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Validity and Reliability of Basic Depression Scale For Turkey

Temel Depresyon Ölçeği'nin Türkçe Geçerlik ve Güvenirliği

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ABSTRACT

Aim: To investigate the validity and reliability of the Basic Depression Scale for Turkey. It was designed and carried out in the form of cross-sectional research methodologically.

Material and Methods: Data analysis for structure validity; Cronbach alpha (α) coefficient used in reliability analysis. Factor analysis applied for validity analysis.

Results: Basic Depression Scale found to have sufficient distribution based on the explanatory factor analysis of the Kaiser Meyer Olkin test. Croncbachs alpha (α) found 0.7. Basic Depression Scale is a reliable measurement tool for Turkey. It concluded that Basic Depression Scale was a valid and reliable scale for young people who receive a university education in Turkey.

Conclusion: The scale is a four-point Likerttype. Max 84, min 21 points can be given. It can be said that the higher the total score, the higher the level of depression based on total scores. There are anhedonia, low self-esteem, and sadness sub-scales. In the end, we suggest that scale should be tested on different groups with different variables under prospect researches in the field.

Keywords: Depression, Validity, Reliability, Scale

ÖZ

Amaç: Temel Depresyon Ölçeğinin Türkçe geçerlik ve güvenirliğini araştırmaktır. Kesitsel araştırma biçiminde dizayn edilerek, metodolojik olarak gerçekleştirilmiştir.

Gereç ve Yöntemler: Yapı geçerliliği için; güvenirlik analizlerinde Cronbach alfa (α) katsayısı kullanılmıştır. Geçerlik analizi için faktör analizi uygulanmıştır.

Bulgular: Temel Depresyon Ölçeği aracı açıklayıcı faktör analizi Kaiser Meyer Olkin (KMO) testine göre dağılım yeterli olduğu sonucu bulunmuştur. Varyans oranları yeterli olmakla birlikte Cronbach alfa(α) 0,70'in üzerinde bulunmuştur. Temel Depresyon Ölçeği üniversite eğitimi alan gençler üzerinde geçerli ve güvenilir olduğu sonucuna varılmıştır.

Sonuç: Ölçek dörtlü likert tipindedir. En yüksek 84, en düşük 21 puan alınabilir. Toplam puan yükseldikçe depresyon düzeyinin yükseldiği söylenebilir. Anhedonya, düşük benlik ve üzüntü alt boyutları bulunmaktadır. Üniversite öğrencileri grubu ile yapılmış olan geçerlik ve güvenirlik çalışmasının farklı gruplar üzerinde de yapılması gerektiği, farklı değişkenler ile sınanması gerektiği önerilmektedir.

Anahtar Sözcükler: Depresyon, Geçerlik, Güvenirlik, Ölçek

INTRODUCTION

According to the World Health Organization's (WHO) estimates for 2017, the number of people in depression is 322 million worldwide. Today, this figure is estimated to be around 350 million. In terms of gender difference, depression is more common in women than in men. It stated that 5.1% of women and 3% of men are depressed in the world. Also, anxiety disorders and depression are becoming more common with aging. World Health Organization reported 4.4% of Turkey's population, 3,260,677 citizens were diagnosed with depression (1). It is quite possible that these numbers are on the rise today. In addition, according to the same report, it is stated that only 50% of depressed people in countries with high levels of welfare can receive treatment, and less than 10% of depressed people in countries with a low level of welfare.

It has also been reported that depression has a strong relationship with suicide (2). Symptoms of individuals diagnosed with depression include hopeless mood and anhedonia. In addition, while physical symptoms include fatigue, weight gain, and sleep disorders, cognitive symptoms include low concentration, suicidal thoughts, and feeling guilty (3). For the diagnosis of depression, the symptoms mentioned above should pass at least two weeks and cause clinical discomfort (4).

Having said that, depression is closely related to anxiety disorder (5). However, in the psychometric analysis of the anxiety questionnaire, Taylor et al (6) stated that anxiety and depression are similar to symptoms such as recurrent negative thinking, especially rumination and hopelessness. In addition, in a global study conducted in Europe and America, depression patients were later found to be associated with extensive anxiety disorder attacks (7). Therefore, triple model, some symptoms of depression such as insomnia, weak concentration, fatigue, negative efficacy and irritability are also symptoms of anxiety disorders.

