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**Mindfulness-based programs, perceived stress and well-being at work: The preferential use of informal practices**

**Programmes fondés sur la pleine conscience, stress perçu et bien-être au travail :  
l'utilisation préférentielle des pratiques informelles**

**Short running title:** Mindfulness-based practices, stress, and well-being

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**Conflicts of Interest**

Nicolas Verger declares that he has no conflict of interest.

Rebecca Shankland declares that she has no conflict of interest.

Lionel Strub declares that he has no conflict of interest.

Ilios Kotsou declares that he has no conflict of interest.

Christophe Leys declares that he has no conflict of interest.

Dominique Steiler declares that he has no conflict of interest.

**Mindfulness-based programs, perceived stress and well-being at work: The preferential use of informal practices**

**Introduction.** Organizations which engage in the promotion of well-being are likely to prevent mental health issues in workers. Mindfulness-based interventions offer new perspectives to increase well-being at work. However, the issue of finding time and framework to practice at work is important. Recent studies suggested that informal mindfulness practices could be useful in reducing stress and increasing well-being. **Objective.** The present study aimed to study how the duration and type of mindfulness practice may enhance employees' well-being. **Method.** A multi-method (qualitative and quantitative), controlled pre/post design study (N = 72) was conducted to collect data about the type of preferred mindfulness practices used during an 8-week MBSR program, and to analyse the effects of the program on employees' well-being. Number of sessions, number of days of practice, and practice time per day were used as moderators. **Results.** Participants reported a preferential use of brief, informal practices. Employees who followed the MBSR program reported higher levels of well-being compared to the wait-list control group ( $\eta^2 = .194$ ). Those who preferentially used informal practices showed the same increase in well-being as those who reported preferentially using formal practices. The number of days of practice did not moderate the effect of the intervention on well-being. **Conclusion.** Brief and informal mindfulness practices appear to be a promising means of increasing well-being in everyday life. Further research is needed to compare an 8-week mainly informal mindfulness-based program to a classical MBSR program to identify whether informal practices may be sufficient to increasing employees' well-being.

**Keywords:** well-being; work; mindfulness; informal practice; practice time.

**Programmes fondés sur la pleine conscience, stress perçu et bien-être au travail :  
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**Introduction.** Les organisations qui s'engagent dans la promotion du bien-être peuvent ainsi contribuer à réduire les problèmes de santé mentale des employés. Les interventions fondées sur des pratiques de pleine conscience offrent des perspectives nouvelles concernant la santé mentale au travail. Toutefois, la question du temps de pratique et du cadre permettant de pratiquer au travail demeure un enjeu important. De récentes études suggèrent que des pratiques de pleine conscience courtes ou informelles peuvent favoriser la réduction du stress et l'amélioration du bien-être. **Objectif.** L'objectif de cette recherche était d'étudier comment le type de pratique de pleine conscience (formelle ou informelle), ainsi que la régularité des pratiques, améliorent le bien-être des employés. **Méthode.** Une étude contrôlée multi-méthodes (qualitative et quantitative) a été menée pour recueillir des données (N = 72) sur le type de pratiques de pleine conscience préférentiellement utilisé pendant un programme MBSR (Mindfulness, Based Stress Reduction) d'une durée de 8 semaines, et pour en analyser les effets sur le bien-être des employés. Le nombre de séances, le nombre de jours de pratique et le temps de pratique par jour ont été utilisés comme modérateurs. **Résultats.** Les participants ont rapporté une utilisation préférentielle de pratiques brèves et informelles. Les employés qui ont suivi le programme MBSR ont déclaré des niveaux de bien-être supérieurs à ceux du groupe témoin sur liste d'attente ( $\eta^2 = 0,194$ ). Ceux qui ont privilégié les pratiques informelles ont montré la même augmentation de bien-être que ceux qui ont déclaré préférer l'usage de pratiques formelles. Le nombre de jours de pratique n'a pas modéré l'effet de l'intervention sur le bien-être. **Conclusion.** Des recherches supplémentaires sont nécessaires pour identifier l'efficacité de programmes de 8 semaines basés principalement sur des pratiques courtes et informelles comparativement à un programme MBSR

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classique, afin d'identifier si les pratiques courtes et informelles peuvent être suffisantes pour accroître le bien-être des employés.

**Mots-clés:** bien-être; travail; pleine conscience; pratique informelle; temps de pratique.

## Introduction

Employee's well-being is important both at an individual level and at an organisational level. Fostering well-being in the workplace has the potential to increase job satisfaction and reduce organizational turnover (Wright & Bonett, 2007). In engaging in the promotion of well-being, organizations are likely to prevent mental health issues in workers (Di Fabio, 2017). Furthermore, organizational turnovers, which are mostly predicted by discontentment with manager relationship, job content, or working conditions, cost at least (i.e. for position such as front desk, concierge, or restaurant workers) \$12.000 per turnover, and have higher financial impacts for higher positions (Tracey & Hinkin, 2008). In addition, it has been showed that psychological well-being mediated the relation between interpersonal conflict and turnover intention (Langove & Isha, 2017). Therefore, by taking care of employees' well-being it may be possible to conjointly foster individual's growth and organizational flourishing.

