

RESEARCH ARTICLE

Feasibility and preliminary clinical outcomes of a mindfulness-based stress reduction program among psychiatry and child neuropsychiatry residents: A pilot study

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Abstract

Background: Burnout, anxiety, depression, insomnia, and impaired mentalizing are common among mental health trainees, potentially impacting well-being and quality of care. Mindfulness-based interventions have shown promise in mitigating these issues. Incorporating such programs into postgraduate training may offer proactive support during a critical developmental stage.

Objective: This study primarily aimed to assess the feasibility and acceptability of implementing a mindfulness-based stress reduction (MBSR) program among psychiatry and child neuropsychiatry residents. Secondary exploratory aims included assessing preliminary changes in burnout, anxiety, depression, insomnia, and mentalizing outcomes.

Methods: This single-center, non-randomized controlled pilot feasibility study included psychiatry and child neuropsychiatry residents. Participation in the intervention group was based on willingness to attend an MBSR program alongside standard institutional support services. A comparison group was identified among residents from the same departments who received standard support only. Feasibility outcomes included recruitment, retention, adherence, and participant satisfaction. Validated scales assessed burnout, anxiety, depression, insomnia, and mentalizing before and after intervention.

Results: Thirty-nine participants were included in the final analysis (19 in the intervention group; 20 in the control group). Feasibility outcomes indicated good

acceptability and participant satisfaction. Exploratory analyses showed a modest reduction in emotional exhaustion in the intervention group compared to controls ($p = 0.0487$), while no significant between-group differences emerged for other outcomes.

Conclusion: This pilot study supports the feasibility and acceptability of implementing an MBSR program among mental health trainees. Exploratory findings suggest possible effects on emotional exhaustion, although results should be interpreted cautiously. Larger controlled studies are needed to assess clinical effectiveness.

Keywords: Burnout; Mindfulness; Resident; Mental health

1. Introduction

In recent years, the mental health of physicians and medical trainees has emerged as a significant concern, drawing the attention of the scientific community. Recent studies reveal that burnout and mental health issues impact 30–60% of physicians on average. This rate is even higher among medical trainees, with burnout levels reaching up to 80% in certain specialties. Similarly, anxiety, depression, and insomnia affect 33.8%, 28.8%, and 30% of trainees, respectively.^{1–4} A literature review focusing specifically on psychiatry residents reports burnout rates of 33.7%, anxiety rates of 53%, and depression rates of 16.5%.⁵

These statistics highlight significant mental health challenges within the medical profession, with serious implications for both the physicians and their patients. For example, increased burnout is linked to a higher incidence of medical errors and suboptimal patient care, as well as more severe mental health issues such as substance dependence and abuse.^{6–8} Conversely, mentalization—understanding others' mental states while being aware of one's own—has been shown to improve empathy and communication with patients, serving as a valuable resource for physicians.^{9,10}

For medical trainees, factors contributing to burnout and affecting mental health are diverse. Research highlights both organizational and environmental factors (e.g., unbalanced schedules, administrative overload, lack of control over the work environment, insufficient reward for effort, and a weak sense of community among staff) as well as individual factors (e.g., rigidity, perfectionism, excessive work dedication, and a mismatch between personal values and job responsibilities).^{11,12} However, trainees in mental health settings may face additional, specific challenges. Their clinical work is inherently relational and emotionally demanding, requiring continuous engagement with patients' internal experiences, exposure to intense affective states, and frequent management of complex interpersonal dynamics. These characteristics make psychiatry training a

high mentalizing-demand context, in which the ability to understand and regulate both one's own and others' mental states is continuously solicited and potentially vulnerable to disruption under stress.

In this context, mentalization may represent a particularly relevant protective factor. The ability to maintain a reflective stance under stress allows clinicians to regulate their own emotional responses while remaining attuned to patients' mental states. Conversely, high levels of stress and emotional exhaustion may impair mentalizing capacities, leading to more rigid or less empathic responses in clinical interactions.

Theoretically, mindfulness and mentalizing share several core features, as both involve the conscious observation of internal states and the integration of cognitive and affective components, while remaining conceptually distinct constructs.¹³ Mindfulness training may therefore enhance mentalizing capacity by promoting decentering from automatic thoughts and reducing emotional arousal,¹⁴ a particularly relevant mechanism in high-stress clinical contexts, where mentalization tends to deteriorate. In this framework, mentalizing may represent a potential mechanism linking mindfulness practice to reduced burnout and improved clinical functioning.

Given the profound impact on physicians' lives and work, numerous psychological interventions have been developed to address work-related stress.^{15–17} Mindfulness-based approaches, in particular, have shown promise in reducing stress and promoting self-care and well-being.¹⁸ Introduced by Jon Kabat-Zinn,¹⁹ mindfulness involves paying attention to the present moment in a non-judgmental and aware manner and is widely applied in medical settings through programs such as mindfulness-based stress reduction (MBSR). Recent reviews indicate that MBSR can benefit physicians by reducing stress, burnout, and anxiety, while enhancing personal well-being, sleep quality, and empathy.^{20–23} Randomized controlled trials in resident physicians further indicate that tailored

mindfulness interventions may improve perceived stress, job strain, empathy, and interpersonal functioning,²⁴ as well as broader domains such as self-compassion, flourishing, and work-related well-being, with effects sustained up to 12 months.²⁵ However, the current literature remains limited by a relative lack of high-quality studies with long-term follow-up.²³ Moreover, relatively limited attention has been given to mental health trainees, whose clinical work presents specific emotional and relational demands that may influence both stress levels and response to interventions.

