Promoting Sustainability: The Effects of Workplace Mindfulness Training

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Abstract

Mindfulness training is enjoying growing popularity in workplaces. In the current study, the effects of workplace mindfulness training were evaluated using quantitative and qualitative methods. The study's novelty value arises from the implementation of workplace training among factory employees and the mixed-methods approach to evaluation. The quasi-experimental design with training and control groups included pre- and post-measurements and four focus group interviews. The results of the pre-post-test indicated that, compared with the participants in the control group, the participants in the mindfulness-based training group displayed significantly greater increases in mindfulness, positive emotions and hope pathways after training. The findings from the focus group interviews also indicated positive effects associated with relaxation, creativity at work, quality of social interactions and quality of sleep. The participants also perceived challenges in the training, such as inexperience, odd and difficult mindfulness practices, difficulties with home practice, a lack of social support and the demanding features of the environment. These results were discussed in light of the added value of the mixed-methods evaluation approach.

Key Words: workplace mindfulness training, mindfulness, positivity, hope

Introduction

Mindfulness training is enjoying growing popularity in work life settings, with the aim to increase employees' mindfulness level and thereby their well-being. Prior evidence suggests that higher mindfulness is associated with reduced stress (Ciesa and Serretti, 2009) and better recovery from work (e.g. Hülsheger, Land, Depenbrock, Fehrmann, Zijlstra and Alberts, 2014). Mindfulness can be defined as non-judgmental, moment-to-moment awareness which can be cultivated through formal meditation and informal practice in everyday life (e.g. Kabat-Zinn, 2003). Trait mindfulness refers to how mindful individual tend to be and act in daily life. Mindfulness is constituted of various facets, such as non-reacting, observing, acting with awareness, describing and non-judging experiences. Of these, non-reacting, defined as the ability to step back from and not be overwhelmed by distressing experiences, is an important contributor to employee well-being (Malinowski and Lim, 2015).

Three broad streams of mindfulness research exist. First, correlational and cross-sectional research explores associations between mindfulness levels and other factors (e.g. Malinowski and Lim, 2015). Second, diverse intervention studies examine the effects of various types of mindfulness training, while the third stream consists of laboratory-based research (c.f. Keng, Smoski and Robins, 2011). In this variety of methods used to study the effects of mindfulness training, there seems to be a lack of studies employing mixed methods. In addition, participants in workplace mindfulness-training interventions frequently have been employees in the health care and education sectors. Therefore, the aim of the current study was to use quantitative and qualitative methods to explore the effects of workplace mindfulness-based stress reduction (MBSR) training for factory employees.

Mindfulness training

Previous research indicates that mindfulness training can lead to higher self-reported mindfulness (e.g. Anderson, Lau and Bishop, 2007), and a number of studies have demonstrated that increases in mindfulness levels mediate the effects of mindfulness interventions on outcomes, such as well-being (for a review, see Keng, Smoski and Robins, 2011). For instance, a structured, group-based MBSR programme employed mindfulness meditation to develop enhanced awareness of the moment-to-moment experiences of perceptible mental processes and thereby improve psychological and physical well-being (e.g. Grossman, Niemann, Schimidt and Walach, 2004). In accordance of these findings, it was proposed that:

Hypothesis 1: Compared with the participants in the control group, the participants in the mindfulness-based training group will display increased mindfulness after the training.

Mindfulness and emotions at work

In general, mindfulness seems to support emotion regulation, for instance, reducing emotional reactivity (e.g. Arch and Craske, 2010). Furthermore, mindfulness seems to stabilise attention in the present and decrease mind wandering, which has close links to negative affect and negative mood. This link is especially strong when the mind wanders to past topics which include negative content (i.e. rumination). (Smallwood and O´Connor, 2011; Smallwood and Schooler, 2015.) Therefore, if mindfulness training can increase focus on the present moment and reduce mind wandering, this training might decrease negative emotions. In line with this speculation, a body of empirical evidence suggests that MBSR training decreases the emotions of fear, anger and worry (Robins, Keng, Ekblad and Brantley, 2012). Mindfulness is associated not only with diminished negativity but also enhanced positive emotions. Overall, evidence from correlational studies suggests that higher mindfulness is associated with higher levels of positive affect (Keng, Smoski and Robins, 2011). For instance, Schutte and Malouff (2011) reported an association of mindfulness with higher positive affect and lower negative affect, and in another study, mindfulness training focused on

loving-kindness meditation was able to increase daily experiences of positive emotions (Fredrickson, Cohn, Coffey, Pek and Finkel, 2008). Based on these findings, it was hypothesised that:

Hypothesis 2: Compared with the participants in the control group, the participants in the mindfulness-based training group will show higher increases of positive affect (a) and greater decreases of negative affect (b).