Well-being can be considered as a complex and dynamic construct defined as the "balance point between an individual's resource pool and the challenges faced" (Dodge et al., 2012, p. 230). Well-being encompasses two aspects: hedonia and eudaimonia. Hedonia refers to the experience of positive emotions and satisfaction with life (Diener, 1984), while eudaimonia (Ryff, 1989; Ryff & Keyes, 1995) refers to a dimension of well-being related to meaning of life and the development of one's potential (Lent, 2004; Ryan & Deci, 2001).

Employee's well-being may reflect a positive psychological capital that increases the ability to cope with stressors and change (Rabenu et al., 2017). Organizations can engage in at least three ways to promote well-being. They may leverage on the competences of leaders and managers (e.g., Hendriks et al., 2020), tailor job-demands to employees (Gauche et al., 2017),

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and foster workers' individual competences to flexibly adapt to everyday organisational settings (Kim *et al.*, 2019). In that sense, research has documented the effects of practices that enable to develop the ability to flexibly adapt to stressful situations and may promote well-being: mindfulness-based practices (Finkelstein-Fox *et al.*, 2019).

## **Mindfulness and well-being at work**

Mindfulness is defined as the ability to pay attention, on purpose, to the present moment, without judgement (Kabat-Zinn, 1982). It can exert positive effects on mental health. For instance, a systematic review of the literature examined the effect of mindfulness-based programs among a specific category of employees: educators (Lomas *et al.*, 2017). The results indicated that mindfulness-based programs had positive effects on mental health, showing reduced levels of anxiety, burnout, and depression. This same study also showed that mindfulness improved distress management (anger and stress), resilience, compassion, empathy, and increased emotion regulation, overall life satisfaction, health, and well-being. Other evidence showed that mindfulness practices reduced perceived stress and negative affect, and enhanced positive emotions (Finkelstein-Fox *et al.*, 2019)

Typically, mindfulness-based programs tend to aim at the reduction of symptoms. Yet, a growing number of studies start to document the positive effects of mindfulness on individual flourishing. A decade ago, mindfulness-based interventions were mostly known to reduce moderate experience of depression or anxiety (Chiesa & Serretti, 2011; Hofmann *et al.*, 2010; Piet *et al.*, 2012). More recently, however, the benefits of mindfulness programs at work, while still efficient to reduce stress, burnout, mental distress, and somatic complaints, have been shown to enhance well-being, protective factors as well as work engagement, productivity and job satisfaction (Vonderlin *et al.*, 2020).

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One of the most validated mindfulness-based programs is the Mindfulness Based Stress Reduction (MBSR) program. MBSR is an eight-week standardized program developed by Jon Kabat-Zinn (1982). It encompasses both formal and informal mindfulness practices. The formal practices consist of specific meditation practices such as the body-scan, sitting or breathing meditation, alongside brief formal practices such as the three minutes breathing space. The informal practices included in this program consist of activities such as mindful eating or mindful walking. MBSR instructors recommend practicing 45 minutes per day, six days per week.

Although the MBSR program has been shown to have positive effects on employees' mental health (Janssen *et al.*, 2018; Lomas *et al.*, 2017), some employees can believe that they do not have sufficient time to practice 45 minutes per day, and therefore may not sign up for such a program. In a converse view, recent meta-analyses that have assessed the effects of brief and informal mindfulness practices have showed an immediate and small significant effect on decreasing negative affect both among clinical and non-clinical populations (e.g., Schumer *et al.*, 2018). Although, this systematic work did not document the effect of brief or informal mindfulness-based practices on well-being – which suggests a research imbalance between the study of the effects on symptoms compared to the effects on positive mental health – brief and informal practices have also been shown to have positive effects on well-being (Birtwell *et al.*, 2019; Hanley *et al.*, 2015; Shankland *et al.*, 2020).

Another problem which organizations can face when seeking to implement mindfulness-based programs is the number of sessions that one needs to implement. Carmody and Baer (2008) conducted a systematic review on the relationship between mindfulness-based programs in-session time and the effect sizes of their positive outcomes. They found no statistically significant correlation between the number of in-sessions and the effects on psychological distress. In



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addition, they found that greater assigned practice time was likely to be associated with smaller effect size. Overall, this systematic review indicated that if practitioners can adapt their MBSR training with fewer sessions, doing so would be worthwhile for specific populations. Indeed, shorter mindfulness sessions could seemingly be implemented without losing any of the benefits of the program on self-reported mental health outcomes.

One of the key components of mindfulness-based programs' efficacy is the extent to which practices may be integrated to everyday life. In that sense, Birtwell et al. (2019) conducted a mixed-methods study analysing how participants managed to integrate the practices into daily life. Their qualitative results indicated that more than half of the participants reported that they were performing informal mindfulness practices. In addition to these data, Birtwell et al. (2019) computed hierarchical regression analyses that indicated that the only variable which significantly predicted well-being and psychological flexibility was the frequency of informal mindfulness practices. No significant results were found regarding formal meditation practices. In summary, Birtwell et al.'s results underlined the potential of informal mindfulness practices which can be easily integrated into everyday life and routines. These results corroborated with other ecological intervention showing that brief six minutes mindful dishwashing could exert positive effects in terms of reduced negative affect (e.g., nervousness), and enhanced positive emotions (e.g., feelings of inspiration; see Hanley et al., 2015). Further documenting the benefits of brief mindful practices, other studies showed the benefits of informal practices such as mindful communication (listening, dialog), mindful team meetings (a minute of silence before a group meeting), mindful noticing of positive experiences, mindful emailing, and daily journaling in terms of reduced perceived stress and burnout symptoms, and improved well-being (Kersemakers et al., 2018).

