factor model compliance diagrams

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [AppendixATurkishversionofMindEatScaleMESTR.docx](#)