Mindfulness and hope at work

Hope can be defined as the perceived capability to see pathways to desired goals and to motivate oneself through agency thinking to use those pathways. The hope construct distinguishes between agency and pathway thinking, but hopefulness requires both as they feed on each other (Snyder, 2002). It has been proposed that, when individuals have mindfulness and can step back from emotional reactivity, they experience more hopeful attitudes (Malinowski and Lim, 2015). Accordingly, an integrated mindfulness and hope-theory-based meditation-training intervention could increase participants' hope (Thorton, Cheavens, Heitzmann and Dorfman, 2014), and in a mindfulness-based meditation-training intervention, the hope of the training group increased significantly more than that of the comparison group (Munoz, Hoppes, Hellman, Brunk, Bragg and Cummins, 2016). In addition, higher trait mindfulness has been found to be associated with lower cynicism (Taylor and Millear, 2016), which can be seen as a counterpoint to hope. Basing on these findings, it was suggested that:

Hypothesis 3: Compared with the participants in the control group, the participants in the training group will display increased hope in general (a) and increased agency (b) and pathways (c) in particular.

Mindfulness and social relations at work

Researchers have suggested that the participants in mindfulness training 'relat[e] more mindfully' to others and the ability to be more present might result in better listening and focusing on others' needs (Bihari and Mullan, 2014),. Social interactions at work can evoke many feelings, from irritation and anxiety to joy. Mindfulness training suppresses automatic tendencies to react to internal and external triggers, such as irritating persons and uncomfortable topics of conservations. Consequently, mindful people might be more able to respond to experiences an intentional and skilful way, exhibiting less reactivity and more tolerance in social interactions, for instance (c.f. Bihari and Mullan, 2014). In a qualitative study of nurses' experiences of MBSR training, the participants explained that the training helped them focus more on patients and listen more deeply at work (Cohen-Katz, Wilev, Capuano, Baker, Deitrich and Shapiro, 2005). In another study, family therapist trainees reported improved compassion and acceptance of others due to training (McCollum and Gehart, 2010). Based on a review by Boellinghaus, Jones and Hutton (2014), qualitative studies seem to give more support than quantitative studies to the idea that mindfulness training improves other-focused concern. This difference suggests that different data collection methods can paint divergent pictures of the benefits of mindfulness training in the context of social relations. In addition, mindfulness also seems to be linked to openness to new social relationships. For example, one type of mindfulness meditation, loving-kindness meditation, has been shown to increase feelings of social connection and positivity towards novel individuals (Hutcherson, Seppälä and Gross, 2008). Together, these findings indicate that mind-

fulness training may affect the quality of social relations. Based on these studies, it was hypothesised that:

Hypothesis 4: Compared with the participants in the control group, the participants in the mindfulness-based training group will show increased openness (a) and friendliness (b) to other people at work.

Mindfulness and creativity at work

Mindfulness has been shown to be associated with creative thinking. However, in a meta-analysis of 33 empirical correlational and intervention studies, the effect sizes ranged from small to medium. (Lebuda, Zabelina and Karwowski, 2016.) The mindfulness–creativity link likely exists as mindful attention to the present moment reduces the tendency to perform habitual responses, and creative problem-solving often requires openness to various new aspects which emerge in the present situation. Similarly, empirical evidence suggests that even brief mindfulness training can lead to better performance on insight problems (a class of problems in which non-habitual responses or intuition are key factors) (Ostafin and Kassman, 2012). Mind wandering, which often decreases as mindfulness increases, however, seems to be beneficial for creativity (Smallwood and Schooler, 2015). Given that the general pattern of evidence supports a positive link between mindfulness and creativity, it was proposed that:

Hypothesis 5: Compared with the participants in the control group, the participants in the mindfulness-based training group will report higher increases of self-reported creativity at work.

Mindfulness and workability

Workability can be defined as employees' ability to do their job satisfactorily or how well and able they can do their job at present and in the near future given their work demands, health and mental resources. This concept can be divided into two dimensions: mental and physical workability (Ilmarinen, Tuomi and Klockars, 1997). To the best of the authors' knowledge, no prior studies have measured the effects of mindfulness training on workability. However, one correlation study proposes that mindfulness has an indirect effect on workability through perceived quality of life (Vindholmen, Høigaard, Spnes and Seiler, 2014). Nevertheless, it can be assumed that constructs such as burnout and work engagement are possible frames of reference as they share features with the concept of workability: all capture dimensions of employee well-being (c.f. Warr, 1990; Harju, Hakanen and Schaufeli, 2014). Generally, lower self-reported mindfulness seems to be associated with ill-being at work, such as higher burnout (e.g. Taylor and Millear, 2016), whereas higher mindfulness seems to be related to well-being at work, such as work engagement (e.g. Leroy, Anseel, Dimitrova and Sels, 2013; Malinowski and Lim, 2015). For example, two facets of mindfulness, non-judgmental attitudes and less reactivity, have been shown to be associated with lower levels of burnout, particularly lower emotional exhaustion and cynicism (Taylor and Millear, 2016). In addition, mindfulness training has been reported to be effective at reducing stress reduction (Ciesa and Serretti, 2009) and supporting recovery from daily work demands (e.g. Hülsheger et al., 2014), for instance, by improving sleep quality and duration (e.g. Hülsheger, Feinholdt and Nübold, 2015). Based on these findings, it was hypothesised that:

