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Original Article

Mindfulness-based group intervention in a public mental health service: preliminary evidence on transdiagnostic mechanisms of change

Valentina Panella[1], Silvia Catasta[1], Alessandro Ridolfi[1], Chiara Ghetti[1], Lorenzo Parenti[1,2]

[1] Department of Mental Health, Azienda USL Toscana Centro, Florence, Italy; [2]Psicoterapia e Scienze Cognitive, Genova, Italy

SUMMARY

Objectives

Transdiagnostic processes such as emotion dysregulation, worry, and rumination are implicated in the onset and persistence of diverse psychopathological conditions. Mindfulness-based interventions (MBIs) target these shared mechanisms and are particularly suitable for public mental health contexts, where patient populations are heterogeneous and resources are limited. This pilot study aimed to evaluate the effects of a group-based mindfulness program implemented within the Italian National Health Service (Servizio Sanitario Nazionale, SSN).

Methods

Ten adult patients (70% female; age range 21-63 years) were recruited from the Centro di Salute Mentale (CSM) di Scandicci Community Mental Health Center– (AUSL Toscana Centro). All were receiving psychiatric and/or psychotherapeutic care within the SSN. Participants completed self-report questionnaires before and after an 8-week group mindfulness program. Outcomes included mindfulness skills, emotion regulation, worry, rumination, dissociation and maladaptive daydreaming. Treatment satisfaction was also assessed.

Results

Paired-sample t-tests showed significant improvements in overall mindfulness skills, with notable increases in nonjudgment and acting with awareness. Reductions were observed in emotion regulation difficulties and pathological worry. Trends toward improvement were detected for rumination and dissociative symptoms, though not statistically significant. Correlation analyses indicated that higher mindfulness skills at post-treatment were associated with lower emotion dysregulation.

Conclusions

These preliminary findings suggest that group-based MBIs are feasible and clinically promising in public outpatient services. By targeting transdiagnostic mechanisms such as emotion dysregulation and worry, mindfulness groups may provide ecologically valid and sustainable interventions for heterogeneous clinical populations in the SSN.

Key words: mindfullenss-based intervention, transdiagnostic model, emotion regulation, rumination, public health services

Valentina Panella
E-mail: dott.valentinapanella@gmail.com

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Introduction

Traditional diagnostic systems such as DSM and ICD classify mental disorders into discrete categories [1]. However, this approach has been criticized for its limited ability to account for the high comorbidity, heterogeneity, and dimensional nature of clinical presentations [2]. In recent decades, transdiagnostic models have offered an alternative framework, emphasizing the role of shared psychological processes that cut across diagnostic boundaries and contribute to the development and persistence of

mental disorders [3,4]. Among the most widely studied are emotion dysregulation and repetitive negative thinking, which encompasses both worry and rumination. These processes are intrusive, persistent, and difficult to disengage from, and they have been linked to depression, anxiety, and stress-related conditions across the lifespan [5,6].

Recently, attention has also turned to dissociation and maladaptive daydreaming as potential transdiagnostic symptoms. Dissociative experiences, ranging from mild detachment to more severe disruptions of consciousness, have been linked to a variety of psychiatric conditions and are increasingly conceptualized as processes that cut across diagnostic categories [7]. Similarly, maladaptive daydreaming – a pattern of immersive and compulsive fantasy activity – has been proposed as a transdiagnostic phenomenon associated with psychological distress and functional impairment [8].

Public health systems, such as Italy's Servizio Sanitario Nazionale (SSN), face the additional challenge of providing care to heterogeneous populations under conditions of high demand and limited resources (Rapporto Wellfare e Salute 2025)*. In these settings, there is a growing need for ecological and sustainable interventions that are effective across diagnostic categories and feasible to implement with limited staff and time [9]. Recent population-based evidence also highlights how large-scale crises, such as natural disasters or pandemics, are associated with marked increases in psychiatric admissions and service burden [10], reinforcing the need for adaptable, transdiagnostic group interventions within public mental health systems. Group-based interventions are particularly advantageous, as they maximize scalability and cost-effectiveness while promoting peer support and common therapeutic factors [11]. Within this framework, interventions that target transdiagnostic mechanisms have high clinical relevance, as they can benefit patients with diverse diagnoses by addressing processes that underlie multiple forms of psychopathology.

Mindfulness-based interventions (MBIs) were originally developed for chronic stress management [12] and have since been applied across diverse psychiatric conditions [13,14].