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**Research aims.** Although these results are promising, little is known about how workers appropriate mindfulness practices in their daily routines, and whether they practice more formal or informal practices. The goal of the present study was therefore to document these practices in organizational settings. In addition, the present research aimed at further documenting the extent to which efficacy depends upon practice time. The present study thus aimed to identify the types of practices employees prefer to use during an MBSR program at work, and how practice time predicted the effects of the program in terms of enhanced well-being, as well as enhanced mindfulness skills, which is considered as the main mediator of efficacy.

**Hypothesis 1 (H1)** Based upon the above-presented literature, it was predicted that employees in the experimental group would qualitatively report a preferential use of brief and informal mindfulness practices at work, and would report benefits in terms of their mindfulness skills and levels of well-being.

**Hypothesis 2 (H2)** Based on quantitative data, it was hypothesized that employees who followed the MBSR program would report higher levels of well-being compared to the wait-list control group.

**Hypothesis 3 (H3)** It was hypothesized that participants who reported using more informal practices would report the same level of benefits on mindfulness and well-being as the participants who reported using more formal practices.

**Hypothesis 4 (H4)** In addition, we predicted that the practice time per day would moderate the relation between mindfulness skills and improved well-being, with the strongest associations expected to be found with the greatest practice time.

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### Method

**Sample and Procedure.** A total of 72 participants (40 females, 32 males) were included in the present study ( $M_{age} = 44.47$   $SD = 7.06$ ). The participants were recruited in three companies and worked between 30 to 70 hours per week ( $M = 45.97$ ,  $SD = 7.18$ ). Based on their motivation to participate in an MBSR program, they were recruited through an email sent by their company, then assigned to either the experimental group or the wait-list control group according to their current schedule. The inclusion criteria were: being employed by the company and having signed the informed consent. The exclusion criterion was having a psychopathological diagnosis.

The experimental group was composed of 29 participants (19 females, 10 males,  $M_{age} = 45.07$   $SD = 7.25$ ). The control group comprised 43 participants (21 females, 22 males,  $M_{age} = 44.07$ ,  $SD = 6.98$ ). The participants took part in between 2 and 8 in-class sessions of the MBSR program. Before and after the program, they were asked to complete the measurement described below on a secured online survey. Written informed consent was obtained from all participants. This article reports a pilot study which was carried out before launching a larger study on the underlying mechanisms of mindfulness and positive psychology interventions, which was approved by the Research Ethical Committee of University Grenoble Alpes (approval n°: 2016-03-08-88), and the research was performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. All participants received free mindfulness training, but they were not additionally compensated for their participation.

### Measures

**Qualitative measures.** Qualitative data were collected through a series of questions about the perceived utility of each type of practice. Participants were asked five open-ended

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questions to address their qualitative experience of the mindfulness program. The questions were related to how much use they perceived the program to have been to them, how easy-to-implement it was, and how much they perceived positive outcomes from it, both at home and at work. The questions were: (1.a) Since the beginning of the mindfulness training, would you say that mindfulness was useful to you in your everyday work? (1.b) Otherwise, could you give some reasons why the mindfulness approach was not useful for you in your day-to-day work? (2) Could you describe how the mindfulness approach has been, or is still useful today, in your day-to-day work? (3) Which formal and informal mindfulness practices that you learned during the program did you preferentially implement in everyday life? (4.a) Which formal and informal mindfulness practices learned during the program did you find easiest to implement at work? (4.b) Which formal and informal mindfulness practices you learned during the program did you find easiest to implement at home, during your travel time or your leisure time? (5) Overall, since the beginning of the mindfulness program, would you say that your mindfulness practices have had a positive impact on your well-being at work?

***Mindfulness.*** Mindfulness was measured using the Five Facets Mindfulness Questionnaire (FFMQ; Baer *et al.*, 2006). The FFMQ is a 39-item Likert scale ranging from 1 (never, or very rarely true) to 5 (very often, or always true). It has five subscales: (a) Observing; (b) Describing; (c) Acting with awareness; (d) Non-judging of inner experience; (e) Non-reactivity to inner experience. Example of its items include: “When I’m walking, I deliberately notice the sensations of my body moving” (item 1); “When I do things, my mind wanders off and I’m easily distracted” (item 5). The FFMQ has shown adequate-to-good internal consistency for all mindfulness facets ( $\alpha = .72$  to  $.92$ ; but see Baer *et al.*, 2006, p. 335). In the present study, we

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used the French validated FFMQ (Heeren *et al.*, 2011). In this study, the FFMQ had excellent internal consistency ( $\alpha = .90$ ).

