

# Psychometric Properties of the Expanded Version of the Inventory of Depression and Anxiety Symptoms in a Turkish Population

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## Abstract

The study examined psychometric properties of the Turkish version of the Inventory of Depression and Anxiety Symptoms-II (IDAS-II) in a Turkish sample. The sample consisted of nonclinical ( $N = 931$ ) and clinical ( $N = 208$ ) individuals. Confirmatory factor analysis showed that Turkish IDAS-II was similar to the original IDAS-II and supported the construct validity of the test. The Turkish IDAS-II showed good internal consistency, significant acceptable retest correlations, and was sensitive to changes over time. The Turkish IDAS-II also showed good convergent and discriminant validity in relation to the Beck Depression Inventory, the Beck Anxiety Inventory, the Mood Disorder Questionnaire, the Maudsley Obsessive Compulsive Inventory, the Panic Agoraphobia Scale, and the Post-Traumatic Stress Disorder Checklist-Civilian Version. Discriminant analyses revealed that the subscales of the Turkish IDAS-II significantly differentiated healthy controls from outpatients.

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The Turkish IDAS-II is a reliable and valid measure for assessing symptoms of depression and anxiety in Turkish-speaking participants.

### **Keywords**

IDAS-II, depression, anxiety, factor analysis, obsessive-compulsive disorder, posttraumatic stress disorder

## **Introduction**

Mood disorders, specifically depression and anxiety disorders, are among the most common psychiatric disorders. Major depressive disorder has shown to be the most common lifetime disorder (16.6%), whereas the most common class of disorders is anxiety disorders (28.8%) (Kessler, Chiu, Demler, Merikangas, & Walters, 2005). According to the World Health Organization (WHO) Health Surveys (Kessler et al., 2009), anxiety, such as depression, is one of the most common psychiatric disorders despite cultural differences in prevalence rates. There are also accumulating data on the co-occurrence of depression and anxiety (Brady & Kendall, 1992; Brown, Campbell, Lehman, Grisham, & Mancill, 2001; Forbush & Watson, 2013; Hiller, Zaudig, & von Bose, 1989; Lewinsohn, Zinbarg, Seeley, Lewinsohn, & Sack, 1997; Mineka, Watson, & Clark, 1998; Sanderson, Beck, & Beck, 1990; Watson & O'Hara, 2017). Approximately 57.5% of individuals with major depression episodes also meet criteria for an anxiety disorder during the same 12-month period (Kessler, 2003; Kessler, Merikangas, & Wang, 2007). In addition, each of the eight anxiety disorders assessed by Kessler et al. (2005) was significantly correlated with major depression with a correlation range of .37 to .62.

The global burden of depression has significant societal, economic, and clinical implications (Marcus, Yasamy, Ommerman, Chisholm, & Saxena, 2012). Moussavi et al. (2007) demonstrated that depression was the fourth leading cause of disability worldwide. Further, comorbid depression considerably worsens health compared to any other single chronic disease or combination of chronic diseases without depression.

Pignone et al. (2002) demonstrated that effective screening and treatment of depressive disorders lead to improved quality of life, daily functioning, employment, and lower rates of mortality. It may also reduce spending on unnecessary health care. Therefore, assessing depression and anxiety, and investigating their comorbidity, has important theoretical and practical implications (Chmielewski, Clark, Bagby, & Watson, 2015).

There are currently more than 100 assessment scales for depression (Demyttenaere & De Fruyt, 2003). Some are widely used (e.g., Beck Depression Inventory (BDI)-II, Beck, Steer, & Brown, 1996; Center for Epidemiological Studies Depression Scale, Radloff, 1977; Hamilton Rating

Scale for Depression, Hamilton, 1960; Inventory of Depressive Symptomatology, Rush et al. (1986)) and have made important contributions to the clinical literature (Joiner, Walker, Pettit, Perez, & Cukrowicz, 2005). However, self-report measures of depression have been criticized for various reasons. Criticisms generally have focused on poor retest reliabilities and poor discriminant and content validities (Ahava, Iannone, Grebstein, & Schirling, 1998; Dozois & Covin, 2004; Watson & O'Hara, 2017; Watson et al., 2007). For instance, the BDI is relatively insensitive to subtle changes in symptoms over a short period of time. In addition, a drastic decrease in BDI scores were observed after an interval of eight weeks in a normal sample, calling into question the test–retest reliability (Ahava et al., 1998; Dozois & Covin, 2004). In addition, high correlations between self-report measures of depression and anxiety symptoms raise concerns about the discriminant validities of existing measures (Dozois & Covin, 2004; Gotlib & Cane, 1989; Watson, Clark, Chmielewski, & Kotov, 2013). Moreover, few measures of depression cover all nine criteria for major depression as outlined in the DSM-IV (Dozois, Dobson, & Ahnberg, 1998; Joiner et al., 2005; Penley, Wiebe, & Nwosu, 2003). In some cases, single items were used to measure specific symptoms, suggesting insufficiency of content of these measures. Finally, the ordering of BDI-II responses from least to most depressed, and the observation that average BDI total scores are below 1 in nonclinical samples and rarely above 2 in patient samples have made it vulnerable to criticisms about the influence of socially desirable and/or defensive responding.

In response to the above criticisms, Watson et al. (2007) developed the Inventory of Depression and Anxiety Symptoms (IDAS). The IDAS has shown good reliability and validity for assessing the symptoms of major depression and anxiety disorders (Watson et al., 2007, 2012). Watson et al. (2012) further expanded the scope of the IDAS to encompass other aspects of the anxiety disorders (e.g., obsessive-compulsive disorder (OCD)) as well as symptoms of bipolar disorder. They also mentioned that although there were different and separate self-report measures which assessed depression, social anxiety, and OCD, combining this diverse content enabled the researchers to develop a more efficient and comprehensive inventory. Assessing depression and anxiety symptoms using a one scale, rather than with multiple scales, is desirable as it eliminates other factors related to common variances (Caspi et al., 2014; Johnson, Rosen, & Djurdjevic, 2011). Therefore, the IDAS-II was developed as a single comprehensive measure to assess diverse symptomatology while eliminating the confounding methodological factors outlined above (Johnson et al., 2011; Reio, 2010)

The IDAS-II was found to be a comprehensive inventory in terms of its coverage of emotional disorders and internalizing disorders. In addition, the IDAS has been used to investigate psychopathology in a range of disorders (Albanese et al., 2018; Mackin, Perlman, Davila, Kotov, & Klein, 2017; Sabharwal et al., 2017; Stanton, Gruber, & Watson, 2017; Watson &

Naragon-Gainey, 2014; Watson, Stasik, Sara, Ellickson-Larew & Stanton, 2015; Weinberg, Liu, Hajcak, Shankman, & Stewart, 2015).

The IDAS-II has shown good reliability and validity for assessing depression and anxiety, as well as for assessing severity of symptoms in clinical samples (Watson et al., 2012). We believe that joint assessment of the highly correlated symptoms of depression and anxiety will aid the assessment of important aspects of psychopathology, the identification and management of risks for patients, the development of appropriate treatment plans, and the monitoring of progress and outcomes. Therefore, we aimed to adapt the IDAS-II for use in Turkish populations to address the lack of a measure that assesses both depression and anxiety. Turkish adaptations of the BDI (Hisli, 1989) and the Hamilton Depression Scale (Akdemir et al., 1996) are widely used in Turkey. These scales are narrower in scope of content compared to the new IDAS-II. In addition, Turkish adaptations of the Symptom Check List-90 (Kılıç, 1991) and the Symptom Assessment-45 Questionnaire (Epözdemir, 2009) are also used in Turkey. Reliability and validity of the Turkish SCL-90 were evaluated using a sample of 122 college students. Although both scales aim to assess different symptoms of psychopathology than the IDAS-II, they also assess paranoid ideation, and psychoticism which is outside the scope of the IDAS-II. Therefore, compared to these scales, the IDAS-II is comprehensive but at the same time content specific. As a result, we expect that the IDAS-II will meet the need for an inventory to assess mood disorders in research and clinical settings in Turkish populations. Such a measure will be beneficial for both clinical practice and research in Turkish populations. To this aim, internal consistency; test-retest reliability; and construct, discriminant, convergent, and concurrent validities of the Turkish version of the IDAS-II were assessed in clinical and nonclinical samples. The factor structure of the IDAS-II was also examined.

