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The Turkish Version of the Cognitive and Affective Mindfulness Scale-Revised

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Abstract

The mindfulness approach to psychotherapy has become a topic of continuously growing scientific interest. In accordance with such interest, various self-report assessment tools have been developed to measure the mindfulness construct. The majority of the studies conducted to investigate the properties of these assessment instruments included Western populations. Thus, the measurement of mindfulness in non-Western cultures still requires further research. Based on this premise, the psychometric properties of the 10 item Cognitive and Affective Mindfulness Scale-Revised (CAMS-R) were investigated in two different studies using two non-clinical Turkish samples. In Study 1, the psychometric properties of the 10 item CAMS-R were examined in an undergraduate student sample (N = 265). Study 2 extended the examination of the psychometric properties of the CAMS-R to an adult community sample consisting of white-collar public employees (N = 88). The results of both studies showed that the Turkish CAMS-R possessed acceptable levels of internal consistency and the scale displayed convergent as well as concurrent validity. Statistically meaningful relationships were found between mindfulness as measures by Turkish CAMS-R and depression, anxiety, well-being as well as perceived stress. The findings from both studies suggest CAMS-R retains its psychometric properties when utilized in a non-Western culture and the Turkish version of CAMS-R is a valid instrument which can be used to measure mindfulness in the Turkish population.

Keywords: mindfulness, assessment, CAMS-R, perceived stress, well-being, depression, anxiety

Introduction

Mindfulness and acceptance based approaches to psychotherapy are the focus of regularly increasing scientific interest. The results of many review studies indicate that mindfulness-based approaches in the treatment of psychological dysfunction have promising implications (Praissman, 2008; Keng, Smoski, & Robins, 2011). However, said improvements in third-wave therapies do not come without cautions to be taken into consideration as put forward by Cullen (2011):

> This emergent phenomenon is both promising and perilous as it is increasingly difficult to gauge, not only the quality and integrity of the program, but whether or not the content has anything to do with mindfulness, let alone which definition of mindfulness is operationally applied in and philosophically guiding the curriculum (p. 186).

One way of overcoming this obstacle is to create psychometrically sound and conceptually accurate assessment instruments for mindfulness construct. This is a notion which emerged as a mainstream in the research related

mindfulness and acceptance-based approaches. As a result, numerous assessment instruments were developed. Each of the current mindfulness scales emphasizes different facets of mindfulness within their own theoretical framework. The reflection of these facets, also referred to as mindfulness skills, corresponds to substantially diverse structures found in mindfulness questionnaires. For example, Mindful Attention Awareness Scale (MAAS) developed by Brown and Ryan (2003) places a special emphasis on open and receptive awareness and attention to present moment experiences. The developers of the MAAS suggest that only present focused attention and awareness are fundamental to mindfulness. Therefore, attitudinal aspects such as acceptance remain peripheral to the measurement of mindfulness. Accordingly, the scale measures mindfulness as a single-dimensional construct. The multi-dimensional mindfulness scales are at the opposite side of this continuum (Baer, Smith, Hopkins, Krietemeyer, & Toney 2006; Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008). Multi-factor mindfulness scales include items specifically developed to measure attitudinal components of mindfulness such as non-judgment and acceptance. These multi-dimensional instruments offer means of comprehensive assessment. On the other hand, a trade-off between brevity and detailed measurement occurs as a natural consequence of the inclusion of multiple factors.

Cognitive and Affective Mindfulness Scale-Revised (CAMS-R) is a 12 item self-report questionnaire developed by Feldman, Hayes, Kumar, Greeson, and Laurenceau (2007). CAMS-R is a refined version of an earlier scale which had consisted of 18 items (Kumar, 2005; Kumar, Feldman, & Hayes, 2008). Following this initial measure the developers of CAMS-R revised the previous instrument in an attempt to establish a brief self-report measure written in everyday language which can nevertheless capture the multi-faceted conceptualization of mindfulness. One of the purposes sought in the revised version of the scale was to create an assessment tool which could be comprehended by individuals without prior experience in mindfulness practice. After such revision, the final version of the CAMS-R which consisted of 12 items was formed.

Prior to the initiation of the present studies, the Mindful Attention and Awareness Scale (Brown and Ryan, 2003) was the sole mindfulness measure which had been adapted to Turkish language (Catak, 2012). It can be stated that mindfulness-based approaches are relatively novel for the Turkish psychotherapy field. Therefore, the adaptation of mindfulness measures to Turkish requires further commitment. In order to introduce Turkish clinicians with a practical and at the same time comprehensive mindfulness measure we opted to adapt CAMS-R to Turkish. CAMS-R possesses several distinctive features which led us to its selection for adaptation. Firstly, CAMS-R assesses mindfulness in a detailed fashion since the scale conceptualizes mindfulness as a multi-faceted construct. The items of the scale are designed to tap different facets of mindfulness including attention, present-focus, awareness, and acceptance. Secondly, CAMS-R allows comprehensive assessment within a relatively brief structure which facilitates the questionnaire administration as well as the data collection. Other multi-dimensional measures of mindfulness such as Five Facets Mindfulness Questionnaire (FFMQ, Baer et al., 2006) are relatively longer and less advantageous in terms of practicality. Furthermore, CAMS-R items place a unique emphasis on mindful relating to thoughts and emotions. Given the trans-diagnostic implications of thoughts and emotions, CAMS-R can be used to assess mindfulness in various diagnostic groups. Finally, certain mindfulness questionnaires in the literature such as Freiburg Mindfulness Inventory (Walach, Buchheld, Buttenmüller, Kleinknecht, & Schmidt, 2006) and Toronto Mindfulness Scale (Lau et al., 2006) are intended for individuals who have experience in mindfulness meditation. On the contrary, the CAMS-R is designed for individuals with no prior experience of mindfulness practice allowing a wider range of application. Based on these considerations we have decided to investigate the psychometric properties of CAMS-R in the Turkish population.