Hypothesis 6: Compared with the participants in the control group, the participants in the mindfulness-based training group

will show increased physical (a) and mental (b) workability.

Methods

Intervention design

Before the training intervention, the researchers discussed with management and other staff how to tailor the mindfulness training to meet the needs of the organisation and employees. In the discussion there was a concern that the scales and measurements might be too difficult to complete as the topic of the questionnaire was abstract and unfamiliar to many. Consequently, there was we attempt to make the questionnaire as easy to complete as possible. Some options on the scales were harmonised, as described in detail in the measures section and discussed in the limitation section. The management and company representative also made an input regarding the protocols of the focus group; for instance, they helped to identify the most suitable times for interviews and the most appropriate interview duration for their employees.

The mindfulness training programme called InnoPresence consisted of 10 sessions and an introductory session at which information (e.g. procedure, risks) was given in oral and written form to obtain informed consent following the principles of the American Psychological Association (2010). The training was held over approximately 10 months, with a break between the spring and autumn sessions. Each training session lasted two hours and took place in a large meeting room in the factory. The first five sessions were intended to increase mindfulness in general and were led by a certified MBSR teacher. These sessions closely followed the principles and guidelines of the MBSR programme, which aims to reduce stress and includes specific exercises, such as mindfulness meditation, body scan and gentle yoga (Kabat-Zinn, 1990; 2003). The participants were also given a CD with recorded exercises to support mindfulness practice at home and were encouraged to informally practice mindfulness at home or work (e.g. mindful lunch, mindful conversation). The last five sessions were aimed at increasing mindfulness at work and included short mindfulness exercises and a variety of group exercises—also art based—led by an experienced facilitator. In these exercises, the participants identified and shared moments in which they felt present and mindful at work, as an example.

The training participants were blue- and white-collar workers in a Finnish company in the forestry industry. Initially, 32 employees expressed willingness to participate, but only 25 actually started the training. The company representative selected the participants and invited them to the introductory session and training, but participation was voluntary. The average number of participants at the training sessions was 17, ranging from 11 to 25 per session.

Quantitative study

Participants

The quasi-experimental design consisted of pre- and post-measurements among employees of a Finnish forest factory. The participants completed a survey before (Time 1) and after the training intervention (Time 2). The analysis included the 17 participants who completed both the pre- and post-test. These participants form the experimental group. Eleven (64.7 per cent) were women, and they had an average age of 43 years and had been at the company for approximately 16 years (SD = 8.2). None had previous mindfulness experience. About 65 per cent had work which included some supervisory responsibilities (e.g. factory foreman/woman).

A control group of 19 co-employees answered identical surveys through an electronic answering system. The control group (N =19) included fewer women and more managers: 52.6 per cent were women (n=10), and about 84 per cent (n= 16) had managerial duties. The participants in this group had an average age of 42 years (SD = 10.43) and had been with the company for 13.5 years (SD = 9.0). The training and control groups had no significant differences in the initial mean values for the main variables measured with independent samples t test.

Pre- and post-test measures
Mindfulness

Mindfulness was assessed with the one-dimensional, 14-item Freiburg Mindfulness Scale (Walach, Buchheld, Buttenmüller, Kleinknecht and Schmidt, 2006). Its scale ranged from 1 (never) to 5 (always). Back translation was used to translate the scale from English to Finnish.

Positive and negative emotions

Positive and negative emotions were measured with a slightly modified version of the Short Form of the Positive and Negative Affect Schedule (PANAS; Thompson, 2007). The respondents were asked to indicate how often they had experienced certain feelings at work during the past week. The scale ranged from 1 (never) to 5 (always) and included 10 feelings: upset, hostile, alert, ashamed, inspired, nervous, determined, attentive, afraid and active. Back translation was used.

Hope

The Trait Hope Scale (Sneider et al., 1991) was used to explore the construct of hope. The scale used ranged from 1 (never) to 5 (always), and sub- and total scores were calculated. Back translation was used to translate the scale from English to Finnish.

