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# Turkish Psychometric Properties of the Perceived Healthy Lifestyle Difficulty Scale for Adolescents

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**Abstract**

**Objective:** This study examined to evaluate the validity and reliability of the Perceived Healthy Lifestyle Difficulty Scale for adolescents and to adapt it to the Turkish language and culture.

**Methods:** The design of this study was methodological and correlational. The study was conducted with 603 adolescents between April and May 2023. Data were collected using an introductory information form and the Perceived Healthy Lifestyle Difficulty Scale for Adolescents. Factor analysis, Cronbach's alpha, and item-total score analysis were used in the data analysis.

**Results:** The scale had 12 items and two sub-dimensions. It was found that the two sub-dimensions explained 44.58% of the scale variance. The total factor loading was >0.30 in the exploratory and confirmatory factor analyses. In the confirmatory factor analysis, all the goodness of fit indices were >0.91. The Cronbach's alpha coefficient for the overall scale is 0.81.

**Conclusions:** The Perceived Healthy Lifestyle Difficulty Scale for Adolescents was found to be a valid and reliable scale for the Turkish sample.

**Keywords** Adolescent · difficulty · lifestyle · scale · validity and reliability

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## INTRODUCTION

Many behaviors acquired and adopted in childhood may be adopted or rejected in adolescence. This situation is also affected by many factors such as the health perception of adolescents, socioeconomic environment, family members, and economic status. However, even when these factors are at the desired level, adolescents are not at the desired level in exhibiting healthy behaviors (1, 2). It is seen that increasing obesity, diabetes, and heart diseases are associated with insufficient healthy food preferences and physical activity. It is emphasized that the adolescent period has a privileged place in the prevention and management of these diseases. In this context, it is necessary to determine the conditions that prevent the formation and continuation of healthy behaviors in adolescents (3).

Adolescents are at the cognitive level to take responsibility for their behaviors with the autonomy they have gained. One of the most critical issues in this period when school life and relationships with peers gain importance is healthy food preferences, exercise, and stress management. Spending most of the day at school leads adolescents to consume fast food (3, 4). In children and adolescents, sedentary lifestyles have been associated with negative outcomes such as obesity and unhealthy lifestyles (5). It also causes them to stay away from physical activity by staying immobile in front of the television and computer for a long time. There is increasing evidence that lifestyle factors influence the development of stress and depression (6). Adolescents can achieve academic success and cope with problematic situations in life with appropriate stress management. Adolescents in the transition period to adulthood are trying to cope with many physical, emotional, and social situations. Adolescents need to be able to identify the situations that prevent these behaviors and to seek solutions to gain healthy behaviors in this critical life stage (7, 8). In adolescents, it has been reported that the difficulty of engaging in healthy behaviors decreases through positive self-expression, situational awareness, solution-orientedness, and mental control (9–12). There are many measurement tools related to the healthy lifestyle behaviors of adolescents in the literature. Similarly, in our country, scales are developed and translated into Turkish by health professionals related to adolescent health (13, 14). However, in addition to defining a behavior, it is also necessary to know the situations that prevent this behavior or create difficulties (9, 15). Therefore, this study was conducted to adapt this scale to Turkish and culture.

## METHODS

### Type of Research

This research was a methodological and correlational study.

### Setting and Participant

It was conducted in April-May 2023 with adolescents studying in 3 different schools in western Türkiye. In methodological studies, a sample of 5-10 times the amount of the substance is required. Also, for factor analyses, the sample size has been defined as up to 500 for excellent validity (16). Accordingly, all adolescents from all schools who met the inclusion criteria were included in the study and invited to participate. The study sample consisted of 603 adolescents who agreed to participate.

### Procedure

The face-to-face interview technique was used in the classroom environment as the data collection method. Data collection from each participant took an average of 20 minutes. Inclusion criteria for the study included the adolescent being between the ages of 13 and 18, having parental consent, and volunteering to participate in the study. The exclusion criteria included adolescents having a mental or intellectual disability, lack of parental consent, and dropping out of the study.

