HALK SAĞLIĞI HEMŞİRELİĞİ DERGİSİ
JOURNAL OF PUBLIC HEALTH NURSING

Araştırma Makalesi/Research Article *2022 - 4(2)*

Turkish Validity and Reliability Study of the Adolescent Stress Questionnaire -Short Form*

Adölesan Stres Anketi-Kısa Formu'nun Türkçe Geçerlik ve Güvenirlik Çalışması

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This article was written as a Master's Thesis that was submitted to Marmara University Nursing Department under Ethics Committee Approval dated 28.06.2019.

Öz

Amaç: Bu çalışmada Anniko ve ark. (2018) tarafından geliştirilen Adölesan Stres Anketi-Kısa Formunun Türkçe geçerlik ve güvenirliliğini değerlendirmek amaçlanmıştır.

Gereç ve Yöntem: Bu çalışma metodolojik tipte bir çalışmadır. Araştırmanın örneklemini 2018-2019 eğitim öğretim yılında üç devlet lisesinde ve iki devlet ortaokulunda öğrenim görmekte olan 850 öğrenciden oluşmaktadır. Veri toplamada sosyodemografik anket formu ve Adölesan Stres Anketi-Kısa Formu kullanılmıştır. Anketin Türkçe formunun oluşturulmasında dil uyarlaması için geri -çeviri tekniği kullanılmıştır. Geçerlilik, yapı ve kapsam geçerliliği ile değerlendirilmiştir. Anketin güvenirliliği için zamana karşı değişmezlik, iç tutarlılık ve madde toplam korelasyonu ile değerlendirilmiştir.

Bulgular: Anketin kapsam geçerliliği indeksi 0.97 bulunmuştur. Doğrulayıcı faktör analizi sonucuna göre tüm maddelerin değerleri istatiksel olarak anlamlı bulunmuştur (p:0.01). Uyum indekslerinin iyi bir uyum gösterdiğini ve anketin dokuz faktörlü yapısını doğruladığı bulunmuştur. Ankete ilişkin toplam Cronbach alfa katsayısı 0.88 ve alt faktörlerine ilişkin Cronbach alfa katsayıları 0.62 ile 0.88 arasında değişmektedir.

Sonuç ve Öneriler: Adölesan Stres Anketi- Kısa Formunun, Türk toplumunda adölesanların stres düzeylerini ölçmek için kullanılabilecek geçerli ve güvenilir bir ölçme aracıdır.

Anahtar Kelimeler: Adölesan Stres Anketi-Kısa formu, adölesan, stres, geçerlik, güvenirlik.

* Geliş Tarihi: 14.01.2022 / Kabul Tarihi: 15.04.2022
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Atıf; *Öztürk Tanış, N., Gür, K. (2022). Turkish validity and reliability study of the adolescent stress questionnaire -short form. Halk Sağlığı Hemşireliği Dergisi, 4(2): 115-133. Doi: 10.54061/jphn.1057628*

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Abstract

Objective: This study aims to assess the reliability and validity of the Adolescent Stress Questionnaire-Short Form (ASQ-S).

Material and Method: This study is a methodological study. The sample of the consists of 850 students enrolled in three public high schools and two public secondary schools in the 2018-2019 academic year. Data were collected with sociodemographic questionnaire form and Adolescent Stress Questionnaire-Short Form. The back-translation technique was used for language adaptation in the creation of the Turkish form of the questionnaire. Validity was evaluated by construct and content validity. The reliability of the questionnaire , invariance against time was evaluated by internal consistency and item-total correlations.

Results: Content validity index of the questionnaire was found to be 0.97. According to the results of confirmatory factor analysis, the values of all items were found to be statistically significant (p:0.01). The fit indices were found to be well matched and the questionnaire had a nine-factor structure. Cronbach's alpha coefficient for the questionnaire was found to be 0.88, and Cronbach's alpha coefficients for the sub-factor ranged from 0.62 to 0.88.

Conclusion: The Adolescent Stress Questionnaire- Short Form is a valid and reliable tool to measure stress levels in adolescents in the Turkish population.

Keywords: Adolescent Stress Questionnaire- Short Form, adolescent, stress, validity, reliability.

INTRODUCTION

Adolescence is a time of important change in which physical growth, sexual development, and psychosocial maturation take place (Byrne et al.,2007; McKay et al., 2016; Moksnes et al., 2016). Adolescents generally face new and complex difficulties at home, at school, and in all other aspects of their lives. Seen as a preparatory road to adulthood, the period of adolescence is a time during which physical growth, sexual development and psychosocial maturity are in progress and the stormy, rapid, moody, unstable, conflicting emotions characteristic of the passage from childhood to adulthood that are thought to have ended when physical growth is attained cause even more stress (Altıparmak et al., 2012, Kulaksızoğlu, 2013; Renk & Creasey, 2003;). Together with these huge changes come the added sources of potential stress caused by conflicts with parents, keeping up with peers, managing romantic relationships and coping with increasing academic demands (Anniko et al., 2018).

