

Effects of a mindfulness meditation course on healthcare students in Brazil

Efeitos de um curso de meditação de atenção plena em estudantes da saúde no Brasil
 Efectos de un curso de meditación de atención plena en estudiantes de la salud en Brasil

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Abstract

Objective: To evaluate the effects of a mindfulness meditation course on healthcare students' emotions and kindness towards themselves and others.

Methods: Mixed method, longitudinal case study including quantitative and qualitative tools. A population of 30 nursing, medical, and speech therapy students formed the control (n=14) and study (n=16) groups. Participants of the study group took an elective course on strategies for the development of mindfulness, which included body scans, conscious breathing and conscious movement, among others. During classes, students also participated in discussions about kindness and compassion based on spirituality and neuroscience. The course duration was of 36 hours throughout nine weeks. Students in both the study and control groups were evaluated through group interviews before and after the course. Evaluation tools included the Perceived Stress Scale (PSS); Mindful Attention Awareness Scale (MAAS); Positive and Negative Affect Schedule X (PANAS-X); and the WHO-5 Wellbeing Index.

Results: Individuals in the study group had significantly lower scores on the PANAS-X (negative affect) after the course in comparison to their previous scores. Other quantitative variables were not significantly altered (p>0.05). Qualitative analyses yielded three categories: (a) difficulties living the present moment and anxiety trying to control the future; (b) meditation practices as a tool for facing such difficulties; and (c) experience characterized by affection.

Conclusion: The elective course focused on mindfulness meditation and compassion helped to develop students' socio-emotional, wellbeing and self-awareness abilities and to reduce the negative affect.

Resumo

Objetivo: Avaliar os efeitos de um curso de meditação de atenção plena nas emoções e na gentileza dos estudantes de Saúde em relação a si mesmos e aos outros.

Métodos: Estudo de caso longitudinal e de método misto com inclusão de ferramentas quantitativas e qualitativas. Os grupos de controle (n=14) e de estudo (n=16) foram formados por uma população de 30 estudantes de Enfermagem, Medicina e Fonoaudiologia. Os participantes do grupo de estudo fizeram curso eletivo sobre estratégias para desenvolver a atenção plena incluindo varredura corporal, respiração consciente e movimento consciente, entre outros. Durante as aulas, os alunos também participaram de discussões sobre gentileza e compaixão, com base em espiritualidade e neurociência. O curso teve duração de 36 horas, ao longo de nove semanas. Os alunos dos grupos de estudo e controle foram avaliados por meio de entrevistas em grupo, antes e após o curso. As ferramentas de avaliação incluíram a Escala de Estresse Percebido (PSS), a Escala de Atenção Plena e Consciência (MAAS), a Escala de Afeto Positivo e Negativo X (PANAS-X); e o Índice de Bem-Estar OMS-5.

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 Conflicts to interest: none to declare.

Resultados: Após o curso, os indivíduos do grupo de estudo alcançaram pontuações significativamente mais baixas no PANAS-X (afeto negativo) em comparação com as pontuações anteriores. Outras variáveis quantitativas não tiveram alterações significativas ($p>0,05$). Três categorias emergiram das análises qualitativas: (a) dificuldades em viver o momento presente e ansiedade na tentativa de controlar o futuro; (b) práticas de meditação como ferramenta para enfrentar tais dificuldades; e (c) experiência caracterizada pelo afeto.

Conclusão: O curso eletivo focado na meditação da atenção plena e compaixão ajudou a desenvolver as habilidades socioemocionais de bem-estar, a autoconsciência dos alunos e a reduzir o afeto negativo.

Resumen

Objetivo: Evaluar los efectos de un curso de meditación de atención plena en las emociones y gentileza de estudiantes de la salud con relación a sí mismos y a los otros.

