

Mindfulness Can Make You Happy-and-Productive: A Mindfulness Controlled Trial and Its Effects on Happiness, Work Engagement and Performance

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Abstract A controlled trial of a Mindfulness Based Intervention (MBI) was conducted on a big Spanish public hospital. The intervention program was offered to the staff as an initiative to promote psychosocial health of workers. Nineteen employees participated of the program, which consisted in three 150-min sessions and other fifteen employees acted as a control group in a waiting-list format. Pre–Post evaluations of Mindfulness, Work Engagement, Happiness and Performance were taken and the data analysis suggests that the intervention program was successful in boosting the existing levels of all the evaluated variables. The practical implications of these findings suggest that shorter versions of traditional MBI programs could be an effective Healthy Organizational Practice to boost happiness and performance among healthcare professionals.

Keywords Mindfulness · Work engagement · Happiness · Performance

1 Introduction

In the past 40 years, Mindfulness—defined as a form of awareness that stems from attending to the present moment in a non-judgmental and accepting manner (Bishop et al. 2004)—has become a strong field of knowledge development in diverse settings, such as public and occupational health, education, and organizational development.

In fact, there is a growing consensus about mindfulness meditation as an effective treatment for a wide range of somatic illnesses and psychological disorders (Arias et al.

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2006; Chiesa and Serretti 2011; Hofmann et al. 2010; Shonin et al. 2013a). However, little attention has been paid to Mindfulness Based Interventions (MBIs) possibilities as tools to promote healthy and positive outcomes, rather than just to reduce negative outcomes, even though the research indicates that mindfulness is positively related to constructs such as vitality, life satisfaction, and interpersonal relationship quality (Brown et al. 2007; Glomb et al. 2012). Indeed, most scientific models of mindfulness offer a primarily extinguishing account of the way mindfulness functions, focusing on the extinction of maladaptive habits and disengagement from negative states of mind, rather than on the cultivation of adaptive behavior and positive states of mind (Garland et al. 2015a). Thus, there is a significant gap in the scientific literature about the potential positive effects of Mindfulness.

Specifically, research has shown that mindfulness is positively related to work engagement, defined as “a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption” (Schaufeli and Salanova 2011), through the employee’s authentic functioning and positive affect (Leroy et al. 2013). These findings echo the Happy-and-Productive worker hypothesis explored by many authors (for a review, see Cropanzano and Wright 2001; Wright et al. 2002). Several studies carried out recently have reported findings that confirm the existence of a link between happiness, operationalized as well-being (a construct that includes positive affect in a broader model), and job performance (Cropanzano and Wright 2001; Zelenski et al. 2008).

In spite of the strong potential of mindfulness in the workplace, the happy-and-productive worker hypothesis, and MBIs’ possibilities as an effective practice to promote organizational health and well-being, only two controlled trials have explored the effects of mindfulness training at work (Shonin et al. 2014a; Hülshager et al. 2013). Therefore, the aim of this study is to conduct a controlled trial of an MBI in order to observe its effects on positive outcomes such as happiness, work engagement, and job performance. A secondary objective of this research is to test the efficacy of a shorter version of an MBI because many organizations do not have the time and resources to implement a classic 8-week program.

2 Mindfulness as a Positive Psychology Intervention

Both Mindfulness and Positive Psychology are relatively new research areas that are rooted in ancient wisdom traditions. On the one hand, Positive Psychology stems from ancient Greek Philosophy and the reflections of Aristippus and Aristotle about the different perspectives on well-being (Ryan and Deci 2001). On the other hand, contemporary Mindfulness practices come from different Buddhist Contemplative Traditions such as Vipassana and Mahayana (Kornfield 2011). Similarly, there has been an incredible increase in the quantity and quality of research in both fields of inquiry (Black 2011; Donaldson et al. 2014). More importantly, both views promote the idea of overcoming suffering and languishing in the service of a “life well lived” (Seligman 2002) and the pursuit of an optimal way of being or “genuine happiness” (Ricard 2010; Seligman 2002).

Positive Psychology is a field of psychological science that focuses on the study and observation of positively deviated behaviors, outcomes, and processes at the individual, collective, and societal levels of analysis (Seligman 2002). Positive Psychology shares a common goal with Mindfulness, based on the idea of developing and increasing skills and tools to promote wellbeing and optimal human functioning. The science of positive psychology is able to propose rigorously tested, meaningful, and sustainable ways to enhance

wellbeing that would offer real-world happiness seekers a more rewarding and effective experience of helping themselves (Howells et al. 2014).

Mindfulness can be defined as a form of awareness that arises from attending to the present moment in a non-judgmental and accepting manner (Bishop et al. 2004). Whether mindfulness is a stable trait for some individuals or a momentary state for others, it is an inherently human quality that can be developed so that individuals can bring quality to the way they attend to thoughts, actions, and emotional states (Mellor et al. 2016). Research has shown that mindfulness is subject to being developed through specific training (Shapiro and Izett 2008). Several studies in the field of cognitive neuropsychology have shown that engaging in as little as ten minutes of daily practice generates structural changes in regions of the brain associated with executive information processing, attention, and self-regulation (Lutz et al. 2007; Hölzel et al. 2011a, b).

Buddhism clearly and strongly endorses “the cultivation of happiness, the genuine inner transformation by deliberately selecting and focusing on positive mental states” (Lama and Cutler 1998, pp. 44–45). In Buddhism, mindfulness is only one aspect of a broader Eightfold Path designed to transform destructive thoughts and behaviors into virtuous ones and promote joy and equanimity (Rahula 1959). Among the factors of the Eightfold Path, Right Effort (*sammappadhana*) is defined as the will to prevent and remove negative states of mind and generate and sustain positive mental states (Rahula 1959). Thus, mindfulness practice was originally intended to strengthen mental capacities in order to disrupt negative states and cultivate positive psychological processes, rather than sustaining an affectively neutral state (Garland et al. 2015a, b). This cognitive skill (Bishop et al. 2004, Dahl et al. 2015) serves as the foundation for cultivating higher-order qualities of mind such as compassion, equanimity, joy, and love. Traditional Buddhist teachings point out that these qualities of mind are the vehicles to overcoming suffering, and that they are clear, scientific, and applicable (Nhat Hanh 2006).