Meta-analytic evidence supports their efficacy in reducing symptoms of anxiety, depression, and stress-related disorders, with small-to-moderate effect sizes across clinical populations across a range of psychiatric conditions [13,15]. Systematic reviews further indicate that MBIs exert beneficial effects on key transdiagnostic processes, including emotion regulation and perseverative cognition such as worry and rumination [16,17].

Specifically, evidence supports their efficacy in reducing symptom severity and enhancing psychological functioning [18]. By fostering awareness, acceptance, and nonjudgment, mindfulness reduces maladaptive regulation strategies such as avoidance and suppression, and mitigates worry and rumination [14].

Emerging research also suggests that mindfulness alleviates maladaptive daydreaming through grounding and self-regulation [18], and may decrease dissociative symptoms by enhancing attentional control and awareness [19,20].

Rather than targeting disorder-specific symptom clusters, MBIs appear particularly suited to transdiagnostic models of psychopathology, as they consistently impact processes that cut across diagnostic categories, such as emotion dysregulation, worry, and rumination [2,3]. Reviews indicate that improvements in these processes partially mediate symptom reduction across anxiety and mood disorders [15,16].

Mindfulness is best understood as a multifaceted construct. The Five Facet Mindfulness Questionnaire (FFMQ) [21] conceptualizes it across five dimensions: observing, describing, acting with awareness, non-judgment and non-reactivity. Facets reflect complementary mechanisms of change: for example, nonjudgment and acting with awareness are inversely associated with worry and rumination [13,14], while nonreactivity facilitates emotional regulation by reducing reactivity to distressing thoughts and feelings [12, 22].

Given this evidence, group-based MBIs represent a feasible and ecologically valid approach for public mental health settings, where heterogeneous clinical presentations benefit from interventions targeting shared transdiagnostic mechanisms. However, evidence from group-based MBIs delivered in clinical settings suggests small-to-moderate improvements in anxiety, emotional regulation, and related processes, with effects observed across heterogeneous diagnostic samples and both standardized and adapted intervention formats [13, 15]. However, most studies rely on controlled designs and larger samples, whereas evidence from naturalistic public mental health services remains limited.

The present study aimed to evaluate the effects of a group-based mindfulness program delivered in an Italian community mental health service. We assessed changes in mindfulness abilities (FFMQ) and in transdiagnostic symptoms, including difficulties in emotion regulation, pathological worry, rumination, dissociative symptoms, and maladaptive daydreaming. We also examined treatment satisfaction, as patient-reported

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outcomes are critical for evaluating feasibility in real-world public contexts.

We hypothesized that participation in the mindfulness-based group intervention would lead to significant increases in mindfulness abilities, as reflected in the total and subscale scores of the FFMQ. Correspondingly, we expected reductions in transdiagnostic symptoms as measured by the questionnaire scores presented in Section 2.4. Finally, we hypothesized that participants would report moderate to high levels of satisfaction with the intervention, supporting its feasibility and acceptability within a public mental health setting.

Materials and methods

Participants

Participants were recruited at the Centro di Salute Mentale (CSM) di Scandicci – Presidio Acciaiolo, part of the Azienda Sanitaria Locale (ASL) Toscana Centro, within the Italian National Health Service (Servizio Sanitario Nazionale, SSN). All participants were patients already receiving psychiatric and/or psychotherapeutic care at the outpatient facility.

Inclusion criteria were: age ≥ 18 years, preserved cognitive functioning, sufficient knowledge of the Italian language, and provision of informed consent. Exclusion criteria included comorbid diagnosis of intellectual disability, active substance abuse and over 65 years of age.

The final sample comprised 10 patients, of whom 7 were female (70%) and 3 male (30%), with ages ranging from 21 to 63 years (M = 41, SD = 17). Regarding treatment setting, 40% were in psychiatric care, 30% in psychological care, and 30% in multiprofessional treatment.

Within the sample, diagnostic heterogeneity was observed, consistent with the clinical variety typically encountered in public outpatient services.

According to ICD-9 classification and DSM-5 correspondence, one patient was diagnosed with panic disorder without agoraphobia (ICD-9: 300.01; DSM-5: Panic Disorder), two with unspecified anxiety disorder (ICD-9: 300.00; DSM-5: Unspecified Anxiety Disorder), one with major depressive disorder, recurrent episode (ICD-9: 296.30; DSM-5: Major Depressive Disorder, recurrent), and one with major depressive disorder, single episode (ICD-9: 296.22; DSM-5: Major Depressive Disorder, single episode). In addition, one patient met criteria for dysthymia (ICD-9: 300.04; DSM-5: Persistent Depressive Disorder), one for adjustment disorder with anxiety and depressed mood (ICD-9: 309.28; DSM-5: Adjustment Disorder with mixed anxiety and depressed mood), and one for attention-deficit/hyperactivity disorder (ICD-9: 314.01; DSM-5: ADHD, combined presentation). Further, one participant presented with disruptive mood and conduct disorder (ICD-9: 312.4; DSM-5: Disruptive, impulse-control, and conduct disorder), while another was classified under relational/family problems requiring clinical attention (ICD-9: V61.0; DSM-5: Other problems related to primary support group).