The internal structure of CAMS-R consists of a second-order latent mindfulness factor that is inferred from four first-order latent factors. These first-order factors include attention, present-focus, awareness, and acceptance dimensions. Each factor is represented by three items in the scale. The items under the factors are designed to convey mindful attitudes towards internal experiences with special relevance to thoughts and feelings. The authors of CAMS-R suggest computing a single total mindfulness score instead of four sub-scale scores since the internal consistency of the total scale is higher than the internal consistency of individual sub-scales.

The developers of CAMS-R also suggest the utilization of the 10 item version of CAMS-R with the omission of 2nd and 7th items since these items may be potentially confounded with worry and rumination respectively. At the face validity level the contents of items 2 and 7 present significant overlap with worry and anxiety (i.e. "I am preoccupied by the future", "I am preoccupied by the past"). In a recent discussion, the current state of mindfulness measures has been criticized for putting less than adequate emphasis on content validity (Grossman, 2011). According to this perspective, the item contents that represent mindfulness by its relative absence or the presence of seemingly opponent constructs such as worry may fail to measure mindfulness. Furthermore, such item contents may present a deviation from the origins of mindfulness construct. It should also be noted that the authors of CAMS-R conducted a series of multiple regression analyses in order to identify whether item 2 and 7 could be independently explained by the construct of mindfulness above and beyond worry or rumination. The results of the analysis showed that the variance in item 2 was uniquely explained by worry ($B = .025$, $SE = .004$, $p < .001$) but not mindfulness ($B = .010$, $SE = .006$, $p = .13$) while item 7 was uniquely predicted by rumination ($B = .021$, $SE = .004$, $p < .001$) but not mindfulness ($B = -.005$, $SE = .006$, $p = .40$). Based on the considerations above and the results obtained by Feldman et al. (2007), our concern was that the inclusion of item 2 and item 7 could weaken the content validity of the whole scale. It should also be noted that the magnitudes of the differences in the relationships between criterion variables (e.g. anxiety, depression, well-being, experiential avoidance and emotion regulation) and two versions of the scale were not statistically significant (Feldman et al., 2007). Therefore, in the present studies we have chosen to exclude these items from the adaptation procedure.

The correlation between the 10 time version and 12 item version of the CAMS-R is highly significant ($r = .97$). Both 12 item and 10 item versions of CAMS-R demonstrated acceptable levels of internal consistency ($\alpha = .77$, $\alpha = .78$, respectively, Feldman et al., 2007). The scale also presented significant relationships with discriminative and convergent variables like depression, anxiety, well-being and emotion-regulation (Feldman et al., 2007). Schmertz, Anderson, and Robins (2009) have found that individuals scoring higher on CAMS-R had fewer scores of target omissions in a sustained attention task which assesses the participants' subjective experience of being unaware of present experience. In a study by Thompson and Waltz (2007), significant relationships were found between CAMS-R and several personality dimensions. In this study it was seen that higher scores on CAMS-R were associated with lower levels of Neuroticism ($r = -.58$, $p < .01$), higher levels of Agreeableness ($r = -.43$, $p < .01$), and higher levels of Conscientiousness ($r = -.27$, $p < .01$). The results of another study (Thompson & Waltz, 2008) demonstrated that higher scores on CAMS-R were significantly positively correlated with self-esteem ($r = .50$, $p < .001$) and unconditional self-acceptance ($r = .45$, $p < .001$). CAMS-R measured mindfulness demonstrated significant positive associations with positive and accepting attitudes towards self ($r = .39$, $p < .001$) and others ($r = .24$, $p < .001$) (Kraus & Sears, 2009). Furthermore, CAMS-R displayed significant correlations with other self-report measures of mindfulness. Initial findings of Feldman et al. (2007) showed that both 12 item and 10 item versions of the scale are significantly correlated with the Mindful Attention Awareness Scale (Brown & Ryan, 2003, $r = .51$, $p < .001$ for CAMS-R 12, $r = .46$, $p < .001$ for CAMS-R 10) and Freiburg Mindfulness Inventory (Walach et al., 2006, $r = .66$, $p < .001$ for CAMS-R 12, $r = .69$, $p < .001$ for CAMS-R 10). These results demonstrate

the suitability of using CAMS-R for the assessment of mindfulness in its own account in addition to utilization of the scale for examining the relationships between mindfulness and other constructs pertaining to personality, well-being and psychopathology.

The majority of the previous studies investigating the assessment of mindfulness involved American or European populations. At the same time, a recent trend for investigating the assessment of mindfulness in non-Western cultures is observable. In two recent studies, the psychometric properties of the Five Facets Mindfulness Questionnaire (FFMQ, Baer et al., 2006) were examined in Chinese and Japanese samples (Deng, Liu, Rodrigues, & Xia, 2011; Sugiura, Sato, Ito, & Murakami, 2012). In both studies the psychometric properties of FFMQ were comparable to those of the original version. Moreover, mindfulness as measured by FFMQ displayed similar relationships with related measures of well-being which was comparable to studies conducted with Western samples.