Adolescents go through an identity crisis and to resolve this, they must recognize the sources of stress in their lives, use all means of coping, be aware of their sources of social support and make their own adjustments. For adolescents to experience a healthy transition into adulthood, it is of vital importance that those in their circle of support–especially parents and health professionals–identify the sources of the adolescent's stress, understand the level of this stress and recognize which strategies can be used for coping (Çam & Engin, 2014; Erdem, 2009; Eryılmaz, 2009; Lohman & Jaris, 2000).A common critique that is made in the literature about the matter of adolescents' sources of stress and their experience with stressors is that the content of existing measuring tools has been derived from similar measures created for adults and therefore do not contain matters particularly relevant to this special time of development (Grant et al., 2004). Another criticism is that many measuring tools are specific to the particular stress factors the researcher is examining (e.g., abuse and family issues) and do not reflect the multidimensional daily stressors that confront the adolescent (Byrne et al., 2007). Adolescent Stress Questionnaire – Short Form (ASQ-S) was developed in response to these criticisms (Anniko et al., 2018).

The Adolescent Stress Questionnaire- Short Form (ASQ-S) differs from others in that it is designed to assess the stressors adolescents face in the home situation, as well as school performance stress, the stress that stems from school attendance, having romantic relationships, coping with peer pressure, interactions with teachers, uncertainty about the future, conflicts between balancing school/leisure time, and financial pressure. At the same time, its short but has comprehensive that structure makes it convenient to use in terms of saving time and resources. Not only can the measure be used in school or healthcare screening, it can also be considered a good choice for many clinicians dealing with adolescents. Adolescents may experience stress-related health problems when they cannot cope with stress during this period. Thus, the ASQ-S could be a valid instrument in assessing adolescents in preventive work (Anniko et al., 2018).

The role of nurses in promoting a healthy lifestyle, and in improving and protecting health is a matter that is a point of discussion worldwide (On, 2016). Nurses help individuals acquire attitudes and skills that will make them a lifestyle for the protection and development of health (Kefeli, 2010). Since nurses are in more contact with adolescents in schools, family health centers and community health centers, they have important responsibilities in planning, implementing and maintaining health promotion and healthy lifestyle behavior programs (Bebiş et al., 2015). This study aims to assess the reliability and validity of the Turkish version of Adolescent Stress Questionnaire- Short Form developed by Anniko et al (2018).

MATERIAL AND METHODS

The Aim and Type of the Study: The methodological study was carried out to assess the reliability and validity of the Turkish version of Adolescent Stress Questionnaire-Short Form developed by Anniko et al (2018).

Place and Time of Study: The study was conducted at in two Anatolian high schools (9th, 10th, 11th, 12th grades), one science high school (9th, 10th, 11th, 12th grades) and two secondary schools (7th and 8th grades) in Çerkezköy district of Tekirdağ province in the 2018-2019 academic year. In selecting the schools where the study would take place, their socioeconomic profile and locations were considered. Three of the schools chosen were in socioeconomically advantaged areas with high academic standards. The socioeconomic background and academic standards of the other two schools selected were at a lower level. Vocational high schools were not included in our study for measuring stress levels according to gender. This was because girls were in the majority in some departments of the schools while boys were in the majority in others. (For example, there were more girls in the chemistry department while boys were in the majority in departments such as electricity and machinery. We did not add this data to avoid a vast gap between the percentages of girls and boys.)

The Targeted Population and Sample of The Study: The study population consisted of 7th, 8th, 9th, 10th, 11th, and 12th grade students who were enrolled at three public high schools and two public middle schools during the 2018-2019 academic year and consented to participate in the research (N=3389). In methodological studies, sample size is based on 5-10 times the total number of scale items (Şencan, 2005). Since this questionnaire study consisted of 27 items, sample size was calculated as at least 135 and at most 270 participants. Contact was made with 950 students who had consented to participate and received approval from their parents, but due to reasons such as incomplete data, the research ended with 850 participants. The students who accepted the research (voluntarily) and who had parental consent for the research were included in the research sample.

Data Collection Tools: In this study, 'Sociodemographic Questionnaire' and 'Adolescent Stress Questionnaire- Short Form' forms were used as data collection tools.

Sociodemographic Questionnaire: This form queried the sociodemographic features of the students (e.g., age, gender, grade, parents' education, parents' occupation, economic status, health status, methods of coping with stress). The sociodemographic questionnaire form consists of 31 questions.

Adolescent Stress Questionnaire: The Adolescent Stress Questionnaire- Short Form was developed by Anniko et al. (2018) in order to measure adolescent stress and stressful experiences. Adolescent Stress Questionnaire - Short Form is a likert type questionnaire consisting of 27 items. Each item in the Adolescent Stress Questionnaire- Short Form assesses how stressful the situation described is for the respondent. There are 4 items to assess the stress caused at home, 3 items to measure school performance stress, 2 items for school attendance, 3 items to measure the stress of romantic relationships, 4 items to measure stress from peer pressure, 3 items to measure the stress of interactions with teachers, 3 items for assessing stress over uncertainty about the future, 3 items to measure the stress of balancing school and leisure time, and 2 items to assess financial stress. Each item is rated on a five-point likert scale: where 1 = not at all stressful (or never has been), 2= slightly stressful, 3 = moderately stressful, 4 = very stressful and 5 = extremely stressful. In the Adolescent Stress

Questionnaire- Short Form, each item gets a positive value from one to five. There is no reverse scored item. The maximum possible score on the questionnaire is 135; the minimum is 27 (Table 5). As the score of overall questionnaires or in the subfactor increases, the level of stress increases. Cronbach's alpha coefficient for ASQ-S was 0.93 ad cronbach's alpha coefficient of subfactor was between 0.64 and 0.89 (Anniko et al., 2018).

