

## Turkish Adaptation of the Short Nutrition Literacy Scale for Young Adults: Validity, Reliability, and Association with Mediterranean Diet Adherence

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**Background and Objectives:** Nutrition literacy (NL) is a critical subdomain of health literacy in young adulthood, a period when lifelong dietary habits are established. This study aimed to adapt the Short Nutrition Literacy Scale for Young Adults (S-NutLit) into Turkish (S-NutLit-Tr), evaluate its psychometric properties, and examine its association with adherence to the Mediterranean diet (MEDAS).

**Materials and Methods:** This descriptive cross-sectional study recruited university students aged 18–25 years (n=252). Following forward–back translation and expert review, a pilot test (n=50) assessed clarity. Confirmatory factor analysis (CFA) tested the two-factor structure (Information Skills; Expert/Interaction Skills). Reliability was evaluated via Cronbach's alpha, corrected item–total correlations (CITC), and composite reliability (CR). Convergent validity was examined using correlations with MEDAS and group comparisons by MEDAS adherence.

**Results:** The revised CFA model demonstrated acceptable fit:  $\chi^2(41)=82.25$ ,  $\chi^2/df=2.01$ , IFI=.92, GFI=.95, CFI=.92, RMSEA=.06. Internal consistency was adequate ( $\alpha=.74$  total;  $\alpha=.70$  Factor 1;  $\alpha=.62$  Factor 2). Most CITC values exceeded .30; Items 7 and 9 were marginal ( $\sim.25$ ) yet did not improve  $\alpha$  if removed and were retained for content coverage. CR values were .71 (Factor 1) and .67 (Factor 2). S-NutLit-Tr showed significant positive, albeit weak, correlations with MEDAS (total  $r=.219$ ,  $p<.001$ ; Factor 1  $r=.140$ ,  $p=.013$ ; Factor 2  $r=.291$ ,  $p<.001$ ). S-NutLit scores differed across MEDAS adherence groups (Factor 1:  $F(2,249)=4.76$ ,  $p=.009$ ; Factor 2:  $F(2,249)=13.44$ ,  $p<.001$ ; total:  $F(2,249)=9.62$ ,  $p<.001$ ), with higher scores in the high-adherence group.

**Conclusion:** The S-NutLit-Tr is a brief, psychometrically sound instrument for assessing nutrition literacy among young adults. Its positive association with Mediterranean diet adherence supports criterion-related (convergent) validity. The scale is suitable for research and public health screening, where strengthening NL may aid healthier dietary choices.

**Keywords:** Health Literacy; Mediterranean Diet; Young Adult

**Received:** 07 March 2026

**Accepted:** 12 July 2026

**Doi:** 10.22038/jhl.2026.91829.1877

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## Introduction

Nutrition is a core determinant of healthy living and supports the development of awareness regarding the effects of foods on health (1, 2). The World Health Organization (WHO) emphasizes that healthy eating is fundamental to optimal growth and development, educational outcomes, lifelong health, and individual productivity, beginning with adequate breastfeeding from birth (3). Noncommunicable diseases (NCDs) such as obesity, diabetes, cancer, and cardiovascular diseases are rising rapidly worldwide; diet and lifestyle play a decisive role in their prevention (4). According to WHO estimates, NCDs account for approximately 41 million deaths annually. WHO's primary strategy to reduce NCD-related mortality is to target modifiable risk factors, including tobacco use, insufficient physical activity, unhealthy diet, and harmful alcohol consumption (5).

Health literacy encompasses individuals' access to information, motivation, and competencies for disease prevention, quality-of-life improvement, health promotion, and participation in health-related decision-making. Food, nutrition, and media literacy fall under this umbrella, with nutrition literacy (NL) representing a key subdomain of health literacy (6). In an era of fast-moving and frequently unvetted information, NL has become a critical tool (7). NL is defined as the capacity to acquire, process, and understand nutrition information and skills necessary to make appropriate dietary decisions (7, 8). Beyond grasping the diet–health relationship, NL also involves recognizing the cultural and social dimensions of eating and situating food choices within their broader environmental context (7). Evidence suggests that individuals with higher NL tend to make healthier food choices, whereas those with lower NL may require greater support to achieve adequate and balanced diets; prioritizing personal health influences eating habits, and strengthening nutrition knowledge along with practical skills (e.g., menu planning) facilitates behavior change (9).