### Instruments

#### *Introductory Information Form*

This form was created to obtain sociodemographic data including age, gender, family characteristics, and economic status of adolescents aged 13-18 years participating in the study (1, 2).

#### *Perceived Healthy Lifestyle Difficulty Scale*

The measurement tool developed by Melnyk et al. (2006) consists of 12 items. The original scale was adapted from a similar scale used with adolescents in an HIV prevention intervention study. The scale includes statements related to healthy lifestyle behaviors such as nutrition, exercise, and stress management (9,10). Scoring the scale is between 1 and 5, ranging from 1 "very difficult to do" to 5 "very easy to do". The scale scores are between 12 and 60. A high score indicates perceived difficulty. Cronbach's alpha is greater than.80 (9–11).

### Validity and reliability stages

#### *Translation Process*

It was translated by two language experts. The translations were reviewed, and the form was corrected. The form was translated back by an expert using the translation-back translation method.

#### *Expert Opinions*

The scale and its translation were sent to 10 experts associated with pediatric nursing. The Davis technique was applied in the expert opinions received for content validity. Accordingly, relevance status is scored between 1 and 4 (17). It was evaluated according to the expert opinions. The content validity index (CVI) was found.

### *Preliminary Test*

It was first applied to 28 adolescents. The scale was found sufficient to be easily understood. It was then applied to the entire sample.

### *Data Analysis*

In the analysis, Cronbach's alpha was examined for internal consistency. Pearson, inter-item correlation, and bisection analysis were examined in the item total score analysis. Response bias was evaluated using the Hotelling T-square test. Exploratory factor analysis (EFA) was performed with 301 participants. Confirmatory factor analysis (CFA) was performed with 302 participants. In the EFA, principal component analysis and Varimax rotation. The factor loading coefficient was determined to be 0.30. The status of the items explaining the original structure was evaluated using CFA. Before the CFA, multicollinearity analysis was performed. There was no multicollinearity among the items. Multiple normality was assessed and found to be satisfied. The normal distribution score averages were evaluated by steepness and skewness. The values were between +2 and the data were normally distributed. The t-test was used in the 27% upper-lower group. IBM Statistical Package for the Social Sciences (SPSS) 26.0 and SPSS AMOS 24.0 programs were used in the evaluation of the data. 0-programs-were-used-in-the-evaluation-of-the-data.>

### *Ethical Consideration*

For the implementation of the study, permission was obtained from the author of the scale via e-mail, and a letter of commitment was signed and sent. The approval of the ethics committee was obtained from the Non-Interventional Ethics Committee of Izmir Bakırçay University (Decision number: 2023/956, Decision Date: March 29, 2023). In addition, permission was obtained from the schools within the scope of the research affiliated with the Provincial Directorate of National Education. Before the study was conducted, the adolescents and parents were informed about the study. Written and verbal consent was obtained from them online for participation.

## RESULTS

### Sample

The mean age of adolescents was 13.46±1.64 in the study. 52.1% (n=314) of them were male.

### Results of the Validity Analysis

Content validity: The CVI value for content validity was 0.92 and was at a consistent level.

Construct validity: Different factor analyses were performed. According to these analyses, the Kaiser-Meyer Olkin (KMO) coefficient was 0.802. Bartlett's test $X^2$ value was 880.596, and p<0.001.

EFA: because of EFA, there were two sub-dimensions in this scale. The scale explained 44.582% of the total variance. The first sub-dimension accounted for 31.247% of the variance, and the second sub-dimension accounted for 13.335%. The factor loadings of the first sub-dimension range from 0.460 to 0.828, and the other from 0.323 to 0.761 (Table 1).

