The Validity and Reliability Study of Turkish Version of Child and Adolescents Mindfulness Measure (Camm)[1]

Çocuk ve Ergenler İçin Bilinçlilik Ölçeği Türkçe Formunun Geçerlik ve Güvenirlik Çalişmasi

Özkan ÇIKRIKÇI

Ordu Üniverstersi, Eğitim Fakültesi, Eğitim Bilimleri Bölümü Altınordu/ ORDU

Abstract

The current paper investigated the psychometric properties of the Turkish version of Child and Adolescents Mindfulness Measure (CAMM) designed to assess mindfulness among children and adolescents over the age of 9 years. Participants were 660 children and adolescents aged between 10 and 17 years. Results from CFA confirmed the single factor model with excellent fit indices. The internal consistency coefficient provided evidence for good internal reliability. Overall, psychometric properties have shown that the Turkish version of CAMM has been a valid tool for measuring mindfulness among children and adolescents.

Keywords: *Mindfulness, reliability, validity, factor structure*

Özet

Bu çalışma dokuz yaş ve üzeri çocuk ve ergenlerin bilinçlilik düzeylerini belirlemek amacıyla geliştirilen Çocuk ve Ergenler İçin Bilinçlilik Ölçeğinin Türkçe formuna ait psikometrik özellikleri sunmaktadır. Yaşları 10 ile 17 arasında değişen 660 çocuk ve ergen çalışmaya katılmıştır. Doğrulayıcı faktör analizi sonuçlarına göre tek faktörlü yapı verilerle iyi düzeyde uyum göstermektedir. İç tutarlık katsayısı incelendiğinde ölçme aracının güvenilir nitelikte olduğu görülmektedir. Sonuç olarak, Çocuk ve Ergenler İçin Bilinçlilik Ölçeği Türkçe formunun bilinçliliğin değerlendirilmesinde kullanılabilecek geçerli ve güvenilir bir ölçme aracıdır.

Anahtar Sözcükler: *Bilinçlilik, güvenirlik, geçerlik, faktör yapısı*

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1. Introduction

Many studies about mindfulness have been conducted to express correlations between mindfulness and psychological health on different samples, for example, undergraduate students (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Brown & Ryan, 2003), community adults (Brown & Ryan, 2003; Chadwick et al., 2008), clinical populations (Baer, Smith, & Allen, 2004; Chadwick et al., 2008; Chadwick, Taylor, & Abba, 2005; Walach, Buchheld, Buttenmuller, Kleinknecht, & Schmidt, 2006), incarcerated youths (Himelstein et al., 2011), elementary school students (Napoli, Krech, & Holley, 2005). The results of studies showed positive correlations between life satisfaction, competence, optimism, sense of autonomy, pleasant affect vitality (Brown & Ryan, 2003), emphaty (Dekeyser, Raes, Leijssen, Leysen, & Dewulf, 2008), counseling self-efficacy (Greason & Cashwell, 2009), emotional intelligence, positive affect (Schutte & Malouff, 2011), marital satisfaction (Burpee & Langer, 2005), positive emotions (Jimenez, Niles, & Park, 2010). On the contrary, depression, social anxiety (Brown & Ryan, 2003), social phobia (Cassin & Rector, 2011), neuroticism (Dekeyser et al., 2008), dissociation (Baer et al., 2006), rumination (Raes & Williams, 2010), experiential avoidance (Baer et al., 2004) have been negatively associated with mindfulness.

Mindfulness can be illustrated as a psychological term of presence of mind comprised individual's awareness of internal and external factors; including thoughts, emotions, actions and surroundings (Chiesa, Calati, & Serretti, 2011; Gunaratana, 1993). Mindfulness, which is theoretically and empirically related to psychological well-being, contains two basic elements namely awareness and nonjudgmental acceptance (Hayes & Feldman, 2004; Kabat-Zinn, 1990). One of the important aspects of awareness in relation to the mindfulness is being obvious and receptive. However, this awareness does not involve judgmental construct (Bishop et al., 2004; Deikman, 1982). The aim of this awareness is to supply links to the present moment with individuals. In the awareness process; labeling, judging, avoiding or attaching to different thoughts and emotions are not employed because of the nature of awareness (Bishop et al., 2004, Treanor, 2011). Moreover, mindfulness that may be manipulated by individuals could be observed clearly when they focus their attention on rumination and fantasy (Brown & Ryan, 2003). As mindfulness has a great role in forming of exposure, it enables to make connection between avoided emotions and thoughts (Baer, 2003; Twohig, Matsuda, Varra, & Hayes, 2005). Overall, the main purpose of mindfulness is focused on expanding awareness of one's present moment experience (Treanor, 2011).

