



Feasibility and Effectiveness of a Mindfulness-Based Program Vs. Relaxation in the Treatment of Burnout in Brazilian Primary Care Providers: a Mixed-Methods Pragmatic Controlled Study

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Abstract

Objectives Mindfulness-based programs (MBPs) have been tested as promising alternatives for managing stress in Primary health care (PHC) providers. The study compared the feasibility and efficacy of an MBP on burnout symptoms in Brazilian PHC providers with a briefer relaxation-based program and with a nonactive control group.

Methods A nonrandomized controlled trial was conducted with mixed-methods evaluation on self-reported symptoms of burnout, and positive and negative affection, mindfulness, self-compassion, decentering, and rumination. The MBP arm (MF) ($n = 62$) consisted of eight mindfulness sessions, the relaxation arm (RE) ($n = 35$) attended four relaxation sessions, and the control arm (CO) ($n = 45$) comprised a waitlist group.

Results The reduction in exhaustion was significantly higher in MF compared with CO ($d = -0.58$; $p = 0.020$), and in RE compared with CO ($d = -0.63$; $p = 0.017$). MF was significantly superior to CO for reducing cynicism ($d = -0.48$; $p = 0.024$). There was also significant superiority of MF compared with CO in positive and negative affect, observing, describing, nonreacting, mindfulness, identification, and rumination. MF and RE were significantly superior to CO for reducing criticism and isolation. Finally, MF was significantly superior to RE and CO for improving nonjudging, self-kindness, and decentering.

Conclusions Mindfulness and relaxation may be efficacious in addressing burnout symptoms in PHC providers, probably with synergistic effects and distinct mechanisms of action. Further studies with a randomized design and larger sample sizes should be performed to confirm these preliminary data and to test whether a mix of mindfulness and relaxation techniques would be more effective than either program on its own.

Keywords Primary health care · Occupational health · Mindfulness · Relaxation · Burnout · Self-compassion

The Brazilian Unified Health System (Sistema Único de Saúde—SUS) has achieved considerable progress in

providing universal health coverage in Brazil (Massuda et al., 2018). Brazil's primary health care (PHC) system uses

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a team-based approach characterized by a set of health actions and services that cover all areas between health promotion and the treatment of common diseases. In fact, the “Family Health Strategy” is the most prevalent PHC model in Brazil, particularly when it comes to attending vulnerable, low-income populations. However, this enhancement in coverage and consequent reduction in inequality of access has come under important structural and economic constraints (Massuda et al., 2018), which pose an increased risk of chronic stress among PHC professionals (Atanes et al., 2015; Lorenz and Guirardello, 2014).

An extensive literature describes the potential causes of PHC providers’ stress as being work overload, difficult patients, and health care system issues (Leonelli et al., 2017; Rushton et al., 2015). PHC professionals with chronically elevated levels of stress are more prone to suffering from burnout (Demarzo et al. 2020). The International Classification of Diseases (ICD-11; WHO, 2019) considers burnout syndrome a work-related chronic state of stress and psychological exhaustion. This occupational phenomenon may impair the quality of the health care offered and diminish the quality of clinical outcomes, as well as decrease patient safety and increase patient dissatisfaction with the health care they receive (Martins et al., 2014; Panagioti et al., 2018; Passero et al., 2016; Salyers et al., 2016). In addition, PHC providers suffering from burnout manifest a lower health status and a greater intention to leave the professional practice, with the subsequent loss of highly trained staff (Montero-Marin et al. 2016; Rabatin et al. 2016).

A range of individual programs for the reduction of burnout symptoms, including mindfulness training and relaxation techniques, have been tested and offer promising results for health care professionals (Asuero et al., 2014; Awa et al., 2010; Esch and Stefano, 2010; Michie, 2002). However, ambivalent results have also been observed in a recent meta-review (Kalani et al., 2018). In general, certain types of relaxation, such as breathing relaxation, have been proposed as effective in reducing physician burnout (Williams et al., 2015). Conversely, while mindfulness-based programs (MBPs) seem to improve the anxiety, depression, stress, and well-being of health care professionals, results seem to be more equivocal in the case of burnout (Lomas et al., 2018). Although meditation practices have shown greater effect sizes than relaxation in the reduction of anxiety symptoms in clinical populations (Montero-Marin et al., 2019), for instance, relaxation techniques are most frequently used in stress management programs, possibly because of their low cost and ease of implementation (Ravalier et al., 2016). Training health professionals in the practice of mindfulness would facilitate not only their own potential health benefits but also the future process of implementing the practice into the health system (Demarzo et al., 2015a; Demarzo et al., 2015b; Rycroft-Malone et al., 2019). Although both mindfulness meditation

and relaxation practices have been recommended for stress prevention in the Brazilian PHC services (Brasil, 2017), further studies are still needed in order to allow optimal programs to be determined and overall costs and benefits to be assessed.

It has been suggested that MBPs should be compared with relaxation techniques in order to separate out the effects of mindfulness training from mere relaxation (Manocha et al., 2011). One study comparing an MBP with relaxation therapy presented the relevant results of both kinds of programs (Jain et al., 2007). This work examined the effects of a meditation program vs. somatic relaxation, each with a duration of 1 month, compared with a nonactive control group, in undergraduate students reporting distress. Results suggested that compared with a no-treatment control group, brief training in mindfulness or somatic relaxation might reduce distress and improve positive mood states. However, mindfulness meditation may be specific in its ability to reduce distractive and ruminative thoughts and behaviors. Comparing this kind of research including active control groups, such as relaxation, with mindfulness training may overcome the limitation of results being confounded by nonspecific unknown factors, as opposed to the unique effects of MBPs (Chiesa and Serretti, 2009; Manocha et al., 2011; Romani and Ashkar, 2014).

Thus, the main objective of this study was to compare the effect of an 8-week MBP for the treatment of burnout symptoms in Brazilian PHC professionals to a brief 4-week relaxation-based program (active control), and a waitlist group (nonactive control). In addition, we qualitatively identified their perceptions of (a) the impact of mindfulness and relaxation training on their health, and (b) the feasibility of this kind of programs in the Brazilian PHC setting. The initial hypothesis was that the 8-week MBP would be superior not only to the 4-week relaxation program with regard to the main factors of burnout but also to secondary outcomes such as affectivity, mindfulness, self-compassion, decentering, and rumination, and that both mindfulness and relaxation would be superior to the waitlist control group.

Method

Participants

The target population of the study was PHC professionals from the city of Porto Alegre, in southern Brazil. The sample involved PHC professionals from 50 health units. A sample size calculation was performed, estimating an effect size of around 0.5 (moderate), with a statistical power of 80% and a confidence interval of 95%. Thus, roughly 65 individuals would be necessary in each of the three arms of the study, totaling 195 people, considering a dropout rate of around 10%.

The inclusion criteria applied to participants were as follows: (a) 18 years of age or over, (b) to have completed elementary education, (c) to be interested in the objectives of this study; (d) to have voluntarily consented to participate in one of the three programs proposed, (e) being a PHC professional for at least the previous 6 months, and (f) to be experiencing any kind of work-related stress. The exclusion criteria were as follows: (a) to have been practicing mindfulness, meditation, yoga, or similar (tai chi chuan, qi gong, etc.) in the previous 6 months; (b) the presence of any diagnosed clinical diseases that would not allow adherence to the study; (c) being in treatment for psychological or psychiatric problems in the therapeutic adjustment phase (less than 3 months of psychological or pharmacological programs); (d) dependence or abusive use of alcohol or other drugs, except for tobacco; and (e) being on medical leave or sickness absence from work.