The majority of the scientific models of mindfulness offer an extinguishing account of how mindfulness works, focusing on getting rid of maladaptive habits and disengaging from negative states of mind, rather than cultivating adaptive behavior and positive states of mind (Garland et al. 2015a). Consequently, the majority of MBIs have focused on the relief of negative symptoms and conditions such as stress, burnout, chronic pain, and addiction relapse (Arias et al. 2006). In doing so, they have left out one of the main aspects of Mindfulness training from the Buddhist tradition perspective: cultivating higher-order qualities of mind through the practice of focused attention and open awareness, by considering elements such as compassion, equanimity, joy, and kindness as simple outcomes, rather than key elements, of the practice (Nhat Hanh 2006). Taking this into account, the combination of Mindfulness and Positive Psychology seems to be the logical path for the integration of two disciplines that share essential goals and values.

3 Positive Consequences of Mindfulness at Work

3.1 Mindfulness and Happiness

Studies have shown that mindfulness promotes both hedonic (Brown and Cordon 2009) and eudaimonic well-being (Brown et al. 2007). Hedonic well-being is associated with pain relief and increased pleasure; eudaimonic well-being stands for living a meaningful, self-realized, and fully functional life (Ivtzan et al. 2016). Despite the focus on deficit

reduction, MBIs have also led to improvements in positive variables, such as positive affect (Geschwind et al. 2011), cognitive functioning (Hölzel et al. 2011a, b), positive reappraisal of thoughts (Hanley and Garland 2014), and improved interpersonal interactions (Goleman 2006).

Garland et al. (2015a) proposed the Mindfulness-To-Meaning theory in order to clarify potential paths through which mindfulness practice enhances positive variables, mainly eudaimonic well-being. The theory posits that mindfulness facilitates positive reappraisal because it evokes a decentered mode of awareness where thoughts and emotions are viewed from a metacognitive perspective—allowing for the flexible construction of more adaptive appraisals. By mindfully accepting experiences instead of dwelling on them, cognitive resources are freed up to broaden the scope of attention to encompass pleasurable and meaningful events and, therefore, build motivation toward purposeful engagement with life (Garland et al. 2015a). Empirical articles aimed at providing evidence for the Mindfulness to meaning theory have found that Mindfulness training stimulates an upward spiral of positive affect and cognition, which are key elements of well-being (Garland et al. 2015b). Furthermore, increases in trait Mindfulness have been associated with more frequent use of positive reappraisal (Garland et al. 2016).

Empirical research conducted to date supports the role of mindfulness in happiness, operationalized as well-being. Ivtzan et al. (2016) conducted a Positive Mindfulness Intervention randomized controlled trial (RCT) that integrated mindfulness with a series of positive psychology variables that effectively increased participants' happiness, operationalized as wellbeing, compared to controls. In this case, wellbeing was assessed through the Pemberton Happiness Index (PHI, Hervás and Vázquez 2013), an integrative measure of well-being that includes items related to different domains of remembered well-being (general, hedonic, eudaimonic, and social well-being) and experienced well-being (i.e., positive and negative emotional events that happened the day before). Using trait measures of mindfulness, significant correlations have been found with a variety of cognitive and affective indicators of mental health and happiness. Mindfulness may facilitate happiness directly by adding clarity and vividness to current experience and encouraging closer, moment-to-moment, sensory contact with life, that is, without dense filtering of experience through discriminatory thought (Brown and Ryan 2003). Trait Mindfulness has been associated with lower levels of emotional disturbance (e.g., depressive symptoms, anxiety, and stress), higher levels of subjective well-being (lower negative affect, higher positive affect, and satisfaction with life), and higher levels of eudemonic well-being (e.g., vitality, self-actualization) (Brown and Ryan 2003; Carlson and Brown 2005). Moreover, people with high levels of this construct are better equipped to recognize, manage, and resolve day-to-day problems, which promotes a healthy mind (Hollis-Walker and Colosimo 2011).

Moreover, Mindfulness has been associated with a more adaptive appraisal of stressful situations (Wolever et al. 2012), promoting better emotion regulation (Hülshager et al. 2013), work-family balance (Allen and Kiburz 2011), and sleep quality (Hülshager et al. 2013). It also produces increases in positive emotions, which, in turn, lead to increases in a wide range of personal resources and life satisfaction (Fredrickson et al. 2008). Finally, Mindfulness meditation frequency has been shown to be a great predictor of well-being, measured with the PHI questionnaire, which considers well-being to be a construct with multiple domains (general, hedonic, eudemonic, and social well-being, as well as positive and negative affect). The PHI also relates positively to the Five Facet Mindfulness Questionnaire (FFMQ) facet of Observing, as well as the attitude of Self Compassion, both significant outcomes of sustained practice (Schoormans and Nyklíček 2011; Campos et al. 2015).

Considering all the empirical evidence provided, it is feasible to consider happiness, operationalized as well-being, as an outcome of mindfulness training.

3.2 Mindfulness and Work Engagement

When employees are engaged in their work, they are highly energetic, enthusiastic, and fully immersed in their jobs (Schaufeli and Bakker 2004; Schaufeli et al. 2002). Having and maintaining this state of mind is an important indicator of employee well-being (Bakker and Demerouti 2008), and it enhances the occurrence of behaviors known to promote efficient organizational functioning (e.g., Rich et al. 2010). According to Rich et al. (2010), engaged individuals can be described as being fully immersed in the activities they are doing. Mindfulness is positively related to work engagement by enhancing this experience of being immersed and attentive. Receptive attention increases the clarity and vividness of one's experiences, so that individuals become more engrossed and positively engaged in their activities (Brown and Ryan 2003).