## Method

### *Participants*

**Nonclinical sample.** The participants were 987 community-dwelling adults living in different cities of Turkey. Participation was on an unpaid, voluntary basis. Participants were excluded from the analyses if they omitted more than five items on the Turkish version of IDAS-II ( $N = 39$ ), or if they reported a previous psychiatric diagnosis ( $N = 17$ ). Thus, the nonclinical sample consisted of 931 individuals (608 females, 323 males; age range = 18–80,  $M$  age = 31.98,  $SD = 11.35$ ). Three participants did not report their gender, and therefore, these data were coded as missing. A subgroup of participants from the nonclinical sample ( $N = 100$ ) was randomly selected to be reassessed after four weeks in order to investigate test-retest reliability. A chi-square test showed that the age distribution between males and females was significantly different ( $p < .001$ ).

*Clinical sample.* The clinical sample consisted of 208 psychiatric outpatients (147 females, 61 males; age range = 18–73,  $M = 38.99$ ,  $SD = 12.88$ ) recruited via Bakirköy Mental Health and Neurological Diseases Education and Research Hospital, Surp Pırgıç Armenian Hospital, Levent Family Health Center, Bursa Private Rentıp Hospital, and Çorlu Military Hospital. Participants were diagnosed with mood disorders and/or anxiety disorders based on DSM-IV-TR criteria. Only patients whose diagnoses (mood and anxiety disorders only) were agreed upon by two psychiatrists based on DSM-IV-TR criteria were included in the study. Patients who met the criteria were informed about the study by the psychiatrists during their visit. Those individuals who agreed to participate were given consent forms. Participation was on an unpaid, voluntary basis. Thirteen participants did not report their age, and therefore these data were coded as missing. A chi-square test showed that the age distribution between males and females was not significant ( $p = .399$ ).

### *Measures*

In assessing the validity and reliability of the Turkish IDAS-II, where possible, we aimed to use similar measures to those used in the original study (Watson et al., 2007, 2012). However, some of the measures used have not yet been adapted to Turkish; therefore, alternative measures were used.

#### *The Expanded IDAS-II*

The IDAS-II contains 99 items which assess symptoms over the past two weeks. Each symptom is rated on a five-point Likert-type scale. The IDAS-II consists of 18 distinct subscales (dysphoria, insomnia, appetite loss, lassitude, suicidality, appetite gain, well-being, traumatic intrusions, traumatic avoidance, panic, claustrophobia, social anxiety, cleaning, ordering, checking, euphoria, mania, and Ill-temper), organized into three broad dimensions (distress, obsessions/fears, and well-being). In addition, Watson et al. (2007) developed the General Depression Scale which consists of all 10 of the Dysphoria items and 2 items from each of suicidality, lassitude, insomnia, appetite loss, and well-being. This scale is short (20 items), similar to traditional counterparts such as the BDI-II, and was developed to assess the core symptoms of depression.

#### *Beck Depression Inventory*

The BDI-I is a 21-item self-report measure that assesses the cognitive and emotional symptoms of depression over the last week. Participants rate each item on a four-point scale ranging from 0 (absent) to 3 (severe). The total score ranges from 0 to 63 (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The BDI was adapted into Turkish by Hisli (1989). In our sample, Cronbach's alpha coefficient was found to be .82.

### *Beck Anxiety Inventory*

The Beck Anxiety Inventory (BAI) is a 21-item self-report measure assessing level of anxiety. The BAI evaluates the physical, emotional, and cognitive aspects of anxiety as well as fear of losing control (Beck, Epstein, Brown, & Steer, 1988). Participants rate each item on a four-point scale ranging from 0 (absent) to 3 (severe). The total score ranges from 0 to 63, and higher scores indicate severe anxiety symptoms. The BAI was adapted into Turkish by Ulusoy, Şahin, and Erkmen(1998). In our sample, Cronbach's alpha coefficient was .91.

### *Panic and Agoraphobia Scale*

The Panic and Agoraphobia Scale (PAS) is sensitive to anxiety symptoms, specifically panic, claustrophobia, and social anxiety. The PAS assesses important aspects of panic disorder with and without agoraphobia (Bandelow, 1999). The scale contains 14 items which assess agoraphobia, anticipatory anxiety, disability, and worries about health. The PAS was adapted into Turkish by Tural, Fidaner, Alkın, and Bandelow(2002). The scale has two forms: a self-report version and a clinician-rated version. In our sample, the Cronbach's alpha coefficient was .91.

### *Mood Disorder Questionnaire*

The Mood Disorder Questionnaire (MDQ) was used to examine the convergent and discriminant validity of IDAS subscales relating to bipolar symptoms, namely, depression, mania, and euphoria. The MDQ is a self-report measure of bipolar I and II disorders (Hirschfeld et al., 2003). The MDQ includes 13 yes/no items which assess lifetime history of manic and hypomanic symptoms. Separate items also evaluate whether manic or hypomanic symptoms or behaviors were experienced at the same time and the level of impairment in functionality due to symptoms. The MDQ was adapted into Turkish by Konuk et al. (2007). In our sample, the Cronbach's alpha coefficient was .87.

### *Maudsley Obsessive Compulsive Inventory*

The Maudsley Obsessive Compulsive Inventory (MOCI) was developed by Hodgson and Rachman (1977) and is the most commonly used self-report measure for assessing the type and severity of obsessive-compulsive symptoms (Sanchez-Meca et al., 2011). The MOCI consists of 30 items, organized into four factors: checking, cleaning, slowness, and doubling. Participants are required to give yes/no responses to each item. The Turkish version of the test includes an additional factor for rumination, which consists of seven

items (Erol & Savaşır, 1988). In our sample, the Cronbach alpha coefficient was .82 for 30 items and .86 for 37 items.

### *Post-Traumatic Stress Disorder Checklist-Civilian Version*

The Post-Traumatic Stress Disorder Checklist-Civilian Version (PCL-C) developed by Ruggiero, Del Ben, Scotti, and Rabalais (2003) consists of 17 items that were designed to assess PTSD. Participants rate each item on a five-point Likert-type scale that ranges from “not at all” to “extremely.” The PCL-C consists of three subscales: re-experiencing, avoidance, and hyperarousal.

The Turkish adaptation of the PCL-C was conducted by Kocabaşoğlu, Özdemir, Yargıç, and Geyran (2005). In our sample, the PCL-C showed strong internal consistency with a Cronbach’s alpha coefficient of .93.

### *Translation of IDAS-II*

When translating the IDAS-II into Turkish, the researchers produced a number of possible alternative translations of each item. These were then sent to four instructors and professors from the departments of English Language and Literature or American Culture and Literature at various universities for consideration. These individuals were asked to indicate the most appropriate item-translation from the suggested alternatives or to suggest an alternative translation. If all instructors unanimously agreed on the same translation, the alternatives for that item were eliminated. Still, those accepted items were represented in the second draft. Based on this feedback, a second draft of the Turkish version of the IDAS-II was prepared and sent to four bilingual experts, who specialized in the areas of clinical psychology or psychiatry. The translators were again asked to choose from a number of alternative translations for each item, or to provide an alternative translation, if necessary. Based on this feedback, the final version of the test was formed. The final version of the test was sent to two translators specializing in clinical psychology for back-translation. The items of the back-translated version were found to be sufficiently similar to those in the original IDAS-II.

