Burnout and depressive symptoms in teachers: Factor structure and construct validity of the Maslach Burnout inventory-educators survey among elementary and secondary school teachers in Hungary

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Abstract
This study validated the Hungarian version of the Maslach Burnout Inventory-Educators Survey on a sample of n = 211 elementary and secondary teachers. To test factorial validity, we ran a series of confirmatory analysis with eight models. The best fitting model was the bifactor model with general burnout and three specific factors: emotional exhaustion, depersonalization, and personal accomplishment. Analyzing the covariates revealed that gender and age were not associated with burnout, but depressive symptoms and overcommitment had a significant relationship with general burnout, and overcommitment was related to emotional exhaustion as well.

KEYWORDS
burnout, depression, job stress, mental health

1 INTRODUCTION
Teachers’ mental health has a widespread impact not just on teaching effectiveness (Thakur, 2012) but even on students' personal and emotional development and academic achievement (Blazer, 2010; Ju, Lan, Li, Feng, & You, 2015; Zhang & Sapp, 2008). Because teaching is a profession with high mental risks (Kyriacou, 2001), several studies have focused on teachers’ well-being and mental health (Parker, Martin, Colmar, & Liem, 2012; Van Droogenbroeck & Spruyt, 2015). Burnout is a psychological response to chronic, work-related stress, characterized by emotional exhaustion, depersonalization, and feeling of low personal accomplishment (Maslach, Schaufeli, & Leiter, 2001). Several studies have shown burnout’s impact on health and productivity (Ahola et al., 2008; Dewa, Jacobs, Thanh, & Loong, 2014; Honkonen et al., 2006; Mohren et al., 2003) including among health care workers (Consiglio, 2014; Pedersen, Serensen, Bruun, Christensen, & Vedsted, 2016; Potter, 2006; Rios-Ríos & García-Izquierdo, 2016) and also among teachers (Brunsting, Sreckovic, & Lane, 2014; Hoglund, Klingle, & Hosan, 2015; Rudow, 1999).

The prevalence of burnout among teachers varies between 5 and 30% depending on the conceptualization and measurement of burnout (Blazer, 2010; Gil-Monte, Carlotto, & Gonçalves, 2011). Although it is difficult to determine the prevalence of burnout due to psychometric difficulties, the data cause concern and justify further research (Ahola et al., 2006).

Although researchers have developed several instruments (Kristensen, Borritz, Villadsen, & Christensen, 2005; Shirom & Melamed, 2006), the most widely used tool to assess burnout is the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1981). Maslach and Jackson (1981) originally designed the MBI to assess burnout syndrome in a variety of human service occupations. Subsequently, Maslach and her colleagues have developed some alternative versions for different sectors: The MBI-Human Services Survey (MBI-HSS) is based on the original MBI and the human services sector uses it; users in the education field apply the MBI-Educators Survey (MBI-ES; Maslach, Jackson, & Schwab, 1996); and finally other professions use the MBI-General Survey (MBI-GS). The MBI-ES is basically the same as the MBI-HSS, with some minor changes in wording. For example, the word “recipient” became “student.” The MBI-ES is intended to measure three burnout dimensions: (a) the core aspect of burnout is the emotional exhaustion, the chronic feeling of tiredness and fatigue, which make teachers lose their enthusiasm; (b) the second dimension is depersonalization, which is a psychological withdrawal including the development of negative or indifferent attitudes toward students; and (c) the third dimension is the feeling of low personal accomplishment referring to losing the belief of one's effectiveness.
Despite the wide use of the MBI, psychologists have not come to a clear consensus regarding its factor structure. Several researchers have questioned the three-factor structure Maslach and Jackson (1981) originally specified. Most of the studies supported the original three-factor model across different occupational groups (Bria, Spânu, Băban, & Dumitrașcu, 2014; Gil Monte, 2005; Loera, Converso, & Viotti, 2014; Schutte, Toppinen, Kalimo, & Schaufeli, 2000), including teachers (Kokkinos, 2006; Silva, Hewage, & Fonseka, 2013); however, in order to support the original model, other users have requested various modifications, such as eliminating items, allowing items to load on more than one factor, or allowing correlation between the factors (Aluja, Blanch, & García, 2005; Gold, Roth, Wright, Michael, & Chin-Yi, 1992; Schaufeli, Daamen, & Van Mierlo, 1994). The results from a meta-analysis including 45 studies of confirmatory and exploratory factor analyses, both descriptive and empirical analyses, showed substantial support for a correlated three-factor model, but solutions with more or fewer factors also received modest support (Worley, Vassar, Wheeler, & Barnes, 2008). Some researchers have suggested fewer dimensions in the burnout structure, such as combining emotional exhaustion and depersonalization into a single factor (Brookings, Bolton, Brown, & McEvoy, 1985). Moreover, Kallith, O’Driscoll, Gillespie, and Bluedorn (2000) excluded the personal accomplishment factor yielding a two-factor model consisting of just emotional exhaustion and depersonalization. Alternatively, some other researchers suggested an increased number of latent factors in order to explain a larger amount of variance. For example conceptualizing Maslach Burnout Inventory-General Survey as a five-factor instrument, Densten (2001) further distinguished the psychological and somatic strain aspects of emotional exhaustion, and two aspects of the lack of personal accomplishment, namely self and others. Emerging problems in the studies on the factor structure of the MBI, like the large amount of variance, remain unexplained (Aluja et al., 2005); the degree of the model’s fitness is usually slightly lower than desired (Kokkinos, 2006); and the large correlations between the dimensions, especially between emotional exhaustion and depersonalization (Worley et al., 2008), have led to calls for an alternative measurement model. The presence of the strong correlation between the factors also implies a hierarchical model containing a second order factor, as Worley et al. (2008) suggested in their meta-analysis.