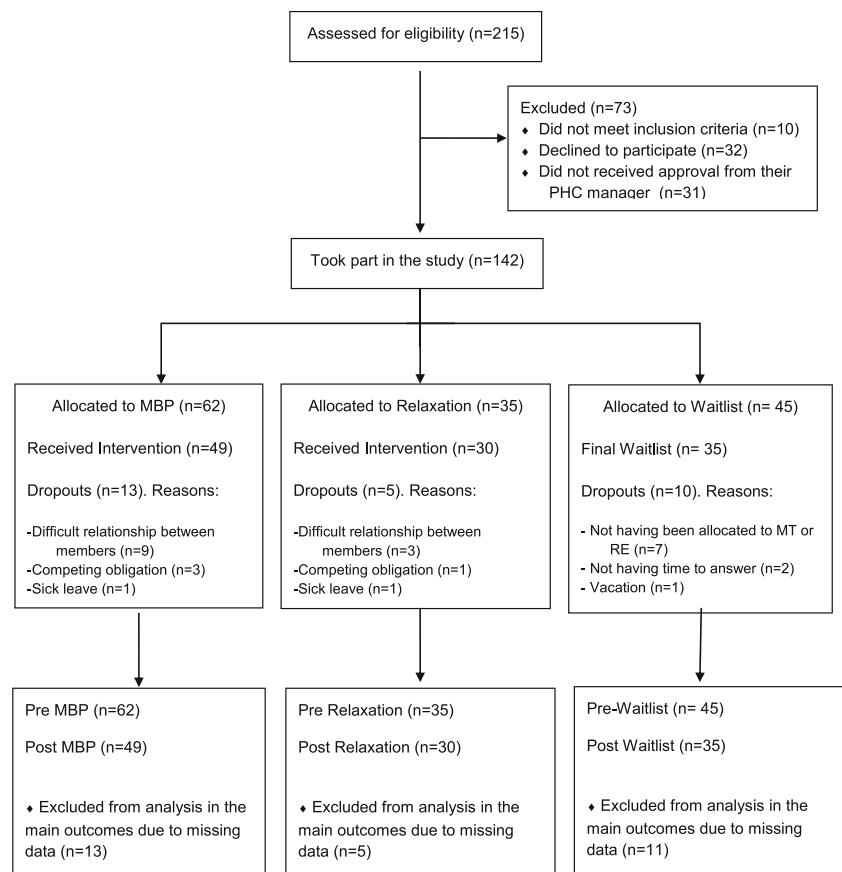
Figure 1 is the flow diagram for the study and shows the number of participants, dropouts, attendance of sessions, and their profile. There were a few difficulties encountered in carrying out recruitment for this study that merit mention. A total number of 215 people initially expressed their willingness to be involved in the research. However, not all of them finally formalized their desire to participate in the study (i.e., by contacting the researcher by email or telephone to receive instructions on checking the inclusion and exclusion criteria).

In the main, these people did not receive approval from their PHC manager to miss work hours. Eventually, a total of 142 professionals with different PHC profiles were authorized to take part in the study.

In the case of participants who dropped out during the programs (13 people in MBP and five people in RE), the reasons identified were conflict with another coworker in the group, inability to attend owing to competing professional duties, leave, or vacation. Other contextual issues observed involved tension for some professionals who left their duties to participate in the sessions. This was particularly an issue in ME because, in most cases, their absence occupied an entire shift. Some participants reported feeling guilty about leaving their duties and coworkers and being overwhelmed by their coworkers' "looks of disapproval." There also were some health unit regions where the study was not approved owing to anticipated or evident problems. The missing values represented a loss of 3% in the pretest and 9% in the posttest data. We chose to work only with complete cases for the pretest and posttest analyses, without data imputations, and according to a per protocol principle. Ten CO participants in did not complete all postprogram measures and were excluded.

The adherence was considered high among all participants who completed the posttest survey. One inclusion

Fig. 1 Participant flow diagram



criterion was to attend at least 50% of the sessions. Most participants in MF ($n = 40$) attended at least six sessions. The majority of participants in RE ($n = 29$) attended 75–100% of the sessions, and there was one case that attended only two sessions. Thus, most of the sample participated in more than 75% of the sessions in both programs. There were no significant differences between the arms regarding adherence and dropouts.

As can be seen in Table 1, most of the sample consisted of women (93%, $n = 132$). A large proportion of the total sample (67.6%, $n = 96$) comprised married individuals, while 22.5% ($n = 32$) were unmarried. The mean age was 40 years, with a standard deviation of 11 years, ranging between 22 and 64 years. The sample consisted predominantly of holders of graduate/postgraduate degrees ($n = 57$, 40.1%), but there was a significant difference between groups regarding the level of schooling ($p = 0.014$). CO had a higher number of participants with full secondary education, whereas MF had a greater prevalence of participants with higher education (32.2%) as well as graduate and postgraduate students (46.8%). Consequently, this variable also interfered in the difference between the means of salary groups ($p = 0.001$), because the occupations in the waitlist control group involved lower levels of schooling and thus a lower income.

Table 2 shows the descriptive statistics for the main and secondary outcomes considering the total group and according to the intervention arm. Taking the response pattern of the sample in terms of burnout syndrome (see Supplementary Materials 2), all the means of the arms at baseline were classified as having a moderate degree of burnout symptoms (Maslach et al., 1996).

Procedure

The study was advertised at all PHC units using informative leaflets, and PHC managers were informed personally by the first author (DS) about the goals of the project. Any interested professionals were released from their duties during working hours to attend the meetings previously scheduled with the heads of the health services. All volunteers were introduced to the study criteria prior to participation. Those who were interested underwent a brief psychiatric evaluation using three scales for screening (Beck's Depression Inventory (BDI-II), Self-Reporting Questionnaire (SRQ-20), and Self-Reporting Questionnaire (alcohol use) (SRQ-A)) (Gomes-Oliveira et al., 2012; Gonçalves et al., 2008; Santos et al., 2016) to exclude severe psychiatric symptoms, suicidal ideation, and alcohol abuse. Eventually, none of the volunteers were excluded, probably because the participants in this study were active health care professionals (not on leave for health problems, or more specifically, for mental health problems) at the time.