For these reasons, the symptoms of both anxiety disorder and depression can be similar, making it difficult to diagnose depression. It is obvious that there is a need to develop a valid and reliable measurement tool in this context (6). There are tools to measure depression for children in the literature (8-10), adolescents (11), adults (12-13), and the elderly (14). Meanwhile, there are measurement tools that deal with depressive symptoms and anxiety symptomatology or common symptoms as well (15-17). In addition, Hamilton Depression Rating Scale (HDRS), which is frequently used in clinics, is compared with the Beck Depression Scale, although both of them measure depression, while the sub-dimensions of the items are analyzed, Beck Depression Scale explains the cognitive areas, while HDRS is a tool that measures physiological and mental symptoms (18).

Unlike the scales mentioned above, the Basic Depression Scale (Cuestionario Básicode Depresión, CBD) (19) is one of the tools designed to isolate all specific symptoms of depression. This scale highlights specific questions related to depression to avoid anxiety disorders and comorbidity problems.

This scale investigates areas of depression involving sadness, anhedonia and low self-esteem, but it also has a single structure (20- 21). The distinction was found between anxiety and depression in both adults (22) and adolescents (17). In addition, it has a distinctive capacity between episodes of acute depression and dysthymia (23). It has also been proven to have a high sensitivity in detecting symptomatic reductions during psychological therapy (24).

Although there are many scales to evaluate depression in different population groups, it is important to distinguish the diagnosis of depression from anxiety. It is clear that adapting a measurement tool, which used to investigate the symptoms of depression, to Turkish Literature, will be functional for all healthcare professionals.

To analyze that issue and reasons below, we wanted to examine the Basic Depression Scale, developed in Spain and tested in terms of its validity and reliability, for Turkey. We chose BDS for three reasons below; It has a single structure, has special expressions developed for the diagnosis of depression, and has proven reliability and validity for usage in the different population groups. In this context, the aim of the study is to research the validity and reliability of the Basic Depression Scale for Turkey.

MATERIAL and METHODS

The research was conducted in order to test the methodological validity and reliability of the BDS for Turkey, which developed to measure the level of depression.

Processes Used in Research-Process

The research was designed in a cross-sectional form. It was determined that it should be applied to 299 students in total at Izmir Katip Celebi University Faculty of Health Sciences, which was determined as a result of power analysis (with 82.788% power) before starting the research (Table 1).

During the research, firstly, Turkish language and structure validity of the relevant scale was made. In addition, compliance with the BECK Depression Scale was tested.

For language validity, 10 specialists with the title of PhD in the field were independently checked by the researcher for the scale items translated into Turkish and their suggestions were asked for each item. After each expert's suggestion, the Turkish items of the scale were finalized. Lastly, Turkish language knowledge control was done by a specialist with a PhD education in Turkish Language and Literature.

Table 1: Individual numbers by strata sections.

Sections	Student number	Wh (weight of strata)	Nh (number of individual per strata)
Nursery Department	745	0.551	165
Physiotherapy and Rehabilitation Department	296	0.219	65
Nutrition and Dietetics Department	312	0.231	69
Total	1353	1	299

Table 2: Individual numbers by strata.

	Student number	Wh (weight of strata)	Nh (number of individual per strata)
Nursery Department			
1. Class	184	0.247	41
2. Class	174	0.234	39
3. Class	174	0.234	39
4. Class	213	0.286	47
Total	745	1	165
Physiotherapy and Rehabilitation Department			
1. Class	93	0.314	21
2. Class	80	0.270	18
3. Class	61	0.206	13
4. Class	62	0.209	14
Total	296	1	65
Nutrition and Dietetics Department			
1. Class	89	0.285	20
2. Class	64	0.205	14
3. Class	71	0.228	16
4. Class	88	0.282	19
Total	312	1	69

After language validation, interview form and Basic Depression Scale and Beck Depression were applied to students electronically by the researcher. 361 students in total filled the electronic form.

The final version of the scale was controlled by a physician who specializes in mental health and diseases.

Choice of Sampling

The minimum numbers to be included in the research for the departments and classes are determined with the stratified sampling calculation below.

$$n_0 = \frac{Nt^2pq}{d^2(N-1)+t^2pq} = \frac{1353 * (1.96)^2 * 0.5 * 0.5}{(0.05)^2 * (1353-1)+(1.96)^2 * 0.5 * 0.5} \cong 299$$

T table value with 95% probability=1.96

For male and female students p=0.5 q=0.5

N=Number of units in a population

p= likelihood of the event to be examined

q= unlikelihood of the event to be examined

t= theoretical value in the table of t in a certain degree of freedom and detected error level.

d= ± deviation according to the frequency of occurrence

Strata weight= $\frac{299}{1353}$ =0.2213

According to Table 2, a total of at least 165 students (41 1st grade, 39 2nd grade, 39 3rd grade, 47 4th grade) from the Nursing Department according to the stratified sampling method; A total of at least 65 students from the Physiotherapy and Rehabilitation Department (21 1st Grade, 18 2nd Grade, 13 3rd Grade, 14 4th grade); A total of at least 69 students (20 1st grade, 14 2nd grade, 16 3rd grade, 19 4th grade) should be included in the research from the Department of Nutrition and Dietetics.