Data Collection: Data were collected in May 2019 from students who consented to participate in the study and were enrolled in the 7th, 8th, 9th, 10th, 11th and 12th grades of three high schools and two middle schools. The data collection took place during class hours at school and the students were informed participation would be on a volunteer basis. All forms were filled in on the basis of self-reporting. Students who experienced problems (e.g., could not understand or misunderstood the question) were provided with the necessary explanations. To perform the reliability analysis of the questionnaire, the test-retest procedure was applied to 37 students in two sessions in a two-week period.

Data Assessment: Data analysis was performed with the SPSS 22.0 and Lisrel 8.0 package programs. To test the reliability of the questionnaire, the Content Validity Index was the criterion used for content validity, Cronbach's alpha coefficient was calculated for internal consistency, Pearson's Correlation Analysis was performed for item analysis, and the test-retest procedure was carried out. Confirmatory Factor Analysis and Exploratory Factor Analysis were performed for construct validity. In the assessment of the sociodemographic data, numbers and percentage distributions of the demographic variables pertaining to the students were calculated. In the study, p values less than 0.05 were considered statistically significant.

Validity and Reliability Adolescent Stress Questionnaire- Short Form (ASQ-S)

Linguistic Validation: A linguistic adaptation was carried out and content validity and construct validity methods were used to test the validity of the questionnaire.

Linguistic Adaptation: Translating the items of a scale into another language is a task that requires the utmost care. Because, during the translation of the scale into another language, differences in expression may occur. If this process is not paid attention to, the validity and reliability results of the scale may be low (Aksayan &Gözüm, 2002). In order for the translation to be meaningful in another language, it must be appropriately adapted to the culture and syntax of the target language. Translators of a scale must be highly fluent in both languages and cultures and also knowledgeable about studies and research in the field of health. There are three types of techniques used in language adaptations: "translation," "group translation," and "back translation." The back translation technique is the most commonly employed method. Here, there must be at least two independent translators involved. The first translator translates the original text into the target language, while the second translator translates the translated text back into the language of the original (Deniz, 2007; Erefe, 2002; Şencan, 2005).

Content Validity: The rating criterion used in testing the content validity of the scale is the Content Validity Index (CVI). The Davis technique is applied here. In this technique, experts assess each scale item on the basis of its relevance, comprehensibility and simplicity, rating each on a scale of 1-4: 1-not relevant, 2-needs heavy revision, 3-acceptable but needs small changes, 4-very relevant. The experts' ratings are evaluated in the calculation of the CVI, and the number of experts marking the items 3 or 4 is divided by the total number of raters. The scale must have a content validity of 0.80 or over (Ardıç, 2008; Şencan, 2005;).

Construct Validity: Factor analysis technique was used to evaluate construct validity. Each sub-dimension is evaluated as a factor. It is the most commonly used method. The purpose of factor analysis is to express a large number of items with a small number of factors (Erefe 2002; Gözüm ve Aksayan, 2003; Şencan, 2005). Values of .30 and over were included in the construct of the factors (Büyüköztürk, 2004). Confirmatory Factor Analysis and Exploratory Factor Analysis were performed to assess construct validity.

Exploratory Factor Analysis is a type of analysis that probes into the nature of the factors measured rather than the testing of a defined hypothesis. The aim of the analysis is to find whether the data set is suitable for factor analysis. The exploratory factor analysis was carried out with "Kaiser-Meyer-Olkin Measure of Sampling Adequacy Analysis (KMO)" and "Bartlett's Test of Sphericity." Bartlett's test is applied after the KMO sample adequacy analysis is performed in order to test whether there are correlations between the variables (Esin, 2015). Confirmatory Factor Analysis was used to test whether the factor construct of the scale created was compatible with that of the original questionnaire. In order to test the construct validity of a scale, the goodness of fit statistics made in confirmatory factor analysis should be at the desired level (Esin, 2015).

Reliability: The results of testing for reliability were obtained by analyzing internal consistency and invariance over time. Internal consistency analysis was carried out with item-total correlation analysis and the calculation of Cronbach's alpha coefficient. Invariance over time was assessed using test-retest correlations.

Ethical Considerations: Permission was received from the Malin Anniko of the questionnaire via email for the adaptation of the Shortened Version of the Adolescent Stress Questionnaire into Turkish. Ethical approval for the study was obtained from the Ethics Board of Marmara University Health Sciences Institute (17.12.2018-252). An official letter of approval was also received on May 7, 2019, from the Provincial Directorate of National Education. Written informed consent forms were received from the students participating in the study and their families.

