Psychometric Properties of the Revised and Abbreviated form of the Turkish Version of the Dysfunctional Attitude Scale

Sedat Batmaz[1]
Department of Psychiatry, School of Medicine, Gaziosmanpasa University,
Tokat, Turkey

Kadir Ozdel[1]
Department of Psychiatry, Diskapi Teaching and Research Hospital, Ankara, Turkey

Abstract
Dysfunctional attitudes are considered to be important risk factors in the onset and maintenance of depression. Thus, a psychometrically reliable and valid measure is necessary for understanding depression. The Dysfunctional Attitude Scale (DAS) is widely used and has good psychometric properties, but there is no consensus about its factor structure. To examine its psychometric properties and factor structure, a total of 885 individuals consisting of patients with depression and healthy controls were evaluated. After the sample was randomly divided into two subsets, exploratory and confirmatory factor analyses were performed. Then the DAS was abbreviated according to the factor profiles and theoretical background. Analyses indicated two factors, named Perfectionism/Achievement and Need for Approval/Dependency for the revised DAS. Reliability analyses revealed a good internal consistency, and the concurrent validity indicated significant correlations with the Beck Depression Inventory and the Automatic Thoughts Questionnaire.

Keywords
therapy, cognitive behavior, factor analysis, assessment

---

[1]Both the authors have equally contributed to the study design, recruitment of participants, execution of the statistical analysis, interpreting the results, and writing the manuscript.

Corresponding Author:
Kadir Özdel, Department of Psychiatry, Diskapi Yildirim Beyazit Training and Research Hospital, Ankara, Turkey.
Email: kadirozdel@gmail.com

Introduction

According to the cognitive theory of depression, beliefs about the self, the future, and the world are the main factors that cause and maintain depression (Beck, Rush, Shaw, & Emery, 1979). These beliefs are reflected in three different levels of cognition. On a more surface level, automatic thoughts, e.g., "She doesn't like me," occur in response to internal or external triggers, while at the deepest level, unconditional beliefs about the self and the others are found, e.g., "I am a failure" and "People are unfaithful." Between these two interrelated cognitive levels, there are strategic conditional beliefs, e.g., "Unless I am very clever, people won't respect me" and "I should please significant others of mine, otherwise they will abandon me," which are called intermediate beliefs (Türkçapar, 2009; Beck, 2011). Dysfunctional attitudes generally represent these intermediate beliefs related to depression.

In the beginning, dysfunctional beliefs were proposed as trait-like cognitive constructs which made people vulnerable to depression and predated the depressive symptoms (Beck, Brown, Steer, & Weissman, 1991). Although subsequent research did not consistently support the conceptualization of a trait-like risk factor, dysfunctional attitudes have repeatedly been found to be related to depressive symptoms (Miranda, Persons, & Byers, 1990; Ingram, 2003) and to outcomes in cognitive-behavioral therapy (CBT) for depression (Brown, Hammen, Craske, & Wickens, 1995; Jarrett, Vittengl, Doyle, & Clark, 2007; Dozois, Bieling, Patelis-Siotis, Hoar, Chudzik, McCabe et al., 2009; Shankman, Campbell, Klein, Leon, Arnow, Manber et al., 2013). To operationalize and measure dysfunctional attitudes, Weissman and Beck (1978) created a 100-item scale called the Dysfunctional Attitude Scale (DAS) and subsequently transformed it into two parallel forms, each consisting of 40 items, i.e., the DAS–A and the DAS–B.

While the DAS–A, the most widely used version of the DAS, has good psychometric properties in terms of internal consistency (e.g., Cronbach's α = .87 in Cane, Olinger, Gotlib, & Kuiper, 1986), temporal stability, and concurrent validity, its factor structure has differed across studies (Cane, Olinger, Gotlib, & Kuiper, 1986; Beck et al., 1991; Sahin & Sahin, 1992; Floyd, Scogin, & Chaplin, 2004; Rogers, Park, Essex, Klein, Silva, Hoyle et al., 2009; Moore, Fresco, Segal, & Brown, 2014). Many of those studies were conducted in non-clinical samples, whereas several others were conducted in clinical samples (e.g., Beck et al., 1991; Floyd et al., 2004; Rogers et al., 2009; Ugurlu, Ugurlu, Turhan, & Türkçapar, 2012), and the number of factors identified differed among these groups.

The number of factors in the DAS, as proposed in the literature, has varied from one to four. Regardless of the number of factors, the scale still had overall adequate internal consistency with Cronbach's α values ranging from .79 to .90 (Cane, Olinger, Gotlib, & Kuiper, 1986; Sahin & Sahin, 1992; Floyd et al., 2004). The one-factor solution proposed that the DAS was a unidimensional scale

(Floyd et al., 2004; Moore et al., 2014). The two-factor solution consisted of two main domains: first, perfectionistic attitudes pertaining to personal achievement, or performance evaluation, e.g., Perfectionism, Performance evaluation, Self-criticism; and second, dependency attitudes pertaining to interpersonal approval, e.g., Need for social approval, Dependency (Cane et al., 1986; Imber, Pilkonis, Sotsky, Elkin, Watkins, Collins et al., 1990; Scott, Stanton, Garland, & Ferrier, 2000; Floyd et al., 2004; Graaf, Roelofs, & Huibers, 2009; Rogers et al., 2009; Mukhtar & Oei, 2010). The three-factor solution identified the factors as Achievement, Dependency, and Self-control. Yet another found four factors for the DAS: Perfectionistic attitudes, Need for approval, Autonomous attitudes, and Tentativeness (Sahin & Sahin, 1992). In the study by Sahin and Sahin, the Autonomous attitudes factor did not discriminate between depressed and non-depressed groups, and further, Cronbach's α values for the Autonomous attitudes and the Tentativeness (α = .26 and α = .10, respectively) were very low, which perhaps could be interpreted as evidence for fewer factors. The authors concluded that these shortcomings could be the consequence of the respondents misunderstanding the reverse-scored items of the scale, i.e., Items 2, 29, 6, 30, 12, 35, 17, 37, 24, and 40. Similarly, other studies also found some factors obtained from these exploratory factor analyses (EFA) were problematic because of reverse-scored items' scoring characteristics (Oliver & Baumgart, 1985; Power, Katz, McGuffin, Duggan, Lam, et al., 1994; Chioqueta & Stiles, 2004), or due to an arbitrary selection of the factors from the use of a scree plot (Graaf et al., 2009). All of these studies were undertaken in samples consisting of 100–982 participants, and most of the participants were undergraduate students.

