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Mindfulness Based Emotional Intelligence Training to Reduce Emotional Vulnerability for Medical Students

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Abstract: *Healthcare professional and students are one of the professional categories vulnerable to stress, anxiety, depression and burnout, and mindfulness-based interventions are used to reduce distress and vulnerability (Lomas et al., 2018; Parcover et al., 2018). A psychological construct also relevant for the well-being is emotional intelligence (Uchino et al., 2015).*

This article presents the results of an existing intervention, combining mindfulness techniques and emotional intelligence exercises (Mindfulness based emotional intelligence intervention - MBEIT, Ciarrochi & Godsell, 2006), used in small medical student's sample, in order to advocate the use of this brief intervention for medical students in educational settings.

The structure of the intervention follows the dimensions of psychological flexibility construct, with a time frame of two hours for each dimension: 'Effective emotional orientation', 'Mindfulness and Emotional Awareness', 'Defusing from unhelpful rules or evaluations', 'Effective values orientation'.

The results of intervention show moderate effect size for the increase of emotional intelligence and of the psychological flexibility (emotional awareness, mindfulness and committed action).

Keywords: *mindfulness, psychological flexibility, emotional intelligence, distress.*

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Background

More than 20 years ago, in British Journal of Medical Psychology, researchers stated that "there is growing evidence to show that mental health professionals, by the nature of their work, are particularly vulnerable to stress" (Rabin et al., 1999). Studies, including several systematic reviews, showed that mindfulness-based interventions reduce distress and vulnerability to burnout for healthcare professional (Rudaz et al., 2017; Lomas et al., 2018) and students (Masuda & Tully, 2012; Parcover et al., 2018). Mindfulness and psychological flexibility is relevant for students also, especially medical students (Palladino, et al., 2013). Another relevant construct for future healthcare professionals is emotional intelligence (Uchino, et al., 2015), and programs combining mindfulness and emotional intelligence reported good results (Enríquez et al., 2017), including for the decrease of emotional regulation difficulties (Chiodelli et al., 2018). An example of mindfulness-based intervention, also targeting emotional intelligence, Mindfulness Based Emotional Intelligence Training (MBEIT), is described by Ciarrochi (Ciarrochi & Godsell, 2006).

One of the best empirically supported mindfulness-based therapy is Acceptance and Commitment Therapy (ACT), one of the third wave cognitive behavioural therapies (A-Tjak et al., 2015). The ultimate goal for ACT is to cultivate psychological flexibility, the ability to be fully in contact the present moment and to adapt behaviour according to personal values (Hayes et al., 2006).

Psychological flexibility is defined as a combination of six related processes: acceptance, cognitive defusing, present moment awareness, self as a context, values, and committed action (Strosahl et al., 2004). The process of being present (mindful) supports a more flexible behaviour by experiencing directly and non-judgmentally the inner and outer events in the individual's life and supports the individual's true values (Christie et al., 2017).

ACT interventions report comparable effects with traditional cognitive behavioral therapy for depression and anxiety (Coto-Lesmes et al., 2020), for chronic pain (Veehof et al., 2011) and burnout (Lloyd et al., 2013). Studies show that ACT works through its proposed processes of change like acceptance, defusing, present moment, values (Levin et al., 2012) and is proposed as a transdiagnostic approach for different pathologies (Levin et al., 2014), especially for subjects with a strong pattern of experiential avoidance (López et al., 2010) or emotional regulation difficulties (Biron & van Veldhoven, 2012). ACT has positive impact in preventive science (Biglan et al., 2008) and well-being (Ciarrochi et al., 2013; Bohlmeijer et al., 2015).

Current paper presents the impact of an existing mindfulness based emotional intelligence intervention (Ciarrochi & Godsell, 2006) on emotional abilities, psychological flexibility and emotion dysregulation in small medical student's sample, in order to advocate the use of this brief intervention for medical students in educational settings.

Method & Procedure

The study is in a randomized controlled trial, addressed to medical students.