Data Collection Tools

Demographic information form: It contains demographic information of the participants such as age, gender, department, and class.

Basic Depression Scale: The Basic Depression Questionnaire (19) (BDS) consists of 21 items. Each item has four response alternatives, depending on the duration of the symptoms: (0) absent for now; (1) for weeks; (2) for months and (3) for years. BDS also has good psychometric indicators in adult samples and its internal consistency has 89 points. It consists of 21 questions in total. It is a 4-point Likert type.

Although this scale investigates areas of depression involving sadness, anhedonia, and low self-esteem, it has also been reported to have a single structure (20, 21).

Beck Depression Scale: Beck Depression Scale was developed in 1961 to measure the behavioral findings of depression in adolescents and adults (25). In 1978, all of the scale was revised and duplications describing the severity were removed and patients were asked to mark their status within last week, including today (26). As severity; It is interpreted as 0-9 = Minimal, 10-16 = Mild, 17-29 = Moderate, 30-63 = Severe. The scale was translated into Turkish as two separate forms, and its validity and reliability tests were run (12, 27).

Data Analysis

Explanatory factor analysis is used in the creation of measurement tools (questionnaire, test, etc.) while confirmatory factor analysis (CFA) is used to test whether these models are verified on the studied sample. The purpose of CFA is to find a small number of latent factors and explain the relationship between the variables to explain the observed covariance among the p variables observed. This analysis enables us to demonstrate to what extent the model obtained is tested with all the observable and unobservable variables together and to what extent the results are compatible with the available data. It shows very clear results in error calculations. While other traditional methods deal with measurement errors separately; this analysis clearly takes into account measurement errors in all analyzes. There is a measurement error dependent on each observed variable and a residual error term associated with latent variables. The analysis is also known as Structural Equation Modeling (SEM). The structural equation modeling process can be defined as linear regression models, factor analysis, CFA, path analysis and structural equation models.

If there is no criterion (reference) to compare a test in the analysis, the construct validity should be tested. Confirmatory factor analysis, i.e. SEM is a multivariate analysis of structural theory on the subject, which is used by many disciplines such as social sciences, behavioral sciences, educational sciences, economics, marketing and health sciences, based on the definition of variables that can be observable and unobservable, based on a particular theory in a causal and relational model. It is a series of statistical methods that bring a hypothesis testing approach.

SEM is a multivariate analysis method that occurs with the combination of factor analysis and multivariate regression analysis. SEM analysis enables us to demonstrate to what extent the model obtained is tested with all the observed and invisible variables together. If the fit indices obtained by testing the model show that there is a fit between the model and the data, the structurally generated hypotheses are accepted, and if the fit indices show that such a fit does not exist, the hypotheses are rejected. First, SEM adopts a confirmatory approach rather than an explanatory approach. While various statistical methods other than SEM try to discover the relationships on the data set; SEM verifies the compatibility of theoretically established relationships with data. SEM shows very clear results in error calculations.

For structure validity; Cronbach alpha (α) coefficient was used in reliability analysis. Explanatory and confirmatory factor analysis was applied for validity analysis. The suitability of the sample number was evaluated by Bartlett's sphericity test using the Kaiser-meyer-olkin (KMO) sample adequacy statistic. Basic Depression Scale items were determined as a single factor structure as a result of the Varimax rotation method. The summability of the scales was evaluated with the Tukey summability test (28-30). SPPS 20 and AMOS 20 (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.) statistical software was used to evaluate the data. $p < 0.05$ and $p < 0.01$ levels were considered statistically significant (31, 32).

RESULTS

After demonstrating the participants' introductory information in the findings part of the research, the explanatory factor analysis and confirmatory factor analysis findings are illustrated.

Explanatory Factor Analysis

According to the KMO (0.911) test, we can say that it is sufficient for the distribution factor analysis. Barlett test value appears to be 3048.795 ($p < 0.05$). In our research, the factors with eigen value greater than 1.30 were included in the scale (Table 3).

In Table 3, the factor loads of the questions in the first dimension range between 0.796 and 0.464, the factor loads of the questions in the second dimension range between 0.817 and 0.416, and the factor loads of the questions in the third dimension range between 0.668 and 0.531.