On the same path, Kahn (1992) argued that personal engagement in work is a function of being psychologically present at work. Psychological presence is similar to mindfulness in that it reflects whether individuals are "fully there" in the present moment, open, attentive, and aware. Psychological presence is positively related to work engagement because individuals who are more present in their work roles experience more personal engagement (Kahn 1990). In addition to greater immersion in activities, mindfulness can also foster engagement by helping individuals to see existing activities in novel and more interesting ways, based on the idea of the "beginner's mind", one of the core elements of Mindfulness practice, thus promoting a heightened state of involvement and wakefulness in these activities (Langer and Moldoveanu 2000).

Mindfulness can be instrumental in shifting one's perspective or "re-perceiving" what is already known (Carmody et al. 2009; Shapiro et al. 2006), thus keeping employees interested, attentive, and involved in their work. To understand how this may work, imagine engaging in what you consider to be a work-related activity, but approach it as if you were doing it for the first time: being receptive and attentive to see what this activity has to offer. This open awareness may lead you to discover new and interesting aspects of the task that were not as "clear" to you before. As the Greek philosopher Heraclitus said "You can't step in the same river twice" (Heraclitus as cited in Plato 1921, p 92). As a result, you may feel more engaged in the activity.

Furthermore, Mindfulness has been positively associated with work engagement through the mediation of the psychological construct of "authentic functioning", defined as being aware of one's self and regulating oneself accordingly (Avolio and Gardner 2005). Work engagement is dependent on people investing their "true selves" in their work (Kahn 1990, 1992). Therefore, by supporting the individual's authentic functioning, mindfulness promotes work engagement. Mindfulness helps individuals to make the conscious decision to engage in work-related activities, thus internalizing external role demands within their core sense of self (Weinstein et al. 2009). Authentic functioning describes this process of internalization by stating that authentic people are both open and humble, expressing their true selves, but willing to adapt at the same time (Leroy et al. 2013).

3.3 Mindfulness and Performance

A recent meta-analysis gathered different random controlled trials of MBIs performed in clinical populations using measures of cognitive capabilities. Results suggest that early

phases of mindfulness training, which are more concerned with the development of focused attention, could be associated with significant improvements in selective and executive attention. However, the following phases, which are characterized by open monitoring of internal and external stimuli, could be mainly associated with improved, unfocused, sustained attention abilities (Chiesa and Serretti 2011). These claims are supported by the findings of Zeidan et al. (2010), who indicate that brief mindfulness training significantly improves visuo-spatial processing, working memory, and executive functioning, compared to a control group that listened to a recorded book.

All these improvements in basic cognitive abilities are potential antecedents for improved performance at work, where focusing one's attention and making complex decisions while taking many factors into account are key behaviors (Goleman 2013). For instance, the ability to sustain focused attention over longer periods of time would probably positively impact the overall productivity of office workers. It would help them to complete their desired number of daily tasks in a shorter time span with fewer interruptions and errors, thus providing the opportunity to achieve the same goals and spend fewer working hours on them. In addition, the ability to take many different factors into account in complex decision making would be likely to increase the efficacy and positive impact of these decisions. As the scope broadens when considering different elements in key decisions, the person becomes more likely to tackle potential difficulties and setbacks in advance.

A recently conducted study evaluating the potential of awareness training through mindfulness meditation showed significant increases in employer-rated job performance in a medium-sized sample of middle managers. These results suggest that mindfulness-based (i.e., present-moment-focused) working styles may be more effective than goal-based (i.e., future-orientated) working styles (Shonin et al. 2014b). In a similar way, Reb et al. (2015) established a strong connection between awareness, absent-mindedness, and work performance. The measures were significantly related to emotional exhaustion, job satisfaction, need satisfaction, task performance, organizational citizenship behaviors (OCBs), and deviance. It is worth noting that all three measures of performance (task performance, OCBs, and deviance) were rated by the employees' supervisors, rather than by the employees themselves.

3.4 Hypotheses

Based on the above, we formulate the following hypothesis:

H1 Participants who complete the intervention program will exhibit statistically significant increases in their levels of Mindfulness, Happiness, Work Engagement, and Performance, compared to participants in the control group.

4 Method

4.1 Participants and Procedure

The study was conducted at a large semi-public Spanish hospital. All the employees were invited (approximately 1,500 individuals) to participate in the workshop through the Human Resources internal on-line training platform. The participants were informed about the nature of the study and given the first evaluation at the beginning of the first session.

Table 1 Baseline demographic characteristics for each condition

	Intervention (N = 19)	Control (N = 15)
Age, mean (SD)	38 (6.11)	36 (6.67)
Female (%)	95%	60%
Tenure, mean (SD)	3.6 (2.1)	3.9 (1.8)

The study was described as a scientific program about the “benefits of mindfulness for managing work stress”. The participants were told that the study would be conducted by university researchers, that the results would be confidential, and that the choice of whether to participate or not would not affect their standing with their employer. Participation was completely voluntary, and individuals were not rewarded for their involvement in the study.

Two successive calls to participate in the study were held. In the first call, 11 individuals (100% women) attended the first session, and all of them completed the intervention program. In the second call, 10 individuals attended the first session (80% women), but two dropped out after the second session. Additionally 15 individuals (60% women) were assigned to a control group in a waiting list format based on the time of soliciting inscription in the course. The term “waiting list” refers to a group of participants included in the outcome study who are assigned to a waiting list and receive intervention after the active treatment group. This control group served as an untreated comparison group during the study. All the control group members participated in the intervention program after the study was over. Baseline demographic characteristics for each group are shown in Table 1.

The Hospital supported the study by allowing the participants to attend the sessions during work hours without losing pay, and by validating the intervention as a professional training activity.

4.2 Mindfulness Program Description

The program was titled “Stress Management and Wellbeing promotion for Health Professionals”, and it was developed by the Hospital’s HR Manager as an adaptation of Mark William’s Mindfulness Based Cognitive Therapy (MBCT). The program was validated by Spain’s national commission for job training activities.

The participants attended three 150-min sessions and received a CD containing guided meditations to facilitate daily self-practice. Weekly sessions were structured considering three different components: (1) A taught/presentation component (approximately 60 min), (2) a facilitated group discussion component (approximately 60 min), and a guided meditation and/or mindfulness exercise (approximately 30 min). A short break (5–10 min) was always scheduled before the guided meditation practice. The participants were encouraged to develop both formal and informal mindfulness practice through follow up worksheets and suggested reading materials. The workshop was guided by the Hospital’s HR Manager, who had received prior training as a Mindfulness teacher. To complete the workshop, participants had to attend all three sessions. The specific session contents and structure are presented in Table 2.