Overall, the DAS, despite some contradictory findings in the literature, has been a valid and reliable scale to measure dysfunctional attitudes related to depression. However, there is no consensus for its latent components, which have theoretical implications for vulnerability factors related to depression (Blatt & Zuroff, 1992; Covin, Dozois, Ogniewicz, & Seeds, 2011). Since there has been no factor analytic study on a large sample consisting of clinically depressed individuals, except for Moore et al. (2014), and since no such study has been conducted in Turkey since 1992 (Sahin & Sahin, 1992), the present study was designed to accomplish two things. First, the psychometric characteristics of the DAS were assessed both in clinical and nonclinical samples in Turkey, and second, the factor structure and latent components were assessed, and an attempt was made to find the most appropriate factor solution. Another goal was to propose an abbreviated form of the scale, which would consist of theoretically relevant subscales to measure dysfunctional beliefs.

Hypothesis 1. An abbreviated form of the DAS (DAS–R) will be a valid and reliable measure in clinical and non-clinical Turkish samples, and scores will be related to the severity of depression.

Method

Participants

The sample consisted of 885 participants (528 women, 59.8%) aged 18 and older (M age $= 35.4$ yr., $SD = 12.3$, range $= 18$–65). All participants were recruited from the outpatient clinics of two different hospitals: the psychiatry clinics of Diskapi Teaching and Research Hospital (Ankara, Turkey), and Mersin State Hospital (Mersin, Turkey).

Measures

Interviewers used a clinical diagnostic interview to screen for and to diagnose any psychiatric disorders. The interviewers were experienced psychiatrists with a special interest in mood disorders and cognitive behavioral therapy They were trained to administer clinical diagnostic scales. As the data were collected as a part of two different study purposes, the interviewers were blind to the hypothesis of this study at the time they recruited the participants. They also completed a sociodemographic and clinical data form, onto which they recorded the age, sex, marital status, level of education, level of income, comorbid medical disorder, and family history of any psychiatric disorder of the participants. The participants completed the DAS, the Automatic Thoughts Questionnaire (ATQ), and the Beck Depression Inventory (BDI).

Structured diagnostic interviews. The interviewers used either the Structured Clinical Interview for DSM–IV (SCID–I; First, Spitzer, Gibbon, & Williams, 2002), or the Mini International Neuropsychiatric Interview (MINI; Sheehan, Lecrubier, Harnett Sheehan, Janavs, Weiller, Keskiner et al., 1997) to screen and diagnose the participants. Both of the interviewers used the Turkish versions of the diagnostic interviews. All diagnoses were according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM–IV; American Psychiatric Association, 1994). Only depressed participants with no comorbid psychiatric disorders, or healthy participants with no axis I diagnoses were enrolled in this study. All interviews were conducted face-to-face at the outpatient psychiatry clinics.

Dysfunctional Attitude Scale (DAS; Weissman & Beck, 1978). The DAS consists of 40 items rated on a 7-point self-report rating scale ranging from 1 (*fully disagree*) to 7 (*fully agree*). The DAS measures the intensity of dysfunctional attitudes which underlie assumptions related to depressive vulnerability, e.g., "If I do not do as well as other people, it means that I am an inferior human being," and "My happiness depends more on other people than it does on me." The score obtained from the DAS may range from 40 to 280, and higher scores indicate more dysfunctional attitudes. The DAS has been reported to consist of different subscales, but the most consistently reported subscales are related to

perfectionism and the need for approval. For this study the Turkish version of the DAS was used, which has been shown to have good psychometric properties (Sahin & Sahin, 1992).

Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980). The ATQ consists of 30 items rated on a 5-point self-report scale ranging from 1 (*not at all*) to 5 (*all the time*). The ATQ assesses the occurrence of negative thoughts and attributions. The ATQ reflects intrusive negative statements related to depression, e.g., "I'm so disappointed in myself" and "I'm not worth anything." The score to be obtained from the ATQ may range from 30 to 150, and the higher the score, the more frequent and intense the negative automatic thoughts. Only the total score of the ATQ was calculated for this study, and the Turkish version was used (Sahin & Şahin, 1992).

Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The BDI is used to rate the severity of depressive symptomatology, and it consists of 21 items. It was created by Beck et al. (1961) and revised by Beck, Steer, and Brown (1996). Participants may obtain up to 63 points on this self-report scale, and the Turkish version has a cutoff score of 17, which discriminates individuals who are depressed vs non-depressed. The higher the score, the more severe is the depression. For this study, the Turkish version of the BDI was used (Kapci, Uslu, Turkcapar, & Karaoglan, 2008).

Procedure

Data for this study were collected as part of two different studies that compared the dysfunctional attitudes and cognitive distortions of depressed patients with healthy controls. Participants were interviewed face-to-face by two psychiatrists who were experienced in working with depressed patients. After having been debriefed about the requirements of the study, only participants who consented were eligible for recruitment. The intake period lasted from November 2011 to November 2013. Both studies were approved by the respective local ethics committees. No compensation was offered to the participants.