Previous researchers have proposed a hierarchical structure of psychological symptoms, and they have used two major types of hierarchical models: second-order factor models and bifactor models. Although a vast majority of researchers in the field of personality and health research have been using the second order factor model for a long time, recently more have been using the bifactor model. In the second-order factor models, the higher-order factors explain the correlations or covariances of primary factors such as burnout factors. In the bifactor model approach, one can estimate the general or common and domain-specific or unique components and their relative size in explaining variance. A bifactor measurement model specifies both a single common factor and at least two specific factors. Accordingly, Reise (2012) proposed estimating the bifactor measurement structure as an effective approach to modeling construct-relevant multidimensionality. The bifactor measurement model allows for the indicators of psychological symptoms to load on an overall primary factor such as general severity and also to have a secondary loading on a specific symptom dimension. Another advantage of adopting the bifactor model is that researchers can study the contribution of the specific factors to predict an external variable independently from the general factor. (Brunner, Nagy, & Wilhelm, 2012; Chen, West, & Sousa, 2006; Reise, Moore, & Haviland, 2010).

As regards the MBI, in spite of its usefulness described above, the bifactor model was usually missing from the alternative models to test. Nevertheless, we ran a series of confirmatory factor analysis (CFA) in order to validate the Hungarian version of MBI–HSS in a healthcare professional sample. In addition to the bifactor model, we also tested a non-hierarchical one-factor, two-factor, three-factor, four-factor, five-factor, and a hierarchical second-order three-factor model. The bifactor model yielded the best fit to the data; however, only the general burnout factor and the specific personal accomplishment factor explained a considerable unique proportion of variance (Mészáros et al., 2014).

Due to the fact that there is no clear agreement regarding the factorial structure of MBI–ES, it is still necessary to investigate the competing factor structures. The measurement model is essential because it influences the interpretation of the three factor scores and general burnout score which can be especially important in teacher population regarding they are less well studied compared to health workers. It is also not clear if burnout is a general construct defined in the same way among teachers and among health workers or if the burnout has some domain-specific differences.

Symptoms of burnout and symptoms of depression are quite similar; therefore, not surprisingly, numerous studies have reported a positive correlation between burnout and depressive symptoms (Ahola, Hakonen, Perhoniemi, & Mutanen, 2014; Ahola et al., 2005; Chiu, Stewart, Woo, Yatham, & Lam, 2015; Iacovides, Fountoulakis, Kaprinis, & Kaprinis, 2003; Takai et al., 2009). Considering the temporal and causal relationship of burnout and depressive symptoms, Shin, Noh, Jang, Park, and Lee (2013) concluded that teachers’ burnout can lead to subsequent increases in depressive symptoms. Moreover, in some other studies, researchers found that not only can burnout enhance depression, but also vice versa; depression can also enhance burnout, showing that these problems are in a rather parallel/reciprocal relationship with each other (Bianchi, Schonfeld, & Lauret, 2015; Toker & Biron, 2012). Because burnout and depression have some common characteristics, especially in the more severe forms of burnout, testing the divergent validity of these two constructs is very important. Conceptually, burnout is job-related whereas depression is context-free and more pervasive, but this scope-based distinction doesn't properly distinguish the late stages of burnout, which also pervasively affects non-work areas as well. A factor analysis has shown the two constructs to be statistically differentiated from each other, where the items of burnout and depression scales did not load on the same factor (Leiter & Durup, 1994).