Although the most popular description of mindfulness belongs to Kabat-Zim (1994), most other researchers make efforts to define mindfulness. On the other hand, descriptions of mindfulness contain the similar factors, terms or constructs. For instance, the definition of mindfulness provided by Baer (2003) is based on "the nonjudgmental observation of the ongoing stream of internal and external stimuli as they arise" (p. 125). Besides from these descriptions, some researchers agree to the model of Bishop et al. (2004). According to this model, mindfulness consists of two components: "self-regulation of attention and adoption of a particular orientation towards one's experience (Keng, Smoski, & Robins, 2011, p.1042). Due to the fact that self-regulation of attention expresses undetailed observation, awareness including thoughts, emotions, actions, and orientation is associated with

the some attitudes towards one's experience. Curiosity, openness and acceptance could be inclusive of these attitudes (Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008; Teasdale et al., 2000; Walsh, Balint, Smolira, Fredericksen, & Madsen, 2009).

There is an evidence of the possible relationship between mindfulness training and improved attention capacities from several experimental studies investigating the benefits of mindfulness practice (Anderson, Lau, Segel, & Bishop, 2007; Jha, Krompinger, & Baime, 2007). Results from these studies evidenced that it is assumed that mindfulness training programs may be beneficial to perform exogenous stimulus detection activities (Rescorla, 2006, Treanor, 2011). Mindfulness with its' potential benefits is more effective than drug therapies and psychotherapeutic interventions (Baer, 2003; Brown & Ryan, 2003; Krasner, 2004). In addition, mindfulness techniques are easier to be performed than other interventions for patients provided that they are well known and understood (McKenzie, Hassed, & Gear, 2012).

During two decades, there have been many improvements and advances in mindfulness-based interventions. As a result of these efforts, positive outcomes of mindfulness-based interventions have been started to be observed (Baer, 2003; Baer, 2009; Grossman, Niemann, Schmidt, & Walach, 2004). In addition, several empirical and theoretical studies were conducted to explore the effects of mindfulness on psychological health and processes (Chiesa et al., 2011; Chiesa & Serretti, 2011; Ellet, 2013; Falkenström, 2010; Giluk, 2009; Gökhan, Meehan, & Peters, 2010; Himelstein, Hastings, Shapiro, & Heery, 2011; Hülsheger, Alberts, Feinholdt, & Lang, 2013; Keng et al., 2010, Lavender, Gratz, & Tull, 2011; Masuda & Wendell, 2010).

To measure mindfulness, some self-report instruments were developed. However, these measures emphasize solely on either everyday mindfulness or mindfulness during sitting meditation. Furthermore, there is a lack of study to investigate the relationship between these two constructs of mindfulness (Thompson & Waltz, 2007). As Toronto Minfdulness Scale (TMS; Bishop et al. 2005) assess mindfulness during formal sitting meditation, Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003; Hansen, Lundh, Homman, & Wangby-Lundh, 2009) and Cognitive and Affective Mindfulness Scale-Revised (CAMS-R; Feldman, Hayes, Kumar, & Greeson, 2003) are measures of everyday mindfulness.

Because of the fact that there is a growing evidence of positive effects of mindfulness on psychological health, measurement of mindfulness becomes crucial. Additionally, further studies and suggestions of mindfulness-based interventions entail reliable and valid measures (Kohls, Sauer, & Walach, 2009). For the purpose of eliminating these weaknesses and providing new opportunities for future studies about mindfulness (Baer et al., 2006), various self-report measures have been developed namely Kentucky Inventory of Mindfulness Skilss (KIMS; Baer et al., 2004), Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003), Freiburg Mindfulness Inventory (FMI; Buchheld, Grossman, & Walach, 2001) and Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006).