Diagnoses were established through routine clinical psychiatric assessment conducted within the public Adult Mental Health Service. Access to the service typically occurs via referral from a general practitioner. The initial psychiatric evaluation includes a comprehensive clinical interview covering personal, family, and psychiatric history, detailed assessment of current symptoms, and a structured mental status examination. Diagnostic formulation is performed by a psychiatrist, often in collaboration with a multidisciplinary team (e.g., psychologist, psychiatric nurse), and includes both categorical and dimensional evaluation of symptom severity and functional impairment in daily life.

ICD-9-CM diagnostic codes were reported because they are currently used within the administrative and clinical record system of the National Health Service (Servizio Sanitario Nazionale, SSN). To enhance international comparability and facilitate interpretation for readers outside the Italian healthcare context, corresponding DSM-5 diagnostic classifications were additionally provided.

Procedure

The study was conducted as a pre-post observational design within a naturalistic clinical context at the Centro di Salute Mentale (CSM) di Scandicci – Presidio Acciaiolo (ASL Toscana Centro). Patients were informed about the aims and procedures of the intervention and voluntarily agreed to participate. Written informed consent was obtained from all participants prior to enrollment.

The intervention was delivered in a group format, with pre-treatment assessments administered during the week preceding the program and post-treatment assessments conducted at the conclusion of the final session. Data collection included validated self-report questionnaires assessing mindfulness-related skills and transdiagnostic symptoms, as well as a brief questionnaire on treatment satisfaction. The program was carried out between February and May 2025.

The study was carried out in accordance with the ethical principles of the Declaration of Helsinki. Ethical approval was obtained from the competent Tuscany Region Ethics Committee - Area Vasta Centro (approval dated February 14, 2025), and was authorized by the Azienda USL Toscana Centro Management with protocol MBi2025 ID 28104 – Internal Ref. No. 85-24.

Intervention

The program consisted of a total of 10 sessions: one

initial meeting for group presentation and administration of baseline questionnaires (T0: FFMQ, DERS-SF, PSWQ, RRS, DES-II, MDS-16), eight intervention sessions, and one final meeting for post-treatment questionnaires (T1: FFMQ, DERS-SF, PSWQ, RRS, DES-II, MDS-16) and an ad hoc satisfaction questionnaire, followed by a structured debriefing.

The intervention consisted of a mindfulness-based group program inspired by the core principles of Mindfulness-Based Stress Reduction (MBSR) [12] and adapted to the context of a public Adult Mental Health Service. The program was not intended as a fully manualized MBSR protocol, but rather as a structured mindfulness-based intervention tailored to enhance feasibility and acceptability within a naturalistic public mental health setting.

Intervention sessions were conducted weekly in the evening and lasted 90 minutes. Although standard MBSR programs typically include two-hour sessions, session length was reduced in agreement with participants' availability and clinical needs. Consistent with mindfulness-based models, the intervention emphasized the integration of intention, attention, and attitude as core components of mindfulness practice, as well as the distinction between formal practices (e.g., sitting meditation, body scan, mindful movement) and informal practices (e.g., mindful engagement in daily activities), in order to target multiple transdiagnostic processes.

Each session followed a consistent structure, including: (a) a psychoeducational component focused on the session theme; (b) a formal mindfulness practice lasting approximately 30-40 minutes, followed by group sharing and reflection; and (c) assignment of home practice, including both formal practices supported by audio-guided recordings and informal mindfulness exercises to be integrated into daily life.

Several adaptations to the standard MBSR format were implemented to optimize suitability for a public mental health context. These included reduced session duration, omission of the full-day silent retreat, shorter and more guided formal practices, flexible and individualized home practice assignments, and the use of simplified and clinically oriented language to accommodate participants with heterogeneous psychiatric conditions and levels of functioning.

