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Mindfulness-based stress reduction for managers: a randomized controlled study

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Background	Mindfulness-based stress reduction (MBSR), which was initially used in clinical settings, has also proved to be an effective tool for managing work-related stress in occupational groups inherently exposed to certain psychosocial risks.
Aims	To examine the potential for work-related stress management using MBSR for middle-level managers who are considered to be particularly affected by the negative effects of stress related to organizational restructuring.
Methods	Middle-level managers participated in a randomized controlled study which implemented a 2 (experimental versus control group) × 2 (baseline, post-treatment) study design, yielding a between-group comparison. The participants were randomly assigned to an 8-week intervention group or to a wait-list control group.
Results	The results showed that, relative to the control group, the MBSR intervention had significant effects on several outcomes in the 144 subjects, including: decreases in perceived work-related stress ($F(1,140) = 20.4$, $P < 0.001$, $d_{diff} = 0.72$), negative affect ($F(1,140) = 45.3$, $P < 0.001$, $d_{diff} = 0.93$), intensity of somatic complaints ($F(1,140) = 20.7$, $P < 0.001$, $d_{diff} = 0.69$), and sickness absence ($F(1,140) = 67.3$, $P < 0.001$, $d_{diff} = 0.69$), and increase in self-esteem ($F(1,140) = 44.1$, $P < 0.001$, $d_{diff} = 1.25$), and positive affect ($F(1,140) = 6.73$, $P < 0.01$, $d_{diff} = 0.43$). No effects were found on frequency of somatic complaints.
Conclusions	These results suggest that MBSR is an effective method for managing work-related stress and bolstering psychological resilience in the workplace, particularly in the face of psychosocial risks of a global, economic nature.
Key words	Managers; mindfulness; occupational stress; perceived work stressors; sick leave.

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Introduction

The global recession has forced the vast majority of European companies to undertake minor or major restructuring. Among occupational groups, middle-level managers have been found to be particularly affected by restructuring and organizational changes [1–3]. Middle-level managers (or 'middle managers') are those in the level below top-level managers, responsible for carrying out the goals set by top-level management. They implement the policies and plans developed by top-level management in setting goals for their departments and other business units. Middle managers can motivate and assist first-line managers to achieve business objectives and also communicate upward by offering suggestions and feedback to top managers. Relative to executive-level managers, they experience higher workload demands and job insecurity and declare a higher level of health-related problems [1,4]. It is usually they who are responsible for laying off employees during downsizing; at the same time, they worry about their own jobs [5]. Sleep disturbance, using alcohol as a way to relax and a number of psychological and physical complaints have been observed in middle managers who had to lay off their staff [6,7]. Research undertaken in the Netherlands, Sweden and the UK points to the disempowerment of middle managers, simultaneously being given more

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responsibilities and fewer resources (having 'to do more with less' [2]). The pressures to make organizations more profitable and at the same time more effective and accountable lead to inevitable contradictions in middle managers' roles, causing further stress [8]. In line with these findings, data on Japanese middle managers shows that the nature of their jobs has significantly changed during the last decade, the change being characterized by a wider range of tasks, work intensification, longer hours, higher stress, more accountability and a worsening work–life balance [9].

Although it is widely suggested that an effective approach to stress prevention should initially aim to deal with the sources of workplace stress, person-directed measures should also be in place to protect individual employees who are subjected to specific situational stressors [10,11]. One example of such measures is mindfulness-based stress reduction (MBSR). In the last three decades, the concept of mindfulness, a state of non-judgmental attentiveness to and awareness of moment-to-moment experiences [12–14], has received considerable attention in clinical [15] as well as in the industrial and organizational psychology literature [16,17]. The possible mechanisms through which mindfulness enhances psychological and behavioural functioning are assumed to be related to self-regulatory processes such as regulation of attention and mood repair, as well as working memory and other cognitive capabilities, within relatively short periods of time [17–19]. As recent research shows, MBSR programmes may be an effective tool in reducing work-related stress for various occupational groups, such as teachers, firefighters, nurses, health care professionals, therapists and lawyers [16,20–23].