Christopher, Charoensuk, Gilbert, Neary, and Pearce (2009) compared the psychometric properties of the Kentucky Inventory of Mindfulness Skills (KIMS, Baer, Smith, & Allen, 2004) and MAAS (Brown & Ryan, 2003) across American and Thai samples. Interestingly, KIMS could not be revalidated in either American or Thai samples in this study. However, MAAS displayed measurement invariance across samples. In another study Christopher, Christopher, and Charoensuk (2009) compared the psychometric properties of KIMS and MAAS using three different samples consisting of Theravada Buddhist Monks, Thai college students and American college students. It was seen that American students had higher mean scores on KIMS Observing and KIMS Accepting without Judgment sub-scales compared to Thai students. No other differences in means scores of American students and Thai students were reported. An important finding in this study was that the Buddhist monks evinced similar associations between mindfulness and related variables and results were comparable to American validation study samples. Two other studies conducted with Turkish and Iranian samples (Catak, 2012; Ghorbani, Watson, & Weathington, 2009) examined the psychometric properties MAAS in these cultures. The findings of these studies showed that MAAS presented similar psychometric properties comparable to its original version. Furthermore, the associations between mindfulness as measured by MAAS and related constructs were comparable to those obtained in Western cultures.

As seen, the results of studies conducted with non-Western samples generally suggest that the mindfulness construct displays a similar assessment pattern in these cultures. A difference in mean sub-scale scores seems to emerge when mindfulness is assessed in a multi-dimensional fashion. Independent of the mindfulness measure employed the relationships between mindfulness and related variables are comparable to the findings of the studies conducted with Western samples.

An important dimension delineating between Eastern and Western societies is their differential emphasis on collectivism and individualism respectively (Triandis, 1993). According to Hui and Triandis (1986), collectivism is defined as "subordination of individual goals to the goals of a collective, a sense of harmony, interdependence and concern for others". When there is a discrepancy between the goals of the individual and the society in a collectivist culture, group goals are considered to have priority over personal goals (Schwartz, 1990). Other types of meditational practices like Loving Kindness Meditation or Compassion Meditation are more relational in nature since they aim to extend compassionate attitudes to one's immediate and general circle of people. Mindfulness meditation is more individualistic in the sense that the aspects and experiences of the self are approached as main practice targets. Mindfulness practice involves focusing on the self with an accepting and non-judgmental

attitude. The members of a society which places priority on the goals of the community over individual goals and values may be inclined to be less accepting and/or more judgmental of themselves. Therefore, it may be possible to observe differences in certain facets of mindfulness such as acceptance or non-judgment when mindfulness is assessed in a collectivist culture. Cross-cultural comparison studies are needed to provide more information about possible differences in mindfulness dimensions as a function of individualistic or collectivist cultures.

In an attempt to extend the cross-cultural investigation of mindfulness we aimed to provide further data for the measurement of mindfulness by examining the psychometric properties of CAMS-R in Turkish student and community samples. The second aim of the study was to investigate the relationships between mindfulness and related measures of psychopathology and well-being.

Study 1

Methods

Participants — Undergraduate students enrolled in four public universities and three private universities in Turkey were the participants of this study. The participants consisted of Caucasian individuals aged between 18 and 32. The mean age of the participants was 21.62 (SD = 2.06). Ninety five participants were male which constituted 35.8% of the sample and one hundred and seventy participants were female which constituted 64.2% of the sample. Fifty four students were at their first study year, which constituted 20.4% of the sample, forty eight students were at their second study year, which constituted 18.1% of the sample, seventy five students were at their third study year, which constituted 28.3% of the sample, and eighty eight students were at their fourth study year, which constituted 33.2% of the sample. The academic fields of the participants included engineering, architecture, urban planning, medicine, dentistry, biology, sociology and philology.

Measures and Variables — Cognitive and Affective Mindfulness Scale Revised (CAMS-R; Feldman et al., 2007): In the present study the 10 item version of the original Cognitive and Affective Mindfulness Scale-Revised was used. CAMS-R includes items like "I can usually describe how I feel at the moment in considerable detail" or "I try to notice my thoughts without judging them" which assess mindful attitudes towards internal experiences. The items of CAMS-R are rated on a 4 point Likert scale from 1 (Rarely/Not at all) to 4 (Almost always). Item 5 is reversely scored. The total score of the CAMS-R is obtained by computing the sum of all items. Higher scores on the scale suggest higher levels of mindfulness. The CAMS-R has been shown to possess acceptable levels of internal consistency (α = .81, n = 279, Greeson et al., 2011, α = .77, n = 298, Feldman et al., 2007).

Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003): MAAS is a commonly used 15 item self-report measure of mindfulness developed by Brown and Ryan (2003). MAAS assesses mindfulness as the open or receptive attention to and awareness of present events and experiences and includes items like "I find it difficult to stay focused on what's happening in the present." or "I do jobs or tasks automatically, without being aware of what I'm doing." The items of MAAS are rated on a six-point Likert scale from 1 (almost always) to 6 (almost never). Higher scores on the MAAS indicate higher levels of mindfulness. The MAAS has been adapted to the Turkish population by Catak (2012) and the Turkish version of the scale was shown to possess good psychometric qualities. In the present study the internal consistency of the scale was also good (α = 81, n = 265).

Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983): A major application field in mindfulness-based approaches is the mitigation of the adverse effects of stress on well-being. It has been shown

that mindfulness training is associated with significant decreases in perceived stress levels (Carmody & Baer, 2008). A recent systematic review on Mindfulness-Based Stress Reduction (De Vibe, Bjørndal, Tipton, Hammerstrøm, & Kowalski 2012) showed the positive effects of mindfulness training on stress. In line with previous literature we expected to find a negative relationship between perceived stress and mindfulness. Perceived stress was measured using Perceived Stress Scale (Cohen et al., 1983) which assesses the level of stress perceived by the individual as response to one's own life situations. PSS includes questions like: "In the last month, how often have you been upset because of something that happened unexpectedly?" or "In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?" which assess the respondent's stress levels in relation with recent stressful life events. The PSS was adapted to Turkish by Erci (2006). In the present study the Cronbach's Alpha value of the scale was .86.

Beck Depression Inventory (BDI; Beck, 1961): It has been showed that mindfulness training is associated with a decrease in depressive symptoms (Barnhofer et al., 2009; Kenny &Williams, 2007; Kumar, Feldman, & Hayes, 2008). Therefore, in the present study we expected to find a negative relationship between depression and mindfulness. Depression was assessed using BDI which assesses various symptom domains of depression by 21 multiple choice questions. Higher scores obtained on the scale indicate more severe depressive symptoms. The Turkish version of the BDI used in this study was adapted by Hisli (1988) and showed to possess good psychometric qualities. The internal consistency of the BDI in the present study was α = .91.

Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988): Beneficial effects of mindfulness training on anxiety symptoms were shown in previous studies (Farb et al., 2010; Lovas & Barsky, 2010; Vøllestad, Sivertsen, & Nielsen, 2011). In line with previous findings we predicted that mindfulness will be negatively associated with anxiety levels. Anxiety was measured using BAI which assesses the severity of anxiety symptoms by 21 multiple choice questions. Higher scores obtained in BAI are indicative of more severe anxiety levels. The Turkish version of the BAI used in this study was adapted by Ulusoy, Şahin, and Erkman (1998) and shown to possess good psychometric qualities. BAI-Turkish demonstrated a good level of internal consistency in the present study (α = .88).

Procedure

Prior to the study the first author of the development study of CAMS-R was contacted via e-mail and his consent on adapting the CAMS-R to Turkish was acquired.

Translation of the Scale — For the translation of the original version of CAMS-R into Turkish language, guidelines of the stage model suggested by Geisinger (1994) for the cross-cultural adaptation of assessment instruments were followed. In the first stage a bilingual individual fluent in both English and Turkish who had extensive experience with mindfulness practice over 15 years translated the CAMS-R items into Turkish. In the second stage, two bilingual individuals fluent in both English and Turkish and experienced in mindfulness practice evaluated the first translation jointly. The evaluation was based on determining congruity of the translated items with original items as well as the comprehensibility of the translation. Following the joint examination of the translation, the suggestions of the evaluators were conveyed to the translator in the third stage. Accordingly, the translator revised the draft version of Turkish CAMS-R in line with the suggestions of the evaluators. In the fourth stage, the author administered the draft version of Turkish CAMS-R to a small convenience sample (n = 5) which had similar participant characteristics with final study sample (e.g. Turkish undergraduate university students). As suggested by Geisinger (1994), the participants in the convenience sample were interviewed by the researcher subsequently

to discuss their experiences regarding understandability of the instructions, wording and comprehensibility of the items. As a result of these discussions, minor alterations were made to draft translation regarding suffixes of time adverb. After said alterations, the final version of Turkish CAMS-R was formed.

The Recruitment of the Participants — The participants were 265 undergraduates enrolled in the universities established Istanbul, Ankara and Izmir. The participation into the study was performed via Survey Monkey online survey system. For contacting the participants, an online search was conducted among electronic mailing groups registered to a search engine. The Turkish equivalents of the keywords "university" and "university students" were used in the search. Initial results enlisted 107 e-mailing groups. In order to reach currently enrolled students, 34 actively used e-mail groups initiated within last 1 to 4 years were chosen among the initial results. Subsequently, 34 groups were contacted by the author via an e-mail which requested voluntary participation into the study. The invitation e-mail conveyed basic information about the study by stating that the study was related to thoughts, feelings and stress levels of university students. Information about the confidentiality of the participation and link of the survey page were also included in the e-mail. The test battery consisted of a consent form, demographics form, mindfulness questionnaires, and other self-report instruments related to anxiety, depression and perceived stress. The survey was kept open to access for 2 weeks. During this time interval 284 students logged to the survey site and 265 of them completed the test batteries. These 265 participants constituted the final sample.

Statistical Analysis — Prior to statistical analysis, continuous and non-continuous variables were examined for their skewness and kurtosis. It was seen that the demographic variables which included age and gender were normally distributed. The continuous variables were not skewed and met the assumptions of normality. The online survey system used in the study was designed to check for unanswered items and prompt the participant to answer the empty item before proceeding to the next page. Therefore, no missing data was found in the completed test batteries. The data were analyzed using factor analysis, correlation analysis, partial correlation analysis, t-test and one way ANOVA.