**Table 1.** Explanatory Factor Analysis (n = 302).

| Item (I) | Factor Loadings | |
|---|---|---|
| | 1st Sub-dimension | 2nd Sub-dimension |
| I1/Eat healthy | | 0.607 |
| I2/Not eat unhealthy foods that I like | | 0.536 |
| I3/Exercise regularly | 0.804 | |
| I4/Exercise instead of watching TV, relaxing, or using the computer | 0.633 | |
| I5/Buy healthy food to eat | | 0.761 |
| I6/Find a safe place to exercise | 0.460 | |
| I7/Have exercise equipment at home (for example, jump rope, weights, and sneakers) | 0.535 | |
| I8/Take the time to buy healthy foods | | 0.744 |
| I9/Take the time to help plan and prepare healthy meals | | 0.627 |
| I10/Take the time to exercise regularly | 0.828 | |
| I11/Take the time to plan an exercise schedule | 0.716 | |
| I12/Cope-Deal with stress | | 0.323 |
| Variance Explained | 31.247 | 13.335 |
| Total variance explained | 44.582 | |
| KMO | 0.802 | |
| Bartlett's test | 880.596 (p<0.001) | |

CFA: The calculated chi-square value was 80.865 and the degree of freedom was 52. The fit indices were RMSEA 0.043, GFI 0.96, CFI 0.96, IFI 0.97, TLI 0.95 and NFI 0.91. The factor loadings of the first sub-dimension ranged between 0.47-0.72 and the other ranged between 0.30-0.66 (Table 2, Figure 1).

**Table 2.** Confirmatory factor analysis model fit indices (n = 302).

| | χ2 | df[a] | χ2/df | RMSEA[b] | GFI[c] | CFI[d] | IFI[e] | TLI[f] | NFI[g] |
|---|---|---|---|---|---|---|---|---|---|
| Two-factor Model | 80.865 | 52 | 1.555 | 0.043 | 0.96 | 0.96 | 0.97 | 0.95 | 0.91 |

[a]*Degree of Freedom,*
[b]*Root Mean Square Error of Approximation,*
[c]*Goodness of Fit Index,*
[d]*Comparative Fit Index,*
[e]*Incremental Fit Index,*
[f]Trucker Lewis *Index,*
[g]Normed Fit Index

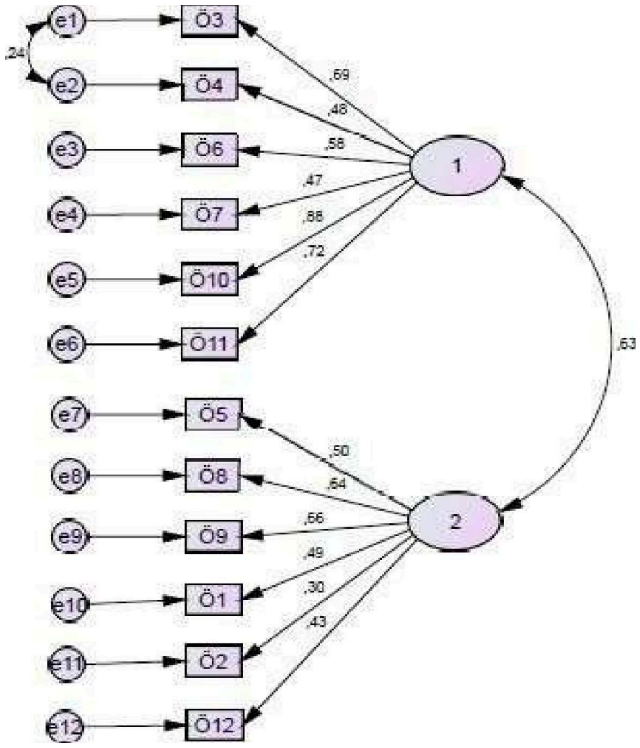


**Figure 1.** Confirmatory Factor Analysis

## Results of the Reliability Analysis

The Cronbach's alpha value was found to be 0.81. This value is 0.80 for the first dimension and 0.68 for the other. Because of the split-half analysis, Cronbach's of the first half was 0.654 and the second half was 0.702. The correlation between them was 0.666 (Table 3). The inter-item correlation coefficients were between 0.106 and 0.619. Because of the Hotelling T-square test, it was determined that there was no response bias in the scale (T-square = 765.875, F = 68.468, and p<0.001). The correlations items with the subscale total score were between 0.296 and 0.743 (Table 4). The difference between the average scores of the upper and the lower 27% groups was statistically significant (p<0.001) (Table 5).

