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The impact of narrative exposure therapy on dysthymia and post-traumatic stress symptoms in nurses in the post COVID-19 period: a randomized clinical trial study

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Abstract

Background and objective The COVID-19 pandemic imposed profound psychological strain on frontline nurses. This randomized clinical trial aimed to evaluate the effects of Narrative Exposure Therapy (NET) on dysthymia and post-traumatic stress symptoms among nursing professionals in the post-pandemic period.

Materials and methods In this randomized controlled trial, 60 eligible nurses from two hospitals in Isfahan, Iran, were randomly assigned to intervention and control groups. The intervention group engaged in six weekly sessions of group NET, each lasting 90 min. The control group received treatment as usual and no active intervention. Data were collected using the Millon Clinical Multiaxial Inventory-III (MCMI-III) at baseline, post-intervention, and a one-month follow-up. Data analysis involved both descriptive and inferential statistical procedures using SPSS Version 21.

Result Baseline scores for dysthymia and post-traumatic stress symptoms were comparable between groups. The intervention group showed statistically significant reductions in symptom scores at post-intervention and one-month follow-up compared to baseline ($p < 0.001$). A significant time $\times$ group interaction was confirmed for both post-traumatic stress symptoms ($p < 0.001$, $\eta^2 = 0.441$) and dysthymia ($p = 0.02$, $\eta^2 = 0.65$), indicating substantially greater improvement in the NET group relative to the control group. No significant differences were observed between post-intervention and follow-up scores within the intervention group.

Conclusion NET effectively reduces dysthymia and post-traumatic stress symptoms in nurses. While these findings suggest that NET promotes mental health recovery, the short follow-up period limits conclusions regarding long-term durability. Future longitudinal research and more diverse sampling are warranted to establish the sustained efficacy of this intervention.

Clinical trial number (IRCT20230905059365N1) (<http://www.irct.ir/>) with the Clinical Trial Registry ({1}) and data of registration 2023-09-25.

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Keywords Narrative exposure therapy, Dysthymia, Post-traumatic stress, Nurses, COVID-19

Introduction

The COVID-19 pandemic imposed an unprecedented psychological burden on healthcare professionals, particularly nurses, who navigated overwhelming workloads and incessant exposure to critical illness and mortality [1]. Empirical evidence indicates that this period of intensive caregiving triggered significant mental health morbidity; approximately 22.8% of nursing staff reported symptoms consistent with dysthymia, while 29.1% met the diagnostic criteria for post-traumatic stress [2, 3]. These clinical challenges compounded by fear of personal infection, concerns regarding family transmission, and systemic stressors such as inadequate training and limited resources precipitated chronic psychological distress. Consequently, many nurses who navigated this crisis experienced enduring psychological instability, which has persisted well into the post-pandemic era [4–6].

If left unaddressed, these psychological sequelae, most notably persistent dysthymia and post-traumatic stress symptoms, exert a detrimental impact on both the personal well-being and professional efficacy of nurses [7–9]. Dysthymia often manifests as chronic fatigue, hopelessness, and impaired concentration, directly compromising the high-stakes decision-making required in clinical settings [10, 11]. Similarly, the persistent nature of post-traumatic stress characterized by intrusive memories and hypervigilance erodes self-efficacy and resilience. These conditions do not merely diminish an individual's quality of life; they pose a systemic threat to healthcare stability by compromising the quality of patient care and increasing the risk of professional burnout [12, 13].

While various therapeutic approaches, such as Cognitive Behavioral Therapy (CBT) and Eye Movement Desensitization and Reprocessing (EMDR), have demonstrated efficacy in managing trauma-related distress [14], Narrative Exposure Therapy (NET) offers distinct advantages for this population [15]. Unlike EMDR, which primarily utilizes bilateral stimulation to facilitate memory processing, or standard CBT, which emphasizes the cognitive restructuring of current thought patterns, NET adopts a comprehensive, life-span perspective. By assisting individuals in constructing a coherent, chronological narrative of their traumatic experiences, NET enables the contextualization of fragmented memories within a broader personal history. For nurses, whose distress is often woven into complex layers of professional and personal crisis, this approach is particularly transformative. Its group-based, culturally sensitive, and time-efficient format facilitates the collaborative reframing of crisis-induced distress in a peer-supported environment,

rendering it a uniquely practical and sustainable intervention for clinical staff [16–18].