NL is typically conceptualized across three dimensions: functional NL (understanding basic nutrition information and healthy living factors), interactive NL (information exchange and behavior change through communication), and critical NL (evaluating information and exercising critical judgment) (6, 10).

McNamara et al. (2021) qualitatively examined how functional, interactive, and critical NL shape food-related decisions among university students aged 18–24, reporting that the university environment can hinder healthy eating and that limited access to kitchen equipment (e.g., refrigerator/stove) constrains meal preparation and narrows purchasing options. The study found that most food-related decisions were anchored in functional NL(11). Young adulthood is a transitional period during which independent living, campus-related conditions, and lifestyle changes may shape long-term dietary patterns (8, 11-13). Irregular routines, adaptation stressors, and campus conditions can facilitate unhealthy eating patterns (14, 15). Eating behavior is shaped by multiple, interacting determinants,

including personal preferences, religious beliefs, stress, future anxiety, body image, food accessibility, and cost (11).

Takeaway (food delivery) consumption is common among young adults. In a sample of 2,130 university students, consuming takeaway food  $\geq 4$  times per week was significantly associated with NL, and two-thirds reported at least weekly takeaway use (8). Concurrently, exposure to conflicting or misleading online nutrition content contributes to confusion, underscoring the need for critical NL to identify trustworthy information and apply it (16-18).

A meta-analysis reported that label exposure improved choices in 16 of 22 studies, reduced calories purchased/consumed in 8 of 13 calorie-focused studies, and increased overall diet quality (19). Students with stronger cooking skills exhibit more positive healthy-eating attitudes, and instruction in this area may support healthier selections (20). Adherence to the Mediterranean diet, characterized by high intake of plant-based foods and olive oil, moderate intake of fish and poultry, and limited intake of red meat and sweets, is widely used as an indicator of healthy diet quality and has been associated with protection against obesity and cardiometabolic diseases (21, 22). To evaluate diet quality in young adults, adherence to the Mediterranean diet is a useful indicator.

A Turkish cultural adaptation of the S-NutLit was previously published by Koc et al., conducted with a convenience sample of young adults ( $n=115$ ) from a single university (23). The present study was initiated independently; written permission from the original scale developer was obtained on 23 October 2023, prior to the publication of that work. Our study extends the existing evidence by employing a larger sample ( $n=252$ ), applying a more comprehensive psychometric framework including composite reliability and corrected item-total correlations, and uniquely examining the association between S-NutLit-Tr scores and Mediterranean diet adherence as an external criterion validity measure.

Against this backdrop, the aim of the present study was to adapt the Short Nutrition Literacy Scale for Young Adults into Turkish (S-NutLit-Tr) and to evaluate its validity and reliability, as well as to examine the relationship between nutrition literacy and adherence to the Mediterranean diet (MEDAS) among young adults.

## Materials and Methods

### *Study Design*

This descriptive, cross-sectional study was conducted with students from the Faculty of Health Sciences at Istanbul Medeniyet University. The objective was to adapt the Short Nutrition Literacy Scale for Young Adults (S-NutLit) developed by Vrinten et al. (17) into Turkish and to assess its validity and reliability.

### *Study Population and Sampling*

The study population comprised students of the Faculty of Health Sciences. Following recommendations for validation studies (24), the target sample size was set at 10–20 participants per item. Given that S-NutLit contains 11 items, the minimum and upper targets were 110 and 220, respectively. The final sample consisted of 252 volunteer university

students aged 18–25 years. This age range was selected to be consistent with the target population of the original S-NutLit study.

### ***Ethical Approval and Informed Consent***

The study was approved by the Istanbul Medeniyet University Social and Humanities Ethics Committee (Decision No. 2024/1, dated 23.01.2024). All participants were informed about the study, provided written informed consent, and the procedures conformed to the principles of the Declaration of Helsinki.