Creativity

The Creativity at Work Scale was developed based on the employee creativity items (Tierney, Farmer and Graen, 1999). The respondents were asked to indicate how often they acted in certain ways at work. The scale included eight statements, such as 'I demonstrate originality in my work', 'I like to produce new ideas in doing my job' and 'I generate novel but feasible work-related ideas'. The scale ranged from 1 (never) to 5 (always).

Social relations: connectivity and kindness at work

Connectivity was measured with the Connectivity at Work Scale adapted from the longer High-Quality Relationship Scale (Carmeli, Brueller and Dutton, 2009). The respondents were asked to indicate how often they acted in certain ways at work. The scale ranged from 1 (never) to 5 (always) and included four items, such as 'I am open to listening to my co-workers' new ideas' and 'I am open to diverse opinions, even if they come from unconventional sources'.

Friendliness in the workplace was measured with the modified Kindness at Work Scale developed by Perhoniemi and Hakanen (2010). In practice, the respondents were asked to self-evaluate, for instance, how often they were friendly to others or tried to cheer up workmates. Four items were included on a scale ranging from 1 (never) to 5 (always).

Workability

The Shortened Workability Index was used to measure the respondents' level of workability (Tuomi, Ilmarinen, Jahkola, Katajarinne, and Tulkki 1998). The index had two questions:

How do you rate your current workability regarding the physical demands of your work? How do you rate your current workability regarding the mental demands of your work? The scale ranged from 1 (very poor) to 5 (very good).

Quantitative analysis

The quantitative data were analysed with statistical methods using SPPS 22. The hypotheses were tested with two-way repeated measures analysis of variance (ANOVA) using time (Time 1/pre-test vs. Time 2/post-test) by group (training group vs. control group). Time was the within-subject factor, while the group the between-subject factor. Finally, a paired samples t-test was conducted to examine the within-group differences between the two time points (see Table 1 p. 23).

Qualitative study

Focus group interviews

Qualitative data were collected through focus group interviews to capture the participants' views, opinions and shared experiences of the training and to get a deeper understanding of the effects of training. Four focus groups were organised. The first author moderated all the interviews, and the research assistant helped tape-record them. The interviews were organised in the factory's meeting room and lasted approximately 50 minutes each. All of the interviews were tape-recorded.

The key questions asked in the focus group interviews were: 1. Why did you decide to take this programme? 2. What motivates you to continue with the programme? 3. What challenges related to the training have you experienced? 4. Have you observed any personal benefits from the programme? 5. How are you practicing mindfulness outside the training? 6. What has been your general experience of the training? In addition to the key questions presented above, more specific questions were asked in an attempt to elicit broader and more detailed answers. The interview questions were devised on the basis of prior studies, for example, the study by Cohen-Katz et al. (2005), and on observations during training. For instance, researchers noted that some practices were more unpleasant than others, and this presented an opportunity to obtain information about the challenges and possible negative experiences faced by employees.

Participants

The company representative invited potential participants to the focus group interviews and helped with the practicalities of the meetings. Also, anyone who had already dropped the training was asked to participate. However, participation was voluntary, and all of those who expressed willingness to participate were admitted. Eighteen participants in the training (experimental) group also took part in the four focus group interviews. Two focus groups were held after the first five sessions before the summer break, and the other two after all the training was completed. The participants included 5 men and 13 women who worked in both office and factory settings. Two participants dropped out during the first five training sessions.

Qualitative analysis

The interview data were transcribed verbatim and subjected to inductive data-driven content analysis (Elo and Kyngäs, 2008). Two researchers independently read the interview transcripts several times and coded the data. The two analyses were compared, and any differences were discussed to reach mutual understanding. The analysis was carried out inductively so that the themes emerged from the data. The same two researchers

analysed all four focus group interviews. Only the themes related to the perceived benefits and challenges of the training are reported here.

Results

Quantitative study

Table 1 (p. 24) shows the alphas, means and standard deviations for the training and control groups and the results of the within-group t-tests.

Mindfulness

Two-way repeated measured ANOVA showed a significant group x time interaction effect on self-reported mindfulness ($F(1,28) = 6.411$, $p = .02$, $n^2 = .19$). This result indicated that the participants in the training group reported significantly higher increases in mindfulness between the two time points than the participants in the control group. Therefore, hypothesis 1 was completely supported (Table 1).

Emotions

There was a significant group x time interaction effect on self-reported positive emotions, ($F(1,34) = 5.405$, $p = .03$, $n^2 = .14$), indicating that the increase in positive emotions was significantly higher in the training group than the control group. There was no significant group x time interaction effect on negative emotions ($F(1,33) = .631$, $p = .43$). Therefore, hypothesis 3a was supported as positive emotions increased after the training, as expected, and hypothesis 3b was rejected (Table 1).

