

Review

Mindfulness for Preventing Psychosocial Risks in the Workplace: A Systematic Review and Meta-Analysis

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Abstract: Organizations today are implementing psychological interventions to promote the job performance and wellbeing of their employees. Mindfulness-based interventions (MBIs) can contribute to providing workers with competencies and skills and develop their strengths. MBIs are therefore becoming more and more present in the workplace, sometimes using online intervention programs, which offer a promising direction in prevention and intervention for health. The objective of this study is to analyze the efficacy of MBIs on psychological variables in the workplace. For this purpose, a search for scientific articles published from 2009 to 2019 was made in the Psycodoc, PsycINFO, and Web of Science databases, where a total of 468 articles were found. After filtering with preestablished inclusion criteria, 24 studies were included in the systematic review and meta-analysis. The results of the meta-analysis suggest that intervention in mindfulness positively influences psychological variables related to employee health and wellbeing. However, it is recommended to continue performing new studies to confirm this finding.

Keywords: workplace; meta-analysis; mindfulness; systematic review

1. Introduction

Mindfulness is defined as paying full attention to experiences at the present moment, with an open, accepting attitude [1]. In the context of labor, highly stressed employees are exposed to greater health risks, which can increase costs for the organization and even loss of productivity [2]. To counteract these effects, some studies have demonstrated that mindfulness-based interventions (MBIs) can improve mental health [3–5] and employee performance [6].

1.1. The Potential of Mindfulness

Mind/body intervention programs are currently enjoying great popularity. Mindfulness-based interventions, such as mindfulness-based cognitive therapy (MBCT) or mindfulness-based stress reduction therapy (MBSRT) are the most common, and are focused on treatment of mental health problems, such as depression or anxiety [7]. Today, they have strong empirical backing [8]. These programs are conceptually based on traditional mindfulness teaching, that is, they form part of philosophical mindfulness and psychoeducation and act on psychological and neuropsychological mechanisms [9]. In the work environment, development of MBIs is acquiring more presence through online intervention, as it offers a promising new direction for intervention and preventive health [10,11]. Such intervention leads to improvement in general subjective wellbeing [12,13], and, therefore, the first

hypothesis posed for this study was that after mindfulness-based intervention, professionals would have lower levels of stress, anxiety, and depression.

1.2. Training in Mindfulness in the Workplace

Organizations are quickly implementing cognitive-behavioral interventions in the workplace to promote employee wellbeing and performance [14]. This may be related to growing violence in the worksite [15]. MBI can provide employees with competencies and skills for coping with such situations and promote their strengths [16]. Some studies have shown the positive effects of such interventions for promoting health in the workplace [17] and increasing employee engagement [18], enabling them to make a higher-quality effort to achieve results [19]. Along with this evidence, the literature shows the positive repercussions that mindfulness intervention could have on employee psychological health in specific work contexts [20], influencing their ability to cope with adverse situations that may arise [21]. Therefore, keeping these considerations in mind, the second hypothesis was posed, in which we expected employees to show more engagement and resilience after mindfulness intervention.

Job stress is one of the main causes of lowered productivity and absenteeism [22]. It affects psychological health and contributes to burnout [23,24], causing the employee to feel apathetic and lose interest in the job [25]. Emotional intelligence is very important here in coping with such stress and burnout [26]. MBIs also help reduce professionals' stress, which notably and significantly alleviates issues associated with sleep problems [27–29]. Furthermore, many studies have analyzed the relationship of MBIs with other variables, such as psychological distress [30,31], negative and positive affects [32], fatigue [33], and so forth [34,35]. Therefore, organizations are starting up MBIs in the workplace to alleviate employee stress [36,37]. Based on these findings, we posed the third hypothesis, in which we expected employees to have less burnout, emotional exhaustion, fatigue, and negative effects and experience an increase in positive affects and sleep quality, showing greater self-efficacy and better personal wellbeing after participation in mindfulness intervention.

1.3. This Study

Mindfulness-based intervention programs in the context of the workplace must be supported by a synthesis of empirical evidence in which the heterogeneity of the different studies shows their efficacy. Meta-analytical studies are intended to overcome the deficiencies and contradictions found in the literature by analyzing the empirical evidence available [38]. This meta-analytical review emphasizes exactly which results the various interventions now show and what influence they exert on psychological variables of employees. Therefore, the main objective of this study was to analyze the efficacy of MBIs on psychological variables of employees.