### ***Data Collection***

Data were collected face-to-face under researcher supervision. Participants completed the self-report questionnaire themselves. The researchers were available only to provide procedural clarification when needed and did not influence participants' responses.

Personal Information Form: demographics and dietary habits.

S-NutLit: an 11-item Likert-type instrument (1="Strongly disagree" to 5="Strongly agree") assessing nutrition literacy in young adults. Items 1–8 constitute Information Skills, and items 9–11 constitute Expert/Interaction Skills. Total scores range from 11 to 55, with higher scores indicating greater nutrition literacy. Content covers locating credible nutrition information, knowledge of sustainable nutrition, basic dietary principles, judging the accuracy of media/advertising, applying nutrition information while cooking, communicating with experts, and adhering to expert advice.

Mediterranean Diet Adherence Screener (MEDAS): developed by Schröder et al.(25) and validated in Turkish by Pehlivanoglu et al. (22). It comprises 14 items, each scored 0/1 according to predefined consumption thresholds. Total scores are interpreted as <7: low adherence, between 7-8: acceptable adherence, and ≥9: high adherence. Assessed domains include fat type and olive oil use; portions of fruits/vegetables; red meat; wine; legumes; fish/seafood; nuts; sweets; tomato sauce with olive oil; and the ratio of white to red meat.

Anthropometric measurements included body weight, height, and neck circumference. Body weight was measured using a calibrated precision scale, height was measured using a stadiometer, and neck circumference was measured using a non-elastic measuring tape.

### ***Procedure***

Written permission was obtained from the original scale developers via e-mail. The instrument was translated from English into Turkish by two language experts; a consensus Turkish version was produced using professional translation services and expert review. This version was back-translated into English by an independent language expert and compared with the original for semantic equivalence; translation validity was thus established.

Content validity was assessed by an expert panel consisting of seven experts. Each expert evaluated the relevance and clarity of each item using a 4-point rating scale ranging from 1 ("not relevant/not clear") to 4 ("highly relevant/highly clear"). For the calculation of the Content Validity Index, ratings of 3 and 4 were considered acceptable. The item-level Content Validity Index (I-CVI), scale-level Content Validity Index based on the average method (S-

CVI/Ave), scale-level universal agreement (S-CVI/UA), and Content Validity Ratio (CVR) were calculated (26, 27).

A pilot test was conducted with 50 students to evaluate the clarity, comprehensibility, and administration time of the Turkish form. Feedback obtained during the pilot test was reviewed before the final administration. No item was removed after the expert review or pilot testing. The finalized Turkish S-NutLit was then administered face-to-face to the target sample. The faculty hosts programs in nursing, social work, health management, audiology, and physiotherapy–rehabilitation; students from the Department of Nutrition and Dietetics were excluded on ethical grounds. For anthropometry, a tape measure (neck circumference), a stadiometer, and a digital scale were used.

### ***Data analysis***

For construct validity, confirmatory factor analyses (CFA) were conducted in the final version for structural validity by SPSS AMOS Version 23.0. The structural validity of the model was evaluated through multiple criteria including model fit indices, standardized factor loadings, and error variances (28). Modification indices were evaluated during CFA, and error covariances were considered between items within the same factor when supported by conceptual relatedness and item content similarity, in addition to modification index values (29). The relationships between the factors and the total score of the developed scale were analyzed using Pearson correlation coefficients. Convergent validity was examined by calculating Pearson correlations between the subscales and total scores of the S-NutLit-Tr and the MEDAS. The assumption of normality was assessed through the Shapiro–Wilk test, examination of skewness and kurtosis values, and visual inspection of histogram plots (30). Pearson correlation coefficients between .20 and .39 were interpreted as weak, and those between .40 and .69 as moderate in strength (31).

For the assessment of internal reliability, Cronbach's alpha and corrected item-total correlations values were calculated using SPSS Version 24.0 (32). Construct reliability was computed for each factor as the squared sum of standardized loadings divided by the squared sum of standardized loadings and the sum of error variances (28).