Results

The mean score of the whole CAMS-R was 26.40 (SD = 4.92) and the item means varied between 2.35 (SD = 0.88) and 2.88 (SD = 0.88). Means and standard deviations of CAMS-R items are presented in Table 1. Gender differences in CAMS-R score means was examined by computing an independent samples t-test. Result of the t-test showed that the difference between CAMS-R mean scores of men and women was not statistically significant. A one way ANOVA test was conducted in order to investigate possible differences in participants' mean CAMS-R scores according to their study year. Results of this analysis did not reveal any significant differences between the mean CAMS-R scores of the participants at different years of study.

Internal Consistency and Factor Structure — The Cronbach's Alpha coefficient was calculated to examine the internal consistency of CAMS-R. Cronbach's Alpha coefficient for the whole CAMS-R was .77 which showed that the CAMS-R Turkish version possessed an acceptable level of internal consistency. The corrected item – total coefficients for the CAMS-R items varied between .21 and .60 and the mean value of item-total coefficients was .44. Item means, item deleted Cronbach's Alpha values and corrected item-total coefficients are presented in Table 1.

In order to examine the internal structure of CAMS-R Turkish version, a Confirmatory Factor Analysis similar to the one employed by Feldman et al. (2007) was conducted. The CFA model based on a first-order latent mindfulness

Table 1

Means and Standard Deviations for the Turkish Version of the Cognitive Affective Mindfulness Scale Revised for Study 1 and Study 2

No	Items	Study 1; Sample 1 (N = 265)						Study 2; Sample 2 (N = 88)					
		M	SD	S	K	CD	IT	M	SD	S	K	CD	IT
1.	Yaptığım şeye odaklanmak benim için kolaydır. It is easy for me to concentrate on what I am doing.	2.71	.81	-.6	-.58	.74	.54	3.38	.70	-.70	-.67	.68	.61
2.	Duygusal acıya tahammül edebilirim. I can tolerate emotional pain.	2.64	.97	-.22	-.91	.77	.30	2.87	1.03	-.41	-.98	.70	.46
3.	Değiştiremediğim şeyleri kabullenebiliyorum. I can accept things I cannot change.	2.35	.88	.25	-.61	.78	.21	2.42	.98	.09	-.43	.73	.30
4.	O anda nasıl hissettiğimi genelde oldukça detaylı olarak tarif edebilirim. I can usually describe how I feel at the moment in considerable detail.	2.66	.94	-.08	-.92	.76	.39	2.84	.93	.93	-1.2	.73	.31
5.	Dikkatim kolaylıkla dağılır. I am easily distracted.	2.53	.80	-.14	-.44	.75	.43	3.02	.79	-.76	.63	.73	.25
6.	Düşüncelerimi ve duygularımı takip etmek benim için kolaydır. It's easy for me to keep track of my thoughts and feelings.	2.74	.80	-.09	-.52	.74	.55	3.23	.77	-.60	-.55	.68	.64
7.	Düşüncelerimi yargılamadan onların farkına varmaya çalışırım. I try to notice my thoughts without judging them.	2.68	.85	.03	-.75	.75	.41	3.08	.89	-.55	-.61	.76	.08
8.	Sahip olduğum düşünce ve duyguları kabullenebiliyorum. I am able to accept the thoughts and feelings I have.	2.88	.88	-.31	-.71	.74	.49	3.18	.90	-.80	-.31	.71	.40
9.	Şimdiki ana odaklanabilirim. I am able to focus on the present moment.	2.83	.79	-.23	-.42	.73	.60	3.35	.74	-.88	.02	.68	.51
10.	Uzun süre boyunca dikkatimi tek bir şeye verebilirim. I am able to pay close attention to one thing for a long period of time	2.37	.90	.13	-.73	.74	.49	3.14	.77	-.27	-1.28	.70	.49

Note. Adapted from Cognitive Affective Mindfulness Scale Revised, Feldman et al. (2007). M: Item Mean, S: Skewness, K: Kurtosis, CD: Cronbach's Alpha if item deleted, IT: Item Total Correlation

