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Mindfulness training and mental health outcomes in non-teaching staff at a public university

Treinamento em mindfulness e impactos na saúde mental em funcionários não docentes de uma universidade pública

Formación en mindfulness e impactos en la salud mental en trabajadores no docentes de una universidad pública

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ABSTRACT

Objective: to evaluate the effectiveness of a Mindfulness-based Intervention in relation to levels of mindfulness, perceived stress, depression, anxiety and burnout. **Methods**: quasi-experimental study with a sample of 60 workers from a public university. Participants were allocated to a group that received intervention (GE: 30) and another that did not receive intervention, considered a control group (CG: 30). They were assessed at the beginning and after the intervention. **Results**: The EG showed an increase in the total mean Mindfulness score and in two facets of the FFMQ scale (observing and non-reactivity to inner experience). When compared to the CG, there was a reduction in the average scores of perceived stress, depression and anxiety. The same effect after intervention was not observed for burnout. **Conclusion**: Mindfulness training showed the sample's perceived levels of stress, depression and anxiety. The data highlight the potential of this intervention to contribute as a prevention and promotion strategy for workers' mental health.

Descriptors: Mindfulness; Stress, Mental health; Workplace.

RESUMO

Objetivo: avaliar a eficácia de uma Intervenção baseada em Mindfulness em relação aos níveis de atenção plena, estresse percebido, depressão, ansiedade e burnout. **Métodos**: estudo quase-experimental com amostra de 60 trabalhadores de uma universidade pública. Os participantes foram alocados em um grupo que recebeu intervenção (GE: 30) e outro que não recebeu intervenção considerado grupo controle (GC: 30). Foram avaliados no início e após a intervenção. **Resultados**: O GE apresentou aumento na pontuação média total de Mindfulness e em duas facetas da escala FFMQ (observar e não reatividade à experiência interior). Quando comparado ao GC houve redução nos escores médios de estresse percebido, depressão e ansiedade. O mesmo efeito após intervenção não foi observado para o burnout. **Conclusão**: o treinamento de Mindfulness diminuiu os níveis percebidos de estresse, depressão e ansiedade da amostra. Os dados evidenciam o potencial desta intervenção para contribuir como estratégia de prevenção e promoção da saúde mental de trabalhadores.

Descritores: Atenção Plena; Estresse, Saúde mental; Ambiente de trabalho.

RESUMEN

Objetivo: evaluar la efectividad de una Intervención basada en Mindfulness en relación con los niveles de mindfulness, estrés percibido, depresión, ansiedad y burnout. **Métodos**: estudio cuasiexperimental con una muestra de 60 trabajadores de una universidad pública. Los participantes fueron asignados a un grupo que recibió intervención (GE: 30) y otro que no recibió intervención, considerado grupo control (CG: 30). Fueron evaluados al inicio y después de la intervención. **Resultados**: El GE mostró un aumento en la puntuación media total de Mindfulness y en dos facetas de la escala FFMQ (observación y no reactividad a la experiencia interior). En comparación con el GC, hubo una reducción en las puntuaciones medias de estrés percibido, depresión y ansiedad. No se observó el mismo efecto después de la intervención en el caso del agotamiento. **Conclusión**: El entrenamiento de Mindfulness mostró los niveles percibidos de estrés, depresión y ansiedad de la muestra. Los datos resaltan el potencial de esta intervención para contribuir como estrategia de prevención y promoción de la salud mental de los trabajadores.

Descriptores: Atención plena; Estrés, Salud mental; Lugar de trabajo.

INTRODUCTION

The current advents of globalization, such as modernization, a constant search for efficiency, excessive workloads, pressure on deadlines, and achievement of goals often result in a significant increase of stressful events in the workplace.[1] In addition, the individual often does not have sufficient ability to deal with these events.[2]

High levels of stress in the workplace affect both labor productivity and worker quality of life, and may evolve to developing chronic stress, which has been related to the development of anxious and depressive symptoms.[1-3]

The scientific literature has evidenced the increasing use of non-pharmacological integrative and complementary practices to manage clinical conditions influenced by stress, demonstrating beneficial health potential in clinical and psychological disorders. Mindfulness training (MT) stands out among such practices.[4,5]

Mindfulness is a psychological state characterized by the intentional regulation of paying attention to what is happening at that moment, promoting greater awareness of present moment experience.[4,5] The concept of mindfulness originates in Buddhism's philosophical and contemplative traditions; however, mindfulness-based practices are usually a secular practice in healthcare.[4,5]

The interest in MT in workplace settings started in companies in the late 1980s, and gained popularity in the 2000s when large companies, such as Google, launched mindfulness programs for their workforce. Since then, MT has been growing across occupational groups and in specific services, such as teaching, education, healthcare, mental health, and social workers.[4-6] Previous studies carried out with university non-teaching staff showed significant work overload and occupational stress rates, anxious and depressive symptoms, and the use of non-assertive coping strategies such as alcohol abuse.[7,8]

The training of these practices can be a low-cost, easily accessible, and non-pharmacological viable alternative for managing stress in the workplace. Evidence has shown the efficacy of MT in improving anxiety and depression symptoms, burnout, mental distress, and somatic complaints, while improving well-being, compassion, and job satisfaction.[1,5-8]

MT at the workplace can be an essential precedent for adding organizational resources, helping workers recognize, respond, and refocus problems. It allows workers to acquire additional strategies to reduce stress and increase well-being, resulting in lower turnover intentions, less emotional exhaustion, and more significant

affective commitment to the work institution.[7-8]

In the "Comprehensive Mental Health Action Plan 2013-2030", the World Health Organization (WHO) recommends that labor institutions should adopt integrated workers' health and well-being strategies that include prevention, early identification, support, and rehabilitation of stress-related symptoms.[9] Therefore, from this panorama, the present study decided to apply mindfulness training in a heterogeneous group of workers with diverse educational backgrounds, and to analyze the effectiveness of this type of training on mental health indicators.