All of these tools aforementioned are useful only in measuring mindfulness among adults. This is why Greco, Baer and Smith (2011) decide to develop a reliable and valid mindfulness measure for use with children and adolescents. Initially, they developed

Child and Adolescents Mindfulness Measure (CAMM) to assess mindfulness among children and adolescents over the age of 9 years. In scale development process, they carried out four separate studies including item development, item reduction, confirmatory factor analysis and convergent and incremental validity, respectively. As a consequence of analysis, it could be concluded that the 10 item CAMM has strong support about the validity and reliability according to the statistical results. The internal consistency was found as .80. Thereafter, confirmatory factor analysis demonstrate a single model with good fit indices (RMSEA = .07, SRMR = .06, CFI = .90, NNFI = .87).

Overall, the literature shows us the lack of a suitable measure of mindfulness among child and adolescents in the Turkish population. In collaboration with the Turkish version of CAMM, the nature of mindfulness among children and adolescents may be best understood for future studies and mindfulness based interventions. Therefore, our aim in the present study was to test the usability of the CAMM for Turkish children and adolescents. In total, the present study sought to explore the psychometric properties of Turkish CAMM.

2. Method

Research Aim

The present study aimed to adopt Child and Adolescent Mindfulness Measure (CAMM) into Turkish. This study included validity and reliability results of CAMM. Validity and reliability analysis were employed in the scale adaptation process. After investigating factor structure of Turkish CAMM, the factorial validity of the instrument was confirmed by means of confirmatory factor analysis.

Participants

Participants were 660 children and adolescents in grades 5-11 who were recruited from two public schools using data collection procedures. The sample was composed of 334 male students (50.6%) and 326 female students (49.4%). The average age of the participants was 13.56 years old (SD= 1.70) with an age range from 10 to 17 years. 5.6% of students were 5th graders ($n = 37$), 16.4% of them 6th graders ($n= 108$), 29.8% of them 7th graders ($n= 197$), 26.8% of them 8th graders ($n= 177$), 10.5% of them 10th graders ($n= 69$), 10.9% of them 11th graders ($n= 72$).

Research Instruments

Child and Adolescent Mindfulness Measure (CAMM)

The 10-item Child and Adolescent Mindfulness Measure was developed by Greco, Baer, & Smith (2011) to assess present-moment awareness and nonjudgmental, nonavoidant responses to thoughts and feelings. Each item was rated on a 5-point likert scale ranging from 0 (never true) to 4 (always true). The Cronbach's Alpha value of CAMM was found .80. All of the items on CAMM were reverse scored. Confirmatory factor analysis revealed that fit indices (RMSEA= .07, SRMR= .06, NNFI= .87, CFI= .90) supported the single factor structure.

Personal Information Form

Researchers developed a form for participants. By means of personal information

form, they expected to obtain comprehensive descriptive information (gender, age, grade level) from participants.

Procedure

The translation of CAMM into Turkish was achieved in two phase, based on back translation method (Brislin, 1970). At first, five academicians who are expert in English and Turkish translated the original form into Turkish, separately. In addition, we had a consensus on a single Turkish translation from all translations. After that, the original form and Turkish form was compared to determine similarities and differences of translations. As a consequence of this evaluation process, the final Turkish form was deeply examined by experts.

The requisite permission to conduct the present study was granted from teachers who were familiar with research steps. The CAMM and MAI were administered to students in groups. The data collection process lasted just 25 minutes, in a single session. Overall, 660 forms were analyzed by AMOS 22 and SPSS 22.

3. Results

Initial Confirmatory factor analysis (CFA)

Confirmatory factor analysis was conducted to verify a factorial structure and theoretical model determined previously (Thompson, 2004). To explore the factorial validity of Turkish form of CAMM, at first, we applied confirmatory factor analysis (CFA) because of the fact that the factorial structure of CAMM was determined by Greco et al. (2011). The consistency of factorial structure in Turkish sample was investigated by means of this process (CFA). The fit indices showed to what extent the model account for the data. In a general manner fit indices values enable researchers to accept or refuse the model. In general, CFI, GFI, and TLI values of .90 or greater indicate satisfactory fit; RMSEA value of .05 or lower show excellent fit (Kline, 2011; Tabachnick & Fidell, 2007). As a result of CFA, it was concluded that single factor model of CAMM (ten items) was not confirmed: x^2 (n=660, df= 35)= 279.28, x^2/df= 7.97, RMSEA= .10 (LO90= .09 – HI90= .11), CFI= .75, GFI= .91, TLI= .68.