### *Procedure*

The study was approved by the Research Ethics Board of the home Institute. A demographics questionnaire was administered to collect information about age, sex, education, social-economic level, and medical history for each participant. The study took approximately 30 to 50 minutes. The demographics questionnaire was administered first, and the order of all other questionnaires was counterbalanced.

## Results

Prior to analysis, data were screened for all IDAS-II items. If an individual omitted more than five items on the IDAS-II, he or she was excluded from the analyses ( $N = 39$ ). In addition, individuals in the nonclinical sample who reported a previous or current psychiatric diagnosis were excluded ( $N = 17$ ). The data were then screened for univariate and multivariate outliers (Tabachnick & Fidell, 2013). There were no outliers identified as multivariate using Mahalanobis distance with  $p < .001$ . For univariate outliers, however, skewness and kurtosis were found to be problematic using z-scores ( $z \geq 3.0$ ) for eight of the IDAS-II items for the nonclinical sample. Therefore, Log10 transformation was used, and the resultant values met the criteria.

Statistical analyses were employed in five steps based on our research goal. In the first and second step, internal consistencies were examined, and test-retest reliability was assessed. In the third, fourth, and the fifth steps, validity analyses were conducted, namely, convergent, discriminant, and concurrent validities.

### *Internal consistencies*

Pearson product moment correlations were calculated separately for the nonclinical and clinical samples to reveal correlations between the IDAS-II subscales. For the nonclinical sample, correlations ranged between  $-.34$  (between Well-Being and Dysphoria) and  $.79$  (between Dysphoria and Ill-Temper). Correlation coefficients between the IDAS-II subscales in the nonclinical sample are presented in Table 1. Pearson correlation coefficients ranged between  $-.45$  (between Well-Being and Dysphoria) and  $.71$  (Panic and Dysphoria) in the clinical sample (Table 2).

Internal consistencies (coefficient alphas) and average interitem correlations (AICs) for the IDAS-II subscales were calculated for both nonclinical and clinical samples. The majority of Cronbach's alpha coefficients were above  $.80$  in the nonclinical sample, indicating a good level of internal consistency. Coefficients for checking and ordering were high, with alpha values of  $.77$  and  $.76$ , respectively, whereas the alpha values for appetite loss and appetite gain were slightly lower at  $.73$  and  $.75$ , respectively. However, the coefficients indicated acceptable internal consistency. In the clinical sample, the majority of the alphas were also above  $.80$ . Appetite loss and mania revealed slightly lower coefficients with alpha values of  $.66$  and  $.71$ , respectively, but these were still in the acceptable range. However, the alpha values for suicidality were  $.49$  and  $.48$  for the nonclinical and clinic samples, respectively, and yielded poor internal consistencies. Cronbach's alpha coefficients and AICs for both samples are presented in Table 3.

AICs should be moderate in range, with values between  $.15$  and  $.50$  (Clark & Watson, 1991). As expected, the majority of AICs fell between  $.15$  and  $.50$  in

**Table 1.** Pearson correlations between IDAS-II subscales in the NC sample.

| IDAS-II Subscales | 1      | 2      | 3      | 4      | 5     | 6     | 7      | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    | 16    | 17    | 18 |  |
|-------------------|--------|--------|--------|--------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|--|
| 1 Dysphoria       | 1      |        |        |        |       |       |        |       |       |       |       |       |       |       |       |       |       |    |  |
| 2 Lassitude       | .78**  | 1      |        |        |       |       |        |       |       |       |       |       |       |       |       |       |       |    |  |
| 3 Insomnia        | .63**  | .56**  | 1      |        |       |       |        |       |       |       |       |       |       |       |       |       |       |    |  |
| 4 Suicidality     | .54**  | .49**  | .42**  | 1      |       |       |        |       |       |       |       |       |       |       |       |       |       |    |  |
| 5 Appetite loss   | .46**  | .37**  | .55**  | .31**  | 1     |       |        |       |       |       |       |       |       |       |       |       |       |    |  |
| 6 Appetite gain   | .33**  | .43**  | .28**  | .20**  | -.02  | 1     |        |       |       |       |       |       |       |       |       |       |       |    |  |
| 7 Well-being      | -.34** | -.16** | -.13** | -.16** | .05   | .09** | 1      |       |       |       |       |       |       |       |       |       |       |    |  |
| 8 Ill-temper      | .79**  | .66**  | .60**  | .52**  | .40** | .32** | -.25** | 1     |       |       |       |       |       |       |       |       |       |    |  |
| 9 Mania           | .42**  | .44**  | .37**  | .27**  | .28** | .32** | .19**  | .40** | 1     |       |       |       |       |       |       |       |       |    |  |
| 10 Euphoria       | .05    | .16**  | .16**  | .11**  | .18** | .25** | .56**  | .10*  | .54** | 1     |       |       |       |       |       |       |       |    |  |
| 11 Panic          | .72**  | .64**  | .60**  | .63**  | .41** | .28** | -.21** | .72** | .39** | .13** | 1     |       |       |       |       |       |       |    |  |
| 12 Claustrophobia | .53**  | .48**  | .47**  | .47**  | .32** | .28** | -.11** | .48** | .43** | .21** | .54** | 1     |       |       |       |       |       |    |  |
| 13 Trauma         | .70**  | .59**  | .55**  | .56**  | .41** | .27** | -.14** | .66** | .41** | .18** | .62** | .49** | 1     |       |       |       |       |    |  |
| intrusions        |        |        |        |        |       |       |        |       |       |       |       |       |       |       |       |       |       |    |  |
| 14 Trauma         | .43**  | .44**  | .37**  | .34**  | .36** | .24** | .11**  | .37** | .47** | .42** | .35** | .47** | .56** | 1     |       |       |       |    |  |
| avoidance         |        |        |        |        |       |       |        |       |       |       |       |       |       |       |       |       |       |    |  |
| 15 Checking       | .45**  | .47**  | .37**  | .31**  | .31** | .24** | .05    | .38** | .59** | .36** | .41** | .51** | .43** | .50** | 1     |       |       |    |  |
| 16 Ordering       | .41**  | .47**  | .40**  | .27**  | .34** | .31** | .18**  | .37** | .53** | .44** | .37** | .50** | .40** | .54** | .68** | 1     |       |    |  |
| 17 Cleaning       | .31**  | .36**  | .38**  | .30**  | .34** | .24** | .08*   | .34** | .43** | .35** | .35** | .54** | .32** | .41** | .53** | .60** | 1     |    |  |
| 18 Social         | .66**  | .56**  | .52**  | .61**  | .35** | .37** | -.15** | .58** | .39** | .18** | .63** | .61** | .61** | .41** | .45** | .43** | .42** | 1  |  |
| anxiety           |        |        |        |        |       |       |        |       |       |       |       |       |       |       |       |       |       |    |  |

Note: N = 931. IDAS: Inventory of Depression and Anxiety Symptoms. \* $p < .05$ ; \*\* $p < .001$ .