Therefore, this study aims to evaluate the response of an eight-week MT intervention on mindfulness, perceived stress, depression, anxiety, and burnout levels in a sample of non-teaching staff workers from a Brazilian public university.

METHODS

Study Design

The present study is a quasi-experimental design, with pre- and post-test with a control-group which was conducted on a public university campus located in the state of São Paulo (Brazil), analyzing the effectiveness of an eight-week mindfulness training intervention in administrative workers. The present study was conducted under the recommendations of the Consolidated Standards of Reporting Trials (CONSORT).[10]

The present study met the specifications in accordance with the resolution of the Brazilian National Health Council (CNS) 466 of 2012, with approval by the Research Ethics Committee of the University of São Paulo under opinion no. 2.104.739/2017 as the first phase of the research project entitled "Mindfulness Training for Stress reduction in workers at a university in the interior of São Paulo".

Study Population

We assessed the eligibility of all technical-administrative workers (non-teaching staff) at a public university campus located in the state of Sao Paulo, Brazil. This category of workers is formed by a wide age group, differing in socioeconomic levels, educational levels, and job functions.

Recruitment

First phase

A team of researchers approached the participants personally in their respective workplace invited them to participate voluntarily. Written consent was obtained from those who agreed to participate, and, after some brief instruction, each participant received a closed envelope containing surveys for self-completion: a sociodemographic, working, and health

conditions questionnaire and a scale to assess the self-report level of stress (PSS14). As an effort to address potential sources of bias, respondents had at least one week to return to the research team and it was pointed out that they could contact the researchers in case of any doubts.

We excluded those workers not found at their workplace after three attempts by the research team (n=163), who were on vacation (n=192) or sick leave (n=114) during the data collection period. Incomplete materials (n=42) and those who did not respond to the questionnaires (n=264) were excluded.

A number of 929 volunteers returned the completed data collection material in the first phase of the trial, corresponding to 54.51% of the total non-teaching staff population on campus.

Second phase

After tabulating the data from the first phase of the study, the inclusion criteria of the participants to proceed to the second phase were obtaining a PSS 14 scale score equal to or above 23 points (median of the scale). Those with a history of regular meditation practice (at least once a week in the last 12 months) and undergoing psychiatric treatment were excluded. We adopted these measures to reduce possible confounding biases for the expected effect of the intervention. In the end, 281 participants met the inclusion and exclusion criteria.

Intervention

Mindfulness training

The intervention occurred between March and December 2018, and it was necessary to perform seven distinct groups for the completion of the study: five groups for data collection and two groups offered later to the participants of the CG (waiting list).

The MT consisted of an eight-week mindfulness intervention, with nine sessions. The intervention protocol was standardized, and the sessions were conducted by the team available to this intervention composed of four instructors certified by Mindfulness Trainings International (MTi).[11] According to the Open Mindfulness Network (ABRAMIND), a mindfulness training program should be guided by instructors who have indispensable criteria to offer participants correct and effective learning of the practices, guaranteeing the achievement of the expected effects.[12]

The MTi instructors provide the mindfulness training practice in a secular context and maintain alignment with the foundations of the Mindfulness-Based Stress Reduction (MBSR) program from Kabat-Zinn[4], and recommendations from the mindfulness good practice manual of the UK

Network for Mindfulness-Based Teachers Good Practice Guidelines for Teaching Mindfulness-based Courses.[12]

The intervention took place in face-to-face group sessions lasting two hours once a week for eight weeks. Participants were able to choose the times in advance (during work breaks or after work). The sessions took place at the Center for Mindfulness and Integrative Therapies of the School of Nursing located on the campus of the University of São Paulo, Brazil. In addition, there was a four-hour immersion session in a larger space with an added natural area (trees, plants, grass, dirt floor). All participants who fully attended the sessions received a completion certificate in Mindfulness Training from the Center for Mindfulness and Integrative Therapies at the University of São Paulo Nursing School in Ribeirão Preto, Brazil.

The MT sessions included themes with a focus on the mind and body connection, including practices focused on breathing, body and emotional awareness and mindful eating.

Individuals were instructed during the face-to-face meeting to perform the practices daily at home for the rest of the week. Printed and audio material was offered to assist the procedure. Audios were made available to participants in diverse options: via email, WhatsApp®, or Compact Disc (CD), according to the preference indicated by the participant. The audios contained a guide to the practice, recorded by the MT instructors.

Outcomes

The primary outcome was to compare the mindfulness level in technical-administrative workers who participated in the eight-week MT (EG) with that of workers who did not participate (waiting list) (CG). As secondary outcomes, we compared perceived stress, depression, anxiety, and burnout levels in the EG and CG.

Outcomes were assessed in the participants selected to the EG and CG at two times: one week before the intervention (T0) to determine baseline levels of the investigated effects, and then after eight weeks (T1) on the last day after the intervention ended.

Instruments

Sociodemographic, Working, and Health Conditions Questionnaire: contemplates data about age, gender, race, educational level, marital status and parenthood, religion, physical activity, meditation practice, alcohol and tobacco use, and psychiatric treatment.

Five Facet Mindfulness Questionnaire (FFMQ-BR): this instrument measures mindfulness levels in a multidimensional way. Although entitled as five facets, the authors who validated the Brazilian version[13]

recommend that the instrument should be analyzed considering seven facets, namely: 1) non-judging of inner experience; 2) acting with awareness - autopilot; 3) observe; 4) describing - positive formulation; 5) describing - negative formulation; 6) non-reactivity to inner experience and 7) acting with awareness - distraction.[22] The Cronbach's alpha (which measures internal reliability) in the current sample was .83 at both T0 (before intervention) and T1 (after intervention).