Its specific objectives were the following: (a) Study the influence of MBIs in reducing stress, anxiety, and depression; (b) analyze engagement, mindfulness, and resilience levels after participation in MBIs, and (c) identify the influence of MBIs on positive and negative affects, burnout, emotional exhaustion, fatigue, sleep quality, self-efficacy, and wellbeing. Based on prior empirical evidence, the following hypotheses were posed:

Hypothesis 1 (H1). *Mindfulness intervention reduces stress, anxiety and depression.*

Hypothesis 2 (H2). *Mindfulness-based intervention programs positively influence engagement, mindfulness, and resilience.*

Hypothesis 3 (H3). *Mindfulness practice positively influences sleep quality, self-efficacy, wellbeing, positive affects, and reduces burnout, fatigue, emotional exhaustion, and negative affects.*

2. Materials and Methods

2.1. Procedure

An exhaustive search was made in the Psycodoc, PsycINFO, Web of Science, and other source databases (PsycARTICLES), following the PRISMA recommendations made by Moher et al. [39]. Methodology search filters were applied in the Psycodoc (quasi-experimental, cross-sectional, program evaluation, treatment results, and empirical studies), in the PsycINFO (evaluated by experts and empirical studies) databases and in Web of Science, the filter for document types (articles). This enabled us to make a faster search, discriminating studies that did not meet the preestablished inclusion criteria. The search strategies used the Boolean operator, and. First, a search was made using the following descriptors: “Mindfulness” and “Workplace”. After a search in the Psycodoc database yielded no results, a second search was made in the databases selected (Psycodoc, PsycINFO, Web of Science, and PsycARTICLES), using the following descriptors: “Mindfulness”) AND “Workplace”. A total of 495 articles were found for screening and review. The search period included studies published from 2009 to October of 2019. Articles were reviewed during the month of November 2019, when the texts dealing with the relationship between mindfulness and intervention carried out in the workplace were analyzed.

2.2. Inclusion and Exclusion Criteria

The inclusion criteria were: (1) Studies published from January 2009 to October 2019, (2) in English or Spanish, (3) evaluated the relationship between mindfulness and the workplace, (4) were on intervention and provided the numerical data necessary for a meta-analysis, (5) complete text available, and (6) evaluated by experts.

The exclusion criteria set were: (1) Duplicate studies, (2) only qualitative data, (3) published in a language other than English or Spanish, (4) on other matters related to mindfulness or the workplace, (5) not on intervention, (6) theses, chapters in books, books, or reviews, and (7) did not present the quantitative results necessary for the meta-analysis.

2.3. Data Extraction and Synthesis

For article selection, first, the title and the abstract were reviewed to apply the first exclusion criterion. Then, the complete text was thoroughly read by three members of the team to be able to apply the rest of the conceptual and methodological criteria set.

The characteristics of the workplace, participants, and interventions were coded by two reviewers (M.M.M. and J.G.S.). In those cases, where there were discrepancies, they were resolved in meetings with the senior researcher (M.C.P.-F.) to reach a consensus.

2.4. Data Analysis: Meta-Analysis

The Cochrane Review Manager (RevMan) version 5.3 was used to test the heterogeneity of the studies included, effect size, data quality, etc. [40]. For data analysis, the Intervention Review option (inverse variance) with random-effects standardized means was used to test intervention effectiveness, since the results of the interventions differed from each other. Interpretation of the effect-size estimates was in line with Cohen's [41] guidelines, where 0.2 was a small effect, 0.5 medium, and 0.8 large. The direction of the effect sizes was considered favorable if the result showed improvement during the intervention. Heterogeneity was considered substantial if $I^2 \geq 75\%$, moderate from 50% to 75%, and low when $I^2 \leq 25\%$ [42].

2.5. Qualification of Risk of Bias

The Cochrane Collaborations risk-of-bias tool was used [43]. Individual studies were scored for risk (1: low risk, 2: high risk, and 3: unclear risk). The potential bias of the studies included was

assessed by inspection of distribution of points on the meta-analysis plots. Two researchers evaluated the risk of bias independently, and disagreements were resolved by consensus in a meeting with the senior researcher.