Hope

There was a significant group x time interaction effect on self-reported hope pathways ($F (1, 32) = 5.347$, $p = .03$, $n^2 = .14$). This indicated that, compared to the control group, the training group showed significant increases in hope pathway. There was no significant group x time interaction effect on hope agency ($F(1,34) = 3.601$, $p = .07$) or on total hope ($F(1,33) = 3.974$, $p = .06$). Therefore, hypothesis 2b was completely supported (Table 1).

Social relations, creativity and workability

There was no significant group x time interaction effect on the quality of social relations, namely, connectivity ($F(1,34) = 1,154$, $p = .30$) and friendliness ($F(1,34) = .002$, $p = .97$). There was no significant group x time interaction effect on creativity ($F(1,34) = 2,501$, $p = .12$), psychological workability ($F(1,34) = 1.193$, $p = .28$) or physical workability ($F(1,34) = .035$, $p = .85$). Hypotheses 4a, 4b, 5 and 6 were rejected as the self-reported quality of social relations, creativity and workability did not increase significantly after the mindfulness training (Table 1).

Qualitative study

The key themes regarding the effects and benefits of the training were the physical and emotional benefits, increased awareness, quality of social interactions, creativity and increased acceptance. These themes are described in more detail in this section.

The physical and emotional changes were the most important benefits described by all the participants. For instance, the interviewees reported that their bodies felt more relaxed due to the training. They were calmer, could keep their calm in difficult situations and could work with a good spirit. For the participants who worked shifts, the practice gave them a tool to fall

	Training group						Control group					
	M	SD	alpha	t	df	p	M	SD	alpha	t	df	p
Mindfulness												
Mindfulness pre	3.30	0.38	.88				3.34	0.55	.88			
Mindfulness post	3.57	0.42	.90	-2.56	12	.025	3.30	0.51	.89	.53	16	.602
Emotions												
Positive emotions pre	3.75	0.53	.84				3.77	0.55	.79			
Positive emotions post	4.09	0.47	.79	-2.88	16	.011	3.74	0.54	.82	.29	18	.774
Negative emotions pre	2.08	0.40	.50				2.18	0.74	.78			
Negative emotion post	1.98	0.48	.72	.89	16	.387	2.23	0.70	.77	-.34	17	.736
Social relations												
Connectivity pre	4.12	0.57	.83				4.18	0.63	.89			
Connectivity post	4.31	0.58	.89	-1.50	16	.154	4.20	0.57	.76	-.12	18	.904
Friendliness pre	4.32	0.48	.76				4.22	0.61	.78			
Friendliness post	4.40	0.55	.89	-.70	16	.492	4.30	0.63	.81	-.92	18	.369
Hope												
Hope agency pre	3.74	0.51	.54				3.53	0.64	.82			
Hope agency post	3.90	0.41	.64	-1.32	16	.207	3.39	0.60	.82	1.37	18	.189
Hope pathway pre	3.35	0.39	.63				3.46	0.49	.60			
Hope pathway post	3.51	0.53	.75	-1.40	16	.180	3.39	0.60	.82	1.00	17	.331
Hope total pre	3.54	0.38	.69				3.47	0.51	.84			
Hope total post	3.71	0.42	.81	-1.49		.158	3.38	0.53	.85	1.35	17	.195
Creativity												
Creativity pre	2.92	0.40	.84				2.95	0.61	.90			
Creativity post	3.18	0.58	.90	-2.12	16	.050	2.95	0.59	.89	.06	18	.955
Workability												
Physical workability pre	4.29	0.47					3.95	1.03				
Physical workability post	4.35	0.49		-.44	16	.668	4.05	0.71		-.52	18	.607
Psychological workability pre	4.06	0.66					4.00	0.67				
Psychological workability post	4.24	0.56		-1.00	16	.332	3.95	0.78		.44	18	.667

Table 1. Mean Scores, SDs, alphas for the study variables and results within the group t-tests

asleep. Several participants reported better sleeping in general, and some blue-collar workers especially highlighted this benefit. For instance, one participant stated: 'Well, in my opinion, it is just there—that you know how to pay attention to relaxation. It is that you are able to fall asleep when you can relax. … Well, yes, all in all, it has a big impact on overall well-being, that, in a way, you know how to get yourself relaxed'.

