Effects of a mindfulness-based intervention on the functional status and mindfulness of primary health care professionals: a before and after study

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Abstract

Background: Contextual factors involving the physical and social environment, as well as personal factors, are closely related to functional status, and they can have positive or negative influences on the health conditions or status of an individual in society. **Objectives:** The objective is to evaluate the effect of a mindfulness-based intervention program on functional status and mindfulness levels in primary health care (PHC) professionals in Ribeirão Preto, Brazil. **Methods:** This is a quasi-experimental study, with 26 PHC professionals, using quantitative methods and an analytical before and after approach of an 8-week mindfulness program. **Results:** There were significant differences in mindfulness facets after the intervention: Observe (p = 0.002); Describe – positive formulation (p = 0.01); Acting with awareness – automatic pilot (p = 0.01) and distraction (p = 0.05); Nonreactivity (p = 0.0005); Nonjudgement (p = 0.01); and in total mindfulness scores (p = 0.0000018). Regarding functional status, significant differences were found: change in health (p = 0.01), overall health (p = 0.007), quality of life (p = 0.04) and feelings (p = 0.01). **Discussion:** The results in improving the functional status and mindfulness of PHC professionals show that mindfulness practices can improve the worker's quality of life and health.

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Keywords: Mindfulness, primary health care, health personnel, quality of life, health promotion.

Introduction

In Brazil, depression, domestic violence, alcoholism, trafficking and use of illicit drugs are demands present in the daily routine of Family Health Strategy professionals[1]. This context may negatively affect their quality of life since they coexist with the inadequacy of resources to perform their roles, high demand and lack of protection from managers[2]. The constant demands mobilize internal and external strategies in these professionals to adapt and maintain their own state of functional health and well-being. Before the excessive demands and/or insufficient resources to cope with them, the adaptation response triggered is prolonged and a chronic stress condition sets in. Prolonged stress may lead to the development of diseases and damages to the quality of life[3,4]. Harmful stress levels in primary health professionals (PHC) professionals may trigger changes in their functional status[5]. Functional status is defined as the healthy life condition of an individual, encompassing their relational, motor, intellectual, expressive, and other skills according to their physical, psychological, gender, life cycle, and social or cultural identities. Negative contextual factors can influence functional status, becoming development obstacles in the physical, cultural and social spheres[5,6], interfering in the health life conditions of the workers.

Mindfulness practices, inserted in a secular context, can be alternative able to reduce levels of stress, anxiety, and negative emotional experiences, as well as increase well-being[7]. These practices are intended to look at experiences as they present themselves, without modifying them[8]. Jon Kabat-Zinn and other researchers at the University of Massachusetts created an intervention program focused on stress reduction, called Mindfulness-Based Stress Reduction (MBSR)[9]. In the program, participants are encouraged to sustain new relationships with their thoughts, feelings, and bodily sensations. In addition, it cultivates the non-judgmental and non-reactive positioning when facing experiences, and the development of the "here and now" consciousness, seeking to move oneself away from ruminations about the past and from afflictions towards the future[10].

Mindfulness-based interventions are studied and disseminated in some countries with PHC professionals[11-14], but there are few Brazilian studies focused on this population. In Brazil, a study with 13 nurses from a hospital showed an improvement in the reactivity regarding internal experiences, greater attention on internal and external experiences, and positive influence of a mindfulness-based intervention on nursing activities[15]. A cross-sectional study with 450 PHC professionals revealed low levels of mindfulness and high levels of perceived stress in this population, as well as correlations between mindfulness, perceived stress and subjective well-being in different types of professionals[16]. There are no national studies on the effects of practicing mindfulness on the functional status of PHC professionals. Thus, the objective of this study was to evaluate the effect of a mindfulness-based intervention program in functional status and mindfulness in PHC professionals.

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Methods

This is a quasi-experimental study using an analytical before and after test performed at a community health center and at six Family Health Centers in Ribeirão Preto, Brazil, from September to December 2015. We included professionals over 18 years old who wanted in taking part in a mindfulness-based intervention program. Professionals who reported being in the acute phase of any clinical condition and with a history of untreated psychopathological changes were excluded. Because it was an exploratory study, the sample size was obtained on the basis of the practicality and feasibility of resources available at the time of the study. Three groups with 8-10 participants were expected. Thus, a minimum of 15 and the maximum of 30 people for the execution of the study. The study was approved by the Institutional Review Board.