***Well-being.*** Well-being was measured through the Warwick-Edinburgh Mental Well-being Scale (WEMWBS; Tennant *et al.*, 2007). The WEMWBS is a 5-point Likert scale self-reported questionnaire (ranging from 0 = ‘none of the time’ to 5 = ‘all of the time’) constructed to assess mental well-being, focusing entirely on positive aspects of mental health. It comprises 14 items related to both hedonic and eudemonic aspects of mental health, including positive affect (feelings of optimism, cheerfulness, relaxation), satisfying interpersonal relationships, and positive functioning (energy, clear thinking, self-acceptance, personal development, competence, and autonomy). Example of its items include: “I have been feeling optimistic about the future” (item 1) or “I have been feeling good about myself” (item 8). An overall score up to 70 is calculated by totalling the scores for each item. Thus, a high score on the WEMWBS represents a high degree of self-perceived well-being. In the present study, the French version of the WEMWBS was used (Trousselard *et al.*, 2016) and showed good internal consistency ( $\alpha = .87$ ).

## Data analyses

***Qualitative analyses.*** Regarding the qualitative examination of which types of mindfulness practice workers preferred to use, and which benefits they perceived from them (H1), we analysed participants’ verbatim accounts. It was addressed the perceived utility, ease of implementation, and benefits of this intervention by asking the participants open-ended questions via an online questionnaire. The two first authors of this article independently analysed the participants’ verbatim quotes in order to identify and label the main themes. Then, the two authors crosschecked the themes they had independently identified to create a common themes grid. Verbatim quotes were read independently a second time to classify each participant’s

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comments into the identified themes. The two independent coders discussed the validity of their results, with the aim of reaching a consensus on their coding when needed. The agreed common themes were numerically labelled in order to calculate the percentage of responses from the participants on each theme.

The participants' comments were further coded to distinguish those who reported a preference for formal practices with a dummy code of 1 (e.g., sitting meditation), or informal practices with a dummy code of 2 (e.g., being mindful while drinking coffee or during one's lunch break) both in the workplace. As participants could report several types of mindfulness practice, the sum of the percentages presented in the Results section is greater than 100%. Where they were deemed relevant and informative, the verbatim comments of participants are reported for illustrative purposes in the Results section.

***Quantitative analyses.*** (1) Chi-square analyses were conducted between the intervention group and the wait-list control group to examine any significant differences in their demographic characteristics: gender, professional occupation. Independent sample *t*-tests were conducted to establish any significant difference between groups in terms of age, and number of working hours. Paired *t*-tests and a mixed ANOVA were performed as a manipulation check to assess the extent to which mindfulness levels statistically and significantly improved in the experimental group, but not in the control group. (2) Descriptive statistics and correlations were also performed to report the number of mindfulness in-class sessions, the number of practiced days, and practice time per day alongside their associations with mindfulness ability and well-being (the results are reported in Table 1).

Regarding the study's objective to assess the efficacy of the MBSR program in the workplace in terms enhanced well-being, a mixed ANOVA was performed to assess the effect of

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the intervention on well-being (H2). Using a dummy coding of participants' verbatim comments as presented above (i.e., 1 = formal practice, 2 = informal practice), independent *t*-tests were then conducted to address any difference in effect between formal and informal practices in terms of mindfulness ability and well-being scores (H3).

In order to address Hypotheses 4 moderation analyses were performed using the PROCESS macro developed by Hayes (2012). PROCESS is a computational macro for path analysis-based moderation which provides estimated coefficients with bootstrapped standard error and 95% bootstrapped confidence intervals (CI). The index of the indirect effect and of the moderation are regarded as significant if the 95% CI does not include zero. In this study, a statistical bootstrapping procedure based on 5,000 resamples was used to calculate a 95% confidence interval around the total direct effect. To prevent multicollinearity issues, the data were mean centred before conducting the analyses.

## Results

**Group differences.** There were no significant differences between the intervention and the control group regarding gender ( $\chi^2(1) = 1.952, p = 0.227$ ) or professional occupation ( $\chi^2(21) = 21.1, p = .451$ ). An independent *t*-test indicated no significant difference of age between the groups ( $t(70) = .586, p = .560, M_{diff} = .999, SE = 1.70$ ). It also indicated no significant difference between groups in terms of pre-intervention mean scores on mindfulness ( $t(70) = -1.102, p = .274, M_{diff} = -4.550, SE = 4.130$ ) or well-being ( $t(70) = -1.846, p = .69, M_{diff} = -2.831, SE = 1.533$ ). No significant mean difference was found across the two groups regarding the mean number of working hours ( $t(70) = .593, p = .555, M_{diff} = 1.028, SE = 1.735$ ). Participants from the experimental group completed a minimum of two in-class sessions, and a maximum of eight

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sessions ( $M = 6.070$ ,  $SD = 1.438$ ). On average, they meditated for 14.90 minutes per day ( $SD = 7.60$ ), with a minimum of two minutes per day and a maximum of 30 minutes per day.

## Qualitative results (H1)

The qualitative results only concern the experimental group who practiced mindfulness.

### *Perceived usefulness of mindfulness practices at work*

In total, 31.92% of participants reported better stress and situation management and improvements in their self-esteem. For instance, participants reported:

“I can gain perspective when an unexpected situation jumps out of nowhere. I breathe, think, and act.”

“I can take some distance when I am in difficult interviews or meetings. It helps me to take some time to breathe. It helps me to be focused and avoid being over-reactive.”

“MBSR helps me to get calmer when I am stressed.”

“I feel less tense.”