In the training, one of the main mindfulness practices was a breathing exercise which taught how to stay present in breathing. This practice seemed to help the participants stay present and calm in difficult work situations. Also, the participants felt that their stress tolerance increased. Factory-floor workers did not panic in difficult and demanding situations. The participants explained that, for example, when a machine broke down, they had to deal with the situation quickly and remain cool-headed. Some white-collar workers felt that their ability to manage information load improved, as described in the following extract: 'Well, I have a bad habit of having lots of emails open at the same time, and then I write a little bit on that and

on that. And then, I have tried to answer one of them, and then that is done, and then next, so they are not all open at once'.

The participants interviewed described increased awareness. As the training progressed, the participants felt that they could more easily notice when they were present in the moment. They also described thinking more clearly and noticing some things that they did not previously. At work, this meant, for instance, that they noticed when they needed to take breaks or calm down. Some changed their way of working. They described working in a more focused way: 'I think, surely, I have the same—that you can somehow pay attention to calming down through breathing. That is the thing. It feels that, all together, everything goes at this point as hard as in the spring. That is not the … the situation is what it is'.

The training seems to have greatly varied effects on social interactions. In general, the participants felt a growing communality within the training group. They considered this to be quite a remarkable change in the everyday work life in the factory. In the training groups, the blue- and white-collar workers,

even some supervisors, could talk to each other and exchange ideas as equals. One participant stressed that 'it has brought, kind of communality here, too, [that] is beneficial. When there are different people like in the factory, like in this group, then you get to know new people'. Many participants also described situations in which they used more mindful conversation styles. They told that they had started to listen to each other and had become more aware of their own ways of talking and listening. One participant described this: 'I have paid attention to, let's say, someone who says really something important. In a way, you look at his/her facial expressions, and sometimes you wake up, and you listen actively'.

The participants also cited benefits related to creativity. They reported that some new ideas emerged from group work dealing with the innovation processes in the factory. For instance, one participant explained how the training helped her think of ideas and break habitual work routines: 'Of course, yes, [at work, this could be useful for getting new ideas]. You are just there and think about everything, and you are present in what you do. It would take much more when you are somewhere else. You just do your work routine and think of something else'.

Increased acceptance meant that the participants could let go of things more easily. In difficult situations, they could more clearly see and understand what was happening and accept it more easily, which seemed to help them move on. A female participant, for instance, felt that, due to the training, she was more able to accept and cope with a difficult situation in her personal life, so it did not disturb her work as much: 'Well, lets' say, … for me, it was kind of, of course ... let's say, at the mental level, this period in my private life was a … heavy spring. In a way, this … I could let go a little bit in between. I have afterwards thought that, if I had had this, it would have been much heavier'.

The analysis showed the different work groups in the first (spring) and second (autumn) set of focus group discussions had somewhat different emphases. In the first set of interviews, the white-collar workers highlighted the importance of communality in the training group. For blue-collar workers, the most important changes were improved relaxation and sleep habits, which aided in recovery from work. In autumn (the second phase), the white-collar workers highlighted the change in chaos management and handling information load, while the blue-collar workers emphasised inventing new ideas and thinking clearly.

Challenges in training

In the focus group discussions, the participants also reported challenges which can be assumed to have influenced how much they benefited from the training, as briefly discussed here. The challenges concerned difficulties with home practice, a lack of social support, odd and difficult mindfulness practices, features of the environment and a lack of experience in mindfulness training.

Some participants found it difficult to practice at home between the training sessions. The primary reasons were difficulties finding time and place at home amid their families. In addition, some participants confessed that they were too lazy to practice at home: 'It is just that laziness. You cannot find that place and time for it'.

A lack of social support seemed to be a challenge for some participants. Support from others in the factory would have increased their commitment to the training, according to some participants. Some interviewees reported that their co-workers, mostly men, who did not belong to the training group called

the practices odd or even ridiculous. One male participant described a specific instance in which social support was lacking: 'What I heard in the smoking area was, "Oh, you are part of that mattress club, too"'. Several participants did not complete the training, which affected negatively the climate of the training group.

Also, the participants considered some mindfulness practices to be odd or difficult and were not motivated to do them. These practices included compassion meditation, yoga, eating, and talking about their experiences in the group, as the following extract indicates: 'Everything was OK, but that walking meditation and that kindness meditation—they were a bit … that walking meditation was really funny'.

The environment also presented challenges. The physical space where the sessions were held was considered to be uncomfortable, especially at the beginning of training. The floor was cold and drafty, and the noise of machines disturbed the practice. A female participant, for example, stressed that concentrating in such a noisy environment was challenging: 'At least, I couldn't cut out that noise there'. However, later in the autumn, these challenges no longer seemed to bother the participants. The practice had become easier—not as challenging any more—and the disturbances did not affect the participants in the same way. Even lying on the floor was considered to be nice. For instance, a female participant explained that a kind of training routine developed, and mindfulness training came more easily: 'Oh, yes, a certain kind of a routine. It was much easier when you knew what you were doing with that pillow and blanket. It was fun to lie down. You really looked forward to it'.