The recruitment of the participants took place through posters and meetings in the health facilities. After signing an informed consent form, the interested parties took part in telephone interviews to collect sociodemographic, personal information, and time availability to participate in the mindfulness-based intervention. By e-mail, the participants answered the evaluation instruments before and after the intervention: a) Five Facet Mindfulness Questionnaire (FFMQ-BR) and b) Dartmouth Primary Care Cooperative Information Project (COOP Function).

The FFMQ-BR questionnaire, validated for Portuguese[17], evaluates the mindfulness levels in a multifactorial way. This is a self-administered questionnaire, containing 39 questions scored on a Likert scale, ranging from 1 (Never or rarely true) to 4 (Almost always or always true). Mindfulness levels are divided into five facets from seven aspects: 1) "Observe": notice how internal and external experiences, such as sensations, emotions and thoughts; 2) "Describe": label the experiences into words (subdivision: positive formulation-ease/ability to describe internal experiences through words; and negative formulation – difficulty/inability to describe internal experiences through words); 3) "Acting with awareness": be focused moment-by-moment in the activity, instead of acting mechanically (subdivision: act on "automatic pilot" – act automatically, without consciousness, but with focused on the activity; and "distraction" – without consciousness, using the vigilant attention, but with no specific focus on the activity); 4) "Nonreactivity to inner experience": allowing the free flow of thoughts and emotions, without allowing yourself be captured by them or without rejecting them; 5) "Nonjudgement of inner experience": adopting a non-evaluative posture about thoughts and emotions. The questions in the scale refer to the seven aspects mentioned to evaluate mindfulness levels. The facets of the questionnaire have a maximum and minimum score for mindfulness evaluation: 1) Observe (max. 35 and min. 7); 2) Describe – positive formulation (max. 25 and min. 5) and negative formulation (max. 15 and min. 3); 3) Acting with awareness – automatic pilot (max. 25 and min. 5) and distraction (max. 15 and min. 3); 4) Nonreactivity to inner experience (max. 40 and min. 8); 5) Nonjudgement of inner experience (max. 40 and min. 8). The maximum score that a participant can achieve in the total FFMQ-BR score is 195 points, by adding the scores in the facets, and the minimum is 39 points, indicating the maximum and minimum level of mindfulness, respectively. The authors of the validation recommend that the score analysis is performed from the facet scores separately.

The COOP Function questionnaire, validated in Portuguese[18], evaluates functional status in nine domains: "Physical fitness", "Feelings", "Daily activities", "Social activities", "Change in health", "Overall health", "Bodily pain", "Social support" and "Quality of life". The answers to the nine questions relate to the person's status in the last four weeks and they have ascending scale answer choices (1 to 5), in which scores above the median value, found in each dimension separately, represent worse functional status conditions, while scores below the median value represent better functional status. It is also recommended that the score analysis is performed from the dimension scores separately.

The intervention performed in this study was an adaptation of the MBSR protocol, which occurred in eight weeks, with a weekly two-hour-long meeting. There was no retreat day. Traditional mindfulness practices during the meetings (bodily "scanning", meditative walk, breathing mindfulness, bodily movements mindfulness and compassion practice) and the same ones suggested for daily routine (formal and informal mindfulness practices) lasting from 5 to 45 minutes (gradually increasing each week). As it was a self-report and it was not mandatory to fill out the practice diaries, the experiences that the participants experienced between the meetings were not controlled. The interventions were carried out in the meeting rooms of three health facilities (morning and afternoon classes) and in a room at the cultural extension center of the university that subsidizes this research (night class) since the health facilities are not open at night. No infrastructure changes were required to carry out the program.

Variables from the COOP Function instrument were presented through the median and interquartile range, while the variables derived from the FFMQ-BR were presented by mean and standard deviation. They were all were evaluated at baseline and eight weeks later by paired T-test and Wilcoxon paired test, using R x64 software 3.3.2, with a significance level of 5%. The Spearman correlation coefficient was calculated to compare the results of the FFMQ-BR and COOP Function instruments. A Shapiro-Wilk test was used to evaluate normality.

Results

Out of the 75 people who expressed interest in taking part in the mindfulness program. Twenty volunteers were excluded because schedule incompatibility, acute phase of clinical conditions, and history of untreated psychological disorders. Twenty-nine volunteers started the study, while 26 were excluded because they did not answer the questionnaires in the initial phase. Three volunteers were lost to follow-up and 26 participants completed the study. Four groups were set up to carry out the intervention.