At the beginning of the first session, the participants filled out the initial questionnaire. After the last session, the participants received the final questionnaire via e-mail and answered within the following week.

Table 2 Specific session content and structure

Session no	Rationale	Structure	Homework
1	Recognizing the tendency to be on automatic pilot. Commitment to learning how to step out of it. Practice in purposefully moving attention round the body.	Class Orientation (Welcome, Format, Intentions) Ground Rules Introductions Raisin exercise (Eating Meditation) Body scan	Body scan Mindfulness of routine activity
2	What is Stress and recognizing its presence and its effects Noticing stress in the body and the chatter of mind Emotion, body sensations, behavior (thoughts are not facts)	Mindful movement Home practice review Thoughts/feelings exercise Pleasant experiences diary sitting meditation introducing posture Explanation of homework Closing	Body scan or mindful movement Sitting meditation with focus on breath (10–15 min) Pleasant experiences diary Routine activity ‘Noticing’
3	Maintaining balance in life is helped by regular mindfulness practice, preparing for the future, the end of the beginning, not the beginning of the end Good intentions can be strengthened by linking the practice with reasons for taking care of oneself	Mindful movement Homework review Reflections on the course Preparing for the future Concluding meditation	

4.3 Measures

4.3.1 Five Facet Mindfulness Questionnaire

The Five Facet Mindfulness Questionnaire (Baer et al. 2006) is a 20-item, brief scale that assesses five different dimensions of Mindfulness, viewing it as higher-order factor. The five dimensions include: (1) Observe, (2) Describe, (3) Act with Awareness, (4) Non Reactivity to own thoughts, and (5) Non Judgment of own experience. Participants indicate the frequency of 20 behaviors on a 7-point Likert scale (0 = *almost never*, 6 = *almost always*). Items include “I’m good at finding words to describe my feelings” and “I’m easily distracted”. Half of the items are reverse scored. The scale presented good internal reliability (Pre $\alpha = 0.88$; Post $\alpha = 0.86$), even though the authors of the latest validation suggest revising the items corresponding to Non-Reactivity (Tran et al. 2013).

4.3.2 Utrecht Work Engagement Scale

The Utrecht Work Engagement Short Scale (Schaufeli et al. 2006) is a 9-item short-version questionnaire that assesses the three aspects of work engagement: (1) vigor, (2) dedication, and (3) absorption. Participants indicate the frequency of specific feelings and behaviors on a 7-point Likert scale (0 = *almost never*, 6 = *almost always*), including “At my job, I feel strong and vigorous” and “I’m enthusiastic about my job”. The scale presented high internal reliability (Pre $\alpha = 0.81$; Post $\alpha = 0.95$).

4.3.3 Pemberton Happiness Index

The Pemberton Happiness Index (Hervás and Vázquez 2013) is an integrative measure of happiness that encompasses the different domains of remembered well-being (general, hedonic, eudemonic, and social) and experienced well-being (positive and negative emotional events that happened the day before). Participants use a 10-point Likert scale (10 = *strong agreement*, 1 = *strong disagreement*) to indicate the degree of agreement with 10 selected statements about remembered happiness, and they respond YES/NO to 10 experiences that occurred the day before, including “I feel very connected to the people around me” and “I did something I really enjoy doing”. The scale showed high internal reliability (Pre $\alpha = 0.85$; Post $\alpha = 0.87$) and consistency.

4.3.4 Self-Evaluated Performance

Six items were taken from the HERO (Healthy & Resilient Organization) questionnaire (Salanova et al. 2012) to assess in-role and extra-role self-rated performance on a 7-point Likert type scale (0 = *almost never*, 6 = *almost always*). The items include, “I achieve my work-related objectives” and “I go beyond my official responsibilities to help my teammates”. The scale showed good internal consistency (Pre $\alpha = 0.80$; Post $\alpha = 0.85$).

4.4 Data Analysis

A significance level of $p < 0.05$ and two-tailed tests were employed throughout. Differences between group allocation conditions at baseline and endpoint were assessed using Analysis of Variance (ANOVA) with a 2×2 design (i.e., a group factor [intervention, control] and a time factor [baseline, endpoint]). In addition, univariate analysis of each outcome variable was performed, following the recommendations made by Winter (2013) to use Student’s t test with small sample sizes to identify effects possibly overlooked in the analysis of variance.

Effect sizes (Cohen’s d) were estimated based on difference scores of each dependent variable, and they showed the size of the between-groups effect (absolute value) using a mean averaged standard deviation. Cohen (1988) defined effect sizes as “small, $d = 0.2$,” “medium, $d = 0.5$,” and “large, $d = 0.8$ ”, stating that “there is a certain risk in inherent in offering conventional operational definitions for those terms for use in power analysis in as diverse a field of inquiry as behavioral science” (p. 25). Effect sizes can also be thought of as the average percentile standing of the average treated (or experimental) participant compared to the average untreated (or control) participant. An effect size of 0.0 indicates that the mean of the treated group is at the 50th percentile of the untreated group. An effect size of 0.8 indicates that the mean of the treated group is at the 79th percentile of the untreated group. An effect size of 1.7 indicates that the mean of the treated group is at the 95.5 percentile of the untreated group (Table 1).