RESULTS

Sample Characteristics

Of the participants, 35.7% were from the first Anatolian high school, 23% from the second, 21.8% were enrolled at the science high school, 8.5% in middle school, and 11.1% were students at the second middle school. Of the students, 34.5% were in 9th grade, 30.8% were 10th-graders, 11.6% were in 8th grade, 8.5% in 12th grade, 8% in 7th grade and 6.6% in 11th grade. Of the participants, 55.3% were female, 44.7% were male. The parents of 97.5% were living. A portion of 93.8% of the participants lived with their parents; 56.3% had mothers who had an elementary school education while the mothers of 26.7% were high school graduates. The fathers of 42.2% were high school graduates; 40% had an elementary school education. Of the students, 91.4% lived in nuclear families; the mothers of 38.2% were working at a regular paying job while this rate was 88.1% among the fathers.

VALIDITY

Linguistic Validation

After obtaining permission for use of the questionnaire developed by Anniko et al. in Sweden in 2018 to measure stress levels in adolescents, a linguistic adaptation of the

questionnaire was first carried out with the aim of introducing this measure to the Turkish population. The translation/back-translation technique was used for the linguistic adaptation. The questionnaire, which was originally developed in English, was first translated into

Turkish by two linguists. Then, the most suitable items were selected and a commonly accepted Turkish text was created. Later, the back-translation method was used in translating the questionnaire back into English, after which problematic statements were reviewed and a final form of the questionnaire was decided upon.

Content Validity

The Content Validity Index (CVI) was used in the assessment of content validity. Following the linguistic adaptation, the questionnaire was sent to 8 experts to assess content validity. The experts were asked to review the questionnaire items for relevance, comprehensibility and simplicity. Revisions were made in response to the suggestions made regarding the items and the completion of the questionnaire's adaptation to the Turkish culture was thus completed. The number of experts assigning 3 or 4 points to the items was divided by the total number of experts to find the Content Validity Index (CVI). CVI was found to be 0.97; this rate indicates good content validity.

Construct Validity

Confirmatory Factor Analysis and Exploratory Factor Analysis were performed to assess construct validity. The coefficient for KMO sample adequacy was found to be 0.83 in the factor analysis. The coefficient is an indication that the questionnaire is adequate enough to reveal the factor construct for 850 questionnaires. Barlett's test result was calculated to be $x2=7990.7$, $p=0.00$. Confirmatory Factor Analysis was used to test whether the factor construct of the questionnaire created was compatible with that of the original questionnaire. As a result of confirmatory factor analysis, t values of all items were found to be significant at the 0.01 level. The error variances of the items were found to be between 0.22 and 0.90 (Table 1).

Table 1. Confirmatory Factor Analysis Results of the Adolescent Stress Questionnaire-Short Version

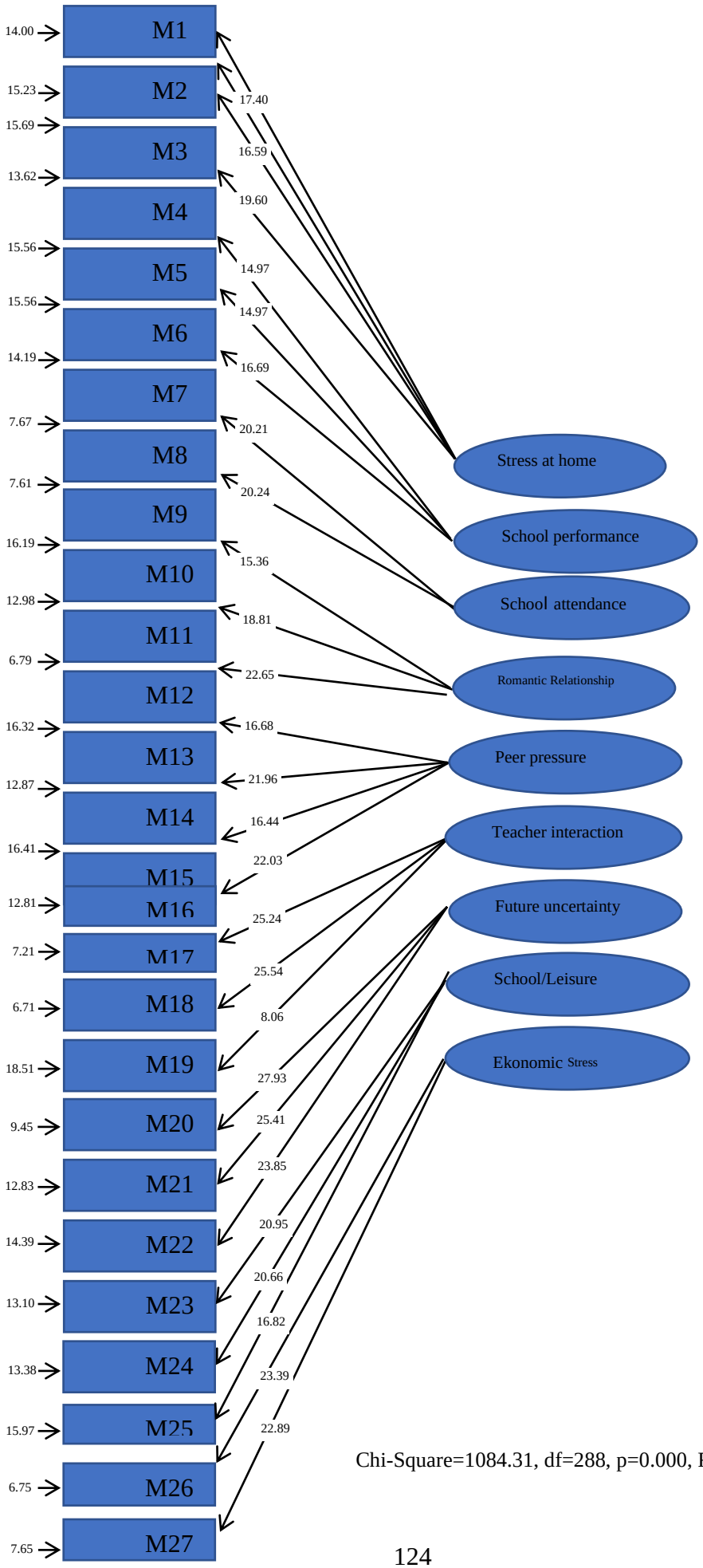
Item Number	Standardized Soulition	T- Values	Error Variance
1.	0.70	19.16	**0.50**
2.	0.65	17.40	**0.58**
3.	0.63	16.59	**0.61**
4.	0.72	19.60	**0.48**
5.	0.59	14.97	**0.65**
6.	0.59	14.97	**0.65**
7.	0.65	16.69	**0.57**
8.	0.81	20.21	**0.35**
9.	0.81	20.24	**0.34**
10.	0.59	15.36	**0.65**
11.	0.71	18.81	**0.49**
12.	0.85	22.65	**0.28**
13.	0.62	16.68	**0.62**
14.	0.77	21.96	**0.41**
15.	0.61	16.44	**0.63**
16.	0.77	22.03	**0.41**
17.	0.87	25.24	**0.24**
18.	0.88	25.54	**0.23**
19.	0.32	8.06	**0.90**
20.	0.88	27.93	**0.22**
21.	0.83	25.41	**0.32**
22.	0.79	23.85	**0.38**
23.	0.75	20.95	**0.44**
24.	0.74	20.66	**0.45**
25.	0.63	16.82	**0.61**
26.	0.86	23.39	**0.26**
27.	**0.84**	**22.89**	**0.29**