However, to date, no study has reported on the effects of MBSR as a workplace stress management intervention for middle managers. Given that middle managers are adversely affected by work-related stress during organizational restructuring, the primary purpose of this study was to examine whether MBSR as an intervention can bring about a decrease in stress and its negative effects on middle managers' well-being, as measured by positive and negative affect, self-esteem and somatic complaints. Additionally, we sought to test the efficacy of MBSR in improving objective outcomes for work-related stress such as decreased levels of sickness-related absence for managers participating in the training. Since sickness absence is considered to have adverse impacts on organizational function this study aimed to demonstrate the effects of MBSR not only on the individual but also at the organizational level.

Methods

Study participants were recruited by putting up posters and sending out e-mails to 30 randomly chosen companies in the financial and service sectors, such as insurance companies, banks and advertising agencies. The e-mail invitations to a stress management programme designed for middle managers contained a brief description and a consent form. We also asked would-be participants: 'How often do you feel stressed?' and only those declaring a frequency of at least 'regularly' were considered eligible. The remaining inclusion criteria consisted of (i) being currently employed as a middle manager, (ii) being over 26 years of age, (iii) having held the same job for at least 2 years, (iv) having no serious mental or physical health issues, such as depression (or other psychiatric disorders) or cognitive impairment, which interfered with participation in the training or assessment, (v) no alcoholism or other substance abuse, (vi) no previous MBSR training and (vii) declaring an intent to participate in the entire MBSR programme.

Individuals meeting the inclusion criteria at baseline screening and who signed the consent form were invited to participate in this randomized controlled study. Approval for the study was obtained from the Central Institute for Labour Protection-National Research Institute's Independent Ethics Committee prior to commencement of the study. Participants were randomized to the intervention groups or to the waiting-list control groups, with a 1:1 allocation ratio. For randomization, sealed envelopes were prepared in advance, marked on the inside either '0' or '1'. Randomization was performed prior to the start of the pre-test into experimental and control groups. The control groups received the identical intervention after the experimental groups had completed the programme. Measures of the outcomes were derived from self-reports administered before the intervention (pre-test) and again approximately 3 months later (following completion by intervention group participants of eight weekly group sessions, one seven-hour group session and also individual follow-up sessions).

The intervention was modelled on the work of Kabat-Zinn and colleagues [12,13] and consisted of a series of eight weekly 180-min group sessions, one seven-hour group session (the 'Mindfulness Day') towards the end of the course, plus an individual follow-up session with each participant. It was delivered by a trainer who had participated in a professional training programme under the direction of Kabat-Zinn. Each session included a range of guided meditative practices, mainly of the following types: (i) sitting meditation, involving directing the awareness in turn to one's breathing, to the body as a whole, to sensations, thoughts, and emotions, and also in a non-differentiating manner to whatever is currently arising in awareness; (ii) body scanning, consisting of bringing awareness (in the form of good-natured, curious attention) to each part of the body in turn, from the

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toes to the head, and also to any sensations or feelings arising during the scanning exercise; (iii) mindful bodywork, i.e. adopting a sequence of hatha-yoga derived postures, designed to stretch and bring awareness to the body, particularly in the context of experiencing the bodily sensations, feelings and thoughts accompanying such an exploration of the boundaries of one's physical capabilities.

Each of the practices was preceded by detailed oral instructions, plus a follow-up process known as 'Enquiry', in which participants were invited to express their experiences of the exercises, and to reflect, in a non-judgemental manner, upon these experiences, and upon the fact of their having arisen. The programme included daily homework exercises, including guided meditations. Participants were each given a set of audio recordings and were asked to practice using these for 20 min, 6 days a week. At each intervention session, participants were asked how many times they had practised at home.