Statistical Analyses

All analyses were performed using IBM SPSS for Windows, Version 22.0 (IBM Corp., 2013). Demographic and clinical data of the participants were analyzed by descriptive statistics. The sample was randomly divided into two equal parts, and an EFA (principal axis factoring) followed by an oblique rotation (direct oblimin) was performed on the first part. Factors for extraction were selected by examining eigenvalues (Kaiser, 1960) and the scree plot (Cattell, 1966), and by conducting a parallel analysis (PA) (Horn, 1965;

O'Connor, 2000; Patil, Singh, Mishra, & Donovan, 2007; Patil, Singh, Mishra, & Donovan, 2008). A confirmatory factor analysis (CFA) using IBM SPSS AMOS, Version 22.0 (IBM Corp., 2013) was performed on the second part. To assess the internal consistency of the scale, and its subscales, Cronbach's α values and corrected item-total correlation coefficients were computed. For concurrent validity, bivariate Pearson correlation analyses were conducted with the measures of depression severity (BDI) and of negative automatic thoughts (ATQ). For group comparisons, i.e. the extent to which dysfunctional attitudes could discriminate between depressed and non-depressed groups according to the mean scores of the factors of the DAS, an independent sample Student's t test was applied. Cohen's d was calculated as the measure of effect size. To identify group membership, i.e. depressed versus non-depressed, of the participants, a binary logistic regression with the total score of the DAS as the predictor variable was conducted, and the overall diagnostic percentage was calculated. To examine the unique associations between dysfunctional attitudes and the severity of depression, a stepwise linear regression analysis was performed. The outcome variable was the severity of depression as measured by the total score on the BDI. To determine the unique additional variance of the DAS after the variance of demographic variables has been partialled out, scores on the retained DAS were entered in the second step. Statistical significance was assumed at $p < .05$.

Results

Sample Characteristics

The distribution of sociodemographic and clinical variables of the total sample, and either half of it, are shown in Table 1. Table 2 presents the mean total ATQ scores, the mean total and subscale DAS scores as well as the mean total BDI scores of these groups. According to the specified cutoff score of 17 of the BDI, 473 (53.5%) participants were currently suffering from a major depressive episode, as would be expected from the way they were recruited.

Exploratory Factor Analysis

We followed the general procedure for conducting an EFA on the first group as described in Field (2013). Therefore, the data were screened initially for sample size and the correlations between the variables. The sample size for the EFA was adequate, well above 300, and the Kaiser-Meyer-Olkin sampling adequacy measure (0.82) was in the meritorious range (Hutcheson & Sofroniou, 1999). We checked for multicollinearity, and the determinant of the correlation matrix (R-matrix) was greater than 0.0001, i.e. no multicollinearity problems were

Table 1. Sociodemographic and Clinical Characteristics of the Participants (N = 885).

Variable	Total Sample (N = 885)				EFA Sample (n = 442)				CFA Sample (n = 443)			
	n	%	M	SD	n	%	M	SD	n	%	M	SD
Sex, women	528	59.8			263	59.5			265	59.8		
Age, yr.			35.37	12.30			36.47	12.20			34.26	12.32
Level of education, yr.			10.69	4.12			10.23	3.93			11.16	4.26
Marital status												
Single	352	39.8			141	32.9			211	47.7		
Married	398	45			206	46.7			192	43.4		
Other	133	15			95	21.3			39	8.9		
Level of Income												
Low	299	33.8			150	34.4			149	34.2		
Intermediate	225	25.4			105	24.1			120	27.5		
High	348	39.3			181	41.5			167	38.3		
Family history of psychiatric disorder	286	32.3			193	43.7			93	21		
General medical disorder	183	20.7			111	25.1			72	17.6		

Table 2. Mean Scores and Standard Deviations For Scales Used in the Study.

Scale	Total Sample (n = 885)		EFA Sample (n = 442)		CFA Sample (n = 443)	
	M	SD	M	SD	M	SD
BDI	23.74	14.67	26.45	14.96	20.54	13.66
ATQ	65.70	30.68	69.38	32.59	62.37	28.48
DAS P	57.34	19.34	57.88	18.24	56.80	20.39
DAS NFA	45.70	11.10	46.66	10.51	44.74	11.60
DAS Total	147.48	31.71	148.63	29.73	146.32	33.56

Note. BDI: Beck Depression Inventory; ATQ: Automatic Thoughts Questionnaire; DAS: Dysfunctional Attitude Scale.

evident. Bartlett's test of sphericity ($\chi^2 = 2,486.76$, $df = 120$, $p < .001$) also indicated that the *R*-matrix differed significantly from an identity matrix, i.e. no singularity problems were present. Based on the *R*-matrix, items were excluded which had multiple correlation coefficients $<.30$ as suggested by Field (2013), which meant that Items 2, 6, 10–12, 14, 18, 22, 23, 25, 28–31, 35, 36, and 38–40 were removed from further analyses. After the removal of these items, EFA was run again and Items 19 and 26 were removed at this stage, since these items did not load significantly on any factor, i.e. factor loadings $<.30$. After repeating the analyses, Items 20 and 27 were discarded for the same reason at the third stage. Finally, again after rerunning the analysis, Item 16 was removed, because it cross-loaded significantly on two factors, i.e. factor loadings both $>.30$. Consequently, in total, 24 items of the original scale had to be dropped from further analyses during the EFA.

To assess how many factors to retain, factors with eigenvalues greater than 1 were selected (Kaiser, 1960), the scree plot visually inspected (Cattell, 1966), and a parallel analysis was conducted (Horn, 1965). The results indicated that four factors had eigenvalues greater than 1.0, the scree plot showed two points of inflexion, one at the third factor, and one at the sixth factor (Figure 1), and the parallel analysis suggested that two factors should be retained. Since among these three results, the most reliable results may be obtained by selecting the parallel analysis option (Williams, Brown, & Onsman, 2012; Ruscio & Roche, 2012; Courtney, 2013), and since two of the results overlapped, i.e. inflexion
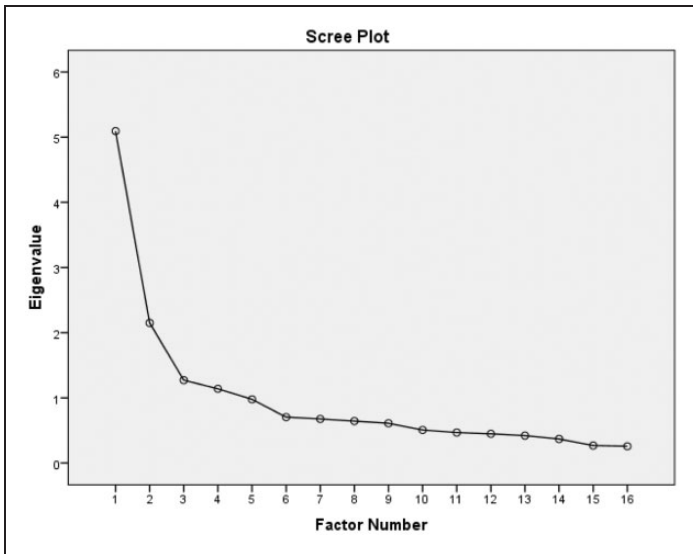

