



## Mindfulness-based intervention for nursing students: Effects on stress and quality of life\*

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**Objective:** to evaluate the effectiveness of an intervention to reduce stress based on Mindfulness in aspects related to Quality of Life, Mindfulness and Perceived Stress in undergraduate and postgraduate students of Nursing. **Method:** evaluation instruments were applied to establish baseline data, and the sample was subsequently submitted to a Mindfulness Based Stress Reduction and Quality of Life, formatted eight consecutive weeks. **Results:** after the intervention, there was a decrease in the level of Perceived Stress, increase in the level of Mindfulness and improvement of the Quality of Life in the psychological area. **Conclusion:** interventions based in Mindfulness are effective and can offer important resources for managing stress and improving the Quality of Life of students.

**Descriptors:** Mindfulness; Mental Health; Quality of Life; Stress; Students.

\* This article refers to the call "Mindfulness and other contemplative practices".

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## **Efetividade de uma intervenção baseada em Mindfulness para redução de estresse e melhora da qualidade de vida em estudantes de enfermagem**

Objetivo: avaliar a efetividade de uma intervenção para redução de estresse baseada em *Mindfulness* em aspectos relacionados à Qualidade de Vida, Atenção Plena e Estresse Percebido, em estudantes de graduação e pós-graduação em enfermagem. Método: aplicados instrumentos de avaliação para a construção de uma linha basal e posteriormente a amostra foi submetida a um Programa de Redução de Estresse e aumento da Qualidade de Vida baseado em *Mindfulness*, formatado em encontros semanais por oito semanas. Resultados: após a intervenção, houve diminuição do nível de Estresse Percebido, aumento do nível de Atenção Plena e melhora da Qualidade de Vida em âmbito psicológico. Conclusão: intervenções baseadas em *Mindfulness* se mostram efetivas e podem constituir um importante recurso para o gerenciamento do estresse e melhora na Qualidade de Vida dos estudantes.

Descritores: Atenção Plena; Saúde Mental; Qualidade de Vida; Estresse; Estudantes.

## **Efectividad de una intervencion basada en Mindfulness para reduccion de estres y mejora de la calidad de vida en estudiantes de enfermeria**

Objetivo: evaluar la efectividad de una intervención para reducción de estrés basada en *Mindfulness* en relación a la Calidad de Vida, Atención Plena y Estrés Percibido, en universitarios y estudiantes de postgrado de Enfermería. Método: previamente se aplicaron instrumentos de evaluación para la construcción de una línea basal y posteriormente la muestra fue sometida a un Programa de Reducción de Estrés y aumento de la Calidad de Vida basado en *Mindfulness*, constituido de encuentros semanales, durante ocho semanas consecutivas. Resultados: se observó que después de la intervención, hubo disminución del nivel de Estrés Percibido, aumento del nivel de Atención Plena y mejora de la Calidad de Vida en ámbito psicológico. Conclusión: intervenciones basadas en *Mindfulness* se muestran efectivas y pueden constituir un importante recurso para manejar el estrés y mejorar la Calidad de Vida de los estudiantes.

Descriptores: Atención Plena; Salud Mental; Calidad de Vida; Estrés; Estudiantes.

## Introduction

Young people who enter the University find a very different reality from the one they lived in high school, and this is an important transition period. In this new context, the university student may face an environment with high demands, little control over the tasks, and the deficit or absence of social support from the university. As a result, studies in the last decade have pointed out that the academic environment can be a setting with a high stressful potential<sup>(1-3)</sup>.

A recent study conducted in a higher education institution in Brazil showed high levels of stress in students, with a proportion of 50%<sup>(4)</sup>. More specifically in the health area, 87.9% of the students in the last years of the Nursing course presented moderate or high levels of stress<sup>(5)</sup>, corroborating with other national studies<sup>(6-7)</sup>.