In addition, psychoeducation on stress was expanded through the integration of the Window of Tolerance framework, conceptualizing stress responses in terms

TABLE I. *Overview of the structure, thematic content, and formal and informal practices of the ten-session mindfulness-based group intervention.*

Session	Main focus	Psychoeducational content	Formal mindfulness practices	Home practice
1	Introduction to mindfulness	Definition of mindfulness; group rules; rationale and structure of the program	Sitting meditation focused on the breath	Breath awareness practice; mindful breathing
2	Exploring awareness	Introduction to mindfulness and automatic pilot	Raisin exercise	Mindful eating
3	Awareness of breath and body	Attention and present-moment awareness	Sitting meditation focused on the breath	Body scan practice; awareness of bodily sensations
4	Stress and the Window of Tolerance	The Window of Tolerance and the optimal arousal zone between hyperarousal and hypoarousal	Brief body scan and sitting meditation focused on the breath	Mindful engagement in daily activities
5	Emotional awareness	Recognition and acceptance of thoughts and emotions; non-judgmental attitude	Mindfulness of emotions	Emotion monitoring; brief daily practice
6	Thoughts and rumination	Relationship with thoughts; decentering	Observing thoughts meditation	Thought awareness diary; cognitive defusion
7	Acceptance and self-compassion	Non-judgment and kindness toward the self	Loving-kindness meditation	Self-compassion practice; daily informal exercises
8	Outdoor meditation practice	Fostering embodied and sensory awareness	Mindfulness of sounds and walking meditation	Mindfulness of sounds; walking meditation practice
9	Managing difficulties	Working with challenging internal experiences	Integrated mindfulness practices	Personalized choice of formal or informal practice
10	Consolidation and closure	Review of learned skills; maintenance planning	Review of core practices	Development of an individual maintenance plan

of hyperarousal and hypoarousal. This framework was included to better address transdiagnostic processes particularly relevant to the clinical population, such as emotion dysregulation and dissociative tendencies. To partially compensate for the absence of the full-day retreat and to support experiential learning, one session was conducted in an outdoor natural setting and was specifically dedicated to walking meditation and mindfulness practice in interaction with the environment.

Across the eight intervention sessions, thematic content progressively addressed key mindfulness-related and transdiagnostic processes, including awareness of bodily sensations and breathing, emotional awareness and regulation, observation of thoughts and rumination, acceptance of internal experiences, self-compassion, and application of mindfulness skills to everyday life and clinical difficulties (see Tab. I).

Groups were facilitated by one psychotherapist and one psychiatrist, both formally trained in mindfulness-based interventions and experienced with the MBSR framework. The intervention was designed to target transdiagnostic mechanisms of change, including dispositional mindfulness, emotion regulation, worry, rumination, and dissociative tendencies, in line with a dimensional approach to psychopathology.

Materials

Pre- and post-treatment outcomes were assessed with the following validated self-report questionnaires:

- Five Facet Mindfulness Questionnaire (FFMQ), measuring facets through the following subscales:
  - observing (attending to internal and external experiences),
  - describing (labeling them with words),
  - acting with awareness (engaging intentionally rather than automatically),
  - non-judgment (accepting inner experience without criticism or self-condemnation),
  - non-reactivity (allowing inner experience to pass without engagement).
- Difficulties in Emotion Regulation Scale – Short Form (DERS-SF), assessing clinically relevant emotion regulation difficulties;
- Penn State Worry Questionnaire (PSWQ), assesses the tendency to engage in excessive, uncontrollable worry;
- Ruminative Responses Scale (RRS), evaluates tendencies toward depressive rumination;
- Dissociative Experiences Scale – II (DES-II), measures frequency of dissociative symptoms experienced in daily life;
- Maladaptive Daydreaming Scale (MDS-16), assesses excessive and compulsive fantasy activity that interferes with daily functioning.

All questionnaires were administered in the first session (T0) and the final session (T1). In addition, a satisfaction questionnaire was developed ad hoc for this study and administered at T1. This measure was designed to capture participants' subjective experience of the intervention in a naturalistic clinical context and was not intended as a standardized or psychometrically validated outcome measure. The instrument consisted of five items rated on a 0-5 scale (0 = no perceived benefit/utility; 5 = maximum perceived benefit/utility), investigating: (1) perceived usefulness of the intervention for overall well-being, (2) willingness to engage in mindfulness treatment again, (3) perceived improvement in symptoms and (4) perceived impact on overall daily functioning. The questionnaire also included an open-ended item for qualitative feedback. The full questionnaire is reported in the Supplementary Materials.

Data Analysis

Final analyses examining pre–post changes in mindfulness skills and transdiagnostic symptoms were conducted on 9 of the 10 enrolled participants, as one participant did not complete all assessment measures. Analyses of treatment satisfaction were conducted on 8 participants, as two individuals did not return the final satisfaction questionnaire within the designated timeframe.

