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Running head: MAV INTERVENTION FOR BURNOUT

Does Mindfulness-, Acceptance-, and Value-Based Intervention Alleviate Burnout? - A Person-Centered Approach

Sanna M. Kinnunen, Anne Puolakanaho, Asko Tolvanen, Anne Mäkikangas, and Raimo Lappalainen

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## Abstract

This study investigated individual differences in changes in burnout symptoms during a brief mindfulness-, acceptance-, and value-based (MAV) intervention. It also studied whether the changes in burnout were simultaneous with the changes in mindfulness skills. The role of practices and learning experiences in these changes were investigated. The participants were employees of various occupations ( $n = 105$ , 80% women, mean age = 48 years). Latent profile analysis was used to investigate the associations between burnout and mindfulness skills during the intervention and a four-month follow-up period. Six distinct profiles were found that differed in levels and changes of both burnout and mindfulness skills. Burnout was reduced and mindfulness skills increased with large effect sizes in three of the profiles (47.4% of the participants). Two profiles (31.1%) presented smaller changes in burnout but had significant increases in mindfulness skills. One profile (11.5%) did not benefit from the intervention. The obtained profiles were compared on practice quantity and frequency, practice continuation, and learning experiences. There were no differences between the profiles in the practice quantity or frequency during the intervention. However, the profiles with the most beneficial changes showed higher learning during the intervention and continued to practice more often after the intervention. These findings show that there are considerable differences in the responses to a brief MAV intervention. The investigated intervention turned out to be effective in alleviating burnout symptoms, even when the initial burnout was high. Attention should be devoted to enhancing learning and practice continuation to improve intervention outcomes.

*Keywords:* burnout, mindfulness, practice, learning, acceptance and commitment therapy, intervention

## Does Mindfulness-, Acceptance-, and Value-Based Intervention Alleviate Burnout? - A Person-Centered Approach

Burnout is a significant problem that threatens the health and work ability of the population (Ahola & Hakanen, 2014). In the Finnish Health 2000 Study, 27.9% of working Finns reported mild burnout symptoms and 2.5% experienced serious symptoms (Ahola, Honkonen, Kalimo, Nykyri, Aromaa, & Lönnqvist, 2004). After this, burnout symptoms in the Finnish working population have decreased somewhat (Suvisaari et al., 2012), but are still considerable. Effective alleviation of burnout is important to mitigate its adverse effects. Mindfulness-, acceptance-, and value-based (MAV) interventions have been noticed to reduce employees' distress and burnout (e.g., Khoury, Sharma, Rush, & Fournier, 2015; Lloyd, Bond, & Flaxman, 2013). The present study used a person-centered approach to investigate the effectiveness and the change mechanisms of MAV intervention on burnout. This approach generated new knowledge of individual variation in burnout development during and after the intervention and offered better understanding of how these differences are related to skills practiced during the intervention. The person-centered approach helped to determine to whom the intervention is beneficial and under what circumstances. This kind of knowledge can be used both to improve intervention effectiveness and to direct interventions to those that are most likely to benefit from them.

### **Burnout and MAV interventions**

Burnout is defined as a persistent, work-related state of ill-being that is characterized by dimensions of exhaustion, cynicism, and reduced professional efficacy (Maslach, Jackson, & Leiter, 1996; Näätänen, Aro, Matthiesen, & Salmela-Aro, 2003). Mindfulness and acceptance skills, as well as values commitment have been identified to account for a significant amount of the variance of burnout-related ill-being beyond work-related factors (e.g., job control)

(Vilardaga et al., 2011), indicating that MAV processes are important to consider in attempts to reduce burnout. Mindfulness refers to the awareness that emerges from paying full attention to the present experience non-judgmentally (Kabat-Zinn, 2003). Acceptance entitles willingness to experience external and internal events as they are, without evaluation or avoidance (Hayes, 2004; Kabat-Zinn, 2003). From a mindful and accepting stance, it is possible to confront difficult psychological content without getting entangled with it, and to overcome barriers for pursuing valued life (Hayes, Bond, Barnes-Holmes, & Austin 2006). Mindfulness and acceptance practices can help reduce the power of one's evaluative mental models (Hayes, 2004), thereby allowing people to function more flexibly in situations, and to be more accepting towards oneself and others. Values have been included into MAV interventions from acceptance and commitment therapy (ACT), expressing the importance of value-based actions in making lasting changes (Hayes, 2004; Hayes et al., 2006). Values give meaning to life and motivate one's actions.

In accordance with the findings of Vilardaga et al. (2010), MAV interventions have been effective in reducing stress and burnout (e.g. Brinkborg, Michanek, Hesser, & Berglund, 2011, Khoury et al., 2015; Lloyd et al., 2013; Regehr, Glancy, Pitts, & LeBlanc, 2014; Virgili, 2015). In general, good MAV skills are associated with better job performance and goal-related actions, as well as improved well-being (e.g., Haeyns, 2004; Hayes et al., 2006; Kabat-Zinn, 2003). In addition, different MAV processes have been found to promote change (i.e., decrease in stress and burnout) (e.g., Khoury et al., 2015; Lloyd et al., 2013). However, the effect sizes in the intervention studies have been relatively small for burnout reduction (e.g., Brinkborg et al., 2011; Khoury et al., 2015; Lloyd et al., 2013; Regehr et al., 2014), questioning the clinical significance of the effects. Previous research has relied on a variable-centered approach which focuses on the

relations between variables at the average (i.e., at the whole data) level. However, inspection of intervention processes at the intra-individual level may reveal novel information regarding to whom MAV interventions are beneficial and under what circumstances. Therefore, in the present study a person-centered approach was utilized in order to gain novel information about intervention processes within individuals.

### **Person-Centered Approach**

The person-centered approach, opposed to more commonly used variable-centered approach, is interested in individual variation in the studied phenomenon. Person- and variable-centered approaches differ both theoretically and methodologically (Bergman & Lundh, 2015).

Theoretically, the person-centered approach views the individual as a whole, consisting of different components that affect together how the individual functions. In contrast, the variable-centered approach is interested in finding generalizable laws that describe the actions of the whole population. Methodologically, the person-centered approach investigates how variables manifest within individuals, whereas variable-centered approach is interested in relations between variables (Laursen & Hoff, 2006; Múthen & Múthen, 2000). In variable-centered approach, it is assumed that the population is homogenous with respect to the studied phenomena, whereas person-centered approach assumes that the population is heterogenous in respect of the levels and changes in the studied phenomena (Laursen & Hoff, 2006).

The person-centered approach is used to identify certain groups of individuals or individual trajectories (Laursen & Hoff, 2006). For example, it can be used to find profiles that resemble each other in terms of certain characteristics (e.g., burnout development) yet at the same time differ from other profiles in terms of those same characteristics (e.g., Muthén & Muthén, 2000; Sterba, 2013). The number of profiles is usually unknown and different profile

solutions are compared based on statistical and theoretical considerations. The methods of person-centered approach have developed rapidly. Sterba (2013) presents the benefits of finite mixture modeling applications, such as latent profile analysis (LPA), over the more traditional non-model-based methods, such as class and cluster analysis. In finite mixture modeling the choice of profile criteria is less arbitrary, as the approaches are model-based (Vermunt & Magidson, 2002). The construction of mixture models is based on probability laws, and various rigorous statistic method are applied to obtain the best-fitting solution for the observed data (Sterba, 2013). This way the profile solution is more reliable and can reveal relevant information of the studied phenomenon. As finite mixture models reveal typical (i.e., profiles consisting of the majority of the study participants) and atypical (i.e., profiles consisting of a minority of the study participants), the method enables producing rich information about the intervention processes at the individual level.

### **The Person-Centered Approach in Burnout and Mindfulness Skills Research**

Both burnout and mindfulness skills have been studied by using person-centered approach. The review of Mäkikangas and Kinnunen (2016) showed that burnout had differing developmental trajectories both in general and in the intervention context. In the intervention context, Häätinen et al. (2009) found three burnout trajectories—namely “low burnout,” “high burnout–benefited,” and “high burnout–not benefited.” Furthermore, during a one-year rehabilitation intervention with a six-month follow-up, Häätinen, Mäkikangas, Kinnunen, and Pekkonen (2013) found different trajectories for different burnout symptoms (i.e., exhaustion, cynicism, and reduced professional efficacy) using a mixture modeling approach. The results showed that the benefits of the intervention were related to the initial level of burnout, as well as the individual profile of burnout (i.e., which symptom was predominant). Altogether, these

studies indicate that the majority of the study participants benefited from the interventions while a minority did not.