The primary aim of this pilot feasibility study was to evaluate the feasibility and acceptability of implementing an MBSR program among psychiatry and child neuropsychiatry residents, including recruitment capability, adherence, retention, and participant satisfaction outcomes. Secondary exploratory aims included the assessment of preliminary changes in burnout, anxiety, depression, insomnia, and mentalizing capacities following the intervention.

Rather than providing definitive evidence of clinical effectiveness, this study was designed to generate preliminary data and identify methodological and organizational factors relevant to the development of future adequately powered controlled trials.

The findings of this pilot study may contribute to informing the implementation and design of future mindfulness-based interventions tailored to the specific needs of mental health trainees.

2. Materials and methods

2.1. Study design and population

This was a single-center, non-randomized controlled pilot study with two parallel groups, conducted over a period of 9 months. The study population consisted of residents at any year of training working in the Psychiatry and Child Neuropsychiatry departments at the “Gaspere Rodolico” University Hospital in Catania. Residents were informed about the opportunity to participate in an 8-week MBSR program. Those who agreed to participate constituted the intervention group. A comparison group was subsequently identified among residents from the same departments who did not participate in the program and continued to receive standard institutional support. The standard support services included access to occupational health services, regular meetings with assigned mentors, and informal debriefing after stressful clinical events.

Because participation in the intervention depended on willingness to attend the MBSR program, allocation was not randomized, and participants were not blinded

to group assignment. Consequently, the study should be considered exploratory and hypothesis-generating.

Inclusion Criteria required participants to be mental health residents at the University of Catania and to provide consent to participate in the study. Exclusion criteria included not being a mental health resident at the University of Catania, having a diagnosis of a psychiatric disorder and using psychiatric medications, having previously participated in a stress reduction program, having any medical or psychiatric condition that could interfere with understanding the questionnaire items or providing informed consent, and not providing consent to participate in the study.

2.2. Study procedure

The procedures followed the project timeline, which includes an initial recruitment phase, an intervention phase, and an analysis phase.

During the recruitment phase, residents were informed about the study and the opportunity to participate in the MBSR program. Those willing to participate were allocated to the intervention group, while a comparison group was subsequently identified among residents from the same departments and training context. As this was a non-randomized study, no allocation sequence was generated, and no allocation concealment procedures were applied. All participants received an information sheet and provided written informed consent prior to inclusion.

In the intervention phase, residents assigned to the intervention group attended the MBSR course. These sessions were held in the evening to accommodate the residents' work schedules. Residents in the control group continued their regular activities without changes. Both groups completed a series of assessments at baseline and after completion of the MBSR program. Additionally, participants in the intervention group completed a feasibility questionnaire at the end of the program, regardless of whether they completed the intervention or discontinued it prematurely; the questionnaire is provided in the [Appendix](#). In the analysis phase, the collected test data were scored, and reference scores for the examined scales were extracted. The data were then entered into an Excel sheet for analysis.

2.3. Tools

2.3.1. MBSR program

The MBSR program, developed by Jon Kabat-Zinn¹⁹ at the University of Massachusetts Medical School in the 1980s, is designed to help individuals manage stress, improve well-being, and enhance awareness. The core practice of the

program is mindfulness, which involves paying attention to the present moment in a non-judgmental and conscious manner. In the present study, the program consisted of eight weekly sessions of approximately 2–2.5 hours each, conducted in person, and included one optional extended session. The program typically lasts eight weeks and includes weekly group sessions where participants learn and practice mindfulness techniques, share their experiences, and receive support. Each session followed a structured format including guided mindfulness practices (e.g., body scan, sitting meditation, mindful movement), group discussions, and psychoeducational components focused on stress awareness and emotional regulation. Additionally, participants are encouraged to dedicate daily time to mindfulness through formal exercises, such as guided meditation, and informal practices, by applying mindfulness to daily activities. In this study, participants were encouraged to engage in daily home practice of approximately 20–30 minutes and were provided with supporting materials, including guided audio recordings and written instructions. The program was delivered by a trained instructor with experience in mindfulness-based interventions. Adherence to the intervention was assessed through session attendance, and participants who attended the majority of sessions were considered to have completed the program. No formal fidelity monitoring procedures were implemented; however, the program followed a standardized MBSR structure.