After inclusion, volunteers were allocated to one of the three arms of the study: the mindfulness arm (MF), relaxation arm (RE), and waitlist control arm (CO). We did not randomize the professionals into the different arms in order to make the study more feasible and pragmatic. The specific reason for this was that we observed in a pilot study that professionals were highly resistant to being randomly allocated to the study groups, even though they had signed an informed consent form. In order to solve this potential limitation in the recruitment process, we decided to enroll the participants according to their willingness and availability to be part of the program groups. At the same time, we also used a criterion for

Table 1 Socio-demographic characteristics of participants

Variable	Total ($n = 142$)	MF ($n = 62$)	RE ($n = 35$)	CO ($n = 45$)	p
Age, Mn (SD)	40.01 (11.00)	41.65 (11.69)	38.6 (11.35)	38.84 (9.58)	0.295
Gender					
Male, n (%)	10 (7)	3 (4.8)	1 (2.9)	6 (13.3)	0.295
Female, n (%)	132 (93)	59 (95.2)	34 (97.1)	39 (86.7)	
Marital status					
Single, n (%)	32 (22.5)	17 (27.4)	9 (25.7)	6 (13.3)	0.367
Married, n (%)	96 (67.6)	39 (62.9)	22 (62.9)	35 (77.8)	
Divorced, n (%)	10 (7.0)	4 (6.5)	4 (11.4)	2 (4.4)	
Widowed, n (%)	4 (2.8)	2 (3.2)	0(0.0)	2 (4.4)	
Schooling					
Completed high school, n (%)	48 (33.8)	13 (21.0)	11 (31.4)	24 (53.3)	0.014
Undergraduate degree, n (%)	37 (26.1)	20 (32.3)	8 (22.9)	9 (20.0)	
Graduate/postgraduate degree, n (%)	57 (40.1)	29 (46.8)	16 (45.7)	12 (26.7)	
Salary, Mn (SD)	805.57 (588.47)	998.71 (661.37)	750.79 (449.91)	581.62 (490.99)	0.001

MF, MBP arm; RE, relaxation arm; CO, waitlist controls

Salary is in US dollars per month

Table 2 Descriptive scores in the main and secondary outcomes by arm

Variable	Total	Pre	Post	MF	Pre	Post	RE	Pre	Post	CO	Pre	Post
	<i>n</i>	Mn (SD)	Mn (SD)	<i>n</i>	Mn (SD)	Mn (SD)	<i>n</i>	Mn (SD)	Mn (SD)	<i>n</i>	Mn (SD)	Mn (SD)
MBI-GS												
Exhaustion	113	3.57 (1.32)	3.41 (1.37)	49	3.66 (1.20)	3.31 (1.17)	30	3.89 (1.37)	3.41 (1.53)	34	3.17 (1.39)	3.57 (1.50)
Cynicism	113	1.37 (1.28)	1.31 (1.21)	49	1.61 (1.32)	1.25 (1.10)	30	1.13 (1.06)	1.20 (1.18)	34	1.22 (1.37)	1.50 (1.40)
Efficacy	113	5.03 (0.92)	4.91 (0.93)	49	4.93 (0.99)	4.95 (0.86)	30	5.41 (0.47)	5.20 (0.71)	34	4.83 (1.03)	4.60 (1.11)
PANAS												
Negative	112	2.42 (0.71)	2.18 (0.79)	49	2.38 (0.68)	1.99 (0.69)	29	2.39 (0.77)	2.11 (0.79)	34	2.51 (0.72)	2.51 (0.84)
Positive	112	2.88 (0.77)	2.95 (0.78)	49	2.97 (0.61)	3.09 (0.68)	29	3.04 (0.71)	3.13 (0.76)	34	2.61 (0.96)	2.60 (0.84)
EQ												
Rumination	103	2.25 (0.43)	2.23 (0.40)	39	2.17 (0.43)	2.29 (0.35)	30	2.30 (0.43)	2.24 (0.36)	34	2.30 (0.43)	2.16 (0.48)
Decentering	103	2.05 (0.65)	2.27 (0.72)	39	1.98 (0.60)	2.37 (0.67)	30	2.18 (0.56)	2.40 (0.61)	34	2.02 (0.78)	2.03 (0.82)
SCS												
Self-criticism	113	3.27 (0.91)	2.94 (0.96)	49	3.26 (0.91)	2.70 (1.00)	29	3.16 (0.98)	2.80 (0.88)	35	3.37 (0.88)	3.38 (0.85)
Over-identification	113	3.23 (0.94)	2.99 (1.03)	49	3.17 (0.83)	2.71 (0.91)	29	3.03 (1.01)	2.91 (1.01)	35	3.47 (1.01)	3.45 (1.07)
Humanity	113	3.22 (0.89)	3.35 (0.88)	49	3.23 (0.82)	3.44 (0.89)	29	3.42 (0.81)	3.42 (0.78)	35	3.04 (1.04)	3.15 (0.94)
Isolation	113	2.89 (1.14)	2.72 (1.07)	49	2.86 (1.08)	2.50 (0.96)	29	2.63 (1.12)	2.47 (1.02)	35	3.16 (1.22)	3.23 (1.11)
Kindness	113	3.00 (0.94)	3.19 (0.90)	49	2.90 (0.88)	3.47 (0.84)	29	3.16 (0.77)	3.07 (0.85)	35	2.99 (1.12)	2.89 (0.91)
Mindfulness	113	3.43 (0.95)	3.47 (0.93)	49	3.43 (0.89)	3.66 (0.80)	29	3.54 (0.82)	3.55 (0.78)	35	3.35 (1.12)	3.14 (1.12)
SCS-Total	113	3.03 (0.76)	3.23 (0.81)	49	3.03 (0.73)	3.45 (0.77)	29	3.20 (0.74)	3.30 (0.70)	35	2.89 (0.81)	2.86 (0.82)
FFMQ												
Observe	113	3.23 (0.85)	3.28 (0.87)	49	3.191 (0.87)	3.43 (0.82)	30	3.20 (0.90)	3.27 (0.88)	34	3.32 (0.78)	3.08 (0.91)
Describe	113	3.32 (0.89)	3.38 (0.90)	49	3.456 (0.83)	3.62 (0.78)	30	3.35 (0.84)	3.40 (0.90)	34	3.10 (0.99)	3.01 (0.98)
Act with awareness	113	3.60 (0.95)	3.71 (0.86)	49	3.656 (0.94)	3.83 (0.70)	30	3.61 (0.92)	3.82 (0.83)	34	3.49 (1.00)	3.44 (1.03)
No-judge	113	3.08 (0.84)	3.38 (0.82)	49	3.189 (0.81)	3.66 (0.79)	30	3.12 (0.96)	3.29 (0.77)	34	2.89 (0.76)	3.07 (0.81)
Not-react	113	2.67 (0.69)	2.78 (0.75)	49	2.659 (0.62)	2.94 (0.69)	30	2.57 (0.69)	2.61 (0.66)	34	2.76 (0.79)	2.69 (0.86)

MF, MBP arm; RE, relaxation arm; CO, waitlist controls; MBI-GS, Maslach Burnout Inventory-General Survey; PANAS, Positive and Negative Affect Scale; EQ, Experiences Questionnaire; SCS, Self-Compassion Scale; FFMQ, Five Facet Mindfulness Questionnaire

distribution of the participants into the experimental programs (MBP or relaxation) based on the health facility/region of the city in which they were working during the period of the study, in order to prevent the exchange of information and contamination between the active arms. Thus, the primary care facilities/regions themselves were previously randomized using simple random allocation into one of the study programs, and the professionals from the different PHC facilities/regions were therefore invited to be allocated to a predetermined active arm (ME or RE). The volunteers comprising CO were professionals who were unable to be involved in any program at that time either because they were on vacation or for other professional reasons. Nevertheless, they were invited to take part in either program if they wished, which were offered to them after completion of the study period. The programs were:

Mindfulness-Based Program The model tested was “Breathworks for Stress” (Burch and Penman 2013; Cusens et al., 2010) (see Supplementary Materials 1). This MBP was inspired by mindfulness-based stress reduction (MBRS) and

mindfulness-based cognitive therapy (MBCT) programs. Originally, the mindfulness program used in the study had a total of eight sessions, each lasting 150 min and held once a week. In order to accommodate participants’ schedules, the protocol was adapted to allow each session to last 2 h, with 16 h in total. There was a recommendation of daily practice lasting an average of 15 min, as well as the suggestion that what was learned should be applied to everyday life. A topic was presented during each session, together with different related practices, inquiries, and well-defined objectives.