“It helped me to reinforce my self-confidence and trust in my abilities.”

“I don't have any stress anymore before meetings.”

“I feel less judgmental and guilty about the negative thoughts I may have.”

“I feel less guilty when I don't succeed in getting a result at work.”

Furthermore, 27.78% of the participants reported that mindfulness practices allowed them to concentrate better and to be less distracted:

“The important point [of this training] is the improvement on my ability to concentrate, and the reduction of my tendency to get distracted.”

“A better ability to concentrate. I am calmer.”

Another 22.20% of the participants reported better management of difficulties and



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unexpected situations, along with more thoughtful management of overall situations:

“I can gain perspective when an unexpected situation jumps out of nowhere. I breathe, think, and act.”

“I can take some distance when I am in a difficult meeting; it helps me take some time to breathe. It helps me bring attention to my thoughts and feelings and avoid being over-reactive.”

Moreover, 22.20% of the participants reported that mindfulness improved the quality of their relations with colleagues at work:

“MBSR helps me to listen to others, in a richer and more active way.”

“I have a better ability to listen to my collaborators.”

“I am more caring towards others.”

A further 15.28 % of the participants reported that mindfulness improved their work efficacy and time management:

“I manage my time better.”

“I make better decisions at work.”

“I manage my tasks better.”

Finally, 8.30% reported that they were more aware of their inner experiences:

“I pay more attention to how I feel.”

“I am quickly aware of my inner states.”

“I pay more attention to my body and to take care of my health.”

## ***Reasons for the perceived uselessness of mindfulness practices***

A low percentage of participants reported that the MBSR program was not useful in their work and explained why they felt this. 5.8% of the participants reported that they had not adhered to the practices, accounting for the perceived uselessness of the training:

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“I don’t adhere to this method. I have problems with it.”

In addition, 2.8% of the participants reported that being unable to attend most of the in-class sessions was the reason for the perceived uselessness of the program:

“I didn’t follow enough in-class sessions.”

A further 1.4% reported that they did not perceive the positive outcomes of the program, which they attributed to their need for a longer period of practice before obtaining benefits in everyday life:

“I don’t feel the benefits of it at a professional level yet. I think I need to practice in the long run, be it formally or informally to perceive the utility of it at work, daily. Even though I know I must not expect anything for mindfulness meditation, I hope I can pursue this practice like 10 minutes a day, in order for me to perceive the benefits of it.”

### ***Preferential use of mindfulness practices at work***

A total of 79.31% of the participants reported that the participants preferred to use brief mindfulness practices such as the three minutes breathing space.

About 36.11% of the participants preferentially used taking breaks and bringing attention and awareness to their five senses and/or movements. About 22.23% of the participants reported that they mostly practiced when sitting at their desk, bringing their attention to their current state. About 20.97% indicated preferentially using informal practices during an activity (acting with awareness while drinking coffee, having lunch, or walking from one place to another). The participants’ verbatim comments are not reported here, as they were not deemed to add any relevant information to the description of these percentages.

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### ***Positive outcomes: improving well-being at work***

For 68.05% of the participants, mindfulness practices were reported to allow them to feel relaxed and peaceful, and to think more positively, thus increasing their perceived well-being:

"I feel less irritated, and more peaceful."

"I feel more at ease and aware of what I am doing."

"Meditation offers me a place where I can take a break and breathe. I feel more peaceful afterwards."

"Mindfulness is being positive to me."

"I can think positively."

"It helps me to take a break and improve my well-being at work."

"It's a moment of well-being for oneself, without any nuisance whatsoever."

After the program, 41.45% of the participants reported a greater awareness of the present moment, an ability to enjoy it more, and that they were able to feel less in a hurry all the time, and to act with more awareness and more thoughtfully:

"I enjoy breaks more. Like lunch."

"I think and enjoy more taking some time for myself."

"I feel more present during my meetings and phone calls."

"I take some time to have a break between two activities."

"I am more aware of what is happening in the present situation."

"I take some time to breathe before acting."

"I am more aware of how I am acting."

## **Quantitative results**

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**Data screening.** When screening the data, no outliers were found regarding the FFMQ, and the WEWBMS scores. However, one aberrant data point was found in the duration of meditation practice, with a value of 160 minutes of practice time per day. As this data point violated the normality of this measure, a winsorizing method was used to replace this score with the next higher score (i.e. with a data point reflecting a practice of 30 minutes of meditation per day). Dealing with this outlier corrected the threat to normality. Except for the measure of the number of in-class sessions that followed a non-parametric distribution, data followed both univariate and multivariate normality ( $p$ 's  $> .05$ ). Box's Test assumed the equivalence of the covariance matrix ( $p = .067$ ). Levene's test indicated a homogeneity of variance for all measures ( $p$ 's  $> .26$ ).