**Table 2.** Pearson correlations between IDAS-II subscales in the clinical sample.

| IDAS-II Subscales | 1      | 2      | 3      | 4      | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    | 16    | 17    | 18 |  |
|-------------------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|--|
| 1 Dysphoria       | 1      |        |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |    |  |
| 2 Lassitude       | .69**  | 1      |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |    |  |
| 3 Insomnia        | .46**  | .35**  | 1      |        |       |       |       |       |       |       |       |       |       |       |       |       |       |    |  |
| 4 Suicidality     | .55**  | .42**  | .40**  | 1      |       |       |       |       |       |       |       |       |       |       |       |       |       |    |  |
| 5 Appetite loss   | .28**  | .19**  | .43**  | .30**  | 1     |       |       |       |       |       |       |       |       |       |       |       |       |    |  |
| 6 Appetite gain   | .13    | .32**  | .05    | .15*   | -.38  | 1     |       |       |       |       |       |       |       |       |       |       |       |    |  |
| 7 Well-being      | -.45** | -.18** | -.14** | -.24** | .17*  | .15*  | 1     |       |       |       |       |       |       |       |       |       |       |    |  |
| 8 Ill-temper      | .58**  | .54**  | .40**  | .53**  | .18** | .10   | -.25  | 1     |       |       |       |       |       |       |       |       |       |    |  |
| 9 Mania           | .34**  | .33**  | .26**  | .32**  | .09   | .10   | .19** | .29** | 1     |       |       |       |       |       |       |       |       |    |  |
| 10 Euphoria       | -.02   | .10    | .09    | .12    | -.04  | .21** | .55** | .06   | .54** | 1     |       |       |       |       |       |       |       |    |  |
| 11 Panic          | .71**  | .61**  | .55**  | .51**  | .32** | .07   | -.31  | .66** | .30** | .07   | 1     |       |       |       |       |       |       |    |  |
| 12 Claustrophobia | .43**  | .36**  | .37**  | .35**  | .19** | .05   | -.15* | .39** | .23** | .15*  | .57** | 1     |       |       |       |       |       |    |  |
| 13 Trauma         | .61**  | .43**  | .42**  | .44**  | .21** | .13   | -.13  | .44** | .27** | .03   | .50** | .29** | 1     |       |       |       |       |    |  |
| intrusions        |        |        |        |        |       |       |       |       |       |       |       |       |       | 1     |       |       |       |    |  |
| 14 Trauma         | .26**  | .22**  | .24**  | .06    | .12   | .11   | .10   | .16*  | .08   | .17*  | .25** | .27** | .32** | 1     |       |       |       |    |  |
| avoidance         |        |        |        |        |       |       |       |       |       |       |       |       |       |       | 1     |       |       |    |  |
| 15 Checking       | .31**  | .28**  | .24**  | .18**  | .16*  | .66   | .07   | .36** | .40** | .28** | .30** | .41** | .14*  | .23** | 1     |       |       |    |  |
| 16 Ordering       | .30**  | .33**  | .28**  | .26**  | .08   | .18*  | .13   | .28** | .50** | .38** | .34** | .40** | .25** | .29** | .65** | 1     |       |    |  |
| 17 Cleaning       | .23**  | .31**  | .21**  | .19**  | .09   | .14*  | -.01  | .20** | .35** | .21** | .25** | .41** | .18** | .21** | .52** | .55** | 1     |    |  |
| 18 Social anxiety | .61**  | .49**  | .34**  | .44**  | .19** | .17*  | -.12  | .43** | .42** | .23** | .48** | .48** | .42** | .24** | .46** | .49** | .35** | 1  |  |

Note: N = 208. IDAS: Inventory of Depression and Anxiety Symptoms. \* $p < .05$ ; \*\* $p < .001$ .

**Table 3.** Cronbach’s alpha coefficients and AICs for IDAS-II subscales in the NC and C samples.

| IDAS subscale        | Groups |     |          |     |
|----------------------|--------|-----|----------|-----|
|                      | NC     |     | C        |     |
|                      | A      | AIC | $\alpha$ | AIC |
| General depression   | .91    | .35 | .87      | .27 |
| Dysphoria            | .90    | .48 | .85      | .38 |
| Lassitude            | .80    | .39 | .73      | .31 |
| Insomnia             | .81    | .41 | .78      | .37 |
| Suicidality          | .49    | .34 | .48      | .39 |
| Appetite loss        | .73    | .47 | .66      | .40 |
| Appetite gain        | .75    | .50 | .76      | .52 |
| Well-being           | .87    | .46 | .82      | .36 |
| Ill-temper           | .87    | .57 | .86      | .55 |
| Mania                | .69    | .32 | .71      | .32 |
| Euphoria             | .82    | .48 | .78      | .42 |
| Panic                | .86    | .43 | .86      | .43 |
| Social anxiety       | .85    | .49 | .86      | .50 |
| Claustrophobia       | .84    | .57 | .87      | .61 |
| Traumatic intrusions | .83    | .56 | .87      | .62 |
| Traumatic avoidance  | .85    | .59 | .76      | .44 |
| Checking             | .77    | .53 | .80      | .56 |
| Ordering             | .76    | .39 | .75      | .37 |
| Cleaning             | .87    | .49 | .90      | .56 |

Note: IDAS: Inventory of Depression and Anxiety Symptoms; NC: nonclinical sample (N = 931); C: clinical sample; AIC: average interitem correlation.

both samples. However, in the nonclinical sample, Ill-Temper (.57), claustrophobia (.57), traumatic intrusions (.56), traumatic avoidance (.59), and checking (.77) revealed slightly higher values; in the clinical sample, appetite gain (.52), Ill-temper (.55), claustrophobia (.61), traumatic intrusions (.62), checking (.52) and cleaning (.52) were slightly higher.

In the nonclinical sample, the Cronbach’s alpha coefficient for 99 items was .96 indicating that the items have high internal consistency. According to the *if item deleted* option, there was no need to delete any item. Split-half Cronbach’s alpha coefficients were found to be .94 and .93 for the first and second half, respectively. The Spearman–Brown correlation coefficient between these two forms was .85. The Turkish IDAS-II was found to be highly reliable for the nonclinical sample.

In the clinical sample, the Cronbach’s alpha coefficient for 99 items was .95 indicating that the items have relatively high internal consistency. There was no

need to delete any item since the Cronbach's alpha scores ranged between .947 and .949. Split-half Cronbach's alpha coefficients were found to be .92 and .91 for the first and second half, respectively. The Spearman-Brown correlation coefficient between these two forms was .81.

### *Test-retest reliability*

To assess test-retest reliability of the Turkish version of the IDAS-II, 100 healthy participants (age range = 20–61,  $M = 26.91$ ,  $SD = 9.72$ ) were reassessed four weeks after the initial assessment. Prior to retesting, all participants were interviewed to confirm that there were no changes in mental health status. For item base analysis results, 75 of the 99 correlations (75%) were found to be significant. Fifty nine of these (60%) were significant at the level of  $p < .01$  and 16 (16%) were significant at the level of  $p < .05$ . The remaining 24 correlations (24%) were not statistically significant.

Retest correlation results for the following IDAS-II subscales were statistically significant: IDAS-II total score, general depression, dysphoria, insomnia, suicidality, well-being, euphoria, Ill-temper, mania, panic, claustrophobia, traumatic intrusion, traumatic avoidance, checking, ordering, and cleaning (all  $p < .01$ ;  $r \geq .22$ ). Retest correlations for lassitude and appetite loss were significant at the level of  $p < .05$  ( $r = .22$ ). However, retest correlations for appetite gain and social anxiety were not statistically significant ( $r = .20$ , and  $r = .11$ , respectively) (see Table 4).