This situation is not restricted to undergraduate students. Graduate students also go on living under stressful conditions<sup>(8)</sup>. In a study conducted with a sample of 2,157 *stricto sensu* graduate Brazilian students, 46,8% of them presented stress levels considered high or very high, which were strongly linked to life academic factors<sup>(9)</sup>.

Stress is characterized by a state in which the body activates physiological resources to face an external or internal threat<sup>(10)</sup>, triggering a cascade of neuroendocrine responses that modulate various physiological functions. In the academic field, it can be exemplified as a reaction to the presentation of a work, test, or performance in an internship. The literature reveals that there is a threshold where stress is natural and exerts a positive effect on neuroplasticity<sup>(11)</sup>. However, when the individual cannot overcome the threat, whether due to the intensity of the stressor or to its extension, it can be observed that maintaining an altered physiological state can compromise organic functions<sup>(10,12)</sup>, such as depression of immunological state, and onset of psychopathologies<sup>(13-14)</sup>. High levels of stress and its chronic occurrence can have a direct impact on life in the university, being a general consensus that this is one of the main factors that lead the student to present low academic performance.

Stress can be evaluated through physiological parameters, such as inflammatory markers and hormone dosage (mainly cortisol). Another way to measure is the use of psychometric scales, such as the Perceived Stress Scale (PSS)<sup>(15)</sup>, one of the most employed to assess subjective stress.

Chronic stress is associated with other aspects of life, such as Quality of Life (QoL), an aspect that can be impacted by the context experienced by the student at university. In this context, among the factors that

contribute to the student's QoL, we can mention the following: overload of activities, full-time demand and short deadlines for tasks, mental and physical wear down, pain, lack of interest, and irritation<sup>(16)</sup>.

In this perspective, low QoL in the students is directly related to the worsening in the performance and success of the teaching-learning process, due to decreased attention capacity, low level of daily energy, and sleep<sup>(17)</sup>.

The unhealthy context of the university can make students adopt unhealthy coping strategies, such as alcohol abuse and smoking<sup>(18)</sup>. In this sense, significant stress levels were identified in Nursing university students, associated with a high prevalence of alcohol consumption and dependence<sup>(19)</sup>.

It is learned that the use of the substance can vary according to the course knowledge area and to its characteristics; it is noticed that the use of anxiolytics and amphetamines, for example, presented twice the use prevalence by Nursing students when compared to students from other courses<sup>(18)</sup>, which may be related to low QoL<sup>(20)</sup>.

In view of the context presented, the implementation of interventions with the purpose of reducing stress and promoting mental health is necessary for the academic environment<sup>(4)</sup>. In the last years, *Mindfulness*-based interventions, understood as practices for keeping attention and conscience turned to the present moment, have been demonstrating significant results and have been applied in universities in the USA and around the world, such as the *Duke University* and the *Brown University*<sup>(21)</sup>. A meta-analysis conducted with 24 studies, involving 1,432 university students from England, United States, Tasmania, and Iran evidenced associations between interventions that use *Mindfulness* and the reduction in anxiety symptoms, and lower levels of depression and of the cortisol hormone, the main hormone related to stress<sup>(22)</sup>.

*Mindfulness*, a term translated into Portuguese as "*atenção plena*" (AP), Full Attention (FA) in English, refers to a mental or psychological state characterized by the intentional regulation of attention to what is happening now. This is a mental state opposed to inattention<sup>(23)</sup>, with its purpose towards the present moment, in a non-judgmental manner, this being an internal resource inherent to all human beings.

Cultivating *Mindfulness* practices is negatively correlated to anxiety, depression, and stress<sup>(24-26)</sup>. In addition, as the individual incorporates the cultivation of mindfulness in daily activities, called informal practices, more intense is the stress reduction arising from the practice<sup>(21)</sup>.

Among the most used *Mindfulness*-based interventions are the *Mindfulness*-Based Cognitive Therapy (MBCT), the Acceptance-Based Behavioral Therapy (ABBT), and the *Mindfulness*-Based Stress Reduction program (MBSR), the latter being the pioneer and one of the most popular for its positive outcomes in the clinical population<sup>(21)</sup>.