## **Results**

### ***Participant characteristics***

The participants' sociodemographic profile indicated a predominantly female sample (79.0%, n=199; males 21.0%, n=53). Ages ranged from 18 to 25 years, with 21 years being the modal age (26.6%). Nearly all participants were single (99.6%). In terms of academic programs, 40.1% were enrolled in Nursing, 23.4% in Health Management, 19.4% in Audiology, 14.7% in Social Work, and 2.4% in Physiotherapy and Rehabilitation.

### ***Construct validity analysis***

The model fit was evaluated using confirmatory factor analysis (CFA) to test whether the translated version fit a hypothesized measurement model. In Model 1, modification indices (MI) exceeding the critical value of 3.84 were examined to improve model fit by adding error

covariances between items loading on the same factor (29). Based on these indices, two covariances were added: one between Item 1 and Item 2 ( $MI=74.59$ ), and another between Item 10 and Item 11 ( $MI=5.61$ ). These matched covariances were added sequentially by examining MI values and ensuring that the items belonged to the same latent factor. Following the modification of the model, the updated diagram is presented in **Figure 1**. As shown in **Table 1**, the revised model demonstrated improved fit indices, meeting the recommended thresholds with  $\chi^2/df$  below 5.0,  $RMSEA < .07$ , and values above .90 for CFI, GFI, IFI, and NNFI (33).

The covariance between Items 1 and 2 was considered conceptually plausible because both items refer to knowing where to find nutrition-related information, whereas the covariance between Items 10 and 11 was considered meaningful because both items relate to using expert or scientific guidance in dietary decisions.

#### ***Content validity and pilot clarity evaluation***

Content validity was evaluated based on the ratings of seven experts. The I-CVI values were 1.00 for all items, and both the S-CVI/Ave and S-CVI/UA were 1.00. The CVR values were also 1.00 for all items, with a mean CVR of 1.00. Therefore, all items were retained. Although some experts provided wording suggestions, particularly regarding the clarity of the “fair trade coffee” example in Item 2, the quantitative content validity indicators supported the retention of all items. To improve clarity, an explanatory footnote defining “fair trade coffee” was included in the questionnaire.

A pilot test was conducted with 50 students to assess the clarity, comprehensibility, and administration time of the Turkish form. Participants reported that the items were generally clear and understandable. The mean administration time was approximately 8–10 minutes. Minor wording adjustments were made based on participant feedback to improve clarity; no item was removed after the pilot test, and the scale was considered suitable for administration in the main study.