Figure 1. Scree plot for the exploratory factor analysis.

point at the third factor in the scree plot, and the results of the parallel analysis, two factors were retained. The analysis was repeated limiting the number of factors to be extracted to two. The principal factor axis method was used for factor extraction, and the direct oblimin method, i.e. oblique rotation, for factor rotation, since the factors were believed to be correlated based on theoretical grounds.

The retained items in the EFA loaded on two distinct factors, and each item's loading strength was over .30. This two-dimensional factor structure explained 45.9% of the total variance of the scale. The first factor consisted of 11 items related to perfectionism/achievement (P/A), i.e., Items 1, 3–5, 7–9, 13, 17, 24, and 37, and the second factor of 5 items was related to the need for approval/dependency (NFA/D), i.e., Items 15, 21, and 32–34. Factor loadings and communalities of each item after the EFA are shown in Table 3.

Confirmatory Factor Analysis

To test the adequacy of the two-factor model of the DAS obtained from the EFA, a CFA was conducted in the second group of participants. The normed fit index (NFI), Tucker–Lewis index (TLI), goodness of fit index (GFI), and comparative fit index (CFI) were reported for the model in the CFA, all of which should be ≥0.90 for a model fit (Baumgartner & Hombur, 1996). In addition to these indices, smaller root mean square error of approximation (RMSEA), which should be ≤0.06 for a good model fit (Hu & Bentler, 1999), standardized root mean square residual (SRMR), which should be ≤0.08 for a good model fit (Hu & Bentler, 1999), and the ratio of χ^2 to degrees of freedom (*df*), which should be <3 for a good model fit (Kline, 2005), values were evaluated. Items for evaluation in the CFA were selected on the basis of the results obtained in the EFA. However, the retained 16-item DAS-R failed to show a good model fit. Therefore, Items 17, 24, and 37 had to be removed at this stage. The remaining 13-item DAS-R with its two-factor solution had adequate fit to the model (NFI = 0.92, TLI = 0.92, GFI = 0.97, CFI = 0.94, χ^2/df = 2.96, RMSEA = 0.06, SRMR = 0.05). The final model consisted of an 8-item P/A dimension, i.e., Items 1, 3–5, 7–9, and 13, and a 5-item NFA/D dimension, i.e., Items 15, 21, and 32–34. The final model is presented in Figure 2. Factor loadings and communalities of each retained item in this CFA model are shown in Table 3. The final scale with its two subscales explained 52.0% of the total variance.

Reliability and Validity of the Revised DAS (DAS–R)

The internal consistency of the scale, and its subscales, were computed using Cronbach's α values. According to the final scale structure obtained after the CFA, Cronbach's α values were .84 for the P/A subscale, .75 for the NFA/D subscale, and .84 for the total scale. The mean corrected item–total correlations

Table 3. Factor Loadings After the Exploratory Factor Analysis, the Corrected Item–Total Correlations, Internal Consistency, and Descriptive Statistics of the DAS–R.

Items	CFA Factor 1 (P/A)	CFA Factor 2 (NFA/D)	h^2	ITC*	EFA Factor 1 (P/A)	EFA Factor 2 (NFA/D)	h^2	ITC*
1	.58	.10	.40	.57	.46	.32	.42	.57
3	.70	−.04	.47	.52	.38	.45	.48	.57
4	.90	−.19	.55	.54	.40	.50	.55	.57
5	.44	.20	.35	.52	.42	.33	.37	.51
7	.74	−.04	.48	.61	.42	.48	.51	.62
8	.42	.33	.43	.57	.60	.20	.45	.62
9	.52	.17	.39	.53	.52	.23	.39	.53
13	.47	.23	.42	.45	.54	.21	.43	.48
15	.12	.63	.45	.48	−.07	.69	.46	.45
21	.12	.56	.37	.51	−.09	.66	.39	.48
32	−.02	.57	.29	.48	−.06	.51	.29	.45
33	−.07	.65	.32	.33	−.35	.70	.38	.26
34	.03	.67	.39	.39	−.09	.67	.45	.35
17	–	–	–	–	.52	−.08	.27	.35
24	–	–	–	–	.31	.17	.26	.37
37	–	–	–	–	.51	−.16	.27	.32
Eigenvalue	5.26	1.50			5.43	1.92		
Variance %	40.46	11.54		52.01*	33.93	12.00		45.92*
Cronbach's α	.84	.75		.84*	.85	.75		.85*
M	25.51	11.66		42.17*	35.60	17.79		53.40*
SD	11.14	7.30		16.41*	13.16	7.13		17.10*

Note. ITC: corrected item – total correlation. *Results for the total scale.

varied substantially, and they ranged from .42 (Item 8) to .90 (Item 4), from .56 (Item 15) to .67 (Item 34), and from .33 (Item 33) to .61 (Item 7) for the P/A, the NFA/D subscales, and the total DAS-R scale, respectively. Deletion of none of the items raised the Cronbach's α values significantly. These results, and the results for the scale structure according to the EFA are presented in Table 3.