Table 3: Basic depression scale and factor loads.

Questions	Factor loads		
	1st	2nd	3rd
1. I consider myself a cheerful person.	0.621		
2. I feel guilty.			0.684
3. I feel unsuccessful.		0.619	
4. I feel unhappy.	0.604		
5. I find it hard to live.	0.542		
6. I feel sad.	0.595		
7. I feel anguished.			0.569
8. I feel guilty about what happened to others.			0.531
9. I consider myself as a weak person.		0.726	
10. I feel afraid of life.		0.485	
11. I feel alone.	0.554		
12. I think I am a person without luck.	0.464		
13. I think others are better than me.		0.654	
14. I would like to be different from how I am.		0.699	
15. I think I am attractive.		0.416	
16. I see more defects than virtues on me.		0.640	
17. I think I am not worth anything.	0.525		
18. Nothing interests me.	0.693		
19. I do not enjoy the things I used to.	0.603		
20. My general motivation is minimal or null.	0.641		
21. I feel unable to enjoy or have fun.	0.796		
Eigenvalues	7.615	1.568	1.316
Variance Disclosure Rates %	36.262	7.464	6.265
Croncbachs'Alpha (α)	0.789	0.716	0.633
Total Disclosed Variance Rate = 49.991 Kaiser Meyer Olkin (KMO) = 0.911 Bartlett test value = 3048.795 p=0.001 Croncbachs'Alpha (α)=0.867			

p*<0.05, p**<0.01

1st Dimension (anhedonia) from questions number 1,4,5,6, 11,12,17,18,19,20,21; 2. Dimension (low self-esteem) from questions number 3,9,10,13,14,15,16; The third dimension (sadness) consists of questions numbered 2,7,8.

According to KMO (0.883) test, we can say that it is sufficient for distribution factor analysis. Barlett test value appears to be 2361,238 (p <0.05). In our study, factors with Eigen value greater than 1.00 were included in the scale.

In Table 4, the factor loads of the questions in the first dimension are in the range of 0.723 and 0.520, the factor loads of the questions in the second dimension are in the range of 0.693 and 0.473, the factor loads of the questions in the third dimension are in the range of 0.707 and 0.706, the factor loads of the questions in the fourth dimension are 0.674 and It varies in the range of 0.650.

In factor analysis, it is acceptable to have variance rates between 40% and 60%. Accordingly, it can be seen that the variance rate in the research is sufficient.

Croncbachs'Alpha (α) of the Basic Depression Scale was found sufficient because it was over 0.70. Therefore, it can be said that they successfully measure three dimensions of Basic Depression Scale. According to these results, the survey we used is a reliable measurement tool.

Table 4: BECK depression scale and factor loads.

Questions	Factor loads			
	1st	2nd	3rd	4th
1. I consider myself a cheerful person.	0.645			
2. I feel guilty.	0.699			
3. I feel unsuccessful.	0.723			
4. I feel unhappy.	0.618			
5. I find it hard to live.	0.560			
6. I feel sad.		0.480		
7. I feel anguished.	0.682			
8. I feel guilty about what happened to others.	0.586			
9. I consider myself as a weak person.	0.520			
10. I feel afraid of life.		0.501		
11. I feel alone.		0.693		
12. I think I am a person without luck.		0.473		
13. I think others are better than me.	0.660			
14. I would like to be different from how I am.	0.601			
15. I think I am attractive.	0.681			
16. I see more defects than virtues on me.				0.674
17. I think I am not worth anything.	0.584			
18. Nothing interests me.				0.650
19. I do not enjoy the things I used to.		0.516		
20. My general motivation is minimal or null.			0.706	
21. I feel unable to enjoy or have fun.			0.707	
Eigenvalues	6.830	1.425	1.300	1.077
Variance Disclosure Rates %	32.523	6.787	6.189	5.127
Croncbachs'Alpha (α)	0.890	0.578	0.484	0396
Total Disclosed Variance Rate = 50.627 Kaiser Meyer Olkin (KMO) = 0.917 Bartlett test value =2361.238 p=0.001 Croncbachs'Alpha (α)=0.883				

p*<0.05, p**<0.01

Confirmatory Factor Analysis

Model Fit Indices

Fit indices such as hi-square / degree of freedom (x2 / df), Root Mean Square Error of Approximation (RMSEA), goodness of Fit Index (GFI), Standardized Root Mean Square Residual (SRMR), comparative fit index (CFI), Incremental Fit Index (IFI) are acceptable and good fit values of the model are given in Table 5.