**Manipulation check in mindfulness scores.** As shown in Figure 1, the paired  $t$ -tests indicated that the mean scores for mindfulness in the experimental group were significantly higher after the intervention ( $t(28) = 4.912, p < .001, M_{diff} = -12.586, SD = 2.256, 95\% \text{ CI} [-17.835, -7.338]$ ). For the control group, paired  $t$ -tests indicated no statistically significant difference between the two measurement points ( $t(42) = -.283, p = .779, M_{diff} = -.283, SD = 1.769, 95\% \text{ CI} [-4.119, -3.119]$ ). A mixed ANOVA indicated no significant within effect of time alone ( $F_{time} (3, 53) = 2.869, p = .096, \eta^2 = .05$ ), or between effect of group alone ( $F_{group} (3, 53) = 0.032, p = .992, \eta^2 = .002$ ). However, the analyses found a statistically significant effect of group accounting for the difference between pre- and post-intervention mindfulness scores. It was found that the interaction Time  $\times$  Group was statistically significant, with a medium effect size ( $F_{time \times group} (1, 55) = 15.606, p < .001, \eta^2 = .221$ ). After the intervention and compared to the control group ( $M_{T2} = 131.70, SD_{T2} = 17.562$ ), the experimental group reported higher average mindfulness scores after the intervention ( $M_{T2} = 137.90, SD_{T2} = 18.397$ ).

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**Correlations.** As presented in Table 1, mindfulness was significantly, moderately, and positively associated with well-being ( $r = .615, p < .001$ ). Age, working hours, number of mindfulness in-class sessions, and daily mindfulness practice time were not found to be significantly correlated with mindfulness or well-being. However, the number of days of practice was significantly correlated to mindfulness ( $r = .406, p = .029$ ), and showed close-to-significant associations with well-being scores ( $r = .363, p = .053$ ).

---- Please insert Table 1 here ----

---- Please insert Figure 1 here ----

**Mixed ANOVA for well-being (H2).** Repeated-measures ANOVAs indicated a significant Time x Group interaction in the well-being scores, with a large effect size ( $F_{time \times group}(1, 55) = 13.239, p < .001, \eta^2 = .194$ ). These results indicated a statistically significant difference between the groups. As we hypothesized, compared to the control group's well-being scores at T2 ( $M_{T2} = 51,28, SD_{T2} = 5,945$ ), employees who followed the MBSR program reported higher levels of well-being ( $M_{T2} = 54,45, SD_{T2} = 7,119$ ). The results of these analyses therefore supported the hypothesis that compared to the wait-list control group, employees who followed the MBSR program would report higher levels of well-being.

**Differences of effects between formal and informal practices (H3).** It was hypothesized that individuals who reported a preferential use of informal practices would report the same level of mindfulness skills and well-being after the intervention as the participants who preferentially used formal practices. Supporting the present study's predictions, independent *t*-tests showed no significant difference in mean scores after the intervention between the 23 individuals who preferentially used informal practice over the six individuals who preferentially

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used formal practices. Specifically, and although Levene's test detected heteroscedasticity in the comparison between mindfulness scores, no statistically significant difference was detected between the scores of those who preferentially used informal practices ( $M = 136.45$ ,  $SD = 15.756$ ) and those who preferentially used formal practices ( $M = 143.50$ ,  $SD = 26.289$ ,  $t(5.959) = -.629$ ,  $p = .552$ , 95% CI [-34.564, 20.433]). Regarding well-being scores after the intervention, no statistically significant difference was found between individuals who preferentially used informal practices ( $M = 54.57$ ,  $SD = 7.292$ ) and those who preferentially used formal practices ( $M = 54.00$ ,  $SD = 7.043$ ,  $t(27) = -.170$ ,  $p = .866$ , 95% CI [-6.250, 7.381]).

***Revised hypothesized moderation model with number of days of practice.*** As was indicated above, the second hypothesis of this research was that the practice time per day would moderate the relation between mindfulness and improved well-being. However, daily practice time did not show any significant association with mindfulness and well-being scores, but the number of days of practice per week showed a significant association with these variables. Given the moderate correlations between the number of days of practice and high mindfulness scores and high well-being scores, it was decided to compute the hypothesized moderation analyses using the number of days of practice rather than the daily practice time.

***Number of days of practice, mindfulness, and wellbeing (H4).*** The number of days of practice was tested as a moderator in the relation between mindfulness scores and well-being. After controlling for mindfulness and well-being scores at T1, the results indicated no significant moderation effect of the number of days of practice in the relation between mindfulness and well-being at T2. The overall moderation model explained 79% of the variance of well-being ( $R^2 = 0.79$ ,  $F(5, 23) = 7.558$ ,  $p < .001$ ). More precisely, mindfulness scores positively predicted well-being ( $\beta = .866$ ,  $SE = .192$ ,  $t(23) = 4.504$ ,  $p = .002$ , 95% CI [-.468, 1.264]), but the number of

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days of practice did not show any significant effect on well-being ( $\beta = -.259$ ,  $SE = .164$ ,  $t(23) = -1.577$ ,  $p = 0.073$ , 95% CI [-.598, -.081]). Hence, there was no evidence for the moderation hypothesis.

## Discussion

Mindfulness-based programs are considered as a promising way to reduce perceived stress and to enhance well-being in workplaces (Janssen et al., 2018). Usually, the programs that are proposed are based on an eight-week duration comprising at least two hours of in-class sessions per week and 45 minutes practice per day, six days per week (Kabat-Zinn, 1982). However, with constrained work-schedules and family constraints, the implementation of long formal daily practices may be difficult for certain employees. In addition, recent studies have suggested that informal mindfulness practices can be enough to reduce negative affect and enhancing well-being, a dimension which had been less studied in past research.