All statistical analyses were conducted using R Studio version 4.4.0 [23]. Descriptive statistics (means, standard deviations, frequencies, and percentages) were calculated to summarize demographic, clinical characteristics of the sample and post-treatment satisfaction questionnaire.

To assess the effects of the intervention, paired-sample t-tests were performed to compare pre- (T0) and post-treatment (T1) scores for each outcome measure (FFMQ, DERS-SF, PSWQ, RRS, DES-II, MDS-16). Effect sizes were calculated using Cohen's d with corresponding standard errors to estimate the magnitude of change.

In addition, Pearson's product-moment correlations were computed among post-treatment scores to explore associations between mindfulness skills and transdiagnostic symptom measures. The significance threshold was set at $p < .05$ (two-tailed). Data visualization was conducted using the ggplot2 package in R Studio.

Results

Demographics and Descriptives Statistics

The final sample consisted of ten participants (7 females, 3 males) with ages ranging from 21 to 63 years ($M = 41$, $SD = 17$). Forty percent of participants were in

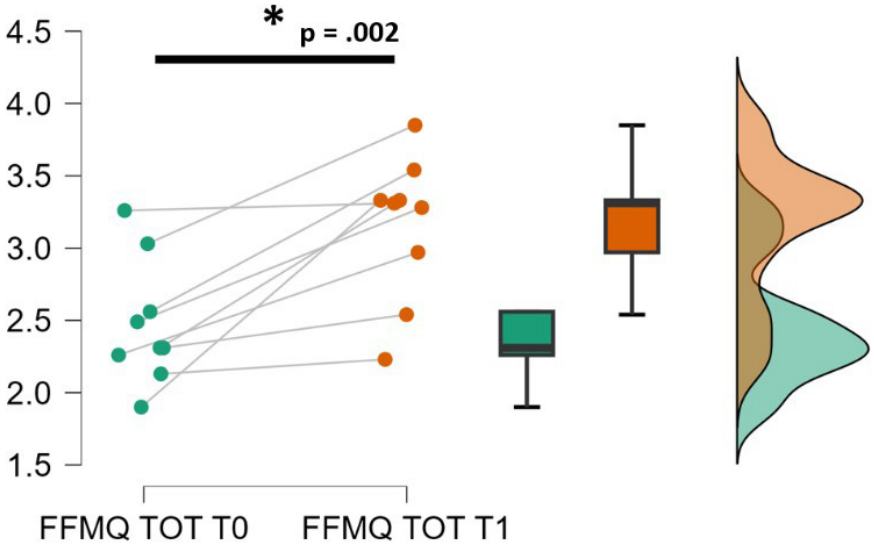


FIGURE 1. *Results of the paired-sample t-test on the total score of the Five Facet Mindfulness Questionnaire (FFMQ) before (T0) and after (T1) the intervention. Green bars represent pre-treatment (T0) scores, and orange bars represent post-treatment (T1) scores. Each panel illustrates individual participant changes (jittered lines), boxplots and group distributions before (T0) and after (T1) the mindfulness-based group intervention.*

psychiatric care, 30% in psychological care, and 30% in multiprofessional programs. Most participants (80%) were employed, and 60% reported satisfaction with family relationships.

Clinical diagnoses were heterogeneous, including anxiety, depressive, and adjustment disorders, as well as ADHD, conduct, and relational problems (see Section 2.1 for details). This diversity reflects the ecological validity of the sample and the transdiagnostic rationale of the intervention.

Pre-Post Changes in Mindfulness Skills

Paired-sample *t*-tests revealed a significant increase in total mindfulness skills as measured by the Five Facet Mindfulness Questionnaire (FFMQ). The overall FFMQ total score improved significantly from pre- to post-treat-