Convergent construct validity was, to some extent, supported. The DAS–R total score more strongly correlated with the depression severity ($r = .37$), and the frequency and intensity of negative automatic thoughts ($r = .28$) compared with the P/A, and NFA/D subscale scores ($rs = .32$, and .26, for both subscales, respectively). These results are presented in Table 4.

Table 5 shows that the depressed group scored significantly higher on both the subscales and on the total score than the non-depressed group. This result
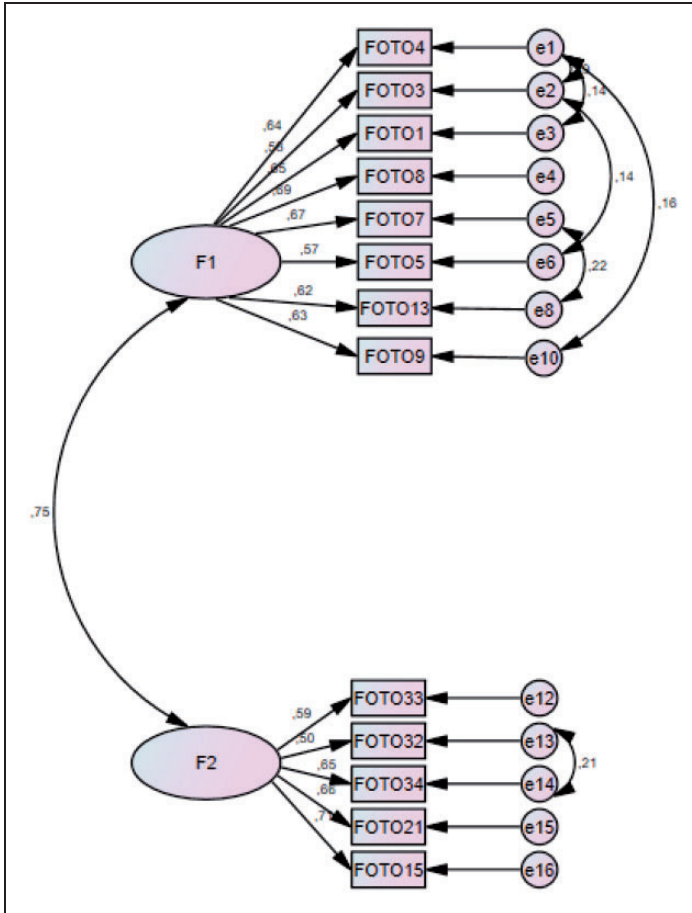
Figure 2. Path diagram of the confirmatory factor analysis.

implies that the revised DAS total score and its subscale scores discriminate depressed participants from healthy controls. The effect sizes were medium for the subscale and total scores of the DAS–R. A binary logistic regression analysis was run with the presence or absence of a depression diagnosis as the outcome, and the total score of the DAS-R as the predictor, to investigate the correct diagnosis percentage ($\chi^2 = 119.26$, $df = 1$, $p < .001$, Nagelkerke $R^2 = .19$, for the model; $B = 0.06$, Wald $= 93.92$, $df = 1$, $p < .001$, for the DAS-R total score). The results revealed that 76% of the participants were overall diagnosed correctly (percentage correct: 23.7% for non-depressed, and 94.2% for depressed).

Table 4. Correlation Matrix of Dysfunctional Attitudes, Negative Automatic Thoughts, and Depression Severity ($N = 885$).

Scale	1	2	3	4
1. BDI				
2. ATQ	.63*			
3. DAS–R P/A	.32*	.26*		
4. DAS–R NFA/D	.32*	.26†	.49*	
5. DAS–R total	.37*	.28*	.92*	.80*

*Correlation significant at the .01 level (two-tailed). †Correlation significant at the .05 level (two-tailed).

Table 5. Means and Standard Deviations of the DAS–R Subscales, and the Total DAS–R Score For the Non-depressed ($n = 412$) and Depressed ($n = 473$) Groups.

Scale	Depressed		Non-Depressed		t	df	ES
	M	SD	M	SD			
DAS–R P/A	27.74	10.65	20.12	10.81	8.85*	883	0.60
DAS–R NFA/D	19.14	6.47	13.38	8.38	10.01*	883	0.67
DAS–R Total	46.87	14.63	33.50	16.48	10.90*	883	0.73

Note. DAS: Dysfunctional Attitude Scale; ES: effect size (Cohen's d). *$p < .001$.

Associations of Dysfunctional Attitudes with Depression Severity

Results of the stepwise linear regression analyses are summarized in Table 6. To determine the unique additional variance of the DAS–R after the variance of demographic variables was partialled out, we undertook these analyses. In the first step, demographic variables explained 4% of the total variance in depression severity. By adding both factors of the DAS–R to the model, an additional unique 13% of the total variance was explained. Thus, the DAS–R factors explained a small but significant proportion of the variance in depression, and remained weakly but significantly associated with depression severity.

Discussion

The growing interest in cognitive behavioral therapies among Turkish mental health professionals and researchers has encouraged us to try to make available an abbreviated version of the DAS to be used in research and practice. Because a

Table 6. Stepwise Linear Regression Analysis With Depression Severity as Outcome Variable: Association With Demographic Variables and Dysfunctional Attitudes ($N = 885$).