Work-related stress was measured using the 40-item Occupational Stress Indicator (OSI-2) [24]. This measure was developed for the Cooperative International Study on Managerial Stress (CIMS) and was designed to diagnose managerial stress specifically. It assesses the following eight groups of the most frequently encountered occupational stressors: work demands, managerial role demands, social relations, work/family conflicts, responsibility, daily hassles, promotion and organizational climate. Positive and negative affect were assessed using Bradburn's Affect Experience Index (AEI) [25]. The 10-item scale is composed of two subscales: one diagnosing positive affect (five items) and the other negative affect (five items). Self-esteem as a cognitive aspect of well-being was measured using the Polish version of the Rosenberg Self-Esteem Scale (RSES) in which self-esteem is defined as a person's overall evaluation of his or her worthiness as a human being [26]. Subjectively perceived physical health was assessed using the Health Questionnaire (HQ) scale [27]. This diagnoses a range of 30 common somatic problems, such as headache, insomnia, stomach pain, heart palpitations and joint pain. The psychometric properties of OSI-2, AEI, RSES and HQ are satisfactory (Table 1). Sickness absence was measured by the question 'For how many days were you absent from your job due to sickness during the past 3 months?'

In order to check the effect of randomization, we examined whether there were significant differences between the intervention and the control groups in terms of background characteristics, sex and age. A chi-squared test for independence was performed on gender, while for age, an independent sample *t*-test was conducted. An independent sample *t*-test was also performed on four dependent variables: work-related stress (OSI-2), positive and negative affect (AEI), self-esteem (RSES), somatic complaints (HQ) and sickness absence, with mean differences at the $P < 0.05$ level being considered significant. We also examined whether there were significant differences between study completers and those who dropped out.

In order to test the effects of the intervention, a series of multivariate repeated-measures analysis of covariance (MANCOVA) in SPSS for Windows 15.0 was performed for the following dependent variables: work-related stress (OSI-2), positive and negative affect (AEI), self-esteem (RSES), somatic complaints (HQ) and sickness absence with two factors: group (intervention or control), time (pre-test or post-test), and one covariate (age). Gender was not included as a covariate since gender distribution, being virtually equal, was not capable of producing data distortions. Additionally, Cohen's *d* was used as effect size measure [28]. An effect size <0.50 is typically considered as small, an effect size between 0.50 and 0.80 as moderate, while an effect size >0.80 is considered as large [28]. Finally, the change significance was compared pairwise between the experimental and control groups.

Table 1. Variables' reliability, range, means, SDs of scores at baseline and means, SDs of scores at follow-up for the MBSR and the control groups

Variables	Cronbach alpha	Range	Control groups		MBSR groups	
			Pre	Post	Pre	Post
			M (SD)	M (SD)	M (SD)	M (SD)
Work-related stress (OSI-2)	0.97	1–240	126.7 (4.35)	125.7 (4.10)	139.0 (4.35)	126.0 (4.10)
Negative affect (AEI)	0.77	1–10	7.20 (0.18)	7.19 (0.17)	7.65 (0.18)	6.42 (0.17)
Positive affect (AEI)	0.76	1–10	7.49 (0.17)	7.59 (0.16)	7.64 (0.17)	8.29 (0.16)
Self-esteem (RSES)	0.78	1–12	9.81 (0.20)	10.0 (0.20)	9.52 (0.20)	11.0 (0.20)
Intensity of somatic complaints (HQ)	0.87	1–155	38.7 (1.91)	39.5 (1.86)	43.0 (1.91)	38.4 (1.87)
Frequency of somatic complaints (HQ)	0.89	1–155	32.4 (2.18)	32.0 (2.17)	35.2 (2.18)	32.8 (2.18)
Sickness absence	–	0–75	3.84 (0.34)	3.69 (0.33)	4.57 (0.34)	1.40 (0.33)