Métodos: Estudio de casos longitudinal y de método mixto con inclusión de herramientas cuantitativas y cualitativas. Una población de 30 estudiantes de Enfermería, Medicina y Fonoaudiología formaron los grupos de control ($n=14$) y experimental ($n=16$). Los participantes del grupo experimental hicieron un curso electivo sobre estrategias para desarrollar la atención plena, que incluyó exploración corporal, respiración consciente y movimiento consciente, entre otras. Durante las clases, los alumnos también participaron en discusiones sobre gentileza y compasión, basadas en espiritualidad y neurociencia. El curso tuvo una duración de 36 horas, durante nueve semanas. Se evaluó a los alumnos de los grupos experimentales y de control mediante entrevistas en grupo, antes y después del curso. Las herramientas de evaluación incluyeron la Escala de Estrés Percibido (PSS), la Escala de Conciencia y Atención Plena (MAAS), la Escala de Afecto Positivo y Negativo X (PANAS-X) y el Índice de Bienestar OMS-5.

Resultados: Después del curso, los individuos del grupo experimental alcanzaron una puntuación significativamente más baja en la PANAS-X (afecto negativo) en comparación con la puntuación anterior. Otras variables cuantitativas no tuvieron modificaciones significativas ($p>0,05$). Surgieron tres categorías de los análisis cualitativos: (a) dificultades de vivir el momento presente y ansiedad en el intento de controlar el futuro; (b) prácticas de meditación como herramienta para afrontar tales dificultades; y (c) experiencia caracterizada por el afecto.

Conclusión: El curso electivo dedicado a la meditación de atención plena y compasión ayudó a desarrollar habilidades socioemocionales de bienestar y la autoconciencia de los alumnos y a reducir el afecto negativo.

Introduction

Healthcare students often experience high stress levels during their academic lives, which may result in enhanced self-criticism and low self-esteem.⁽¹⁻³⁾ These students develop negative affect (NA), and conditions such as irritable bowel syndrome and depression. The psychological affliction endured by them combined with negative feelings have a strong impact on quality of life, and can lead to mood swings, despair and anxiety.^(4,5) Previous work has shown that meditation practices, structured learning of self-awareness, and relaxation techniques positively affect several emotional aspects of healthcare students. In the search for references that supported this work, were found no articles about the effects of including mindfulness practices in the healthcare curriculum of Brazilian universities.

The World Health Organization (WHO) declared that wellbeing promotion is as important as the reduction of mental diseases.⁽⁶⁾ This suggests the need for new and effective prevention strategies, and such strategies may be represented by mindfulness meditation practices. According to Kabat-Zinn,⁽⁷⁾ this form of meditation “emerges

through paying attention on purpose, in the present moment and nonjudgmentally to the unfolding of experience moment by moment” and emphasizes the transience of experiences. It involves the regulation of attention, and an orientation toward the present with gentle curiosity, openness, and acceptance. Mindfulness meditation promotes the subjective feeling of wellbeing, vitality, adaptive emotional control, behavioral stability and lower levels of NA and psychopathological symptoms.⁽⁸⁾

The meditative practice has been increasingly seen as an emotional support for healthcare students, mainly to help them manage stress, provide emotional support and teach them attentional focus.^(9,10) Some studies have suggested the insertion of these practices into the formal curriculum.^(11,12) Health sciences undergraduate courses have also promoted elective courses similar to the one reported here, such as the Monash University in Australia and the Rochester School of Medicine and Dentistry in the USA.^(13,14) We have evaluated the effects of a mindfulness meditation course on healthcare students’ emotions and kindness towards themselves and others.

Methods

We conducted a mixed method, longitudinal case study including quantitative and qualitative tools, based on the theory of Yin.⁽¹⁵⁾ The study was approved by the Research Ethics Committee under number 1.150.962.

Participants included medical, nursing, and speech therapy students from a public university in São Paulo, who had to agree to participate in the study, enroll in the elective course and have a minimum class attendance of 85%. The control group included volunteer students of the same class and university as their study group peers. They did not take the elective course and accepted to answer the forms before and after the course took place. Control group students volunteered after the researcher's personal invitation in each undergraduate classroom. The exclusion criteria adopted was the failure to answer the forms.

The study group initially included 24 students, but eight were excluded. The average age was 21.8 years, ranging between 19 and 30 years. The control group initially included 26 students, and 12 were excluded. The average age was 20.8 years, ranging between 18 and 24 years (Figure 1).