5 Results

Results showed a significant interaction effect of group (intervention, control) and time (pre, post) for all the dependent variables [Mindfulness ($F(1) = 43.10$, $p < 0.001$), Happiness ($F(1) = 25.84$, $p < 0.001$), Performance ($F(1) = 23.68$, $p < 0.001$), except

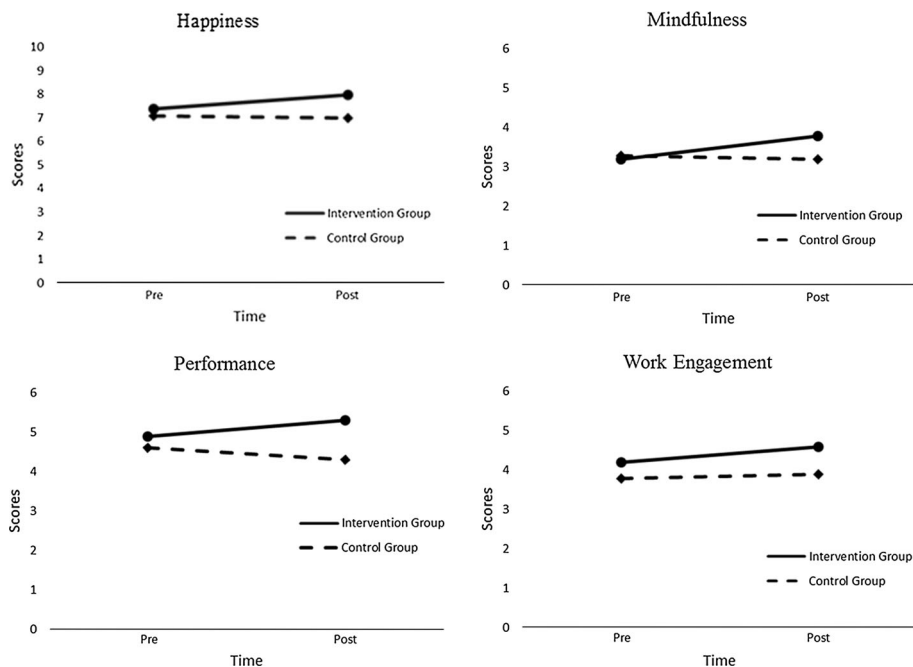


Fig. 1 Line plots showing the impact of time factor (pre, post) on dependent variables across groups

Work Engagement ($F(1) = 2.22, p < 0.05$). Figure 1 shows plotted means for each time factor (pre, post) across the groups (intervention and control). A clear and strong effect of the Mindfulness Program was observed for each outcome variable, suggesting that the Mindfulness Program improves levels of trait Mindfulness, Happiness, and Performance. Correlations, standard deviations, and Cronbach's alphas are shown in Table 3 for pre-intervention scores and in Table 4 for post-intervention scores on each variable.

Further analysis was carried out using paired samples t tests for both groups (intervention, control) to test for differences between time factors. The results indicate significant differences in the intervention group's dependent variable mean scores [Mindfulness ($t(18) = -7.88, p < 0.001, d = 0.66$), Happiness ($t(18) = -5.03, p < 0.001, d = 0.63$), Work Engagement ($t(18) = -4.06, p < 0.001, d = 0.50$), Performance ($t(18) = -4.76, p < 0.001, d = 0.72$)]. This supports the ANOVA results that include Work Engagement among the outcome variables whose levels increased significantly in the intervention group.

Results from t test comparisons of the time factor for the control group indicated no significant differences for the outcome variables Mindfulness ($t(14) = 0.496, p = 0.62$) and Work Engagement ($t(14) = -1.02, p = 0.32$), and significant interactions for Happiness ($t(14) = 2.24, p < 0.05, d = 0.07$) and Performance ($t(14) = 2.41, p < 0.05, d = 0.46$).

Finally, interaction effects were further examined by comparing time factors (pre, post) across each group (intervention, control). The results of t test comparisons between groups (intervention, control) showed no significant interactions in all the outcome variables at baseline time [Mindfulness ($t(32) = -0.44, p = 0.66$), Happiness ($t(32) = -0.65, p = 0.52$), Work Engagement ($t(32) = -1.40, p = 1.70$), Performance ($t(32) = -1.70$).

Table 3 Pre intervention means, standard deviation, internal consistency reliability coefficients and correlations (N = 34)

Variables	Mean	SD	α	1	2	3	4	5	6	7
(1) Total Mindfulness (FFMQ)	3.48	0.68	0.88	0.71**	—	—	—	—	—	—
(2) Observe (FFMQ)	3.10	0.87	0.69	0.62**	—	—	—	—	—	—
(3) Describe (FFMQ)	3.47	0.81	0.63	0.72**	0.36**	—	—	—	—	—
(4) Awareness (FFMQ)	3.43	0.81	0.83	0.82**	0.26	0.40*	—	—	—	—
(5) Non Judgement (FFMQ)	3.63	1.10	0.84	0.67**	0.49**	0.25	0.62**	—	—	—
(6) Non Reactivity (FFMQ)	3.24	0.76	0.62	0.50**	0.42*	0.32	0.28	0.41*	—	—
(7) Total Happiness (PHI)	7.57	1.24	0.85	0.49**	0.36**	0.21	0.25	0.42*	0.54**	—
(8) Remembered Happiness (PHI)	7.48	1.27	0.87	0.38**	0.37**	0.22	0.24	0.41*	0.52**	0.99**
(9) Experienced Happiness (PHI)	7.25	1.40	0.92	0.23	0.12	0.08	0.30	0.36*	0.48**	0.61**
(10) Total Work Engagement (UWES)	4.24	1.06	0.81	0.19	0.10	0.12	0.01	0.08	0.50**	0.64**
(11) Dedication (UWES)	3.90	1.29	0.86	0.21	0.06	0.13	-0.02	0.09	0.47**	0.61**
(12) Vigor (UWES)	4.03	1.14	0.81	0.21	0.06	0.12	-0.06	0.18	0.47*	0.75**
(13) Absorption (UWES)	4.10	1.15	0.80	0.05	0.08	0.25	-0.03	0.04	0.50**	0.61**
(14) Performance	4.91	0.75	0.80	-0.68	-0.08	0.24	-0.12	0.02	0.12	0.29
(15) In role Performance	4.85	0.90	0.76	1.61	-0.53	0.83	-0.23	-0.07	0.05	0.16
(16) Extra Role Performance	4.97	0.82	0.87	0.71**	-0.93	0.34	0.04	0.12	0.16	0.32
Variables	8	9	10	11	12	13	14	15	16	
(1) Total Mindfulness (FFMQ)	—	—	—	—	—	—	—	—	—	—
(2) Observe (FFMQ)	—	—	—	—	—	—	—	—	—	—
(3) Describe (FFMQ)	—	—	—	—	—	—	—	—	—	—
(4) Awareness (FFMQ)	—	—	—	—	—	—	—	—	—	—
(5) Non Judgement (FFMQ)	—	—	—	—	—	—	—	—	—	—
(6) Non Reactivity (FFMQ)	—	—	—	—	—	—	—	—	—	—
(7) Total Happiness (PHI)	—	—	—	—	—	—	—	—	—	—
(8) Remembered Happiness (PHI)	—	—	—	—	—	—	—	—	—	—