factor and second-order latent attention (items 1, 5 and 10), present-focus (item 9), awareness (items 4, 6 and 7), and acceptance (items 2, 3 and 8) factors was tested in Amos V.16 software using maximum likelihood estimation. Chi-square test was significant (χ^2 (30, N = 265) = 87.5, p =.000), thus indicating a non-fit. However, it should be recalled that chi-square statistic is known to be influenced by the sample size and the number of variables in the model. Root Mean Square Residual was 0.08 which suggested a marginal fit (Browne & Cudeck, 1993). Goodness of Fit Index and Comparative Fit Index were .94 and .91 respectively which indicated good model fit as suggested by Byrne (1994). The model and standardized parameter estimates for the second-order CFA described above are depicted in Figure 1.
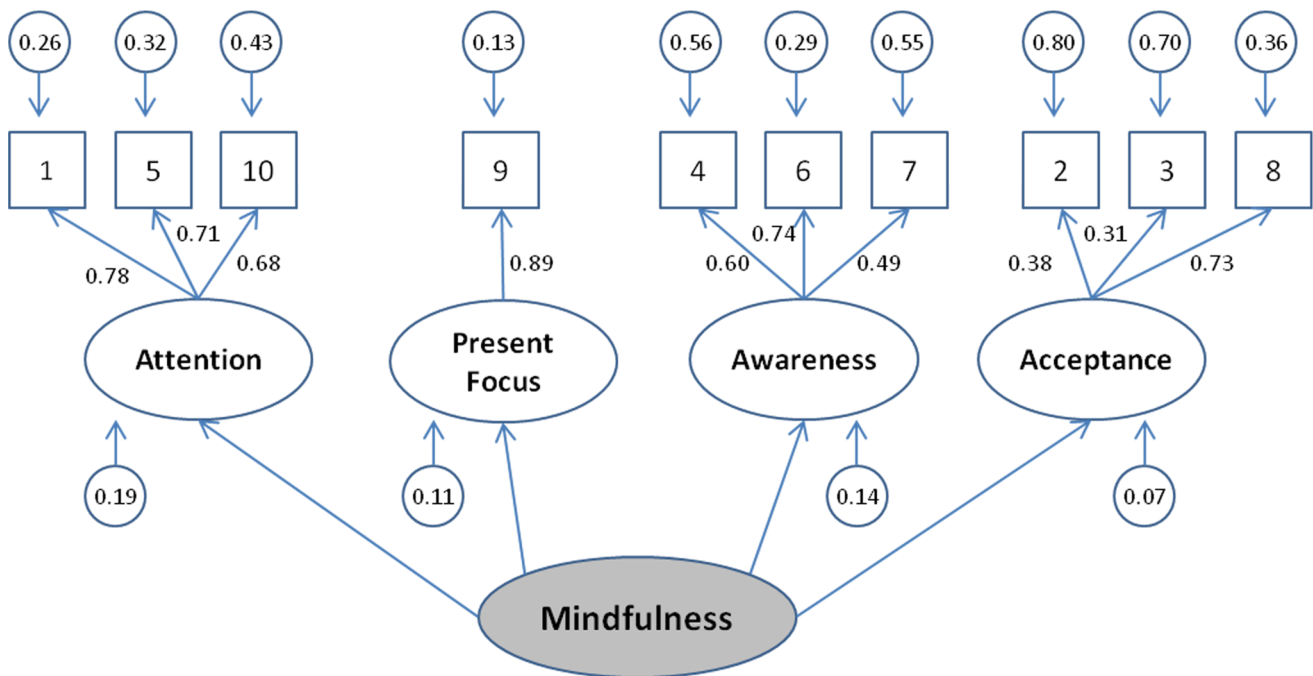

Figure 1. Standardized parameter estimates of the second order CFA for the Turkish version of 10 item Cognitive and Affective Mindfulness Scale-Revised.

The Relationships Between Mindfulness and Related Constructs — The correlations between CAMS-R scores and other psychological constructs are presented in Table 2. The results of the analysis showed that all correlations between mindfulness and other variables were significant in predicted directions. A significant negative relationship was found between mindfulness, depression and anxiety levels ($r = -.51$, $p < .001$, $r = -.33$, $p < .001$, respectively). The perceived stress was also significantly negatively associated with

mindfulness ($r = -.51$, $p < .001$). The previous findings related to the effects of mindfulness on anxiety and depression showed that perceived stress displays a significant mediation effect (Weinstein, Brown, & Ryan, 2009). In line with these findings, we examined whether the magnitude of the relationship between mindfulness and related variables would attenuate when perceived stress was controlled for. Accordingly, partial correlations were calculated between mindfulness, depression and anxiety controlling for perceived stress. The results of the analysis showed that the negative relationship between mindfulness, anxiety and depression remained significant. However, the magnitude of the correlation for both anxiety and depression decreased substantially after controlling for perceived

Table 2

Correlations Between Mindfulness and Related Constructs

Measures	M	SD	C	CAMS-R	MAAS	CAMS-R controlling for PSS
CAMS-R	26.40	4.92	.77	1.00	.52**	-
MAAS	3.96	.68	.82	.52**	1.00	-
PSS	28.85	7.91	.86	-.51**	-.42**	-
BDI	16.16	10.82	.91	-.51**	-.42**	-.28**
BAI	12.63	9.16	.88	-.33**	-.34**	-.18**

Note. M: Scale mean, SD: standard deviation, C: Cronbach's Alpha
**Correlation is significant at the 0.01 level (2-tailed)

stress. The zero-order and partial correlations between mindfulness and other variables are presented in Table 2.

The criterion validity of CAMS-R was also examined using the BDI total scores of the participants. A total score of 17 or above on BDI is advised as the clinical cut-off score for BDI in the Turkish population (Hisli, 1988). Accordingly, two groups were created based on the cut-off criteria. The CAMS mean scores of these groups were examined by conducting an independent samples t-test. We expected that mean CAMS-R scores of the groups above and below the cut-off would differ significantly and the participants above the cut-off score in BDI were expected to have significantly lower levels mindfulness. The results of the t-test showed that the difference between the mean scores of the group above the cut-off score (N = 78, M = 23.21, *SD* = 4.98) and the group below the cut of score (N = 187, M = 27.72, *SD* = 4.25) was statistically significant in the predicted direction (t (263) = 7.4, p < .001, d = .92). As expected, the participants whose BDI scores were above the clinical-cut off had significantly lower levels of mindfulness.