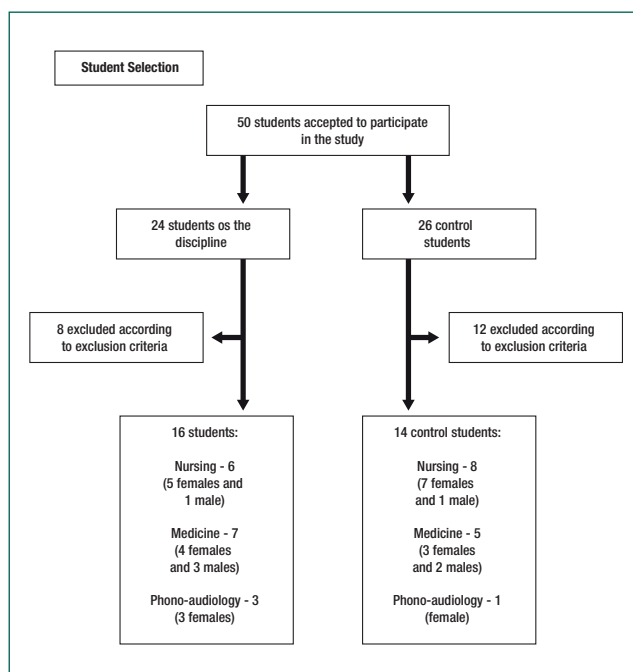


Figure 1. Flowchart of study participants

The University of this study offers a menu of elective courses with the aim to add relevant content and skill sets to the curriculum. In addition to taking mandatory core classes, students freely choose from elective courses. Among the elective courses offered, was included “Mindfulness practices for the promotion of whole health based on spirituality and neuroscience.”

Procedures

The elective course started in August 2015. It spanned nine weeks, with classes once a week, totaling 36 hours. Enrollment was offered to students with a maximum of 25 spots available. Each four-hour class included the activities described in appendix 1. The course overview read “Presentation of the concepts and principles of spirituality and neuroscience for the practice of mindfulness and concentration that promote good, whole health. Discussions about the need to perceive, identify and handle emotions, and on knowledge of how emotions originate, are processed and affect the mind. Analysis of meditation practices that calm the mind, relax the body and promote kindness, self-compassion, and compassion towards others. Development of an understanding of spirituality and neurosciences with recommended reading lists and presentation of talks about spirituality and whole health”. The course syllabus included a theoretical section and a practical meditation section. All classes had the same teacher, who conducted the meditations and interviews. The first author of this article behaved as a participant observer throughout the course and was the one who recorded and transcribed the interviews. Students were invited to participate in the study, which demanded they answered four psychometric evaluation forms and participated in two interviews (on their first and last day of classes). None of the students abandoned the course.

Quantitative tools

On the first and last days of classes, students in the two groups were evaluated with use of four quantitative tools validated to Portuguese that measured perceived stress, attention, NA and PA, and wellbeing. Evaluation tools included the Positive

and Negative Affect Scales X (PANAS-X);⁽¹⁶⁾ Mindful Attention Awareness Scale (MAAS);⁽¹⁷⁾ Perceived Stress Scale (PSS);⁽¹⁸⁾ and the WHO-5 Wellbeing Index.⁽¹⁹⁾ Each student responded to the PANAS-X, which includes the following 60 items: PA (10 items); basic PA including joviality, self-assurance and mindfulness (11 items); NA (10 items); basic NA including fear, hostility, guilty and sadness (15 items); and other affective states including shyness, fatigue, serenity and surprise (14 items). Each item contained adjectives and the answers were provided in a 5-point Likert scale. Students also responded individually to the MAAS that comprises 15 items in a 6-point Likert scale going from almost always mindful to almost never mindful. Students individually responded to the PSS that contains 10 items with a Likert scale ranging from 0/never to 4/very frequently – higher scores corresponded to higher stress levels. Finally, the WHO-5 was used to evaluate how study participants felt over the prior two weeks in a scale from 0/never to 5/all the time, where higher scores represented more wellbeing.