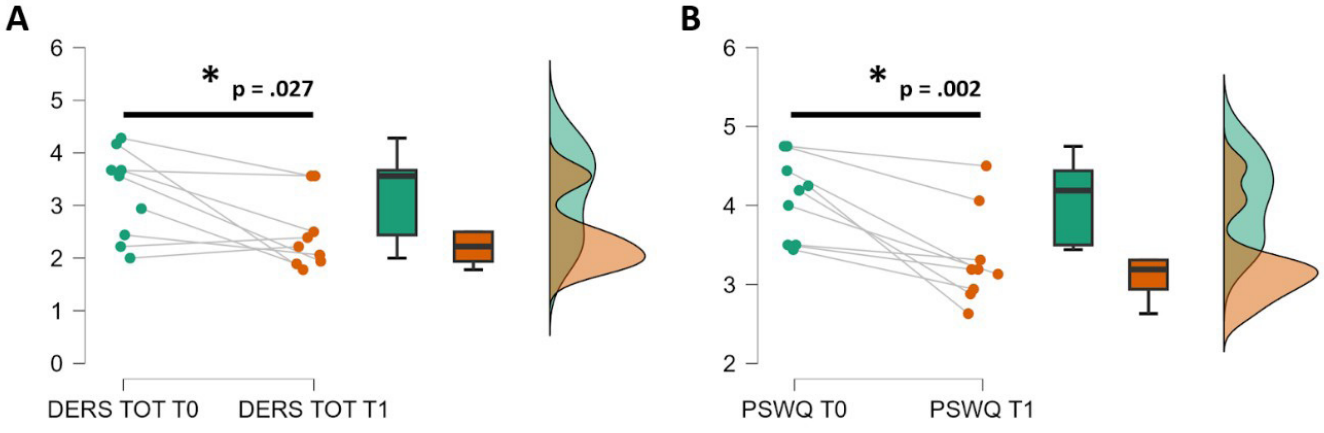


FIGURE 2. *Pre-post intervention changes in transdiagnostic symptom measures. (A) Difficulties in Emotion Regulation Scale – Short Form (DERS-SF) total scores and (B) Penn State Worry Questionnaire (PSWQ) total scores. Green bars represent pre-treatment (T0) scores, and orange bars represent post-treatment (T1) scores. Each panel illustrates individual participant changes (jittered lines), boxplots and group distributions before (T0) and after (T1) the mindfulness-based group intervention.*

ment ($t(8) = -4.386$, $p = .002$, $d = 1.46$, CI [-2.40, -0.48]) as shown in Figure 1.
Among subscales, significant increases were observed in *Observing* ($p = .015$, CI [-1.83, -0.19]), *Acting with Awareness* ($p = .007$, CI [-2.03, -0.30]), and especially *Non-judging of Inner Experience* ($p < .001$, CI [-3.01, -0.76]). *Describing* and *Non-reactivity* subscales showed non-significant but positive trends toward improvement ($p = .10$ and $p = .12$, respectively).
These findings indicate a substantial enhancement of core mindfulness abilities, particularly the capacity for non-judgmental awareness and intentional action, following group participation.

Effects on Transdiagnostic Symptoms

The mindfulness intervention was also associated with meaningful changes in transdiagnostic psychological processes.
Significant reductions were observed in emotion regulation difficulties (DERS-SF total, t(8) = 2.705, p = .027, d = 0.90, CI [0.1, 1.67]) (Fig. 2.A) and pathological worry (PSWQ, t(8) = 4.493, p = .002, d = 1.50, CI [0.51, 2.45]) (Fig. 2.B).
Non-significant but positive trends were found in rumination (RRS, p = .058, d = 0.74, ns), dissociative symptoms (DES-II, p = .083, d = 0.66, ns), and maladaptive daydreaming (MDS-16, p = .430, d = 0.18, ns).
Overall, these results suggest that participation in the mindfulness group not only enhanced mindfulness skills but also contributed to reductions in transdiagnostic mechanisms commonly implicated across psychopathologies.

Correlation analyses

Correlation analyses between post-treatment scores revealed significant associations between mindfulness skills and transdiagnostic outcomes. Specifically, higher FFMQ total scores were inversely correlated with emotion dysregulation ($r = -.67$, $p < .05$, CI [-0,92, -0.01]) and worry ($r = -.52$, $p = .15$, ns), and showed negative trends with rumination ($r = -.51$, $p = .16$, ns).
A strong positive correlation between emotion dysregulation and worry was also found ($r = .95$, $p < .001$, CI [0.78, 0.99]).

Treatment Satisfaction

Eight out of ten participants completed the post-treatment satisfaction questionnaire. Average total satisfaction was 14.88/20, corresponding to a high overall evaluation of the intervention (see Fig. 3). Most participants rated the program as *useful* ($M = 4.1/5$) and *applicable in the future* ($M = 4.6/5$), reporting moderate to high perceived benefits on symptom improvement ($M = 3.1/5$) and overall life quality ($M = 3.0/5$).