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Results

The e-mail invitations resulted in a total of 190 responses of which 156 individuals met the inclusion criteria and signed the consent form. There were four experimental and four control groups, each consisting of about 18 participants (minimum 17, maximum 19). Of the 78 participants randomized to the intervention groups, six dropped out, giving reasons of insufficient time (n = 4) or resignation from their job (n = 2). Of these, two attended three sessions and provided no assessment data at post-intervention. The remaining four attended either four or five sessions, but failed to provide post-intervention assessment data. Of the 78 participants randomized to the control groups, six individuals failed to complete end-of-study assessments. Overall dropout from the study was relatively low (8%) and did not differ between the intervention and control groups.

Data at both the pre- and post-intervention stages was available for 144 individuals, aged between 28 and 56 (M = 39.4; SD = 8.4), of whom 71 (49%) were women and 73 (50%) were men. Most were married (66%) or cohabitating (8%), whereas 12% were single, 9% were separated, divorced or widowed and 5% did not answer this question. Most participants reported white collar and professional occupations. All of them had a higher education qualification. Their average job tenure was 6.2 years (SD = 2.5). An analysis of gender and age as potentially confounding variables showed that there were no significant differences between the intervention and the control groups regarding gender. However, we decided to include age in the MANCOVA analysis as a covariate in order to control for its potential impact on the dependent variables. In order to check the randomization procedure, we tested the differences in pre-test scores for four dependent variables. The outcomes of the t-tests showed that the pre-test scores for work-related stress (OSI-2) in the control and the MBSR groups did not differ significantly, nor did the scores for positive and negative affect (AEI). Similarly, no significant differences were observed in self-esteem (RSES), intensity of somatic complaints (HQ), frequency of somatic complaints (HQ) or sickness absence. Differences between the six participants who failed to provide post-treatment data and the remainder of the sample (N = 144) were examined using one-way analysis of variance and chi-square analyses. No significant differences were found for demographic variables (age, gender), nor for any of the dependent variables as measured pre-treatment.

Means and SDs of scores at baseline and at follow-up for the MBSR and the control groups are presented in Table 1. Repeated-measures MANCOVA for work-related stress (OSI-2) as a dependent variable showed a significant interaction: intervention (MBSR versus control group) and time (pre- versus post-), $F(1,140) = 20.4$, $P < 0.001$, $d_{diff} = 0.72$. A comparison of means with *post hoc* tests showed that the MBSR group experienced a significant reduction in perceived work-related stress ($F(1,140) = 54.7$, $P < 0.001$) while no changes were observed in the control groups. Further repeated-measures MANCOVA showed a significant and strong interaction of time × group for negative affect (AEI) ($F(1,140) = 45.34$, $P < 0.001$, $d_{diff} = 0.93$) and univariate analysis showed that participants in the MBSR groups experienced a greater decrease in negative affect ($F(1,140) = 95.7$, $P < 0.0001$) than did those in the control group.

A significant interaction of time × group for positive affect (AEI) was also obtained ($F(1,140) = 6.73$, $P < 0.01$, $d_{diff} = 0.43$), and univariate analysis for group differences showed that participants from the MBSR group experienced greater increases in positive affect ($F(1,140) = 19.3$, $P < 0.001$) than participants from the control group. Of the potentially confounding variables in relation to positive affect, there was a significant interaction of time × age ($F = 5.79$, $P < 0.05$). A significant interaction of time × group was found for self-esteem (RSES) and this effect was very large ($F(1,140) = 44.1$, $P < 0.0001$, $d_{diff} = 1.25$). Univariate analysis revealed that the participants in the MBSR group experienced a greater increase in self-esteem ($F(1,140) = 120.5$, $P < 0.001$) than those in the control group. Of the potential confounding variables, significant interactions were time × age ($F = 9.00$, $P < 0.01$). A significant interaction of time × group was found for intensity of somatic complaints (HQ) ($F(1,140) = 20.7$, $P < 0.001$, $d_{diff} = 0.69$), but not for frequency of somatic complaints. Univariate analysis revealed that participants in the MBSR group experienced a greater reduction in the intensity of somatic complaints ($F(1,140) = 47.9$, $P < 0.001$) than did those in the control group. A significant interaction with time × group was found for sickness absence $F(1,140) = 30.2$, $P < 0.001$, $d_{diff} = 0.98$). Univariate analysis revealed that participants in the MBSR group experienced a greater reduction in sickness absence levels ($F(1,140) = 67.3$, $P < 0.001$), than did those in the control group.