The fit indexes showed that the model was a good fit, and the nine-factor construct was confirmed. The following values were found in our study: X2/ Degree of Freedom: 1084.31/288=3.76, GFI=0.90, AGFI=0.87, CFI=0.95 and NNFI=0.94. RMR was found to be 0.086, SRMR to be 0.051 and RMSA was 0.063 (Table 2).

Table 2. Confirmatory Factor Analysis Fit Indexes

Fit Indexes	**Significance ***	**Result**
X^2 / Degree of freedom	Below 5 = Moderate fit Below 3 = Excellent fit	1084.31/288=3.76
p value	p <.05 = No fit p >.05 = Excellent fit	0.00
Goodness of Fit Index (GFI)	Above .90 Good fit Above .95 Excellent fit	0.90
Adjusted Goodness of Fit Index (AGFI)	Above .90 Good fit Above .95 Excellent fit	0.87
Comparative Fit Index (CFI)	Above .90 Good fit Above .95 Excellent fit	0.95
Non-Normed Fit Index (NNFI)	Above .90 Good fit Above .95 Excellent fit	0.94
Root Mean Square Residual (RMR)	Below .10 Poor fit Below .08 Good fit Below .05 Excellent fit	0.086
Standardized Root Mean Square Residual (SRMR)	Below .10 Poor fit Below .08 Good fit Below .05 Excellent fit	0.051
Root Mean Square Error of Approximation (RMSA)	<.10 = Poor fit <08 = Good fit <.05 = Excellent fit	0.063

Figure 1. Adolescent Stress Questionnaire- Short Form Confirmatory Factor Analysis Results



Chi-Square=1084.31, df=288, p=0.000, RMSEA=0.063

RELIABILITY

Table 3. Reliability Analyzes of Adolescent Stress Questionnaire Sub-Factors

Sub Factors	Scale Items	x	ss	r	r1	α
Stress of Home Life	1.Arguments at home	2.34	.21	.47	.59	
	2. Disagreement between your parents	2.00	.10	.38	.59	**.78**
	3.Disagreement between you and your mother	2.29	.20	.42	.55	
	4. Disagreement between you and your father	2.26	.24	.46	.63	
Stress of School Performance	5. Having to study things you do not understand	3.10	.36	.46	.41	
	6. Teachers expecting too much from you	2.49	.36	.47	.45	**.62**
	7. Keeping up with school work	2.54	.42	**.**42	.43	
Stress of School Attendance	8. Getting up early in the morning to go to school	2.78	.55	.36	.65	**.78**
	9. Going to school	2.68	.59	.37	.65	
Stress of Romantic Relationships	10. Getting along with your boy/girl-friend	1.51	.99	.32	.49	
	11.Breaking up with your boy/girlfriend	1.81	.34	.29	.56	**.74**
	12. Making the relationship with your boy/girlfriend work	1.65	.14	.34	.68	
Stress of Peer Pressure	13. Pressure to fit in with peers	.77	.07	46	49	
	14. Being hassled for not fitting in	.01	.29	46	66	**.77**
	15. Peers hassling you about the way you look	1.79	.26	38	49	
	16. Being judged by your friends	.88	.18	52	64	
Stress of Teacher Interaction	17. Lack of respect from teachers	2.01	1.36	.51	.67	
	18. Not being listened to by teachers	2.00	1.34	.50	.72	**.72**
	19. Getting along with your teachers	1.46	0.94	.31	.29	
Stress of Future Uncertainty	20.Concern about your future	3.42	1.37	.52	.79	
	21. Having to make decisions about future work or education	3.28	1.39	.47	.76	**.88**
	22.Putting pressure on yourself to meet your future goals	3.40	1.43	.47	.75	
Stress of School/Leisure Conflict	23.Not getting enough time for leisure.	2.91	1.49	.54	.59	
	24.Not enough time for activities outside of school hours.	2.55	1.45	.55	.61	**.73**
	25.Having too much homework.	2.48	1.48	.47	.47	
Stress of Financial Pressure	26.Not enough money to buy the things you need.	1.75	1.20	.44	.76	**.86**
	27.Not enough money to buy the things you want.	1.91	1.29	.46	.76	