Although meta-analyses consistently support the efficacy of NET in reducing both post-traumatic stress [11, 19] and depressive symptomatology [20], the long-term psychological recovery of nurses in the post-COVID period remains under-investigated. Prior research has predominantly focused on immediate, short-term crisis responses; however, the sustained sequelae specifically the prevalence and management of chronic post-traumatic stress and dysthymia that impede long-term professional functioning remain largely overlooked. Therefore, this study aims to systematically evaluate the effectiveness of NET in ameliorating symptoms of dysthymia and post-traumatic stress among nurses who navigated the COVID-19 crisis. By tailoring this intervention to the Iranian cultural context, which emphasizes verbalizing emotions this study, seeks to provide an evidence-based strategy to improve nurses' mental health and, consequently, the quality of healthcare delivery.

Materials and methods

Study design

This study was designed as a two-arm, parallel-group randomized controlled trial (RCT). Assessments were conducted at three time points: baseline (T0), immediately post-intervention (T1), and a one-month follow-up (T2). The follow-up was essential to evaluate the durability of the intervention effects.

Study setting and recruitment

The study was conducted at Al-Zahra and Amin hospitals in Isfahan, Iran both tertiary teaching hospitals affiliated with Isfahan University of Medical Sciences. The study population comprised nurses actively employed in these centers. Recruitment occurred from June to September 2024, approximately one year after the official conclusion of the COVID-19 pandemic. Since participants were recruited from shared clinical environments, rigorous precautions were implemented to mitigate the risk of inter-group contamination.

Participants

Eligible participants were female nurses, who met the following inclusion criteria: (1) a minimum of six months of experience in COVID-19 wards (2). Absence of major life stressors during or after the pandemic (e.g., bereavement, severe financial crisis, or divorce) (3). No pre-existing diagnosed psychiatric disorders or current use of psychotropic medication (4). Onset of post-traumatic stress symptoms at least one month after direct exposure

to COVID-19 patients (5). a score above 75 on the dysthymia and post-traumatic stress subscales of the Milon Clinical Multiaxial Inventory-III (MCMI-III) [21] (6). Clinical confirmation of symptoms via a semi-structured interview conducted by a psychiatrist, and (7) provision of written informed consent. Exclusion criteria included incomplete questionnaire responses, absence from more than two intervention sessions, or withdrawal of consent. To control for confounding variables, we confirmed that none of the participants had received any formal psychotherapeutic interventions or pharmacological treatments for depression or PTSD symptoms from the time the pandemic ended until the initiation of this study. This was verified through self-reporting and clinical interviews during the enrollment phase.

Sampling and randomization

Using convenience sampling, 60 eligible nurses were selected. To ensure the robustness of the randomization, the process was strictly decoupled: a research assistant, who was not involved in the patient recruitment or clinical intervention, assigned the unique numerical codes (1–60) to the participants. Subsequently, the same research assistant used the online randomization software (Randomizer APP 11.0.0) to allocate these codes to either the intervention (I) or control © group. This ensured that the researcher performing the intervention had no influence over the allocation sequence, thereby maintaining allocation concealment and eliminating selection bias.

Sample size

The sample size was determined using G*Power (version 3.1.9.7) based on a repeated measure ANOVA [22]. With an alpha level of 0.05, a power of 0.90, and a medium effect size ($f=0.25$), a minimum sample of 56 was required. To account for potential attrition, the final enrollment target was set at 60 participants.

Blinding

Due to the nature of the behavioral intervention and the shared workplace of the participants, double blinding was not feasible. However, the data analyst remained blinded to group allocation to minimize assessment and reporting bias.