2.3.2. Psychometric scales

Participants completed the following psychometric scales:

- (i) Self-administered sociodemographic questionnaire: This questionnaire collects data on sex, age, marital status, living conditions, specialization, and year of training, as well as lifestyle habits or interventions that might affect stress levels (e.g., exercise, smoking, alcohol, substance use, past or ongoing psychotherapy).
- (ii) Maslach Burnout Inventory (MBI): This 22-item self-report scale, developed by Christina Maslach and Susan E. Jackson, assesses burnout across three core dimensions:
 - (a) Emotional exhaustion (MBI-EE): Assesses feelings of emotional depletion, fatigue, and being overwhelmed by work demands. This dimension reflects the core stress component of burnout and captures the extent to which individuals feel drained and unable to give of themselves psychologically. Scores range from 0 to 54.
 - (b) Depersonalization (MBI-DP): Evaluates emotional detachment, cynicism, and a distant or impersonal attitude toward patients or clients. This dimension reflects a defensive coping mechanism in response to chronic stress, characterized by reduced empathy and a tendency to treat others in a detached or dehumanized manner. Scores range from 0 to 30.
 - (c) Reduced personal accomplishment (MBI-RP): Measures a diminished sense of professional efficacy, achievement, and competence at work. Lower scores indicate a reduced perception of effectiveness and usefulness, reflecting feelings of inadequacy and decreased satisfaction with one's professional role. Scores range from 0 to 48.
- (iii) Self-Rating Anxiety Scale (SAS-20): This 20-item self-report instrument assesses the frequency and severity of anxiety symptoms. Raw scores were converted into standardized index scores (raw score $\times$ 1.25) according to the original scoring procedure, with higher values indicating greater levels of anxiety. Standardized scores range from 25 to 100.
- (iv) Patient Health Questionnaire-9 (PHQ-9): This tool evaluates the severity of depressive symptoms through nine questions about the participant's feelings and behaviors over the past two weeks. Scores range from 0 to 27, with higher scores indicating more severe depression.
- (v) Insomnia Severity Index (ISI): This self-assessment questionnaire consists of seven questions about the nature and impact of insomnia, with scores ranging from 0 to 4 per question. Higher scores reflect greater severity of insomnia. Total scores range from 0 to 28, with higher scores indicating greater insomnia severity.
- (vi) Multidimensional Mentalizing Questionnaire (MMQ): This 33-item self-administered questionnaire assesses mentalization through six dimensions, divided into positive and negative aspects. Higher scores in positive dimensions reflect better mentalizing capacities, whereas higher scores in negative dimensions reflect greater mentalizing difficulties.
 - (a) Reflexivity (MMQ-R): Positive dimension related to understanding the deeper meaning of life events.
 - (b) Ego-strength (MMQ-Eg): Positive dimension related to managing daily challenges and painful experiences effectively.
 - (c) Relational Attunement (MMQ-RA): Positive dimension referring to tuning into others' emotional and cognitive states.
 - (d) Relational Discomfort (MMQ-RD): Negative dimension indicating discomfort and difficulty in interpersonal interactions.

- (e) Distrust (MMQ-D): Negative dimension reflecting a closed mindset and distrust in interpersonal relationships.
- (f) Emotional Dyscontrol (MMQ-ED): Negative dimension related to impulsivity and difficulty managing emotional aspects of one's experience.

2.3.3. Feasibility questionnaire

At the end of the study, a feasibility questionnaire was administered to participants in the intervention group who completed the MBSR program. This questionnaire, consisting of 14 questions, explored various aspects such as:

- (i) Participants' satisfaction and the program's impact on their personal lives, interpersonal relationships, work environment, and clinical practice.
- (ii) Benefits, challenges, and obstacles encountered during the MBSR program.
- (iii) Organizational aspects, including scheduling, location, and implementation methods.

Participants in the intervention group who did not complete the program were asked to respond to a single question, selecting from a list the reasons for their discontinuation. The questionnaire is provided in the supplementary material.

2.4. Confidentiality of information and ethical considerations

The personal data of enrolled subjects were processed in accordance with Legislative Decree 196/03, the EU General Data Protection Regulation (GDPR), and all other applicable regulations. Data were exported in a pseudo-anonymized format for statistical analysis. All participants provided written informed consent prior to the initiation of any research procedures. The study was conducted in accordance with the ethical standards of the 1964 Declaration of Helsinki and its later amendments. Ethical approval was obtained from the Internal Ethics Review Board of Psychological Research (IERB) under protocol number IERB-Edunict-2024.08.01/02.

2.5. Statistical analysis

Statistical analyses were primarily focused on feasibility and acceptability outcomes, including recruitment capability, participant retention, adherence to the intervention, and satisfaction with the MBSR program. These outcomes were summarized using descriptive statistics derived from the feasibility questionnaire and study participation data.

Descriptive analyses were also conducted on the sociodemographic characteristics of the two study arms. Baseline comparisons between groups, including

psychometric scale scores, were performed using the Mann–Whitney *U* test.

Exploratory analyses of clinical and psychological outcomes were conducted to assess preliminary changes in burnout, anxiety, depression, insomnia, and mentalizing dimensions following the intervention. Between-group comparisons at post-intervention and comparisons of pre–post score changes were performed using the Mann–Whitney *U* test and the Wilcoxon signed-rank test, depending on whether analyses involved paired or unpaired data.

The primary analyses were conducted using a per-protocol approach, including only participants who completed both baseline and post-intervention assessments. Given the exploratory and pilot nature of the study, as well as the limited sample size, no imputation methods were applied for missing data, and analyses were conducted on available cases only.

Finally, a sample size estimation was performed to inform the design of future adequately powered studies. The estimation was based on burnout scale results using the two-sided Mann–Whitney *U* test with Monte Carlo simulations conducted in PASS 2021 software.

Statistical analyses were performed using STATA 18 (StataCorp, USA). Given the exploratory nature of the analyses and the limited sample size, *p*-values were interpreted descriptively, with statistical significance set at $p < 0.05$.