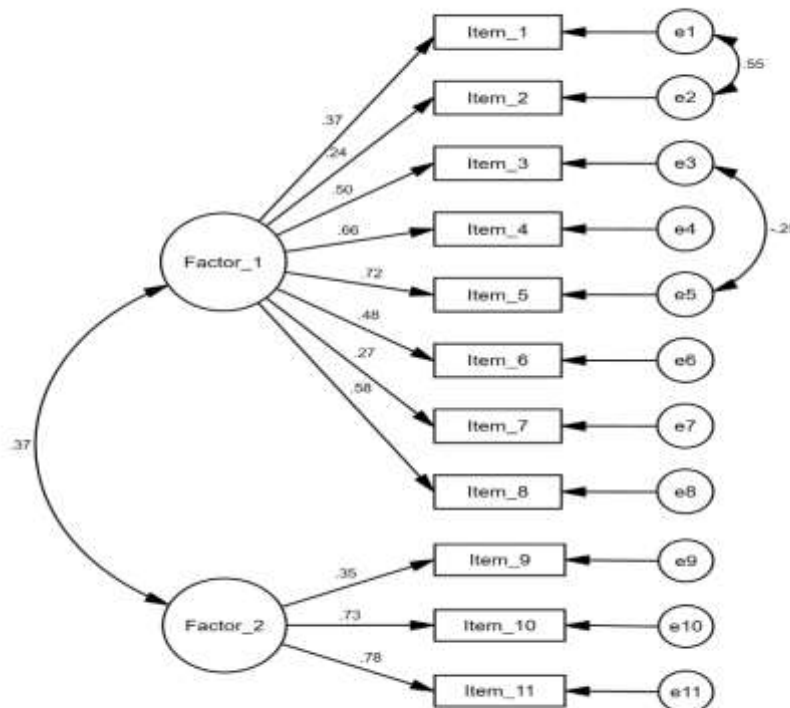


Figure 1. Standardized path diagram of the two-factor CFA model

Table 1. Goodness of fit indices of the S-NutLit-Tr

| Models  | Model Fit Indices |    |             |     |     |     |      | RMSEA |
|---------|-------------------|----|-------------|-----|-----|-----|------|-------|
|         | $\chi^2$          | df | $\chi^2/df$ | IFI | GFI | CFI | NNFI |       |
| Model 1 | 176.74            | 43 | 4.11        | .75 | .90 | .75 | .68  | .11   |
| Model 2 | 82.25             | 41 | 2.01        | .92 | .95 | .92 | .90  | .06   |

Note: Model 1 represents the initial results, while the findings from covariances added version are represented in Model 2.  $\chi^2$  = Chi-square goodness of fit statistic, *df* = degrees of freedom, NNFI = non-normed fit index, GFI = goodness of fit index, CFI = comparative fit index, RMSEA = root mean square error of approximation.

Normality assumptions were assessed for the factor scores and the total scale score using the Shapiro–Wilk test, skewness and kurtosis values, and visual inspection of histograms. The total scale score did not significantly deviate from normality according to the Shapiro–Wilk test ( $p=.079$ ), and the skewness and kurtosis values were within acceptable ranges (skewness = $-.24$ , kurtosis = $.26$ ). Therefore, Pearson correlation analysis and one-way ANOVA were used. The intercorrelations among the factors and the total scale score are presented in **Table 2**. The mean total scale score was  $3.32 \pm 0.53$ , with a higher mean score for Factor 1 ( $3.57 \pm 0.60$ ) than for Factor 2 ( $2.65 \pm 0.71$ ). Factor 1 and Factor 2 were moderately correlated ( $r=.386$ ,  $p<.001$ ). Both factors showed strong positive correlations with the total scale score ( $r=.941$  and  $r=.677$ , respectively;  $p<.001$ ).



**Table 2. Intercorrelation matrix of scale and factors**

|                  | M ± SD     | Factor_1 | Factor_2 | Mean Scale Score |
|------------------|------------|----------|----------|------------------|
| Factor_1         | 3.57 ± .60 | 1        | .386*    | .941*            |
| Factor_2         | 2.65 ± .71 |          | 1        | .677*            |
| Mean Scale Score | 3.32 ± .53 |          |          | 1                |

**Note.** M = mean, SD = standard deviation.

\*Pearson correlation is significant at the 0.01 level (2-tailed)

To further examine convergent validity, Pearson correlation analyses were conducted between the S-NutLit-Tr scores and the MEDAS total score. Significant positive correlations were found between both Factor 1 and the MEDAS total score ( $r = .140$ ,  $p = .013$ ) and Factor 2 and the MEDAS total score ( $r = .291$ ,  $p < .001$ ). Additionally, the overall S-NutLit score was positively correlated with MEDAS ( $r = .219$ ,  $p < .001$ ). These results indicate weak but statistically significant positive associations between Mediterranean diet adherence and nutrition literacy scores.

**Table 3** presents the mean scores of the S-NutLit-Tr factors and the overall scale according to Mediterranean diet adherence categories. Participants had a mean MEDAS score of  $6.39 \pm 1.99$ . When categorized, 127 individuals (50.4%) showed low adherence, 107 (42.5%) showed moderate adherence, and 18 (7.1%) showed high adherence to the Mediterranean diet. Participants with high adherence showed the highest mean scores for Factor 1 ( $3.93 \pm 0.48$ ), Factor 2 ( $3.33 \pm 0.65$ ), and the overall scale ( $3.77 \pm 0.46$ ), whereas those with low adherence had the lowest scores ( $3.50 \pm 0.61$ ,  $2.49 \pm 0.59$ , and  $3.22 \pm 0.51$ , respectively). One-way ANOVA results indicated significant differences across adherence groups for Factor 1 ( $F=4.76$ ,  $p=.009$ ), Factor 2 ( $F=13.44$ ,  $p<.001$ ), and the overall scale ( $F=9.62$ ,  $p<.001$ ).