Relaxation-Based Program This program worked as an active control group and was composed of four sessions with a duration of 2 h held every 2 weeks (see Supplementary Materials 1). The activities involved mutual help conversations about stressful situations at work, psychoeducation on stress, various techniques of stress inoculation, and relaxation techniques such as diaphragmatic breathing, progressive muscle relaxation, relaxing visualization, and stretching exercises. This program was paired in length (8 weeks) to the mindfulness program, but not in the number of sessions (four instead of eight)

and total duration (eight instead of 16 h). Another of our intentions with this group was to evaluate whether a brief relaxation program would be efficacious in reducing burnout symptoms, particularly exhaustion. If confirmed, this program would become a feasible alternative to be offered and implemented in PHC, given that there are insufficient numbers of experienced mindfulness teachers in Brazil.

All participants received texts and audios pertaining to the practice(s) proposed for each session (for the two different program types), sent to them by email, as a means of encouraging home practice. Each audio track had an average of 15 min. Both the mindfulness and relaxation programs were conducted by the first author (DS), a clinical psychologist with 15-year experience and specializing in cognitive-behavioral psychotherapy, who holds a master's degree in clinical psychology and who has had 3-year experience in mindfulness training after her certification and long experience as a yoga instructor. Justification for the researcher coordinating both programs was that she could control the different psychological mechanisms and the way of conducting the different practices without overlapping between the two programs (MBP and relaxation) and the different objectives associated with each.

Measures

The instruments used for screening were the Beck's Depression Inventory (BDI-II), the Self-Reporting Questionnaire-20 (SRQ-20), and the Self-Reporting Questionnaire-A (SRQ-A). The BDI-II consists of 21 statements about depressive symptoms in the previous 15 days that are rated on a 0-to-3 ordinal scale. Total scores range between 0 and 63 (0–13, minimal/no depression; 14–19, mild depression; 20–28, moderate depression; and 29–63, severe depression). The BDI-II has been validated in Brazil (Gomes-Oliveira et al., 2012), with a Cronbach's coefficient of internal consistency $\alpha = 0.93$. The SRQ-20 is a 20-item self-report screening tool developed by the World Health Organization (WHO). It employs a "yes" or "no" answer format and is designed to detect nonspecific psychological distress, including suicidality. It has been validated in Brazil by Santos et al. (2016) (Cronbach's $\alpha = 0.80$). The SRQ-A is a five-item self-report screening tool also developed by the WHO that has been designed to detect alcohol-related disorders (Cronbach's $\alpha = 0.86$) (Gonçalves et al., 2008).

Socio-demographics, Dropouts, and Unwanted Effects

Participants completed a survey at baseline to identify age, gender, schooling, marital status, occupation, monthly income, and housing data. We included open questions about reasons for dropping out and potential unwanted effects of mindfulness practice at posttest. Participants who completed fewer than four sessions were considered dropouts.

Maslach Burnout Inventory—General Survey This instrument, which was developed by Maslach et al. (1996), is the commonly used tool to measure professional burnout. There are 16 items grouped into three dimensions: exhaustion, cynicism, and (lack of) efficacy. The answers are organized through a Likert-type frequency scale with seven items, rated from 0 ("never") to 6 ("always"). Schuster et al. (2015) have recently validated the Brazilian MBI-GS. The internal consistency values observed in the present study were: exhaustion (T0: $\alpha = 0.83$; T1: $\alpha = 0.88$), cynicism (T0: $\alpha = 0.71$; T1: $\alpha = 0.79$), efficacy (T0: $\alpha = 0.83$; T1: 0.93). Burnout symptoms were the primary outcome of the present study.

Positive and Negative Affect Schedule The PANAS (Positive and Negative Affect Schedule) is a two-dimensional model scale of affectivity. It consists of 22 adjectives used to describe subjective affective states, which include positive and negative dimensions. These are rated using a Likert-type scale of five points ranging from 1 ("not at all") to 5 ("extremely"). The PANAS has been validated in Brazil by Zanon et al. (2013) with appropriate psychometric properties. The internal consistency values observed in the present study were as follows: PANAS-positive (T0: $\alpha = 0.89$; T1: $\alpha = 0.93$), PANAS-negative (T0: $\alpha = 0.90$; T1: $\alpha = 0.93$).

Five Facet Mindfulness Questionnaire The FFMQ (Five Facet Mindfulness Questionnaire) was derived from a factorial analytical study composed of five independent validation questionnaires, which contain the five factors that represent the characteristics of mindfulness as it is currently conceptualized (Baer et al., 2006). The five facets are as follows: observing, describing, acting with awareness, nonjudging of inner experience, and nonreactivity to inner experience. The scale has a Likert-type format of one to five points ("never or very rarely true" to "many times or always true"), with a total of 39 items. It is one of the most widely used scales in mindfulness research and has been validated in Brazil with good psychometrics (Barros et al., 2014). The Cronbach's alpha values obtained in the present study were as follows: observing (T0: $\alpha = 0.79$; T1: $\alpha = 0.88$), describing (T0: $\alpha = 0.83$; T1: $\alpha = 0.85$), acting with awareness (T0: $\alpha = 0.88$; T1: $\alpha = 0.90$), nonjudging (T0: $\alpha = 0.78$; T1: $\alpha = 0.84$), and nonreactivity (T0: $\alpha = 0.70$; T1: $\alpha = 0.82$).

Experience Questionnaire This instrument contains 20 phrases that express behaviors related to the ability to observe one's own thoughts and feelings in an objective manner. The response options are presented using a five-point Likert-type scale ranging from zero ("never") to 4 ("always"). The EQ (Experience Questionnaire) is divided into two subscales that measure decentering and rumination (Fresco et al., 2007a). The EQ has not yet been validated in Brazil, and the questionnaire was consequently translated and culturally adapted by

the authors for this study. The Cronbach's alpha values obtained in the present study were as follows: decentering (T0: $\alpha = 0.88$; T1: $\alpha = 0.95$) and rumination (T0: $\alpha = 0.69$; T1: $\alpha = 0.83$).

Self-Compassion Scale The SCS (Self-Compassion Scale) (Neff, 2003) is composed of 26 items with a Likert-type scale of five points ranging from 1 (“almost never”) to 5 (“almost always”). Items are divided into six subscales that are composed of positive (self-kindness, common humanity, and mindfulness) and negative (self-criticism, isolation, and over-identification) items that measure the attitude of the respondents towards themselves in relation to personal failures and painful events. This scale has shown cross-cultural validity (Neff et al., 2019) and has been validated in Brazil by Souza and Hutz (2013). The Cronbach's alpha values obtained in the present study were as follows: self-kindness (T0: $\alpha = 0.82$; T1: $\alpha = 0.90$), common humanity (T0: $\alpha = 0.68$; T1: $\alpha = 0.84$), mindfulness (T0: $\alpha = 0.79$; T1: $\alpha = 0.91$), self-criticism (T0: $\alpha = 0.77$; T1: $\alpha = 0.90$), isolation (T0: $\alpha = 0.83$; T1: $\alpha = 0.87$), and over-identification (T0: $\alpha = 0.70$; T1: $\alpha = 0.86$).