Discussion

The present pilot study provides preliminary and exploratory evidence that participation in a mindfulness-based group intervention was associated with im-

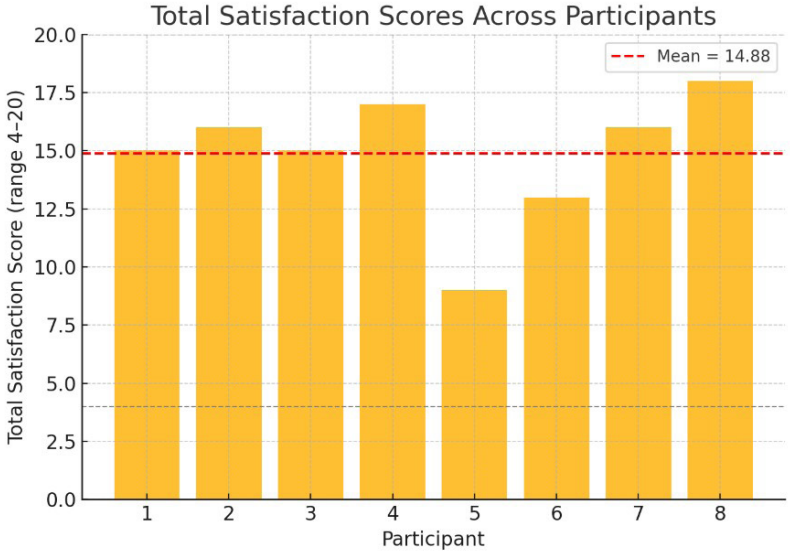


FIGURE 3. *Total satisfaction scores reported by participants following the mindfulness-based group intervention. Each bar represents an individual participant's total score (possible range: 4-20), with higher values indicating greater perceived benefit and satisfaction. The red dashed line represents the group mean satisfaction level.*

provements in dispositional mindfulness and selected transdiagnostic processes within a naturalistic public mental health setting, particularly in the facets of non-judging and acting with awareness, accompanied by reductions in emotion dysregulation and worry. Moderate improvements were also observed in rumination, dissociative experiences, and maladaptive daydreaming. Correlation analyses further indicated that greater post-treatment mindfulness abilities were associated with lower emotion dysregulation, suggesting that enhanced mindfulness skills may contribute to the reduction of transdiagnostic symptoms. Although a strong association emerged between emotion dysregulation and worry, this result must be interpreted with considerable caution. With a very small sample, correlation coefficients can be highly unstable and may overestimate the strength of associations. The wide confidence intervals observed reflect this uncertainty and limit generalizability. Thus, these findings should be considered preliminary and hypothesis-generating.

Participants also reported high satisfaction, supporting the feasibility and acceptability of this intervention in real-world public health settings.

The findings align with transdiagnostic models of psychopathology [2,3], which emphasize that common underlying mechanisms – such as emotion dysregulation, worry, and repetitive negative thinking – contribute to the development and persistence of a wide range of mental disorders. The improvements observed in the present study are consistent with recent evidence showing that targeting such shared processes can yield benefits across diagnostic categories [4-6].

Mindfulness-based interventions are particularly well-suited to this framework because they enhance awareness, cognitive flexibility, and emotion regulation [12,14]. By cultivating non-judgmental awareness and attentional control, MBIs address cognitive-emotional loops that sustain psychopathology, including maladaptive worry and rumination [13,22]. In this study, the significant link between FFMQ and DERS scores suggests that increased mindfulness may modulate these processes, supporting a process-based understanding of therapeutic change.

Of particular interest are the preliminary reductions observed in dissociative experiences and maladaptive daydreaming, two emerging constructs recently proposed as transdiagnostic phenomena. Dissociation has been identified as a multidimensional process present across diagnostic boundaries [7], while maladaptive daydreaming has been linked to emotional dysregulation and avoidance in diverse psychopathological conditions [8]. Both appear to respond positively to mindfulness and self-monitoring interventions [18-20], consistent with the modest yet meaningful improvements found here.

The current results are in line with meta-analytic evidence demonstrating that MBIs effectively reduce symptoms of anxiety, depression, and stress across clinical populations [13]. Previous studies have shown that the facets of non-judgment and acting with awareness are central to symptom improvement and emotional resilience [14,22]. Similar to the present findings, transdiagnostic cognitive-behavioral interventions have yielded comparable outcomes in emotion regulation and repetitive thinking [4,11].

Furthermore, these results echo the public health perspective articulated by Martin et al. (2018) [9], who argue that transdiagnostic, process-based interventions are critical for broadening the accessibility and impact of evidence-based treatments. In this context, integrating mindfulness groups into multidisciplinary community services offers an ecologically valid and resource-efficient approach, aligning with the DSM-5's dimensional understanding of mental disorders [1].

Beyond replicating established effects of MBIs on anxiety-related processes, the present study extends existing evidence by exploring dissociative symptoms and maladaptive daydreaming as emerging transdiagnostic targets within a public mental health context. To our knowledge, few studies have examined these constructs within group-based mindfulness interventions delivered in routine clinical services. This exploratory focus represents a novel contribution to the literature and provides a rationale for future controlled investigations.