3. Results

A total of 49 participants were recruited, with 25 included in the intervention group and 24 in the control group. Six participants in the intervention group did not complete the MBSR program, resulting in a final per-protocol sample of 19 participants in this group. In the control group, four participants withdrew during follow-up and were not included in the final analysis, resulting in 20 participants in the control group. Therefore, exploratory outcome analyses were conducted on a per-protocol sample of 39 participants.

Feasibility data were collected from participants who completed the intervention ($n = 19$) and from those who discontinued the program prematurely ($n = 6$). A participant flow diagram summarizing enrollment, follow-up, and analysis is presented in [Figure 1](#).

[Table 1](#) presents the descriptive sociodemographic characteristics of the study sample, while [Table 2](#) reports baseline psychometric scores for both groups. No statistically significant between-group differences were observed at baseline for most sociodemographic

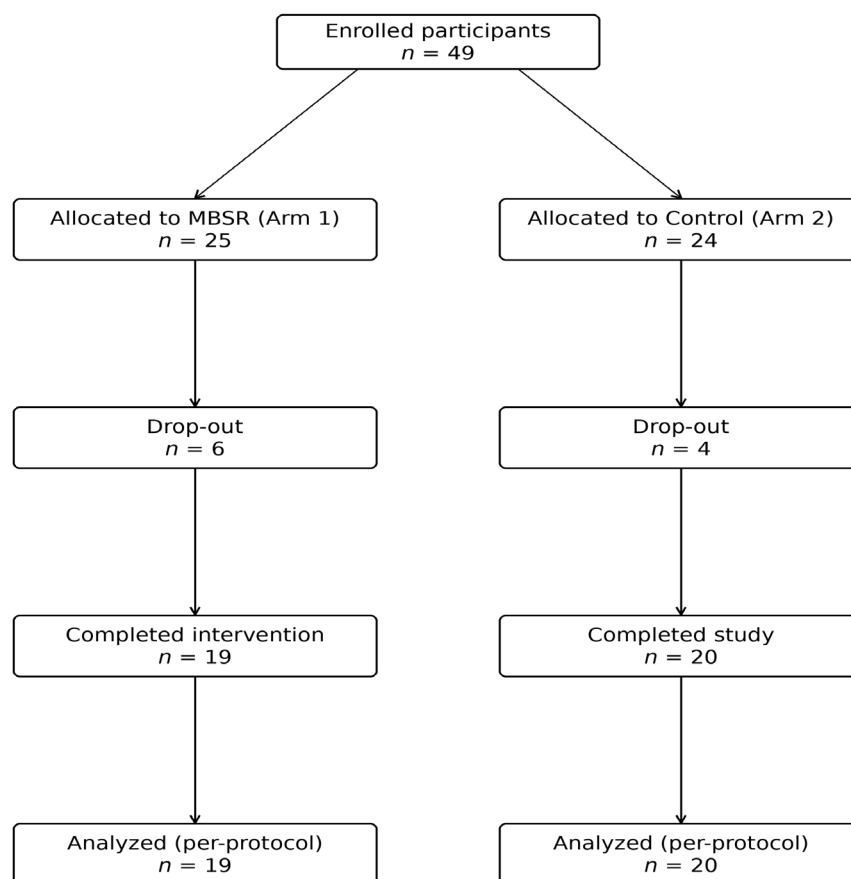


Figure 1. Participant flow diagram

or psychometric variables, with the exception of the MBI personal accomplishment subscale. Participants in the control group showed higher baseline scores in this dimension, indicating a greater perceived sense of professional efficacy.

Feasibility findings derived from the post-intervention questionnaire are summarized in Table 3. Overall, participants reported good acceptability and satisfaction with the MBSR program, although difficulties related to time availability and home practice adherence were frequently reported among participants who discontinued the intervention.

Exploratory analyses of clinical and psychological outcomes are presented in Tables 4 and 5. Table 4 reports post-intervention psychometric scores for both groups. A modest between-group difference was observed for the emotional exhaustion subscale of the MBI, although this finding should be interpreted cautiously, given the exploratory nature of the study and the limited sample size.

Table 5 summarizes pre-post changes in psychometric

scores across study outcomes. No statistically significant between-group differences were observed for most exploratory outcomes. Significant within-group improvements were observed in the control group for the MBI depersonalization and reduced personal accomplishment subscales ($p = 0.0018$ and $p = 0.0026$, respectively), whereas no significant within-group changes emerged in the intervention group.

Finally, a sample size estimation based on burnout scale results was performed to inform the design of future adequately powered studies. Based on the most conservative scenario related to the MBI-RP indicator, an estimated sample size of 150 participants per group would provide 80% power to detect a mean difference of 0.5 (assuming a standard deviation of 1.5 in both groups) using a two-sided Mann–Whitney U test with an alpha level of 0.05. Estimates were based on 2000 Monte Carlo simulations from a normal distribution.