The aim of the present study was to better document the types of practices used by participants in a standardized Mindfulness Based Stress Reduction program at work, and the benefits they perceived in doing so. Qualitative data was collected to address whether the employees showed a preferential use of brief and informal mindfulness practices over formal ones, and the benefits associated. It was hypothesized that participants would mainly report using brief and informal mindfulness practices at work, and that individuals who preferentially used brief and informal practices would report the same benefits in terms of increased levels of well-being as those who used more formal mindfulness practices.

Quantitatively, it was hypothesized that after the intervention, employees would report higher mindfulness skills and greater well-being. Additionally, this research hypothesized a

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moderation effect of daily practice time, with greater associations between mindfulness and well-being, observed with greater practice time.

The findings of the present multi-method study are twofold. First, as hypothesized, employees reported a preferential use of brief and informal practices, presumably because these appear to be easier to implement in the workplace. As the results showed, of the 29 participants, twenty-three people (i.e., 79.31%) reported a preferential use of brief or informal practices, while the other six (i.e., 20.69%) reported a preferential use of formal mindfulness practices. In other words, more than three quarters of the participants reported that they used preferentially informal mindfulness practices, and most of them indicated that practicing mindfulness allowed them to manage stressful situations differently and increased their well-being. This suggests that informal mindfulness practices may be a valuable means of developing mindful skills in working populations who may be unable to perform regular formal mindfulness practices throughout the week, as is recommended in the MBSR program. Such data connects with a recent study which showed the benefits of informal practices in workplaces in terms of reduced perceived stress and burnout symptoms, and improved well-being (Kersemaekers et al., 2018).

Second, employees who followed the MBSR program reported higher levels of well-being compared to the wait-list control group. In addition, and in line with Kersemaekers et al.'s (2018) study, the present study showed that the intervention was beneficial regardless of whether participants preferred to use formal or informal practices. Indeed, as hypothesized, the results of the present research showed that both informal and formal practices are effective, with no mean difference between participants' scores after the intervention. In other words, although most participants reported a preferential use of informal practices, this preference did not appear to



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reduce the benefits of the intervention compared to those who reported a preferential use of formal practices.

These results highlight the potential for brief mindfulness-based practices at work and the usefulness of proposing tailored mindfulness-based programs which consider individual difference and preferential use of formal or informal practices. Informal practices may constitute a way of increasing adherence to the program. Indeed, some verbatim quotes in the study indicated that a small proportion of participants reported that they had failed to adhere to certain aspects of the formal program. Hence, the results of the study suggest that managers might benefit from taking into consideration the needs, work constraints, and practice preferences of their employees when offering a mindfulness-based program in their workplace.

The results of the present study connect with previous research that has highlighted the benefits of mindfulness at work. Indeed, the present study's findings are in line with research that has already documented how mindfulness-based programs may promote well-being in organizations (e.g., Laurent *et al.*, 2016) and reduce perceived stress (van Wietmarschen *et al.*, 2018; Walsh & Shapiro, 2006). Furthermore, the results of the present study corroborate those of a recent mixed-method study by Birtwell *et al.* (2019), which showed that most participants practiced informal practices, and that these practices predicted well-being. In addition, and in line with Carmody and Baer (2008), the present research found that the number of in-class sessions was not significantly associated with mindfulness or well-being.

However, some of the present findings failed to confirm the present research's hypotheses. Contrary to expectations, daily practice time was not associated with either mindfulness skills or well-being. Rather, exploratory correlation analyses revealed that the number of days of practice was moderately associated with higher levels of mindfulness and

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close-to-significantly associated with higher levels of well-being. This suggested a potential moderating effect of the number of days of practice in terms of well-being and motivated the computation of exploratory moderation analyses. Regarding well-being, the analyses did not find any significant moderation effect of the number of days of practice in the relationship between mindfulness and levels of well-being. This lack of evidence of effect might be explained by the relatively low mean scores and standard deviations in relation to daily practice time. One might expect that a greater range of scores, and therefore a greater variance in daily practice time (e.g., from null to one hour) may detect with more sensitivity a potential effect. Indeed, research has shown that meditation tends to show cognitive effects from a threshold of 20 minutes of practice time per day (e.g., Wenk-Sormaz, 2005), while in the sample of the present study the mean practice time was below this threshold. Thus, it could be suggested that, with greater practice time and variance in practice time, differences between high and low practice time would become statistically significant.

These approaching-significant-level results suggest that the present study was hindered by a lack of statistical power. Presumably, the sample size of 29 participants was too small to reach enough statistical power. Accordingly, future research with a greater sample size could be conducted with the aim of confirming that participants might experience a reduction in their perceived stress very early in their practice. Indeed, post-hoc power analyses, conducted with G\*Power for *F*-test family analyses with an alpha error set to .05, and statistical power set to .95, found that a minimum of 40 participants should allow to reach a moderate effect size. As a further limitation, the present controlled study was not based on a formalized randomization of the participants which might have led to a selection bias or other uncontrolled systematic biases as the participants were selected according to their schedules (availability on the proposed session

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time). Nevertheless, and as has been specifically argued in the present paper, employees must manage work constraints, which is why the selection of the participants was made based on their planning and availability. A third limitation, and an area of potential improvement for future studies, is that we did not precisely measure the type of mindfulness practices in which the participants engaged each day. Hence, it was not possible to distinguish precisely the proportion of formal and informal practices that workers used in the workplace.