Data Analyses

A nonrandomized pragmatic controlled trial was conducted with mixed-methods evaluation. To facilitate interpretation of the data, we worked with the mean of the subscales in such a way as to reflect the range of possible answers of the original anchors. All the data collected in this study were entered into a database in the SPSS Statistics V22.0 software package and analyses were then performed. Descriptive analyses of socio-demographic variables were performed by arms. Fisher's exact test was used to compare the distribution of categorical characteristics and analysis of variance (ANOVA) was used to compare the means of those variables that were considered continuous.

In order to compare the changes in posttest means from baseline, we performed an analysis of covariance (ANCOVA) through multiple regression models. Given the observed possible differences between the arms with respect to schooling, the dependent variables were the pre-post difference between the burnout subscales (main outcomes) and the other secondary outcomes, and the independent variables were arms (MF, RE, and CO), schooling (completed high school, undergraduate degree, graduate/postgraduate degree; we did not include salary in the model because of the high degree of collinearity between both schooling and salary), and the baseline value of the corresponding scales involved. Altogether, overall *F*-tests of group effect and *t* test *p*-values for pairwise effects are reported. Normality was verified by graphs of normality on the residues, which did not reveal significant deviations.

Qualitative data analysis was performed to compare the two active arms (MF and RE). A total of twenty focus groups were held; there were six mindfulness groups and four relaxation groups at pretest and posttest. In the mindfulness group, 47 PHC providers participated in the pretest focus groups, while 40 participated in the posttest focus groups. In the relaxation group, 35 participants attended the pretest focus groups and 30 participated in the posttest focus groups.

The methodology used to analyze the data was thematic analysis, according to the approach by Braun and Clarke (2006). Respondents were asked to spontaneously express their reflections on the main characteristics, challenges, needs, and issues pertaining to their work context (pretest focus groups), and their perceptions of their experiences with the programs in the corresponding posttest focus groups. Only the topics relevant to their perception of the programs (attitudes) as well as barriers and facilitators to implementation (feasibility) are presented in this paper. Sampling did not involve a saturation strategy because it was deemed important to listen to all participants as part of the program protocols. However, topic saturation was achieved considering the richness of contents that emerged. Given the large number of repeated answers, it was felt that this approach enabled an understanding of the investigated phenomena to be reached. In terms of topic coding, the first author (DS) was the main judge. To maximize rigor and ensure the reliability of this analysis, a second judge, the last author (MD), was involved. Saturation was reached after reading 50% of the material. It was therefore not necessary to read the entire body of data recorded in the focus groups. The sequence of interviews was selected based on the following criteria: longer duration in recording time and a greater number of participants in the focus group. After comparing their independent analyses, the authors discussed the proposed topics and reached a consensus for their final determination based on the focus groups, using Nvivo qualitative data analysis software (Bazeley & Jackson, 2013).

Results

Preliminary and partial ancillary results of this project were published elsewhere (Pizutti et al., 2019). In this paper, we present the results from the full sample recruited focusing on burnout (primary outcome) as well as the previously unpublished qualitative analysis.

Impact of Programs on Burnout and Secondary Outcomes

Table 3 shows intragroup and intergroup differences adjusting for schooling and baseline scores for the burnout primary

Table 3 Burnout primary outcome pre-post changes and group comparisons

Subscale/ group	Within group			Comp.	Between group			<i>F</i>	<i>p</i>
	Mean diff.	SE	95% CI		Mean diff.	SE	95% CI		
Exhaustion								3.65	0.029
MF	−0.32	0.15	(−0.62, −0.02)	MF-RE	0.09	0.24	(−0.39, 0.567)		0.718
RE	−0.41	0.20	(−0.79, −0.02)	MF-CO	−0.57	0.24	(−1.05, −0.092)		0.020
CO	0.25	0.18	(−0.11, 0.62)	RE-CO	−0.66	0.27	(−1.20, −0.119)		0.017
Cynicism								2.65	0.076
MF	−0.27	0.14	(−0.55, 0.01)	MF-RE	−0.25	0.22	(−0.69, 0.188)		0.258
RE	−0.02	0.18	(−0.37, 0.32)	MF-CO	−0.51	0.22	(−0.95, −0.067)		0.024
CO	0.24	0.17	(−0.09, 0.57)	RE-CO	−0.25	0.24	(−0.74, 0.231)		0.301
Efficacy								1.90	0.155
MF	0.01	0.10	(−0.20, 0.20)	MF-RE	0.05	0.17	(−0.28, 0.379)		0.760
RE	−0.05	0.13	(−0.31, 0.21)	MF-CO	0.31	0.16	(−0.01, 0.627)		0.060
CO	−0.31	0.12	(−0.55, −0.06)	RE-CO	0.26	0.18	(−0.11, 0.622)		0.167

MF, MBP arm; RE, relaxation arm; CO, waitlist controls

Models adjusted for schooling and baseline scores

outcome sub-scales. As can be seen, the results indicated a significant difference between groups in terms of exhaustion, showing that reductions in exhaustion were significantly higher in MF compared with CO ($p = 0.020$), as well as in RE compared with CO ($p = 0.017$). A trend was observed in the omnibus between-group comparison in cynicism, and reductions of cynicism were significantly higher in MF compared with CO using post hoc comparisons ($p = 0.024$). There were no significant differences between groups in terms of efficacy, although the post hoc comparison between MF and CO presented a trend favoring ME ($p = 0.060$).

As can be seen in Table 4, MF was superior to CO for improving negative ($p = 0.008$), and positive ($p = 0.033$) affectivity, although the omnibus test only showed a trend in the latter case. There were no significant differences between MF and RE in both negative and positive affect, but RE only showed a trend when compared with CO. When observing the FFMQ analyses, MF is seen to be superior to RE in nonjudging ($p = 0.021$), and it showed a trend in nonreactivity ($p = 0.053$). MF produced greater improvements than CO in all the FFMQ subscales except for acting with awareness. RE was not significantly superior to CO in any of the FFMQ subscales. In the analysis of self-compassion scores, MF was superior to RE in self-kindness ($p = 0.001$). MF showed greater improvements than CO in all the SCS subscales except for common humanity. RE was superior to CO in self-criticism ($p = 0.026$) and isolation ($p = 0.036$). MF was superior to RE in decentering ($p = 0.011$). ME also showed greater improvements than CO in decentering ($p < 0.001$) and rumination ($p = 0.011$). However, RE was not superior to CO in either decentering or rumination.

Unwanted Effects

No participants were found to experience lasting negative effects from either MBP or relaxation programs. After a few sessions, there were cases ($n = 6$) in MF where participants experienced intense emotional discomfort (e.g., crying, manifestations of anger, and/or feelings of anxiety or fear) or physical discomfort (e.g., muscle tension, headache, and/or dizziness). All symptoms were explored in the inquiry period of the sessions. All experiences of emotional or physical discomfort were found to be transient (lasting only 1 or 2 days). Only dizziness was mentioned in RE because of the breathing exercises.