4. Discussion

Our pilot study aimed to highlight the strengths and

Table 1. Sociodemographic characteristics of the intervention and control groups

Characteristic	Total (<i>n</i> = 39)	Intervention group (<i>n</i> = 19)	Control group (<i>n</i> = 20)	<i>p</i> -value
Age (Median)	27.76	27.45	28.06	0.916
Gender				0.073
Male	14 (35.90)	4 (21.05)	10 (50.00)	
Female	25 (64.10)	15 (78.95)	10 (50.00)	
Marital status				0.9707
Single	37 (94.87)	18 (94.74)	19 (95.00)	
Married	2 (5.13)	1 (5.26)	1 (5.00)	
Divorced	0 (0.00)	0 (0.00)	0 (0.00)	
Widowed	0 (0.00)	0 (0.00)	0 (0.00)	
Living condition				0.448
Lives alone	13 (33.33)	5 (26.32)	8 (40.00)	
Lives with family of origin	10 (25.64)	4 (21.05)	6 (30.00)	
Lives with same-age roommates	6 (15.38)	6 (31.58)	0 (0.00)	
Lives with partner	10 (25.64)	4 (21.05)	6 (30.00)	
Specialization				0.926
Psychiatry	29 (74.36)	14 (73.68)	15 (75.00)	
Child Neuropsychiatry	10 (25.64)	5 (26.32)	5 (25.00)	
Year of study				0.495
First year	16 (41.03)	8 (42.11)	8 (40.00)	
Second year	12 (30.77)	7 (36.84)	5 (25.00)	
Third year	6 (15.38)	3 (15.79)	3 (15.00)	
Fourth year	5 (12.82)	1 (5.26)	4 (20.00)	
Physical exercise				0.829
None	8 (20.51)	3 (15.79)	5 (25.00)	
Light	20 (51.28)	11 (57.89)	9 (45.00)	
Moderate	11 (28.21)	5 (26.32)	6 (30.00)	
Intense	0 (0.00)	0 (0.00)	0 (0.00)	
Smoking				0.340
Yes	11 (28.21)	5 (26.32)	6 (30.00)	
No	28 (71.79)	15 (78.95)	13 (65.00)	
Alcohol				0.412
Abstinent	5 (12.82)	3 (15.79)	2 (10.00)	
Occasionally	22 (56.41)	11 (57.89)	11 (55.00)	
Only on weekends	8 (20.51)	4 (21.05)	4 (20.00)	
Regularly	4 (10.26)	1 (5.29)	3 (15.00)	
Other substances				1
Yes	0 (0.00)	0 (0.00)	0 (0.00)	
No	39 (100.00)	19 (100.00)	20 (100.00)	

(cont'd...)

Table 1. (Continued)

Characteristic	Total (<i>n</i> = 39)	Intervention group (<i>n</i> = 19)	Control group (<i>n</i> = 20)	<i>p</i> -value
Current psychotherapy				0.562
Yes	12 (30.77)	5 (26.32)	7 (35.00)	
No	27 (69.23)	14 (73.68)	13 (65.00)	
Past psychotherapy				0.842
Yes	15 (38.46)	7 (36.84)	8 (40.00)	
No	24 (61.54)	12 (63.16)	12 (60.00)	

Notes: Data are presented as *n* (%) unless otherwise indicated. Percentages were calculated using the number of available cases in each column as the denominator: total, *n* = 39; intervention group, *n* = 19; control group, *n* = 20. No missing data were observed for sociodemographic variables.

Table 2. Median and associated measure of dispersion for each scale administered to both groups at the beginning of the MBSR program

Tool	Intervention group, Median (IQR)	Control group, Median (IQR)	<i>p</i> -value
SAS-20	43.75 (40–55)	43.13 (36.3–47.5)	0.3044
PHQ-9	6 (4–9)	5 (2–10.5)	0.5919
ISI	4 (3–9)	7 (3–8)	0.7130
MBI-EE	20 (14–27)	27 (18–32.5)	0.1151
MBI-DP	11 (8–13)	12 (11–18.5)	0.5912
MBI-RP	21 (15–23)	26 (23–32)	0.0017
MMQ-R	37 (31–40)	37 (32–39.5)	0.7644
MMQ-Eg	17 (15–21)	19 (15.5–21)	0.6716
MMQ-RA	19 (15–21)	19.5 (15–21.5)	0.5430
MMQ-RD	10 (8–13)	12 (8–15.5)	0.4288
MMQ-D	10 (8–11)	9 (7–13)	0.8541
MMQ-ED	10 (7–12)	9 (7–14.5)	0.4803

Abbreviations: IQR: Interquartile range; ISI: Insomnia Severity Index; MBI-DP: Maslach Burnout Inventory - Depersonalization; MBI-EE: Maslach Burnout Inventory - Emotional Exhaustion; MBI-RP: Maslach Burnout Inventory - Reduced Personal Accomplishment; MMQ-D: Multidimensional Mentalizing Questionnaire - Distrust; MMQ-ED: Multidimensional Mentalizing Questionnaire - Emotional Dyscontrol; MMQ-Eg: Multidimensional Mentalizing Questionnaire - Ego-strength; MMQ-R: Multidimensional Mentalizing Questionnaire - Reflexivity; MMQ-RA: Multidimensional Mentalizing Questionnaire - Relational Attunement; MMQ-RD: Multidimensional Mentalizing Questionnaire - Discomfort; PHQ-9: Patient Health Questionnaire-9; SAS-20: Self-Rating Anxiety Scale-20.

challenges of implementing a mindfulness program to reduce burnout levels and improve mental health among residents, as well as to determine the sample size required for a subsequent trial to assess the effectiveness of such a program on residents' mental health. The hypothesis was that incorporating stress reduction programs into the training curricula of mental health residents could positively impact patient care and the quality of services

provided.