**Table 3. Group comparisons of S-NutLit-Tr scores according to Mediterranean diet adherence categories**

|                    | MEDAS            | S-NutLit-Tr         |                      |                     |
|--------------------|------------------|---------------------|----------------------|---------------------|
|                    | Total Score      | Factor_1            | Factor_2             | Total Score         |
| Low adherence      | $4.80 \pm 1.15$  | $3.50 \pm .61$      | $2.49 \pm .59$       | $3.22 \pm .51$      |
| Moderate adherence | $7.62 \pm 0.71$  | $3.60 \pm .54$      | $2.74 \pm .78$       | $3.37 \pm .52$      |
| High adherence     | $10.39 \pm 0.61$ | $3.93 \pm .48$      | $3.33 \pm .65$       | $3.77 \pm .46$      |
| Overall            | $6.39 \pm 1.99$  |                     |                      |                     |
| Group comparison   |                  | $F=4.76$ , $p=.009$ | $F=13.44$ , $p<.001$ | $F=9.62$ , $p<.001$ |

**Note.** Values are presented as mean ± standard deviation. Group comparisons were conducted using one-way ANOVA

### Reliability analysis

The reliability results of the S-NutLit-Tr are presented in **Table 4**. Cronbach's alpha values were .70 for Factor 1 and .62 for Factor 2, both falling within the acceptable range when considering the number of items in the subscales. At the scale level, Cronbach's alpha was calculated as .74, indicating acceptable internal consistency for the total scale. All corrected item-total correlation (CITC) values exceeded the recommended threshold of .30, indicating that each item was sufficiently correlated with the total score—except for Item 7 and 9, which showed a marginal value of .25 (30). Construct reliability (CR) values calculated based on CFA results



were .71 for Factor 1 and .67 for Factor 2, exceeding the minimum acceptable threshold of .60 and supporting the internal consistency of both factors (Hair et al., 2014).

**Table 4. The reliability results of the S-NutLit-Tr**

| Factors and items | CITC | Ca  | CR  |
|-------------------|------|-----|-----|
| <b>Factor_1</b>   |      | .70 | .71 |
| Item_1            | .43  |     |     |
| Item_2            | .34  |     |     |
| Item_3            | .38  |     |     |
| Item_4            | .50  |     |     |
| Item_5            | .50  |     |     |
| Item_6            | .37  |     |     |
| Item_7            | .26  |     |     |
| Item_8            | .44  |     |     |
| <b>Factor_2</b>   |      | .62 | .67 |
| Item_9            | .26  |     |     |
| Item_10           | .51  |     |     |
| Item_11           | .53  |     |     |

**Note.** CITC = corrected item-total correlation, Ca = Cronbach alpha, CR = composite reliability

## Discussion

In this study, the Turkish version of the Short Nutrition Literacy Scale for Young Adults (S-NutLit-Tr) was evaluated in terms of validity and reliability evidence, including structural validity, content validity, convergent validity, internal consistency, corrected item-total correlations, and composite reliability. The findings indicate that the S-NutLit-Tr is a valid and reliable instrument for assessing nutrition literacy in this population. Confirmatory factor analysis (CFA) largely supported the intended two-factor structure (Information Skills and Expert/Interaction Skills). After minor model modifications, global fit indices reached acceptable levels (e.g.,  $\chi^2=82.25$ ,  $df=41$ ,  $\chi^2/df=2.01$ ,  $IFI=.92$ ,  $GFI=.95$ ,  $CFI=.92$ ,  $RMSEA=.06$ ), meeting commonly recommended thresholds and supporting the suitability of the factor structure for the target group. Internal consistency was adequate ( $\alpha = .74$  overall;  $\alpha = .70$  for Factor 1;  $\alpha=.62$  for Factor 2), which supports the instrument's reliability at the scale and subscale levels. The relatively lower Cronbach's alpha observed for Factor 2 may partly be attributable to the limited number of items included in this subscale, as internal consistency coefficients are known to be influenced by scale length (34).