Data collection and instruments

The MCMI-III, originally developed by Theodore Milon, was used to assess symptoms of dysthymia (14 items) and post-traumatic stress (16 items). The Persian version of this instrument has demonstrated robust psychometric properties, with Cronbach's alpha coefficients ranging from 0.64 to 0.89 and diagnostic validity reported at 0.86 for dysthymia and 0.93 for post-traumatic stress [21].

Demographic data (e.g., marital status, clinical experience, shift type) were also collected at baseline.

Intervention

The intervention group received six weekly 90-minute sessions of group Narrative Exposure Therapy (NET), based on the protocol by Albert et al. (2017) [18] (Table 1). The sessions were facilitated by a multidisciplinary team: the first researcher (Master's in Psychiatric Nursing), the third researcher (Ph.D. in Psychiatric Nursing), and a clinical psychologist (Ph.D.). The sessions involved an initial interactive lecture followed by facilitated group narratives where participants processed their experiences in COVID-19 wards. To enhance engagement, relevant therapeutic homework was assigned weekly.

Control condition and ethics

The control group received treatment as usual (TAU) without active intervention during the study period. To maintain ethical parity, the control group was provided with the full educational package on CD, and offered a supplementary session upon completion of the study.

Contamination prevention

To mitigate the risk of inter-group information exchange (contamination), which is a common challenge in workplace-based trials, several strategies were implemented: (1) Logistical Separation: The intervention sessions were held at a location (Qaem Psychological Counseling Clinic) completely separate from the participants' clinical working environments. (2) Behavioral Protocols: Participants in the intervention group were explicitly requested to refrain from discussing specific therapeutic content or homework assignments with their colleagues in the clinical setting. (3) Temporal Sequencing: To further prevent interaction, we ensured that the participants from the intervention and control groups were scheduled for different shifts or worked in separate wards whenever possible. (4) Monitoring: A designated contact person monitored for any potential cross-contamination through regular informal check-ins with participants throughout the study period.

Statistical analysis

Data were analyzed using SPSS version 21. Descriptive statistics (mean, SD, frequencies) were supplemented by inferential tests, including Chi-square, independent t-tests, and Repeated Measures ANOVA. Partial eta squared (η^2) was calculated to determine effect sizes (0.01 = small, 0.06 = medium, ≥ 0.14 = large). Prior to analysis, assumptions of normality (Shapiro-Wilk) and sphericity (Mauchly's test) were verified.

Table 1 Narrative exposure therapy program offered to the intervention group

Sessions	Goals	Content	Homework
First	Introduction, and psychological education	Familiarizing group members with each other and with the therapists, explaining the interventions, and clarifying the issue	Reflecting on events during the COVID-19 outbreak and the accompanying emotions
Second	First narrative presentation by one member for discussion, identification, acceptance of emotions, and redefining concepts	Listening carefully to the narrative of a child's illness and death, extracting details, labeling shared details based on priority issues, and expressing the resulting emotions	Thinking about the story and noting situations that evoke feelings separate from what happened
Third	Second narrative presentation by one member for discussion, identification, and acceptance of emotions	Listening carefully to the narrative of a 25-year-old man's illness and lasting disabilities, extracting details, labeling shared details based on priority issues, expressing the resulting emotions	Reflecting on the narrative and noting individuals' analyses of that stressful event, and attempting to change perspectives
Fourth	Providing an explanatory overview for individuals to distinguish between themselves, and the problem	Listening carefully to the narrative of a 45-year-old father with a young child and the anxieties and concerns of his wife, extracting details, labeling shared details based on priority issues, and expressing the resulting emotions, and challenging the narrative	Practicing awareness of the present, past, future, and how to return to the present and manage emotions
Fifth	Reframing meaning, and creating new labels for the problem, presenting alternative narratives, encouraging members to engage in behaviors contrary to the emotions derived from the narrative, and creating miraculous problem-solving situations	Listening carefully to the narrative of a 32-year-old pregnant mother, extracting details, labeling shared details based on priority issues, and expressing the resulting emotions	Asking miracle questions, externalizing the problem, and offering solutions to reduce anxiety and stress
Sixth	Discussing the validation and affirmation of members' interpretations of the narrative, and evaluating the outcomes of narrative exposure therapy	Listening carefully to the narrative of a newly hired female colleague's illness, extracting details, labeling shared details based on priority issues, and expressing the resulting emotions	Rewriting the narrative in the present with a new title

Result

The participant flow through the trial is illustrated in Fig. 1. (CONSORT flow diagram).