Discussion

The results of our study showed that those middle managers who participated in the MBSR courses reported decreased sickness absence and perceived stress, as well as improved cognitive (self-esteem) and emotional well-being as compared with those in the control group. The largest impact observed among intervention participants was in relation to the emotional aspect of well-being, in particular with regard to negative affectivity. These results add to the growing body of evidence showing that

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the MBSR is associated with improved psychological well-being [15,17,18], which can also be considered as better emotion regulation.

One particularly striking feature of this study is the clear-cut directional impacts on affect, i.e. the increase in positive affect and the decrease in negative affect, of the MBSR intervention. The effect size for the negative affect (0.93) was considerably greater than that for positive affect (0.43). Kiken and Shook have also showed in their study that mindfulness may attenuate thoughts that emphasize negativity but not those that emphasize positivity [29]. The stress-reducing effect of MBSR observed in this study is consistent with the most common findings of other studies both in clinical settings [15] and in the workplace [16,17]. It clearly points to a non-specific effect of MBSR in decreasing stress levels, irrespective of the source of the stress. Such a potential of mindfulness has been hypothesized by other researchers, who demonstrated decreases in various types of work-related stress, such as that of primary school teachers [20], firefighters [22], health care practitioners and therapists [21]. One interesting finding of our study was the considerable rise in self-esteem in managers participating in the intervention, as compared to those in the control group. Some other studies investigating change following MBSR have also found significant improvements in self-esteem, as measured using the same RSES [30].

Finally, we found that mindfulness training also had a beneficial effect on self-rated intensity of illness symptoms. This finding is in line with the large body of evidence showing mindfulness practice bringing about improvements in a range of somatic conditions and diseases [15]. However, we did not observe a significant improvement in declared frequency of somatic complaints. A possible reason for this is the fact that our participants could through their mindfulness practice have learned how better to cope with the discomfort associated with somatic complaints, while remaining aware of existing episodes of such problems. We also found that improved self-perception regarding health is related to an objective indicator of that measure, namely sickness absence. The MBSR group participants reported significantly fewer workdays off due to sickness, as compared with the control group. This finding is a strong argument for employers, who have a direct interest in workforce productivity and capability, to advocate and support cost-effective worksite stress management measures of this type for their employees.

In addition to its strengths, which include an unusually large sample size for a study examining the effects of MBSR training, and objective measurement of stress, namely sickness absence, the study also has certain limitations. One of these limitations is the relatively short-term follow-up. Future research should thus focus on the long-term effects of MBSR and include follow-up over a period of ≥1 year.

Key points

- As an occupational group, middle-level managers have been found to be particularly affected by restructuring and organizational changes.
- The results of our study showed that those who participated in mindfulness-based stress reduction courses reported decreased levels of work-related stress, as well as improved cognitive (self-esteem) and emotional well-being as compared with those in the control group.
- The mindfulness-based stress reduction group participants reported significantly fewer workdays off due to sickness as compared with the control group, suggesting that employers should advocate and support this form of cost-effective workplace stress management for their employees.

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Conflicts of interest

M.S. is a qualified mindfulness trainer who runs courses and workshops for corporate clients and young people. D.Ż.-Z. and S.B. declare no conflicts of interest.

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