Regarding clinical outcomes, the overall pattern of results does not provide consistent evidence of clinically meaningful between-group differences but suggests preliminary signals that warrant further investigation. In particular, the only difference, albeit modest, between groups emerged in the emotional exhaustion dimension of

Table 3. Feasibility study results for participants who completed the MBSR program and for participants who withdrew from the program prematurely

Participants who completed the intervention	<i>n</i>	%
Q-1. Overall, how satisfied are you with this experience?		
Quite satisfied	0	0
Indifferent or moderately satisfied	9	47.4
Mostly satisfied	7	36.8
Very satisfied	3	15.8
Q-2. Have you found that the program had a positive benefit/impact on yourself?		
Not at all useful	1	5.3
Somewhat useful	9	47.4
Mostly useful	6	31.6
Very useful	3	15.8
Q-3. And on your interpersonal relationships?		
Not at all useful	4	21.1
Somewhat useful	7	36.8
Mostly useful	6	31.6
Very useful	2	10.5
Q-4. And on your relationship with colleagues?		
Not at all useful	4	21.1
Somewhat useful	6	31.6
Mostly useful	8	42.1
Very useful	1	5.3
Q-5. And on your clinical practice?		
Not at all useful	3	15.8
Somewhat useful	8	42.1
Mostly useful	6	31.6
Very useful	2	10.5
Q-6. What have you learned? What do you consider to be the benefits of participating? (up to 3 words)		
Calm, relaxation, anxiety reduction	8	42.11
Concentration, control, focusing on the moment	7	36.84
Sharing, communication	3	15.79
No benefit	1	5.26
Q-7. What were the main challenges you encountered during the program? What would you suggest changing for future programs? (up to 3 words)		
Nothing, don't know	5	26.32
Time, completing daily tasks	8	42.11
Shyness in sharing	6	31.58

(cont'd...)

Table 3. (Continued)

Participants who completed the intervention	<i>n</i>	%
Q-8. What were the main obstacles you encountered during the program?		
Lack of time	6	31.57
Level of mood/health/energy	4	21.05
Day and time of the group meeting not suitable	2	10.53
Amount of daily commitment required (daily homework)	5	26.32
Other	2	10.53
Q-9. Was the course location easily accessible?		
Yes	18	94.74
No	1	5.26
Q-10. Were the proposed times suitable?		
Yes	15	78.95
No	4	21.05
Q-11. What time slot would you have preferred?		
Morning	2	10.53
Afternoon	8	42.10
Evening	9	47.37
Q-12. Would you have preferred to have the course held directly at your workplace?		
Yes	15	78.95
No	4	21.05
Q-13. Would you have preferred an online course?		
Yes	0	0
No	19	100
Q-14. Did attending the program with your work colleagues make you feel uncomfortable?		
Not at all	5	26.32
Somewhat	7	36.84
Quite a bit	6	31.58
Very much	1	5.26
Participants who discontinued the intervention prematurely		
Q-15. What caused you to withdraw from the course before its completion?		
Personal/work commitments not compatible with the course schedule	3	50
The time required for daily personal practice	0	0
Lack of interest in the topics covered	1	16.67
I expected a more theoretical course	0	0
I expected a relaxation program		0
Other	2	33.33

Abbreviation: MBSR: Mindfulness-based stress reduction.

Table 4. Median and IQR for each scale administered to both groups at the end of the MBSR program

Tool	Intervention group, (Median (IQR))	Control group, Median (IQR)	<i>p</i> -value
SAS-20	42.5 (37.5–51.25)	43.75 (37.5–48.75)	0.8547
PHQ-9	5 (4–8)	7 (2.5–9)	0.9775
ISI	5 (2–7)	4 (2–5.5)	0.4029
MBI-EE	17 (12–22)	22 (16–26.5)	*0.0487
MBI-DP	10 (8–13)	10.5 (7.5–13.5)	0.5912
MBI-RP	20 (14–23)	21.5 (17.5–23)	0.2197
MMQ-R	34 (27–41)	37 (27.5–40.5)	0.7143
MMQ-Eg	18 (15–21)	17.5 (15.5–19.5)	0.8436
MMQ-RA	16 (15–19)	19 (14.5–22)	0.4043
MMQ-RD	9 (8–11)	9 (6.5–12)	0.7767
MMQ-D	8 (7–10)	8 (6.5–10)	0.9434
MMQ-ED	8 (7–11)	7.5 (6–14)	0.7025

Note: * $p < 0.05$.

Abbreviations: IQR: Interquartile range; ISI: Insomnia Severity Index; MBI-DP: Maslach Burnout Inventory - Depersonalization; MBI-EE: Maslach Burnout Inventory - Emotional Exhaustion; MBI-RP: Maslach Burnout Inventory - Reduced Personal Accomplishment; MMQ-D: Multidimensional Mentalizing Questionnaire - Distrust; MMQ-ED: Multidimensional Mentalizing Questionnaire - Emotional Dyscontrol; MMQ-Eg: Multidimensional Mentalizing Questionnaire - Ego-strength; MMQ-R: Multidimensional Mentalizing Questionnaire - Reflexivity; MMQ-RA: Multidimensional Mentalizing Questionnaire - Relational Attunement; MMQ-RD: Multidimensional Mentalizing Questionnaire - Relational Discomfort; PHQ-9: Patient Health Questionnaire-9; SAS-20: Self-Rating Anxiety Scale-20.