Variable	Step 1					Step 2				
	B	SE	β	t	p	B	SE	β	t	p
Constant	35.78	3.36		10.63	<.001	13.58	3.83		3.54	<.001
Sex	−2.91	1.11	−0.10	−2.63	.009	−1.70	1.04	−0.06	−1.62	.10
Age	−0.20	0.05	−0.17	−3.89	<.001	−0.20	0.05	−0.17	−4.20	<.001
Marital Status	1.23	0.62	0.08	1.98	.05	1.82	0.59	0.12	3.11	.002
Level of Education	−0.19	0.16	−0.05	−1.25	.21	−0.13	0.15	−0.04	−0.90	.37
Level of Income	−1.15	0.72	−0.06	−1.59	.11	−0.53	0.68	−0.03	−0.79	.43
DAS-R P/A						0.38	0.06	0.23	6.31	<.001
DAS-R NFA/D						0.83	0.13	0.23	6.27	<.001
R^2			.04					.17		
Adj R^2			.03					.16		
SE			14.44					13.46		
df_n, df_d			5, 884					7, 884		
F			5.45					19.70		

Note. DAS: Dysfunctional Attitude Scale.

psychometrically sound measure is essential for research on depression, and because the DAS required further assessment to be used for research in Turkish clinical samples, the current study evaluated the psychometrics and the factor structure, and refined the selection of items of the DAS. Results from this study are encouraging in general for using the DAS–R, i.e., the 13-item DAS, in clinical settings. Findings from the current study provide some evidence for the suitability of the DAS as a measure of cognitions related to depression in a Turkish cultural context. Reliability analyses showed good Cronbach's α values, and moderate to strong correlations were found between the corrected item and total scores. These results reflect a good reliability, consistent with the other studies in the literature as well as the original study (Weissman & Beck, 1978; Imber et al., 1990; Floyd et al., 2004).

When the relationship between the dysfunctional attitudes measured by the DAS–R and the depressive symptom severity was examined, there were two important results. First, the depressive symptom severity was moderately correlated with the DAS–R total and subscale scores ($rs = .32$ to $.37$). Second, the DAS–R scores accounted for 17% of the total variance in depression severity. Although this was smaller than what de Graaf et al. (2009) found (i.e., 31%), it was still statistically significant. As proposed by theory (Beck et al., 1979), these

results suggest that dysfunctional attitudes are significant factors, but not the only factors related to the onset and maintenance of depression.

With respect to the latent factor structure of the DAS, the current study supported a two-factor model, which in prior literature has had more support and a strong theoretical background (Nietzel & Harris, 1990; Ouimette, Klein, Anderson, Riso, & Lizardi, 1994; Coyne & Whiffen, 1995). Although there have been several studies which identified different numbers of factors (Sahin & Sahin, 1992; Power et al., 1994; Moore et al., 2014), the two-factor model is consistently the most widely adopted (Imber et al., 1990; Beck et al., 1991; Blatt & Zuroff, 1992; Floyd et al., 2004; Macavei, 2006). Further, Moore et al. (2014) suggested that the one-factor solution was a higher order factor, which in fact consisted of two factors, i.e. Perfectionism and Dependency. Moore et al. (2014) further reported that only four items consistently loaded on the Dependency factor, and no significant correlation was found between the relevant test and the Dependency factor score, so they retained only one factor, which consisted of items purely related to perfectionistic attitudes. This result is highly similar to the results obtained in the current study. Nevertheless, it is theoretically more relevant to keep two factors even in both of these samples, according to the theory by Beck et al. (1979). Another issue with the studies that found three- or four-factor solutions is with the reverse-scored items, e.g., "It is possible to gain another person's respect without being especially talented at anything." These items reflect functional statements either related to Dependency or Perfectionism. Therefore, it appears that these methods used in detecting the latent factor structures seem to create artificial factors, which in fact pertain to either Perfectionism or Dependency components. The current DAS-R does not contain any reverse-scored items.

One of the strengths of the current study was its sample size. Outpatient treatment-seeking depressed patients comprise a unique sample. Since dysfunctional attitudes are frequently related to depression, samples consisting of patients with clinical depression alongside healthy comparisons are important for understanding the clinical utility of the DAS.

Results of the current study offer another clinically relevant finding, i.e., the abbreviated form of the DAS may as reliably be used as the original DAS to detect dysfunctional attitudes related to depression. In addition to being more practical to use shorter forms of a scale, there have been many studies in the literature that suggested the use of shorter assessment tools to be more user-friendly (Bell & Lumsden, 1980; Johansson, Solvoll, Opdahl, Bjørneboe, & Drevon, 1997; Subar, Ziegler, Thompson, Johnson, Weissfeld, Reding et al., 2001).

Limitations and Conclusion

There are a number of limitations. First, the sample of the current study consisted of outpatient treatment-seeking depressed patients without any comorbid

conditions. Therefore, this study sample may not represent patients with more complex disorders. Second, results of the current study do not provide information whether dysfunctional attitudes measured by the DAS are specific to depression.

In summary, the current study suggests that the DAS–R is a psychometrically sound and valid measure of dysfunctional attitudes related to depression. Consistent with many of the previous research findings, it was concluded that the DAS–R consisted of two distinct factors, demonstrated good concurrent validity, and performed well in discriminating clinically depressed patients from healthy controls.

Declaration of Conflicting Interests

Funding

References

American Psychiatric Association. (Ed.) (1994). *Diagnostic and statistical manual of mental disorders*. (4th ed.) Washington, DC: Author.

Baumgartner, H., & Hombur, C. (1996). Applications of structural equation modeling in marketing and consumer research: a review. *International Journal of Research in Marketing*, *13*, 139–161.

Beck, A. T., Brown, G., Steer, R. A., & Weissman, A. N. (1991). Factor analysis of the Dysfunctional Attitude Scale in a clinical population. *Psychological Assessment*, *3*(3), 478–483. doi: 10.1037/1040-3590.3.3.478

Beck, A. T., Rush, A., Shaw, B., & Emery, G. (1979). *Cognitive therapy of depression*. New York: Guilford Press.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory* (2nd ed.). San Antonio, TX: The Psychological Corp.

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, *4*, 561–571.

Beck, J. S. (2011). *Cognitive behavior therapy basics and beyond* (2nd ed.). New York: Guilford Press.

Bell, R., & Lumsden, J. (1980). Test length and validity. *Applied Psychological Measurement*, *4*, 165–170.

Blatt, S. J., & Zuroff, D. C. (1992). Interpersonal relatedness and self-definition: two prototypes for depression. *Clinical Psychology Review*, *12*(5), 527–562.

Brown, G. P., Hammen, C. L., Craske, M. G., & Wickens, T. D. (1995). Dimensions of dysfunctional attitudes as vulnerabilities to depressive symptoms. *Journal of Abnormal Psychology*, *104*(3), 431–435.