Furthermore, mindfulness studies have indicated the existence of intra-individual variation. For example, Kiken, Garland, Bluth, Palsson, and Gaylord (2015) noticed individual variation in the changes in state mindfulness during meditation intervention, with these differences predicting changes in psychological distress. In addition, cross-sectional studies using LPA have identified subgroups of mindfulness skills that differed from one another regarding emotional outcomes, such as symptoms of depression and anxiety (Bravo, Boothe, & Pearson, 2016; Pearson, Lawless, Brown, and Bravo, 2015). Based on these results, studying the development of burnout and mindfulness skills *simultaneously* at the intra-individual level during an intervention could reveal unique change mechanisms – which is aim of the current study.

The present study uses the person-centered approach (specifically LPA) to investigate the profiles of burnout and mindfulness skills among the sample of MAV interventions participants. This kind of an analysis strategy has the potential to reveal new information of the joint development of burnout and mindfulness outcomes and to be used to better understand how the intervention affects different groups of participants. From the clinical point of view, this kind of information is essential for the development of more accurate measures of intervention effectiveness. Furthermore, when there is clarity on the typical and atypical development profiles of mindfulness skills and burnout, people who have an atypical development profile (i.e., are unlikely to benefit from the intervention) can be recognized earlier and given additional attention during the intervention. It is also possible to determine what kinds of intervention practices differentiate the profiles and use this information, for example, to increase the amount of



practices associated with better outcomes in the intervention program. From the health care policy point of view, the knowledge of individual variation can be used to direct short MAV interventions to those groups that are likely to benefit from them. For the research community, the understanding of individual trajectories can illuminate the process of skills attainment and create basis for further research on individual trajectories among intervention participants.

### **Intervention Practices, Learning Experiences, and Intervention Outcomes**

In addition to uncovering the profiles of burnout and mindfulness skills, it is also essential to recognize the factors that differentiate these profiles. This kind of knowledge can be used to improve intervention effectiveness for participants that react differently to the intervention. MAV practices have been identified as potential mechanisms for beneficial changes in mindfulness skills and well-being outcomes (e.g., Carmody & Baer, 2008; Hayes, 2004; Kabat-Zinn, 2003). However, the results regarding the importance of practices are inconsistent. Vettese et al. (2009) evaluated 24 studies inspecting the associations between home practice quantity and clinical functioning in MAV interventions and found that only half of these studies demonstrated support for the clinical benefits of the practice. Only a minority of reviewed papers showed an association between MAV practices and skills improvement. Since this review, a few studies have shown that practices were associated with skills improvement or beneficial intervention outcomes (e.g., Kristeller, Wolever, & Sheets, 2014; Rosenzweig, Greeson, Reibel, Green, Jasser, & Beasley, 2010).

In addition to practice quantity, the frequency of practice has been investigated. Studies have reported that those who practiced over three times a week had less anxiety and depression (Perich, Manicavasagar, Mitchell, & Ball, 2013) and were less likely to relapse into depression (Crane et al., 2014) than those who practiced less often. Regarding the long-term effects of the

practices, the results have been mixed. Goldberg, Del Re, Hoyt, and Davis (2014) found no connection between practice time and intervention outcomes at the follow-up, but Perich et al. (2013) showed that practice time during intervention had a negative correlation with the level of depression at the 12-month follow-up. However, Perich et al. (2013) reported that the continuation of practice did not have significant effects at the follow-up. Grow, Collins, Harrop, and Marlatt (2015) found that more practice was associated with less substance abuse and craving at the follow-ups after the relapse prevention program. Vowles and McCracken (2008) also reported that changes in the self-reported acceptance and values-based action from pre- to follow-up measurement accounted for a significant amount of variance in well-being outcomes.

Studies have also reported the significance of practice quality apart from practice quantity (e.g., Goldberg et al., 2014), indicating that doing the practices is not enough; rather, the practices need to be done with attention and effort to generate positive effects. Furthermore, mindfulness skills improvement or pursuing a valued life have been reported to mediate outcomes in MAV interventions (e.g., Carmody & Baer, 2008; Forman, Herbert, Moitra, Yeomans, & Geller, 2007; Vowles & McCracken, 2008). Studies have also suggested that more psychological acceptance, less dysfunctional thinking, cognitive defusion, and willingness to act regardless of difficult thoughts and emotions mediate changes in well-being (e.g., Forman et al., 2007; Forman et al., 2012). The mediation studies indicate that learning these skills is essential to obtain favorable outcomes in MAV interventions. One way to measure practice quality is to assess how participants evaluate their progress in the skills acquisition. Altogether, previous research shows considerable variation in the significance of intervention practices for intervention outcomes. It is possible that the effects of the practices are different for different participants, and this variability can be revealed by using the person-centered approach.

### **The Present Study**

This study uses the person-centered approach to study individual differences and effects of a MAV intervention for burnout. This study investigates whether different profiles can be found based on both burnout and mindfulness skills and their changes during the eight-week MAV intervention and at the four-month follow-up. The novel contribution of this study is that it demonstrates how levels and changes of burnout and mindfulness skills are intertwined at the intra-individual level. The effectiveness of the MAV intervention used in this study has been determined in a randomized controlled trial (RCT) with treatment-as-usual (TAU) as a control condition, showing superior effects of the MAV compared to TAU (Puolakanaho, Tolvanen, Kinnunen, & Lappalainen, 2017). That study also found that MAV skills were the mediator of well-being outcomes, creating a basis for presuming that mindfulness skills development is associated with burnout development. The burnout-mindfulness skills profiles are also compared in terms of practice quantity (how many practices are performed during the intervention), frequency (how often practices are completed during the intervention), and continuation (how often participants practice between the end of the intervention and follow-up), as well as self-reported learning experiences. This increases the understanding of how these factors are associated with different burnout-mindfulness skills profiles. Thus, the research questions are as follows:

- 1) Can we identify different profiles based on burnout and mindfulness skills and their change patterns both during the intervention and the four-month follow-up? How do these profiles differ from one another?
- 2) Are there differences in the following intervention-related factors between the profiles?
  - a. Practice quantity during the intervention

- b. Practice frequency during the intervention
- c. Practice continuation after the intervention
- d. Learning experiences

Following the well-established practice in person-centered research, no detailed expectations are proposed regarding the number, level, or direction of the burnout-mindfulness skills profiles were set.

## **Method**

### **Procedure**

The present study was conducted as a part of the RCT titled “The Effectiveness of Mindfulness Practices in the Recovery of Burnout” (Muupu), which was funded by the Finnish Social Insurance Institution and registered under ClinicalTrials.gov. The research protocol was approved by the ethical committee of the Central Finland Health Care District. Results of the RCT are presented in Puolakanaho et al. (2017). The present study focuses on the differences among intervention participants. The participants were recruited using newspaper and web page announcements and with the help of partner employee-health-care units. Enrollment took place via a specific web page and was open to anyone who was interested in the study. After registering for the study, candidates were interviewed. The participants were selected based on information they provided in the enrollment questionnaires and during the selection interview. The inclusion criteria were the following: The person needed to be between 25 and 60 years old, to be currently working, to have an Internet connection that was available daily, and to belong to the group of the most exhausted workers in Finland according to the cutoff score of Bergen Burnout Indicator. The cutoff was set at the 75th percentile (39–47 points) of the age group, as reported in the manual by Näätänen et al. (2003). People who had regular psychotherapy, major

pharmaceutical changes, psychological or somatic conditions, or other practical reasons that would hinder their participation were excluded.

### **Participants and Sample Attrition**

Participants of the Muupu research were paired based on sex, age, and education. Each pair was randomly assigned to a MAV intervention group (10 separate groups,  $n = 109$ ) or to a control group (treatment-as-usual in Finland, 10 separate groups,  $n = 109$ ). The control group is not included in this study. A pilot study with two MAV groups was conducted before the RCT; the participants completed the same intervention program but did not go through the randomization ( $n = 27$ ). Except for two individuals, the pilot group participants fit the inclusion criteria. In the present study, the final sample consisted of both the randomized mindfulness group ( $n = 109$ ) and the pilot group ( $n = 27$ ). They received the intervention free of charge and gave informed consent. The participants did not receive payment or compensation for participating in the study. The participants received web questionnaires before the intervention (pre), after the intervention (post), and four months after the post-measurement (f-up). All the pre-measurements were completed within a two-week period before the start of the intervention. Reminders to complete the questionnaires were sent via e-mail and telephone.