Table 5. Median score differences (pre- vs. post-MBSR) for each scale in both groups

Tool	Median Δ Score – Intervention group 1		Median Δ Score – Control group 2	
	(Median; IQR)	<i>p</i> -value	(Median; IQR)	<i>p</i> -value
SAS-20	2.5 (–2.5–10)	0.1408	–0.6 (–3.1 –3.1)	0.8222
PHQ-9	0 (–2–3)	0.3953	0 (–3–3)	0.8214
ISI	0 (–2–3)	0.6705	1.5 (–1–3.5)	0.0878
MBI-EE	3 (–1–8)	0.0697	3.5 (–1–6.5)	0.0561
MBI-DP	1 (–3–3)	0.4795	2.5 (–1–5)	0.0018
MBI-RP	1 (–2–5)	0.2501	5 (–1–10)	0.0026
MMQ-R	2 (–1–4)	0.1351	0 (–3.5–6.5)	0.5250
MMQ-Eg	–1 (–3–2)	0.9035	1 (–1–3)	0.3093
MMQ-RA	0 (–1–3)	0.2892	1 (–1–1)	0.4323
MMQ-RD	1 (–1–3)	0.2061	2 (–1–3.5)	0.0759
MMQ-D	2 (0–3)	0.1650	1 (–0.5–2.5)	0.0643
MMQ-ED	1 (0–2)	0.0658	0.5 (0–2)	0.0785

Note: *p*-values refer to within-group pre-post comparisons performed using the Wilcoxon signed-rank test.

Abbreviations: IQR: Interquartile range; ISI: Insomnia Severity Index; MBI-DP: Maslach Burnout Inventory - Depersonalization; MBI-EE: Maslach Burnout Inventory - Emotional Exhaustion; MBI-RP: Maslach Burnout Inventory - Reduced Personal Accomplishment; MMQ-D: Multidimensional Mentalizing Questionnaire - Distrust; MMQ-ED: Multidimensional Mentalizing Questionnaire - Emotional Dyscontrol; MMQ-Eg: Multidimensional Mentalizing Questionnaire - Ego-strength; MMQ-R: Multidimensional Mentalizing Questionnaire - Reflexivity; MMQ-RA: Multidimensional Mentalizing Questionnaire - Relational Attunement; MMQ-RD: Multidimensional Mentalizing Questionnaire - Relational Discomfort; PHQ-9: Patient Health Questionnaire-9; SAS-20: Self-Rating Anxiety Scale-20.

burnout. This finding is consistent with existing literature, which indicates that this dimension is more sensitive to change following mindfulness-based interventions compared to other subscales of the Maslach Burnout Inventory, as observed, for example, in studies conducted among nursing staff.²⁶ One possible interpretation is that mindfulness-based practices may support emotional regulation and stress awareness, domains closely related to emotional exhaustion. In this sense, an improvement in emotional exhaustion may be consistent with reduced perceived emotional overload during clinical work.

Importantly, the present study specifically focused on psychiatric residents, a population that may be particularly vulnerable to burnout due to the high emotional and relational demands of their clinical work. Unlike other medical specialties, psychiatric practice requires continuous engagement with patients' subjective experiences, emotional distress, and complex interpersonal dynamics. This constant exposure may increase the risk of emotional exhaustion and challenge professional identity, making interventions targeting emotional awareness and regulation, such as MBSR, particularly relevant in this context.

An additional point of interest concerns the personal accomplishment dimension of burnout. However, because baseline differences were already present between groups for this subscale, changes over time should be interpreted cautiously. Although previous studies have suggested possible positive effects of MBSR on professional accomplishment among healthcare professionals,²⁷ the present findings remain preliminary and may also reflect non-specific contextual influences.

Importantly, the feasibility findings represent the most robust outcome of this study. Several interesting elements emerged from the feasibility questionnaire. According to the responses to the first seven questions, residents generally reported satisfaction with the program, noting benefits in various aspects of their relational and professional lives, as well as in clinical practice. Additionally, participants seemed to have gained a greater awareness of staying present and managing their emotions. However, the main obstacles were finding time for daily activities and practicing the techniques learned during the course.

Regarding organizational aspects of the course, participants preferred holding the program in the afternoon or evening and favored a location within the workplace. All participants expressed a preference for in-person courses over online ones.

An interesting finding from the final question pertains to the formation of groups consisting of their colleagues.

Although responses were not definitive, they suggested some discomfort among participants about attending the program with their peers. This sense of discomfort is quite common in groups composed of colleagues and is often highlighted by MBSR facilitators as a key challenge when organizing mindfulness programs in the workplace. This discomfort may also help explain the minimal differences in the questionnaire scores we observed. Since the MBSR program relies on participants disconnecting from their thoughts and openly sharing their emotional experiences with others during the sessions, feeling safe and comfortable is crucial. However, sharing such experiences with work colleagues may hinder this process.