Exploratory Factor Analysis

The exploratory factor analysis (EFA) process was started so as to explore the factorial structure of CAMM in Turkish sample. EFA was conducted with using maximum likelihood estimation. Results from EFA showed two factors explaining 44.32% of total variance. In EFA process, a factor loading of .40 was accepted as a criterion for the retention of items (Hair, Anderson, Tahtam, & Black, 1998). The first factor consisted of eight items, whereas second factor had two items (5, 10). These items were examined with respect to the nomological validity. In nomological validity, items are assessed in the light of theoretical structure and researcher(s) can eliminate item(s) from the pool due to the fact that item doesn't show consistency with scale (Şencan, 2005). Because of the fact that the second factor including two items (5, 10) may not demonstrate consistency with whole measure, as well as the original form of CAMM consisted of a single factor, it was decided that two items were excluded from the pool.

After elimination process, the EFA was repeated with eight items. The KMO value was found to be .78 and Barletts Test of Sphericity was found significant ($x^2_{(45)}$= 1025.25, p<.001). According to these results, it was stated that the number of participants was big enough and the data were suitable for factor analysis. The single factor model with eight items accounted for 35.14% of total variance and factor loadings ranged from .43 to .70 (Table 1).

Table 1. The results of Exploratory Factor Analysis

Items	Initial EFA		Items	The Second EFA
	Factor 1	**Factor 2**		
7	.67		7	.70
1	.62		8	.63
8	.61		1	.62
3	.59		6	.61
6	.59		3	.60
4	.58		4	.56
9	.56		9	.52
2	.40		2	.43
5		.76		
10		.74		
Variance	28.90%	15.42%		35.14%
Total Variance	44.32%			35.14%

The Second Confirmatory Factor Analysis

To obtain better fit to the data, the second CFA was carried out with eight items. Results from the second CFA indicated excellent fit to the data: x^2 (n=660, df= 20)= 67.97, x^2/df= 3.39, RMSEA= .06 (LO90= .04 – HI90= .07), CFI= .93, GFI= .97, TLI= .91. Additionally, factor loadings ranged from .35 to .65 (Figure 1). According to fit indices and factor loadings, it was determined that the single factor model with eight items confirmed in Turkish participants.
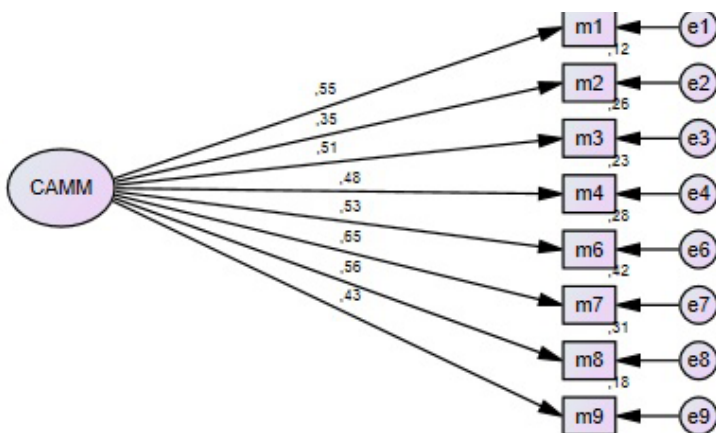
Figure 1. Factor loadings for the CAMM

Item Analysis

Item analysis is an investigation process in which individuals' responses to items are analyzed to determine what extend each item is sufficient to measure the participants' attitudes (Everitt, 2006). Two separate analyses were employed to fulfill item analysis. Firstly, the differences between mean scores of the upper 27% and lower 27% were calculated for each item by conducting the independent t test. The t test results demonstrated that there are significant differences between each items' means of the upper 27% and lower 27% points (Henson, 2006). Secondly, the item-total correlation was applied to identify problematic items of whole scale. In the light of literature (Field, 2013; Nunnally & Bernstein, 1994), we agreed to the criterion of .30 as the cutoff item-total point. Based on the criterion no item was eliminated due to the sufficient correlation coefficient between the sum score of the items and item. As seen from Table 2, item-total correlations ranged from .49 to .69.