Although the distinction still needs further clarification, all in all it seems that depression and burnout can be regarded as related but different constructs. Because of the overlap between the two constructs, there is a robust relationship between them. Therefore, depression is an appropriate construct to be used in testing the construct validity of burnout measurement.

Another construct associated with burnout is overcommitment, which Siegrist et al. (2004) defined as an exaggerated involvement
and effort in work beyond what the organization formally requires, and which is a consequence of one's high feelings of need for esteem and approval. Overcommitted people are unable to withdraw from work obligations. Empirical studies have supported the theoretical assumption that this intense continuous effort and the lack of ability to withdraw from work results in burnout, particularly with the fatigue/exhaustion component of burnout (Kristensen et al., 2005; Philips, Egan, & Kane, 2012; Takaki, Nakao, Karita, Nishikitani, & Yano, 2006). However, the causal relationship of overcommitment and burnout is still not clear. A current study with a longitudinal design pointed out that burnout predicts overcommitment as a maladaptive coping style and an increased level of overcommitment in turn leads to more burnout (Avanz, Zaniboni, Balducci, & Fracaroli, 2014). Accordingly, overcommitment has a significant relationship with burnout, and therefore this is also a relevant construct to be used in testing the construct validity of burnout measurement.

The aim of this study was to test the construct validity of the Hungarian version of MBI–ES. The first step in this process was to test several alternative measurement models with CFA. The second step was to investigate the associations of burnout factors with depressive symptoms and overcommitment.

To test the factor structure, we tested several previously proposed measurement models of the MBI–ES with CFA. We compared eight alternative models (see Figure 1) in which we also included a bifactor model, which, despite its growing popularity, had not been tested previously with the Education Survey form. Finding the best fitting factor structure of the measurement model is substantively important because it influences the results’ interpretation and application. For example, it can clarify whether one can use the global score of MBI–ES as an index of the underlying latent construct of general burnout.

To support the construct validity of MBI–ES, we investigated the associations of burnout factors with depressive symptoms and overcommitment in one CFA with a covariates model. Regarding depression, according to the literature, the strongest association emerged with emotional exhaustion (Glass, McKnight, & Valdimarsdottir, 1993; Tourigny, Baba, & Wang, 2010), which subscale is often considered to be the core aspect of burnout. Because the general burnout factor captured by bifactor structure just reifies the core aspects of burnout, we expected a more prominent relationship between depression and general burnout than between depression and specific subscales.

Overcommitment theoretically is related to one’s being overwhelmed, investing too much energy in one’s work. We expected that among the three components of MBI–ES, emotional exhaustion would be most related to overcommitment, rather than depersonalization or personal accomplishment, or even than general burnout.

2 | METHODS

2.1 | Procedure and participants

We based this cross-sectional research on a convenient sample of teachers who were either living in Budapest or participating in a postgraduate course in Budapest. Participation in the study was voluntary and anonymous. Administration of the questionnaires was paper and pencil based. All participants gave written informed consent. The Institutional Review Board of Institute of Psychology at Eötvös Loránd University (Budapest, Hungary) approved the study.

Two hundred eleven teachers (87.6% women) were willing to answer the questionnaire. The mean age was 42.8 years (SD = 10.5). The mean of the years the participants spent in the profession of teaching was 18.7 (SD = 11.0), and the mean years spent at the current workplace was 10.9 (SD = 9.8); 21.8% of the participants reported that their current workplace was also their first workplace in their lives. The mean of the participants’ working hours per week was 41.8 (SD = 10.9); 20.7% of the participants stated that the majority of children they teach was considered children with special needs, and for another 28.8% of teachers, it was a frequent duty to take care of children with special needs in their classes. The majority of participants (46.4%) worked in a primary school, 15.9% in secondary school, and 14.9% in both.

