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Adaptation of the Job Stress Scale into Turkish

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Abstract

The aim of this research is to adapt the job stress scale developed by Parker in 1983 into Turkish and to conduct a validity and reliability study. Exploratory factor analysis of the job stress scale was conducted on a sample of 167 teachers and confirmatory factor analysis was carried out on a sample of 185 teachers. The 13-item scale was first adapted into Turkish and reviewed by field experts. As a result of the exploratory factor analysis of the five-point Likert-scale, a two-factor structure emerged and it is seen that this structure explains 69.336% of the total variance. According to the exploratory factor analysis, the scale items were collected in two clusters called job anxiety and time stress. This two-factor structure was confirmed by confirmatory factor analysis. Confirmatory factor analysis fit indices are at best fit and acceptable fit levels. This adaptation research whose validity and reliability were fulfilled was found to be compatible with the results of the scale developed by Parker. The Cronbach Alpha coefficient calculated to determine the reliability of the scale was determined as .843. The job stress scale is valid and reliable in the sample of teachers.

Keywords: Job anxiety, Time stress, Scale development, Factor analysis, Validity and reliability.

Introduction

The word “stress”, which etymologically comes from the root of “estrictia” in Latin, has been defined in different ways according to the relevant century. While it expressed negative meanings such as disaster, trouble, and grief in the 17th century, it involved meanings such as pressure, coercion, and constructive power for people, objects, and souls in the following centuries (Güçlü, 2001: 92). Today, it is defined as "mental stress" (Turkish Language Association: TDK, 2022). Although the origin of the word stress is Latin, it has passed from English to our language. The word stress is expressed by behaviorists as “the reaction of metabolism in the face of adverse situations” (Yamuç & Türker, 2015: 390). Once the literature is examined, numerous definitions of stress emerge. Özmutaf (2006:75) defines stress as individuals' reaction to environmental factors; Magnuson (1990) defines stress as the individual's reaction to the difference between their expectations and their real world; and Robins (1996) defines stress as a result of the voluntary or involuntary dynamic conditions that individuals face as a consequence of limitation or opportunity. According to these expressed definitions, we can define stress in the most general sense as the physical or mental reactions of the individual in order to adapt to the situation as a result of the extraordinary demands, exerted oppression, or encountered opportunities.

A job or working life is a crucial part of life in terms of social, cultural, and economic aspects. Working life, which corresponds to an important time period in the daily life process, causes the positive and negative burden on the mind of the individual to be experienced more intensely than other life events. Keser (2014:20) stated that the time spent at work covers a large part of people's lives, and therefore work stress has an important place in daily life. Therefore, work stress emerges as an important source of stress in daily life (Erkutlu & Chafra, 2006). Job stress is defined as the entity of the relationships between the demands, restrictions, and situations encountered in working life and personal characteristics (Draper et al., 2004). According to another definition, it is also defined as a negative situation or tension (Yenihan et al., 2014:39) that arises as a result of the interaction between the individual and her or his environment. In addition, the stress that is exposed prevents people from performing their daily work and causes them to react both physically and mentally (Gül, 2007: 319; Tekin, 2010: 33).

Parallel to the industrial revolution, the need for qualified manpower in societies came forth, and mass education was introduced to meet this need. The spread of mass education brought about the spread of the school system,

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and along with the prevalence of the school system, teaching began to be considered a profession (Aslan, Aslan, & Cansever, 2012; Eskicumalı, 2004). Teaching, which is recognized as a profession, has been defined as a profession made by experts who organize and implement teaching within the realms of a specific plan and program in line with determined goals (Yazar, 2015). In light of this information, it is an undeniable fact that teaching is a profession and that the teaching profession entails stress, as in every profession. As a matter of fact, it is known that teachers in schools are also faced with work stress, as in every institution. Today, teachers work in business environments dominated by many variables that affect the work environment and the process. Like every institution, schools have their own stress sources. It should not be ignored that there are sources of stress that are not encountered in other institutions in schools where the human element plays a leading role. For this reason, acknowledging the sources of stress that teachers and school administrators are exposed to is important for them to be successful in stress management.

As the literature is reviewed, the causes of stress encountered in working life have been collected under different headings by the researchers. The causes of stress are listed by McGrath (1976, cited in Ertekin, 1993) as task-dependent, role-played, depending on the environment in which the behavior takes place, depending on the physical environment, shaped according to the social environment, and depending on the individual himself. Cooper et al. (1988), on the other hand, divided them into five groups: organizational practices, job/task characteristics, organizational culture/climate, interpersonal relations, and personal characteristics of employees. Eroğlu (1998) classified the causes of stress into six groups: general stress causes, environmental conditions, economic conditions, social life, working life, and personality structure.