The MBSR, designed by Kabat-Zinn, is an eight-week structured program with weekly meetings of approximately 2.5 hours and a silent retreat period. A number of studies have been carried out to test the efficacy of the MBSR in different health contexts, such as depression, anxiety, chronic pain, and diseases related to stress<sup>(26-32)</sup>. Regarding stress reduction, specifically in university students, a recent review has analyzed 15 studies that used the MBSR program as intervention and found out that, in 73% of the analyzed studies, the protocol was effective for stress reduction. It was also observed that the outcomes are long-lasting, and even maintaining their positive effects after one year<sup>(33)</sup>.

*Mindfulness* has been studied in Brazil in the last years<sup>(34-38)</sup>; however, there still is a significant gap in the national context, considering the particularities and reality of the Brazilian university and graduate population.

Despite several studies evidencing high-stress levels and other psychological problems among university students<sup>(39-41)</sup>, few studies in the literature show effective interventions for dealing with this problem. From this reality, in this study we seek to find an alternative for promoting non-pharmacological mental health in this population, in order to assertively deal with personal and academic life stressors.

This study had the objective of evaluating the effects of a *Mindfulness*-based intervention on the FA, QoL, and PS levels in undergraduate and graduate Nursing students.

## Method

This is a pilot and quasi-experimental study of the before and after type that aims at the possibility of testing, evaluating, reviewing, and improving the strategies for the development of future research studies with interventions based on *Mindfulness* Practices.

Initially, disclosure was made by affixing posters at the Ribeirão Preto School of Nursing, University of São Paulo, as well as on social networks, about an introductory lecture on *Mindfulness* and Stress, open to undergraduate and graduate students, where the nature, focus, and structure of the program were exposed, as

well as the commitment required from the participants during the program. The questions and doubts that the potential participants had about the program were welcomed.

After the lecture, the subjects who demonstrated interest in participating were guided to complete pre-program evaluation data, which consisted of questionnaires on sociodemographic data and health conditions, assessment of Perceived Stress, evaluation of *Mindfulness* and of Quality of Life, and they made a decision about enrolling in the *Mindfulness*-Based Stress Reduction and Quality of Life Program. Participation as a research subject was manifested by signing the Free and Informed Consent Form.

The inclusion criteria were defined as follows: being 18 years of age or older, with no predilection for gender or race, and being a student in the undergraduate or graduate Nursing course at the University of São Paulo - USP, Ribeirão Preto Campus. Those subjects who reported being in an acute phase or treating some psychiatric disorders such as mood, thought, personality, or substance abuse disorders were excluded.

The participants were evaluated at two moments: before the beginning of the intervention, with baseline data (T0), and after the eight weeks of intervention (T1).

Data collection took place at the Center of *Mindfulness* and Integrative Therapies of the Ribeirão Preto School of Nursing (*Escola de Enfermagem de Ribeirão Preto*, EERP), located in the University of São Paulo (USP), Ribeirão Preto Campus.

Information regarding age, gender, schooling level, marital status, number of children, religion, physical activity, smoking habit, use of alcohol, number of sleep hours, morbidity profile, and bowel habits were collected by means of a sociodemographic questionnaire.

All the participants were evaluated before and at the end of the intervention in relation to the following variables: levels of FA, PS, and QoL.

To evaluate the *Mindfulness* level, the Mindful Attention Awareness Scale (MAAS), translated and validated into Portuguese, which consists of a self-report instrument, with 15 items, with answer options that range from (1) almost always to (6) almost never. This scale has been adapted and validated for Brazil and is a unidimensional and reliable instrument for application in university students and adults in general<sup>(42)</sup>. The MAAS evaluates the frequencies of attention state according to time, and all items assess *Mindfulness*.