2.2 | Measurement tool

2.2.1 | Maslach Burnout Inventory–Education Survey

We assessed burnout with the Hungarian version of the MBI–ES, which Maslach et al. (1996) specifically developed to measure burnout among teachers. We obtained permission from the copyright owner (Mind Garden, Inc.) to translate the MBI–ES into Hungarian language and to use it for the present study. We translated the instrument from English into Hungarian and validated by back-translation to ensure that the two versions were equivalent. The questionnaire consists of 22 items. Emotional exhaustion is measured by nine items, including, for one example: “I feel emotionally drained from my work.” Depersonalization consists of five items, with a sample item being “I don’t really care what happens to some students.” Finally, personal accomplishment is formed by eight items, with a sample item of “I can easily create a relaxed atmosphere with my students.” All items have a 7-point response scale ranging from 0 (“never experienced such a feeling”) to 6 (“experience such feelings every day”). Higher scores on the emotional exhaustion and depersonalization subscales indicate higher burnout, whereas higher scores on personal accomplishment indicate lower burnout. In the previous research, the internal consistency of the factors ranged from 0.83 to 0.91 for emotional exhaustion, from 0.50 to 0.83 for depersonalization, and from 0.69 to 0.82 for personal accomplishment. In the present research, the internal consistencies were appropriate: 0.86 for emotional exhaustion, 0.64 for depersonalization, 0.76 for personal accomplishment, and 0.67 for general burnout.

2.2.2 | Center for Epidemiological Studies-Depression Scale

We used the Center for Epidemiological Studies-Depression scale (CES-D; Radloff, 1977) to assess depressive symptoms, which instrument Radloff (1977) developed to measure depressive symptomatology in the general population. The measurement consists of 20 items using a 4-point frequency scale ranging from 0 (rarely or none of the time) to 3 (most or all of the time). The center for epidemiological studies-depression scale consists of a list of generic symptoms of depression. We asked respondents to indicate how often they experienced each described statement during the week that preceded the date of
the survey. A sample item is "I thought my life was a failure." The internal consistency of the scale is high: 0.85 in the general population. In the present study, the internal consistency was good at 0.86.

2.2.3 Overcommitment (ERI-Q)

We assessed overcommitment using the Hungarian version of the overcommitment scale (Salavecz, Neculai, Rózsa, & Kopp, 2006) from the Effort-reward Imbalance Questionnaire (Siegrist et al., 2004). This is composed of six 4-point Likert-scaled items ranging from 0 (strongly disagree) to 3 (strongly agree). Examples of these items include "I get easily overwhelmed by time pressures at work" and "I start thinking about work problems as soon as I get up in the morning." The total score varies between 0 and 18, where the higher the score, the more likely a subject is to experience overcommitment at work. The Cronbach's alpha ranges from 0.64 to 0.82. In the present study, the internal consistency was below the usual value at 0.58.

FIGURE 1 The alternative measurement models of MBI-ES
2.2.4 Working with children with special needs

In order to measure the extent of working with children with special needs, we used a Likert-type question such as "How typical is, that you have to teach children with special needs as well (like dyslexia, ADHD, behavioral disorders, autism, etc.)?" The possible answers ranged from "It occurs very rarely, and even then is not very disturbing (just a few classes where it occurs)" which has been coded as 1, to "Mostly I teach these children (more than half of the class, or as working in a special institution, every member of the class are with special needs)" which has been coded as 4.

3 DATA ANALYSIS

We used structural equation modeling (SEM) with Mplus 6.0 to estimate the degree of fit of eight alternative measurement models. The models were (a) a one-factor model; (b) a two-factor model combining emotional exhaustion and depersonalization into one factor (Brookings et al., 1985); (c) a two-factor model with only emotional exhaustion and depersonalization, eliminating personal accomplishment (Kalliath et al., 2000); (d) a three-factor model as was originally proposed (Maslach & Jackson, 1981); (e) a second-order factor model, with the three originally proposed factors and with a second-order burnout factor; (f) a four-factor model delineating a job and client-related aspects of depersonalization (Iwanicki & Schwab, 1981); (g) a five-factor model distinguishing two aspects of emotional exhaustion, namely somatic and psychological strain, and two aspects of personal accomplishment, namely self and others (Densten, 2001); and (h) a bifactor model, with the three factors and a general burnout factor.

We performed all analyses with maximum likelihood parameter estimates with standard errors and chi-square test statistics that were robust to non-normality of observation. We used the full information maximum likelihood estimator to deal with missing data (Muthén & Muthén, 2007).