### *Construct validity*

In the first step, a factor analysis was used to test the factor structure of the Turkish version of the IDAS-II ( $N = 931$ ). A principle component analysis was used as a factor extraction method. The Kaiser-Meyer-Olkin index was 0.92 (perfect fit) (Bartlett's chi-square = 10310.18,  $p = 0.001$ ). Furthermore, both eigenvalues ( $> 1$ ) and Scree Plot graphics indicated three factors. Similar to the original study (Watson et al., 2012), these analyses revealed the presence of three interpretable factors, which were rotated to oblique simple structure using promax. With the exception of the appetite gain subscale, the Turkish version of the IDAS-II had a similar factor structure to the original IDAS-II. The three factors were labeled in conformity with the original study: distress, obsession/fear, and positive mood explained 64.66% of the total variance. The distress subfactor (eigenvalue = 7.99) consisted of dysphoria, Ill-temper, panic, lassitude, traumatic intrusions, social anxiety, mania, insomnia, suicidality, traumatic avoidance, and appetite loss subscales and explained 44.44% of total variance. The obsession/fear subfactor (eigenvalue = 2.37) consisted of ordering, checking, claustrophobia, and cleaning subscales and explained 13.17% of total variance. Finally, the positive mood subfactor

**Table 4.** Test–retest correlation coefficients for IDAS-II subscales.

| IDAS-II subscales   | Test–retest correlations |
|---------------------|--------------------------|
| General depression  | .40**                    |
| Dysphoria           | .36**                    |
| Lassitude           | .22*                     |
| Insomnia            | .56**                    |
| Suicidality         | .36**                    |
| Appetite loss       | .22*                     |
| Appetite gain       | .20                      |
| Well-being          | .28**                    |
| Ill-temper          | .47**                    |
| Mania               | .34**                    |
| Euphoria            | .26**                    |
| Panic               | .45**                    |
| Social anxiety      | .11                      |
| Claustrophobia      | .40**                    |
| Traumatic intrusion | .50**                    |
| Traumatic avoidance | .38**                    |
| Checking            | .38**                    |
| Ordering            | .56**                    |
| Cleaning            | .41**                    |

Note: *N* = 100. IDAS: Inventory of Depression and Anxiety Symptoms. \**p* < .05; \*\**p* < .01.

(eigenvalue = 1.09) consisted of euphoria, well-being, and appetite gain subscales and explained 6.05% of total variance. In the original study, the appetite gain subscale was in the first factor; however, it was the third factor (with a loading of .48) in our study. Appetite gain also had a significant secondary loading (.43) on the first factor.

In the second step, to assess construct validity, a confirmatory factor analysis (CFA) was carried out using AMOS version 20 for the nonclinical group (*N* = 931). We hypothesized a three-factor model similar to the original study, with the appetite gain subscale on the first (distress) factor. In accordance with the original model, the Turkish version of the IDAS-II revealed acceptable fit indexes (root mean square error of approximation (RMSEA) = .06, comparative fit index (CFI) = .97; goodness of fit index (GFI) = .95; Tucker Lewis index (TLI) = .95; adjusted GFI = .92) and the results indicated good fit  $\chi^2(103, N = 931) = 427.3, p < .001$  in the nonclinical sample. For a consistent model, Hu and Bentler (1999) recommend a cutoff point of .06 for RMSEA and .95 for TLI and CFI. These results showed that the structure of the Turkish IDAS-II was similar to the original IDAS-II and supported the construct validity of the test.

### *Convergent validity*

To test convergent validity, correlations were calculated between scores on the IDAS-II subscales, the BDI, and the BAI for both nonclinical and clinic samples. In line with the original study (Watson et al., 2007, 2012), general depression, dysphoria, lassitude, appetite loss, and well-being revealed higher correlations with the BDI than with the BAI in both samples. Conversely, panic, claustrophobia, checking, ordering, cleaning, Ill-temper, mania, and euphoria revealed higher correlations with the BAI than with the BDI in both samples. Insomnia, suicidality, appetite gain, and social anxiety showed higher correlations with the BAI than did the BDI in both samples. In the nonclinical sample, the correlations between traumatic intrusions and the BDI and traumatic intrusions and the BAI were of equal magnitude, while for the clinical sample, the correlation between traumatic intrusions and the BAI was slightly higher than the correlation between traumatic intrusions and the BDI. Table 5 shows results for all correlations between the IDAS-II subscales and the other test measures.

The convergent validity of the OCD subscales was assessed using the MOCI in both nonclinical and clinical samples. Results for both samples are presented in Table 6. IDAS-II cleaning was significantly associated with the cleaning subscale of the MOCI, whereas checking correlated with the control subscale of the MOCI. The MOCI does not have a counterpart for IDAS-II ordering. In the nonclinical sample, IDAS-II ordering was most highly correlated with the rumination subscale, whereas, for the clinical sample, this subscale was most highly correlated with the control and doubting subscales of the MOCI. In both samples, the MOCI cleaning score was most highly correlated with IDAS-II cleaning score.

The convergent validity of the PTSD subscales was assessed using the PCL-C in both nonclinical and clinical samples. In the nonclinical sample, the correlation coefficients between IDAS-II traumatic intrusions and PCL-C hyperarousal, and traumatic intrusions and PCL-C avoidance were equal, while the correlation with PCL-C re-experience was slightly lower. IDAS-II traumatic avoidance was most highly correlated with PCL-C avoidance. In the clinical sample, IDAS-II traumatic intrusions was most highly correlated with PCL-C re-experience, and IDAS-II traumatic avoidance was most highly correlated with PCL-C avoidance. Correlations between IDAS-II PTSD subscales and PCL-C scales are presented in Table 7.

The convergent validity of IDAS-II panic, claustrophobia, and social anxiety subscales were examined using the BAI and the PAS in both samples. In the nonclinical sample, the IDAS-II panic subscale had its highest correlation with the BAI. IDAS-II panic was also significantly correlated with PAS total score and PAS panic attack subscale. IDAS-II claustrophobia was associated with the panic total score and the agoraphobic avoidance subscale. The IDAS-II

**Table 5.** Correlations between IDAS-II subscales and BDI, BAI, MDQ, MOCI, PAS, and PCL-C total scores in the NC and C samples.

| IDAS-II subscales  | BDI    | BAI    | MDQ   | MOCI   | PAS    | PCL-C  |
|--------------------|--------|--------|-------|--------|--------|--------|
| General depression |        |        |       |        |        |        |
| NC                 | .74**  | .66**  | .42** | .46**  | .37**  | .65**  |
| C                  | .72**  | .54**  | .17*  | .32**  | .35**  | .51**  |
| Dysphoria          |        |        |       |        |        |        |
| NC                 | .73**  | .66**  | .43** | .46**  | .36**  | .65**  |
| C                  | .66**  | .52**  | .20** | .32**  | .34**  | .51**  |
| Lassitude          |        |        |       |        |        |        |
| NC                 | .59**  | .58**  | .41** | .44**  | .26**  | .54**  |
| C                  | .52**  | .48**  | .15*  | .35**  | .20**  | .36**  |
| Insomnia           |        |        |       |        |        |        |
| NC                 | .52**  | .55**  | .36** | .34**  | .28**  | .52**  |
| C                  | .44**  | .41**  | .15*  | .21**  | .26**  | .39**  |
| Suicidality        |        |        |       |        |        |        |
| NC                 | .49**  | .56**  | .30** | .37**  | .40**  | .50**  |
| C                  | .61**  | .45**  | .32** | .28**  | .37**  | .42**  |
| Appetite loss      |        |        |       |        |        |        |
| NC                 | .40**  | .39**  | .26** | .31**  | .28**  | .37**  |
| C                  | .23**  | .22**  | .00   | .17*   | .17*   | .14*   |
| Appetite gain      |        |        |       |        |        |        |
| NC                 | .17**  | .23**  | .21** | .18**  | .07    | .27**  |
| C                  | .16*   | .02    | .08   | .09    | -.10   | .06    |
| Well-being         |        |        |       |        |        |        |
| NC                 | -.41** | -.17** | .02   | -.12** | -.11** | -.27** |
| C                  | .49**  | -.17   | .07   | -.11   | -.14   | -.18** |
| Ill-temper         |        |        |       |        |        |        |
| NC                 | .64**  | .66**  | .43** | .43**  | .33**  | .60**  |
| C                  | .51**  | .54**  | .29** | .32**  | .32**  | .48**  |
| Mania              |        |        |       |        |        |        |
| NC                 | .28**  | .41**  | .45** | .39**  | .21**  | .39**  |
| C                  | .19**  | .34**  | .48** | .33**  | .17*   | .32**  |
| Euphoria           |        |        |       |        |        |        |
| NC                 | -.03   | .17**  | .39** | .23**  | .13**  | .13**  |
| C                  | -.05   | .18*   | .41** | .20**  | .05    | .06    |
| Panic              |        |        |       |        |        |        |
| NC                 | .56**  | .76**  | .41** | .40**  | .46**  | .56**  |
| C                  | .56**  | .74**  | .18** | .33**  | .51**  | .45**  |
| Claustrophobia     |        |        |       |        |        |        |
| NC                 | .48**  | .56**  | .32** | .49**  | .42**  | .54**  |
| C                  | .41**  | .47**  | .10   | .42**  | .37**  | .30**  |
| Social anxiety     |        |        |       |        |        |        |
| NC                 | .54**  | .59**  | .35** | .47**  | .42**  | .61**  |
| C                  | .43**  | .46**  | .25** | .45**  | .34**  | .39**  |