Perceived Stress Scale (PSS14): this scale can assess the self-report level of stress, and has 14 questions with answer options ranging from zero (never) to four (always). The questions with a positive connotation (4, 5, 6, 7, 9, 10 and 13) have their summed score reversed. The other questions are negative, summed directly. The total scale score can range from zero (no stress) to 56 (extreme stress).[14] The Cronbach's alpha in the current sample was .86 at T0 and .85 at T1.

Beck Depression Inventory (BDI-II): the BDI-II consists of 21 sets of statements about depressive symptoms over the past 15 days rated on an ordinal scale from zero to three, producing total scores ranging from zero to 63.[15] The Cronbach's alpha in the current sample was .87 at T0 and .88 at T1.

Beck Anxiety Inventory (BAI): the BAI consists of 21 questions about how the individual has been feeling over the past week, expressed in common anxiety symptoms (such as sweating and feelings of anguish). Each question presents four possible answers, and that which most closely resemble the individual's mental state should be marked and ranges from zero to 63.[16] The Cronbach's alpha in the current sample was .88 at T0 and .86 at T1.

Maslach Burnout Inventory - General Survey (MBI-GS): this general version for burnout measurement maintains a factor structure consistent with various occupations of work. It is composed of three dimensions: Emotional Exhaustion (EE), with six variables; Cynicism (CY), with four variables, and Work Effectiveness (WE), with six variables. Scoring is by a Likert scale (zero to six), ranging from never 0; sometimes a year or less 1; once a month or any less 2; a few times during the month 3; one once a week 4; sometimes during week 5, until every day 6. Burnout levels with the MBI-GS scale are defined as values up to 1.33 considered low; between 1.34 and 2.43 moderate, and above 2.43 high in each dimension.[17] The Cronbach's alpha in the current sample was .92 at T0 and .93 at T1.

Sample size

We used the PSS14 numerical scale to calculate the sample size based on a study[18] because of its high methodological rigor. After applying a protocol of mindfulness

practices in patients with heart disease, changes in outcomes after 12 weeks compared with baseline values (intragroup effect) of -2.4 points were detected, and differences between treatment groups (intergroup effect) of -1.0 point on the psychological outcome of perceived stress as measured by the PSS14 scale.

Considering that it was desired to detect a difference of 2.4 points (δ) on the scale with a significance level of 5% ($z1-\alpha$=1.96) and a power of 80% ($z1-\beta$=1.96), the result was 23 participants for each group.

Information related to variance in the wait-list control and intervention groups was also obtained from a study[27], and a correlation of 0.75 was assumed. A possible loss of 35% was adopted in the follow-up to perform the calculation (nc= $n1-$loss). With this application, the value of participants from each group amounted to 40.

Participants

The second phase of the study included a sample draw, and after defining the number of participants from each group, the workers were invited. We considered the variables age, gender, and level of work (basic, technical, and higher-level) to pair the groups.

The 80 participants that accepted to participate in this step were allocated into the Experimental Group (EG) and waiting-list Control Group (CG), and they were not able to choose which group they would like to be in. The selected participants were invited through phone calls and by email to participate in the study's second phase and signed a new written informed consent form specific to this stage.

As this intervention could not be masked (participants knew which group they were in and instructors knew they were performing the intervention), the instructors who accomplished the intervention had no contact with the data or any approach related to the research in order to avoid possible research bias.

Statistical analyses

Participants who attended at least 6 out of 9 sessions of the intervention were considered for data analysis. Pearson's chi-squared test and Fisher's exact test were conducted to compare the distributions of the nominal variables between the EG and waiting-list CG.

The Mann-Whitney test compared any intergroup changes in intervention outcomes between baseline characteristics (T0) and after the eight weeks of intervention (T1) for the CG and EG. The non-parametric test was chosen after considering the sample size and inspecting the histograms of the numerical variables by the group. The α =

0.05 was adopted as the significance criterion in all analyses.