Basic Depression Scale 1st Degree Confirmatory Factor Analysis Structural Equation Model

In the model obtained ($\chi^2 = 407.602$, df = 172, $p < .001$), first level confirmatory factor analysis of the Basic Depression

Table 5: Statistical values for the compliance of structural equation model.

Measure	Good fit	Acceptable fit
(/sd)	≤ 3	≤ 4-5
RMSEA	≤ 0.05	0.06-0.08
SRMR	≤ 0.05	0.06-0.08
IFI	≥ 0.95	0.94-0.90
CFI	≥ 0.97	≥ 0.95
GFI	≥ 0.90	0.89-0.85
TLI	≥ 0.95	0.94-0.90

Acceptable Fit*, Good Fit**

Scale was performed. Fit values after improvement for this model are presented in Table 6.

The results given in Table 6 indicate that the model shows acceptable goodness of fit values. The model after improvement has been presented in Figure 1.

When Figure 1 is examined, only Question 1 shows a negative effect, while other questions show a positive effect between 0.12 and 1. In this context, the first question must be scored in reverse in the scale calculation. Impact values and test statistics for this model are examined in Table 7.

As can be seen in Table 7, all questions have a statistically significant ($p < 0.05$) effect on the model.

Confirmatory Factor Analysis of the 1st Degree According to the Basic Depression Scale Sub-Dimensions Structural Equation Model

The hypotheses to be created to evaluate the significant effect of the dimensions created for the Basic Depression Scale on the model are as follows.

H_1: Sub-dimensions of Basic Depression have an effect on Basic Depression score.

$H_{1,1}$: 1st Dimension (BDS 1) has an effect on the Basic Depression Scale.

$H_{1,2}$: 2nd Dimension (BDS2) has an effect on the Basic Depression Scale.

Table 6: Basic depression scale 1st confirmatory factor analysisgoodness of fit results.

Measure	$\Delta\chi^2/sd$	RMSEA	SRMR	IFI	CFI	GFI	TLI
BDS Model	2.37**	0.62*	0.57*	0.920*	0.919*	0.900**	0.901*

RMSEA= Root Mean Square Error of Appoximation; **CFI=** Comparative Fit Index; **GFI=** Goodness of Fit Index; **AGFI=** Adjusted of Goodness Fit Index, **sd=** Degree of Freedom
Acceptable Fit*, Good Fit**

Table 7: Basic depression scale 1st degree confirmatoryfactor analysi test results.

Tested Path			Standardized Forecast *(β)*	Forecast *(β)*	Standard Error	Critical Value	P
TD1 (1. Quest.)	<---	F1 (BDS)	-.394	-.857	.124	-6.886	<0.0001
TD2 (2. Quest.)	<---	F1 (BDS)	.491	.791	.094	8.444	<0.0001
TD3 (3. Quest.)	<---	F1 (BDS)	.715	1.335	.114	11.680	<0.0001
TD4 (4. Quest.)	<---	F1 (BDS)	.740	1.209	.100	12.047	<0.0001
TD5 (5. Quest.)	<---	F1 (BDS)	.595	1.055	.106	9.999	<0.0001
TD6 (6. Quest.)	<---	F1 (BDS)	.712	1.130	.097	11.675	<0.0001
TD7 (7. Quest.)	<---	F1 (BDS)	.566	.786	.082	9.604	<0.0001
TD8 (8. Quest.)	<---	F1 (BDS)	.360	.453	.071	6.361	<0.0001
TD9 (9. S Quest.)	<---	F1 (BDS)	.633	1.083	.103	10.530	<0.0001
TD10 (10. Quest.)	<---	F1 (BDS)	.581	1.116	.113	9.836	<0.0001
TD11 (11. Quest.)	<---	F1 (BDS)	.590	1.121	.113	9.957	<0.0001
TD12 (12. Quest.)	<---	F1 (BDS)	.483	1.054	.127	8.318	<0.0001
TD13 (13. Quest.)	<---	F1 (BDS)	.619	1.272	.122	10.405	<0.0001
TD14 (14. Quest.)	<---	F1 (BDS)	.546	1.042	.112	9.318	<0.0001
TD15 (15. Quest.)	<---	F1 (BDS)	-.124	-.253	.114	-2.231	*.026*
TD16 (16. Quest.)	<---	F1 (BDS)	.527	1.083	.120	9.040	<0.0001
TD17 (17. Quest.)	<---	F1 (BDS)	.624	.939	.090	10.404	<0.0001
TD18 (18. Quest.)	<---	F1 (BDS)	.572	.881	.072	12.285	<0.0001
TD19 (19. Quest.)	<---	F1 (BDS)	.498	.787	.092	8.547	<0.0001
TD20 (20. Quest.)	<---	F1 (BDS)	.698	1.231	.090	13.745	<0.0001
TD21 (21. Quest.)	<---	F1 (BDS)	.644	1.000			

*p<0.05

$H_{1,3}$: The 3rd Dimension (BDS 3) has an effect on the Basic Depression Scale.