(continued)

**Table 5.** Continued

| IDAS-II subscales    | BDI   | BAI   | MDQ   | MOCI  | PAS   | PCL-C |
|----------------------|-------|-------|-------|-------|-------|-------|
| Traumatic intrusions |       |       |       |       |       |       |
| NC                   | .61** | .61** | .43** | .41** | .37** | .59** |
| C                    | .41** | .37** | .26** | .21** | .34** | .60** |
| Traumatic avoidance  |       |       |       |       |       |       |
| NC                   | .37** | .42** | .38** | .37** | .22** | .45** |
| C                    | .16*  | .24** | -.03  | .19** | .08   | .28** |
| Checking             |       |       |       |       |       |       |
| NC                   | .37** | .49** | .38** | .55** | .31** | .38** |
| C                    | .15*  | .37** | .21** | .60** | .24** | .18** |
| Ordering             |       |       |       |       |       |       |
| NC                   | .33** | .45** | .37** | .51** | .24** | .37** |
| C                    | .23** | .37** | .20** | .52** | .27** | .27** |
| Cleaning             |       |       |       |       |       |       |
| NC                   | .30** | .41** | .29** | .60** | .27** | .35** |
| C                    | .22** | .26** | .08   | .66** | .10   | .10   |

Note: IDAS: Inventory of Depression and Anxiety Symptoms. NC: nonclinical sample ( $N = 713$ ); C: clinical sample ( $N = 208$ ); BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory; MDQ: Mood Disorder Questionnaire; MOCI: Maudsley Obsessive Compulsive Inventory; PAS: Panic and Agoraphobia Scale; PCL-C: Post-traumatic Stress Disorder Checklist-Civilian Version. \* $p < .05$ ; \*\* $p < .001$ .

**Table 6.** Correlations between IDAS-II OCD subscales and the Maudsley Obsessive Compulsive Inventory (MOCI) in the NC and C samples.

| IDAS-II subscales | MOCI total |       | MOCI control |       | MOCI cleaning |       | MOCI slowness |       | MOCI doubting |       | MOCI rumination |       |
|-------------------|------------|-------|--------------|-------|---------------|-------|---------------|-------|---------------|-------|-----------------|-------|
|                   | NC         | C     | NC           | C     | NC            | C     | NC            | C     | NC            | C     | NC              | C     |
| Cleaning          | .60**      | .66** | .40**        | .54** | .62**         | .73** | .41**         | .36** | .41**         | .49** | .42**           | .41** |
| Checking          | .55**      | .60** | .50**        | .59** | .36**         | .47** | .40**         | .48** | .44**         | .49** | .44**           | .35** |
| Ordering          | .51**      | .52** | .38**        | .45** | .39**         | .40** | .39**         | .42** | .39**         | .45** | .43**           | .34** |

Note: IDAS: Inventory of Depression and Anxiety Symptoms; NC: nonclinical sample ( $N = 713$ ); C: clinical sample ( $N = 218$ ); MOCI: Maudsley Obsessive Compulsive Inventory. \*\* $p < .001$ .

claustrophobia subscale was also significantly correlated with BAI, and IDAS-II social anxiety was significantly correlated with BAI and PAS total scores. Correlation coefficients between social anxiety and subscales of PAS were similar.

In the clinical sample, IDAS-II panic and claustrophobia subscales revealed the highest correlation with BAI. IDAS-II social anxiety revealed the highest correlations with the BAI, the BDI, and the PCL-C total score. Correlations among IDAS-II panic, claustrophobia and social anxiety subscales and BAI,

**Table 7.** Correlations between IDAS-II PTSD subscales and PCL-C subscales.

| IDAS-II subscales   | PCL-C total          |       | PCL-C re-experience |       | PCL-C avoidance |       | PCL-C hyperarousal |       |
|---------------------|----------------------|-------|---------------------|-------|-----------------|-------|--------------------|-------|
|                     | NC                   | C     | NC                  | C     | NC              | C     | NC                 | C     |
|                     | Traumatic intrusions | .59** | .60**               | .52** | .62**           | .53** | .49**              | .53** |
| Traumatic avoidance | .45**                | .28** | .39**               | .22** | .44**           | .26** | .35**              | .25** |

Note: IDAS: Inventory of Depression and Anxiety Symptoms; PCL-C: Post-traumatic Stress Disorder Checklist-Civilian Version. NC: non-clinical sample (N = 713); C= clinical sample (N = 218). \*\*p < .001.

**Table 8.** Correlations between IDAS-II panic, claustrophobia, and social anxiety subscales and BDI, BAI, PAS panic attacks, PAS agoraphobic avoidance, PAS and PCL-C total scores in the NC and C samples.

| IDAS subscales | BDI   |       | BAI   |       | PAS               |       |                       |       | PCL-C total |       |             |       |
|----------------|-------|-------|-------|-------|-------------------|-------|-----------------------|-------|-------------|-------|-------------|-------|
|                |       |       |       |       | PAS panic attacks |       | agoraphobic avoidance |       | PAS total   |       | PCL-C total |       |
|                | NC    | C     | NC    | C     | NC                | C     | NC                    | C     | NC          | C     | NC          | C     |
| Panic          | .56** | .56** | .76** | .74** | .45**             | .45** | .35**                 | .43** | .46**       | .51** | .56**       | .45** |
| Claustrophobia | .48** | .41** | .56** | .47** | .32**             | .25** | .40**                 | .35** | .42**       | .37** | .54**       | .30** |
| Social anxiety | .54** | .46** | .59** | .43** | .34**             | .24** | .37**                 | .31** | .42**       | .34** | .61**       | .39** |

Note: IDAS: Inventory of Depression and Anxiety Symptoms. NC: non-clinical sample (N = 713); C: clinical sample (N = 218); BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory; PAS: Panic and Agoraphobia Scale; PCL-C: Post-traumatic Stress Disorder Checklist-Civilian Version. \*\*p < .01.

BDI, PAS panic attacks, and PAS agoraphobic avoidance and PCL-C total scores for both samples are presented in Table 8.

The convergent validity of IDAS-II mania subscales was assessed using the MDQ in both samples. IDAS-II mania revealed significant correlation with MDQ with *r* values of .48 and .45 for the clinical and nonclinical samples, respectively. Euphoria revealed slightly lower correlations with MDQ with *r* values of .41 and .39 for the clinical and nonclinical samples, respectively.