The **inclusion criteria** were to be a medical student, volunteering for the study; the **exclusion criteria** were above average scores for psychological flexibility, emotional intelligence, distress or declared undergoing pharmacological treatment or psychotherapy for mental health disorders.

Research team offered feedback on scores for all evaluated persons and recommended free clinical evaluation to the persons with high DASS-21 scores.

The selected persons were randomly assigned in two study condition – intervention and waiting list.

The intervention used Mindfulness Based Emotional Intelligence Training (Ciarrochi & Godsell, 2006), translated in Romanian language and adapted by a group of psychotherapists with ACT experience. The intervention was structured in 6 sessions of two hours each (first session was an introductory one, next four mindfulness-based intervention and the last one feedback and questionnaires session).

Each of the four mindfulness-based sessions targets a dimension of training as presented by the authors: effective emotion orientation, emotional awareness, defusing, effective action. The trainers used techniques as lecture, group discussion, exercises and meditation.

The research team measured the targeted variables in three moments in time: T1- before intervention, T2 -after intervention and T3 - 6 months follow up.

The control group received, after the end of the study, feedback on evaluated measures and a half day workshop on mindfulness and emotional intelligence.

Participants Sample A total of 128 of volunteering medical students were assessed; eighty persons were selected and randomly assigned, forty persons into intervention group and forty persons on waiting list. Average for age the sample is 21.4 (SD 1.6), 62% are women, 64% were raised in urban areas. Figure 1 presents the participant's flow.

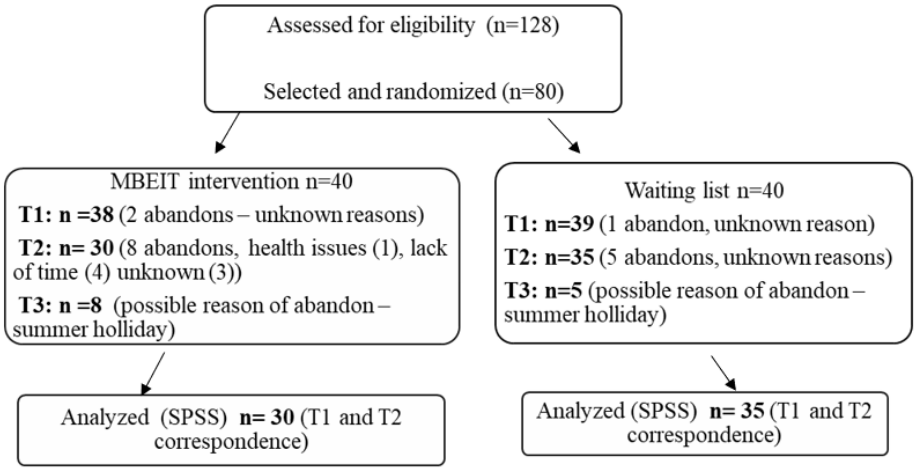


Figure 1. Flow of participants

Measures

Measured variables were psychological flexibility (CompACT- R12), depression, anxiety and stress levels (DASS 21), emotional intelligence (WLEIS) and related construct, emotion dysregulation (DERS -SF).

Wong and Law Emotional Intelligence Scale (Law et al., 2004) has sixteen self-report items evaluating abilities to identify, understand, use and regulate emotions. The instrument has good psychometric properties, is stable across cultures and it widely used in psychological research, in many countries, including Romania (Runcan & Iovu, 2013). Example item: 'I always know whether I am happy or not.'

Difficulties in Emotion Regulation Scale Short Form, evaluates six categories of difficulties that are leading to emotion dysregulation, like the lack of awareness, acceptance or strategies to regulate emotion (Gratz & Roemer, 2004). The instrument has thirty-six self-report items, good psychometric properties, it was translated and validated in many languages, including Romanian (Voinescu et al., 2013) . The short form (Kaufmann et al., 2016), has 18 items, Cronbach's alpha α =.89, correlations with original version for entire questionnaire and for sub-scales are highly significant, ranging between .9 and .97. Example item: 'When I'm upset, I feel guilty for feeling that way'.