Results

Participant flow

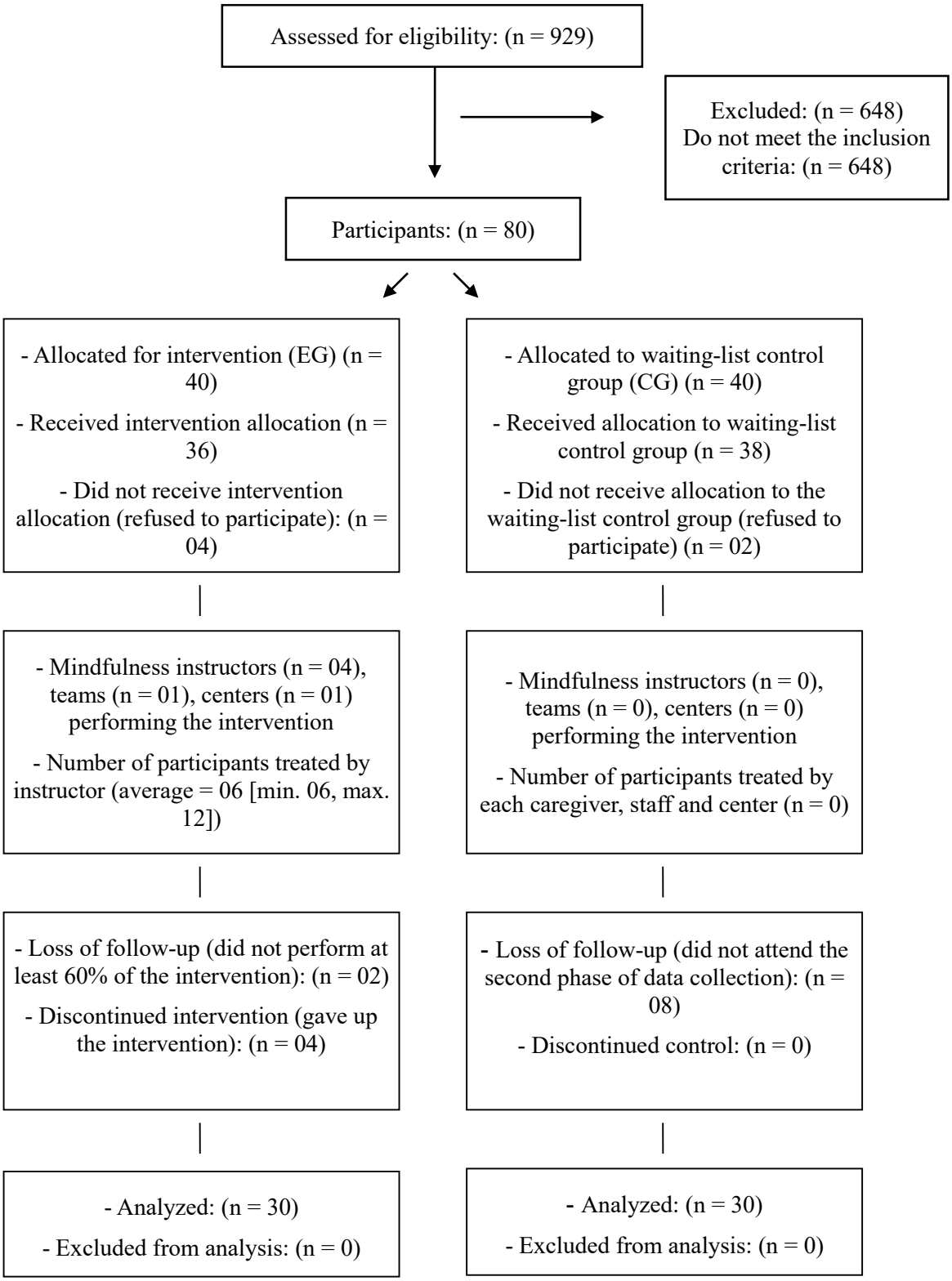
The participants were divided in two groups: 40 allocated in the EG and 40 in the waiting-list CG. The flow of participants in the second phase of the study is shown in Figure 1. Of the 40 participants allocated to the EG, four refused to participate in this study phase because although alternative times were offered, they reported a time conflict with personal activities.

There was a total of six losses in the EG: four participants only went to the first session and gave up on the study, saying that they did not identify with the practice. Two other participants performed only 50% of the intervention sessions, justifying absences due to personal unforeseen circumstances, and were therefore excluded from the final analyses. Finally, 30 EG participants completed the eight-week intervention, conducting at least 60% of the MT sessions.

The average participation in the intervention was 90%, which corresponds to eight of the nine sessions contained in the eight-week MT. Of the 30 EG participants included in the final analyses, 14 (46.7%) completed the whole training schedule.

Two participants in the waiting-list CG refused to participate in the second phase, alleging loss of interest in continuing and conflicting schedules for data collection. Another eight participants only performed the first stage of data collection (T0) and did not attend the second (T1), and were therefore excluded from the analyses.

In total, 60 participants (30 from the EG and 30 from the waiting-list CG) completed all study phases and were considered for statistical analysis (Figure 1).



Source: Modified CONSORT flow diagram for individual randomized controlled trials of non-pharmacological treatments [31].

Figure 1 - Flow diagram of the participants in the second phase of the study.

Sample characteristics

Table 1 shows sociodemographic characteristics and working and health conditions of the sample. The 60 participants evaluated did not differ in any of the variables registered at baseline (T0). The average age was of 40.37 years (SD = 8.88), 60% were women and 40% men. The majority in both groups reported being married (CG 70.0% and EG 66.7%).

The two groups were equally distributed in educational level (at least with high school degree) and job level (most occupying positions as technical level, CG 53.3%, and EG 76.7%). Some people in both groups declared to have some religion (CG 63.3% and EG 70.0%), even though not all practice the same. Half of the two groups reported regularly getting some physical exercise (50.0%). A few participants consumed tobacco (CG 10.0%, EG 3.3%), but a considerable percentage regularly consumed some alcoholic drinks (at least twice a week) (CG 53.3%, EG 33.3%).

Table 1 - Sociodemographic characteristics and working and health conditions of experimental and control groups samples in a Mindfulness Training intervention clinical trial (n = 60).

Characteristics	CG (n = 30)	EG (n = 30)	Statistics
Age, years [mean (SD)]	40.37 (8.88)	40.80 (8.88)	Z = 0.170. p = 0.865
Men [n (%)]	12 (40.0)	12 (40.0)	Fisher p = 1.000
Married [n (%)]	21 (70.0)	20 (66.7)	Fisher p = 1.000
Has children [n (%)]	16 (53.3)	18 (60.0)	Fisher p = 0.795
Educational level [n (%)]			χ^2 = 1.80. df = 2. p = 0.406
High school	6 (20.0)	7 (23.3)	
Undergraduate	15 (50.0)	10 (33.3)	
Post-graduate	9 (30.9)	13 (43.3)	
Function level [n (%)]			Fisher p = 0.079
Basic	6 (20.0)	1 (3.3)	
Technical	16 (53.3)	23 (76.7)	
Higher	8 (26.7)	6 (20.0)	
Weekly work, hours [mean (SD)]	39.00 (3.05)	39.87 (0.73)	Z = 1.08. p = 0.281
Working time, years [mean (SD)]	12.53 (8.35)	12.33 (6.94)	Z = 0.47. p = 0.639
Have another job [n (%)]	4 (13.3)	1 (3.3)	Fisher p = 0.353
Has some religion [n (%)]	19 (63.3)	21 (70.0)	Fisher p = 0.785

Practices religion [n (%)]*	8 (47.1)	12 (57.1)	Fisher p = 0.745
Physical exercise [n (%)]	15 (50.0)	15 (50.0)	Fisher p = 1.000
Tobacco use [n (%)]	3(10.0)	1 (3.3)	Fisher p = 0.612
Alcohol use [n (%)]	16 (53.3)	10 (33.3)	Fisher p = 0.192

Alpha criteria = 0.05; CG: waiting-list control group; EG: experimental group; df: degree of freedom; SD: standard deviation; Z: Mann-Whitney test; Fisher: Fisher's exact test; χ^2: Pearson's chi-squared test; *Missing 2 participants.