Initially, 136 participants were assigned to the MAV groups; however, 29 (non-respondents [NR]) withdrew before completing the post-measurement, thereby yielding a sample of 107 individuals (respondents [R]). There were no significant differences in initial burnout (R:  $M = 4.15$ ,  $SD = 0.62$ ; NR:  $M = 4.40$ ,  $SD = 0.63$ ), sex (1 = male, 2 = female; R:  $M = 1.80$ ,  $SD = 0.40$ ; NR:  $M = 1.79$ ,  $SD = 0.41$ ), or education (R:  $M = 2.63$ ,  $SD = 0.54$ ; NR:  $M = 2.79$ ,  $SD = 0.62$ ) between these groups based on an independent samples  $t$ -test. However, the nonrespondents were slightly younger (R:  $M = 47.97$ ,  $SD = 7.83$ ; NR:  $M = 44.07$ ,  $SD = 7.53$ ) and

had higher initial stress (R:  $M = 2.22$ ,  $SD = 0.48$ ; NR:  $M = 2.43$ ,  $SD = 0.48$ ) than the respondents. Of the 107 participants who completed the post-measurement, two were excluded from the analyses because their burnout scores dropped significantly between enrollment and pre-measurement (randomization was completed in the enrollment phase when the burnout score of these participants matched the inclusion criteria). Their scores were too far ( $> 3 SD$ ) from the mean of the research sample. The final study sample ( $n = 105$ ) consisted of the participants who were either randomized to the mindfulness group ( $n = 81$ ) or belonged to the pilot group ( $n = 24$ ). No significant differences were found between the randomized and pilot participants in terms of sex, age, education, and the main study variables, namely burnout and mindfulness skills at pre-, post-, and f-up measurements ( $t$ -tests'  $p$ -values  $> .05$ ).

Participants from the central region of Finland were chosen because face-to-face group meetings were held in a city in central Finland. All the participants were Caucasian, and the majority (80%) were women. The average age of the participants was 47.8 ( $SD = 7.78$ , a range of 29–60 years), and the majority (69%) had a polytechnic or university degree. Of the respondents, 32% had vocational education and 2% had participated in short employment courses. The participants worked approximately 40.6 hours per week ( $SD = 8.67$ ). Of the respondents, 88% were married or cohabiting, 12% were divorced, 9% were single, and 1% were widowed. Twelve percent evaluated their economic situation as very good and 51% rated it as rather good, whereas 32% and 4% considered it rather tight and very tight, respectively.

The final sample consisted of 105 participants who completed both pre- and post-measurements. At the four-month follow-up, 2% ( $n = 2$ ) of the data were missing because a few participants did not complete the follow-up questionnaire. The data from other 98% of the participants was complete due to the web-questionnaire that required that every question was

answered before the form completion. Although the web-questionnaire data was almost complete, week-calendar data (practice quantity and frequency during the intervention) was missing from 10.5% ( $n = 11$ ) of the participants.

### **Intervention**

The program used in this study was a MAV intervention that followed the program described in Williams and Penman (2011). Value-based components and practices of ACT (Hayes, 2004; Lappalainen et al., 2009) were added to the program. The eight-week group intervention combined with a web-based program aimed at increasing mindfulness and acceptance skills and clarifying the values of the participants. The basic principles and weekly practices were presented in weekly group meetings and participants were guided to deepen their experiences through exercises and information provided via the Muupu-website. Each week of the program had its own theme, namely: (week 1) differentiating oneself from one's thoughts and emotions, and evaluating one's personal resources and the use of one's time; (week 2) practicing observing without evaluations, defining one's values, and forming individual intervention objectives; (week 3) experiencing the connection between mind and body and familiarizing oneself with the reactions that emerge in difficult situations; (week 4) recognizing the automaticity of thinking and distancing oneself from one's mind (own thoughts) and letting go of one's control efforts; (week 5) learning to face difficulties with openness, empathy, and curiosity; (week 6) practicing compassion and acceptance, clarifying one's own life and work values, and increasing value-based actions; (week 7) investigating the connection between mood and daily routines and recognizing the sources of joy and gratitude; and (week 8) recognizing coping strategies for future use, and defining reminders of being present in changing situations.

During the intervention, the participants were instructed to do formal mindfulness practices (e.g., body scan and breathing meditation, 10–15 minutes each) twice a day for six days a week. The participants were also instructed to do informal practices such as doing routine tasks mindfully. In addition, the participants had access to a wide variety of audiotapes and videos and were encouraged to use these to help them abandon their belief in the literal truth of their own thoughts and evaluations and to pursue valued lives. They were also advised to perform value-based actions in their daily lives. The intervention was standardized and delivered by two psychologists who had experience and education related to MAV interventions.

### **Measures of Outcomes**

Reliability statistics (Cronbach's alphas) for all the measures are presented in Table 1. Burnout was measured using the Bergen Burnout Indicator (subsequently BBI) (Näätänen et al., 2003), which is composed of 15 items and has three subscales: exhaustion (five items, e.g., "I am snowed under with work"), cynicism (five items, e.g., "I feel dispirited at my work and I think of leaving my job"), and reduced professional efficacy (five items, e.g., "I frequently question the value of my work"). The six-point response scale ranged from 1 (completely disagree) to 6 (completely agree). The scale was transformed into a five-point scale to make it easier to compare with the measure of mindfulness skills. The total mean score of the items was used. To assess the severity of pre-measurement burnout, the means of the age group-based estimates for mild (original scale [OS]: 2.96-3.30, transformed scale [TS]: 2.47-2.75) moderate (OS: 3.31-3.96, TS: 2.76-3.30), and severe burnout (OS: > 3.96, TS: > 3.30) were used as presented in Näätänen et al. (2003).

Mindfulness skills were measured using the Five-Facet Mindfulness Questionnaire (subsequently FFMQ) (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). The questionnaire



consists of 39 items measuring five facets of mindfulness: observing (eight items, e.g., “When I’m walking, I deliberately notice the sensations of my body moving”), describing (eight items, e.g., “I’m good at finding the words to describe my feelings”), acting with awareness (eight items, e.g., “When I do things, my mind wanders off and I’m easily distracted”), non-judging (eight items, e.g., “I criticize myself for having irrational or inappropriate emotions”), and non-reacting (seven items, e.g., “I perceive my feelings and emotions without having to react to them”). The five-point response scale ranged from 1 (never or very rarely true) to 5 (very often or always true). The total mean score of the items was used to acquire an overall picture of the mindfulness skills development.

### **Measures of Practices**

**Practice quantity.** The participants filled in week calendars that contained all the practices presented during the intervention. They marked the number of times they had performed each practice and the time of that practice (each weekday of every week had its own column). The participants were instructed to fill in the calendar immediately after the practice. Practices consisted of different kinds of mindfulness, acceptance, and value exercises. The sum score of the practices (PRAQ) was used as an indicator of overall practice.

**Practice frequency.** The overall frequency of practices per week was calculated from the week calendars which showed the number of days each week the participants had done the practices. The mean score of weekly frequencies (PRAF) was used.

**Practice continuation.** The continuation of practice was measured with two question sets in the follow-up questionnaire. The first question set (COMF) concerned the amount of time spent on mindfulness practices. It asked, “Do you do the following: a) formal mindfulness practices, b) other mindfulness practices, c) applying mindfulness to daily living, and d)

engaging in the material related to mindfulness?” The scale was as follows: 0 (I do not do them at all), 1 (less than 1 hour a week), 2 (1–2 hours a week), 3 (2–3 hours a week), and 4 (over 3 hours a week). The total mean score was used in the analyses. The second question set (COVA) was about the frequency with which values were pondered and value-based actions were performed in life in general and in the context of work. The following questions were asked: “How often do you ponder what the meaningful things in your life/work are?” and “How often do you consciously act to promote meaningful things in your life/work?” The scale was as follows: 0 (not at all), 1 (occasionally), 2 (monthly), 3 (weekly), and 4 (almost daily). The total mean score was used in the analyses.

**Learning experiences.** These were measured with the Learning Experience Questionnaire (LEQ) developed for this study (see Appendix A for details) to assess the acquisition of the skills practiced during the intervention. The questionnaire had 13 items that depicted the following: learning to recognize one’s thoughts, reactions, and behavior patterns; learning to apply mindfulness in one’s daily life; learning to clarify one’s values and to perform value-based actions; and learning to find opportunities to affect one’s well-being at work. The scale ranged from 1 (not at all) to 5 (very well). The total mean score at post-measurement and the mean change score from post- to follow-up measurement were used in the analyses.

### **Statistical Analysis**

Preliminary analyses were conducted using SPSS Statistics 22 to calculate the means, standard deviations, correlations (Spearman’s correlation), and reliabilities (Cronbach’s alphas) of the variables.