Cane, D. B., Olinger, L. J., Gotlib, I. H., & Kuiper, N. A. (1986). Factor structure of the dysfunctional attitude scale in a student population. *Journal of Clinical Psychology*, *42*(2), 307–309.

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, *I*, 245–276.

Chioqueta, A. P., & Stiles, T. C. (2004). Psychometric properties of the Norwegian version of the Dysfunctional Attitude Scale (Form A). *Cognitive Behaviour Therapy*, *33*(2), 83–86.

Courtney, M. G. R. (2013). Determining the number of factors to retain in EFA: Using the SPSS R-Menu v2.0 to make more judicious estimations. *Practical Assessment, Research and Evaluation*, *18*(8). Available online: http://pareonline.net/getvn. asp?v=18&n=8

Covin, R., Dozois, D. J. A., Ogniewicz, A., & Seeds, P. M. (2011). Measuring cognitive errors: initial development of the cognitive distortions scale (CDS). *International Journal of Cognitive Therapy*, *4*(3), 297–322.

Coyne, J. C., & Whiffen, V. E. (1995). Issues in personality as diathesis for depression: the case of sociotropy-dependency and autonomy-self-criticism. *Psychological Bulletin*, *118*(3), 358–378.

Dozois, D. J. A., Bieling, P. J., Patelis-Siotis, I., Hoar, L., Chudzik, S., McCabe, K., & Westra, H. A. (2009). Changes in self-schema structure in cognitive therapy for major depressive disorder: a randomized clinical trial. *Journal of Consulting and Clinical Psychology*, *77*(6), 1078–1088.

Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics* (4th Edition). London: Sage publications.

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. (2002). *Structured clinical interview for DSM-IV–TR axis I disorders. Research Version, Non-patient Edition. (SCID–I/NP)*. New York: Biometrics Research, New York State Psychiatric Institute.

Floyd, M., Scogin, F., & Chaplin, W. F. (2004). The Dysfunctional Attitudes Scale: factor structure, reliability, and validity with older adults. *Aging & Mental Health*, *8*(2), 153–160.

De Graaf, L. E., Roelofs, Æ. J., & Huibers, M. J. H. (2009). Measuring dysfunctional attitudes in the general population: the Dysfunctional Attitude Scale (Form A) Revised. *Cognitive Therapy and Research*, *33*, 345–355.

Hollon, S. D., & Kendall, P. C. (1980). Cognitive self-statements in depression: development of an automatic thoughts questionnaire. *Cognitive Therapy and Research*, *4*(4), 383–395.

Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, *30*(2), 179–185.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(1), 1–55.

Hutcheson, G. D., & Sofroniou, N. (1999). *The Multivariate Social Scientist: an introduction to generalized linear models*. London: Sage Publications.

IBM Corp. (2013). *IBM SPSS statistics for Windows* (Version 22.0). Armonk, NY: Author.

Imber, S. D., Pilkonis, P. A., Sotsky, S. M., Elkin, I., Watkins, J. T., Collins, J. F., Shea, M. T., Leber, W. R., & Glass, D. R. (1990). Mode-specific effects among three treatments for depression. *Journal of Consulting and Clinical Psychology*, *58*(3), 352–359.

Ingram, R. E. (2003). Origins of cognitive vulnerability to depression. *Cognitive Therapy and Research*, *27*(1), 77–88.

Jarrett, R. B., Vittengl, J. R., Doyle, K., & Clark, L. A. (2007). Changes in cognitive content during and following cognitive therapy for recurrent depression: substantial and enduring, but not predictive of change in depressive symptoms. *Journal of Consulting and Clinical Psychology*, *75*(3), 432–446.

Johansson, L., Solvoll, K., Opdahl, S., Bjørneboe, G. E., & Drevon, C. A. (1997). Response rates with different distribution methods and reward, and reproducibility of a quantitative food frequency questionnaire. *European Journal of Clinical Nutrition*, *51*(6), 346–353.

Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement*, *20*, 141–151.

Kapci, E. G., Uslu, R., Turkcapar, H., & Karaoglan, A. (2008). Beck Depression Inventory II: evaluation of the psychometric properties and cut-off points in a Turkish adult population. *Depression and Anxiety*, *25*(10), 104–110.

Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York: Guilford Press.

Macavei, B. (2006). Dysfunctional Attitudes Scale Form A: norms for the Romanian population. *Journal of Cognitive & Behavioral Psychotherapies*, *6*(2), 157.

Miranda, J., Persons, J. B., & Byers, C. N. (1990). Endorsement of dysfunctional beliefs depends on current mood state. *Journal of Abnormal Psychology*, *99*(3), 237–241.

Moore, M. T., Fresco, D. M., Segal, Z. V., & Brown, T. A. (2014). An exploratory analysis of the factor structure of The Dysfunctional Attitude Scale–Form A (DAS). *Assessment*, *21*, 570–579.

Mukhtar, F., & Oei, T. P. S. (2010). Exploratory and confirmatory factor validation of the Dysfunctional Attitude Scale for Malays (DAS–Malay) in Malaysia. *Asian Journal of Psychiatry*, *3*(3), 145–151.

Nietzel, M. T., & Harris, M. J. (1990). Relationship of dependency and achievement/ autonomy to depression. *Clinical Psychology Review*, *10*(3), 279–297.

O'Connor, B. P. (2000). SPSS and SAS programs for determining the number of components using parallel analysis and Velicer's MAP Test. *Behavior Research Methods, Instruments and Computer*, *32*(3), 396–402.

Oliver, J. M., & Baumgart, E. P. (1985). The dysfunctional attitude scale: psychometric properties and relation to depression in an unselected adult population. *Cognitive Therapy and Research*, *9*(2), 161–167.

Ouimette, P. C., Klein, D. N., Anderson, R., Riso, L. P., & Lizardi, H. (1994). Relationship of sociotropy/autonomy and dependency/self-criticism to DSM-III–R personality disorders. *Journal of Abnormal Psychology*, *103*(4), 743–749.