To measure the PS level we use the Perceived Stress Scale (PSS), translated and validated in Brazil<sup>(43)</sup>. The PSS evaluates, through 14 items, how unpredictable,

uncontrollable, and overloaded the respondents find their lives. The answer alternatives range from zero to four (0 = never; 1 = almost never; 2 = sometimes; 3 = almost always; 4 = always). The score is obtained by adding up all the items in the scale; the items stated positively (4, 5, 6, 7, 9, 10 and 13) and those inversely graded (0 = 4, 1 = 3, 2 = 2, 3 = 1 and 4 = 0). The PSS scores range from 0 to 56, with a higher score indicating more stress.

To evaluate the students' QoL level, the brief instrument for evaluating quality of life (WHOQOL-BREF) was used, developed from the WHOQOL-100, by the Quality of Life Group of the World Health Organization (OMS)<sup>(44)</sup>. This public domain instrument consists of 26 questions, and the answers follow a Likert-type scale from 1 to 5; the higher the score, the better the QoL. WHOQOL-BREF evaluates four domains: physical, psychological, social relations, and environment. The validation study demonstrated that the scale performs well and is a useful and valid alternative to measure QoL in Brazil<sup>(44)</sup>.

A total of 15 students, representing 2.8% of the student population at the EERP/USP, started the pilot program on a voluntary basis. Throughout the research development, five individuals dropped out, resulting in a group of 10 students (n=10). It is thus a non-probabilistic sample, for convenience.

Considering that, in general, a *Mindfulness* program assembles between 10 and 15 individuals, to allow for a better follow-up, this sample size was appropriate for the development of the pilot project.

The intervention was conducted by a qualified and certified trainer to guide the *Mindfulness* practices and it consisted of weekly two-hour sessions throughout eight weeks. The intervention aimed at developing skills such as attention regulation, emotional regulation, body conscience, and change in the perspective of the *self*, based on the Mindfulness-Based Stress Reduction program – MBSR<sup>(23)</sup>. The themes of the sessions were described in Figure 1.

Session One	What is <i>Mindfulness</i> : Leaving the Autopilot State
Session Two	<i>Mindfulness</i> in Breathing
Session Four	<i>Mindfulness</i> in Daily Life
Session Four	Extending <i>Mindfulness</i> skills to challenging situations
Session Five	<i>Mindfulness</i> , acceptance, and skillful action
Session Six	Silence Day
Session Seven	<i>Mindfulness</i> and Compassion
Session Eight	<i>Mindfulness</i> for Life

Figure 1 - Them of the Intervention by Session of the *Mindfulness*-Based Program

The data were analyzed through the *Statistical Package for the Social Sciences*® (SPSS). The characteristics of the studied variables were submitted to descriptive statistics, by means of frequency distribution, absolute and percentage numbers, mean, minimum, and maximum. In the constructs evaluated, the differences of means of the sample at the various times proposed in the study were analyzed by means of the Student's t-test with a significance level of 5% and by Wilcoxon's non-parametric test, with comparative purposes. Pearson was used to test the correlation between the variables.

The study was conducted respecting the ethical precepts in force and set forth in Resolution No. 466 of December 12<sup>th</sup>, 2012, of the National Health Council. Approval of the Research Ethics Committee under CAAE: 77835617.1.0000.5393.

## Results

Of the 10 subjects who participated in the survey, eight were female (80%) and two were male (20%), six were undergraduate students and four were graduate students. Of these, eight reported having a religious belief and six claimed to practice this belief regularly. Regarding age, the mean was 25.3 years old (SD=4.0). Regarding the data collected, five students practiced physical exercises regularly, nine reported no smoking, six reported consuming alcohol, with a mean weekly consumption frequency of 1.5, seven denied using medications and, of those who reported using them, two reported the use of psychotropic drugs. As for the sleep hours, the mean was 7.1 (SD=1.0), seven reported regular or regular to bad bowel habits, seven denied having chronic non-transmissible diseases and, of those who reported having, they reported migraine (Table 1).