Latent profile analysis (LPA), which is a type of finite mixture modeling (Muthén & Muthén, 1998-2012; Sterba, 2013), was used to investigate profiles based on the levels and

changes of both burnout and mindfulness skills from pre- to post-intervention and to follow-up. LPA identifies latent classes (e.g., subpopulations) from the observed data and estimates the parameters for these latent classes (Muthén & Muthén, 1998-2012). LPA can be divided into a within-class and a between-class model: The within-class model defines how data are generated for persons in a certain class, while the between-class model defines how classes differ from each other (Sterba, 2013). In this study, the differences between the profiles were evaluated based on the mean differences in burnout and mindfulness skills. The within-class model was specified so that variances of burnout and mindfulness skills were fixed to be the same across the profiles. Burnout and mindfulness skills were not allowed to correlate with one another within the profiles. Within the latent profile, the observations are expected to follow multidimensional normal distribution. In LPA, people are not classified into certain profiles for subsequent analyses; rather, they are given the posterior probability of belonging to each profile, of which reason exact  $n$  values for the profiles are estimates (Vermunt & Magidson, 2002). This approach considers the uncertainty of the classification and strengthens the analyses. The parameters of the class solutions were estimated using the maximum likelihood estimation with robust standard errors (Muthén & Muthén, 1998-2012). At this stage, we also tested for differences between intervention groups (12 MAV groups that completed the intervention at different times) that could affect the LPA results. Intra-class correlations of burnout and mindfulness skills variables varied between .001 ( $p = .98$ ) and .029 ( $p = .63$ ), indicating that there were no significant differences between the groups.

LPA also provides statistical tests to determine the existence and number of latent classes (Muthén & Muthén, 1998). Because it is a model-based approach, the choice of group criteria is less arbitrary (Vermunt & Magidson, 2002). The following statistical criteria were used in this

study: a) the Bayesian information criterion (BIC) and b) the bootstrap likelihood ratio test (BLRT). The BIC and BLRT are the most consistent criteria for identifying the best-fitting solution based on simulation studies, and they perform well with small samples (Nylund, Asparouhov, & Muthén, 2007; Tolvanen, 2007). The solution with the lowest BIC value is considered the best-fitting model. The BLRT compares solutions with different numbers of latent profiles; a *p*-value below .05 suggests that the solution with *k* profiles fits the data better than the solution with *k*-1 profiles. The distinctiveness of the profiles was assessed using entropy and average latent class posterior probabilities (AvePP). Entropy illustrates the accuracy of the overall classification, while AvePP evaluates the certainty of placing an observation into a particular class using posterior probabilities. Using the most likely latent membership, AvePP is calculated for each of the classes, assessing the accuracy of the classifications. The values of both entropy and AvePP range from 0 to 1, and the values near 1 indicate a clear classification (Celeux & Soromenho, 1996). For the cases in the most likely latent class, an AvePP above .70 indicates that the solution that is found can be interpreted using the mean trajectories (Nagin, 2005). The theoretical interpretability of the profile solution was also considered.

The effect sizes for changes in burnout and mindfulness skills were calculated for each profile to evaluate the significance of the changes. The within-group effect size for change from pre- to post-measurement was calculated by dividing the mean change from pre- to post-measurement by the combined standard deviation of the three measurement points  $[(m_{\text{post}} - m_{\text{pre}})/\text{sqrt}((v_{\text{pre}} + v_{\text{post}} + v_{\text{f-up}})/3)]$  in the whole sample (Morris & DeShon, 2002). Corresponding calculations were performed for changes from post- to follow-up measurements as well as from pre- to follow-up measurements for both burnout and mindfulness skills. This effect size measure is comparable with Cohen's *d*, where .20 indicates a small effect size, .50 signifies a medium

effect size, and .80 denotes a large effect size (Cohen, 1992). Confidence intervals (95%) for the effect sizes were also calculated to evaluate the significance of the effects (Cohen, 1990); if the interval does not contain zero, this indicates a significant effect.

The identified profiles were compared in terms of practices and learning experiences. The equality of means of practices and learning experiences between profiles was tested using a chi-square test with posterior probability-based multiple imputations (Muthén & Muthén, 1998-2012). When class membership is used as an observed variable, the uncertainty of group classification can produce distorted estimates and standard errors (Clark & Muthén, 2009). By executing analyses with posterior probabilities, the uncertainty of the classification is considered. For these calculations, the chi-square test is a robust analysis method. The LPA and related analyses were performed using Mplus version 7 (Muthén & Muthén, 1998-2012).

## **Results**

### **Descriptive Statistics**

The means, standard deviations, Cronbach's alphas, and correlation matrix (Spearman's correlations) of the study variables are shown in Table 1.

### **Profiles of Burnout and Mindfulness Skills**

The fit information of the mixture modeling for simultaneously estimated burnout and mindfulness skills profiles is presented in Table 2. The six-profile solution was supported by the BLRT test and the BIC value. Both the entropy value (.90) and the AvePPs (range of .91–.99) were high, illustrating the distinctiveness of the profiles in the obtained solution. This solution was also clear when considered theoretically. Therefore, a six-profile solution was chosen for the subsequent analyses. Figure 1 shows the six profiles and the estimated means for burnout and mindfulness skills at the three measurement points. Table 3 presents results of the within-group

effect size calculations for the profiles. There was variation between the profiles regarding effect sizes during the follow-up period in terms of both burnout (a range of 0.35–4.92) and mindfulness skills (a range of 0.77–4.41). The profiles are described below in more detail.

Profile 1, “Mild burnout–benefited greatly,” was composed of 30.1% ( $n = 32$ ) of the participants ( $AvePP = .93$ ). There was a considerable decrease in burnout during the intervention, and the decrease continued until the follow-up, showing a large overall effect size. Mindfulness skills displayed also a continuing increase with a large effect size.

Profile 2, “Severe burnout–not benefited, but improved mindfulness skills,” included 29% ( $n = 30$ ) of the participants ( $AvePP = .91$ ). This profile had a continuing but insignificant decrease in burnout during the follow-up. Burnout was still moderate at the follow-up. Mindfulness skills increased significantly, showing a large overall effect size.

Profile 3, “Moderate burnout–benefited slightly,” consisted of 12.1% ( $n = 13$ ) of the participants ( $AvePP = .92$ ). The profile of these participants showed a decrease in burnout with a large effect size during the intervention. However, burnout increased a little after the intervention, diminishing the overall beneficial change in burnout to a slight decrease with a medium effect size. Even though the decrease was significant, burnout was still moderate at the follow-up. The similar kind of reverting change pattern was also found for mindfulness skills, but the increase during the follow-up period was still significant with a large effect size.

Profile 4, “Severe burnout–benefits not maintained,” included 11.5% ( $n = 12$ ) of the participants ( $AvePP = .95$ ). In this profile, there was a significant decrease in burnout from pre- to post-measurement with a medium effect size, but the change reverted to an insignificant level by the follow-up. Burnout was still severe at the follow-up. There was an insignificant increase in mindfulness skills during the follow-up period.

Profile 5, “Severe burnout–benefited greatly,” was composed of 9.5% ( $n = 10$ ) of the participants ( $AvePP = .94$ ). In this profile, the initial level of burnout was as severe as in Profile 4, but burnout reduced to low during the follow-up. Both the decrease in burnout and the increase in mindfulness skills continued up to the follow-up with a large overall effect size.

Profile 6, “Moderate burnout–benefited” ( $AvePP = .99$ ), consisted of 7.8% ( $n = 8$ ) of the participants. This profile had a decrease in burnout during the intervention, which was maintained until the follow-up, with a large overall effect size. The respondents in this profile had high mindfulness skills at the beginning of the study, and there was a significant increase in these skills, with a large overall effect size. There were slight reversions in the changes of both burnout and mindfulness skills, but these did not change the significance of the overall effects.

### **Differences in Practices and Learning Experiences Between the Profiles**

The profiles were the following: Profile 1, “Mild burnout–benefited greatly,” Profile 2, “Severe burnout–not benefited, but improved mindfulness skills”, Profile 3, “Moderate burnout–benefited slightly,” Profile 4, “Severe burnout–benefits not maintained,” Profile 5, “Severe burnout–benefited greatly,” and Profile 6, “Moderate burnout–benefited”. Regarding demographics, there were no significant differences in the age or in the education between the six profiles. However, the sex difference between the profiles was statistically significant (overall  $\chi^2(5) = 23.64, p = .000$ ). The pairwise comparisons showed that Profile 3, “Moderate burnout–benefited slightly,” had more men than the most of the other profiles and Profile 6, “Moderate burnout–benefited,” had more women than the most of the other profiles.