3. Results

3.1. Study Selection

Figure 1 shows the study selection process (Flowchart). Of 468 studies identified in the Psycodoc, PsycINFO, and Web of Science databases and 27 additional records identified through other sources (PsycARTICLES), 65 duplicates were eliminated. A total of 430 studies were screened, leaving 426 for review. Then, 393 more were eliminated for various reasons. The PRISMA diagram in Figure 1 shows the flow of articles from the original search to the final inclusion. In the end, 24 studies were included in the systematic review and meta-analysis.

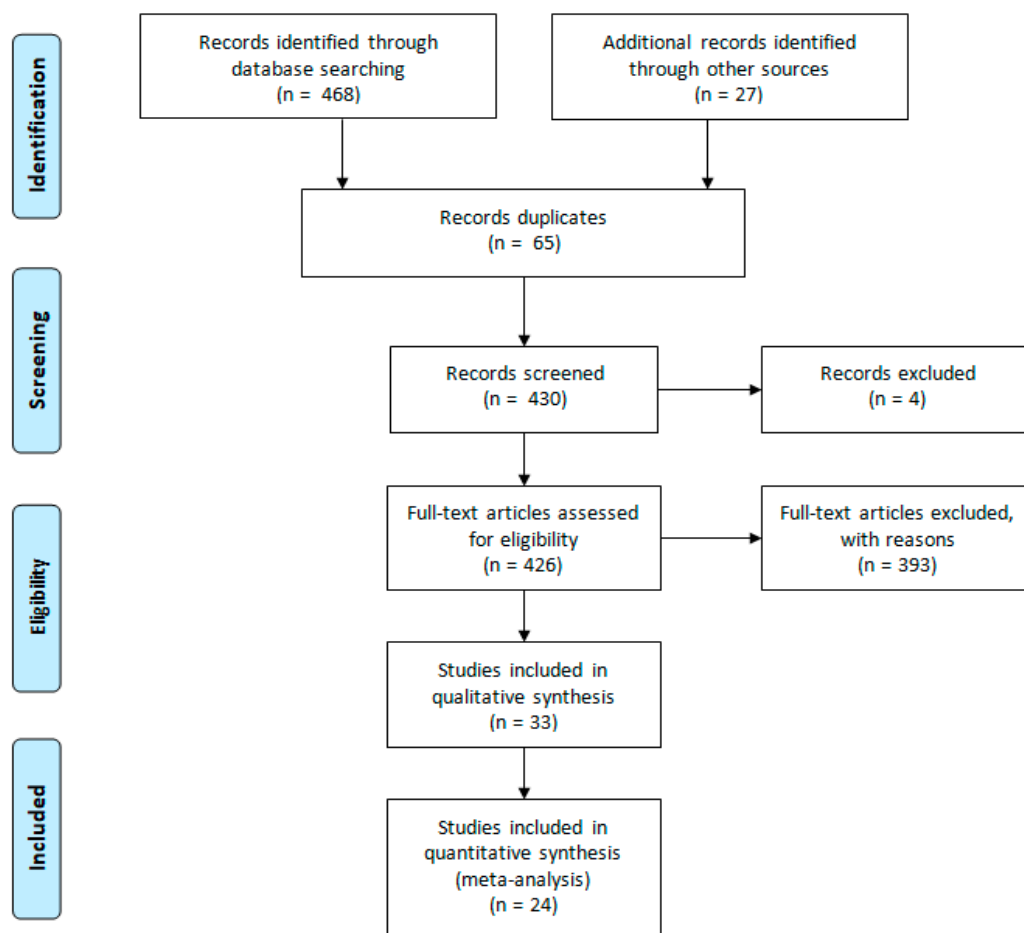


Figure 1. Mindfulness in the workplace: PRISMA flowchart with steps in article selection [39].

Table 1 shows the characteristics of the 24 articles included. The various studies carried out mindfulness-based intervention, evaluating the efficacy of the interventions in comparisons extracted in the pretest–post-test results.

Table 1. Studies dealing with the relationship between mindfulness and thworkplace.