Because the chi-square test is sensitive to sample size, where the probability of rejecting a hypothesized model increases with the sample size, we used relative fit indices to analyze the models. The first fit index was the root mean squared error of approximation (RMSEA). An RMSEA below 0.05 indicates an excellent fit, and a value above 0.10 indicates a poor fit. The closeness of the model fit using RMSEA (CFit of RMSEA) is a statistical test (Browne & Cudeck, 1993) that evaluates the statistical deviation of RMSEA from the value 0.05. Nonsignificant probability values (p > .05) indicate an acceptable model fit (Brown, 2006). A satisfactory degree of fit requires the comparative fit index (CFI) and the Tucker-Lewis Index (TLI) to be higher than or close to 0.95 (Brown, 2006). The next fit index is the standardized root mean square residual (SRMR). An SRMR value below 0.08 is considered a good fit (Kline, 2011). The last fit index is the Bayesian information criteria, which do not have a clear cut-off. The general rule is that the lower number represents a closer fit.

We also followed the double-index strategy proposed by Hu and Bentler (1999), who pointed out that a cut-off value close to 0.08 for SRMR and a cut-off value close to 0.06 for RMSEA are necessary to make a decision regarding a relatively good fit between the hypothesized model and the observed data. Hu and Bentler (1999) demonstrated that the combination of decision criteria including RMSEA ≤ 0.06 and SRMR ≤ 0.08 provides the opportunity to reject misclassified models.

In order to test the construct validity of the Hungarian version of MBI-ES, we tested a CFA with covariates model. Then, we ran a CFA with the previously best fitting model with covariates. Covariates analyzed in the model were gender, age, depressive symptoms, and overcommitment. We entered the latter two variables as observed variables.

4 RESULTS

We conducted a series of confirmatory factor analyses in order to find the best fitting measurement model of the Hungarian version of the MBI-ES. The fit indices of the eight alternative measurement models are presented in Table 1. All models except Model 1 (one-factor model) yielded SRMR value below 0.08. However, only the bifactor model reached the low level of RMSEA that is not different significantly from the predefined value of 0.05. Therefore, only model 8, the bifactor model with a general burnout factor and three domain-specific factors, yielded an acceptable level of model fit, suggesting that the bifactor model is superior to the alternative models.

TABLE 1 Confirmatory factor analysis of the eight measurement models of burnout

<table>
<thead>
<tr>
<th>Alternative measurement models</th>
<th>χ²</th>
<th>df</th>
<th>RMSEA</th>
<th>Cfit p</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR</th>
<th>BIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1. One-factor model</td>
<td>547**</td>
<td>209</td>
<td>0.088</td>
<td>&lt;0.001</td>
<td>0.70</td>
<td>0.66</td>
<td>0.089</td>
<td>15719</td>
</tr>
<tr>
<td>Model 2. Two-factor model</td>
<td>442**</td>
<td>208</td>
<td>0.073</td>
<td>&lt;0.001</td>
<td>0.79</td>
<td>0.77</td>
<td>0.078</td>
<td>15592</td>
</tr>
<tr>
<td>Model 3. Two factor model</td>
<td>200**</td>
<td>76</td>
<td>0.088</td>
<td>&lt;0.001</td>
<td>0.82</td>
<td>0.79</td>
<td>0.070</td>
<td>10089</td>
</tr>
<tr>
<td>Model 4. Three-factor model</td>
<td>432**</td>
<td>206</td>
<td>0.072</td>
<td>&lt;0.001</td>
<td>0.80</td>
<td>0.77</td>
<td>0.076</td>
<td>15586</td>
</tr>
<tr>
<td>Model 5. Hierarchical Second-order model with three factor</td>
<td>432**</td>
<td>206</td>
<td>0.072</td>
<td>&lt;0.001</td>
<td>0.80</td>
<td>0.77</td>
<td>0.076</td>
<td>15586</td>
</tr>
<tr>
<td>Model 6. Four-factor model</td>
<td>423**</td>
<td>203</td>
<td>0.072</td>
<td>&lt;0.001</td>
<td>0.80</td>
<td>0.77</td>
<td>0.074</td>
<td>15589</td>
</tr>
<tr>
<td>Model 7. Five-factor model</td>
<td>284**</td>
<td>142</td>
<td>0.069</td>
<td>&lt;0.001</td>
<td>0.82</td>
<td>0.79</td>
<td>0.071</td>
<td>13368</td>
</tr>
<tr>
<td>Model 8. Bifactor model</td>
<td>302**</td>
<td>189</td>
<td>0.053</td>
<td>0.30</td>
<td>0.90</td>
<td>0.86</td>
<td>0.058</td>
<td>15515</td>
</tr>
</tbody>
</table>