Participants had a mean age of 37.9 ± 12.5 years old, 84.6% were female, 76.9% were white, 46.2% were single and 46.2% were married, 80.8% had 14 years of study or more. Most participants (92.3%) reported having a religion, 30.8% reported participating in religious, psychotherapeutic, artistic or musical groups, and 69.2% reported having some kind of hobbies; 30.8% had comorbidities and 15.4% used psychotropic drugs. Nine participants were from the multiprofessional team (four psychologists, two dentists, two physiotherapists and one nutritionist), five from the nursing team, five from the medical team, seven community health agents, and 69.2% had a workload of 40 hours a week (Table 1).

After evaluating the mindfulness levels, significant differences were observed in six mindfulness facets after the intervention: "Observe" (before: 26.4 ± 6.1, after: 29.8 ± 5.3, p = 0.002); "Describe – positive formulation" (before: 16.3 ± 4.7, after: 17.8 ± 4.4, p = 0.01); "Acting with awareness – automatic pilot (before: 16.8 ± 2.7, after: 18.0 ± 1.7, p = 0.01) and distraction" (before: 10.7 ± 3.0; after: 11.7 ± 2.3, p = 0.05); "Nonreactivity to inner experience" (before: 19.0 ± 4.9, after: 22.6 ± 4.3, p = 0.0005) and "Nonjudgement of inner experience" (before: 23.8 ± 6.2; after: 27.5 ± 6.9, p = 0.01). There were also significant differences in total mindfulness scores (before: 123.8 ± 17.5, after: 139.2 ± 15.9, p = 0.0000018) (Table 2).

Regarding functional status, there were significant differences for the domains: "Change in health" [before: median of 2 (2.3); after: 2 (1.2), p = 0.01)], "Overall health" [before: median of 3 (2.3); after: 2 (2.3) p = 0.007], "Quality of life" [before: median of 2 (2.3); after: 2 (2.2), p = 0.04] and "Feelings" [before: median of 3 (2.3); after: 2 (2.3), p = 0.01] (Table 3).

Before the intervention, there was a significant correlation between the facet "Describe – positive formulation" and the "Feelings", "Social activities", "Overall health" and "Quality of life" domains; and "Describe – negative formulation" and "Overall health". "Acting with awareness – Distraction" facet had a significant correlation

Table 1. Distribution of primary health care professionals according to socio-demographic and labor-related variables – Ribeirão Preto, 2018

Age [mean (sd)]	37.9 (12.5)
Gender [n (%)]	
Female	22 (84.6)
Male	4 (15.4)
Race [n (%)]	
White	20 (76.9)
Black	6 (23.1)
Marital status [n (%)]	
Single	12 (46.2)
Married	12 (46.2)
Separate	2 (7.6)
Education [n (%)]	
Elementary school	1 (3.8)
High school	4 (15.4)
College	21 (80.8)
Religion [n (%)]	
Yes	24 (92.3)
No	2(7.7)
Previous diseases [n (%)]	
Yes	8 (30.8)
No	18 (69.2)
Use of psychotropic drugs [n (%)]	
Yes	4 (15.4)
No	22 (84.6)
Participation in religious, psychotherapeutic, musical or artistic groups [n (%)]	
Yes	8 (30.8)
No	18 (69.2)
Workplace [n (%)]	
Nursing team	5 (19.2)
Physician team	5 (19.2)
Community health agents	7 (26.9)
Multiprofessional team	9 (34.7)
Working load [n (%)]	
Até 40h/wk	18 (69.2)
Até 60h/wk	8 (30.8)

Table 2. Levels of mindfulness before and after the intervention based on mindfulness in primary health care professionals – Ribeirão Preto, 2018

Facets of mindfulness	Baseline Mean (SD)	After intervention Mean (SD)
Nonjudge	23.8 (6.2)	27.5 (6.9)**
Act with awareness (automatic pilot)	16.8 (2.7)	18.0 (1.7)*
Observe	26.4 (6.1)	29.8 (5.3)**
Describe (positive)	16.3 (4.7)	17.8 (4.4)**
Describe (negative)	11.0 (3.4)	11.7 (2.7)
Noreact	19.0 (4.9)	22.6 (4.3)**
Act with awareness (distraction)	10.7 (3.0)	11.7 (2.3)**
Total of mindfulness	123.8 (17.5)**	139.2 (15.9)**

* Wilcoxon test. $p < 0.05$.
** T test. $p < 0.05$.