Discussion

The present study was designed to investigate the effectiveness of a tailored MBRS-based training intervention at a Finnish forestry industry company. In addition to conventional pre-post questionnaires, focus group interviews captured the experiences of the perceived benefits. Thus, the novelty of this study lies in the implementation of the workplace training among factory employees and the mixed-methods approach to evaluating of the effectiveness of the training.

Based on existing empirical evidence, it was hypothesised that, compared with the participants in the control group, the participants in the mindfulness-based training group would show higher increases in mindfulness (H1) and positive affect (H2a) and greater decreases in negative affect (H2b). The training group was also expected to display higher increases in hope (H3a), hope agency (H3b) and hope pathways (H3c). Finally, it was proposed that the training group would experience higher increases in openness (H4a) and friendliness (H4b) towards co-workers and in self-reported creativity at work (H5) and physical (H6a) and psychical (H6b) workability.

In general, the results revealed that the training intervention was effective at increasing the mean scores for the all measured variables in training group (Table 1.). Unexpectedly, not all the changes in the mean scores were statistically significant, and the results of the two-way repeated measures ANOVA supported only three hypotheses. As hypothesised, mindfulness levels (H1), positive emotions (H2) and hope pathways (H3c) increased significantly in the training group compared to the control group. As expected, the control group reported no significant changes. Overall, these findings are in line with existing evidence suggesting that mindfulness-based training increases mindfulness levels, positive emotions in general and hope specifically (e.g. Anderson et al., 2007; Robins et al., 2012; Keng et

al., 2011; Munoz et al. 2016; Schutte and Malouff, 2001; Fredrickson et at., 2008).

Unexpectedly, based on the pre-post-test measures, the self-reported quality of social relations, creativity at work and work-ability did not increase significantly, so hypotheses 4a, 4b, 5 and 6 were rejected. The discrepancies between the current and previous findings likely arise from the use of non-identical scales in studies. For instance, mindfulness and creativity are measured with multiple scales. More specifically, the self-reported creativity scales used in the current study clearly differ from those used to study the ability to resolve insight problems or to generate ideas as indicators of creativity (c.f. Ostafin and Kassman, 2012).

The reported challenges during the training also offer explanations for the results and the absence of some expected effects. Based on the focus group interviews, the key challenges were difficulties with home practice, the perceived lack of social support, odd and difficult mindfulness practices, certain features of the environment and lack of experience of mindfulness training. When planning future workplace mindfulness trainings and interventions, these issues could be taken into account, for instance, in the selection of the training space and which mindfulness practices to present in earlier and later in training. Most likely, odder and more difficult practices should be introduced later when the participants have more experience and established routines.

However, it is worth noting that the qualitative focus group interviews indicated benefits related to creativity, workability and quality of social relations. For instance, the pre- and post-measurements did not indicate significant increases in creativity levels, but the qualitative data suggested that the participants experienced heightened creativity. The participants, for instance, reported that the training gave them new ideas and enabled them to break habitual patterns of thought. These findings support the notion that mindfulness can decrease habitual thinking, thereby increasing creativity (c.f. Ostafin and Kassman, 2012). In addition, the pre-and post-tests did not indicate statistically significant improvements in the quality of social interactions, but the participants in the focus groups spontaneously reported experiences related to improved quality of social interactions, such as a feeling of community and increased ability to focus on and listen to others. These results are in line with the claim of Boellinhaus et al. (2014) that qualitative studies offer stronger support than quantitative research that mindfulness increases other-focused concern, which is a necessary for constructive social interactions. Thus, the results of the quantitative and qualitative analysis were not identical. Possible explanations include that not all the participants who answered the survey were interviewed, and qualitative measures might simply be more sensitive than quantitative measures (c.f. Boellinhaus et al., 2014).

However, some quantitative and qualitative results were also well in line. For instance, based on the pre-post-test, levels of mindfulness improved significantly due to the training, and the participants in the qualitative interviews reported improvements to their level of awareness and their ability to be present in the present moment. In addition, the focus groups interviews pointed to some benefits not measured in the pre-post-test. For instance, the questionnaires included no questions about the relaxation of the physical body or the quality of sleep, but the interviewees considered these to be important benefits of the training. These findings accord with existing evidence suggesting that mindfulness is associated with sleep quality and recovery from work (e.g. Hülsheger et al., 2014; 2015). Likely, the

discrepancies arose as the topics and options in the tests were pre-selected and presented to the respondents, but in the focus group discussions, the participants were free to raise any benefits or other issues they felt were relevant. Similarly, a systematic review of the effects of mindfulness-based interventions on nurses and nursing students found that qualitative and uncontrolled studies cited benefits, such as internal calmness, better communication and clearer analysis of difficult situations, only rarely taken into account in randomised controlled trials (Guillaumie, Boiral and Champagne, 2016).