Three subscales of 1st level single factor model, which obtained by explanatory factor analysis for the Basic Depression Scale are illustrated in Figure 2.

The test results for the model obtained are as in Table 8

When Table 8 is analyzed, it can be seen that the sub-dimensions of the Basic Depression Scale have a statistically significant (p <0.05) effect on the Basic Depression Scale.

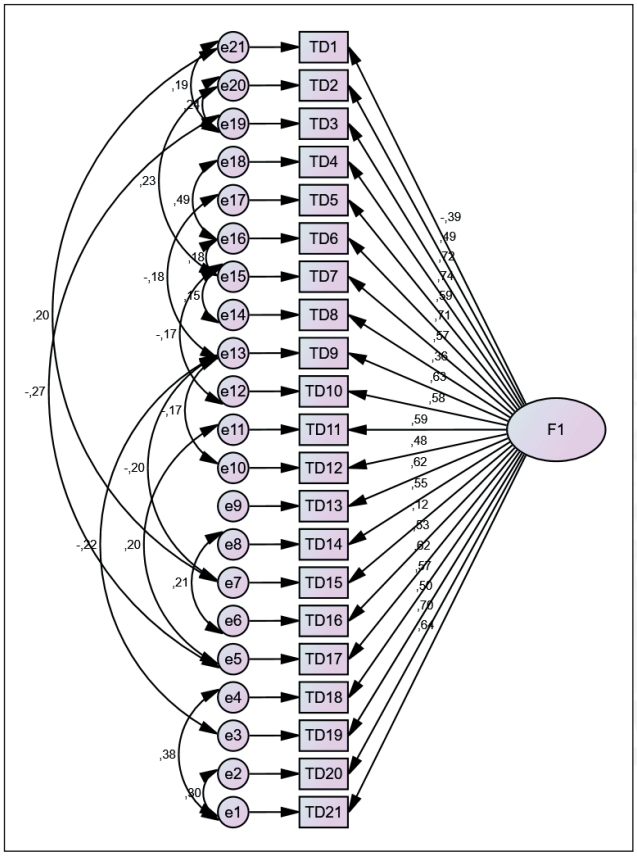

Figure 1: Basic Depression Scale 1st Degree Confirmatory Factor Analysis Model.

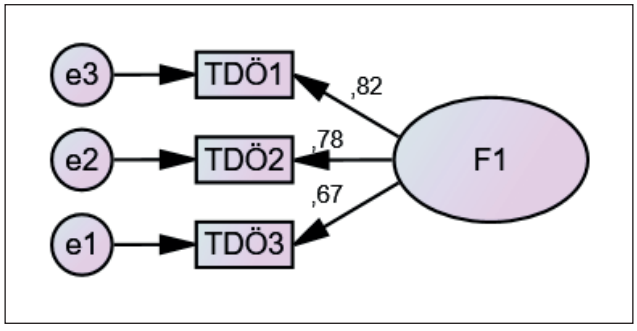

Figure 2: SEM Model Based on the Basic Depression Scale Sub-Dimensions.

We can say that these effects have a positive effect of 0.671 (β = 0.671) for the first dimension, 0.777 (β = 0.777) for the second dimension and 0.824 (β = 0.824) for the third dimension.

Structural Equation Model (SEM)

In SEM, when it is wanted to examine whether there is a statistically significant interaction between the scores of Basic Depression Scale and BECK Depression Scale;

H_0: There is no interaction between the Basic Depression Scale and the BECK Depression Scale.

H_1: There is an interaction between the Basic Depression Scale and the BECK Depression Scale.

In the model obtained (χ ^ 2 = 47.145, df = 13, p <.001), there are 3 sub-dimensions measured by the Basic Depression Scale and 4 sub-dimensions measured by the BECK Depression Scale.

When the fit values in Table 9 are analyzed, it can be seen that the model generally has the desired fit values. The model tested is shown in Figure 3.

The relations resulting from the analysis after the adjustments are given in Figure 3.

When Table 10 is examined, there is a statistically significant interaction between the Basic Depression Scale and the BECK Depression Scale (p <0.05). Turkish form of the scale can be examined in Table 11.