Statistical analysis

Students' answers were compiled in an Excel spreadsheet and analyzed with the IBM SPSS software, version 22.0. Comparisons between the control and study groups were performed with the chi-square and Student's T test, and comparisons between and within groups were performed with repeated measures MANOVA. Differences with $p < 0.05$ were considered significant.

Qualitative data collection and analysis

The qualitative aspects of the study were based on group interviews conducted in the first day and last day of the elective course. Interviews were recorded and transcribed by the researcher who acted as a participant observer in the course. There was no blind rater. Data were analyzed through categorical and thematic data analysis.⁽²⁰⁾ Questions asked in the first interview included: a) Why did you choose to take this course? b) How did you perceive yourselves emotionally? Questions asked in the second interview included: a) How are you feeling about

your emotions? b) How do you evaluate the course? The author fully transcribed the interviews and conducted the analysis in four stages, namely: 1 – attentive and repetitive reading of the transcription in search of underlying meaning of data; 2 – data compilation in an Excel spreadsheet; 3 – comparative analysis of data in search of similarities and differences; 4 – synthesis of data in the form of expressions, themes, patterns and categories of hypothesis. Additionally, a field diary was used to register qualitative notes on the prevailing mood and atmosphere in the class.

Results

Table 1 shows the sociodemographic profile of study and control group participants. Women accounted for 75% of the study group and 78% of the control group, a difference that was not significant ($p = 0.825$).

Table 1. Sociodemographic characteristics of the study and control groups

Sociodemographic data	Study group (n=16)	Control group (n=14)
Single	15/16	12/13*
Age group 18-24	14/16	13/13*
Age group 25-30	2/16	0*
Male	4/16	3/14
Female	12/16	11/14
Public transportation users	10/16	5/6*
Nursing students	6/16	8/14
Medical students	7/16	5/14
Speech Therapy students	3/16	1/14
Prior knowledge of meditation	0	0*
Health problems	4/16	1/6*

*Some participants of the control group did not answer all sociodemographic questions

Quantitative results

When applying the PANAS-X, MAAS, EEP and WHO-5 before taking the course, were found no significant differences between the control and study groups, regardless of the tool applied ($p > 0.05$) (Table 2).

We applied repeated measures MANOVA to test the effect of the elective course on variables over time. We found no differences between the study and control groups in any of the variables between the first and second time points, $F(11) =$

Table 2. Comparison of scores obtained from study and control groups before the elective course

Comparison of scores	n(%)	n(%)	p-value
PANAS pos. attentiv.	11.00(2.19)	11.07(3.22)	0.894
PANAS negative	19.94(8.01)	22.43(5.04)	0.366
PANAS neg. fear	10.31(3.91)	11.71(2.70)	0.315
PANAS neg. host	12.31(5.89)	12.64(4.27)	0.956
PANAS neg. blame	10.13(5.08)	12.14(4.22)	0.329
PANAS neg. sadness	9.06(5.22)	12.14(5.23)	0.115
WHO 5	12.44(4.27)	11.50(5.02)	0.507
MAAS	59.69(10.28)	50.71(9.06)	0.028
PPS	21.19(6.98)	25.00(6.03)	0.144

*Student's t test; SE- Standard Error; n- Number of participants; MAAS- Mindful Awareness Attention Scale; PANAS- Negative Affect and Positive Affect Scales; WHO 5- Wellbeing Index; PPS- Perceived Stress Scale

1.375, $p= 0.268$, $\eta^2= 0.223$, $OP= 0.400$. On the other hand, univariate tests indicated an effect of the elective course on total negative PANAS-X, as well as on the Fear and Hostility aspects of the scale, when comparing the first and second time points ($p<0.05$) (Table 3). No other significant differences were detected.

Qualitative results

Facing up to daily difficulties represented one of the main reasons for students' choice for the elective course. Those enrolled in the course stated they sought self-knowledge and self-control. Several of them complained from lack of concentration and excessive number of activities. Three thematic categories emerged: (a) difficulties living the present moment and anxiety trying to control the future; (b) meditation practices as a tool for facing such difficulties; and (c) experience characterized by affection.