Comprehensive Assessment of ACT Processes has 23 items self-report, assessing three dimensions (experiential openness, behavioural

awareness and valued action) (Francis et al., 2016). Items were scored on a seven-point Likert scale, ranging from 0 ("strongly disagree") to 6 ("strongly agree") and some of the items are reversed. Higher scores indicate greater experiential openness, behavioural awareness and valued action, overall, a high level of psychological flexibility. An example of item is "*I can identify the things that really matter to me in life and pursue them' /, I make choices based on what is important to me, even if it is stressful*".

Short version of CompACT (Calinici & Calinici, 2021) has 12 items, good internal consistency (α between .78-.82 for sub-scales and .88 for total scale) and correlations with other instruments in line with the one presented by authors for the original scale (with DASS 21 r=.57, p<.001) and good model fit with the three factor model described by authors.

Depression, Anxiety, Stress Scale – DASS 21 screening instrument for distress, evaluates depression, anxiety and stress symptoms (Henry & Crawford, 2005). Items are scored on a three-point Likert scale, higher scores indicate greater levels of distress. Items examples "*I felt that I was rather touchy.'/, I found it hard to calm down after something upset me*". The scale is largely used in research, with good psychometric properties (α ranges between .82 and .95), successfully translated and used in many languages, including Romanian (Szabó et al., 2011).

Cluj Emotional Intelligence Scale (CEIS) is a self report 19 items instrument evaluating five facets of emotional intelligence: self emotions, other's emotions, regulate self-emotions, regulate emotion's of others, use emotions (Calinici et al., 2020). The items are scored on a seven-point Likert scale, higher scores indicating greater levels of emotional intelligence. Example item: „*I can realize quickly what generates my emotions".*

The instrument has very good reliability (α = .90), test retest reliability and high correlations with WLEIS (Law et al., 2004) and good predictive validity, tested in relation with well-being measures.

Intervention

The trainers assigned the participants into groups of ten persons each and delivered the intervention in six weekly sessions. The trainers were licensed psychologist, with previous experience in mindfulness programs and trained for current intervention by the research team in four sessions of two hours each. The research team also verified the trainer's adherence to intervention's manual by randomly listening to intervention session's recordings. The adherence, scored by key points for each session, is over 80%.

Mindfulness Based Emotion Intelligence Training (MBEIT): The introductory session presents the aim of the intervention, administrative issues and theoretical basis; emotional intelligence and mindfulness theories are briefly presented. In second session, **'Effective emotional orientation'** participants learn be more willing to experience their emotions, even in demanding situation. In the third session, **'Emotional Awareness'** participants enhance their ability to notice the emotions in the self and others, their evolution over time and the thoughts that accompany the emotions. In the fourth session, **'Defusing from unhelpful rules or evaluations'** participants learn to identify description, evaluation and irrational believes that may accompany intense emotions. The trainers teach techniques to defuse irrational believes, like altering the 'verbal label' of the problematic experiences, breathing meditation to facilitate a more detached, 'observer' type perspective, learning to look at thoughts, rather than through thoughts' (Ciarrochi et al., 2007). In the fifth session, **'Effective action orientation'** participants learn to identify their values and how to commit to their values. Ending Session (6) collected feedback, questions, answers, and the post-intervention questionnaire's scores.

Results and discussion

Collected data were analysed using SPSS 25.

Normal distribution of the data, for both conditions, pre and after intervention, was tested with Shapiro-Wilk tests and the results were not statistically significant (data follow normal distribution). Descriptive statistics for study conditions, before and after intervention are provided in Table 1. Data for follow up are not presented, due to the reduced number of respondents. Post-hoc achieved **power of the t tests**, based on sample size and medium size effect is good, power = (1-β err probability) = 0.63, computed with G*power 3.1.9.2.

T tests between control and intervention groups, for pre-intervention scores, shows no statistically significant differences; after the intervention there were significant differences for almost all the measured variables. The indicator unbiased g Hedge shows medium to large size effect, implying important changes for measured variables, as Table 1 presents. The only dimensions that were not statistically different were 'Use of emotions' (sub-scale of Emotional intelligence) and 'Strategies' (sub-scale of Difficulties in Regulate Emotion).