Qualitative Data

The topics identified in the verbatim were compared with the literature and were individually discussed to build a coherent picture of participants' overall experiences with the programs. They were formulated based on the identification and selection of topics valued by the interviewees themselves and by two researchers, given the theoretical references from this scientific field. The main topics found at the posttest associated with perceptions of the programs and feasibility for implementation were related to the "impact of the intervention," "strengths and weaknesses," and "barriers and facilitators."

The impact of the intervention refers to reports of any kind of benefit to health, quality of life at work and personal life, and positive change in behavior (frequencies observed in MF, $n = 115$; frequencies observed in RE, $n = 27$). Some of these subtopics were included in both MF and RE (e.g.,

Table 4 Secondary outcome pre-post changes and group comparisons

Scale	Subscale Group	Within group			Comp.	Between group			<i>F</i>	<i>p</i>
		Mean diff.	SE	Mean diff. 95% CI		Mean diff.	SE	Mean diff. 95% CI		
PANAS	Negative								3.76	0.026
	MF	−0.38	0.08	(−0.54, −0.21)	MF-RE	−0.10	0.14	(−0.37, 0.17)		0.454
	RE	−0.27	0.11	(−0.49, −0.06)	MF-CO	−0.37	0.13	(−0.63, −0.10)		0.008
	CO	−0.01	0.10	(−0.21, 0.19)	RE-CO	−0.26	0.15	(−0.56, 0.03)		0.082
	Positive								2.65	0.075
	MF	0.17	0.08	(0.01, 0.33)	MF-RE	0.01	0.13	(−0.26, 0.27)		0.954
FFMQ	RE	0.16	0.11	(−0.05, 0.37)	MF-CO	0.29	0.13	(0.02, 0.55)		0.033
	CO	−0.12	0.10	(−0.32, 0.08)	RE-CO	0.28	0.15	(−0.02, 0.57)		0.064
	Observing								4.27	0.016
	MF	0.23	0.10	(0.04, 0.42)	MF-RE	0.16	0.15	(−0.14, 0.46)		0.295
	RE	0.07	0.12	(−0.17, 0.32)	MF-CO	0.45	0.15	(0.14, 0.75)		0.004
	CO	−0.21	0.12	(−0.45, 0.02)	RE-CO	0.29	0.17	(−0.05, 0.63)		0.093
	Describing								2.74	0.069
	MF	0.20	0.09	(0.02, 0.37)	MF-RE	0.13	0.14	(−0.15, 0.40)		0.368
	RE	0.07	0.11	(−0.15, 0.29)	MF-CO	0.33	0.14	(0.05, 0.61)		0.021
	CO	−0.13	0.11	(−0.34, 0.08)	RE-CO	0.20	0.16	(−0.10, 0.51)		0.192
	Awareness								1.58	0.211
	MF	0.18	0.10	(−0.01, 0.37)	MF-RE	0.01	0.15	(−0.30, 0.30)		0.999
	RE	0.18	0.12	(−0.06, 0.42)	MF-CO	0.25	0.15	(−0.05, 0.56)		0.104
	CO	−0.07	0.12	(−0.30, 0.16)	RE-CO	0.25	0.17	(−0.08, 0.59)		0.140
	Nonjudging								3.95	0.022
	MF	0.47	0.09	(0.29, 0.66)	MF-RE	0.35	0.15	(0.05, 0.64)		0.021
	RE	0.13	0.12	(−0.11, 0.36)	MF-CO	0.35	0.15	(0.05, 0.64)		0.022
	CO	0.13	0.11	(−0.09, 0.35)	RE-CO	0.01	0.16	(−0.33, 0.33)		0.998
Nonreact.								3.02	0.053	
MF	0.28	0.09	(0.10, 0.45)	MF-RE	0.28	0.14	(−0.01, 0.56)		0.056	
RE	0.01	0.11	(−0.23, 0.23)	MF-CO	0.31	0.14	(0.02, 0.59)		0.035	
CO	−0.03	0.11	(−0.25, 0.19)	RE-CO	0.03	0.16	(−0.29, 0.35)		0.849	
SCS	Kindness								9.54	<0.001
	MF	0.53	0.10	(0.33, 0.73)	MF-RE	0.54	0.16	(0.21, 0.86)		0.001
	RE	−0.01	0.13	(−0.27, 0.25)	MF-CO	0.63	0.16	(0.31, 0.94)		<0.001
	CO	−0.10	0.12	(−0.34, 0.14)	RE-CO	0.09	0.18	(−0.27, 0.45)		0.624
	Criticism								5.73	0.004
	MF	−0.56	0.11	(−0.79, −0.34)	MF-RE	−0.15	0.18	(−0.51, 0.22)		0.427
	RE	−0.42	0.15	(−0.71; −0.12)	MF-CO	−0.61	0.18	(−0.97; −0.25)		0.001
	CO	0.05	0.14	(−0.23; 0.31)	RE-CO	−0.46	0.20	(−0.86, −0.06)		0.026
	Humanity								0.44	0.646
	MF	0.20	0.11	(−0.02, 0.42)	MF-RE	0.12	0.18	(−0.24, 0.47)		0.507
	RE	0.08	0.14	(−0.21, 0.36)	MF-CO	0.15	0.18	(−0.20, 0.50)		0.392
	CO	0.05	0.13	(−0.22, 0.31)	RE-CO	0.03	0.20	(−0.36, 0.43)		0.872
	Isolation								4.52	0.013
	MF	−0.36	0.10	(−0.57, −0.16)	MF-RE	−0.09	0.17	(−0.43, 0.24)		0.586
	RE	−0.27	0.14	(−0.54, −0.01)	MF-CO	−0.49	0.17	(−0.81, −0.16)		0.004
	CO	0.12	0.12	(−0.12, 0.37)	RE-CO	−0.39	0.19	(−0.76, −0.03)		0.036
	Mindfulness								4.52	0.013
	MF	0.23	0.10	(0.03, 0.43)	MF-RE	0.20	0.16	(−0.13, 0.52)		0.228

Table 4 (continued)

Scale	Subscale Group	Within group			Comp.	Between group			<i>F</i>	<i>p</i>
		Mean diff.	SE	Mean diff. 95% CI		Mean diff.	SE	Mean diff. 95% CI		
EQ	RE	0.03	0.13	(− 0.23, 0.29)	MF-CO	0.48	0.16	(0.16, 0.80)	4.34	0.003
	CO	− 0.25	0.12	(− 0.49, − 0.02)	RE-CO	0.28	0.18	(− 0.07, 0.64)		0.117
	Identification								0.015	
	MF	− 0.47	0.11	(− 0.69, − 0.24)	MF-RE	− 0.29	0.18	(− 0.65, 0.07)	0.117	
	RE	− 0.18	0.15	(− 0.47, 0.11)	MF-CO	− 0.52	0.18	(− 0.88, − 0.16)	0.005	
	CO	0.05	0.14	(− 0.21, 0.32)	RE-CO	− 0.23	0.20	(− 0.63, 0.17)	0.253	
	Decentering								9.54	< 0.001
	MF	0.37	0.09	(0.19, 0.54)	MF-RE	0.09	0.13	(− 0.17, 0.36)	0.001	
RE	0.27	0.10	(0.07, 0.47)	MF-CO	0.34	0.13	(0.08, 0.60)	< 0.001		
CO	0.03	0.10	(− 0.16, 0.22)	RE-CO	0.24	0.14	(− 0.03, 0.52)	0.624		
Rumination								3.42	0.037	
MF	0.06	0.06	(− 0.05, 0.17)	MF-RE	0.10	0.09	(− 0.07, 0.27)	0.484		
RE	− 0.05	0.06	(− 0.17, 0.08)	MF-CO	0.13	0.08	(− 0.04, 0.30)	0.011		
CO	− 0.07	0.06	(− 0.19, 0.05)	RE-CO	0.03	0.09	(− 0.15, 0.20)	0.085		