A total of 60 eligible nurses were enrolled and randomly allocated to either the intervention or control group ($n = 30$ per arm). All participants completed the six-week intervention (or control period) and participated in both the immediate post-intervention and one-month follow-up assessments, resulting in a 100% completion rate with no attrition or exclusions.

Baseline data numbers analyzed

Demographic variables were well-balanced across groups at baseline (Table 2). Participants in the intervention group ranged in age from 24 to 56 years, while the control group ranged from 22 to 52 years. The majority of participants in both cohorts were married, held a Bachelor's degree, had one child, and performed rotating shift work. Statistical analysis confirmed no significant baseline differences between the groups regarding these demographic characteristics ($p > 0.05$).

Treatment effects on dysthymia

Findings from the repeated measures ANOVA indicated that the intervention's effect, the timing of measurements, and the interaction between group and time on the dysthymia scores of nurses were statistically

significant. Therefore, the variations in dysthymia scores across the three measurement points were significantly different between the two groups (Table 3).

Accordingly, the findings showed that NET significantly reduced nurses' dysthymia, and this reduction was stable over the one-month follow-up period. In other words, the magnitude of change in dysthymia in the intervention group was significantly greater than in the control group, indicating that the intervention effectively improves these symptoms and reduces related distress.

Further analysis using the Bonferroni post hoc test revealed key within-group and between-group differences (Table 4).

Within Intervention Group: The average dysthymia scores in the intervention group were significantly lower both immediately post-intervention and at the one-month follow-up, compared to the pre-intervention baseline scores ($p < 0.05$ for both comparisons). However, there was no statistically significant difference between the mean scores at the immediate post-study interval and the one-month follow-up interval ($p > 0.05$).

Within Control Group: The mean scores in the control group did not show significant differences across the three measurement periods ($p > 0.05$). Notably, one month after the study, the mean score in the control group was significantly higher than it was immediately after the study ($p < 0.05$).