When the studies on job stress in the literature are examined, the sample of the studies has always been selected from different occupational groups. As a matter of fact, Balcı (1993) carried out studies on university lecturers, Gümüştekin & Öztemiz (2004) carried out studies on flight crew, Demiral et al. (2007) carried out studies on municipal employees, Soysal (2009) carried out studies on employees in different sectors, Ersan et al. (2012) carried out studies on health care professionals, Tuna & Baykan (2013) carried out studies on oncology nurses, Avcı (2018) carried out studies on social workers, Çiçek (2020) carried out studies on civil aviation personnel, and Gürbüz (2020) carried out studies on university administrative staff. Besides, there are many studies abroad that demonstrate that teachers experience burnout and high levels of job stress (Abel & Sewell, 1999; Cox & Brockley, 1984; Farber, 1984; Feitler & Tokar, 1982; Kyriacou & Sutcliffe, 1978). In addition, Ünal (2000), Bulut (2005), and Erkmen & Çetin (2008) conducted studies on teachers' styles of coping with stress. In this context, no study has been found in Turkey on the determination of teachers' job stress levels. With this study, it is aimed at developing a scale to determine teachers' job stress. The research is important in terms of eliminating this shortcoming in the literature. For this purpose, the job stress scale developed by Parker in 1983 was adapted to Turkish, and a validity and reliability study was conducted.

Method

This research, using the descriptive scanning method, was carried out on two different samples with the participation of teachers working in Hakkari province and its districts. 167 teachers randomly selected from the population of Hakkari province constitute the sample of exploratory factor analysis (EFA), and 185 teachers randomly selected from the population of Hakkari districts constitute the sample of confirmatory factor analysis (CFA). The difference between EFA and CFA samples stemmed from the difference in the number of teachers working in the provinces and districts that make up the universe. Of the 167 teachers who were EFA participants, 93 (56%) were women and 74 (44%) were men. Of the 185 teachers who were CFA participants, 107 (58%) were women and 78 (42%) were men.

The Job Stress Scale developed by Parker in 1983 was used in the research. The 13-item scale was first adapted into Turkish and reviewed by field experts. Responses to the 5-point Likert-type Job Stress Scale were scored based on "(5)-totally agree", "(4)-agree", "(3)-undecided", "(2)-disagree" and "(1)-totally disagree". In order to test the construct validity of the 13-item scale, the Cronbach's Alpha test was used to test the reliability of EFA and CFA.

In the study, first of all, the data were reviewed in terms of extreme values and missing data, and their suitability for factor analysis was tested to determine whether they showed a normal distribution. As a result of these preliminary evaluations, it was determined that the scale was suitable for factor analysis, and then EFA and CFA were performed.

Moreover, regarding the sample size, Muthén & Muthén (2002), Bollen (1989), and Bentler & Chou (1987) stated that 5–10 times the number of items in the scale would be sufficient, while Anderson & Gerbing (1984)

stated that the selected sample would be sufficient. They stated that it should be greater than 100. Considering these criteria, it is seen that the sample size in this study is sufficient for EFA and CFA.

Findings

Among the statistical techniques, factor analysis is used to obtain information about the dimension structure of measurement tools and the items to be collected in these dimensions (Baykul, 2000). The process before factor analysis is to test the adequacy of the sample size (Tabachnick & Fidell, 2001). Çokluk et al. (2010) stated that the Kaiser-Meyer-Olkin (KMO) test is an instructive guide for sample adequacy in factor analysis and that the sample size should take a value between .80 and .90 for it to be considered "good". Leech, Barrett, and Morgan (2005) state that factor analysis cannot be performed if the value obtained according to the KMO test result is less than .50, and Field (2005) and Pallant (2001) state that factor analysis cannot be performed if the value obtained according to the KMO test result is less than .60. During the development of the job stress scale, the KMO value was found to be .821, and it was determined that the sample was "good" and suitable for factor analysis. In addition, the results of the Bartlett Sphericity test (χ^2)=1255.890, sd = 55, p =.000) demonstrate that the data show a multivariate normal distribution and are suitable for factor analysis (Çokluk et al. 2010).