Table 3 continued

Variables	8	9	10	11	12	13	14	15	16
(9) Experienced Happiness (PHI)	0.53**	—	—	—	—	—	—	—	—
(10) Total Work Engagement (UWES)	0.63**	0.55**	—	—	—	—	—	—	—
(11) Dedication (UWES)	0.59**	0.58**	0.93**	—	—	—	—	—	—
(12) Vigor (UWES)	0.75**	0.45**	0.87**	0.84**	—	—	—	—	—
(13) Absorption (UWES)	0.61**	0.33	0.87**	0.78**	0.86**	—	—	—	—
(14) Performance	0.29	0.18	0.26	0.31	0.44*	0.37	—	—	—
(15) In role Performance	0.17	0.05	0.12	0.21	0.20	0.18	0.84**	—	—
(16) Extra Role Performance	0.32	0.25	0.33	0.31	0.55**	0.44**	0.81**	0.38*	—

FFMQ Five Facet Mindfulness Questionnaire (0 = Minimum; 6 = Maximum), *PHI* Pemberton Happiness Index (0 = Minimum; 10 = Maximum), *UWES* Utrecht Work Engagement Scale (0 = Minimum; 6 = Maximum)

* $p < 0.05$, ** $p < 0.01$

Table 4 Post intervention means, standard deviation, internal consistency reliability coefficients and correlations (N = 34)

Variables	Mean	SD	α	1	2	3	4	5	6	7
(1) Total Mindfulness (FFMQ)	3.48	0.68	0.86	—	—	—	—	—	—	—
(2) Observe (FFMQ)	3.10	0.87	0.68	0.63**	—	—	—	—	—	—
(3) Describe (FFMQ)	3.47	0.81	0.67	0.56**	0.27	—	—	—	—	—
(4) Awareness (FFMQ)	3.43	0.81	0.84	0.51**	0.09	0.28	—	—	—	—
(5) Non Judgement (FFMQ)	3.63	1.10	0.82	0.78**	0.52**	0.41*	0.48**	—	—	—
(6) Non Reactivity (FFMQ)	3.24	0.76	0.82	0.56**	0.37*	0.22	0.15	0.18	—	—
(7) Total Happiness (PHI)	7.57	1.24	0.87	0.48**	0.34	0.12	0.15	0.35	0.48**	—
(8) Remembered Happiness (PHI)	7.48	1.27	0.89	0.53**	0.32	0.15	0.21	0.38*	0.45*	0.96**
(9) Experienced Happiness (PHI)	7.25	1.40	0.90	0.34	0.16	0.18	0.27	0.34	0.24	0.60**
(10) Total Work Engagement (UWES)	4.24	1.06	0.95	0.27	0.03	0.08	-0.04	0.01	0.53**	0.65**
(11) Dedication (UWES)	3.90	1.29	0.85	0.24	0.03	0.09	-0.05	-0.27	0.45*	0.70**
(12) Vigor (UWES)	4.03	1.14	0.90	0.30	0.09	0.08	-0.01	0.04	0.44*	0.73**
(13) Absorption (UWES)	4.10	1.15	0.82	0.27	0.03	0.18	0.04	-0.09	0.47*	0.56**
(14) Performance	4.91	0.75	0.85	0.08	0.09	0.20	-0.30	-0.18	0.13	0.25
(15) In role Performance	4.85	0.90	0.81	-0.62	0.12	0.03	-0.45*	-0.28	0.05	0.11
(16) Extra Role Performance	4.97	0.82	0.87	0.21	0.32	0.33	-0.49	-0.30	0.18	0.33
Variables	8	9	10	11	12	13	14	15	16	
(1) Total Mindfulness (FFMQ)	—	—	—	—	—	—	—	—	—	—
(2) Observe (FFMQ)	—	—	—	—	—	—	—	—	—	—
(3) Describe (FFMQ)	—	—	—	—	—	—	—	—	—	—
(4) Awareness (FFMQ)	—	—	—	—	—	—	—	—	—	—
(5) Non Judgement (FFMQ)	—	—	—	—	—	—	—	—	—	—
(6) Non Reactivity (FFMQ)	—	—	—	—	—	—	—	—	—	—
(7) Total Happiness (PHI)	—	—	—	—	—	—	—	—	—	—
(8) Remembered Happiness (PHI)	—	—	—	—	—	—	—	—	—	—

Table 4 continued

Variables	8	9	10	11	12	13	14	15	16
(9) Experienced Happiness (PHI)	0.62**	—	—	—	—	—	—	—	—
(10) Total Work Engagement (UWES)	0.42*	0.55**	—	—	—	—	—	—	—
(11) Dedication (UWES)	0.71**	0.52**	0.93**	—	—	—	—	—	—
(12) Vigor (UWES)	0.76**	0.45**	0.92**	0.96**	—	—	—	—	—
(13) Absorption (UWES)	0.60**	0.39*	0.90**	0.86**	0.86**	—	—	—	—
(14) Performance	0.18	−0.13	0.30	0.35	0.36	0.26	—	—	—
(15) In role Performance	0.05	−0.19	0.17	0.20	0.18	0.12	0.88**	—	—
(16) Extra Role Performance	0.28	0.07	0.35	0.39*	0.46*	0.34	0.85**	0.51**	—