r=item total correlation
r1=item subscale score correlation

Item-total correlations (r) for all items on the Adolescent Stress Questionnaire were found to be over 0.20. The item correlations for the subscales (r1) showed that the item-subfactor correlations for the subfactor “Stress at home” were in the range of 0.55-0.63. The item-subscale correlations for the subfactor “School performance stress” varied between 0.41-0.45. The item-subscale correlation for the subfactor “School attendance stress” was found to be

0.65. The item-subscale correlations for the subfactor "Romantic Relationship stress" varied between 0.49-0.68. The item-subscale correlations for the subfactor "Peer pressure stress" varied between 0.49-0.66. The item-subscale correlations for the subfactor "Stress due to interactions with teachers" varied between 0.29-0.72. The item-subscale correlations for the subfactor "Stress of future uncertainty" varied between 0.75-0.79. The item-subscale correlations for the subfactor "Stress over balancing school/leisure time" varied between 0.47-0.61. The item-subscale correlations for the subfactor "Financial stress'' was found to be 0.76 (Table 3).

The study of the questionnaire was started off with a pilot study with 37 participants. It was found at the end of the pilot study that the 27-item questionnaire related to Adolescent Stress demonstrated a reliability level of α=0.90. After the responses of the participants were found to be reliable, the Adolescent Stress Questionnaire- Short Form was applied with no changes made to 850 participants (items=27), and an overall reliability coefficient of 0.88 was found. The coefficient showed that the questionnaire was quite adequately reliable. Cronbach's alpha values for the subscales were as follows: 0.78 for "Stress at home," 0.62 for "School performance stress," 0.78 for "School attendance stress," 0.74 for "Stress of romantic relationships," 0.77 for "Peer pressure stress," 0.72 for "Stress over interactions with teachers," 0.88 for "stress over uncertainty in the future," 0.73 for "Stress due to balancing school/leisure time," and 0.86 for "Financial stress" (Table 3).

Stability of the questionnaire over time was assessed with test-retest correlations. The analysis showed that the mean values in all the subfactors did not show any variance over time when the two measurements were compared. The correlations revealed that only the subfactors of stress over school performance showed a weak correlation at 0.39, while the stress over uncertainty about the future and the financial stress subfactors demonstrated a moderately positive correlation. The other subfactors well as the overall scale exhibited statistically positive and strong correlations (Table 4).

Table 4. Invariance over time test-retest correlations

Sub-factors	Before	After	t	p	Correlation
Stress of Home Life	7.76 ± 3.44	7.16 ± 3.3	1.721	.09	0.80
Stress of School Performance	7.41 ± 2.48	6.92 ± 2.47	1.086	0.28	0.39
Stress of School Attendance	4.32 ± 2.64	4.46 ± 2.87	-0.635	0.52	0.89
Stress of Romantic Relationships	4.54 ± 2.26	4.57 ± 2.08	-0.093	0.97	0.66
Stress of Peer pressure	7.03 ± 3.79	6.76 ± 3.74	0.682	0.50	0.79
Stress of Future Uncertainty	5.38 ± 3.24	5.97 ± 3.28	-1.05	0.30	0.44
Stress of Teacher İnteraction	8.89 ± 3.89	9.05 ± 4.14	0.321	0.75	0.70
Stress of School/Leisure Conflict	6.27 ± 3.41	7.19 ± 3.6	-2.494	0.01	0.79
Stress of Financial	2.68 ± 1.25	2.62 ± 1.14	0.269	0.79	0.47
ASQ-S	54.27 ±15.98	54.7±17.02	-0.272	0.78	0.83

ASQ-S= Adolescent Stress Questionnaire- Short Form

DISCUSSION

The period of adolescence incorporates many deep changes. Besides experiencing changes in sexual and physical maturity, the individual progresses toward independence and taking on the responsibilities of adulthood, which involves making changes at home, at school and in

the social setting. These changes cause adolescents to feel a potential increase in their burden of stress (Anniko et al. 2018). In this period, adolescents inevitably go through an identity crisis and must learn to recognize the sources of their stress, become aware of the techniques of coping with stress and adjust themselves accordingly. For a healthy development, it is essential that the issue of stress is tackled during adolescence (Lohman & Jaris,2000). This study tested the Adolescent Stress Questionnaire developed by Anniko et al. (2018) for validity and reliability in the Turkish population. The validity of a measuring tool indicates that the scores determined by the instrument are suitable, meaningful and useful in reaching conclusions (Şencan, 2005).