Discussion

In Study 1, the internal structure of the Turkish version of 10 item CAMS-R as well as the relationship between CAMS-R measured mindfulness and other related constructs were examined in a sample of undergraduate students. The results showed that the Turkish version of CAMS-R demonstrated accepted levels of internal consistency. The Cronbach's Alpha value calculated for Turkish CAMS-R was comparable to values reported by Feldman et al. (2007). The results of the confirmatory factor analysis indicated that the internal structure of the Turkish version of CAMS-R retained the second-order factor structure reported for the original version.

All associations between mindfulness and related constructs were significant in predicted directions. There was a substantial reduction in the association between mindfulness and well-being when perceived stress was controlled. However, the relationship between mindfulness and related measures remained significant although its magnitude was reduced. This finding may indicate a partial mediation where the effects of mindfulness on well-being can be partially explained by the effects of mindfulness on perceived stress levels. This suggestion is also in line with the findings of Weinstein et al. (2009) study where a significant mediation effect for perceived stress was reported.

An examination of the item means showed that all acceptance items of Turkish CAMS-R had lower mean values compared to those of original CAMS-R reported by Feldman et al. (2007) in three samples. The results also showed that no gender difference was evident between the total CAMS-R scores for men and women. Regarding the criterion validity, the CAMS-R demonstrated statistically meaningful associations with measures of perceived stress, depression and anxiety with the direction of the association being negative.

Study 2

Study 2 was conducted in order to investigate the psychometric properties of Turkish CAMS-R further in a community sample.

Methods

Participants and Recruitment Process — The community sample in the Study consisted of eighty eight adults who worked white-collar public officers at a local municipality in Istanbul city of Turkey. The participation into this study occurred as part of another study conducted by the author within the same sample. The age of the participants varied between 18 and 51, and the mean age of the sample was 34.64 (SD = 7.4). 43.2% of the participants were men (n = 38) while 56.8% of the participants were women (n = 50). 63.6% of the participants were married, 34.1% of the participants were single and 2.3% of the participants were widowed. The job descriptions of the participants are as follows: 8% (n = 7) of the participants were accountants, 5.7% (n = 5) of the participants were architects, 40.9% (n = 36) of the participants were administrative clerks, 13.6% (n = 12) participants were engineers, 1.1% (n = 1) of the participants were lawyers, 1.1% (n = 1) of the participants were psychologists, 8% (n = 7) participants were public relations specialists, 14.8% (n = 13) participants were technicians and 6.8% (n = 6) participants were city planners. Prior to recruitment of the participants, an official application was made to the Municipality's public relations department. The content, extent and procedures of the study were explained in the application. Within three weeks an affirmative response was obtained from the institution. The participation into the study was on voluntary basis and research forms were administered to eighty eight participants who expressed their willingness to participate. The administration of the forms was carried out by the author in a group setting at the Municipality Conference Hall. Prior to filling out the research forms, all participants were briefed regarding the purpose of the study as well as confidentiality of their answers. Following the signing and collection of consent forms the research forms were administered. The research forms battery included a short demographic form, mindfulness questionnaires and other questionnaires related to variables in question including well-being, perceived stress. Following completion, all participants were thanked and debriefed.

Measures and Variables — General Health Questionnaire 12 item version (GHQ-12; Goldberg, 1972). The positive association between mindfulness and well-being has been shown in numerous studies (Bränström, Kvillemo, Brandberg, & Moskowitz, 2010; Howell, Digdon, Buro, & Sheptycki, 2008; Weinstein et al., 2009). In line with previous findings we predicted that higher levels of mindfulness would be associated with better subjective well-being. Well-being was measured with the 12 item GHQ (Goldberg, 1972) which was adapted to the Turkish population by Kòlòç (1996). GHQ includes questions like "Have you recently felt constantly under strain?" or "Have you recently felt you couldn't overcome your difficulties?" which are designed to assess the respondent's well-being levels in face of recent distress. A higher score on this questionnaire is accepted as an indicator of lower levels of well-being and presence of psychological distress.

Other variables of the Study 2 including mindfulness and perceived stress were measured by the instruments presented in Study 1. The predictions regarding the variables were as explained in Study 1.

Statistical Analysis — The skewness and curtosis of variables were examined prior to statistical analysis. This preliminary analysis showed that the demographic variables were normally distributed and all continuous variables met the normality assumptions. The missing answers constituted the 1.6% of the total data. According to Widaman (2006), missing values which constitute less than 2% of complete data can be assumed to occur at random. The

missing data was imputed based on EM algorithm using SPSS v.16 Missing Value Analysis software. Subsequently, the data were analyzed using reliability analysis, t-test and correlation analysis.

Results

The mean value of CAMS-R in this study was 30.60 (*SD* = 4.69) and item means ranged between 2.42 (*SD* = 0.98) and 3.38 (*SD* = 0.70). The mean CAMS-R scores of the participants were examined according to the gender using independent samples t-test. The results of this test showed that CAMS-R mean scores of men and women in the sample did not differ significantly.

Internal Structure — The Cronbach's Alpha was calculated in order to examine the internal consistency of the Turkish CAMS-R. The Cronbach's Alpha value found for the questionnaire was .73 which indicated that the CAMS-R Turkish version possessed an acceptable level of internal consistency. The corrected item–total coefficients of CAMS-R items ranged between .08 and .62 and the mean value of item-total coefficients was .41. Item means, item-total correlations and Cronbach's Alpha values when item deleted are shown in Table 1. The factor structure of the CAMS-R could not be examined since employing factor analysis is not recommended for sample sizes under 100 participants (Gorsuch, 1983).