Notes: χ² = chi-square test statistic; df = degrees of freedom; **: p < .001; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; Cfit = closeness of fit. SRMR = standardized root mean square residual.
The standardized factor loadings for the bifactor model are shown in Table 2. All items except item 4 loaded significantly on the general burnout factor. The items of personal accomplishment had negative factor loadings on this general burnout factor, being a positive measurement versus the other two specific factors. All eight items of personal accomplishment had significant factor loadings whereas not all items loaded significantly on their specific factor in the case of emotional exhaustion and depersonalization. Regarding emotional exhaustion, most of the items were loaded significantly: items about "feeling used up," "feeling fatigued," and "working too hard" with high factor loadings and items about "feeling emotionally drained," "working with people is a strain," and "feeling frustrated" with lower factor loadings, the remaining three items about "feeling burned out," "working with people is stressful" and "feeling at the end of my rope" did not load significantly on this specific factor, but did so on the global factor. From the five items of depersonalization, two items loaded significantly: "seeing students as impersonal objects," "becoming more callous," and the remaining three items: "emotionally hardening," "not taking care of students' and "students blame me" did not load significantly on this factor, but did on the general factor.

We also calculated the explained common variances (Sijtsma, 2009) and found that general burnout explained 58% of the common variance, while the proportions of explained common variance by the specific factors were 13% for emotional exhaustion, 11% for depersonalization, and 17% for personal accomplishment. This result also supports the bifactor structure, showing that the general factor explains a bigger amount of variance of the items than do the specific factors all together.

We evaluated the internal consistency by calculating omega and omega hierarchical coefficients, besides Cronbach's alpha, which are recommended in case of multidimensionality and hierarchically structured constructs (Zinbarg, Revelle, Yovel, & Li, 2005) because Cronbach alpha can be a misleading index in these cases (Cortina, 1993). Omega coefficients estimate how a certain scale score assesses the combination of general and specific constructs, and a certain target construct (Brunner et al., 2012). Omega coefficients estimate the reliability of a latent factor (such as emotional exhaustion score) combining the general and the specific factor variance. Therefore, the omega coefficients of emotional exhaustion show the proportion of variance attributable to a mixture of the general burnout factor and the specific emotional exhaustion factor. Contrarily, the coefficient

<table>
<thead>
<tr>
<th>Short form of items</th>
<th>Emotional exhaustion</th>
<th>Depersonalization</th>
<th>Personal accomplishment</th>
<th>General burnout</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. feel emotionally drained</td>
<td>0.281</td>
<td></td>
<td></td>
<td>0.646</td>
</tr>
<tr>
<td>2. feel used up</td>
<td>0.871</td>
<td></td>
<td></td>
<td>0.490</td>
</tr>
<tr>
<td>3. feel fatigued</td>
<td>0.477</td>
<td></td>
<td></td>
<td>0.488</td>
</tr>
<tr>
<td>6. working with people is a strain</td>
<td>0.148</td>
<td></td>
<td></td>
<td>0.526</td>
</tr>
<tr>
<td>8. feel burned out</td>
<td>0.042</td>
<td></td>
<td></td>
<td>0.722</td>
</tr>
<tr>
<td>13. feel frustrated</td>
<td>0.113</td>
<td></td>
<td></td>
<td>0.780</td>
</tr>
<tr>
<td>14. working too hard</td>
<td>0.352</td>
<td></td>
<td></td>
<td>0.394</td>
</tr>
<tr>
<td>16. working with people is stressful</td>
<td>0.077</td>
<td></td>
<td></td>
<td>0.617</td>
</tr>
<tr>
<td>20. feel at the end of one's rope</td>
<td>−0.054</td>
<td></td>
<td></td>
<td>0.685</td>
</tr>
<tr>
<td>5. students as impersonal objects</td>
<td>0.357</td>
<td></td>
<td></td>
<td>0.321</td>
</tr>
<tr>
<td>10. become more callous</td>
<td>0.947</td>
<td></td>
<td></td>
<td>0.476</td>
</tr>
<tr>
<td>11. emotionally hardening</td>
<td>0.009</td>
<td></td>
<td></td>
<td>0.571</td>
</tr>
<tr>
<td>15. not taking care of students</td>
<td>0.140</td>
<td></td>
<td></td>
<td>0.312</td>
</tr>
<tr>
<td>22. students blame me</td>
<td>0.104</td>
<td></td>
<td></td>
<td>0.560</td>
</tr>
<tr>
<td>4. understanding students</td>
<td></td>
<td></td>
<td>0.382</td>
<td>−0.026</td>
</tr>
<tr>
<td>7. dealing effectively with student's problems</td>
<td></td>
<td></td>
<td>0.405</td>
<td>−0.379</td>
</tr>
<tr>
<td>9. positive influence on others</td>
<td></td>
<td></td>
<td>0.538</td>
<td>−0.231</td>
</tr>
<tr>
<td>12. feel energetic</td>
<td></td>
<td></td>
<td>0.337</td>
<td>−0.507</td>
</tr>
<tr>
<td>17. creating relaxed atmosphere</td>
<td></td>
<td></td>
<td>0.420</td>
<td>−0.279</td>
</tr>
<tr>
<td>18. feel exhilarated with students</td>
<td></td>
<td></td>
<td>0.526</td>
<td>−0.350</td>
</tr>
<tr>
<td>19. accomplishing worthwhile things</td>
<td></td>
<td></td>
<td>0.545</td>
<td>−0.390</td>
</tr>
<tr>
<td>21. deal with emotional problems calmly</td>
<td></td>
<td></td>
<td>0.342</td>
<td>−0.394</td>
</tr>
<tr>
<td>Cronbach α</td>
<td>0.86</td>
<td>0.64</td>
<td>0.76</td>
<td>0.67</td>
</tr>
<tr>
<td>Omegaα</td>
<td>0.88</td>
<td>0.72</td>
<td>0.77</td>
<td>0.90</td>
</tr>
<tr>
<td>Omega hierarchicalβ</td>
<td>0.15</td>
<td>0.23</td>
<td>0.50</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Notes. Boldfaced factor loadings are significant at, at least p < .05.