**Discriminant validity**

Depression and anxiety symptoms are not independent but are interrelated. We examined the degree to which IDAS-II subscales diverge from other concepts which they should not be similar to. Results of correlations conducted to investigate the discriminant validity of the IDAS-II are presented in Table 5.

IDAS-II general depression, dysphoria, lassitude, appetite loss, and well-being revealed higher correlations with the BDI than with the BAI in both samples. This result indicated that these items tap symptoms of depression rather than anxiety. Conversely, panic, claustrophobia, social anxiety, checking, ordering, and cleaning revealed stronger correlations with the BAI than with the BDI in both samples. This differential pattern indicates that the latter scales tap components of anxiety rather than depression. However, IDAS-II appetite gain revealed weak correlations with all other inventories. Appetite gain revealed its highest correlation with PCL-C (.27) in the nonclinical sample and with the BDI (.16) in the clinical sample. In addition, insomnia yielded its highest correlation with the BDI (.44) in the clinical sample, whereas its highest correlation in the nonclinical sample was with the BAI (.55), the BDI (.52), and the PCL-C (.52). The IDAS cleaning, ordering, and checking subscales revealed stronger correlations with the MOCI total score than total scores of the BDI, BAI, MDQ, PAS, or PCL-C.

The correlation between IDAS-II traumatic avoidance and PCL-C was higher than any correlations between IDAS-II traumatic avoidance and the BDI, MDQ, MOCI, or PAS. This result supports the discriminant validity of the traumatic avoidance subscale. In the clinical sample, IDAS-II traumatic intrusions were most highly correlated with PCL-C total score. However, in the nonclinical sample, traumatic intrusions had slightly higher correlations with the BDI and the BAI than with the PCL-C total score. In both samples, IDAS-II mania and euphoria subscales showed stronger correlations with MDQ total score than with BDI, BAI, MOCI, PAS, or PCL-C, indicating discriminant validity of the mania and euphoria subscales.

The discriminant validity of IDAS-II panic, claustrophobia, and social anxiety subscales were examined with the BAI and PAS in both samples. In both samples, panic and claustrophobia subscales revealed higher correlations with the BAI. However, IDAS-II social anxiety yielded slightly higher correlation with PTSD total score (.60) than with the BAI (.59) in the nonclinical sample. On the other hand, social anxiety revealed higher correlations with the BDI (.46) and the MOCI (.45) than with the BAI (.43).

### *Concurrent validity*

All IDAS-II subscales were able to differentiate between the nonclinical and clinical samples. Independent samples *t* tests revealed that patients had significantly higher scores on dysphoria, lassitude, suicidality, insomnia, appetite loss, appetite gain, Ill-temper, mania, panic, social anxiety, claustrophobia, traumatic intrusions, traumatic avoidance, checking, ordering, and cleaning. Conversely, the nonclinical sample had significantly higher scores on well-being and euphoria. In order to quantify these group differences, effect sizes were computed using Cohen's *d*. Results showed that 13 of the 19 comparisons (general depression, dysphoria, lassitude, suicidality, insomnia, well-being, Ill-temper, panic,

**Table 9.** Mean scores of both groups for the Turkish IDAS-II subscales with effect sizes.

| IDAS-II subscales  | Clinical (N = 218) |       | Nonclinical (N = 713) |       | t         | Cohen's d |
|--------------------|--------------------|-------|-----------------------|-------|-----------|-----------|
|                    | M                  | SD    | M                     | SD    |           |           |
| General depression | 60.66              | 14.51 | 41.68                 | 13.44 | -17.59*** | -1.35     |
| Dysphoria          | 31.54              | 8.84  | 19.93                 | 8.02  | -17.94*** | -1.37     |
| Lassitude          | 19.00              | 5.26  | 13.38                 | 5.12  | -13.85*** | -1.08     |
| Insomnia           | 16.53              | 5.79  | 11.84                 | 4.78  | -11.84*** | -0.88     |
| Suicidality        | 11.08              | 5.12  | 7.49                  | 2.85  | -13.04*** | -0.86     |
| Appetite loss      | 7.42               | 3.11  | 5.90                  | 2.61  | -7.09***  | -0.53     |
| Appetite gain      | 6.76               | 3.36  | 5.92                  | 2.74  | -3.68**   | -0.27     |
| Well-being         | 18.01              | 6.59  | 23.02                 | 6.58  | 9.65***   | 0.76      |
| Ill-temper         | 13.83              | 5.67  | 9.34                  | 4.63  | -11.64*** | -0.86     |
| Mania              | 10.85              | 4.43  | 9.78                  | 3.71  | -3.48**   | -0.25     |
| Euphoria           | 8.84               | 3.98  | 9.91                  | 4.19  | 3.30**    | 0.26      |
| Panic              | 20.84              | 7.94  | 12.19                 | 5.27  | -18.37*** | -1.28     |
| Social anxiety     | 15.28              | 6.72  | 9.83                  | 4.60  | -13.42*** | -0.94     |
| Claustrophobia     | 12.90              | 5.89  | 7.94                  | 4.20  | -13.60*** | -0.97     |
| Trauma intrusions  | 11.39              | 4.99  | 7.65                  | 3.84  | -11.52*** | -0.84     |
| Trauma avoidance   | 11.09              | 3.91  | 8.59                  | 3.97  | -8.00***  | -0.63     |
| Checking           | 8.20               | 3.41  | 6.17                  | 2.87  | -8.58***  | -0.64     |
| Ordering           | 12.70              | 4.74  | 10.56                 | 4.05  | -6.43***  | -0.48     |
| Cleaning           | 17.07              | 8.24  | 13.17                 | 6.06  | -7.49***  | -0.54     |

Note: df = 919. IDAS: Inventory of Depression and Anxiety Symptoms. \*\*p < .01; \*\*\*p < .001.

social anxiety, claustrophobia, traumatic intrusions, traumatic avoidance, and checking) revealed large effect sizes. Two of the 19 comparisons (appetite loss and cleaning) revealed moderate effect sizes, whereas the remaining four comparisons (appetite gain, mania, euphoria, and ordering) revealed small effect sizes. Mean scores and effect sizes are presented in Table 9.

### Age effect

As reported earlier, the age distribution between males and females was significantly different in nonclinical sample. Pearson correlations were calculated between age and IDAS-II subscales in nonclinical sample. Results showed that correlation between age and suicidality subscale ( $r = -.086, p < .05$ ) and age and ordering subscale ( $r = -.068, p < .05$ ) was significant.

### Discussion

The IDAS-II was developed to assess specific symptoms of major depression, anxiety disorders, and bipolar disorder (Watson et al., 2012). Watson et al.

established that the expanded version of the IDAS-II is a reliable and valid tool to assess depression and anxiety as well as bipolar symptoms and to assess severity of symptoms in both clinical and nonclinical samples. The present study was motivated by the need to examine the utility of the IDAS-II for Turkish-speaking samples. We developed a Turkish version of the IDAS-II and examined its factor structure, reliability, and validity in Turkish-speaking participants.

In terms of reliability, Cronbach's alpha values of 99 items were very high for the nonclinical and clinical samples. In addition, most of the Turkish IDAS-II subscales revealed Cronbach's alpha values above .80. In addition, most of the AICs were in the moderate range, as expected. In contrast to the original study (Watson et al., 2007), only the suicidality subscale yielded relatively low Cronbach's alpha values. A possible explanation for this result could be that the suicidality subscale is more likely to be affected by age, cultural, and contextual effects. On the other hand, all other analyses supported the reliability and validity of the suicidality subscale. Overall, these results demonstrated that the Turkish IDAS-II items and subscales have high internal consistencies, but the suicidality subscale should be considered cautiously.