Baseline mental health profile

The EG and waiting-list CG did not differ at baseline T0: total score and seven facets of mindfulness level on the FFMQ-BR (p values ≥ 0.05); perceived stress (p = 0.847); depression score (p = 0.276) anxiety score (p = 0.428); burnout (p = 0.05).

Post-intervention State

FFMQ

After the eight-weeks of MT, the EG had higher average scores than the waiting-list CG for Facet 3 - Observe (average CG = 28.35, SD = 5.68 vs. average EG = 23.86, SD = 7.06; p = 0.010) and Facet 6 - Non-reactivity to inner experience (average CG = 18.30, SD = 4.72 vs. average EG = 22.21, SD = 4.28; p = 0.002), as well as the total FFMQ-BR score (average CG = 117.00, SD = 18.88 vs. average EG = 131.15, SD = 19.27; p = 0.012) (Table 2).

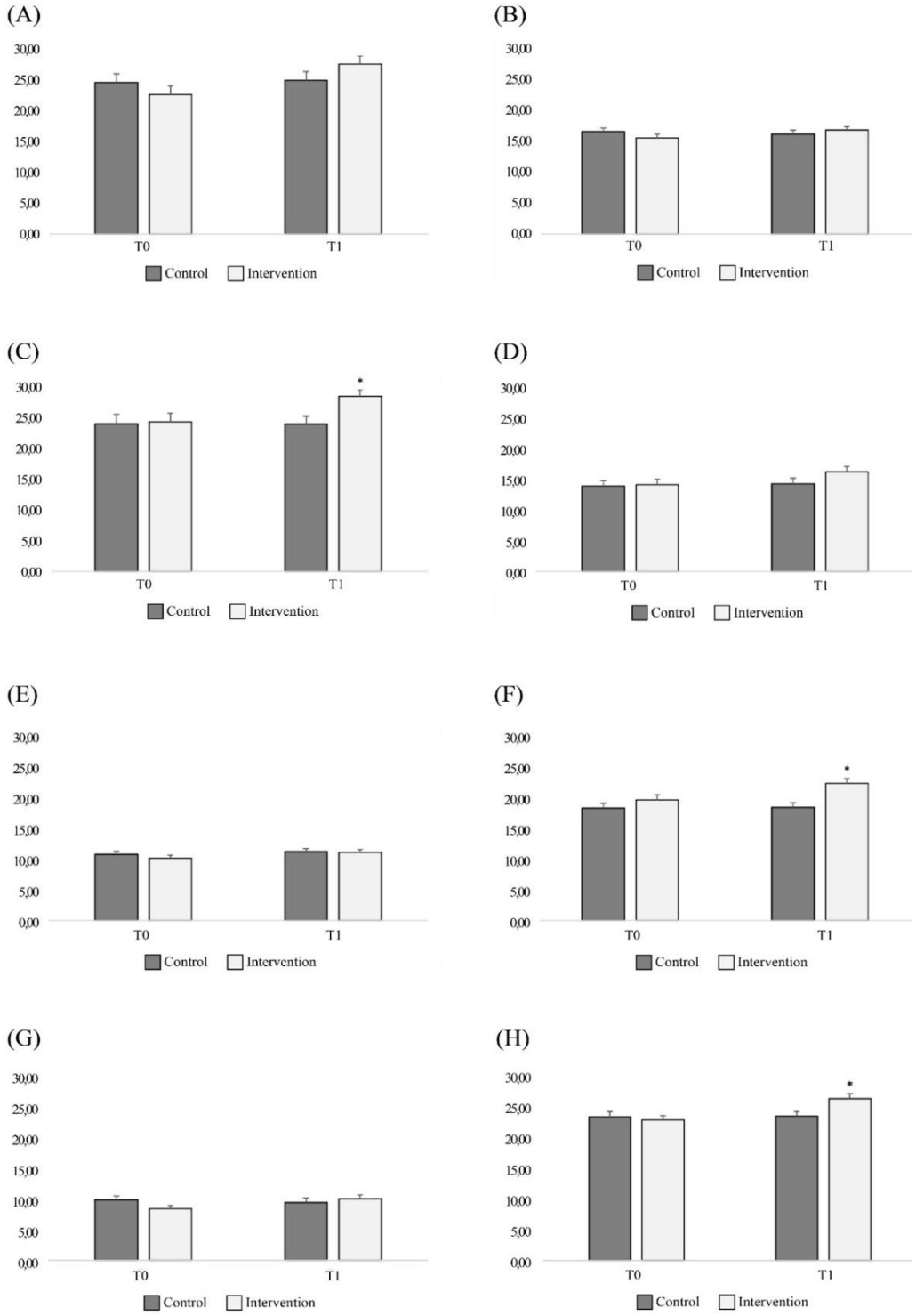
Table 2 - Comparison between T0 and T1 in the experimental group EG and wait-list control group CG at the mindfulness level in a Mindfulness Training intervention clinical trial (n = 60).