(a) Difficulties living the present moment and anxiety trying to control the future

This category was based on the question about how students perceive themselves emotionally. Students mentioned difficulties in being present within each moment, demonstrated concerns about the coming days and future engagements, which caused stress, anxiety and lack of tolerance with themselves and others.

Student 8: "I am not able to live one day at a time, I just can't do it, I am here, but my head is wandering about everything I will do tomorrow, about how I'm going to find time to do stuff."

Student 9: "I am also a very anxious person. I am not able to live one day at a time, I am always thinking if something is going to work out, if it doesn't work out, what will I do, I must have a plan B, otherwise I can't get myself organized."

Student 10: "I am also very anxious, I have gone to therapy because of this condition, but I am still like that, I am not able to think about the present moment, right now I am thinking about other things. This year has been very stressful."

At the end of the elective course, students were interviewed a second time. They were asked to evaluate the course and report perceived changes in emotions, if expectations were met, and if they thought the course should be a mandatory part of the curriculum, as an investment on the whole health of future healthcare professionals. The following two categories were identified.

Table 3. Comparison of scores obtained from study and control groups before (T0) and after (T1) the elective course

	Study group (n=16)		Control group (n=14)		Time X Group Effect p-value	Effect size	Observed power
	T0 Average(SD)	T1 Average(SD)	T0 Average(SD)	T1 Average(SD)			
PANAS positive	28.13(5.97)	27.94(7.28)	27.43(6.30)	26.86(4.96)	0.878	0.001	0.053
PANAS pos. Joviality	21.13(6.27)	23.69(5.30)	19.93(7.70)	20.71(5.31)	0.495	0.017	0.103
PANAS pos. Self-Affir.	15.81(4.05)	15.56(4.62)	14.43(3.39)	14.21(3.49)	0.980	<0.001	0.050
PANAS pos. Attentiv.	11.00(2.19)	11.62(3.03)	11.07(3.22)	11.21(1.25)	0.706	0.005	0.066
PANAS Negative	19.94(8.01)	17.50(3.97)	22.43(5.04)	27.29(7.93)	0.017*	0.118	0.690
PANAS neg. Fear	10.31(3.91)	9.69(2.12)	11.71(2.70)	14.79(5.67)	0.042*	0.140	0.540
PANAS neg. Host	12.31(5.89)	10.00(3.10)	12.64(4.27)	16.00(5.71)	0.023*	0.171	0.642
PANAS Neg. Blame	10.13(5.08)	10.00(4.31)	12.14(4.22)	14.86(6.76)	0.131	0.080	0.325
PANAS neg. Sadness	9.06(5.22)	9.00(3.60)	12.14(5.23)	13.43(4.88)	0.515	0.015	0.098
WHO 5	12.44(4.27)	14.56(3.22)	11.50(5.02)	11.43(3.48)	0.176	0.064	0.269
MAAS	59.69 (10.28)	59.06 (10.99)	50.71 (9.06)	48.86(9.13)	0.799	0.002	0.057
PPS	21.19 (6.98)	16.63 (4.95)	25.00 (6.03)	24.50(4.47)	0.129	0.080	0.326

* $p<0.05$; n- Number of participants; T0- before the elective course; T1- after the elective course; Size Effect- Partial Eta Squared (Less than 0.01 indicates a small effect size, 0.06 indicates a medium effect size and greater than 0.14 indicates a large effect size)

(b) Meditation practices as a tool for facing such difficulties

Students reported feeling calmer throughout the course and more focused on the present moment. They could identify situations that caused emotional distress and attempted to deal with these situations through meditation.

Student 1: “It has helped a lot, I feel more focused, and I have managed to go through the activities (...). I am feeling calmer also.”

Student 14: “I used the meditative practice when I felt the need, for example: I am very agitated or thinking of more than one thing at same time and know I will not be able to take care of everything. Then, I will stop and think one thing at a time”.

Student 21: “One day, I was at the lab and fell asleep, and my box of gloves simply disappeared, I was very angry. Then, I had two paths to follow: I could either explode, take out on people who had nothing to do with it, or I could take a deep breath. I went to the small patio in front of the lab, I sat down and thought: ‘Let’s see if it works now,’ I started to count my breaths, again, it was not a brutal and complete change, but just the fact that I managed to control myself and did not take out on people, well that was something. It was a very positive experience that renewed my ideals and my belief in meditation. I thought: ‘Look, this is a practical example where it really worked.’”