Table 2. Item-Total Score Correlations and Differences Between Mean Scores Of The Upper 27% And Lower 27%

Item	r_{tt}	t
1	.63**	18.42***
2	.49**	8.86***
3	.62**	16.98***
4	.61**	18.00***
5	.62**	19.00***
6	.69**	23.08***
7	.64**	18.11***
8	.57**	16.91***

*Note. ***p<.001, **p<.01 r_{tt}: Item-total score correlation coefficient*

Internal Reliability

The internal reliability was evaluated by means of the Cronbach's Alpha coefficient and split-half reliability. As presented in Table 3, the Cronbach's Alpha coefficient for the entire scale was found as .73. Cronbach's alpha value of the CAMM for female students was found to be .74; for male students was found to be .72. Split-half reliability was also found as .74. Therefore, it could be concluded that these results demonstrated good internal consistency of the items in the total scale (Table 3).

Table 3. Internal Consistency, Means, and Standard Deviations

Scale	Range			M	SD
	α	Min	Max		
Total Scale	.73	4	32	20.23	6.23
Female	.74	4	32	19.99	6.31
Male	.72	4	32	20.48	6.14

Note. SD: Standard Deviation; α: Cronbach's Alpha Coefficient

4. Discussion

Recently there has been a great awareness on mindfulness among school aged children experiencing a various social, emotional, and behavioral problems, which affect their all parts of school life, interpersonal relationships and their potential, related to the weakness of mindfulness (Greenberg, Domitrovich, & Bumbarger, 2001; Schonert-Reichl & Lavlor, 2010). Therefore, identification of mindfulness among child and adolescents has become a crucial concern in psychological research. However, there is no instrument on assessing mindfulness directly in Turkish sample. The present study provides opportunity with psychologists and educators to assess mindfulness among Turkish child and adolescents. This study seeks to describe the adaptation of Child and Adolescent Mindfulness Measure (CAMM) into Turkish. Firstly, the Turkish translation of CAMM was performed. Whether the instrument provides language equivalency or not was investigated by means of the back translation method. Secondly, item analysis was performed to assess whether each item can be adequate to measure the participants' attitudes. Item analysis assessed according to the cutoff item-total point and it was concluded that no item was eliminated from the scale.

The initial confirmatory factor analysis (CFA) was applied to confirm the factorial structure of the CAMM. The CAMM with ten items did not show a single factor structure similarly the original form. In other words, the single factor with ten items was not be verified in Turkish sample. This is why, exploratory factor analysis (EFA) was employed in order to explore the factorial structure of CAMM. Two items (5, 10) were eliminated from the pool. A single factor with eight items was determined in EFA process. After results of EFA obtained, second CFA was applied with eight items. Moreover, results from second CFA showed an appropriate model with excellent fit indices.

Because of the fact that reliability coefficient of .70 was accepted as a criterion for the internal consistency (Creswell, 2002), the CAMM showed satisfactory reliability coefficients. As for convergent validity, the relationship between mindfulness and metacognitive awareness was examined. Furthermore, the significant correlation between mindfulness and metacognitive awareness was determined.

According to results of validity and reliability analysis, it can be concluded that the CAMM presented adequate model, demonstrated strong internal consistency as expected in every case. The CAMM is an instrument aimed to assess child and adolescents' mindfulness. The Turkish form of CAMM is an eight item scale formatted with 5 point likert scale ranging from 0 (never true) to 4 (always true). All items are reversed scored. Scores of the CAMM could be range from 0 to 32. Getting high scores refers that students have great amount of mindfulness. Overall, the Turkish version of CAMM seems to be an appropriate measure with sufficient reliability and validity of its scores.

There are several limitations in this study. The main limitation is related to the methodology. Generalizability of the results is another limitation of the study, as expected in every study. CAMM is still need of further psychometric validation among Turkish people. Moreover, studies should be further conducted to show the temporal stability of the scale. Test-retest reliability should be investigated. Finally, CAMM which is the only instrument to assess mindfulness in Turkish language can be used in educational and psychological researches.

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