The lower reliability of the Expert/Interaction Skills factor may also be related to Turkish young adults' limited or variable experience with nutrition professionals, suggesting that the wording and cultural relevance of this factor should be further examined in future studies. Most corrected item-total correlations exceeded the recommended cutoff, with the exception of Items 7 and 9, which were marginal ( $\sim.25$ ). Although the relatively lower CITC values for Items 7 and 9 may indicate limited consistency with the overall construct, removal of these items did not meaningfully improve Cronbach's alpha, and both items were retained

on content grounds because they capture theoretically important facets of the construct, particularly within a brief scale structure. Specifically, Item 7 assesses practical food preparation competency a dimension conceptually distinct from information-seeking items yet essential for capturing functional nutrition literacy. Item 9 addresses the Expert/Interaction Skills dimension by measuring help-seeking behaviour from qualified professionals; its relatively lower CITC likely reflects the heterogeneity of young Turkish adults' experiences with healthcare providers, rather than item invalidity, as routine contact with nutrition professionals is limited in non-clinical university samples. Composite reliability estimates derived from the CFA (CR=.71 for Factor 1; CR=.67 for Factor 2) exceeded the minimum acceptable threshold of .60, further supporting subscale consistency. The moderate correlation between Factor 1 and Factor 2 indicates that the subscales are related but reflect different aspects of nutrition literacy, while their strong correlations with the total score are expected because the total score is derived from these two subscales. Overall, the scale remains a dependable measurement tool, and its 11-item brevity affords practical advantages for large-scale screening and field applications by enabling quick, self-administered completion.

These findings are broadly consistent with the earlier Turkish adaptation by Koc et al., who also confirmed the two-factor structure and reported acceptable fit indices ( $\chi^2/df=1.246$ , CFI=0.974, RMSEA=0.046) in a sample of 115 young adults (23). The present study corroborates that psychometric structure in a larger and independent sample, and further extends the validation evidence by demonstrating significant associations between S-NutLit-Tr scores and Mediterranean diet adherence—a criterion-related validity dimension not examined in the prior Turkish study.

Young adulthood is a critical period during which lifelong dietary behaviors are established (35). In this phase, unhealthy eating patterns and rapid weight gain elevate the risk of chronic conditions such as type 2 diabetes, cardiovascular diseases, and certain cancers (36, 37). Young people also frequently obtain nutrition information from digital media and the internet, where inconsistent or low-quality content may lead to confusion (38). Consequently, nutrition literacy—the ability to locate, understand, and apply trustworthy information—assumes particular importance (39). Higher levels of nutrition literacy are associated with healthier eating behaviors and favorable health outcomes, whereas lower levels are linked to suboptimal dietary practices and long-term disease risk (39, 40).

Whether nutrition literacy is meaningfully associated with young people's eating patterns is a key empirical question. Adherence to the Mediterranean diet is often used as an indicator of healthy eating. Broadly, the literature shows that individuals with greater nutrition knowledge and literacy tend to report higher adherence to a Mediterranean-type pattern (41, 42). For example, in the Delicious project conducted across Mediterranean countries, higher nutrition knowledge was positively associated with Mediterranean diet adherence, suggesting that young people with stronger knowledge are more likely to adopt this healthy,

traditional pattern (42). In the study, group comparisons by Mediterranean diet adherence mirrored these observations: participants with high adherence had significantly higher S-NutLit-Tr scores than those with low adherence, and this difference was evident for both subscales (Information Skills and Expert/Interaction Skills). This pattern suggests that as nutrition knowledge and related skills increase, the likelihood of choosing healthier foods also rises.