EFA and principal component analysis, which are dimension reduction techniques, are frequently used by researchers to obtain information about the component and factor structure of data collection tools (Costello & Osborne, 2005). Since it is known that the vertical rotation method in EFA facilitates the interpretation of the results obtained (Rennie, 1997), the varimax rotation method was used in EFA (Tatlıdil, 1992). In addition, the scree plot, which allows us to visually evaluate the factor structure, was examined. Significant changes observed in the curve in the scree plot are guiding factors in deciding the factor structure (Ledesma, Valero-Mora, & Macbeth, 2015). Contrary to statistical data, this approach is frequently used, although it is criticized for being intuitive (Zwick & Velicer, 1986). The scale consisting of 13 items was excluded from the scope of the two overlapping items, and an EFA of 11 items was performed. The scree plot obtained as a result of the EFA of the Job Stress Scale is given in Figure 1.

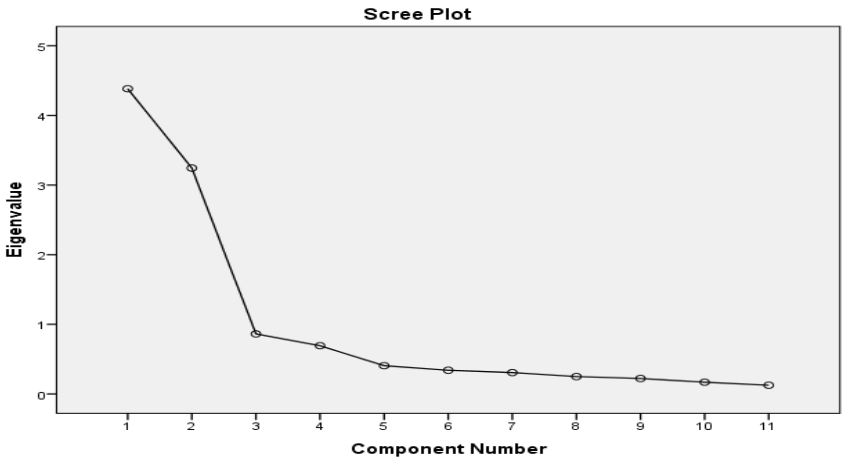

Figure 1. Scree Plot

The aim of the Scree Plot is to reveal the number of dominant factors (Çokluk et al. 2010). As a matter of fact, an indicator of the number of factors is the accelerated or rapid declines in the scree plot (Büyüköztürk, 2002). In addition, horizontal lines are used for the explained variance. By examining the scree plot, the components of the point on the graph where the slope starts to disappear or the accelerated decline begins have been determined (DeVellis, 2017). According to Figure 1, the point where the slope started to disappear occurred after the second factor. In light of this information, it can be said that the scale has a two-factor structure. However, while deciding on the factor structure of the scale as well as the scree plot, attention was paid to ensuring that the eigenvalue of each factor should be greater than 1. It was determined that the eigenvalue of the third factor was less than 1, and it was decided that the job stress scale had a two-factor structure. The ratio of variance explained for each factor as a result of the EFA of the job stress scale, Bartlett's Test of Sphericity values, KMO values, Cronbach Alpha reliability coefficients for the whole scale, and each dimension are given in Table 1.

Table 1. The Explained Variance, Bartlett's Test of Sphericity, KMO, and Alpha Coefficients of the Job Stress Scale

Variance				
Dimension	Explained (%)	Cumulative (%)	Cronbach Alpha	KMO
Factor 1	37.973	37.973	.911	.821
Factor 2	31.363	69.336	.886	
			Bartlett's Test χ^2= 1255.890; SD= 55; P= .000	
			Total Scale (Cronbach Alpha Coefficient)	.843

According to Table 1, the scale has a two-factor structure consisting of 11 items, and it is seen that this structure explains 69.336% of the total variance. It is seen that the first factor (F1) explains 37.973% and the second factor (F2) explains 31.363% of the variance. In addition, when the whole scale is considered, Cronbach's Alpha coefficient was found to be .843. When Cronbach's Alpha coefficient for each factor was calculated, it was .911 for the first factor and .886 for the second factor. The two-factor structure of the work stress scale and the factor loads of the items that make up the structure are as in Table 2.

Table 2. Item Factor Loads of the Job Stress Scale

Strategical Dimension	Items	Item Factor Load
Factor 1	a4	.874
	a11	.857
	a8	.833
	a6	.810
	a10	.809
	a2	.802
Factor 2	a3	.862
	a5	.858
	a1	.843
	a9	.809
	a7	.763

According to Table 2, it is seen that the item load values of the scale vary between .763 and .874. When the items clustered under the factors were reviewed, it was determined that the first factor was related to "Time Stress" and the second factor was related to "Job Anxiety", and labeling of the factors was done in this way. In order to determine the accuracy of the scale, which was determined to have a two-factor structure as a result of EFA, the CFA process was initiated, and the results in Figure 2 were obtained.