Furthermore, based on the current results, a key strength of a qualitative approach is that it can point to issues, such as benefits and challenges, especially relevant for a particular group of employees due to the type of work they do. For instance, some participants did physical shift work, which likely explains why they highlighted in the interviews that the training enabled them to relax physically and sleep better. Those doing office work, in contrast, emphasised benefits associated with better managing intensive knowledge work and multitasking. Therefore, it appears that qualitative research might be able to better inform interventions about occupation- or work-specific factors and relevant indicators (e.g. quality of sleep, ability to manage knowledge work) and to take into account communities' unique characteristics in planning interventions. Overall, these results support the view that qualitative data can complement quantitative data (c.f. Molina-Azorin, Bergh, Corley and Ketchen, 2017) and thus suggest that integrating or mixing methods can create synergy and help better understand the benefits and challenges of mindfulness training in work life settings.

Although this study provides evidence suggesting that mindfulness training can increase mindfulness levels, positive emotions and hope based on the pre-post-test and the participants' experiences of various benefits mentioned in the focus group discussions, the conclusions must be tempered by the potential limitations of the study. First, the study design resulted in small training and control groups. The factory where the training was held was also quite small, and more than 10 per cent of all employees were included in either the training or control group. During the design of the current study, the authors were not aware of any mindfulness studies on factory employees, so the training and intervention were designed and planned in close co-operation with the factory management and human resource staff to ensure the environmental fit of the procedures. Doing so was considered to be important as it is well known that organisational interventions often fail due not to the content of their design but to contextual and process factors (c.f. Biron, Karanika-Murray and Cooper, 2012). Therefore, based on management and staff feedback, some questionnaire scales were homogenised to ensure the respondents' ability to answer fluently. Thus, the scales used are not totally identical with the original ones, which should be taken into account when comparing results between studies.

As well, for practical reasons, follow-up-tests were not conducted, so the current data do not provide information about the long-term effects. Additionally, some scales used in the current study could be applied differently in future studies. For instance, creativity and the quality of social relations could be measured through co-workers' evaluations, instead of or in addition to self-reported. Further, although the atmosphere of the focus group discussions was free and positive, that they were organised at the workplace most likely influenced how they proceeded. Experiences of mindfulness practices can be quite personal and not appropriate for sharing at work. Therefore, participants likely more discussed their experiences related to

work than their personal experiences (c.f. Cohen-Katz et al. 2005). Also, social desirability bias might have appeared, especially during the focus group interviews. In practice, this means that participants may have discussed matters and answered questions intentionally in a manner that would be viewed favorably by other participants and/or by researchers.

At a more general level, it is important to note that mindfulness training in a workplace setting may have specific pitfalls and limitations. First, some may experience unpleasant feelings or discomfort during the formal training exercises, especially if they have a past history of trauma (Creswell, 2017). Second, not everyone is willing to express, deal with or discuss these feelings in a workplace setting. Therefore, training may in some cases threaten employees' privacy, especially if they have no awareness before the training of potential consequences that may cause them discomfort. On the other hand, it is widely accepted that employee well-being depends on multiple factors, such as individual factors (e.g., level of mindfulness), work-related factors (e.g., workload), organisational factors (e.g., the organisation's culture) and management (e.g., leadership styles). Thus, in stressful work situations, demanding factors should be identified and modified accordingly. Mindfulness training should not be used as the only way of coping with stress, especially in cases where the stress is clearly a result of factors other than individual ones, for example, an overly heavy workload, a low level of autonomy or destructive leadership.

Overall, this study suggests that mindfulness training can support, at least indirectly, employee well-being as employees' mindfulness, positive emotions and hopefulness increased significantly, and they reported benefits related to the quality of sleep and ability to relax. Together, these factors lay a strong foundation for employee well-being. For instance, positive emotions have been shown to mediate the effect of mindfulness on work engagement, which is a positive work-related state of well-being characterised by vigour, dedication and absorption (Malinowski and Lim, 2015). Furthermore, positive, hopeful employees seem to be more able to perceive or experience job resources than job demands. Job resources are factors which help employees to achieve work-related goals, reduce physiological and psychological costs and stimulate personal growth and development (Xanthopoulou, Bakker, Demerouti and Schaufeli, 2007). Finally, the abilities to relax and sleep well are important contributors to recovery from work (c.f. Hülsheger et al., 2015).

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