Patil, V. H., Singh, S. N., Mishra, S., & Donovan, T. (2008). Efficient theory development and factor retention criteria: a case for abandoning the 'Eigenvalue greater than one' criterion. *Journal of Business Research*, *61*(2), 162–170.

Patil, V. H., Singh, S. N., Mishra, S., & Donovan, D. T. (2007). Parallel analysis engine to aid determining number of factors to retain. Available from http://smishra.faculty. ku.edu/parallelengine.htm. Accessed on June 29, 2015. [Computer software],

Power, M. J., Katz, R., McGuffin, P., Duggan, C. F., Lam, D., & Beck, A. T. (1994). The Dysfunctional Attitude Scale (DAS): a comparison of Forms A and B and proposals for a new subscaled version. *Journal of Research in Personality*, *28*(3), 263–276.

Rogers, G. M., Park, J-H., Essex, M. J., Klein, M. H., Silva, S. G., Hoyle, R. H., . . . March, J. S. (2009). The dysfunctional attitudes scale: psychometric properties in depressed adolescents. *Journal of Clinical Child and Adolescent Psychology*, 53, *38*(6), 781–789.

Ruscio, J., & Roche, B. (2012). Determining the number of factors to retain in an exploratory factor analysis using comparison data of known factorial structure. *Psychological Assessment*, *24*, 282–292.

Sahin, N. H., & Sahin, N. (1992). How dysfunctional are the dysfunctional attitudes in another culture? *The British Journal of Medical Psychology*, *65*(Part 1), 17–26.

Şahin, N. H., & Şahin, N. (1992). Reliability and validity of the Turkish version of the Automatic Thoughts Questionnaire. *Journal of Clinical Psychology*, *48*(3), 334–340.

Scott, J., Stanton, B., Garland, A., & Ferrier, I. N. (2000). Cognitive vulnerability in patients with bipolar disorder. *Psychological Medicine*, *30*(2), 467–472.

Senol-Durak, E., Durak, M., & Elagoz, F. O. (2011). Testing the psychometric properties of the Ways of Coping Questionnaire (WCQ) in Turkish university students and community samples. *Clinical Psychology Psychotherapy*, *18*, 172–185.

Shankman, S. A., Campbell, M. L., Klein, D. N., Leon, A. C., Arnow, B. A., Manber, R., Keller, M. B., Markowitz, J. C., Rothbaum, B. O., Thase, M. E., & Kocsis, J. H. (2013). Dysfunctional attitudes as a moderator of pharmacotherapy and psychotherapy for chronic depression. *Journal of Psychiatric Research*, *47*(1), 113–121.

Sheehan, D., Lecrubier, Y., Harnett Sheehan, K., Janavs, J., Weiller, E., Keskiner, A., Schinka, J., Knapp, E., Sheehan, K. F., & Dunbar, G. C. (1997). The validity of the Mini International Neuropsychiatric Interview (MINI) according to the SCID–P and its reliability. *European Psychiatry*, *12*(5), 232–241.

Subar, A. F., Ziegler, R. G., Thompson, F. E., Johnson, C. C., Weissfeld, J. L., Reding, D., Kavounis, K. H., Hayes, R. B., & Prostate, Lung, Colorectal, Ovarian Cancer Screening Trial Investigators. Is shorter always better? Relative importance of questionnaire length and cognitive ease on response rates and data quality for two dietary questionnaires. *American Journal of Epidemiology*, *153*(4), 404–409.

Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics* (3rd ed.). New York: HarperCollins.

Türkçapar, M. H. (2009). *Klinik Uygulamada Bilişsel-Davranışçı Terapi: Depresyon*. Ankara: HYB Publ.

Uğurlu, G. K., Uğurlu, M., Turhan, L., & Türkçapar, M. H. (2012). Dysfunctional attitudes in alcohol dependents: a comparative study. *Journal of Cognitive Behavioral Psychotherapy and Research*, *1*(2), 113–120.

Weissman, A. N., & Beck, A. T. (1978). Development and validation of the Dysfunctional Attitude Scale: a preliminary investigation. Paper presented at the annual meeting of the American Educational Research Association, Toronto, Ontario, Canada.

Williams, B., Brown, T., & Onsman, A. (2010). Exploratory factor analysis: A five-step guide for novices. *Australasian Journal of Paramedicine*, *8*(3). Retrieved from http://ro.ecu.edu.au/jephc/vol8/iss3/1

Author Biographies

Sedat Batmaz, born in 1980 in Berlin, Germany, graduated from Hacettepe University, School of Medicine (Ankara, Turkey) in 2004, and got his specialty in psychiatry from Oncology Training and Research Hospital, Psychiatry Clinic (Ankara, Turkey) in 2010. He passed the psychiatry board examination of the Psychiatric Association of Turkey in 2012. He has been a diplomate of the Academy of Cognitive Therapy since 2012, and a certified cognitive behavioral psychotherapist of the EABCT since 2013. He is currently employed as an assistant professor of psychiatry in Gaziosmanpasa University, School of Medicine (Tokat, Turkey). His research interests mainly focus on cognitive behavioral therapy, metacognitive therapy, mood disorders, and transdiagnostic approaches to psychopathology.

Kadir Ozdel, born in 1978, graduated from Osmangazi University, School of Medicine (Eskisehir, Turkey) in 2003, and got his MD in psychiatry from Ankara University, School of Medicine, Department of Psychiatry (Ankara, Turkey) in 2009. He is a diplomate member & trainer and consultant of the Academy of Cognitive Therapy. He also is secretary general and trainer of The Association of Cognitive & Behavioral Psychotherapies (Turkey) which is a member of the European Association for Behaviour and Cognitive Therapies. He is currently employed as an associate professor of psychiatry in Diskapi YB Teaching and Research Hospital [Turkish Ministery of Health] (Ankara, Turkey). His research interests mainly focus on cognitive behavioral therapies, mood disorders, psychiatric assessment and to psychopathology.