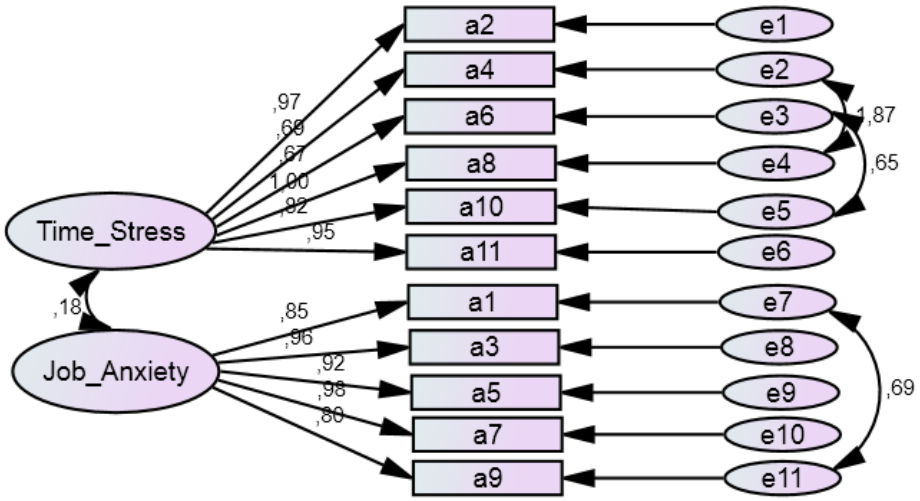

Figure 2. Confirmatory Factor Analysis Results

Figure 2 shows the correlation and error values of the two-factor structure of the job stress scale. Considering the error values, it was decided to adjust the fit indices, and modifications were made in three spots (between

items a4–a8, a6–a10, and a1–a9). The fit index values of the job stress scale obtained after these modifications are summarized in Table 3.

Table 3. Results of the Job Stress Scale by Confirmatory Factor Analysis (CFA)

Indexes and Measurement	Best fit*	Acceptable Fit*
$X^2/sd=2.421$	***0≤measurement<3***	3<measurement≤5
GFI=.914	.95≤measurement≤1.0	***.90≤measurement≤.95***
AGFI=.979	**.90≤measurement≤1.0**	*.85≤measurement≤.90*
CFI=.979	***.95≤measurement≤1.0***	.90≤measurement≤.95
RMSEA=.088	0≤measurement≤.05	***.05≤measurement≤.08***
SRMR=.0308	***0≤measurement≤.05***	.05≤measurement≤.08

*[Çokluk, Şekercioğlu & Büyüköztürk (2010); Hu & Bentler (1999); Meydan & Şeşen (2011); Şimşek Sümer (2000); Tabachnick & Fidell (2001)]

When Table 3 was examined, some of the fit indices (χ^2/sd; AGFI; CFI; and SRMR) were found to have the best fit, while others (GFI and RMSEA) were found to be at acceptable fit levels. According to these values, the two-factor structure revealed by EFA was confirmed by CFA. The correlation matrix between the overall scale and each dimension is given in Table 4.

Table 4. Job Stress Scale Correlation Matrix (N=185)

		Job Anxiety	Time Stress	Total
Job Anxiety	Correlation Coefficient (r)	1		
	p			
Time Stress	Correlation Coefficient (r)	.179	1	
	p	.015		
Total	Correlation Coefficient (r)	.715**	.816**	1
	p	.000	.000	

When the correlation analysis results in Table 4 were examined, it was determined that there were significant and .01 positive relations between the whole scale and both dimensions. Another result in the table is that the highest correlation is between the whole scale and time stress (r =.816, p =.000), and the lowest relationship is between the whole scale and the job anxiety dimension (p =.715, p =.000).

Conclusion and Discussion

Within the scope of this research, the Job Stress Scale, which was adapted into Turkish and whose validity and reliability studies were carried out, was developed by Parker in 1983. Responses to the 5-point Likert-type Job Stress Scale were scored based on "(5)-totally agree", "(4)-agree", "(3)-undecided", "(2)-disagree" and "(1)-totally disagree". Although it consists of 13 items, the final version of the scale consists of 11 items because two overlapping items are excluded from the scope. EFA and CFA were used to determine whether the scale met the validity criterion.

It is sufficient for the item factor load to have a value of .32 and above (Tabachnick & Fidell, 2001). In addition, Hair et al. (2010) stated that the item factor load should be .50 and above. On the other hand, Comrey & Lee (1992) described the item load value as "very good or excellent," provided that the item factor load was .63 or above. According to these evaluations, it is possible to characterize all item factor loads on the job stress scale as excellent.