The differences in practices and learning experiences are shown in Table 4. There were no significant differences between the profiles regarding practice quantity (PRAQ int) or practice frequency (PRAF int) during the intervention. However, the profiles differed in the continuation

of practices. Profile 3 spent less time doing mindfulness practices (COMF) than Profiles 1, 2, 5, and 6. Profiles 2, 3, and 4 performed the value practices (COVA) less often than Profile 6, and Profile 3 performed them less often than Profiles 1 and 5. Profile 1 spent less time doing both mindfulness and value practices than Profile 6. There were also differences in the learning experiences. Profile 3 experienced less learning (LEQ post) than Profiles 1, 2, 5, and 6. In addition, Profiles 2 and 4 experienced less learning than Profiles 5 and 6. Profile 1 experienced less learning than Profiles 5 and 6. There were no significant differences between the profiles in the change score of learning experiences from post-measurement to follow-up (LEQ change).

### **Discussion**

A recent review of the person-centered approach to burnout research (Mäkikangas & Kinnunen, 2016) suggests that there is variation in burnout development both in general and in the intervention context. The present study used the person-centered approach to investigate burnout development during the eight-week mindfulness-, acceptance-, and value-based (MAV) intervention and the four-month follow-up. Compared to previous person-centered intervention studies, burnout and intervention-related outcome, mindfulness skills, were used simultaneously to create the profiles. The study revealed six profiles that showed different baseline levels and change patterns for both burnout and mindfulness skills. When effect sizes of the changes were considered, majority of the profiles showed beneficial changes in terms of reduction in burnout (Profiles 1, 3, 5, and 6; 59.5% of the participants) and improvement of mindfulness skills (Profiles 1, 2, 3, 5, and 6; 88.5%). However, there were differences in the levels of changes between the profiles. The results offer a more detailed picture of intervention effectiveness than previous whole-sample level studies (e.g., Khoury et al., 2015; Regehr et al., 2014).



There were two profiles (Profiles 1 and 5) that benefited greatly from the intervention (39.6% of the participants). The profiles showed considerable and continuing decrease in burnout and increase in mindfulness skills, with large overall effect sizes. The level of burnout was low at the follow-up, and especially the results of Profile 5 (decrease in burnout from high to low) were promising. Consequently, people with severe initial burnout appeared to benefit greatly from this brief MAV intervention. In addition to these profiles, Profile 6 had decrease in burnout and increase in mindfulness skills that were maintained up to the follow-up, with large overall effect sizes. This profile was considered to have benefited from the intervention, with relatively low burnout at the follow-up. These three profiles account for 47.4% of the participants, indicating that approximately half of the participants had considerable reductions in burnout.

Of the last three profiles, Profile 3 was considered to have benefited slightly from the intervention, since there was significant decrease in burnout during the follow-up period, although the initial reduction during the intervention was partly reversed before the follow-up. Profile 2 had insignificant change in burnout, but the trend was towards continued burnout reduction. It would have been interesting to observe if the reduction had continued and if the changes would have been more favorable with longer follow-up period. In Profiles 2 and 3, burnout was still moderate at the follow-up, but both profiles had considerable increase in mindfulness skills. There was also a profile (11.5%) that did not benefit from the intervention in terms of either burnout or mindfulness skills.

Overall, the profiles demonstrated that burnout and mindfulness skills can have different change patterns in the intervention context. MAV skills have been identified as a mediator of intervention outcomes in the MAV intervention in question (Puolakanaho et al., 2017), and for the most part burnout and mindfulness skills appeared to have simultaneous increases and

decreases within the profiles. However, there were differences in the magnitude of the changes and significant increases in mindfulness skills did not necessarily mean significant decreases in burnout. The person-centered approach revealed a more detailed picture of the associations between burnout and mindfulness skills than variable-centered approach did. The person-centered approach enables new ways to study mechanisms of change and offers methods to understand how individual variation affects the results of effectiveness studies. This approach can also be used to study the mechanisms of intervention effects in more detail. This kind of knowledge is also useful in clinical practice, for example, when determining for whom these kinds of short MAV interventions are beneficial. Furthermore, these profiles show that the results of an intervention are not definite by the evaluation at the end of the treatment period. For some participants, the benefits can begin to manifest slowly after the intervention and for some participants the initial positive development can reverse after a few months. Adding occasional follow-up sessions to the short interventions could be good practice to evaluate if the offered treatment has been sufficient. Additional help could then be offered to those that need it.

To further understand profile differences, we examined the differences in intervention practices and learning experiences. Although previous research (e.g., Carmody & Baer, 2008; Perich et al., 2013) indicates that practice quantity and frequency are associated to intervention outcomes, in this study, neither did differentiate the profiles during the intervention. Generally, all the profiles performed less formal practices than was instructed in the program (twice a day, six days a week), but some of the profiles experienced great changes regardless of this. This calls into question how practices should be completed to obtain positive effects; for example, enhancing the practice quality could be more important than merely increasing the practice quantity (see, e.g., Goldberg et al., 2014). In the present study, some of the participants could

have merely performed the practices by playing the audiotapes, rather than focusing on the practices completely and learning the principles entailed in them.

It has been reported that more psychological acceptance, cognitive defusion, and willingness to act regardless of difficult thoughts mediated changes in well-being following MAV interventions (e.g., Forman et al., 2007; Forman et al., 2012). In accordance with earlier findings, the profiles with the most beneficial changes experienced more learning of MAV skills than most of the other profiles which offers some support to the importance of practice quality. Profile 3, “Moderate burnout–benefited slightly,” experienced significantly less learning than almost all the other profiles. In this profile, the reduction of burnout was significant during the intervention but during the follow-up the positive development of both mindfulness skills and burnout was reversed. It is possible that they had not learned the new skills in a way that they were ready to practice independently. Longer intervention or more support during the intervention could have helped the participants with these kinds of learning experiences to maintain the benefits after the intervention. By following the learning, it could be possible to offer additional support to participants who struggle with learning the new skills.

Although there were no differences in practice quantity and frequency during the intervention, the profiles differed in the continuation of mindfulness and value practices after the intervention. Profiles in which the beneficial changes in mindfulness skills were continued or maintained after the intervention did both more mindfulness practices and value pondering than the profiles with less beneficial changes. In previous studies, practice continuation was not significant for the beneficial outcomes at the follow-up (Perich et al., 2013). However, the practice time during the intervention predicted better outcomes at the follow-up (Grow et al., 2015), and the present study supports the importance of continued practice.

The patterns for the continuation of mindfulness and value practices resembled each other in the profiles and those profiles with higher mindfulness practice continuation also reported more value pondering. Especially Profile 6 (“Moderate burnout–benefited”) was active with both types of practices and although the burnout reduction in this profile was not as high as in Profiles 1 and 5, it demonstrated the highest mindfulness skills throughout the follow-up period.

Mindfulness and value practices can support each other and lead to better long-term effectiveness of the intervention when combined in daily life. Overall, practice continuation can indicate that the participants have incorporated mindfulness and value practices into their daily lives more permanently. In some intervention programs, follow-up meetings have been used to enhance long-term intervention effectiveness. Regular follow-up sessions that are repeated a few times a year could be added to the present program as well to improve learning and practice continuation.

### **Limitations and Future Research**

The sample size was relatively small for latent profile analysis; however, it was suitable for the exploratory nature of this study, and the obtained solution was distinctive. One limitation in latent profile analysis is that it can produce additional spurious latent profiles in the case that correlation between main variables, mindfulness skills and burnout, exists within profiles (Lubke & Neale, 2006). In the analyses of this study, mindfulness skills and burnout were not allowed to correlate within profiles. In the present study, the mindfulness skills measure was used as a composite score, as the overall development of mindfulness skills was on the focus. There have been studies indicating that all the facets do not have similar associations with well-being outcomes, especially when inexperienced meditators are evaluated (e.g., Baer et al., 2006).

Therefore, an interesting venue for future research would be to evaluate the simultaneous development of burnout and different facets of mindfulness skills.

There was dropout before the pre-measurement, and differences were found between respondents and nonrespondents, which might have resulted in bias in the sample. It is also important to remember that the respondents participated voluntarily in the intervention and that most of them were highly educated. The follow-up period was relatively short; a longer follow-up would have allowed a more comprehensive analysis of the stability of changes. All the participants did not return the week calendar of their practices which could have affected the results regarding the importance of the practice quantity and frequency during the intervention as differentiators between the profiles. There was also relatively high variation in practice times within the profiles (high standard deviation), which could have dissipated the differences between the profiles. Moreover, all the measures were self-rated.

More research on individual outcome profiles should be done to test if the profiles of the present study are replicable in different settings. This approach could illuminate if these kinds of outcome profiles are unique for intervention participants. It would also be important to understand in more detail the associations between burnout and mindfulness skills within the different profiles. In the present study, burnout and mindfulness skills appeared to have mostly simultaneous increases and decreases within the profiles. However, the magnitude of changes differed which could indicate that there are differences in the associations of burnout and mindfulness skills between the profiles. In the future, more intensive longitudinal studies would be needed in order to investigate the intra-individual change processes in more detailed manner. It would also be interesting to study the profiles of burnout and mindfulness skills development in the control condition where no intervention was administered. Furthermore, the conclusions

regarding the importance of learning experiences and practice continuation for the development of burnout and mindfulness skills are based on correlational findings and need to be verified with experimental design.