Table 3. Domains of functional status before and after the intervention based on mindfulness in primary health care professionals – Ribeirão Preto, 2018

Domains of functional status	Baseline Median (interquartil interval)	After intervention Median (interquartil interval)
Physical fitness	2.5 (2;4)	3 (2;3)
Feelings	3 (2;3)	2 (2;3)*
Daily activities	2 (2;3)	2 (1;3)
Social activities	2 (1;3)	2 (1;3)
Change in health	2 (2;3)	2 (1;2)*
Overall health	3 (2;3)	2 (2;3)*
Social support	2.5 (1;4)	2 (1;3)
Quality of life	2 (2;3)	2 (2;2)*
Bodily pain	3 (2;3)	2 (2;3)

* Wilcoxon test. $p < 0.05$.

with the domain "Social support" and the facet "Nonjudgement of inner experience" with the "Social activities" domains. So all correlations were negative and moderate, indicating that individuals with better mindfulness levels tend to have better functional status scores (Table 4). After the intervention, there were negative and moderate correlations between the facets "Describe – positive formulation" and "Change in health" and "Quality of life" domains, as well as moderate correlations between the facet "Nonjudgement of inner experience" and the "Social activities" and "Quality of life" domains. And a positive correlation between the "Nonreactivity to inner experience" facet and the "Social support" domain, indicating that individuals with better mindfulness levels in the "Nonreactivity to inner experience" facet tend to have worse values in the "Social support" domain (Table 5).

Discussion

Our results suggest that mindfulness practice is associated with improvement in mindfulness levels and improvement of the functional status of PHC professionals.

Similar to our findings, studies that investigated the effects of mindfulness interventions on PHC professionals[14,19] shown reduced levels of anxiety, perceived stress, perceived tension, and perceived tension and emotional load at work, as well as significant differences in mindfulness facets. These interventions presented even better results on burnout, mood status, empathy, and mindfulness levels[12,13], as they included discussion topics about the work process, such as: work environment, burnout, work activity, relationship with patients and self-care.

With positive results in the "Observe" and "Describe – positive formulation" facets, we infer about greater self-awareness about experiences and openness to naming them. This improvement can generate self-knowledge, empathy and compassion in relationships between professional-user, enhancement of body awareness, self-regulation of attention and emotion. These last three considered important mindfulness underlying mechanisms[20,21]. There was no significant difference in the negative formulation of the facet "Describe". It is important to emphasize that positive and negative formulations are aspects that might cause biases and changes in the metric properties of the instrument, in cultural adaptation[17]. The distinction of these aspects in the present study suggests that the understanding of the instrument was not compromised.

Positive outcomes in the "Acting with awareness" facet, in its two subdivisions, may indicate the greater attention achieved by the professionals, contributing to active listening during care, conscientious handling of instruments and drugs, attention when filling medical records and effective interpersonal communication. The best results in the "Nonreactivity to inner experience" and "Nonjudgement of inner experience" facets may indicate openness to deal with their own emotions and those of the users, as well as contribute to greater acceptance on adverse situations, such as lack of human and financial resources, team relationships and management's helplessness.

Table 4. Spearman correlation coefficient between mindfulness levels and functional status domains, before intervention – Ribeirão Preto, 2018

Before intervention		Physical fitness	Feelings	Daily activities	Social activities	Change in health	Overall health	Social support	Quality of life	Bodily pain
Observe	Coefficient	-0.11	-0.23	-0.20	-0.21	0.22	-0.08	-0.44	-0.04	0.11
	p	0.59	0.27	0.33	0.29	0.29	0.68	0.03	0.84	0.59
Describe (positive)	Coefficient	0.08	-0.42	-0.36	-0.61	0.15	-0.49	-0.04	-0.52	-0.31
	p	0.69	**0.03***	0.07	**0.01***	0.46	**0.01***	0.86	**0.01***	0.12
Describe (negative)	Coefficient	-0.12	-0.10	0.26	0.06	-0.11	-0.46	0.04	-0.37	0.00
	p	0.57	0.61	0.20	0.79	0.60	**0.02***	0.83	0.06	1.00
Act with awareness (automatic pilot)	Coefficient	-0.06	0.01	-0.18	-0.33	-0.09	-0.11	-0.01	-0.04	0.26
	p	0.76	0.96	0.39	0.10	0.66	0.58	0.98	0.83	0.21
Act with awareness (distraction)	Coefficient	-0.20	0.10	-0.04	-0.21	-0.10	-0.12	-0.41	-0.15	0.26
	p	0.34	0.62	0.85	0.31	0.62	0.57	**0.04***	0.47	0.20
Noreact	Coefficient	-0.01	-0.20	-0.08	-0.13	0.25	-0.13	-0.08	-0.19	-0.13
	p	0.96	0.33	0.69	0.53	0.22	0.52	0.68	0.36	0.53
Nonjudge	Coefficient	0.17	-0.10	-0.17	-0.48	-0.10	-0.28	-0.04	-0.09	-0.22
	p	0.40	0.62	0.40	**0.01***	0.63	0.16	0.83	0.67	0.28