Authors	Study Design	Place	Total Intervention Time	Intervention Sessions
Mäkinieni and Heikkilä-Tammi [32]	2-group controlled trial	Finland	10 months	10 × 2.5 h sessions
Bonilla and Padilla [7]	Single-group uncontrolled trial	Puerto Rico	8 weeks	8 × 90 min sessions + daily practice at home
Dobie, Tucker, Ferrari, and Rogers [12]	Single-group uncontrolled trial	Australia	8 weeks	3 × 30 min sessions/week
Kersemaekers et al. [9]	Single-group uncontrolled trial	Germany	10 weeks	2 full days + 8 2.5 h sessions + daily practice at home with 10 min audio recording
Gallego, Aguilar-Parra, Cangas, Rosado, and Langer [8]	Controlled trial, 4 studies	Spain	8 weeks	2 × 30 min/week + daily practice at home with audio recording
Klatt, Norre, Reader, Yodice, and White [17]	2-group controlled trial	Denmark	8 weeks	First intervention personal attendance (1 h) + daily practice at home with audio recording
van Berkel, Boot, Proper, Bongers, and van der Beek [18]	2-group controlled trial	Netherlands	6 months	90 min/week
García-Rubio, Luna, Castillo, and Rodríguez-Carvajal [5]	2-group controlled trial	Spain	6 weeks	2 sessions/week + 10 min audio
Brito [3]	Single-group controlled trial	Chile	8 weeks	8 × 2–1/2 h sessions
Slatyer, Craigie, Heritage, Davis, and Rees [6]	3-group controlled trial	Australia	6 months	One attended session + daily practice at home with 25 min audio recording
Huang, Li, Huang, and Tang [1]	2-group controlled trial	China	8 weeks	2 × 1 h sessions/week + 45 min daily practice at home
Blanco et al. [16]	2-group controlled trial	Spain	3 months	2 × 3 h sessions at work + daily practice at home with audio recording
Trowbridge, Lawson, Andrews, and Pecora [37]	Single-group uncontrolled trial	Kansas	6 weeks	2 sessions/week + daily 20 min practice at home with audio recording
Crain, Schonert-Reich, and Roeser [28]	2-group controlled trial	Canada	8 weeks	Total 11 sessions (36 h)
Duchemin, Steinberg, Marks, Vanover, and Klatt [34]	2-group controlled trial	Ohio	8 weeks	Weekly 1 h sessions + daily practice at home with 80-min audio recording
Horan and Taylor [35]	Single-group uncontrolled trial	Kentucky	10 weeks	Weekly 1 h meetings
Lilly et al. [11]	2-group controlled trial	Washington	7 weeks	Online (daily 20–45 min audio)
Grégoire and Lachance [33]	2-group controlled trial	New York	5 weeks	15 min daily audio sessions
Pang and Ruch [36]	3-group controlled trial	Switzerland	8 weeks	Weekly 1 h sessions + daily practice at home with audio recording (20–40 min)
Bartlett, Lovell, Otahal, and Sanderson [30]	2-group controlled trial	New York	5 weeks	Weekly 20 min meditations. Total intervention time 7.5 h
Wolever et al. [2]	3-group controlled trial	North Carolina	12 weeks	1.15 h intervention/week. Total intervention 14 h
Aikens et al. [10]	2-group controlled trial	Michigan	7 weeks	Online. Total 8 classes 30–45 min
Craigie et al. [21]	Single-group uncontrolled trial	New York	4 weeks	Weekly 1.30 h Session + 30 min daily practice at home
Chin, Slutsky, Raye, and Creswell [14]	2-group uncontrolled trial	Florida	6 weeks	First day attended workshop + 25 min guided practice (5 days/week)

The sample size varied from nine participants in the study by Dobie et al. [12] to 279 in the study by Kersemaekers et al. [9].

The time that the interventions took differed in the various studies. The study by Craigie et al. [21] lasted 4 weeks, while the study by Mäkinemi and Meikkila-Tammi [31] lasted 10 months. However, in most of the studies, for example, those by Gallego et al. [8] and Huang et al. [1], the duration was 8 weeks. The program methodology in most of them was intervention with personal attendance, with mindfulness practice at home, while listening to audio recordings. However, some studies used online intervention [10,11].

Table 1 shows the results of the studies selected for systematic review and meta-analysis. To extract the information in this study, they were coded in the following process: (1) authors and year of publication, (2) study design, (3) place, (4) total intervention time, and (5) intervention sessions.