(c) Experience characterized by affection

This analytical category was based on the student-professor relationship and on the space of kindness promoted by the professor that contributed to a positive evaluation of the discipline.

Student 4: “The elective course went beyond my expectations (...) It was totally different, it was very nice to be here and receive a hug from the professor. Being welcomed by everyone, I think, made me see things differently.”

Student 14: “I found the project very interesting. I think the atmosphere contributed, as did the professor, always very kind. These things helped us to keep attending, I wanted to be here, even having to wake up early to get here, it is not something I

did because it was required, I felt like doing it. I feel different about other courses, I thought this was very useful, I liked it very much.”

Student 17: “I really liked the professor, she really showed me the kindness in people. Because she was kind for no reason, and this was very cool, I did not expect it, much less from a professor. We are so used to professors we don’t even know the name, and they don’t know ours, and we have no contact whatsoever. Cool, it was very cool.”

Records in the field diary showed that three medical students were not motivated to go through with the activities proposed in the classroom. They slowly became more integrated, and when presenting their opinion about the topic of the seminar on spirituality and whole health, the class had a pleasant surprise. They had clearly dedicated time to the book, expressed profound ideas and made reflections and connections to their lives.

Students’ presentations on the books took the form of a seminar where they showed a wide and deep understanding of contents used in the exercises. Students treated each other cordially and respectfully in every class. All of them were able to perform the mindfulness meditation practices during classes. In the beginning, they felt embarrassed with the exercises and defensive in relation to their colleagues, but they slowly relaxed. They felt welcome in the class, which further improved attendance.

Discussion

We hypothesized that an elective course on mindfulness meditation practices based on spirituality and neuroscience would promote the whole health of students and have beneficial mental effects. Our results confirmed this hypothesis by showing that students who took the elective course had reduced NA, specifically fear and hostility, in agreement with previous findings.^(8,21,22) The elective course significantly affected fear and hostility, among the NAs. We speculate that classes provided a safe and kind environment, which allowed students to overcome these feelings. The same was not observed in the control group, whose fear and hostility in-

creased between the beginning and the end of the discipline.

The effect on NAs is especially relevant because neurological processes in the human brain more easily stimulate them in comparison to PAs. Negative affects induce faster learning and fade out more slowly than PAs, thus interfering more strongly with judgement and decision-making. The negative bias of the brain has a key evolutionary function in the avoidance of danger and development of social and cognitive functions.⁽²³⁾

Fear is a primary emotion. All humans experience it since the early childhood through a pre-organized mechanism that allows our species to react to danger or threat. Fear develops early and resists change.⁽²⁴⁾ It may paralyze an individual who will attempt to escape and avoid the facing of different situations. Stimuli such as safety may reverse this primeval emotion. Our elective course provided a safe environment, reinforced by the compassionate attitude of the professor and the very essence of the meditation practice.

On the other hand, hostility represents a secondary or social emotion. Humans develop it in their lives throughout social and cultural exchanges. The elective course included Buddhist precepts of compassion and kindness that can modulate hostility. Compassion places an individual at the same level of the other; it takes him or her to understand that the other also longs for happiness and attempts to avoid suffering.

Practicing compassion and self-compassion requires recognizing one's own suffering, mistakes, escapes and all associated negative feelings evoked during these processes. Only then, can an individual kindly avoid becoming fixated on paths that lead to suffering without denying them or attempting to find guilty parties in a nonjudgmental way.⁽²⁵⁾

In a recent study, was mentioned that a "wandering mind is an unhappy mind", because when the human mind drifts, it tends to focus on negative experiences.⁽²⁶⁾ When students have a difficult time living the present moment, they tend to increase their level of emotional distress. Even though the attention instrument has not shown a significant result, students reported they can feel when their

minds wander, either by thinking of many things at the same time or by trying to solve problems that have not yet happened. The course practices helped them to modulate the uncomfortable emotions related to wandering.