PANAS, Positive and Negative Affect Schedule; *FFMQ*, Five Facet Mindfulness Scale; *SCS*, Self-Compassion Scale; *EQ*, Experiences Questionnaire; *MF*, MBP arm; *RE*, relaxation arm; *CO*, waitlist controls

Models adjusted for schooling and baseline scores

improvements in affectivity, interpersonal relationships, self-compassion, and other health benefits such as sleep quality); but other subtopics only appeared in MF (e.g., attention and emotion regulation, and reduction in cognitive rumination, as well as ability to decenter, observe, and act with awareness).

Strengths and weaknesses included references to the protocols of the proposed interventions, highlighting their positive qualities as well as criticisms and suggestions regarding the work or conduct of the teacher (frequencies in MF, $n = 49$; frequencies in RE, $n = 34$). MF participants highlighted the fact that the program was very objective and practical, and that it facilitated empowerment and the exchange of experiences. However, their comments also included the complaints that the sessions were not comfortable in terms of their physical structure and setting, and that the sessions could have been longer and more frequent. In the case of RE, the subtopics were very similar, highlighting the sense of openness and trust that the instructor created in the group as a facilitator for the exchange of experiences, but the need for more sessions in a more comfortable location also emerged.

Finally, barriers and facilitators for implementation indicate beliefs, behaviors, and conditions of the system in the workplace that hinder the implementation of strategies to care for workers' health. They also include initiatives or ideas that could serve as strategies to remove those barriers to implementation (frequencies in MF, $n = 51$; frequencies in RE, $n = 16$). The main barriers observed in MF were related to personal characteristics and prejudices that could prevent the

adoption of adequate attitudes for practice. Also, difficulties related to management, bureaucracy, lack of qualified professionals to provide instruction, and the lack of substitute staff to carry out duties were also among the comments made. Facilitators appeared to include the need for individuals to find awareness and conviction, which could be achieved by demonstrating results based on previous data and also through the improvements seen in other participants. Importantly, a national occupational health policy encouraging health practices that improved productivity and quality of the service would also serve as a spur for managers. The main barriers indicated by RE were also the lack of personal ability owing to the absence of previous experience or knowledge, and the extremely large workload professionals were under. As facilitators, having the ability to involve people so that they could be convinced by their own practice and being able to meet staffing requirements so as not to miss sessions were also important topics. To illustrate the topics identified in the corpus, a number of statements by study participants are highlighted in Supplementary Materials 3.

Discussion

This pragmatic study tested the feasibility and effectiveness of applying the “Breathworks for Stress” program for the reduction of burnout in Brazilian PHC providers. Our study is of

interest because there is little research that compares MBPs to active controls in health professionals in order to evaluate burnout. Most studies have small samples, with no active control groups, and MBPs questionably adapted from the original protocols (e.g., without accounting for risks). Several programs, such as relaxation, cognitive-behavioral training, and recreation might reduce burnout symptomatology in PHC providers, particularly exhaustion (Awa et al., 2010). Goyal et al. (2014) reviewed 47 clinical trials studying MBPs but did not present evidence of meditation programs for improving psychological stress and well-being as compared with other active treatments (e.g., exercise and other behavioral therapies). However, there is emerging evidence that MBPs could be a viable alternative to improve mental health and well-being in occupational settings and health care staff (Bartlett et al., 2019; Lomas et al., 2018).

We observed that exhaustion was reduced in both MF and RE to a significantly greater extent than in CO, but there were no significant differences between MF and RE, although the relaxation program had a shorter duration of four sessions. This result could be possible because strategies that directly activate the parasympathetic nervous system promote a decrease in respiratory and cardiac rhythm, blood pressure, and muscle tension, thus helping to decrease activation levels (Klainin-Yobas et al., 2015). Thus, relaxation training could serve as a useful tool to promote a state of rest and as an incentive for self-care among exhausted PHC providers. Nevertheless, the relaxation program was no better than the control waitlist regarding other burnout dimensions, which was a similar result to that of previous findings (Ruotsalainen et al., 2014). On the contrary, MF was significantly superior to CO in improving cynicism. Mindfulness training involves more active and sustained work of focusing attention, in addition to the constant observation of the causes of discomfort, which is something that is not emphasized in relaxation training. Although there were no significant differences between the MBP and relaxation in treating burnout, they could involve different pathways of change (Montero-Marin et al., 2019).

In this sense, MF was significantly superior to CO and marginally superior to RE in improving nonreactivity to inner experience. Also, MF was significantly better than CO and RE for improving nonjudging, self-kindness, and decentering. These results may illustrate the unique benefits of MBPs compared with relaxation. The presence of nonreactivity and nonjudging are believed to represent acceptance (Baer et al., 2006), which could be related to a sensitivity to more subtle changes in emotional states, allowing an individual to self-regulate as soon as a new emotion arises, resulting in possible self-harmful effects become less pronounced by involving more executive control (Teper and Inzlicht, 2013). On the other hand, the change in self-kindness was a strong result in this study because it was observed in both quantitative and

qualitative data, and this might suggest that this facet of self-compassion could be a central mechanism in the mindfulness program (Keng et al., 2012; Gu et al., 2015). High levels of self-compassion have been found to be related to fewer burnout symptoms (Beaumont et al., 2015; Durkin et al., 2016), and evidence exists that self-compassion measures are directly linked to positive affect and to psychological well-being (Germer and Neff, 2013; Satici et al., 2013). Decentering has been proposed as a skill developed by mindfulness training (Feldman et al., 2010; Lebois et al., 2015; Shapiro et al., 2006), but it can also be improved by other techniques such as cognitive therapy (Bieling et al., 2012). Decentering may give PHC providers the ability to objectively observe their own thoughts and emotions as temporary and human events and not as absolute truths, facilitating disidentification with internal experience and learning to disengage with negative thoughts and emotions, and thus reducing reactivity (Fresco et al., 2007b; Bohlmeijer et al., 2010).

Regarding the secondary outcomes of positive and negative affect, MF presented a higher level of change to that of CO, with no significant differences between MF and RE. RE was better than CO, but the difference was marginally significant. Perhaps if the relaxation program had had a longer duration, it would possibly have achieved results as significant as those of the MBP, as found by Jain et al. (2007) and Josefsson et al. (2012). In general, it has been said that affectivity impacts the psychological well-being of PHC professionals (Burton et al., 2017; Irving et al., 2009), and a possible specific mediating role of affectivity between mindfulness and burnout in PHC staff has recently been proposed (Montero-Marin et al., 2015).