It seems important to highlight that the pre/post study design of the present study allowed changes to be addressed over two time points. Measuring mindfulness allowed checking the validity of the intervention. There are few risks that our results might have been affected by method variance bias that might arise due to occasion factor that bias measures in a similar way. Indeed, the present study was conducted with a control group and a pre/post study design. The separation in time between two measurements allows to increase trust in the causal relations of the present study (Spector, 2019).

In conclusion, this study suggests that even brief and informal mindfulness practices may be useful for employees' well-being in their work settings. Research has suggested that the indirect effects of mindfulness and well-being at work will benefit the team and the wider organization as they reduce burnout and turnover intentions, and increase task performance (Reb *et al.*, 2017; Tracey & Hinkin, 2008). The qualitative results of the present study also underlined how these practices helped concentration and decision-making, for example, and reduced the tendency to hurry constantly. This may underline the importance of these practices in organizational settings in terms of burnout prevention and employees' well-being promotion (Birtwell *et al.*, 2019; Reb *et al.*, 2017; Tracey & Hinkin, 2008). Future research may continue to

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analyse how mindfulness-based programs tailored to the preferred type of practices can improve adherence, practice time, and positive outcomes at work.

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Table 1. Correlations between the variables at T2

Variables	M	SD	Mindfulness	Well-being	Age	Working Hours	Number of sessions attended	Number of days practiced	Mindfulness practice time
1. Mindfulness	131,520	16,324	-						
3. Well-being	51,470	5,890	<b>.615**</b>	-					
4. Age	44.470	7.061	.006	.109	-				
5. Working hours	45.970	7.188	.102	.005	.145	-			
6. Number of sessions attended	6.071	1.438	-.070	.002	-	-.028	-		
7. Number of days practiced	3.311	1.834	<b>.406 *</b>	<b>.363</b>	.065	-.072	-.064	-	



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of days of				†					
practice									
8.	15,76	7,854	.094	-.045	-	-.094	.144	.133	-
Mindfulness				.155					
daily									
practice									
time									

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Notes.  $N = 72$  for all measures except for mindfulness practice time, number of sessions attended, number of days of practice, practice time (per day) where  $n = 29$ . Correlations are expressed with Pearson product-moment  $r$  for all measures, except for number of sessions where correlations are expressed with Spearman  $\rho$  due to nonparametric distribution, †  $p < .06$ , \*  $p < .05$ , \*\*  $p < .01$  (two-tailed tests). Significant and close-to-significant values are presented in bold to facilitate reading.

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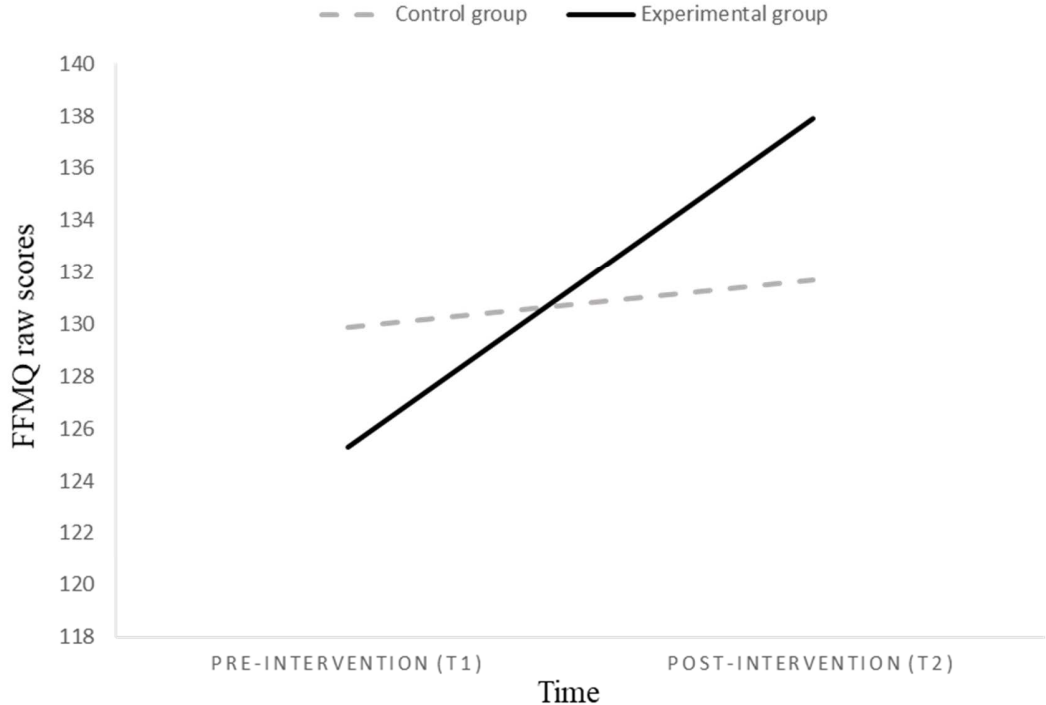


Figure 1: Manipulation check through mindfulness scores

Note: FFMQ = Five Facet Mindfulness Questionnaire