3.2. Results of Meta-Analysis

The findings of the meta-analysis of mindfulness in the workplace and its variables are presented in Table 2. A consistently positive effect of mindfulness was found to be related to the different variables.

Table 2. Mindfulness in the workplace and influence with different variables (meta-analytical estimates of effect).

Results	k	SMD	95% Confidence Interval		Significance <i>p</i>	Heterogeneity	
			Lower Limit	Upper Limit		Z	I ² (%)
Mindfulness							
All data	14	-1.21	-1.86	-0.56	<.0003	3.64	97%
MAAS	7	-1.28	-2.95	0.39	0.13	1.50	99%
FFMQ (Multifaceted measurements)	2	-0.89	-1.05	-0.72	<0.0001	10.56	0%
FFMQ Observing	2	-1.04	-1.41	-0.67	<0.0001	5.46	0%
FFMQ Describe	2	-0.78	-1.15	-0.42	0.0001	4.18	2%
FFMQ Acting and awareness	2	-0.89	-1.26	-0.52	<0.0001	4.75	0%
FFMQ Non-reactivity	2	-1.10	-1.48	-0.72	<0.0001	5.72	0%
FFMQ Non-judging	2	-0.66	-1.06	-0.26	0.001	3.24	14%
Other measurement instruments	5	-1.73	-4.04	0.57	0.14	1.47	98%
Depression, anxiety, and stress							
Depression	7	1.43	-0.05	2.92	0.06	1.90	98%
Anxiety	6	0.34	0.11	0.56	0.003	2.95	13%
Stress	16	1.55	1.09	3.01	<0.0001	4.17	98%
Affect							
Positive affect	3	-0.28	-0.68	0.12	0.17	1.37	0%
Negative affect	4	0.42	0.09	0.75	0.01	2.53	0%
Fatigue	2	0.84	0.54	1.13	<0.0001	5.57	0%
Burnout	4	2.02	-0.84	4.87	0.17	1.38	99%
Emotional Exhaustion	2	0.01	-0.46	0.48	0.97	0.04	0%
Engagement	2	0.08	-0.32	0.49	0.68	0.41	52%
Resilience	3	-0.35	-0.74	0.04	0.07	1.78	51%
Wellbeing	3	-2.68	-6.64	1.29	0.19	1.32	99%
Sleep quality	4	2.05	-0.79	4.89	0.16	1.42	99%

Note. SMD= standardized mean difference. Instruments used: Mindfulness (CAMM, CAMS-R, FFMQ, FFM, Five-Facet Mindfulness Questionnaire, Freiburg Mindfulness Scale, KIMS, and MAAS); depression (BDI-II, CCAPS-34, CES-D, DASS, DASS21, and STAI); anxiety (CCAPS-34, DASS, DASS21, SAS and STAI); stress (C-SOSI, DASS, DASS21, EEP-14, PSM-9, PSS, PSS-10, PSS-14, PSM-9, and PSQ); positive and negative affect (PANAS); fatigue (CIS, Fatigue Scale and the Checklist Individual Strength Questionnaire); burnout (BM, BO, MBI, and ProQOL); emotional exhaustion (CDPE and MBI); engagement (UWES); resilience (CD-RISC and CD-RISC10); engagement (UWES); wellbeing (WHO-Five); job satisfaction (JSQ); and, sleep quality (JSS and PSQI).

3.3. Risk of Bias in Studies Included

The publication bias in the majority of cases was low. In general, no high risk of bias was observed. The funnel plots are presented below with the results found for risk of bias with the different variables (Figure 2). As may be observed in the figure, one study by van Berkel et al. [18], which analyzed the mindfulness, depression, anxiety and stress variables, was the one at most risk of bias.