Taken together, these findings suggest that while the clinical effects remain uncertain, the program appears acceptable and feasible within this population, supporting its implementation in future studies. Further research into modified MBSR protocols that take this issue into account would be beneficial, along with the creation of shorter modules tailored to specific work-related stressors, identified through prior needs assessments. Future studies may help clarify how these organizational aspects influence both participation and potential clinical outcomes.

Finally, the feasibility questionnaire was also administered to participants who did not complete the MBSR program. The predominant reason for premature dropout was a conflict between course schedules and personal or work commitments.

In summary, participants generally welcomed the MBSR program as it is structured. However, having a location within the workplace might enhance participation, and creating more mixed groups, possibly including non-healthcare staff, could be beneficial.

This study has several limitations. First, a major limitation is the absence of random allocation. Participation in the intervention group was based on self-selection, which may have introduced selection bias and limited causal inference. Second, the relatively high dropout rate in the intervention group may reflect feasibility challenges and could have introduced attrition bias. Participants who discontinued the intervention may differ systematically from those who completed it, potentially influencing the observed outcomes.

Third, the small sample size and single-center design limit the generalizability of the findings and reduce statistical power. Fourth, participants in the intervention group received the MBSR program in addition to institutional support services, while the control group had access only to the usual support. This difference in total intervention exposure may have contributed to observed outcomes and

complicates attribution solely to the mindfulness program. Fifth, the reliance on self-reported measures introduces the risk of response bias, including social desirability effects. Additionally, no correction for multiple testing was applied, increasing the risk of type I error. Lastly, the potential discomfort of sharing personal experiences in a group composed of colleagues may have influenced both engagement and outcome reporting. Finally, the absence of long-term follow-up limits conclusions regarding the durability of the observed effects, and a Hawthorne effect cannot be excluded.

Future studies should consider larger, multicentric samples, matched intervention exposure, and alternative delivery formats to enhance reliability and applicability.

5. Conclusion

In conclusion, this pilot feasibility study supports the acceptability and practical implementation of an MBSR program among psychiatry and child neuropsychiatry residents. Although exploratory analyses suggested possible signals in the emotional exhaustion dimension of burnout, the study was not designed to establish definitive clinical effectiveness, and findings should therefore be interpreted cautiously.

The study underscores the importance of carefully considering the organizational aspects of such programs, including scheduling, location, and group composition, to enhance participation and implementation. Future research should explore tailored mindfulness interventions to address specific work-related stressors and potentially expand the scope of participants to include mixed groups from various workplace sectors.

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Conflict of interest

Pasquale Caponnetto serves as one of the Editors-in-Chief of this journal, but was not in any way involved in the editorial and peer-review process conducted for this paper, directly or indirectly. The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Ethics approval and consent to participate

Ethical approval was obtained from the Internal Ethics Review Board of Psychological Research (IERB) under protocol number IERB-Edunict-2024.08.01/02. Written informed consent was obtained prior to participation in the study.

Consent for publication

Written informed consent for releasing their data and/or images in this paper was obtained from all participants prior to their inclusion in the study.

Availability of data

Data are available from the corresponding author upon reasonable request.

Further disclosure

The authors used AI-based tools (e.g., ChatGPT, OpenAI) to assist with the translation and language editing of this manuscript. All scientific content, study design, data analysis, and conclusions were entirely developed by the authors.

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Appendix

Feasibility and Acceptability Questionnaire

Q-1. Overall, how satisfied are you with this experience?

1. Quite dissatisfied
2. Indifferent or moderately satisfied
3. Mostly satisfied
4. Very satisfied

Q-2. Did you find that the program had a positive benefit/impact? On yourself:

1. Not at all useful
2. Somewhat useful
3. Mostly useful
4. Very useful

Q-3. On your interpersonal relationships:

1. Not at all useful
2. Somewhat useful
3. Mostly useful
4. Very useful

Q-4. On your relationships with colleagues:

1. Not at all useful
2. Somewhat useful
3. Mostly useful
4. Very useful

Q-5. On your clinical practice:

1. Not at all useful
2. Somewhat useful
3. Mostly useful
4. Very useful

Q-6. What have you learned? What do you consider to be the benefits of participating? (3 words)

Q-7. What were the main challenges you encountered during the program? What would you suggest changing for future programs? (3 words)

Q-8. What were the main obstacles you encountered during the program? (Multiple answers possible)

1. Lack of time
2. Level of mood/health/energy

3. Day and time of the group meeting not suitable
4. Amount of daily commitment required (daily homework)
5. Other

Q-9. Regarding the organization: Was the course location easily accessible?

1. YES
2. NO

Q-10. Were the proposed times suitable?

1. YES
2. NO

Q-11. What time slot would you have preferred?

1. Morning
2. Afternoon
3. Evening

Q-12. Would you have preferred to have the course held directly at your workplace?

1. YES
2. NO

Q-13. Would you have preferred an online course?

1. YES
2. NO

Q-14. Did attending the program with your work colleagues make you feel uncomfortable?

1. Not at all
2. Somewhat
3. Quite a bit
4. Very much

Q-15. (TO BE FILLED OUT ONLY IF YOU DID NOT COMPLETE THE PROGRAM) What caused you to withdraw from the course before its completion?

1. Personal/work commitments not compatible with the course schedule
2. The time required for daily personal practice
3. Lack of interest in the topics covered
4. I expected a more theoretical course
5. I expected a relaxation program
6. Other_____