DISCUSSION

The use of a measuring tool can only be achieved through validity and reliability analysis. Validity is that the tool measures the subject or area it wants to measure as accurately as possible without mixing it with another area. Both content / language and structure validity of the scale to be validated should be made. In this context, for the content and language validity of the BDS, first the language validity was made by 10 PhD titled researchers who are experts in their field with control of Turkish grammar following the final research based on the independent translation method. For content validity, after the validity and reliability analysis was made, experts in the field made content control.

Factor analysis method should be used to ensure structural validity. Accordingly, construct validity is the degree of accuracy of the symptoms (33, 34). For the adequacy of the sample size, the KMO value made before the factor analysis must be over 0.50. Values between 0.60-0.69 indicate goodness of fit. However, in order to assess whether the sample size is sufficient, the result of Barlett's test sphericity analysis should be statistically significant (35-37).

In this research, KMO test was determined as 0.911 and Barlett's test sphericity analysis was determined as

Table 8: Structural equation model regression weights after corrections made according to modification indexes.

Tested Path			Standardized Forecast *(β)*	Forecast *(β)*	Standard Error	Critical Value	P
BDS1 (1st Dimension)	<--	F1 (BDS)	0.671	1			
BDS2 (2nd Dimension)	<--	F1 (BDS)	0.777	2.944	0.258	11.409	>0.0001
BDS3 (3rd Dimension)	<--	F1 (BDS)	0.824	4.157	0.367	11.323	>0.0001

*p<0.05

Table 9: Statistical values regarding the adaptation of the structural equation model.

Scale	$\Delta\chi^2/sd$	RMSEA	SRMR	IFI	CFI	GFI	TLI
Model	3.63*	0.08*	0.13	0.97**	0.97**	0.96**	0.95**

RMSEA= Root Mean Square Error of Appoximation; **CFI=** Comparative Fit Index; **GFI=** Goodness of Fit Index; **AGFI=** Adjusted of Goodness Fit Index, Degree of Freedom
Acceptable Fit*, Good Fit **

Table 10: Structural equation model regression weights after corrections made according to modification indexes.

Tested Path			Standardized Forecast *(β)*	Forecast *(β)*	Standard Error	Critical Value	P
F1 (Basic Depression Scale)	<-->	F2 (BECK Depression Scale)	0.925	7.165	0.783	9.731	>0.0001

*p<0.05

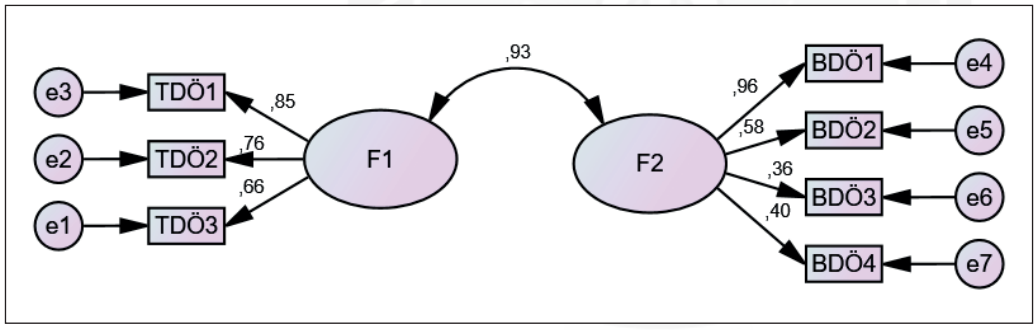

Figure 3: SEM Model for Interaction between Basic Depression Scale and BECK Depression Scale

3048.795 before factor analysis. This result was found statistically significant (p <.05). These values obtained in the study show that, for example, it is sufficient for factor analysis.

According to the literature, it is stated that items with a factor load value below 0.30 should be omitted from the scale (38). Since there was no item with a factor load below 0.20 in the scale, there was no item omitted from the scale.

Reliability is complementary with validity. It examines whether the measurement is consistent (39). In this context, by determining the reliability coefficient, it is determined how relevant the measurement tool is with the whole picture (40-45). The higher the total item correlation score shows that the items reflect similar characteristics and the internal consistency is high (45). It can be said that the items used in this way is sufficient for purposeful measurement (38). In general, total item correlation score, items with 0.30 and higher are reported to distinguish individuals well (42-46).

For the construct validity of the scales, total item score analysis is used with validity as well as reliability (47). Two half-test reliability, one of the reliability types used to examine the level of meeting the mentioned criteria, is explained by the reliability coefficient calculated for the whole test using the Sperman-Brown formula, based on the relationship between the two halves of the test by splitting the two-half of the test. Two half-test reliability, also known as test-split method, shows consistency between test scores obtained (44).