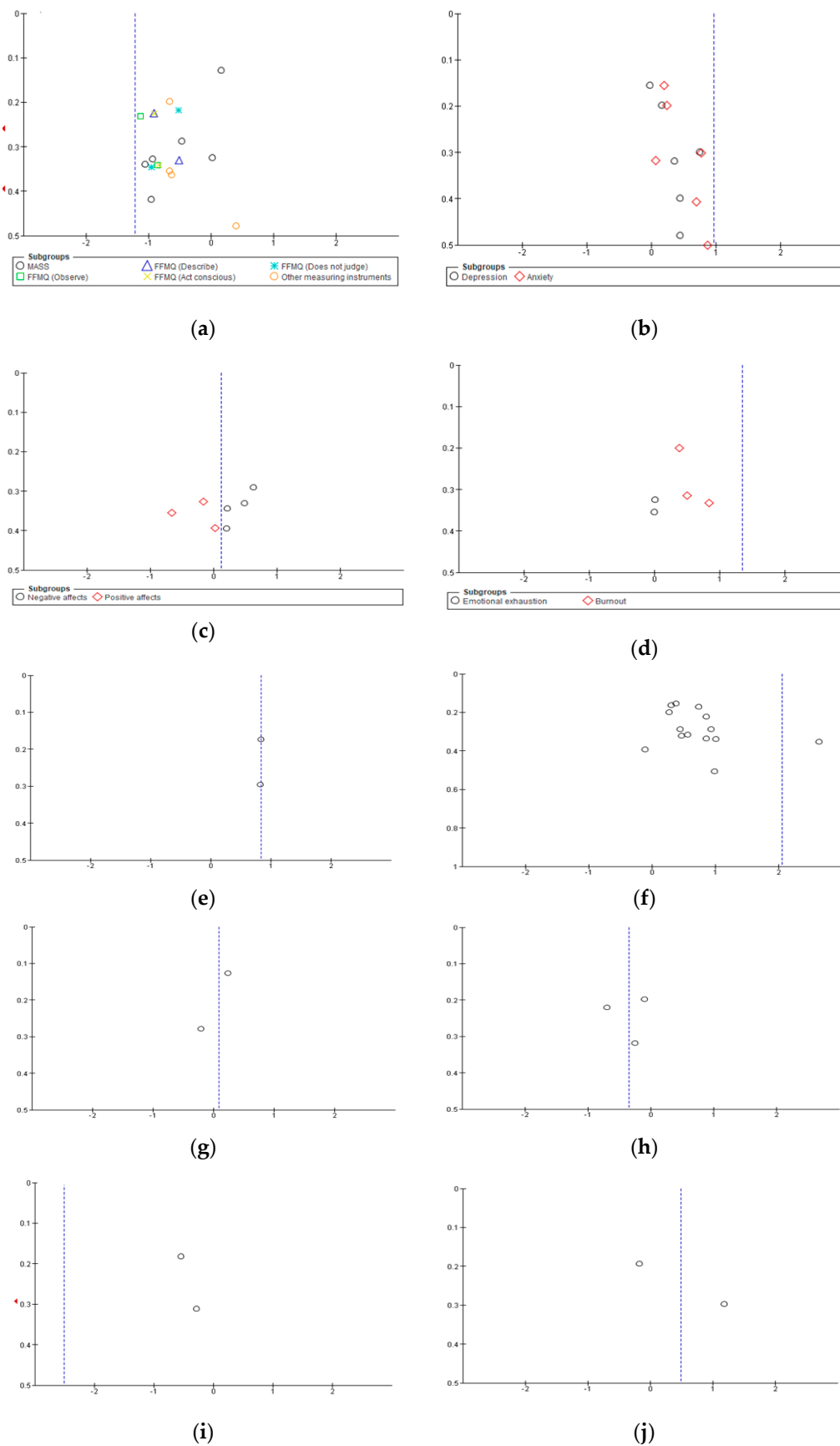


Figure 2. Risk of bias for all variables. (a) Mindfulness. (b) Depression and anxiety. (c) Negative and positive affects. (d) Emotional exhaustion and burnout. (e) Fatigue. (f) Stress. (g) Engagement. (h) Resilience. (i) Wellbeing. (j) Quality of sleep.

3.4. Meta-Analytical Differences between Attended and Online Intervention

To check the efficacy of attended (Figure 3) and online (Figures 4 and 5) interventions, the meta-analysis was performed for each of them, as shown in Figures 3–5.