Test-retest reliability results showed that the majority of the retest correlations of the 99 items were found to be significant, and correlations for 16 of the 18 subscales were significant. Watson and O'Hara (2017) reported retest correlations of the IDAS-II after a two-week interval in college students, and the correlation coefficients were lower than those in a patient sample. The original IDAS-II revealed a mean correlation of .67 after two weeks and a mean correlation of .66 after an interval of 9.5 months. Dysphoria showed the strongest correlation among other subscales ranging from one week to four years with  $r$  values of .83 to .64, respectively. This raised the question of whether some subscales within the IDAS-II are more trait specific (Watson & O'Hara, 2017). The IDAS-II assesses symptoms within the "last two weeks including today." Therefore, the IDAS-II can be considered a measure of *state* rather than *trait* depression. In *state* measures of depression, test-retest correlations of depressive symptoms decrease as the retest interval increases, because there is no enduring vulnerability for depressive symptoms which contributes to stability over time (Abela & Hankin, 2008). By its nature, retest correlations are expected to be lower in *state* measures compared to *trait* counterparts and to be lower than in patient populations (Nezu, Ronan, Meadows, & McClure, 2000). Therefore, the Turkish IDAS-II appears to be sensitive to changes in depression and anxiety symptoms over time, with good consistency.

CFA was carried out to reveal the factor structure of the Turkish IDAS-II. The issue of a minimum ratio between the number of participants and the number of items in a factor analysis is complicated. Gorsuch (1983) and Hatcher (1994) recommended a ratio of 5:1 but suggested that higher ratios reveal better results. However, Nunnally (1978) recommended a ratio of at

least 10:1. There remains no consensus on the ideal ratio since the number of items per factor and the magnitudes of item loading differ and may work differently in every scale (MacCallum, Widaman, Preacher, & Hong, 2001). Our CFA results revealed acceptable fit indexes with good fit values and thus supported the construct validity of the Turkish IDAS-II. Therefore, the Turkish IDAS-II is composed of 99 items, 3 factors, and 18 subscales, consistent with the original form.

The IDAS-II dysphoria subscale contains 10 items which capture symptoms of depression. However, Watson et al. (2007) developed a 20-item General Depression Scale that is similar to other measures of depression such as the BDI. These two broad subscales revealed the strongest associations with indicators of psychopathology. As expected, these two subscales revealed the highest correlations with the BDI in both samples. General Depression and Dysphoria also revealed the highest internal consistencies in both clinical and nonclinical samples. These two subscales also best differentiated patients and healthy controls. Since these subscales were most strongly correlated with traditional measures of depression, they appear to be reliable and valid.

The appetite gain subscale was able to differentiate clinical and nonclinical samples, but the effect size of the difference was relatively low. Similarly, in the original study, appetite gain was weakly correlated with the BDI and the BAI and failed to differentiate between nonclinical and clinical samples (Watson et al., 2007). Earlier research using the BDI indicated that appetite/weight gain symptoms are not specific to depression and are pervasive in the general population. Therefore, items relating to increased appetite were excluded from the original BDI in order to avoid "false positives" (Beck & Steer, 1993). However, Watson et al. (2012) proposed that appetite gain may be useful for assessing atypical forms of depression (Joiner et al., 2005) which are characterized by appetite/weight gain (American Psychiatric Association, 1994).

In the original study (Watson et al., 2012), for OCD subscales, the highest correlations were between checking and ordering in both samples. The OCD subscales revealed high internal consistencies and good convergent validity with the MOCI. However, the MOCI differs from the IDAS-II in two ways: the MOCI does not have a subscale for ordering and the Turkish MOCI features a seven-item rumination format (Erol & Savaşır, 1988). Overall, all correlations between MOCI and IDAS-II OCD subscales were in the expected range and in line with results from the original study by Watson et al. (2012). The IDAS-II OCD subscales revealed significant convergent and discriminant validity both in relation to the MOCI and to other measures used in the present study.

The traumatic intrusions subscale showed high internal consistency in both samples. It was most highly correlated with the PCL-C re-experience subscale than with other PCL-C subscales in the clinical sample. In the nonclinical sample, correlations between traumatic intrusions and subscales of PCL-C were equal. The correlation coefficients between traumatic intrusions with the

BDI and the BAI in the nonclinical sample were equal. One possible explanation for this result could be the high comorbidity rate between PTSD depression and anxiety disorders (Campbell et al., 2007; Sadock & Sadock, 2007). In addition, both traumatic intrusions and avoidance were able to differentiate between the clinical and nonclinical samples, as expected.

The IDAS-II social anxiety, panic, and claustrophobia subscales revealed high internal consistencies. However, it is notable that these subscales were also significantly correlated with PCL-C total score and BDI. This could be explained by the high comorbidity rates found between mood and anxiety disorders with PTSD (Brady & Clary, 2003; Brown et al., 2001; Westermeyer & Canive, 2013). However, this relationship is weaker in the clinical sample than in the nonclinical sample.

The IDAS-II euphoria subscale revealed high internal consistency for both samples. The euphoria subscale was positively correlated with IDAS-II mania and well-being in both samples. While this pattern was also observed in the original study (Watson et al., 2012), the direction for the correlation with mania is unexpected in our study. Watson et al. (2012) proposed that euphoria may be assessing heightened mood which is the characteristic of manic episodes (American Psychiatric Association, 2000; Gruber, Mauss, & Tamir, 2011) and, therefore, reflects pathologic positive affect. Our results seem to support this relationship. The correlation between mania and MDQ was slightly stronger than the correlation between mania and euphoria.

Appetite gain subscale was relatively weakly correlated with the BDI and the BAI. For this reason, it was judged to be less sensitive to psychopathology; therefore, it is not surprising that it revealed small effect sizes in patient and healthy control groups' comparisons. In addition, as indicated before, euphoria was found to be related to the well-being subscale which is expected to yield higher scores in a nonclinical sample. This may explain why euphoria revealed a small effect size in this comparison. Overall, our results are consistent with those reported by Watson et al. (2007) and our results feature larger effect sizes both in the number and magnitude compared to those reported in the original study (Watson et al., 2012). Although the mania subscale revealed good convergent and discriminant validity, the alpha value for this subscale was lower compared to other subscales, and its items loaded onto more than one factor. Therefore, the mania subscale must be interpreted cautiously in future studies.

## **Limitations and future directions**

Our sample size meets the recommended participant-to-item ratio (for CFA; Hu & Bentler, 1999) with close to 10 participants per item. Although we assessed a total number of 931 nonclinical participants, a larger clinical sample size than that included in the present study may be required. Second, although our non-clinical sample predominantly consisted of young and middle-aged individuals,

there was a significant difference in the age distribution between males and females. It will be important to replicate these results with other populations such as older adults, and more balanced sampling in terms of gender and age distribution. Third, the majority of the IDAS-II subscales revealed significant retest correlations over the four-week interval. However, the correlation coefficients were relatively weak. As previously mentioned, since the IDAS-II assesses symptoms over the past two weeks, our four-week interval may have led to the weaker correlation coefficients. In our study, we examined retest correlation after only one month and our data are limited to 100 participants. Using different retest intervals can help us to examine how the Turkish version of the IDAS-II responds to change as a function of time and treatment. Fourth, no positive measure of emotional well-being was used in this study. In future studies, at least one emotional well-being measure (e.g., WHO-Five, The Profile of Mood States) can be used to assess divergent validity of the IDAS-II. Finally, some of the correlations between subscales and Cronbach alpha values are rather low, although these were significant. Further longitudinal studies may provide information about the effect of clinical treatment on Turkish IDAS-II scores in a clinical sample.

**Authors' note**

This study was carried out as a partial fulfillment of master degree of the second author.

**Compliance with ethical standards**

The authors confirmed that their manuscript met the guidelines for ethical conduct and report of research.

**Informed consent**

Informed consent was obtained from all individual participants included in the study.

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