Mindfulness	Time	CG (n = 30)	EG (n = 30)	Mann-Whitney Test
Facet 1 - Non-judging of inner experience - Average (SD)	T0	24.57 (7.85)	22.63 (7.54)	Z=0.97; p=0.332
	T1	24.93 (7.46)	27.53 (7.14)	Z=1.23; p=0.219
Facet 2 - Acting with awareness - autopilot - Average (SD)	T0	16.39 (2.97)	15.56 (3.50)	Z=1.16. p=0.245
	T1	16.00 (3.42)	16.70 (3.05)	Z=0.83. p=0.409
Facet 3 - Observe - Average (SD)	T0	23.89 (8.01)*	24.24 (6.75)[2]	Z=0.07; p=0.946
	T1	23.86 (7.06)*	28.35 (5.68)[2]	Z=2.57; **p=0.010**

Facet 4 - Describing - positive formulation - Average (SD)	T0	13.80 (4.85)	14.10 (5.07)	Z=0.16; p=0.876
	T1	14.17 (4.89)	16.10 (4.72)	Z=1.75; p=0.080
Facet 5 - Describing - negative formulation - Average (SD)	T0	10.70 (2.63)	10.10 (2.44)	Z=0.78; p=0.438
	T1	11.17 (2.57)	11.03 (2.40)	Z=3.03; p=0.759
Facet 6 - Non-reactivity to inner experience - Average (SD)	T0	18.20 (4.12)	19.52(4.01)**	Z=1.11; p=0.263
	T1	18.30 (4.72)	22.21 (4.28)**	Z=3.03; **p=0.002**
Facet 7 - Acting with awareness - distraction - Average (SD)	T0	9.83 (3.28)	8.38 (3.89)**	Z=1.40; p=0.163
	T1	9.37 (2.83)	9.97 (3.58)**	Z=1.18; p=0.238
Total score (SD)	T0	116.39 (21.31)**	113.82 (17.65)***	Z=0.70; p=0.484
	T1	117.00 (18.88)**	131.15 (19.27)***	Z=2.52; **p=0.012**

Alpha criteria = 0.05; CG: waiting-list control group; EG: experimental group; SD: standard deviation.*Missing 2 participants. **Missing 1 participant. ***Missing 3 participants.

Figure 2 - Average and standard error of facet scores (1 to 7) and mindfulness total score (FFMQ-BR).



Alpha criteria < 0.05; (A) Facet 1: t = 1.38. p = 0.173; (B) Facet 2: Z = 0.83. p = 0.409; (C) Facet 3: Z = 2.57. p = 0.010; (D) Facet 4: Z = 1.75. p = 0.080; (E) Facet 5: Z = 0.31. p = 0.759; (F) Facet 6: t = 3.38. p = 0.001; (G) Facet 7: Z = 1.18. p = 0.238; (H) FFMQ-BR total: t = 2.98. p = 0.004.

Perceived stress

There was a significant reduction in the perceived stress score only in the EG (which received the Mindfulness Training) after eight weeks of intervention (T1) when compared to the waiting-list CG (average CG = 29.60, SD = 4.78 vs. average EG = 22.47, SD = 7.26; p <0.001) (Table 3).

Table 3 - Comparison between T0 and T1 in the experimental group and waiting-list control group at perceived stress level in a Mindfulness Training intervention clinical trial (n = 60).

Perceived stress	CG (n = 30)	EG (n = 30)	Mann-Whitney Test
T0 average (SD)	30.73 (6.11)	30.77 (8.18)	Z=0.19; p=0.847
T1 average (SD)	29.60 (4.78)	22.47 (7.26)	Z=3.78; **p<0.001**

Alpha criteria = 0.005; CG: waiting-list control group; EG: experimental group; SD: standard deviation.

Depression and anxiety

After the eight-weeks of MT, the participants scored a reduced depression level only in the EG when compared to waiting-list CG (average CG = 11.77, SD = 6.50 vs. average EG = 6.73, SD = 6.63; p<0.001) (Table 3) and in the anxiety level (average CG = 15.13, SD = 6.35 vs. average EG = 6.87, SD = 5.49; p = 0.003 (Table 4).

Table 4 - Comparison between T0 and T1 in the experimental group and waiting-list control group in the depression and anxiety level in a Mindfulness Training intervention clinical trial (n = 60).

	CG (n = 30)	EG (n = 30)	Mann-Whitney Test
Beck Depression			
T0 average (SD)	11.97 (7.53)	11.37 (9.16)	Z=1.09; p=0.276
T1 average (SD)	11.77 (6.50)	6.73 (6.63)	Z=4.42; **p<0.001**
Beck Anxiety			
T0 average (SD)	14.67 (7.29)	13.27 (6.65)	Z=0.79; p=0.428
T1 average (SD)	15.13 (6.35)	6.87 (5.49)	Z=2.98; **p=0.003**

Alpha criteria = 0.05; CG: waiting-list control group; EG: experimental group; SD: standard deviation.