Table 11: Turkish form of the basic depression scale.

Temel Depresyon Ölçeği Lütfen size uygun olduğunu düşündüğünüz maddeyi işaretleyiniz.	**Şu an yok**	**Haftalardır**	**Aylardır**	**Yıllardır**
1. Kendimi neşeli bir insan olarak görüyorum.				
2. Kendimi suçlu hissediyorum.				
3. Kendimi başarısız hissediyorum.				
4. Kendimi mutsuz hissediyorum.				
5. Yaşamak bana zor geliyor.				
6. Kendimi üzgün hissediyorum.				
7. Izdırap/acı çekiyorum.				
8. Başkalarının başına gelenler konusunda kendimi suçlu hissediyorum.				
9. Kendimi zayıf bir insan olarak görüyorum.				
10. Hayattan korkuyorum.				
11. Kendimi yalnız hissediyorum.				
12. Şanssız biri olduğumu düşünüyorum.				
13. Başkalarının benden daha iyi olduğunu düşünüyorum.				
14. Olduğumdan farklı biri olmak istiyorum.				
15. Çekici olduğumu düşünüyorum.				
16. İyi yanlarımdan ziyade kusurlu yanlarımı görüyorum.				
17. Hiçbir değerim olmadığını düşünüyorum.				
18. Hiçbir şey ilgimi çekmiyor.				
19. Eskiden hoşlandığım şeylerden artık hoşlanmıyorum.				
20. Genel motivasyonum çok az ya da hiç yok.				
21. Hiçbir şeyden zevk alamıyorum veya eğlenemiyorum.				

The reliability coefficients of Spearman-Brown, Guttman split-half and Cronbach α, which were made to calculate the two half-test reliability coefficients of the scale, were found to be sufficient. The Cronbach α technique is recommended for the investigation of the reliability of Likert type scales and is a measure of the internal consistency of the items contained in the measurement tool (45). In order to be considered sufficient in a measurement tool, the reliability coefficient must be close to 1. If the Cronbach α coefficient is less than 0.40, the measurement tool is said to be unreliable, if it is between 0.40-0.59 it has low reliability, it is quite reliable between 0.60-0.79, and it is highly reliable between 0.80-1.00 (39). In the research, Cronbach α reliability of BDS was calculated to examine the internal consistency. Cronbach α reliability coefficient was found as 867. Accordingly, the internal consistency of the scale was found to be highly reliable.

According to the results of the research, the tool explanatory factor analysis for the Basic Depression Scale, whose validity and reliability was tested, was found to had a sufficient distribution according to the Kaiser Meyer Olkin (KMO) test. In addition, factor loadings of the questions of the scale consisting of 3 sub-dimensions vary between 0.416 and 0.817. Although variance rates are sufficient, Croncbachs'Alpha (α) was found over 0.70. In the light of these findings, the Basic Depression Scale can be seen as a reliable measurement tool.

When the fitness indexes were analyzed, according to the first Level Confirmatory Factor Analysis Structural Equation Model, BDS is an acceptable good fit and we can conclude that all questions had statistically significant effects on the model. Again based on the first Level Confirmatory Factor Analysis Structural Equation Model, it was concluded that the sub-dimensions have a positive and significant effect on the BDS. When the interaction between BDS and BECK Depression Scale scores was examined according to the structural equation model, a significant interaction was observed between the two scores.

CONCLUSION

As a result, it was concluded that the Basic Depression Scale was valid and reliable for young people with university education. The Basic Depression Scale consists of three dimensions, referring to the attributes of anhedonia, low self-esteem and sadness, which are among the nine diagnostic criteria of depression; 1. Dimension (anhedonia) from questions 1,4,5,6,11,12,17,18,19,20,21 (min 11-Max 44); 2. Dimension (low self-esteem) from questions number 3,9,10,13,14,15,16 (Min 7-Max 28); 3. Dimension (sadness) consists of questions numbered 2, 7, 8, (min 3- max 12). In total, min 21, max 84 points can be obtained. As the number of points received increases, the level of depression increases.

It is thought that keeping the questionnaire short will be functional in terms of the fact that it can be used in emergency clinics and in situations requiring rapid intervention in order to fill the people themselves. It is recommended that the validity and reliability study of the university student group be conducted on different groups and tested with different variables.

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Project development, wrote and edited the manuscript, collected and managed the data: **Melike Tekindal,** Analysed the data, wrote, and edited the manuscript: **Mustafa Agah Tekindal.**

Conflicts of Interest

The authors declare that they have no conflict of interest.

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