### **Conclusions**

This study revealed six distinctive outcome profiles among participants of a brief MAV intervention. It showed that even people with severe initial burnout can benefit from a brief MAV intervention. Short MAV interventions could be a cost-effective way to alleviate burnout. The results also indicate that higher learning of MAV skills during the intervention and practice continuation after the intervention could lead to more substantial changes in burnout and mindfulness skills. Occasional follow-up sessions could be used to enhance practice continuation and learning after the intervention, and this could increase long-term intervention effectiveness.

## References

- Ahola, K., & Hakanen, J. (2014). Burnout and health. Teoksessa Leiter, M. P., Bakker, A. B. & Maslach, C. (Eds.), *Burnout at work: A psychological perspective* (pp. 10–31). Hove, East Sussex: Psychology Press.
- Ahola, K., Honkonen, T., Kalimo, R., Nykyri, E., Aromaa, A., & Lönnqvist, J. (2004). Työuupumus Suomessa. Terveys 2000 -tutkimuksen tuloksia [Burnout in Finland – results from the Finnish Health 2000 Study]. *Suomen Lääkärilehti*, *59*, 4109–4113.
- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, *13*, 27–45.  
doi:10.1177/1073191105283504
- Bergman, L.R., & Lundh, L.-G. (2015). Introduction: The person-oriented approach: Roots and roads to the future. *Journal for Person-Oriented Research*, *1*, 1–6. doi:  
<http://dx.doi.org/10.17505/jpor.2015.01>
- Bravo, A. J., Boothe, L. G., & Pearson, M. R. (2016). Getting Personal with Mindfulness: a Latent Profile Analysis of Mindfulness and Psychological Outcomes. *Mindfulness*, *7*, 420–432. doi: 10.1007/s12671-015-0459-7
- Brinkborg, H., Michanek, J., Hesser, H., & Berglund, G. (2011). Acceptance and commitment therapy for the treatment of stress among social workers: A randomized controlled trial. *Behaviour Research and Therapy*, *49*, 389-398.  
doi:10.1016/j.brat.2011.03.009
- Carmody, J., & Baer, R. A. (2008). Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress reduction program. *Journal of Behavioral Medicine*, *31*, 23–33.  
doi:10.1007/s10865-007-9130-7

- Celeux, G., & Soromenho, G. (1996). An entropy criterion for assessing the number of clusters in a mixture model. *Journal of Classification*, *13*, 195–212.  
doi:10.1007/BF01246098
- Clark, S. L., & Muthén, B. (2009). *Relating latent class analysis results to variables not included in the analysis*. Manuscript submitted for publication. Retrieved from <http://statmodel2.com/download/relatinglca.pdf>
- Cohen, J. (1990). Things I have learned (so far). *American Psychologist*, *45*, 1304–1312.  
doi:10.1037/0003-066X.45.12.1304.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, *112*, 155–159. doi:10.1037/0033-2909.112.1.155
- Crane, C., Crane, R. S., Eames, C., Fennell, M. J., Silverton, S., Williams, J. M. G., & Barnhofer, T. (2014). The effects of amount of home meditation practice in Mindfulness Based Cognitive Therapy on hazard of relapse to depression in the Staying Well after Depression Trial. *Behaviour Research and Therapy*, *63*, 17–24.  
doi:10.1016/j.brat.2014.08.015
- Forman, E. M., Chapman, J. E., Herbert, J. D., Goetter, E. M., Yuen, E. K., & Moitra, E. (2012). Using session-by-session measurement to compare mechanisms of action for acceptance and commitment therapy and cognitive therapy. *Behavior Therapy*, *43*, 341–354. doi:10.1016/j.beth.2011.07.004
- Forman, E. M., Herbert, J. D., Moitra, E., Yeomans, P. D., & Geller, P. A. (2007). A randomized controlled effectiveness trial of acceptance and commitment therapy and cognitive therapy for anxiety and depression. *Behavior Modification*, *31*, 772–799.  
doi:10.1177/0145445507302202
- Goldberg, S. B., Del Re, A. C., Hoyt, W. T., & Davis, J. M. (2014). The secret ingredient in



mindfulness interventions? A case for practice quality over quantity. *Journal of Counseling Psychology*, *61*, 491–497. doi:10.1037/cou0000032

Grow, J. C., Collins, S. E., Harrop, E. N., & Marlatt, G. A. (2015). Enactment of home practice following mindfulness-based relapse prevention and its association with substance-use outcomes. *Addictive Behaviors*, *40*, 16–20.

doi:10.1016/j.addbeh.2014.07.030

Hayes, S. C. (2004). Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies. *Behavior Therapy*, *35*, 639–665.

doi:10.1016/S0005-7894(04)80013-3

Hayes, S. C., Bond, F. W., Barnes-Holmes, D., & Austin, J. (Eds.) (2006). *Acceptance and mindfulness at work: Applying acceptance and commitment therapy and relational frame theory to organizational behavior management*. New York: The Haworth Press. Also published in *Journal of Organizational Behavior Management*, *26*, numbers 1/2.

Hätinen, M., Kinnunen, U., Mäkikangas, A., Kalimo, R., Tolvanen, A., & Pekkonen, M. (2009). Burnout during a long-term rehabilitation: Comparing low burnout, high burnout–benefited, and high burnout–not benefited trajectories. *Anxiety, Stress & Coping*, *22*, 341–360. doi:10.1080/10615800802567023

Hätinen, M., Mäkikangas, A., Kinnunen, U., & Pekkonen, M. (2013). Recovery from burnout during a one-year rehabilitation intervention with six-month follow-up: Associations with coping strategies. *International Journal of Stress Management*, *20*, 364–390.

doi:10.1037/a0034286

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present and future. *Clinical Psychology: Science and Practice*, *10*, 144–156. doi:10.1093/clipsy/bpg016

Khoury, B., Sharma, M., Rush, S. E. & Fournier, C. (2015). Mindfulness-based stress

- reduction for healthy individuals: A meta-analysis. *Journal of Psychosomatic Research*, 78, 519–528. doi: 10.1016/j.jpsychores.2015.03.009
- Kiken, L. G., Garland, E. L., Bluth, K., Palsson, O. S., & Gaylord, S. A. (2015). From a state to a trait: Trajectories of state mindfulness in meditation during intervention predict changes in trait mindfulness. *Personality and Individual Differences*, 81, 41–46. doi:10.1016/j.paid.2014.12.044
- Kristeller, J., Wolever, R. Q., & Sheets, V. (2014). Mindfulness-based eating awareness training (MB-EAT) for binge eating: A randomized clinical trial. *Mindfulness*, 5, 282–297. doi: 10.1007/s12671-012-0179-1
- Lappalainen, R., Lehtonen, T., Hayes, S., Batten, S., Gifford, E., Wilson, K., ... McCarry, S. (2009). *Hyväksymis- ja omistautumisterapia käytännön terapiatyössä* [Acceptance and commitment therapy in therapeutic practice]. Tampere: Suomen Käyttäytymistieteellinen Tutkimuslaitos Oy. Hoitomenetelmien julkaisuja 8.1.
- Laursen, B., & Hoff, E. (2006). Person-centered and variable-centered approaches to longitudinal data. *Merrill-Palmer Quarterly*, 52, 377–389. doi: <http://dx.doi.org/10.1353/mpq.2006.0029>
- Lloyd, J., Bond, F. W., & Flaxman, P. E. (2013). The value of psychological flexibility: Examining psychological mechanisms underpinning a cognitive behavioural therapy intervention for burnout. *Work & Stress*, 27, 181–199. doi: 10.1080/02678373.2013.782157
- Lubke, G., & Neale, M. C. (2006). Distinguishing between latent classes and continuous factors: Resolution by maximum likelihood? *Multivariate Behavioral Research*, 41, 499–532. doi: 10.1207/s15327906mbr4104\_4
- Maslach, C., Jackson, S., & Leiter, M. P. (1996). *MBI: Maslach burnout inventory manual*