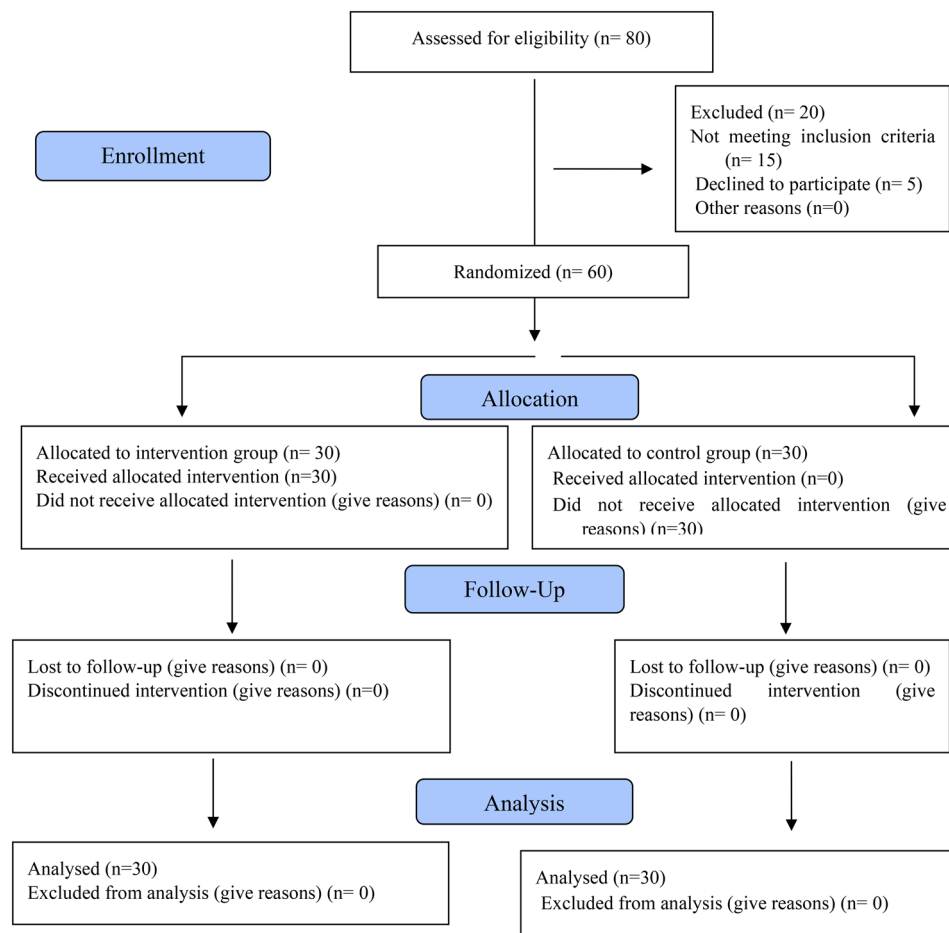


Fig. 1 CONSORT flow diagram1: participant flow

Between Groups: Prior to the study, there was no significant difference in dysthymia scores between the two groups ($p > 0.05$). However, both immediately post-intervention and one month after the study, the mean dysthymia score in the intervention group was significantly lower than that of the control group ($p < 0.05$ for both time points).

These comprehensive findings strongly suggest that NET effectively reduced nurses' dysthymia, and this therapeutic impact was sustained over the one-month follow-up period.

Treatment effects on post-traumatic stress symptoms

The results from the repeated measures ANOVA for post-traumatic stress symptoms scores also indicated that the intervention's effect, the measurement time, and the interaction effect between group and time were statistically significant. Consequently, the changes in post-traumatic stress symptoms scores across the three measurement times were significantly different between the control and intervention groups (Table 5). Essentially, NET proved effective in alleviating post-traumatic stress

symptoms in nurses. The findings demonstrated that the intervention significantly reduced post-traumatic stress symptoms, and this reduction was stable over the one-month follow-up period. The magnitude of improvement in post-traumatic stress symptoms scores was greater in the intervention group compared to the control group, indicating the intervention's efficacy in improving symptoms and reducing related disorders.

Furthermore, the Bonferroni post hoc analysis provided detailed within-group and between-group comparisons (Table 6).

Within Intervention Group: The average post-traumatic stress symptoms scores in the intervention group were significantly lower immediately and one month after the study compared to the pre-intervention ($p < 0.05$ for both comparisons). Crucially, there was no significant difference between the immediate and one-month post-study scores ($p > 0.05$), confirming maintenance.

Within Control Group: In the control group, there were no significant differences in the mean PTSD scores across the three measurement periods ($p > 0.05$).

Table 2 Demographic characteristics of participants in the intervention and control groups

Variable	Control Group	Intervention Group	Test statistic	P	Effect size	CI
Education Level						
Bachelor's	27 (90.0)	25 (83.8)	-	0.706 a	0.09	-
Master's	3 (10.0)	5 (16.7)				
Marital Status						
Married	16 (53.3)	24 (80.0)	-	0.060 a	0.33	-
Single	12 (40.0)	4 (13.3)				
Divorced	2 (6.7)	2 (6.7)				
Number of Children						
No Children	15 (50.0)	8 (26.7)	3.559	0.169 b	0.24	-
One Child	9 (30.0)	12 (40.0)				
2–3 Children	6 (20.0)	10 (33.3)				
Work Shift						
Fixed Morning	10 (33.3)	5 (16.7)	-	0.203 a	0.27	-
Fixed Evening	1 (3.3)	2 (6.7)				
Fixed Night	6 (20.0)	3 (10.0)				
Rotating	13 (43.3)	20 (66.7)				
Income Level (Perspective)						
Acceptable	27 (90.0)	27 (90.0)		1 a	0.00	-
Insufficient	3 (10.0)	3 (10.0)				
Age	37.60 (8.41)	38.27 (7.02)	0.334	0.740 c	0.29	[3.31,4.65]
Clinical Work Experience	13.30 (7.73)	13.21 (6.67)	-0.049	0.961 c	0.01	[-0.64,3.46]