When comparing the measures obtained by the application of the MAAS and PSS scales and the total WHOQOL-BREF and its domains, before and after the *Mindfulness*-based intervention by means of the Wilcoxon's Test, a statistically significant difference was observed when comparing the values of the T0 (before intervention) and T1 (after intervention) scores resulting from applying the MAAS and PSS scales, as well as in the psychological domain of WHOQOL-BREF. After the *Mindfulness*-based intervention, the students presented higher values in the *Mindfulness* level ( $p=0.005$ ) and in the psychological domain related to the QoL assessment ( $p=0.017$ ) and lower values in relation to PS ( $p=0.037$ ) (Table 2).

Table 1 - Distribution of the students according to the sociodemographic and clinical variables (n=10). Ribeirão Preto, SP, Brazil, 2018

Variable	n (%)	Mean (SD*)	Median (CI†)
<b>Gender</b>			
Female	8 (80)		
Male	2 (20)		
<b>Religious belief</b>			
Yes	8 (80)		
No	2 (20)		
<b>Regular practice of religious belief</b>			
Yes	6 (60)		
No	2 (20)		
<b>Age</b>		25.3(4.0)	25.0 (20-30)
<b>Physical activity</b>			
Yes	5 (50)		
No	5 (50)		
<b>Cigarette consumption</b>			
Yes	1(10)		
No	9 (90)		
<b>Consumption of alcoholic beverages</b>			
Yes	6 (60)		
No	4 (40)		
<b>Weekly frequency of consumption of alcoholic beverages</b>		1.5 (0.37)	1.5 (1)
<b>Use of medications</b>			
Yes	3 (30)		
No	7 (70)		
<b>Type of medication</b>			
Psychotropic drugs	2 (67)		
Others	1 (33)		
<b>Sleep hours per day</b>		7.1 (1.0)	7.2 (4.5-8.0)
<b>Bowel habit</b>			
Regular/Regular to bad	7 (70)		
Slow	3 (30)		
<b>CNCD‡</b>			
Yes	2 (20)		
No	8 (80)		

\*SD = Standard Deviation; †CI = Confidence Interval; ‡CNCD = Chronic Non-Communicable Disease

Table 2 - Comparison of the scores of the MAAS and PSS scales, and the total WHOQOL-BREF and its domains, before (T0) and after (T1) the *Mindfulness*-based intervention. Ribeirão Preto, SP, Brazil, 2018

Variables	Before (T0)				After (T1)				p-value*
	Mean	SD†	Median	(CI‡)	Mean	(SD†)	Median	(CI‡)	
MAAS§	45.8	(10.8)	43.5	(29-68)	57.4	(9.3)	57.5	(45-75)	0.005
PSS	28.8	(12.2)	33.0	(12-43)	22.2	(12.2)	21.0	(10-49)	0.037
WHOQOL-BREF¶ Total	63.3	(16.9)	61.9	(39.2-96.4)	68.3	(16.2)	70.0	(33.9-94.6)	0.285
Physical Domain	61.1	(17.9)	60.7	(28.6-92.9)	68.6	(16.3)	73.2	(35.7-92.9)	0.092
Psychological Domain	58.7	(19.5)	58.3	(25-95.8)	67.5	(12.7)	68.7	(45.8-91.7)	0.017
Social Domain	65.0	(21.1)	58.3	(41.7-100.0)	66.7	(23.6)	66.7	(16.7-100.0)	0.620
Environmental Domain	68.4	(15.0)	65.6	(53.1-96.9)	70.3	(17.6)	71.9	(37.5-93.8)	0.593

\*Student's t-test, Pearson's and Wilcoxon's Chi-square test; †SD = Standard Deviation; ‡CI = Confidence Interval; §MAAS = Mindful Attention Awareness Scale; ||PSS = Perceived Stress Scale; ¶WHOQOL-BREF = World Health Organization Quality of Life-BREF



## Discussion

The literature has pointed out that students have been showing high levels of stress<sup>(45-46)</sup>. The significant reduction in the mean baseline stress level in this study, from a score of 28.8 at T0 to 22.2 at T1, with a significance level of  $p=0.037$ , evidences the effectiveness of the program. Stress reduction is one of the pillars of *Mindfulness*-based programs, especially in the one used as a reference for the intervention tested in the present study (MBSR). By means of conducting *Mindfulness* practices, it is possible to develop skills to assertively deal with stressful events, diminishing anxiety problems or other patterns of negative thoughts, which can be the onset of a stress reaction cycle, contributing to the increase in the number of psychological disorders<sup>(47-49)</sup>.