- (3<sup>rd</sup> ed.). Palo Alto, CA: Consulting Psychologists Press.
- Morris, S. B., & DeShon, R. P. (2002). Combining effect size estimates in meta-analysis with repeated measures and independent-groups designs. *Psychological Methods*, *7*, 105–125. doi:10.1037/1082-989X.7.1.105
- Muthén, L. K., & Muthén, B. O. (1998-2012). *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.
- Muthén, L. K., & Muthén, B. O. (2000). Integrating person-centered and variable-centered analyses: Growth mixture modeling with latent trajectory classes. *Alcoholism: Clinical and Experimental Research*, *24*, 882–891. doi:10.1111/j.1530-0277.2000.tb02070.x
- Mäkikangas, A., & Kinnunen, U. (2016). The person-oriented approach to burnout: A systematic review. *Burnout Research*, *3*, 11–23. doi: 10.1016/j.burn.2015.12.002
- Nagin, D. S. (2005). *Group-based modeling of development*. Cambridge, MA: Harvard.
- Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling*, *14*, 535–569. doi:10.1080/10705510701575396
- Näätänen P., Aro, A., Matthiesen, S., & Salmela-Aro, K. (2003). *Bergen burnout indicator 15*. Helsinki: Edita.
- Pearson, M. R., Lawless, A. K., Brown, D. B., & Bravo, A. J. (2015). Mindfulness and emotional outcomes: Identifying subgroups of college students using latent profile analysis. *Personality and Individual Differences*, *76*, 33–38. doi:10.1016/j.paid.2014.11.009
- Perich, T., Manicavasagar, V., Mitchell, P. B., & Ball, J. R. (2013). The association between meditation practice and treatment outcome in mindfulness-based cognitive therapy for bipolar disorder. *Behaviour Research and Therapy*, *51*, 338–343.

doi:10.1016/j.brat.2013.03.006

Puolakanaho, A., Tolvanen, A., Kinnunen, S. M., & Lappalainen, R. (2017). Mindfulness, Acceptance, and Value-based Skills Mediate Multiple Outcomes in Burnout Intervention: A Randomized Controlled Trial. In review.

Regehr, C., Glancy, D., Pitts, A., & LeBlanc, V. R. (2014). Interventions to reduce the consequences of stress in physicians: A review and meta-analysis. *The Journal of Nervous and Mental Disease*, 202, 353–359. doi:10.1097/NMD.0000000000000130

Rosenzweig, S., Greeson, J. M., Reibel, D. K., Green, J. S., Jasser, S. A., & Beasley, D. (2010). Mindfulness-based stress reduction for chronic pain conditions: Variation in treatment outcomes and role of home meditation practice. *Journal of Psychosomatic Research*, 68, 29–36. doi:10.1016/j.jpsychores.2009.03.010

Sterba, S. K. (2013). Understanding linkages among mixture models. *Multivariate Behavioral Research*, 48, 775–815. doi:10.1080/00273171.2013.827564

Suvisaari, J., Ahola, K., Kiviruusu, O., Korkeila, J., Lindfors, O., Mattila, A., ... & Pirkola, S. (2012). Psykkiset oireet ja mielenterveyden häiriöt. In S. Koskinen, A. Lundqvist & N. Ristiluoma (Eds.), *Terveys, toimintakyky ja hyvinvointi Suomessa 2011* [Health, workability, and well-being in Finland 2011] (pp. 96–107). Raportti 68/2012. Helsinki: Terveiden ja hyvinvoinnin laitos.

Tolvanen, A. (2007). *Latent growth mixture modeling: A simulation study*. Finland: University of Jyväskylä.

Vermunt, J. K., & Magidson, J. (2002). Latent class cluster analysis. In J. Hagenars & A. McCutcheon (Eds.), *Applied Latent Class Analysis* (pp. 89–106). New York, NY: Cambridge University Press. doi:10.1017/CBO9780511499531.004

Vettese, L. C., Toneatto, T., Stea, J. N., Nguyen, L., & Wang, J. J. (2009). Do mindfulness

meditation participants do their homework? And does it make a difference? A review of the empirical evidence. *Journal of Cognitive Psychotherapy*, 23, 198–225.

doi:10.1891/0889-8391.23.3.198

Villardaga, R., Luoma, J. B., Hayes, S. C., Pistorello, J., Levin, M. E., Hildebrandt, M. J., ...

Bond, F. (2011). Burnout among the addiction counseling workforce: The differential roles of mindfulness and values-based processes and work-site factors. *Journal of Substance Abuse Treatment*, 40, 323–335. doi:10.1016/j.jsat.2010.11.015

Virgili, M. (2015). Mindfulness-based interventions reduce psychological distress in working adults: A meta-analysis of intervention studies. *Mindfulness*, 6, 326–337.

doi:10.1007/s12671-013-0264-0

Vowles, K. E., & McCracken, L. M. (2008). Acceptance and values-based action in chronic pain: A study of treatment effectiveness and process. *Journal of Consulting and Clinical Psychology*, 76, 397–407. doi:10.1037/0022-006X.76.3.397

Williams, M., & Penman, D. (2011). *Mindfulness: A practical guide to finding peace in a frantic world*. London, England: Piatkus.

Table 1

*Means, Standard Deviations, Reliabilities (Cronbach's Alphas), and Correlations of the Study Variables*

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11
1 BBI pre	3.20	0.54	<b>.78</b>										
2 BBI post	2.61	0.75	.51**	<b>.90</b>									
3 BBI f-up	2.48	0.84	.43**	.73**	<b>.92</b>								
4 FFMQ pre	3.18	0.46	-.36**	-.01	-.07	<b>.91</b>							
5 FFMQ post	3.56	0.41	-.11	-.31**	-.33**	.37**	<b>.92</b>						
6 FFMQ f-up	3.60	0.46	-.08	-.31**	-.49**	.51**	.72**	<b>.93</b>					
7 PRAQ int	111.65	52.67	.02	.13	.02	.03	-.02	.04	<b>.74</b>				
8 PRAF int	5.58	2.63	.02	.13	.02	.03	-.02	.04	1.00**	-			
9 COMF	1.00	0.76	.12	-.05	-.12	.17	.31**	.51**	.23*	.23*	<b>.75</b>		
10 COVA	2.68	0.86	.09	-.09	-.11	.17	.35**	.42**	.04	.04	.39**	<b>.86</b>	
11 LEQ post	3.40	0.56	.03	-.22*	-.27**	.29**	.54**	.61**	.14	.14	.30**	.26**	<b>.91</b>
12 LEQ change	-0.00	0.52	.07	-.06	-.19	-.01	.12	.26**	.01	.01	.34**	.31**	-.22*

*Note.* BBI = Bergen Burnout Indicator, FFMQ = Five Facet Mindfulness Questionnaire, PRAQ = practice quantity, PRAF = practice frequency, COMF = continuation of mindfulness practices, COVA = continuation of value practices, LEQ = Learning Experiences Questionnaire, int = during the intervention, change = from post- to follow-up.

Responses that were more than three standard deviations from the sample mean were relocated to the tails (3 *SD*) of the distribution of the variable before the analyses. Reliability estimates (Cronbach's alphas) for scales are presented on the diagonal in bold.

*N* = 94–105.

\*\*  $p < .01$ . \*  $p < .05$ .

Table 2

*The Fit Information of the Mixture Analysis of Burnout and Mindfulness Skills*

Profiles	logL	BIC	BLRT	Entropy
1	-517.943	1091.733	-	-
2	-454.955	998.336	.0000	0.814
3	-434.986	990.975	.0000	0.796
4	-414.962	983.505	.0000	0.842
5	-396.047	978.252	.0000	0.881
<b>6</b>	<b>-374.806</b>	<b>968.347</b>	<b>.0000</b>	<b>0.896</b>
7	-367.887	987.088	.2381	0.907

*Note.* logL = log likelihood, BIC = Bayesian information criterion, BLRT = bootstrap likelihood ratio test, Entropy = accuracy of overall classification.

The fit information supporting the chosen solution is bolded.

Burnout has been measured using Bergen Burnout Indicator (BBI) and mindfulness skills using Five Facet Mindfulness Questionnaire (FFMQ).