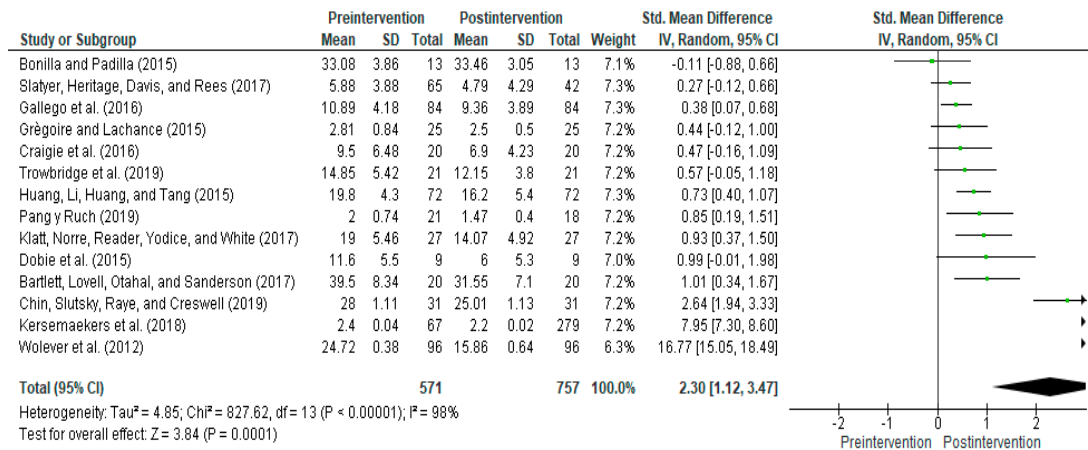


Figure 3. Meta-analysis of mindfulness in the workplace and influence on stress (attended intervention).

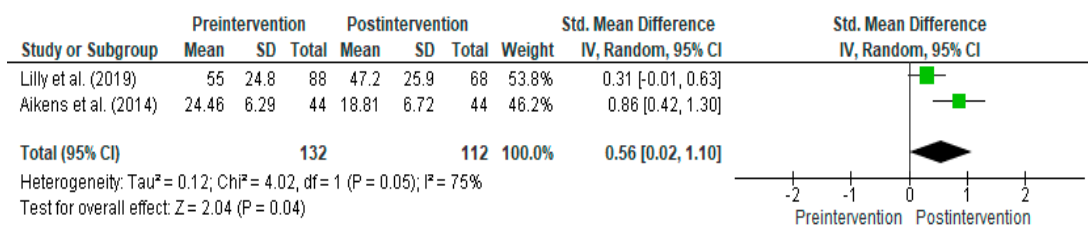


Figure 4. Meta-analysis of mindfulness in the workplace and influence on stress (online intervention).

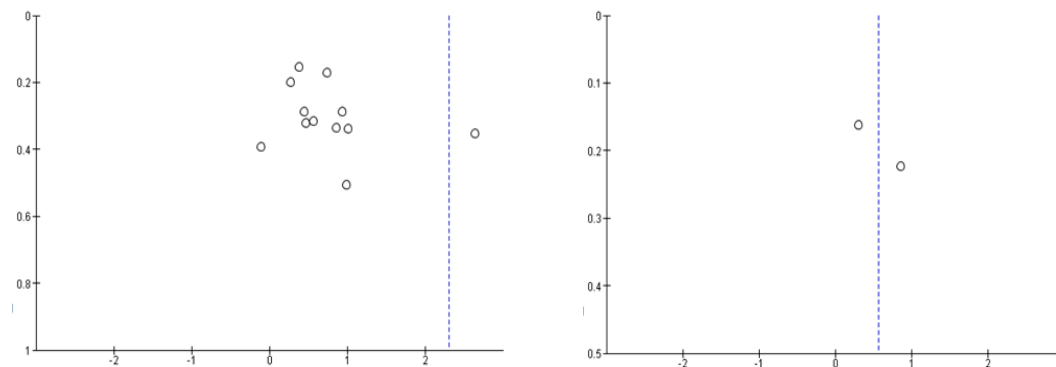


Figure 5. Risk of bias stress (attended intervention–online intervention).

4. Discussion

4.1. Summary of Evidence

The objective of this study was to analyze the efficacy of MBIs for psychological variables in the workplace. The studies concentrated on different psychological aspects and, therefore, different instruments. In view of the findings of those studies, the first hypothesis referring to reduction in stress, anxiety, and depression after mindfulness-based intervention programs were applied was confirmed. Thus, in the study by Klatt et al. [17], after mindfulness intervention, health, and wellbeing of employees improved, depression, anxiety, and stress levels were lower. Results in most of the other studies, among which was the study by Dobie et al. [12], were similar. Furthermore, practicing

mindfulness in the work context was an effective strategy, not only for reducing exhaustion and perceived stress, but also for increasing employee satisfaction [1].