The scores of burnout responses did not suffer significant change after eight weeks of MT in any of the dimension scores or the total score of the MBI-GS scale in the

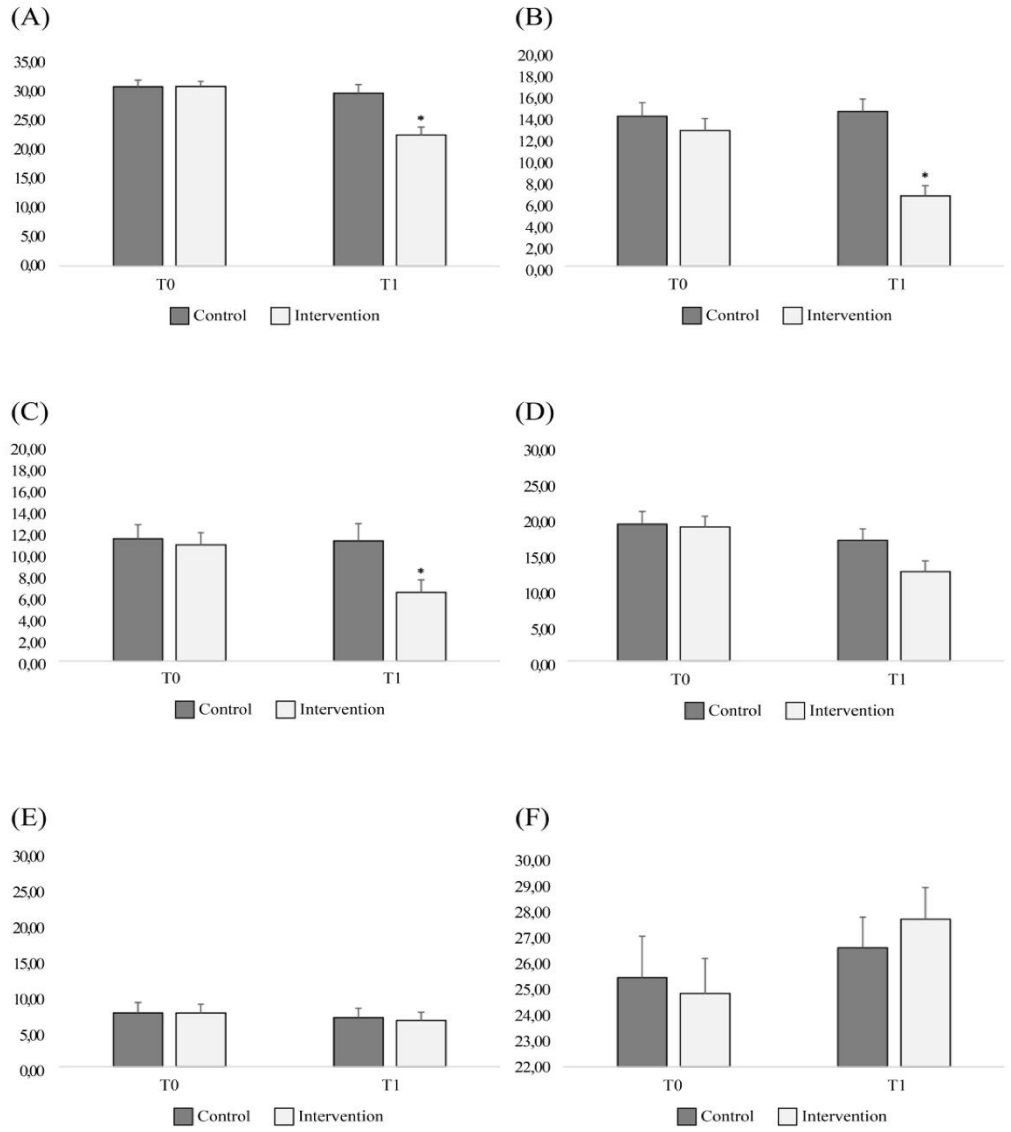
EG when compared to the CG: Emotional Exhaustion: (average CG = 17.70, SD = 8.58 vs. average EG = 13.10, SD = 8.70; p = 0.083); Cynicism: (average CG = 7.20, SD = 7.17 vs. average EG = 7.87, SD = 7.55; p = 0.736); Work Effectiveness: (average CG = 26.66, SD = 7.39 vs. average EG = 27.77, SD = 6.83; p = 0.486); and Total score: (average CG = 51.34, SD = 13.05 vs. average EG = 47.63, SD = 12.17; p = 0.314) (Table 5).

Table 5 - Comparison between T0 and T1 in the experimental group and waiting-list control group for burnout level in Mindfulness Training intervention clinical trial (n = 60).

Burnout	Time	CG (n = 30)	EG (n = 30)	Mann-Whitney Test
Emotional Exhaustion (EE) average (SD)	T0	19.67 (9.23)	20.07 (10.29)	Z=0.02; p=0.988
	T1	17.70 (8.58)	13.10 (8.70)	Z=1.73; p=0.083
Cynicism (CY) average (SD)	T0	7.90 (8.27)	7.87 (7.55)	Z=0.22; p=0.823
	T1	7.20 (7.17)	6.77 (6.72)	Z=0.34; p=0.736
Work Effectiveness (WE) average (SD)	T0	25.48 (8.72)	24.97 (6.58)	Z=0.99; p=0.323
	T1	26.66 (7.39)*	27.77 (6.83)	Z=0.70; p=0.486
Average Total (SD)	T0	52.45 (14.23)*	52.50 (13.71)	Z=0.05; p=0.964
	T1	51.34 (13.05)	47.63 (12.17)	Z=1.00; p=0.314

Alpha criteria = 0.05; CG: waiting-list control group; EG: experimental group; SD: standard deviation. *Missing 1 participant.

Figure 3 - Mean and standard error of (A) perceived stress (PSS14); (B) depression (BDI-II); (C) anxiety (BAI); (D) burnout Emotional Exhaustion (EE), (E) burnout Cynicism (CY) and (F) burnout Work Effectiveness (WE).



Alpha criteria<0.05; (A) PSS14: Z=4.42. p<0.001; (B) BDI-II: Z=2.98. p=0.003; (C) BAI: t=4.49. p<0.001; (D) EE: Z=1.73. p=0.083; (E) CY: Z=0.34. p=0.736; (F) WE: Z=0.70. p=0.486.

DISCUSSION

We adopted a quasi-experimental study design to determine the effectiveness of an eight-week MT as a workplace mental health promotion intervention. Compared with the waiting-list control group, the experimental group increased the average score of mindfulness and decreased perceived stress, depression, and anxiety levels. However, the effects on burnout were generally not statistically significant.