Table 1 Descriptive Statistics pre and post intervention for Control and MBEIT groups

	Initial Mean(SD)	Final Mean (SD)	Initial Mean(SD)	Final Mean (SD)	g*	P	Confidence interval (95%)
	Control Group		Intervention (MBEIT) Group				
WLEIS	**55 (9.5)**	**54.74 (9.14)**	**52.23 (9.07)**	**62.4 (5.52)**	**1.0**	**	**[0.48, 1.51]**
Self-Emotion	14.57(2.84)	14.51 (2.87)	13.87 (3.10)	16.83 (1.86)	.94	**	[0.43, 1.46]
Others Emotion	14.91(2.97)	14.6 (2.56)	13.67 (2.97)	16.23 (2.22)	.68	**	[0.18, 1.18]
Use Emotion	14.34 (3.23)	14.4 (3.24)	13.50 (3.66)	15.40 (2.50)	.34	-	-
Reg. Emotion	11.17 (4.11)	11.23 (3.94)	11.20 (3.46)	13.93 (3.10)	.76	**	[0.25, 1.26]
CEIS						**	**[1.08-2.21]**
Self-Emotion		**81.4(10.58)**	**79.60(10.24)**	**98.07(9.55)**	**.88**	**	[0.81-1.89]
Others Em.	**76.73(11.32)**		20.63(4.82)	26.90(3.85)	.83	**	[0.56-1.60]
Use	19.37(6.49)	21.05(5.68)	20.77(5.56)	25.87(3.55)	.78	**	[0.17-1.17]
Emotion	21.67(5.73)	20.96(5.23)	11.77(3.45)	14.57(3.16)	.68	**	[0.48-1.51]
Reg.	11.47(3.80)	12.11(4.08)	12(3.27)	14.83(3.21)	.76	**	[0.37-1.40]
Emotion	11.27(4.43)	10.98(4.35)	14.43(2.67)	15.67(3.17)	.73		
Reg. Oth. Em.	12.97(3.85)	12.60(3.71)				**	**[0.49, 1.53]**
CompACT 12	**35.4 (8.79)**	**35.2 (8.45)**	**35.87 (5.82)**	**43.37 (7.65)**	**1.1**		
Valued Act.	13.77 (3.28)	13.83 (3.29)	14 (3.08)	15.47 (3.15)	.51	**	[0.01, 1.00]
Experience Op.	9.4 (3.88)	9.37 (3.87)	8.83 (3.54)	12.93 (4.37)	.87	**	[0.36, 1.38]
Behavioral Aw.	12.23 (5.45)	12 (5.02)	13.03 (4.13)	14.97 (3.59)	.67	**	[0.17, 1.17]
DERS	**51 (14.68)**	**51.17 (14.28)**	**52.67 (11.32)**	**39.07 (8.8)**	**-1.02**	**	**[-1.52, -0.48]**
Strategies	8.89 (3.59)	8.86 (3.35)	9.23 (2.91)	7.37 (2.7)	0.036	-	-
Awareness	5.86 (2.13)	5.89 (2.1)	6.43 (2.37)	4.17 (1.21)	-0.98	**	[-1.50, -0.47]
Clarity	8.54 (3.5)	8.66 (3.40)	8.80 (2.93)	6.10 (1.49)	-0.95	**	[-1.46, -0.44]
Goals	11 (3.33)	10.74 (3.27)	10.93 (3.14)	8.97 (2.58)	-0.6	**	[-1.09, -0.10]
Impulse	7.86 (3.82)	8 (3.67)	8.40 (2.99)	5.87 (2.76)	-0.65	**	[-1.15, -0.15]
Non-acceptance	8.86 (3.55)	9.03 (3.39)	8.87 (3.10)	6.60 (2.63)	-0.79	**	[-1.30, -0.29]
DASS-21	**31.63 (11.96)**	**31.6 (12)**	**35.93 (19.09)**	**23.4 (11.97)**	**-0.68**	****	**[-1.19, -0.18]**
Depression	9.14 (5.01)	9.31 (5.06)	12.03 (6.34)	7.23 (4.90)	-0.42	**	[-0.91, - 0.08]
Anxiety	11.43 (4.62)	11.43 (4.47)	10.93(5.51)	8 (4.44)	-0.77	**	[-1.28, -0.26]
Stress	11.06 (4)	10.86 (4.01)	12.97(6.42)	8.17 (4.12)	-0.66	**	[-1.16, -0.16]