Note. Values are presented as n (%) or mean (SD)

^a Fisher's exact test. ^b Chi-square test. ^c Independent-samples t test

CI=confidence interval; effect sizes for categorical variables are reported as Cramér's V; effect sizes for continuous variables are reported as Cohen's d

Table 3 Dysthymia scores at baseline, post-intervention, and 1-month follow-up

Group	Time/ Measurement	M(SD)		
Intervention	Pre-Intervention	87.13(7.195)		
	Post- Intervention	80.17(7.948)		
	One- Month Follow-up	80 (7.961)		
Control	Pre-Intervention	88.90 (10.32)		
	Post- Intervention	87.60 (6.78)		
	One- Month Follow-up	88.47 (7.69)		
Score	F	P	Partial η^2	
Time	16.452	< 0.001	0.221	
Group	6.530	0.002	0.101	
Time×Group	4.043	0.020	0.065	

Note. Values are presented as means and standard deviations. Results are from a repeated-measures analysis of variance. M= mean; SD= standard deviation η^2 =partial eta squared

Between Groups: Prior to the study, there was no notable difference in post-traumatic stress symptoms scores between the two groups ($p > 0.05$). However, immediately following the study and one month later, the average post-traumatic stress symptoms score in the intervention group was significantly lower than that of the control group ($p < 0.05$ for both time points).

These results strongly suggest that NET continued to effectively alleviate post-traumatic stress symptoms in nurses and maintained its positive impact even a month after the intervention concluded.

Discussion

This study investigated the efficacy of group-based Narrative Exposure Therapy (NET) on dysthymia and post-traumatic stress symptom among nurses during the demanding post-pandemic period. The findings revealed that a six-session NET protocol yielded significant, sustained reductions in dysthymic symptomatology, with gains persisting at the one-month follow-up.

These results align with a growing body of evidence. For instance, Mauritz et al. (2021) observed that NET fosters effective emotional regulation, thereby mitigating general stress and depressive symptoms [23]. Similarly, Ebrahimi et al. (2018) demonstrated that while initial emotional expression during group NET may induce temporary distress, it ultimately facilitates a sustained decline in depressive manifestations [24]. Furthermore, Kamran et al. (2020) and Naemi et al. (2020) underscored that for nurses navigating the aftermath of COVID-19, active, empathetic listening and the transcendence of crisis-centered discourse are vital for emotional release and the maintenance of hope [25, 26]. These principles resonate deeply with the tenets of supportive-expressive therapy.

Conceptually, dysthymia frequently stems from entrapment within rigid, self-defeating cognitive frameworks dominated by narratives of failure and hopelessness. In the high-stakes environment of post-pandemic nursing a landscape marked by moral strain and emotional

Table 4 Interaction effects and between- and within-group comparisons of dysthymia scores across three time points

Comparison	Group	Mean Difference (M)	Standard Error (SE)	P- value	95%CI
within Group Comparisons					
Intervention Group	Pre vs. Post	6.967	1.215	0.006	[4.59,9.35]
	Pre vs. follow up	7.133	1.252	0.006	[4.67,9.59]
	Post vs. follow up	0.167	0.759	1	[-1.41,1.754]
Control Group	Pre vs. Post	1.300	1.102	1	[-0.91,3.51]
	Pre vs. follow up	0.433	1.087	1	[-1.74,2.61]
	Post vs. follow up	-0.867	0.940	0.45	[-2.71,0.98]
Between-Group Comparisons					
Pre-Intervention	Both Groups	-1.767	2.254	0.436	[-6.18,2.65]
Post- Intervention	Both Groups	-7.433	1.150	<0.001	[-9.73,-5.14]
One- Month Follow-up	Both Groups	-8.467	1.205	<0.001	[-10.87,-6.07]