The second hypothesis, in which it was expected that employees would show more engagement, mindfulness, and increased resilience, was supported by several studies. The study by Grégoire and Lachance [33] found increased levels of mindfulness and engagement [17] after intervention in mindfulness. After intervention, resilience also increased in participants, enabling them to cope with more adverse everyday situations at work [6,21].

The mindfulness programs carried out in the workplace motivated employees, reinforcing job performance and intensifying their wellbeing [36]. Thus, such programs reduce negative [32] and increase positive emotions [7]. They also improved sleep quality [28], generating conditions that reduced emotional exhaustion and burnout [16]. These findings confirmed the third hypothesis, in which it was expected that after MBI, employees would have lower levels of burnout, emotional exhaustion, fatigue, and negative affect, and would experience an increase in positive affects and sleep quality, showing better self-efficacy, and personal wellbeing. Other data indicate that after intervention, turnover also diminishes [35].

Therefore, when mindfulness-based intervention was carried out in the work-place to reduce stress and depression or to improve sleep quality, a favorable effect was observed after its completion [2]. Nevertheless, with online intervention, such as the intervention carried out by Aikens et al. [10] and Lilly et al. [11], heterogeneity was found to be lower. In spite of this, according to Sard-Pecka et al. [31], both types of interventions (attended and online) reduce stress levels. In favor of online interventions, it could be said that they are usually more economical, since there is no instructor present, scheduling is more flexible, and they can be done from home [4].

After the meta-analysis, the efficacy of intervention could be confirmed, since most of the studies had favorable results after mindfulness practice. However, some studies included were highly heterogenous, possibly because of the variety of measurement instruments used, which limits the scope of the results [38]. Bias was somewhat uncertain in some domains. However, we believe that this may have been influenced by unsuitability of the Cochrane Collaborations risk assessment tool for this type of study.

Nonetheless, among the main objectives of mindfulness are improvement in performance [5] and wellbeing [14]. Therefore, the mindfulness-based intervention programs favor improved health and, thereby, quality of life [9].

4.2. Study Limitations

One of the main limitations of this study was the sample sizes, which did not vary much from one to another. Another of the limitations was related to the search strategy, as it concentrated on the PsycDoc, PsycINFO, and Web of Science databases, and, therefore, some studies published in other resources may have been involuntarily omitted. Quantitative data were lacking in the results section of some of the studies reviewed and so could not be included in the meta-analysis. Another of the limitations was the variety of instruments used to measure the variables studied. Finally, there were very few studies on online interventions.

4.3. Future Lines of Research

A future line of research recommended is widening knowledge on this subject with new studies, including other variables, such as emotional intelligence, which would enable new evidence to be found. In general, we suggest that new studies include quantitative results on variables in the pretest and post-test so that they can be used in meta-analytical studies, which would help advance research in this field.

4.4. Practical Applications of the Results

The implications of this study are relevant, insofar as they emphasize the benefits of mindfulness-based intervention for employee quality of life. Therefore, given the proximity and availability of such intervention, it should be put into practice in business to improve employee health, wellbeing, and quality of life.

5. Conclusions

This review of studies on mindfulness-based intervention confirmed its positive influence on several psychological aspects. The results analyzed suggest that this type of intervention is effective in the organizational context and is an effective solution for job performance, leading to the improved wellbeing of employees.

Therefore, training in mindfulness in the workplace can be an effective focus for employees, since the results show a favorable effect on employee health after application of mindfulness intervention, improving quality of life and physical and psychological wellbeing.

Author Contributions: M.d.C.P.-F., M.d.M.M.J., and J.G.S.S. contributed to the conception and design of the review. J.J.G.L. and I.M.R. applied the search strategy. All authors applied the selection criteria. All authors completed the assessment of risk of bias. All authors analyzed the data and interpreted data. M.d.M.M.J., M.d.C.P.-F., I.M.R., and J.G.S.S. wrote this manuscript. M.d.C.P.-F. and J.J.G.L. edited this manuscript. M.d.C.P.-F. was responsible for the overall project. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest: The authors declare no conflict of interest.

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