Table 3

*Within-Profile Effect Sizes and Confidence Intervals (CIs) for Burnout and Mindfulness Skills*

			Effect size estimate	CI Lower 2.5%	CI Upper 2.5%
Profile 1	Burnout	pre vs. post	1.65***	1.18	2.12
		post vs. f-up	0.58*	0.02	1.14
		pre vs. f-up	2.23***	1.60	2.85
	Mindfulness skills	pre vs. post	1.14***	0.65	1.63
		post vs. f-up	0.42*	0.04	0.79
		pre vs. f-up	1.56***	1.08	2.04
Profile 2	Burnout	pre vs. post	0.48	-0.41	1.36
		post vs. f-up	0.56	0.00	1.11
		pre vs. f-up	1.03	-0.14	2.20
	Mindfulness skills	pre vs. post	0.81*	0.19	1.43
		post vs. f-up	0.17	-0.23	0.58
		pre vs. f-up	0.99**	0.42	1.56
Profile 3	Burnout	pre vs. post	1.23**	0.51	1.96
		post vs. f-up	-0.60	-1.45	0.25
		pre vs. f-up	0.63*	0.13	1.14
	Mindfulness skills	pre vs. post	1.35***	0.73	1.97
		post vs. f-up	-0.47	-1.34	0.40
		pre vs. f-up	0.88*	0.03	1.73
Profile 4	Burnout	pre vs. post	0.74*	0.01	1.47
		post vs. f-up	-0.39	-0.89	0.12
		pre vs. f-up	0.35	-0.40	1.11
	Mindfulness skills	pre vs. post	0.87	-0.39	2.14
		post vs. f-up	-0.11	-0.97	0.76
		pre vs. f-up	0.77	-0.06	1.60
Profile 5	Burnout	pre vs. post	3.91***	2.98	4.84
		post vs. f-up	1.01*	0.05	1.97
		pre vs. f-up	4.92***	3.68	6.16
	Mindfulness skills	pre vs. post	3.94***	2.32	5.57
		post vs. f-up	0.47	-0.45	1.39
		pre vs. f-up	4.41***	2.47	6.35
Profile 6	Burnout	pre vs. post	1.37**	0.41	2.33
		post vs. f-up	-0.28	-1.24	0.68
		pre vs. f-up	1.09**	0.27	1.91
	Mindfulness skills	pre vs. post	1.39***	0.96	1.82
		post vs. f-up	-0.10	-0.65	0.45
		pre vs. f-up	1.29**	0.52	2.06

Note. \*\*\*  $p < .001$ . \*\*  $p < .01$ . \*  $p < .05$ . ES  $> .20$  small. ES  $> .50$  medium. ES  $> .80$  large.

Burnout has been measured using Bergen Burnout Indicator (BBI) and mindfulness skills using Five Facet Mindfulness Questionnaire (FFMQ).



Table 4

*Means and Standard Errors of Practices and Learning for the Profiles and  $\chi^2$  Test Results*

Profile	1 (30.1%, <i>n</i> = 32)	2 (29.0%, <i>n</i> = 30)	3 (12.1%, <i>n</i> = 13)	4 (11.5%, <i>n</i> = 12)	5 (9.5%, <i>n</i> = 10)	6 (7.8%, <i>n</i> = 8)	Test scores	
Measure	M (SE)	M (SE)	M (SE)	M (SE)	M (SE)	M (SE)	Overall $\chi^2(p)$	Pairwise comparisons
PRAQ int	107.58 (11.35)	114.93 (9.92)	111.90 (23.25)	111.73 (16.22)	105.30 (11.80)	122.42 (17.65)	0.99 (.963)	
PRAF int	5.38 (0.57)	5.75 (0.50)	5.59 (1.16)	5.59 (0.81)	5.27 (0.59)	6.12 (0.88)	0.99 (.963)	
COMF f- up	0.96 (0.14)	1.03 (0.13)	0.44 (0.17)	0.92 (0.23)	1.40 (0.24)	1.60 (0.28)	14.28 (.014)	3 < 1, 2, 5, 6 1 < 6
COVA f- up	2.70 (0.15)	2.63 (0.16)	2.07 (0.27)	2.60 (0.29)	3.11 (0.21)	3.41 (0.18)	23.34 (.000)	1, 2, 3, 4 < 6 3 < 1, 5
LEQ post	3.41 (0.11)	3.39 (0.07)	2.98 (0.11)	3.05 (0.18)	3.96 (0.16)	3.86 (0.12)	45.15 (.000)	3 < 1, 2, 5, 6 1, 2, 4 < 5, 6
LEQ change	-0.04 (0.11)	0.01 (0.08)	-0.16 (0.15)	-0.12 (0.18)	0.29 (0.15)	0.18 (0.19)	5.50 (.358)	

*Note.* PRAQ = practice quantity, PRAF = practice frequency, COMF = continuation of mindfulness practices, COVA = continuation of value practices, LEQ = Learning Experiences Questionnaire, int = during the intervention, f-up = 6-month follow-up, change = from post- to follow-up measurement.

Responses that were more than three standard deviations from the sample mean were relocated to the tails (3 *SD*) of the distribution of the variable before the analyses.

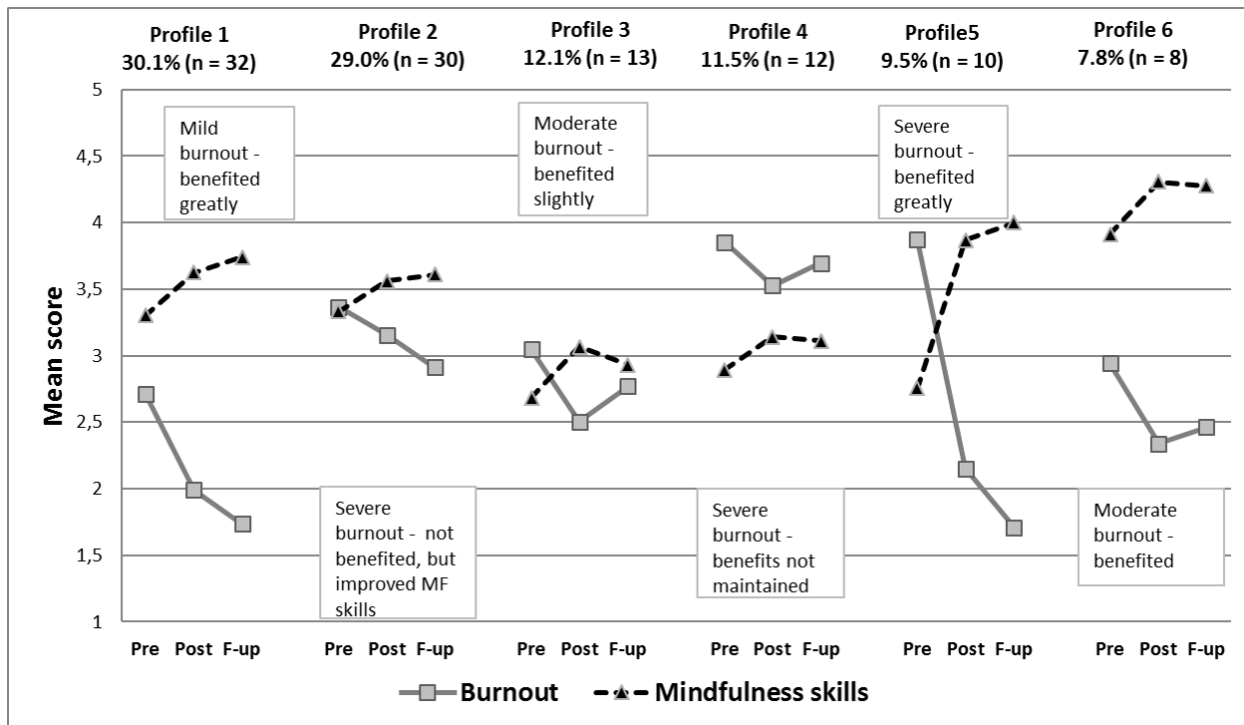


Figure 1. Estimated means for burnout and mindfulness skills for the latent profiles at three measurement points (n = 105)

Note. Cut-offs for burnout scores based on Näätänen et al. (2003). Mild burnout 2.47-2.75, moderate burnout 2.76-3.30, severe burnout > 3.30.

Burnout has been measured using Bergen Burnout Indicator (BBI) and mindfulness skills using Five Facet Mindfulness Questionnaire (FFMQ).

## Appendix A.

## Learning Experiences Questionnaire (LEQ)

The LEQ questionnaire has been developed for the research project titled “The Effectiveness of Mindfulness Practices in the Recovery of Burnout” (Muupu). Its author is Anne Puolakanaho.

Here are the instructions, scale, and the items of the questionnaire:

Assess the following items compared to the situation before the Muupu intervention.

Choose the option that best describes your experience:

1 = Not at all, 2 = Rather poorly, 3 = To some extent, 4 = Rather well, 5 = Very well

Table A1

*Items of the LEQ questionnaire*

- 
1. I have learned to be mindful of my thoughts, emotions, and bodily reactions.
  2. I have learned to recognize my behavior patterns, especially my pursuing and avoidance efforts.
  3. I have learned to let go of harmful mental models.
  4. I have learned to apply mindfulness skills into my daily life.
  5. I have learned to let go of my routinized habits.
  6. I have learned to renew my customary ways to function in life.
  7. I have learned to clarify my values.
  8. I have learned to plan value-based actions.
  9. I have learned to perform value-based actions.
  10. I have learned to clarify view of my work conditions.
  11. I have learned to clarify if my values are fulfilled in my work.
  12. I have learned to define what I can myself do to promote my well-being at work.
  13. I have learned to clarify how my work conditions could be developed to support my well-being at work and to prevent burnout.
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