Relationships Between Mindfulness and Other Constructs — The associations between mindfulness and well-being as well as perceived stress were examined using correlation analysis. The results of the analysis showed that the predictions regarding the relationships between mindfulness and related variables were supported. The CAMS-R scores were significantly negatively associated with PSS (r (88) = -.56, $p < .001$) which indicates that more mindful individuals perceived themselves as being less under stress. A significant negative relationship was also found between CAMS-R scores and GHQ-12 (r (88) = -.36, $p < .001$) which indicates that lower levels of mindfulness is associated higher levels of psychological distress.

Discussion

In Study 2 we sought to investigate the psychometric properties of the 10 item Turkish CAMS-R further in a community sample. In addition, we examined the relationships between mindfulness and well-being as well as perceived stress. Similar to the results of Study 1, the results of the analysis showed that the Turkish CAMS-R demonstrated acceptable levels of internal consistency. No gender differences were found between the CAMS-R mean scores of men and women. The mean value of CAMS-R found for the community sample in the present study was relatively higher than the mean value obtained for the student sample in Study 1. We conducted an independent samples t-test based on mean CAMS-R values of two samples. Results of this test showed that the difference between the mean CAMS-R values of the participants in Study 1 and Study 2 was not statistically significant. Mindfulness as measured by CAMS-R demonstrated statistically meaningful associations with perceived stress and well-being. Higher level of mindfulness was significantly related with lower levels of perceived stress and psychological distress.

General Discussion

In Study 1 and Study 2 the psychometric properties of the Turkish version of the 10 item Cognitive and Affective Mindfulness Scale-Revised were investigated in two non-clinical samples. The results of both studies showed that Turkish CAMS-R possessed acceptable levels of internal consistency. The internal structure of Turkish CAMS-R displayed a second-order factor structure which was comparable to the original version of the scale.

The studies which included an analysis based on gender differences in mindfulness levels had reported that a significant effect of gender was not observed (Feldman et al., 2007; Brown & Ryan, 2003; Catak, 2012). We have identified a similar pattern which showed that no gender differences were found between the mean CAMS-R scores of women and men. The findings from both studies showed that mindfulness as measured by CAMS-R had statistically meaningful relationships with anxiety, depression, perceived stress and well-being. Thus, we have obtained supporting evidence for the criterion validity of Turkish CAMS-R. The Turkish version of the CAMS-R was also significantly associated with the MAAS. The magnitude of the relationship between two mindfulness measures was statistically significant and comparable to results reported by Feldman et al. (2007), thus further support for the concurrent validity of CAMS-R was assured. The findings from both studies were comparable to the results of previous studies conducted with Western samples, thus further support was provided for the assumption that mindfulness possesses similar assessment patterns in non-Western cultures.

An important finding was that all acceptance items of Turkish CAMS-R had lower mean values compared to those of original CAMS-R reported by Feldman et al. (2007) for three samples. This result also overlaps with the findings of previous studies. In a study conducted by Köse et al. (2004) it was seen that self-acceptance levels of the Turkish participants were significantly lower than those of American participants. Similarly Christopher, Christopher, and Charoensuk (2009) also reported that American college students had higher acceptance scores than Thai college students. Present findings together with the previous findings may indicate a cultural difference with regard to the acceptance of inner experiences. As noted, the members of collectivist cultures may be prone to judge themselves less as acceptable as a result of placing higher priority on the goals and values of the society and letting go of their own in face of discrepancy. If members of a non-Western culture have relatively lower self-acceptance it may be important to emphasize acceptance processes during assessment and treatment delivery. Exploring the self-acceptance themes in the context of clients' presenting problems and placing more emphasis on self-acceptance as a therapeutic process may have valuable implications when applying mindfulness-based interventions in collectivist cultures.

Certain limitations of the presents study need to be mentioned. First, the results presented are based on cross-sectional data therefore no causality can be inferred from these findings. Also, in both Study 1 and Study 2, non-clinical samples were employed. In order to examine the relationship between mindfulness and related measures of psychopathology, replication of these findings in clinical populations is recommended. Also, items 2 and 7 have been excluded from the adaptation procedure in the present studies which may constitute another limitation. Furthermore, we have not assessed the participant's prior experience in meditation or mindfulness practice. Therefore, the possible influence of previous mindfulness experience on the results cannot be determined. It should also be noted that although we present a preliminary investigation of reliability and validity, a broader analysis including more diverse measures of personality is also warranted in order to examine the convergent and discriminant validity of Turkish CAMS-R. Finally, we have not examined the temporal reliability of Turkish CAMS-R which leaves an open area of investigation for future studies.

Despite limitations described above, the findings of the present studies provide support for the validation of CAMS-R in the Turkish population. The psychometric properties of the Turkish version of CAMS-R are comparable to original version of the scale. Furthermore, the pattern of associations found between CAMS-R measured mindfulness and other related constructs is consistent with previous studies. Based on these findings, it can be concluded that the Turkish CAMS-R is a valid assessment tool which can be utilized to measure mindfulness in the Turkish population.

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