Table 5. Spearman correlation coefficient between mindfulness levels and functional status domains, after the intervention – Ribeirão Preto, 2018

After intervention		Physical fitness	Feelings	Daily activities	Social activities	Change in health	Overall health	Social support	Quality of life	Bodily pain
Observe	Coefficient	-0.05	-0.18	-0.11	-0.05	-0.24	-0.22	-0.31	-0.17	-0.30
	p	0.79	0.37	0.60	0.81	0.24	0.28	0.13	0.41	0.14
Describe (positive)	Coefficient	0.06	-0.10	-0.16	-0.32	-0.39	-0.36	-0.08	-0.44	-0.25
	p	0.79	0.61	0.44	0.11	**0.05***	0.07	0.72	**0.03***	0.23
Describe (negative)	Coefficient	0.22	-0.12	0.13	0.04	-0.30	-0.07	0.38	-0.05	-0.16
	p	0.27	0.57	0.52	0.86	0.14	0.74	0.06	0.80	0.44
Act with awareness (automatic pilot)	Coefficient	-0.06	0.10	0.12	-0.14	-0.34	-0.20	0.31	0.07	0.04
	p	0.77	0.62	0.55	0.50	0.09	0.33	0.12	0.72	0.86
Act with awareness (distraction)	Coefficient	0.09	-0.13	-0.24	-0.32	-0.29	-0.17	-0.21	-0.17	-0.10
	p	0.66	0.52	0.25	0.11	0.14	0.41	0.30	0.42	0.62
Noreact	Coefficient	0.11	-0.18	0.00	-0.01	-0.18	-0.20	0.58	0.02	-0.19
	p	0.61	0.38	1.00	0.96	0.38	0.32	**0.00**	0.92	0.35
Nonjudge	Coefficient	-0.01	0.08	-0.24	-0.43	-0.34	-0.31	0.13	-0.41	-0.09
	p	0.96	0.69	0.23	**0.03***	0.09	0.13	0.54	**0.04***	0.66

Currently, 15% of absence from work among PHC professionals are related to mental disorders[22], which may highlight the impact of unfavorable conditions on the health of the professional. It is known that the qualified supply of healthcare, through the knowledge of the professional, is related to the increased probability of desirous results. One of the relevant aspects to ensure quality care includes the proper assessment of health needs and the prevention of errors by actions performed by professionals[23,24]. With a more favorable functional status, professionals are able to perform the activities of their scope with greater effectiveness, contributing positively to absenteeism and job satisfaction[25]. This is the first study that evaluates functional status in PHC professionals after mindfulness-based interventions[26].

The correlations between mindfulness facets and the functional status domains emphasize the moderate correlation between the facet "Nonjudgement of inner experience" and domain "Quality of life", and the negative and moderate correlations between the facet "Describe" and the domains "Change in health" and "Quality of life". The nonjudgmental and curious attitude towards mental events improves the self-awareness and reduction of disadaptive cognitive styles (rumination and concern)[21] favoring the perception of quality of life by the PHC professionals. The positive correlation of the "Social support" domain and the "Nonreactivity to inner experience" facet may refer to the greater ability to deal with their physical or emotional events to the detriment of the needs of others. Improving non-reactive posture can foster self-regulation of emotions, self-responsibility, and autonomy to deal with their own experiences in a sustainable and healthy way.

The small sample and lack of control are limitations in the present study. It was not mandatory to fill out the practice journals, so it was not possible to evaluate the development of each participant outside the face-to-face meetings. The application of the evaluation instruments by email did not bring benefit in the recruitment period as we lost 47.2% of the initial sample. Nevertheless, participants benefited from the variety of schedules offered and they adhered to the intervention, with only a 10% follow-up loss. The exclusion of retreat during the intervention does not seem to have affected the results. The program developed in this study evidences a low-cost strategy, without the use of complex technologies, drugs or infrastructure changes, and it covers latent human resources in each participant, which substantiates the differential and the relevance of this research. After the program, they are able to apply the practices and concepts of mindfulness by themselves on their daily routine, accessing the skills trained at any time.

Research that investigates the promotion of well-being and quality of life in PHC professionals should be implemented and disseminated, responding to the challenge of making integrative and

complementary practices permanent and, in fact, to make a policy of comprehensive health care in a national level.

In the present study, the results in improving the functional status and mindfulness of PHC professionals show that mindfulness-based practices can improve the worker's quality of life and health and they can be replicated in other centers.

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