The scale, which consists of eleven items, has a two-factor structure, and has an eigenvalue above 1, explains 69.336% of the total variance. This determined ratio is seen as sufficient (Scherer, Wiebe, Luther, & Adams, 1988; reported by Tavşancıl, 2014:48). When each factor is considered, it is seen that the first factor (F1), consisting of six items, explains 37.973% of the variance, and the second factor, consisting of five items, explains 31.363% of the variance. Considering the two-factor structure of the scale, there are six items in the first factor and five items in the second factor. As a matter of fact, as Costello & Osborne (2005) stated, a factor containing two or fewer items is generally unstable and weak. According to this view, we can say that the scale has a stable and strong structure. In addition, the explained variance is an indicator of the developed scale, and it is sufficient for the explained variance to be between 40% and 60% (Çokluk et al. 2010). Consequently, we can assert that the job stress scale is suitable for the specified criteria, according to the number of items clustered in each factor and the variance explained.

When the item expressions of the scale were reviewed, the factor names were assigned in this way because the first factor was clustered as "Time Stress" and the second factor as "Job Anxiety". Because when naming factors (labeling), they should be labeled in accordance with an institutional structure, items with a high load value should be taken into account, and it should be taken into account that these items are gathered in the same cluster due to the common feature (Şencan, 2005).

CFA is performed to test the accuracy of the factor structure obtained as a result of EFA and to determine its theoreticity (Eroğlu, 2005; Gürbüz & Şahin, 2017). In the evaluation of the model established with DFA, fit indices such as GFI, AGFI, CFI, χ^2/sd, RMSEA, and SRMR are used. Beauducel & Wittmann (2005) stated that these fit indices provide the most valid information for evaluating CFA results. GFI and CFI fit indices take values ranging from 0 to 1. Among these fit indices, Sümer (Sümer, 2000) indicates that it is acceptable for the GFI value to be .85 and above, Sivo et al. (2006), Perry et al. (2015) indicate that it is a good fit between .90 and .95, and Baumgartner & Homburg (1996), Erkorkmaz et al. (2013), Hu & Bentler (1999), Schreiber et al. (2006), Schermelleh-Engel et al. (2003), and Marsh et al. (2006) indicate that it is an excellent fit between the model and the data. Similarly, it is acceptable for the CFI value to be .90 and above, and a value of .95 and higher is interpreted as an indication of perfectness in terms of the data (Sümer, 2000; Şimşek, 2007).

The corrected Chi-square statistic (χ^2/sd) is one of the most important criteria for model fit. A score below five is considered moderate or acceptable (Bollen, 1989; Sümer, 2000), while a score below two or three is interpreted as having a perfect fit (Schreiber et al., 2006). Since the corrected Chi-square statistics (Özdamar, 2013), which is an index sensitive to the number of items and sample size, will not be sufficient alone, RMSEA and SRMR values, which are other fit indices, should also be taken into account. Yaşlıoğlu (2017:81) stated that RMSEA and SRMR values give the most reliable information about the model. RMSEA and SRMR values of .08 or less are acceptable (Schreiber et al. 2006), while values close to zero or less than .05 indicate a perfect fit (Sümer, 2000). The last index value to be considered for DFA is the AGFI index. The acceptable value for this index is .80 and above (Sümer, 2000).

Considering the fit indices obtained as a result of the CFA of the job stress scale, it is seen that they are in harmony with the reference values stated in the literature. As a matter of fact, it was determined that (χ^2/sd; AGFI; CFI; and SRMR) had a good fit, while some (GFI and RMSEA) were at an acceptable level of fit, and the two-factor structure in EFA was confirmed according to CFA.

Finally, to test the reliability of the job stress scale, Cronbach's Alpha reliability coefficient was calculated and found to be .843. It had been stated that the Cronbach Alpha reliability coefficient was accepted as excellent above .90, high between .80 and .90, and reliable between .70 and .79 (Cohen et al. 2007). It has also been stated that the number of items in the scale is low or that the acceptable level of Cronbach's Alpha reliability coefficient in newly developed scales is .60 and above (Child, 1970; Nunnally, 1978; reported by Alemdar & Köker, 2013). As a result of this information, it was decided that the job stress scale is valid and reliable for teachers.

Author (s) Contribution Rate

The article was written by a single author.

Conflicts of Interest

There are no conflicts of interest regarding the publication of this paper.

Ethical Approval

Ethical permission (03.04.2023-2023/38) was obtained from Hakkari University Scientific Research and Publication Ethics Committee for this research.

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