The fact that many of the scales developed in English are translations makes it necessary to perform an extensive analysis in order to ensure cultural and linguistic equivalence. The instrument to be used in our study must be adapted to the Turkish language and culture. İf it is to be translated from a different language and culture, the adaptation must be done according to psycholinguistic characteristics (Erefe, 2002; Çapık ve ark. 2018; Şencan, 2005). The first step is to contact the developer of the original scale and obtain permission for the use of the instrument (Şencan, 2005). Written permission was therefore obtained from Anniko et al. for the use of the Adolescent Stress Questionnaire- Short Form (ASQ-S) the researchers had developed. After obtaining permission for use of the questionnaire developed by Anniko et al (2018) in Sweden in 2018 to measure stress levels in adolescents, a linguistic adaptation of the questionnaire was first carried out with the aim of introducing this measure to the Turkish population. The translation/back-translation technique was used for the linguistic adaptation in this study.

Following the translation procedure, content analysis is performed to determine whether each of the items can measure the intended concept and to detect whether there are any discrepancies in meaning. Experts are called upon for their opinions in the process of content validity analysis. This group of experts is made up of from 3-20 individuals (Şencan, 2005; Esin, 2015, Aksayan et al., 2002). The opinions of 8 experts were enlisted in adapting the Adolescent Stress Questionnaire into the Turkish language and culture. The "Davis Technique" was used in calculating the Content Validity Index (CVI). In order to say that a measuring tool has content validity, the CVI score should equal or exceed 80% (Şencan, 2005; Alpar, 2018). The CVI score in this study was found to be 97%.

The most commonly used method of measuring the construct validity of an instrument is factor analysis (Aksayan ve Gözüm, 2003). Scores on the overall scale may be investigated as well as the scores of subfactor. The purpose of factor analysis is to reduce many individual items into a fewer number of factors (Şencan, 2005). Confirmatory Factor Analysis (CFA) and Exploratory Factor Analysis (EFA) were performed in this study. An assessment is first made of whether the data set for exploratory factor analysis is suitable for factor analysis. For this, Kaiser-Mayer-Olkin (KMO) and Bartlett's test are used to see whether the variables display a correlation with each other. A KMO value of below 0.50 indicates that the sample size is not suitable for testing validity (Şencan, 2005).

The coefficient for KMO sample adequacy was found to be 0,83 in the factor analysis. The coefficient showed that the 850 questionnaires were adequate enough to reveal factor construct. Also, according to Barlett's sphericity test, which looks into the significance of the factor constructs, the dimensions obtained were structurally valid ($p=0,000$, $p<0,05$).

Confirmatory factor analysis is used to test the hypotheses formulated about the analysis. Exploratory factor analysis is used to test which groups of variables obtained through factor

analysis have a high correlation with which factor and whether these groups of variables are adequately represented in these factors (Özdamar, 2004).

The confirmatory factor analysis confirmed the nine-factor construct of the questionere. The model displayed a good fit according to the fit indexes. The first element to be reviewed in CFA is the p value. This value provides information on the significance of the difference between the expected covariance matrix and the observed covariance matrix. The p value is expected to be significant. A p value of .01 is significant. It is also expected for p to be significant in many confirmatory factor analysis results where the sample is a large one (Çoklu et al., 2012).

Another fit index that is accessed is X2/Degree of Freedom. A value less than 3 points is an excellent fit; less than 5 means a moderate degree of good fit (Sümer, 2000). In our study, this value was found to be 1084.31/288=3,76. This signifies a moderate fit. Values exceeding 0.90 in GFI, AGFI and CFI are acceptable levels of fit. Values below 0.05 in RMSA, RMR and SRMR indicate excellent fit; values less than 0.08 are acceptable levels of fit (Çoklu et al., 2012, Şimşek, 2007). The following values were found in our study: GFI=0.90, AGFI=0.87, CFI=0.95 and NNFI=0.94. RMR was found to be 0.086, SRMR to be 0.051 and RMSA was 0.063.

Reliability is the element that determines whether all aspects of a measuring tool have the capacity to measure. In this study, internal consistency was assessed with two methods. The first was Cronbach's alpha reliability coefficient; the second, Item-total score reliability (Esin, 2015).

Item-total score reliability provides information as to the reliability of each item on the scale. In this test, the variance seen in each item is compared with the variance seen in the total test score. A value of r is obtained for each item. If the item-total correlation coefficient is low, this shows that the item measures a different quality on the scale (Esin, 2015). An item-total correlation of 0.30 or over shows that the items can differentiate between individuals, whereas a correlation of 0.20-0.30 signals the need for revision and a value of less than 0.20 means that the relevant item should not be included in the scale (Büyüköztürk, 2004).