During the second and final interview, students who took the course had a calmer demeanor, statements indicated they accepted their difficulties and limitations more easily and perceived their emotions more intensely. These individuals also reported facing up to stressful situations in a less agitated manner. They often used meditation in these processes, which led them to solve the problem calmly or accept the lack of solution in a self-compassionate manner.

Study participants revealed how deeply they felt about the kindness and attention demonstrated by the professor towards them and appreciated having a space where she would attentively listen to them. The third analytical category provides evidence of students feeling surprised with the professor's accessible and kind behavior. The faculty's attitude stimulated the participation of students in the course and renewed their belief in an affectionate relationship between students and professors. Many previous studies focused on exchanges between students and professors indicated that the kind of attention dedicated to individuals or the group can promote or erode a learning environment. Respect and cordiality towards students potentiate trust, dialogue, support and orientation, resulting in better education.^(27,28)

In a previous study, was investigated a putative association between the faculty attitude and a positive learning experience. The authors concluded that affective dimensions cannot be separated from intelligence, as both evolve in parallel. Professors must lean on affective and cognitive aspects of education for promoting a positive learning experience.⁽²⁸⁾

Thus, for the implementation of such a discipline in the undergraduate course, one must think that the teacher's role goes beyond teaching meditation techniques, it is part of the method itself with personal involvement and due attention to students.

This was an exploratory study. Since this was a convenience sample, the reduced number of participants had implications for quantitative results.

Ideally, a group of control students would take a different course but with the same intentions, as the meditation course described here. Also, our study relied on a small sample size, further affected by the fact that some students did not perform all proposed meditation practices. A future work involving larger cohorts may bring to light other positive aspects of including mindfulness meditation practices in the healthcare curriculum.

Another important point was that the teacher conducted the interview, which led to a reflection about a possible interference in the course evaluation. Although comments from students were not mandatory, all reported their experiences spontaneously. Currently, the course is in the fifth year and interviews were not conducted by the teacher in charge, and results were very similar.

There may be a bias, although we could not understand in this case, because we believe the teacher's influence was indeed in the course outcome and related to the process of conducting the discipline and building up the bond of trust with students.

Conclusion

The elective course focused on mindfulness meditation and compassion developed socio-emotional, wellbeing and self-awareness abilities in the students, and reduced the negative affect. Individuals in the study group reported the beneficial effects of meditation on the reduction of anxiety and they had lower scores in NA, specifically fear and hostility. Perceived stress was also lower among these students, who perceived that their anxiety emerged from the difficulty of living the present moment and from the constant anticipation of future problems. They became more aware of their emotions and realized the importance of knowing how to handle and accept them.

Collaborations

Araujo AC, Santana CLA, Kazasa EH, Lacerda SS and Tanaka LH contributed to the study design,

data analysis and interpretation, article writing, critical review of intellectual content, and approval of the final version to be published.

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Appendix 1. Syllabus

Syllabus
Presentation of the program and work to be developed. Definition of time slots. Introduction to research on the neuroscience of mindfulness and other techniques. Practical training: Body scan 10' Tasks for the week: Daily body scan 10'
Brain function and the effect of executive functions on cognitive and behavioral learning. Practical training: Focused mindfulness with the five senses and body scan Tasks for the week: Daily body scan 10'
Concepts and the foundation of mindfulness and concentration practices. Practical training: Focused mindfulness with the five senses and multifocal exercises Tasks for the week: Choosing one daily activity to focus attention
Central axis for the development of mindfulness and concentration: ethics, psychophysical and psychospiritual. Practical training: Shamatha, one cycle Tasks for the week: Shamatha, one cycle
What is the 8-week mindfulness program? Tasks for the week: Respiration as the anchor
Emotional education and socio-emotional learning (SEL). Study of primary emotions: anger, fear, sadness, and joy. Feelings: frustration, anxiety, anguish and satisfaction. Tasks for the week: Shamatha, two cycles
Seminar Practice of compassion meditation Tasks for the week: compassion meditation
Seminar Practice of open-heart meditation Tasks for the week: open-heart meditation
Seminar Practice of meditation Course evaluation and second interview