α: Omega refers to the proportion of explained variance in the scale score attributed to the global and specific factors.

β: Omega hierarchical refers to the proportion of explained variance of the scale score attributed to the specific factor.

Short form of items

because the MBI–ES is a copyrighted measurement tool, we used the main phrases instead of the whole sentences.
omega hierarchical estimates the reliability of a latent factor with all other latent construct variances removed. For example, in this case, the coefficient omega hierarchical of emotional exhaustion shows the proportion of variance of this scale that is attributable to this specific factor only, without the general burnout factor. Thus, the omega hierarchical provides information on whether scores for a specific factor can be interpreted as a general characteristic of teaching, or if they are more specific to teaching children with special needs.

We calculated the coefficients for the best fitting bifactor model for both the general and the specific factors, and these are presented in Table 2. Omega coefficients were appropriate; thus, the specific scale scores adequately represent the mixture of general burnout and the respective specific factors.

There is no clearly defined cut-off for omega hierarchical coefficients. However, Reise, Bonifay, and Haviland (2013) tentatively proposed rather strict advice to evaluate omega hierarchical values for specific factors, specifically that the minimum value would be greater than 0.50 and the preferred value would be closer to 0.75. Because values of the omega hierarchical also depend on such factors as the number of specific factors and the test length (Reise et al., 2013), we proposed a more lenient approach in this research. We regarded coefficients around 0.20 as salient, in which case the specific factor would explain at least 20% of the variance in specific factor scores. Using our criterion, the contribution of a specific factor to the explained variance would not be negligible. Regarding the omega hierarchical, the emotional exhaustion and the depersonalization had quite a low value, implying that only a small proportion of the observed variance is attributable to the respective component, and the general burnout factor explains a much larger proportion of the variance in these scores. Personal accomplishment has an omega hierarchical coefficient with a moderate value of around 0.50, denoting that its score is attributable partly to the specific underlying dimension and partly to the general burnout factor.

In order to test the concurrent validity of MBI–ES, we ran the bifactor model with covariates including depression, and overcommitment controlling for gender and age. We also introduced in the model the extent of teaching children with special need as another covariate. The standardized coefficients are presented in Table 3. Depressive symptoms and the extent of teaching children with special needs had a significant and strong relationship with the general burnout factor, but had no significant relationship with the specific subscales. Overcommitment was in a significant relationship with the emotional exhaustion factor and also with the general burnout factor.