Note. M = Mean Difference; SE = Standard Error; CI = Confidence Interval. Within-group comparisons were adjusted for multiple comparisons (e.g., Bonferroni). Between-group comparisons represent the difference between the Intervention and Control groups at each time point

Table 5 Mean post-traumatic stress symptom scores across three time points (pre-intervention, post-intervention, and one-month follow-up) in the intervention and control groups

Group	Time/ Measurement	M(SD)		
Intervention	Pre-Intervention	83.47 (9.445)		
	Post- Intervention	70.80 (6.666)		
	One- Month Follow-up	70.03 (5.391)		
Control	Pre-Intervention	82.13 (6.21)		
	Post- Intervention	83.87 (5.65)		
	One- Month Follow-up	85.10 (5.839)		
Score	F	P	Partial η^2	
Time	44.971	< 0.001	0.437	
Group	21.809	< 0.001	0.273	
Time×Group	45.782	< 0.001	0.441	

Note. Values are presented as means and standard deviations. Results are from a repeated-measures analysis of variance. M= mean; SD= standard deviation η^2 =partial eta squared

exhaustion such fixed, maladaptive interpretations likely perpetuate chronic dysphoria. Group NET provides an emotionally secure scaffold for nurses to confront and restructure these painful memories. By transforming private burdens into shared, reconstructed experiences

through interpersonal empathy and collective reinterpretation, the dialogic process of NET expands the emotional meaning of distress, facilitating more adaptive cognitive appraisals. It is noteworthy, however, that individual personality traits, which may moderate treatment receptivity, were not accounted for in this analysis and warrant future investigation [23, 24].

A pivotal finding of this study was the significant reduction in post-traumatic stress symptoms. This outcome is consistent with research by Fan et al. (2021), highlighting the broad utility of the intervention [27], and is further corroborated by studies [28, 29] documenting the mitigation of trauma-induced physiological and psychological sequelae. By fostering emotional disclosure within a structured, supportive environment, NET enables the processing of intrusive, ruminative memories the cognitive hallmarks of post-traumatic stress. Nurses often suppress emotionally charged patient-care encounters to maintain professional composure, an avoidance strategy that exacerbates mental strain. Group NET encourages emotional articulation and social resonance, wherein participants reflect upon and co-narrate shared experiences.

Table 6 Interaction effects and between- and within-group comparisons of post-traumatic stress symptom scores across three time points (pre-intervention, post-intervention, and one-month follow-up)

Comparison	Group	Mean Difference (M)	Standard Error (SE)	P- value	95%CI
within Group Comparisons					
Intervention Group	Pre vs. Post	12.667	1.650	<0.001	[9.42,15.92]
	Pre vs. follow up	13.433	1.720	<0.001	[10.03,16.84]
	Post vs. follow up	0.767	0.890	0.463	[-1.04,2.57]
Control Group	Pre vs. Post	-1.733	1.100	0.782	[-3.90,0.43]
	Pre vs. follow up	-2.967	1.320	0.220	[-5.57,-0.37]
	Post vs. follow up	-1.233	0.970	0.071	[-3.14,0.67]
Between-Group Comparisons					
Pre-Intervention	Both Groups	1.33	2.043	0.517	[-2.67,5.33]
Post- Intervention	Both Groups	-13.067	1.596	<0.001	[-16.19,-9.94]
One- Month Follow-up	Both Groups	-15.067	1.451	<0.001	[-17.90,-12.23]

Note. M= Mean Difference; SE=Standard Error; CI =\ Confidence Interval. Within-group comparisons were adjusted for multiple comparisons (e.g., Bonferroni). Between-group comparisons represent the difference between the Intervention and Control groups at each time point

This reciprocal exchange promotes cognitive reframing and emotional catharsis, demonstrating a dual efficacy for both chronic dysphoria and acute trauma symptoms.