FFMQ Five Facet Mindfulness Questionnaire (0 = Minimum; 6 = Maximum), *PHI* Pemberton Happiness Index (0 = Minimum; 10 = Maximum), *UWES* Utrecht Work Engagement Scale (0 = Minimum; 6 = Maximum), Performance (0 = Minimum; 6 = Maximum)

* $p < 0.05$; ** $p < 0.01$

Table 5 Pre–Post Intervention and Control Groups Scores—Mean (SD)

	Intervention (N = 19)		Control (N = 15)	
	Pre	Post	Pre	Post
Mindfulness (FFMQ)	3.2 (0.5)	3.8 (0.4)	3.3 (0.5)	3.2 (0.6)
Observe (FFMQ)	3.0 (0.8)	3.6 (0.6)	3.0 (0.9)	2.8 (0.7)
Describe (FFMQ)	3.4 (0.7)	3.9 (0.6)	3.6 (0.7)	3.4 (0.7)
Awareness (FFMQ)	3.5 (0.5)	3.7 (0.5)	3.6 (0.7)	3.3 (0.7)
Non Judgement (FFMQ)	3.2 (1.1)	3.8 (0.9)	3.6 (1.3)	3.4 (1.1)
Non Reactivity (FFMQ)	3.0 (0.8)	3.5 (0.7)	3.0 (0.8)	2.7 (0.7)
Happiness (PHI)	7.4 (1.0)	8.0 (0.9)	7.1 (1.3)	7.0 (1.3)
Remembered Happiness (PHI)	7.4 (1.0)	7.8 (0.9)	7.2 (1.3)	7.2 (1.3)
Experienced Happiness (PHI)	6.6 (1.6)	7.3 (1.4)	6.1 (1.4)	6.3 (1.2)
Engagement (UWES)	4.2 (0.8)	4.6 (0.8)	3.8 (0.9)	3.9 (0.8)
Dedication (UWES)	4.3 (1.0)	4.6 (0.7)	3.5 (1.2)	3.6 (1.1)
Vigor (UWES)	4.0 (0.9)	4.6 (0.8)	3.7 (1.1)	3.7 (1.1)
Absorption (UWES)	4.3 (0.8)	4.7 (0.8)	3.8 (1.2)	3.8 (1.2)
Performance	4.9 (0.6)	5.3 (0.5)	4.6 (0.6)	4.3 (0.7)
In role Performance	4.5 (0.6)	5.2 (0.5)	4.4 (0.8)	4.3 (0.7)
Extra Role Performance	4.8 (0.5)	5.3 (0.4)	4.6 (0.7)	4.5 (0.7)

FFMQ Five Facet Mindfulness Questionnaire (0 = Minimum; 6 = Maximum), *PHI* Pemberton Happiness Index (0 = Minimum; 10 = Maximum), *UWES* Utrecht Work Engagement Scale (0 = Minimum; 6 = Maximum), Performance (0 = Minimum; 6 = Maximum)

$p = 0.9$]. Comparison of the same variables at the end time shows significant interactions in all outcome variables [Mindfulness ($t(32) = -3.39$, $p < 0.05$, $d = 1.17$), Happiness ($t(32) = -2.49$, $p < 0.05$, $d = 0.89$), Work Engagement ($t(32) = -2.33$, $p < 0.05$, $d = 0.87$), Performance ($t(32) = -4.77$, $p < 0.001$, $d = 1.64$)]. Mean and standard deviation scores for each variable across both groups at different times (pre, post) are shown on Table 5.

6 Discussion

A controlled trial was conducted to assess the effectiveness of a short MBI as a Positive Organizational Psychology optimization intervention for improving Mindfulness, Work Engagement, Happiness, and Job Performance. A small sample of healthcare workers was allocated to the MBI group or a waiting list control group that received the intervention protocol once the study had ended. Outcomes are consistent with the proposed hypothesis. After participating in the three-week intervention program, participants showed significant improvements with moderate effect sizes, compared to controls, on levels of Mindfulness, Work Engagement, Happiness, and Job Performance. The findings suggest that the abbreviated Mindfulness training program is a successful strategy for improving employee happiness, work engagement, and performance (for a graphic representation of differences between the intervention and control groups, see Fig. 1).

The results are generally consistent with the findings from the following studies on Mindfulness in occupational contexts: (1) a randomized controlled trial by Shonin et al.

(2014a, b) showing that an 8-week second-wave MBI called MAT (Mindful Awareness Training) diminished the levels of work-related stress and psychological distress, and increased job satisfaction and employer-rated job performance; (2) a cross-sectional study by Ho (2011) showing that an employee meditation experience was positively associated with self-directed learning, organizational innovativeness, and organizational performance in Taiwanese technological company workers; (3) a cross-sectional study of employed (i.e., >20 h per week) parents by Allen and Kiburz (2012) showing that trait mindfulness was positively associated with work-life balance, sleep quality, and vitality; (4) a longitudinal growth modeling study about the positive effect of MBIs on promoting Work Engagement through the mediation of Authentic Functioning (Leroy et al. 2013); and (5) a controlled trial of an 8-week mindfulness training program in a UK-based organization that reported improved scores on measures of well-being, satisfaction with life, hope, and diminished scores of anxiety (Mellor et al. 2016).

Unexpectedly, participants allocated to the control group showed a statistically significant decrease in their well-being and performance scores. To find a possible explanation for this occurrence, we took a closer look at the participants' work conditions and possible events that could help us to explain this negative outcome. First, the participants were allocated to the control group using a "first-come, first-served" logic, and so it is plausible that some frustration could be experienced by those who wished to attend the first round of sessions of the program and could not do so because they did not respond fast enough. The negative emotions associated with this event could somewhat explain the decrease in self-ratings of well-being and performance, inducing perceptions of low self-efficacy and lack of psychological resources to cope with their existing job demands. Second, some participants in the control group could have been impeded by their work load and existing resources from successfully enrolling in and attending the program at that specific moment. In this regard, knowing that there is a stress management program available at their workplace and not being able to attend due to time/work constraints could produce heightened awareness of negative and stressful experiences. This poses a significant challenge to developing successful interventions in the future. Securing support and commitment from management, translated specifically into time and space to conduct the intervention program within the required time margins, is a critical element for success, as well as making sure that participants' workload does not keep them from attending this kind of initiative. The negative changes experienced by the control group members are consistent with the idea that awareness heightens affective experience and reactivity, exacerbating negative symptoms when not coupled with acceptance and coping/reappraisal skills.