The present findings underscore the clinical feasibility and ecological validity of implementing mindfulness-based group interventions in public mental health services. Such programs provide an effective and sustainable means of addressing transdiagnostic factors – such as emotion dysregulation and worry – that are pervasive across diagnostic categories. The group format further supports scalability and peer learning, which are essential in resource-limited public contexts.

From a service-level perspective, group-based transdiagnostic interventions may represent a flexible and resource-efficient response to fluctuating mental health demands in public healthcare systems. Evidence from population-based studies indicates that periods of collective stress and crisis are associated with increased psychiatric admissions and service utilization [10], underscoring the need for scalable interventions capable of addressing heterogeneous clinical needs.

From a clinical standpoint, embedding MBIs within the Italian National Health Service may enhance both preventive and therapeutic outcomes, complementing ongoing psychiatric and psychotherapeutic treatments. The high satisfaction levels reported by participants further suggest strong acceptability and integration potential within routine care. Although the observed pre–post changes were consistent with improvements in mindful-

ness skills and reductions in transdiagnostic symptoms, these findings must be interpreted with caution. Given the small sample size and the absence of a control group, it is not possible to attribute improvements exclusively to mindfulness-specific mechanisms. Changes may also reflect nonspecific therapeutic factors, including group cohesion, social support, expectancy effects, concurrent pharmacological or psychotherapeutic treatments, spontaneous symptom fluctuation, regression to the mean, or life events occurring during the intervention period. Therefore, the present results should be considered exploratory and hypothesis-generating rather than confirmatory evidence of clinical effectiveness.

Limitations

Some limitations of the present study should be considered when interpreting the findings. The small sample size inevitably limits the statistical power of the analyses and the extent to which the results can be generalized. Consequently, findings should be interpreted as exploratory and cannot support robust conclusions regarding effectiveness. However, as a pilot investigation, the study was primarily aimed at exploring feasibility and preliminary outcomes within a real-world clinical setting. In addition, participants were simultaneously involved in other treatment modalities provided by the public mental health service, such as pharmacotherapy, individual psychotherapy, or psychoeducational sessions. These concurrent interventions may have interacted with the mindfulness program, potentially contributing to the observed improvements.

With respect to measurement limitations, treatment satisfaction was evaluated using an ad hoc questionnaire developed for the present study, which has not been psychometrically validated. Therefore, satisfaction outcomes should be interpreted cautiously as preliminary and descriptive indicators rather than standardized measures of intervention acceptability.

Finally, the absence of a control group and lack of follow-up prevent firm conclusions about causality and the long-term maintenance of effects. Nonetheless, the consistent trends across multiple measures suggest that the observed changes are meaningful and warrant further investigation in larger, controlled studies.

Conclusions

In summary, this exploratory study suggests that a structured mindfulness-based group intervention can be feasibly implemented within a public mental health service and may be associated with improvements in mindfulness skills and selected transdiagnostic symptoms. However, due to the small sample size and uncontrolled design, these results should be interpreted as preliminary and hypothesis-generating and cannot support robust conclusions regarding effectiveness or mechanisms of change.

Future research should aim to replicate these results with larger and more representative samples, and to include control groups and follow-up assessments to evaluate the durability and specificity of observed effects. Exploring the mechanisms of change – for instance, how specific facets of mindfulness contribute to symptom improvement – may also clarify the processes through which MBIs exert their therapeutic impact.

Moreover, further studies conducted in public healthcare contexts could help refine and adapt mindfulness-based programs to ensure accessibility, sustainability, and cost-effectiveness. By targeting core transdiagnostic factors, mindfulness interventions may represent a valuable resource for promoting psychological well-being across a wide range of clinical populations.

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Conflict of interest statement

Authors declare no existing or potential conflict of interest.

Author contributions

The study was conceptualized and designed by V.P., S.C., A.R., C.G., and L.P. Data collection and delivery of the intervention were carried out by V.P., S.C., A.R., and C.G.. Data analysis was conducted by L.P. and V.P. The manuscript was drafted by L.P. and V.P., and all authors critically revised and approved the final version prior to submission.

Ethical consideration

The study was conducted in accordance with the principles of the Declaration of Helsinki. Ethical approval was obtained from the Ethics Committee of the Azienda Sanitaria Locale (ASL) Toscana Centro (reference number: MBi2025–ID 28104 – Internal Ref. No. 85-24) approved on February 14th, 2025. All participants were informed about the aims and procedures of the study and provided written informed consent prior to participation. Confidentiality and anonymity were ensured throughout the study.

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