### TABLE 3 Standardized coefficients of CFA with covariates model

<table>
<thead>
<tr>
<th></th>
<th>Special needs*</th>
<th>Depressive symptoms</th>
<th>Overcommitment</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional exhaustion</td>
<td>-0.04</td>
<td>0.19</td>
<td>0.31</td>
<td>20%</td>
</tr>
<tr>
<td>Depersonalization</td>
<td>0.01</td>
<td>-0.02</td>
<td>-0.11</td>
<td>2%</td>
</tr>
<tr>
<td>Personal accomplishment</td>
<td>-0.06</td>
<td>-0.03</td>
<td>0.15</td>
<td>9%</td>
</tr>
<tr>
<td>General burnout</td>
<td>0.15</td>
<td>0.58</td>
<td>0.23</td>
<td>56%</td>
</tr>
</tbody>
</table>

Notes. Boldfaced regression coefficients are significant at, at least $p < .05$; special needs

*means the extent of teaching children with special needs.

## 5 DISCUSSION AND IMPLICATIONS

The present study supported the bifactor measurement model of MBI in a sample of teachers similarly to our previous study in a sample of health care workers (Mészáros et al., 2014). Furthermore, we found that emotional exhaustion and depersonalization scores mainly reflect general burnout rather than their specific meanings, and only a small amount of variance is explained by the specific factors. However, the score of personal accomplishment reflects the specific meaning in a higher degree, which is similar to our previous study (Mészáros et al., 2014).

We also estimated the covariates of burnout factors, namely extent of teaching children with special needs, depressive symptoms and overcommitment. The extent of teaching children with special needs was significantly associated only with the general factor. This implies that this external impeding factor has influence on the overall burnout phenomenon, and does not have effect through specific factors such as having little success therefore having less personal accomplishment, or through having greater emotional burden. Depressive symptoms were significantly associated only with the general burnout factor. This finding is in accordance with the previously reported robust connection between burnout and depression (Ahola et al., 2014; Glass et al., 1993; Tourigny et al., 2010). Furthermore, this study also highlighted the fact that the depressive symptoms are related to the general aspect of burnout, and this association is not limited to any specific dimension. Overcommitment was significantly associated with the general burnout and emotional exhaustion dimensions. Although the link between overcommitment and burnout was previously repeated (Avanzi et al., 2014; Philp et al., 2012), our study could present evidence that controlling for the link between overcommitment and general burnout factor, overcommitment is also related to the emotional exhaustion dimension. This finding is in line with the previous studies in which burnout was measured by the work-related factor of the Copenhagen Burnout Inventory (Avanzi et al., 2014; Philp et al., 2012) or by fatigue (Takaki et al., 2006), which items show similarity in content with the items of emotional exhaustion.

Our study has some important implications. The results suggest that in further studies, MBI–ES should be used as a bifactor measurement with its advantages (Reise, 2012), using the latent variable approach, both the general and specific components can be used to gain a better understanding of burnout. Our study also suggests that in the conceptualization of burnout, unidimensionality could be a more appropriate approach. The scores of emotional exhaustion and probably depersonalization should be used cautiously because they may reflect more the general burnout dimension and only a small portion of variance could be attributed to their specific meanings. Another implication of this study is that teaching children with special needs and depressive symptoms are closely related to the general burnout factor and not to the specific factors. However, due to the cross-sectional nature of this study, it is not clear if burnout increases the depressive symptoms or if teachers having the tendency to experience depressive symptoms are more likely to suffer more burnout symptoms. Clarification of the proper use of this measurement is a fundamental contribution to helping the prevention, the early detection, and the treatment of burnout.
We should also mention this study’s limitations. First, the cross-sectional design does not allow us to make assumptions about the causality. Second, being a self-report study with paper- and pencil-based questionnaires, it is not free from several biases. And third, having a convenient sample, we could not have a representative data of Hungarian teachers. Even though the sample consisted of teachers from different school types (elementary and high school), the generalizability of the results is limited.

6 | CONCLUSIONS

Our study revealed the bifactor structure of MBI-ES and thus proposes a more sophisticated analysis of the results of the scale in further research and also encourages the further unidimensional conceptualization of burnout. Teaching children with special needs, depressive symptoms and overcommitment are connected with the general aspects of burnout. Additionally, unlike depressive symptoms, overcommitment has a stronger relationship with one specific component of burnout, namely emotional exhaustion. It is still not clear if depressive symptoms increase burnout or if burnout can increase depressive symptoms. They may also develop in parallel. Further research is necessary to identify the causal pathways in order to plan appropriate prevention programs for teachers.

CONFLICT OF INTEREST

The authors have declared that they have no conflict of interest.

REFERENCES


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