High stress levels seem to be related to harmful effects on physical and mental well-being and consequently promote a reduction in QoL in students<sup>(50-53)</sup>. After the *Mindfulness* program (T1), we perceived an increase in the global levels of this parameter. There was also an increase in all four domains separately when compared to the results obtained at baseline (T0). We highlight as significant the increase in the QoL level in the psychological domain of the scale, from 58.7 at T0 to 67.5 at T1 ( $p=0.017$ ).

The concept of QoL is defined as the individuals' perception of their cultural context, value system, goals, expectations, standards, and life concerns<sup>(20)</sup>. The *Mindfulness* state is understood as conscious well-being towards what is happening at the moment, relating with all the experiences, whether unpleasant, pleasant or neutral, reducing suffering and increasing the well-being sensation<sup>(23,54)</sup>. By dealing with life situations and concerns in a conscious and non-judgmental manner, stress is reduced and, consequently, an enhancement of QoL is promoted<sup>(23,55-56)</sup>, which ratifies the results of this study.

*Mindfulness* is characterized by the intentional regulation of attention to what is happening at the exact moment, being the opposite of an inattention state<sup>(23)</sup>, low FA levels seem to be associated with a higher levels of stress and of procrastination in students<sup>(57)</sup>.

In the present study, a significant increase in the FA level was observed in students after the eight-week *Mindfulness*-based program, with an increase from 45.8 points at T0 to 57.4 points at T1 ( $p=0.005$ ), evaluated by means of the MAAS. The MBSR program offers FA training, promoting greater awareness of what is happening at each moment, with an attitude of non-judgment and acceptance of the experience. The

increase in FA may give rise to new ways of responding and dealing in relation to oneself and to the world<sup>(56)</sup>, allowing the practitioners to relate more directly with their life experiences and less with the emotions triggered by these experiences.

Since high stress levels seem to be related to low FA levels, *Mindfulness*-based interventions seem to be associated with greater resilience to stress within the university context, resulting in an increase of the students' FA, therefore improving their academic performance<sup>(58)</sup>.

The limitations of this pilot study are primarily characterized by the fact that it is a convenience and non-probabilistic sample, and by the fact that it was carried out in a single higher education institution. Thus, it is not a completely representative sample. However, despite the restricted number of subjects that participated, the results obtained were consistent and concordant with studies previously conducted on similar populations<sup>(14,33,57,59)</sup> and confirm the benefits of the *Mindfulness* practices where positive effects on PS, QoL, and FA were demonstrated.

The pre- and post-intervention showed a statistically significant difference, thus concluding that this intervention program based on *Mindfulness* can be an efficient strategy for the promotion of the mental health of undergraduate and graduate students, in the Brazilian context.

It is worth mentioning that this pilot study is the first intervention study with a *Mindfulness* program conducted in a population of Nursing students in Brazil. The presence of consistency in the effects of the intervention, based on the results of this study, is considered credible.

## Conclusion

The results found in this study advocate that an intervention program based on *Mindfulness* aiming at Stress Reduction and at the Increase in Quality of Life showed to be efficient in the reduction of PS, enhancement of QoL, and increase of the FA level of undergraduate and graduate Nursing students.

In this sense, the teaching institutions can consider the results of this study as an indicator of the potential of these intervention programs based on *Mindfulness*, among Nursing students, as a strategy to reduce the stress levels, enhance quality of life, and increase the levels of *mindfulness*, aiming at promoting the mental health and well-being of the students and, therefore, improving their academic performance.

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