MF was superior to CO in the facets of observing and describing (FFMQ). This result differed from that found by Manotas et al. (2014), who presented significant results only in the observing facet using a sample of health care professionals; however, it was similar to that found in the study by Josefsson et al. (2012), who compared three groups, with programs of the same 4-week length. Moreover, this study had similar results in relation to relaxation compared with those obtained in the present study, with no significant differences observed between mindfulness and relaxation. They also suggested that increasing well-being while reducing psychological symptoms in a working population should take longer than 4 weeks and would include more than seven sessions. Nevertheless, it is essential to differentiate the choice of exercises proposed. In the study by Josefsson et al. (2012), the relaxation group exclusively performed an exercise that consisted of “bringing body awareness to each part of the body and relaxing it,” which is very similar to the practice of body scan meditation. In general, relaxation seems to elevate some mindfulness skills, but to a considerably lower extent than meditation exercises (Agee et al., 2009; Moritz et al., 2015; Gao et al., 2018). On the contrary, body scan meditation

could lead to relaxation, but as a side effect, not as a specific goal. Body scan meditation invites the subject to notice their sensations without reacting to them, whereas relaxation invites the subject to try to relax, to directly soften the discomfort of sensations. This reflects the importance of designing programs that control the variables that are unique to both MBPs and relaxation programs, so that there is no risk of overlap. Finally, only the acting with awareness facet of the FFMQ produced no significant changes between the three groups. In similar studies (Josefsson et al., 2012; Manotas et al., 2014), no changes were seen in this facet. It has been pointed out that the best way to improve the evolution of this facet is by informal practices introduced into daily life activity (Manotas et al., 2014), but this was not applied in the present study. Nevertheless, in qualitative accounts, the ability to be more aware and present in day-to-day actions, although present in both MF and RE, appeared to be more prevalent in the former.

The self-criticism and isolation subscales presented significantly greater improvements in favor of MF compared with CO, and RE also functioned better compared with CO. However, only MF was significantly superior to controls in over-identification and mindfulness, while no significant differences were found in common humanity between the groups. Thus, the MBP was able to help to reduce all the negative facets of self-compassion, and also to improve the positive facets of self-kindness and mindfulness, while relaxation was appropriate for reducing self-criticism and isolation, but it did not improve the positive facets. Thus, relaxation seemed to be limited only to working on negative facets of self-compassion. The reasons for these possible differences between both programs should be studied in further research.

The qualitative part of the study indicated that programs for occupational stress reduction, particularly those that do not intervene at the organizational level, such as this study, need to be very conscious of the conflict between the individual and the organization (Montero-Marín et al., 2013), so that compliance with work-related demands remains in focus. Previous research recognized the need to use a clear framework to map the key contextual and facilitating factors that support complex implementation, ensuring intervention integrity and also promoting flexible training at the same time (Aikens et al., 2014; Gracia et al., 2018; Sekhon et al., 2017). A reflection on what is being proposed, in terms of the subject-institution domain, is important to keep in mind the intention behind any program. When considering the introduction of mindfulness or relaxation training for the Brazilian PHC professionals, it is essential to be aware of this specific public health scenario. We have observed that the two main categories that might act as barriers and facilitators are those related to personal characteristics (e.g., prejudices, personal, and experience) and those associated with how the program has been adjusted to the organizational context (e.g., workload, availability of substitute staff, the balance

between health practices and productivity, and bureaucracy). These two general categories have been observed in other occupational contexts, such as education (Wilde et al., 2019) and private sector companies (Montero-Marín et al., 2020). According to our results, they could work together to determine the degree of success of program implementation, regardless of whether it is a mindfulness or relaxation program. On the other hand, we have observed that both mindfulness and relaxation were mentioned as programs involving health-related benefits, but the benefits gained by ME also included acceptance, as well as attention and emotion regulation processes, which again points to possible unique benefits of MBPs compared with relaxation.

If we consider that MBPs have a relatively high cost because they require extensive professional training and require a large number of sessions and a great deal of individual practice, it is necessary to discuss the variable for which the expected effect is most compelling. If the effect is specifically targeted at the main symptomatology of burnout, we can consider that the relaxation program might be effective on the dimension of exhaustion. But we must also consider that other health-related outcomes such as acceptance, self-compassion, and decentering, which are central concepts within MBPs, could support the benefits of reducing more aspects of burnout, such as cynicism. Nevertheless, a longitudinal evaluation of both interventions is required, including a longer follow-up period and a lengthier exposure to the relaxation program.

Limitations and Future Research

The lack of randomization procedures is the main limitation of this study (i.e., the subgroups that preferred to go into MF, RE, and CO might have belonged to different populations, making it difficult to interpret the results). Lack of randomization may suggest that there are nonrandom differences between baseline groups that have influenced the findings, and for this reason, the qualitative analysis was added to support the results. In addition, analyses including covariates were performed, suggesting that postprogram differences between subjects in both MF and RE were maintained when controlling for baseline scores. Moreover, as this clinical trial addresses feasibility, the nonrandomization in this study becomes an important element for understanding the difficulties and limitations found in this field, since randomization had to be designed for the first phase of this study. Another important limitation of the study was the lack of equivalence in the number of sessions of the active arms (MF and RE). Future studies should test whether the same number of relaxation sessions might contribute to better outcomes than the four sessions in this study, or even exceed the mindfulness program in some measures. Also, the fact that multiple constructs were measured using common methods (e.g., multiple-item scales presented within the same survey) could lead to

spurious effects due to the measurement instruments rather than to the constructs being measured (common method bias).

In summary, we have observed that both programs proposed in this study are feasible as options for maintaining the well-being of PHC providers. But we must reflect on how we can facilitate the feasibility of research in Brazilian PHC settings. Future studies with this population should draw on methodological designs that facilitate access to research involving new clinical trials. It is essential that management is fully engaged in the studies, ensuring that the project design can be maintained when going into the field, and that a condition of equality can be guaranteed for all participants. This means that those who have less autonomy in their current positions will have sufficient access to the program.

Author Contributions DS codedesigned and conducted the study, assisted with the data analyses, and wrote the first version of the manuscript. SA analyzed the data and wrote part of the results. EF collaborated on the study design. SF collaborated on the study design. JMM assisted with the data analyses, review of the literature, and the writing and editing of the paper. GL assisted with the qualitative data transcription. LP conducted part of the study. AG collaborated with the study design and review of the literature. TS collaborated on the study design. JGC collaborated on the study design. MD designed and supervised the study and collaborated in the writing and editing of the manuscript. All authors revised and approved the final version of the manuscript.

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Data Availability The individual anonymized participant data are available for any analytical purpose that may be related to the aims of the present study upon reasonable request made to the corresponding author.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval This study was conducted according to the Declaration of Helsinki. It was submitted and approved by the Federal University of São Paulo Research Ethics Committee (ref. number: CAAE 30431114.6.0000.5505), respecting all the criteria for all research conducted on human beings.

Informed Consent All the study participants evidenced their agreement by signing the informed consent form. Participants were given a random code with which they could withdraw from the study at any time after they had filled out the questionnaires, on request.

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