Even considering the presence of these negative outcomes, we believe the findings of this study support the happy and productive worker theory (Wright et al. 2002), which proposes the relevance of positive affect and wellbeing as key elements in promoting healthy and high-achieving work environments and workers. Moreover, it serves as a valid and innovative example of a Positive Organizational Intervention designed to develop specific positive outcomes associated with high performance and psychosocial well-being.

Regarding the underlying psychological mechanisms that explain the effectiveness of the mindfulness intervention program, the structure and content of the program indicate that attention-related skills, such as awareness and observation, and perceptual focus shifting skills, such as acceptance, non-judgment, and non-reactivity, are the two main components. Attention monitoring skills cultivated through mindfulness meditation exercises enhance awareness of the present moment experience. As such, attention monitoring is a mechanism for the effects of mindfulness on improving cognitive functioning

outcomes in affectively neutral contexts (Lindsay and Creswell 2016), and it heightens affective experience and reactivity, both exacerbating negative symptoms and enhancing positive experiences. Therefore, attention monitoring skills alone are not sufficient to improve performance on cognitive tasks that balance attentional control with emotion regulation. Acceptance modifies the way one relates to the present moment experience, regulating reactivity to affective experience. Thus, attention monitoring and acceptance skills together boost performance on cognitive tasks that involve emotion regulation, reduce negative reactivity (e.g., anxiety, depression, stress), reduce grasping for positive experiences (e.g., craving, substance use), and improve stress-related health outcomes (Lindsay and Creswell 2016). Moreover, positive reappraisal could be another plausible psychological mechanism explaining the effects of the intervention program. Garland et al. (2015a) propose the mindfulness-to-meaning theory, which asserts that by modifying how one attends to the cognitive, affective, and interoceptive sequelae of emotion provocation, mindfulness introduces flexibility into the creation of autobiographical meaning, stimulating the natural human capacity to positively reappraise adverse events and savor the positive aspects of experience. By fostering positive reappraisals and emotions, mindfulness may generate deep eudemonic meanings that promote resilience and engagement with a valued and purposeful life. Another important mechanism through which mindfulness is believed to modulate dysphoric mood states and enhance well-being (whether work-related or otherwise) is via the cultivation of compassion and self-compassion. Research has shown that mindfulness can lead to a greater awareness of the individual's own suffering and psychological distress, and this helps to achieve a greater awareness of the suffering of others (Shonin et al. 2013a). In turn, greater levels of compassion and self-compassion are thought to lead to improvements in levels of tolerance, cooperation (e.g., with senior management), and interpersonal skills in general (Shonin et al. 2013b). Based on this idea, there is empirical evidence supporting the relationship between facets of mindfulness and self-compassion as relevant elements to explain well-being (Baer et al. 2012; Campos et al. 2015). Last but not least, Davidson and Schuyler (2015) presented relevant neuroscientific evidence pointing to four constituents of well-being attained through Mindfulness training, these are: (1) Sustained Positive Emotion; (2) Recovery from negative emotion; (3) Empathy, altruism and pro-social behavior; and (4) Mind wandering, mindfulness and emotion-captured attention. All of the neural circuits identified as underlying to these four constituents of well-being exhibit plasticity, and thus can be transformed through experience and training regimes as short as 2 weeks.

Although the efficacy of shorter versions of traditional MBIs remains to be demonstrated in the long run, the findings of this study suggest that it is relevant to utilize these abbreviated treatments. They are a cost and time effective way to introduce Mindfulness training and practice as a Healthy Organizational Practice (Salanova et al. 2013) aimed to promote Work Engagement, Happiness, and Job Performance. The traditional eight-week programs are a "gold standard" for MBIs, but establishing the necessary commitment from management to develop such a program in any kind of organization is difficult to accomplish without any prior experience in Mindfulness. In this regard, shorter versions of consistently proven intervention protocols could act as a successful first step in developing Mindfulness practice as a long term strategy to effectively promote and sustain an Engaged, Happy, and Productive workforce. In fact, Jon Kabat-Zinn (1990), who developed MBSR, describes mindfulness as a skill that can only be developed through continuous practice. Comparing it with a muscle, he explains that mindfulness can only grow, become stronger, and become more flexible when we continuously work on it and challenge it (Hülshager 2015).

6.1 Limitations

The most relevant limitation of the study is the sample size, combined with the lack of a proper active control intervention, instead of the waiting list format. It was a significant challenge to recruit participants in a highly demanding work environment in terms of quantitative overload and limited time. Therefore, it is necessary to clarify and establish management's commitment to supporting the intervention program as a key element when repeating the study with a larger sample size. Even though positive results were observed, the size of the sample is too small to make assumptions about the general efficacy of short MBIs as Positive Organizational Psychology optimization interventions. Furthermore, the lack of a specific and comparable alternative intervention for the control group undermines the value of the results, considering that any kind of intervention is usually better than nothing at all. Additionally, the exclusive use of self-report measures is a weakness that should be addressed in future research projects by incorporating second and third person ratings, as well as behavioral indicators such as key performance indicators.

6.2 Future Research

The most important line of research that emerges from the results of this study involves conducting high-standard controlled trials with larger samples and active control group intervention programs. Following this approach would be a necessary step in validating the efficacy of shorter versions of MBIs and making a stronger case for Mindfulness as a strategy to promote happy and productive workers. As a complementary approach, intervention evaluation through diary studies could yield relevant information about the underlying psychological mechanisms affected by Mindfulness practice that have a direct impact on Happiness, Work Engagement, and Job Performance, such as positive emotions, coping mechanism, character strengths, and mindsets. Another possible line of inquiry would be to consider the influence of organizational practices and characteristics and their positive/negative interactions with Mindfulness, Happiness, Work Engagement, and Job Performance at both an individual and collective level of analysis.

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