These findings show that Mindfulness training interventions has the potential to improve mental health parameters and lessen the mental illness risks for workers. The results corroborate previous studies with mindfulness-based practices to improve mental health parameters in samples of workers.[2,6, 19]

After the MT, the EG presented higher average scores than the CG in the total mindfulness score, and a significance level of 0.05 was measured by the Brazilian version of FFMQ-BR for the facets three "observe" and six "non-reactivity to inner experience". Increasing mindfulness level in workers can provide better cognitive performance, improved self-perception, and psychological flexibility, decreased rumination and worry, thereby influencing quality of life. A high level of mindfulness can contribute to more conscious decisions in the workplace, leading to improved performance.[1.]

This study also aimed to elucidate which aspects of mindfulness (facets) would be impacted by the intervention. According to a study[20], the facet "observe" strongly correlates with the construct of "openness to experience," which can benefit workers by making them more aware and attentive. A more attentive mind facilitates cognitive processes, which are essential for good performance of work functions. Openness to new experiences can encourage learning related to new technologies, which are increasingly present in work environments.

There was also a significant increase in facet "non-reactivity to inner experience." This facet refers to "allowing thoughts to come and go, without letting me be affected or taken by them", which may reflect in increased emotional regulation, contributing to recognize difficulties without letting negative emotions or thoughts influencing their actions.

Increasing this facet can be a facilitator to solve problems more effectively in the workplace and can also be related to the increase of self-compassion, which can help workers reduce overload and guilt, becoming more understanding of themselves.[21]

The experimental group also presented a decrease in perceived stress levels. This result is consistent with a systematic literature review showing that interventions with mindfulness-based practices show positive results in decreasing perceived stress in workers.[6]

High levels of perceived stress are associated with several stress-related physiological biomarkers, such as hypothalamic–pituitary–adrenal axis hyper-reactivity, immunological, cardiovascular, and metabolic function markers. When

perceived stress becomes chronic, it constitutes a moderately increased risk factor for cardiovascular disease and a significant risk factor for developing mental health problems.

Perceived stress can also compromise the individual's work performance and impact the work environment, generating a conflicting organizational climate and reducing institutional effectiveness. Lower levels of perceived stress may affect improvement in physical and mental health, conferring a protective factor for the prevention of diseases associated with this outcome, and contribute to greater cognitive performance and promote a friendlier work environment, with better relationships between co-workers.

Another significant result in the present study after the eight-week MT intervention was the average reduction of depression and anxiety levels. Few studies have demonstrated the effects of mindfulness-based practices on depression and anxiety symptomatology in non-clinical populations. The results obtained after MT is in line with those shown in a systematic literature review[22], where the authors presented positive psychological results related to decreasing depression and anxiety in non-clinical populations through mindfulness-based interventions, considering it as a promising modality for stress management in non-clinical populations.

Depression and anxiety symptoms may affect work performance, leading to higher absenteeism and decreased performance in work functions. Workers who present positive symptoms for depression and anxiety may benefit from the results obtained with the MT since the decrease in these parameters has a positive impact on mental health, which may reflect an improvement in dynamics activities at work.

Regarding the effect of MT on burnout levels, although EG participants at the present intervention showed trends toward positive changes in burnout improvement, there was no statistically significant difference when comparing the experimental and waiting-list control groups at a significance level of 0.05. The literature has shown reduced burnout in workers after mindfulness-based interventions.[2,5,6]

The authors mentioned previously pointed to the need for further investigations of burnout in different contexts to better understand the syndrome's causes and effects. There is an absence of controlled studies in the Brazilian scientific literature, which have

evaluated the impact of mindfulness-based practices on burnout.

The burnout scale used in the present study (MBI-GS) addresses general aspects of work and understands burnout as an "individual's crisis related to work". It is possible that the burnout levels after the MT did not present a significant decrease because the intervention does not consist in the insertion of changes in the structure of the work organization, which more directly refer to the issues of scale.

Although the results obtained in the present study did not reach a statistically significant effect on burnout, the benefits presented after the intervention regarding the increase in mindfulness level and reduction of perceived stress, anxiety, and depression levels implicate an improvement of psychological well-being for the workers. This result infers that burnout prevention since its occurrence is usually preceded or accompanied by prolonged periods of stress.

Developing and cultivating a mindfulness state generates benefits in clinical aspects associated with psychopathology and improving interpersonal relationships, quality of life, coping, and emotional regulation. The results obtained in the present study infer that mindfulness interventions constitute a non-pharmacological, low-cost, and self-sustaining alternative, with positive effects on improving workers' mental health and may contribute to a healthier work environment.

Some limitations to highlight are that the CG participants knew they were in the waiting-list condition, and data related to race or ethnicity were not collected.

Implications for work health practice

Research into alternatives that promote stress reduction and increased well-being, like mindfulness practices, should be broadened and widespread in workplaces as a strategy for promoting and restoring mental health.

The results have implications and might give methodological support to mindfulness and occupational health researchers who design, implement, and maintain health and wellness programs in work environments. This trial can contribute with the methodological backing for future research on the theme and for implementing mindfulness practices in work contexts. After performing the MT, the individual becomes able to achieve the practices alone, incorporating the concepts of mindfulness in their daily lives and sustaining the gained benefits.

CONCLUSION

The obtained data indicate that the MT resulted in increased mindfulness and

reduced perceived stress, depression, and anxiety levels in a sample of non-teaching staff university workers. These results demonstrate the beneficial potential of mindfulness training for a non-clinical sample. It is considered that the outcomes of the present study show the effectiveness of a low-cost practice with multiple benefits to this population.

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