Cronbach's alpha reliability coefficient is calculated to determine whether each item is able to measure the same quality. This technique is used in measures that do not have two responses but are arranged on a Likert-type rating scale , or when item responses are the same at different times of measurement (Şencan, 2005; Erefe, 2002). Cronbach's alpha reliability coefficient may be between 0-1. A coefficient of less than 0.40 shows that the questionnaire is unreliable, a value (α) of 0.40-0.60 indicates low reliability, while 0.60-0.80 points to good reliability and values of 0.80-1.00 indicate a high degree of reliability (Karagöz, 2018). Cronbach's alpha coefficient was the Adolescent Stress Questionnaire in this study was 0.88. The coefficient for the subfactor varied between 0.62-0.88. Cronbach's alpha (α) coefficient in the original questionnaire was 0.93. The coefficients for the subfactor varied between .64-0.89.

CONCLUSION AND RECOMMENDATIONS

The ASQ-S is a valid and reliable measure that can be used to assess stress levels/experiences with stress among adolescents in the Turkish population. The questionnaire can also be used to evaluate stress at home, school performance stress, school attendance

stress, the stress caused by romantic relationships, stress from peer pressure, stress due to interactions with teachers, stress over uncertainty about the future, the stress of balancing school and leisure time, and financial stress. As the score increases, the stress level of the adolescent increases.

This measure can be reliably used in preventive studies, by school nurses and specialists in adolescent health in the planning of training programs on coping with stress, and in determining areas of multiple stress that are specific to adolescents. The tool can also be used in comprehensive screening and follow-ups.

Ethical Considerations: Ethical approval for the study was obtained from the Ethics Board of Marmara University Health Sciences Institute (17.12.2018-252).

Author Contributions: Idea: NÖT, KG; Design: NÖT, KG; Resources and Materials: NÖT, KG; Data Collection: NÖT, KG; Data Analysis: NÖT, KG; Literature Review: NÖT, KG; Writing: NÖT, KG; Critical Review: NÖT, KG

Conflict of interests: No.

Financial Disclosure: No.

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APP 1: Adolescent Stress Questionnaire- Short Form (in Turkish)

Son 6 ayda aşağıda belirtilen deneyim veya durumları ne kadar stresli bulduğunuzu işaretleyiniz. Herhangi bir durumun sizinle ilgili olmadığını düşünüyorsanız ilk seçeneği işaretleyin (böyle bir şey olmadı).

	Hiç stres yaratmadı (veya böyle bir şey olmadı)	Biraz stres yarattı	Kısmen stres yarattı	Oldukça fazla stres yarattı	Çok çok fazla stres yarattı
Evdeki tartışmalar.	☐	☐	☐	☐	☐
Ebeveynlerin arasındaki fikir ayrılıkları.	☐	☐	☐	☐	☐
Annenle arandaki fikir ayrılıkları.	☐	☐	☐	☐	☐
Babanla arandaki fikir ayrılıkları.	☐	☐	☐	☐	☐
Anlamadığım şeyleri çalışmak zorunda kalmak.	☐	☐	☐	☐	☐
Öğretmenlerin benden çok fazla beklentilerinin olması	☐	☐	☐	☐	☐
Okul ödev ve etkinlikler ile başa çıkmak	☐	☐	☐	☐	☐
Okula gitmek için sabah erken kalkmak.	☐	☐	☐	☐	☐
Okula gitmek.	☐	☐	☐	☐	☐
Erkek/kız arkadaşınla iyi geçinmek.	☐	☐	☐	☐	☐
Erkek/kız arkadaşından ayrılmak.	☐	☐	☐	☐	☐
Erkek/kız arkadaşınla aranızdaki ilişkiyi ayakta tutmak.	☐	☐	☐	☐	☐
Akranlarının baskılarına ayak uydurmak.	☐	☐	☐	☐	☐
Akranlarının yaptıklarına ayak uyduramadığın için eleştirilmek.	☐	☐	☐	☐	☐
Akranlarının fiziksel görünümünün hakkında seninle dalga geçmeleri.	☐	☐	☐	☐	☐

	Hiç stres yaratmadı (veya böyle bir şey olmadı)	Biraz stres yarattı	Kısmen stres yarattı	Oldukça fazla stres yarattı	Çok çok fazla stres yarattı
Arkadaşların tarafından eleştirilmek	☐	☐	☐	☐	☐
Öğretmenlerin tarafından sana saygı gösterilmemesi	☐	☐	☐	☐	☐
Öğretmenlerin seni dinlememesi	☐	☐	☐	☐	☐
Öğretmelerinizle geçinebilmek	☐	☐	☐	☐	☐
Geleceğin konusunda endişelenmek	☐	☐	☐	☐	☐
Gelecekteki çalışman veya eğitimin konusunda karar vermek zorunda olman	☐	☐	☐	☐	☐
Geleceğe hedeflerini yerine getirmek için kendi kendine yarattığın baskı	☐	☐	☐	☐	☐
. Dinlenmek için yeterli zamanının olmaması.	☐	☐	☐	☐	☐
Okul saatlerinin dışında yapılan aktivitelere katılmaya yeterli zamanının olmaması.	☐	☐	☐	☐	☐
Ev ödevlerinin çok olması	☐	☐	☐	☐	☐
İhtiyacın olan şeyleri alacak yeterli paranın olmaması	☐	☐	☐	☐	☐
İstediğin şeyleri alacak yeterli paranın olmaması	☐	☐	☐	☐	☐