**Table 3.** Scale reliability analysis results (n = 603).

| | | Division by Two-Halves Analysis (Split Half) | | | | |
|---|---|---|---|---|---|---|
| | Cronbach Alfa | First half of Cronbach Alfa | Second half of the Cronbach Alfa | Spearman-Brown | Guttman split half | Correlation between the two halves |
| Total Scale | 0.81 | 0.654 | 0.702 | 0.800 | 0.795 | 0.666 |
| First sub-dimension | 0.80 | | | | | |
| Second sub-dimension | 0.68 | | | | | |

**Table 4.** Cronbach's alpha, item scale, and subscale total score adjusted correlations after deletion (n = 603).

| Item (I) | Cronbach's alpha when item is Deleted | Corrected Item-Total Score Correlation *(r)** | Corrected Item-Subscale Total Score correlation *(r)** |
|---|---|---|---|
| I1 | .797 | .403 | .434 |
| I2 | .804 | .332 | .345 |
| I3 | .780 | .588 | .648 |
| I4 | .795 | .430 | .447 |
| I5 | .797 | .400 | .450 |
| I6 | .792 | .459 | .461 |
| I7 | .797 | .413 | .440 |
| I8 | .793 | .451 | .471 |
| I9 | .791 | .478 | .478 |
| I10 | .775 | .633 | .743 |
| I11 | .782 | .556 | .715 |
| I12 | .807 | .312 | .296 |

***** *Significant at p<.001*

**Table 5.** Scale Total Score 27% Lower-Upper Group Comparison.

| Groups | M+SD | t p |
|---|---|---|
| 27% Subgroup (n = 163) | 41.28+4.68 | 42.483 <0.001 |
| 27% Upper Group (n = 163) | 21.19+3.80 | |

*M: Mean, SD: Standard deviation*

## DISCUSSION

In this study, the CVI was calculated as 0.92 for the content validity of the scale. To ensure consistency between expert opinions in the evaluation of measurement tools, the CVI value should be above 0.80 (18,19). According to this result, it was found that the content validity of the Turkish version of the scale was achieved.

Bartlett's test and KMO were used to analyze the construct validity. These tests are critical for assessing the suitability for factor analysis. Bartlett's test was used to evaluate the level of correlation between variables. If this test is significant ($p < 0.05$), it means that there are significant correlations between the variables (19–21). In this study, the results of Bartlett's test were significant ($\chi^2 = 880.596$, $p < 0.001$). This means that it is suitable for factor analysis. A significant Bartlett's test result allows reliable results to be obtained in determining the dimensions and verifying the factor structure.

The KMO criterion was used to assess sample adequacy. The KMO value varies between 0 and 1, and a value above 0.60 indicates that the dataset is sufficient. A KMO value of 0.80 and above indicates a superb level of adequacy.(19–21) In this study, the KMO value was found to be 0.80. A high KMO value indicates that the common variance between variables is high, and the results obtained by factor analysis are reliable.

According to the explanatory factor analysis, there were two dimensions for the Turkish sample. In the original study, the scale items were grouped into two dimensions. Although the factor

obtained in this study is similar to the factor structure of the original scale, two dimensions were not specified. In the original scale, content groups were mentioned but not sub-dimensions. The titles of these content groups are healthy eating/buying healthy food products, exercising regularly/finding a safe place to exercise (9, 12). In this study, the content of the first dimension was healthy eating and the other was exercising. In this respect, it is compatible with the original scale.

The factors obtained because of the EFA were found to be compatible with the theoretical framework of the scale. This shows that the subscales of the scale are adequate and valid in measuring adolescents' perceived healthy lifestyle difficulties.

According to factor loadings, it was found to which factors each item loaded significantly. Factor loadings of 0.30 indicate that the items have a strong relationship with the relevant factors (19–21). The factor loadings met this criterion and supported the construct validity. The factor loadings for the original scale could not be compared since they were not given in the article.