At the correlational level, S-NutLit-Tr scores showed significant but weak positive associations with MEDAS (total  $r \approx .22$ ,  $p < .001$ ; subscales  $r \approx .14$  and  $r \approx .29$ ), supporting the scale's criterion-related (convergent) validity. Consistent with prior work, relationships between nutrition literacy and diet quality typically fall in the low-to-moderate range (43, 44). Modest coefficients likely reflect the inherently multifactorial nature of dietary behavior, which is shaped not only by knowledge/literacy but also by motivation, taste preferences, financial constraints, food access, and social context. Even so, adequate nutrition literacy provides a foundational capacity for locating credible information and making sound dietary decisions (45). Therefore, initiatives to enhance nutrition literacy should go beyond information provision, incorporating skills training that facilitates everyday application and addressing environmental constraints to support healthier choices (46).

Although diet is influenced by multiple determinants, our results suggest that young adults' nutrition literacy is generally at a moderate level, with relatively lower scores on the Expert/Interaction Skills dimension. This pattern may indicate lower perceived competence in seeking information from professionals and applying scientific nutrition knowledge, underscoring a need for education and professional guidance. Interventions should aim not only to increase knowledge but also to improve the translation of knowledge into practice—that is, building practical skills for everyday food selection and preparation. Notably, approximately half of the young participants showed low adherence to the Mediterranean diet, implying that a substantial proportion are not meeting recommended healthy eating guidelines. Similar findings have been reported elsewhere, with many young adults failing to meet Mediterranean diet criteria and exhibiting eating habits that diverge from recommended patterns (47, 48). This situation highlights both potential future health risks and the importance of improving nutrition literacy levels as part of health promotion.

This study has some limitations. First, the sample was recruited from a single university and consisted predominantly of female students enrolled in health sciences programs. Therefore, the findings should be interpreted within the context of a university-based young adult sample and should not be generalized to all Turkish young adults without caution. Future studies should evaluate the S-NutLit-Tr in larger, more gender-balanced, and more diverse samples from different universities, academic disciplines, and sociodemographic backgrounds.

## **Conclusion**

The Turkish adaptation of the S-NutLit offers a practical and psychometrically sound tool for assessing nutrition literacy among young adults. The present validity and reliability evidence, encompassing structural, content, and convergent validity alongside acceptable internal consistency and composite reliability, supports its use in both research and public health practice. Its significant positive association with Mediterranean diet adherence further reinforces its criterion-related validity and underscores the importance of nutrition literacy as a modifiable determinant of dietary behavior. Future research should evaluate the instrument across diverse sociodemographic groups, broader age ranges, and more gender-balanced samples. Longitudinal designs are needed to examine the predictive validity of the S-NutLit-Tr, while clinical or intervention-based studies may help determine whether improvements in nutrition literacy translate into measurable changes in dietary behavior and health-related outcomes. Ultimately, by equipping young adults with the knowledge and skills to make more informed dietary choices, efforts to strengthen nutrition literacy may contribute meaningfully to healthier societies.

**Acknowledgements:** The authors thank all students for participating in the study. We thank Dr. Mehmet Haydaroglu for methodological advice on the statistical aspects of the study.

**Availability of data and material:** The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

**Conflicts of Interest:** The authors declare that there is no conflict of interest to disclose.

**Consent for Publication:** Not applicable.

**Ethics approval and consent to participate:** The study was approved by the Istanbul Medeniyet University Social and Humanities Ethics Committee (Decision No. 2024/1, dated 23.01.2024). All participants were informed about the study, provided written informed consent, and the procedures conformed to the principles of the Declaration of Helsinki.

**Funding:** This study was supported by the Scientific and Technological Research Council of Turkey (TÜBİTAK) under the 2209-A University Students Research Projects Support Program.

**Authors' Contributions:** Concept: B.S., H.Y.Ö.; Study Design: B.S., H.Y.Ö.; Data Collection/ Processing: B.S. Analysis or Interpretation: H.Y.Ö.; Literature Search: B.S., H.Y.Ö.; Writing: B.S., H.Y.Ö.; Critical Review: H.Y.Ö. Final Approval: All authors.

**Declaration of generative AI and AI-assisted technologies in the writing process:** Generative AI was used only for grammar editing.

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