WLEIS - Emotional Intelligence, CEIS- Cluj Emotional Intelligence Scale, VA- Valued Action, OP Openness to Experience, BA- Behavioural Awareness, CompACT 12 - Psychological Flexibility, DERS - Difficulties in Regulate Emotion, DASS -21 Depression, Anxiety, Stress

Conclusions

The present study shows that mindfulness based emotional intelligence training increases psychological flexibility and emotional intelligence, reducing psychological distress and difficulties to regulate emotions, factors associated with better mental health, well-being and work performance (Martins et al., 2010; O'Boyle et al., 2011; Sánchez-Álvarez et al., 2016).

The effort to translate and validate a process measure for psychological flexibility and its processes ads valuable information for the assessment of current ACT intervention; many recent studies (Stockton et al., 2019; Coto-Lesmes et al., 2020) report a lack of investigation for processes of psychological flexibility like behavioural activation or committed action, existing studies focusing only on acceptance or cognitive defusing.

Effect size for ACT processes after MBEIT intervention are moderate to high, comparable with the ones presented by a systematic review reporting $g = 0.56$, 95% CI: 0.37–

0.76, $p < 0.001$. (A-Tjak et al., 2015)

Effect size for decrease of depression, anxiety and stress symptoms after the intervention is moderate, in line with one reported by other studies (Bohlmeijer, Fledderus, Rokx, & Pieterse, 2011).

Effect size for emotional intelligence after training is moderate to high, in line with results reported by systematic reviews, for ability EI: 0.54, 95% CI: 0.45, 1.63, $p < 0.001$ (Mattingly & Kraiger, 2019). Comparable effect size measured with WLEIS and CEIS, which are new instruments, recommends CEIS as a stable, but sensitive to changes, instrument.

The effect size for the decrease of emotional regulation difficulties is also in line with other results reported after mindfulness based intervention, as an example in a Brazilian sample of students (Chiodelli et al., 2018).

For psychological flexibility, emotional intelligence and emotion regulation difficulties the results are a little bit higher than the ones reported in other studies; one possible explanation is the fact that only subjects with average levels of psychological flexibility and emotional intelligence were admitted in the study; combining training for ACT processes and emotional intelligence training may help in increasing the variables more than when targeted alone.

Limitations of present study may be related to sample characteristics (small sample, with volunteer subjects) and type of assessment (all targeted variables are self- report evaluated). Insufficient data to assess the long-lasting effect of the training is another serious limitation.

Further studies should investigate the effects of the intervention adressed to a larger number of students, added to regular classes, not in volunteer settings, with evaluation after 6 month/ one year, to assess the effect of the investigation in 'real setting condition'.

Adding elements to this version of training would also be a plus, dimensions like 'Use of Emotions' and Strategies (to regulate emotions) should be better targeted in future trainings.

Replication of the results for other categories of students involved in healthcare related field (e.g., psychologists, social workers) would be a plus, in order to advocate the inclusion of this type of brief intervention into curriculum for students from domanins at risk for burnout and psychological distress.

Ethics approval and consent to participate

The current research was approved by the ethics committee Scientific Council of Babes-Bolyai University Cluj-Napoca, Nr. 5769/13/04/2018. All the participants were informed about the procedures and they gave the informed consent to participate. All methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

CMS was the main researcher which coordinated all the research activities, CT performed the statistics, CHT supervised the intervention and dealed with the ethical issues. CMS and CT wrote the main manuscript text. All authors reviewed the manuscript.

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