According to the CFA in this study, the factor loadings ranged between 0.30 and 0.72. It was determined that the fit indices (GFI, NFI, CFI, TLI, and IFI) were greater than 0.90. The RMSEA value was less than 0.080 and the chi-square value divided by the degrees of freedom was less than 5 (Figure 1). According to this result, there is a strong and significant relationship between the scale and its sub-dimensions. In Kelly et al. (2012) study, it was evaluated within the structure of the general scale, and the fit indices were found as NFI = 0.88, IFI = 0.91, CFI = 0.91, and RMSEA value was 0.074 (22). Although these values are evaluated within the general scale structure, it is seen that there are similar results in this study.

The Cronbach's alpha coefficient is an indicator of homogeneity in scales. It is recommended that Cronbach's alpha should be above 0.80 for a reliable scale and its sub-dimensions (23, 24). In this study, the total Cronbach's alpha was greater than 0.80, indicating that the reliability is high. The high Cronbach's alpha indicates that the scale measures the healthy lifestyle difficulties perceived by adolescents at a good level (23). The alpha values of the scale in previous studies are similar to the results of this study (9–12,22).

Another method that shows internal consistency is the split-half method. In the literature, it is recommended that there should be at least a 0.70 correlation between the two halves, Cronbach's alpha of both halves should be above 0.70, and Spearman-Brown and Guttman Split-Half coefficients should be greater than 0.80 (24). In this study, it was seen that the recommendations were within the limits and very close to the limits. These results show that the scale has a good level of reliability. Because the halving analysis was not performed in the original form of the scale, the results could not be compared.

The correlations with the scale total score ranged between 0.312 and 0.633. The correlations of the scale items with the two-dimensional total score ranged between 0.296 and 0.743. It was determined that no item significantly increased Cronbach's alpha when removed from the scale. High correlations between items may lead to high Cronbach's alpha values. At the same time, a high correlation between items may lead to similarity of items. It is recommended to remove an item that causes a high correlation from the scale structure. In the literature, the correlation between items should be less than 0.90 (20, 21). In this study, the inter-item correlation coefficients of the scale were found to be less than 0.90. This result shows that although the items measure the same topic, they are not similar items, and the scale has a high level of reliability in terms of reliability.

One of the methods used to assess the reliability and validity of the scales is the upper-lower group (27%) comparison. This analysis assumes that the respondents are grouped into two groups: positive values (upper group) and negative values (lower group). If the scale can distinguish these groups from each other in a meaningful way, it means that it can make accurate measurements.(25) In this study, when the total mean scores of the scale were evaluated, a statistically significant difference was found between adolescents in the upper 27% group and adolescents in the lower 27% group ($p<0.001$). This result shows that the scale has good measurement and discrimination power.

### Limitations

Some limitations of the study should also be considered. First, the sample group was selected from a specific geographical region, and generalizability across Türkiye may be limited. Second, self-report scales have the risk of social desirability bias as they are based on how participants perceive themselves. Therefore, conducting similar analyses with larger sample groups from different regions and socioeconomic levels in future studies may provide more comprehensive data on the validity and reliability of the scale.

### Implications for Nursing Practice

Identifying and managing adolescents' healthy lifestyle challenges directly concerns health professionals (pediatric nurses, public health nurses, public health specialists, pediatricians, etc.). Pediatric nurses, as members of the multidisciplinary team, should use standardized measurement tools when assessing adolescents' healthy lifestyle challenges. In this regard, the measurement tool in question will form the basis for future evaluations and research.

## CONCLUSION

In this study, it was concluded that the Perceived Healthy Lifestyle Difficulties Scale for Adolescents is a valid and reliable scale for the Turkish sample. This scale can be used as an important

tool in understanding adolescents' healthy lifestyle difficulties and evaluating the effects of interventions in this field. Promoting and maintaining healthy lifestyle behaviors is of great importance for the prevention of chronic diseases among young people. In this sense, it can help to develop effective interventions to promote healthy lifestyle behaviors.


| | |
|---|---|
| Ethics Committee Approval | The approval of the ethics committeeEthics committee approval was obtained from the Non-Interventional Ethics Committee of Izmir Bakırçay University (Decision number: 2023/956, Decision Date: March 29, 2023). |
| Informed Consent | Written consent was obtained from the participants. |
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