These psychological advancements must, however, be contextualized within the broader organizational realities of nursing. Systemic stressors including understaffing, excessive workloads, and diminished managerial support exert a profound influence on mental health. Consequently, the observed therapeutic gains may derive not only from intra-personal emotional processing but also from the psychosocial relief inherent in a structured, supportive group intervention. Integrating systemic awareness into future intervention frameworks is imperative to enhance the feasibility and durability of NET. Furthermore, while such interventions are potent, they should be viewed as complementary to, not a replacement for, comprehensive clinical monitoring and necessary psychiatric or pharmacological management [30].

Limitations and recommendation

Several methodological limitations should be acknowledged when interpreting the findings of the present study. First, the sample was restricted to female nurses recruited from only two hospitals in Isfahan, Iran. In light of documented gender-, culture-, and profession-related variations in stress perception, emotional processing, and coping responses, the generalizability of these findings to male nurses or to other clinical and geographical settings should be considered with caution. In addition, the use of convenience sampling prior to random allocation, may have introduced selection bias and limited the representativeness of the study population. Future research would therefore benefit from multicenter recruitment strategies involving larger and more heterogeneous samples to enhance external validity and to determine whether the observed effects remain stable across hospitals, regions, and nursing specialties.

A second limitation concerns the exclusive reliance on self-report measures. Although such instruments are practical and widely used in psychological research, they remain vulnerable to response bias, recall bias, and social desirability effects, particularly in emotionally burdened populations such as nurses working in post-crisis contexts. Participants may have unintentionally over reported or underreported their symptoms due to fatigue, self-presentation concerns, or difficulties in accurately monitoring internal states. To strengthen the empirical rigor of future trials, multimethod assessment frameworks are recommended, including clinician-rated instruments, structured diagnostic evaluations, and psychophysiological indicators where feasible. The inclusion of objective or behavioral outcomes such as absenteeism, sleep wake patterns, occupational functioning, or validated performance-based indices would also allow for a

more robust triangulation of treatment effects beyond subjective symptom reports. Moreover, because the group format itself may have encouraged socially desirable or conformity-driven narratives, future studies may consider incorporating independent narrative elicitation procedures to reduce this potential source of distortion.

Additional limitations relate to the design and context of the trial. Participant blinding was not feasible, as is common in psychosocial interventions, and this may have increased expectancy effects. Furthermore, because participants were drawn from shared clinical environments, contamination between groups cannot be ruled out. The absence of pre-pandemic baseline data also limits temporal interpretation, as it precludes direct comparison between post-pandemic symptom levels and pre-crisis psychological functioning. As a result, the findings should be interpreted primarily within the immediate post-pandemic context rather than as evidence of change across the full arc of the crisis experience. Future studies should adopt mixed-method and cross-cultural designs to more fully capture the socio-organizational ecology of nursing and to deepen the interpretive validity of intervention outcomes. Where methodologically possible, key contextual confounders—including staffing levels, workload intensity, prior psychiatric history, and unit-level exposure to infection should also be controlled through stratification, matching, or statistical adjustment in order to refine causal inference.

Another important limitation is the relatively short follow-up period. Although the findings suggest that therapeutic gains were maintained at one month, this interval is insufficient to support firm conclusions regarding the long-term durability of treatment effects. Without more extended follow-up assessments such as six-month or annual evaluations it remains unclear whether the observed symptom reduction reflects temporary emotional stabilization or a more enduring reorganization of psychological functioning. Longitudinal designs are therefore strongly recommended to clarify the trajectory of relapse, maintenance, or continued recovery over time. Future investigations should also examine intervention dosage and maintenance strategies, including the possible role of booster sessions, in order to determine whether benefits can be sustained under ongoing or changing workplace stressors.

Finally, future research should move beyond symptom reduction alone and evaluate broader individual and organizational outcomes. In particular, examining variables such as perceived quality of care, empathic engagement, occupational resilience, and team functioning may help illuminate the wider relational and professional implications of NET in nursing settings. In parallel, cost-effectiveness analyses and implementation studies are needed to determine the feasibility, scalability, and

economic value of integrating NET into routine mental health support systems within real-world healthcare environments.

Taken together, while the present findings provide promising preliminary support for the use of narrative- and dialogue-based interventions in reducing dysthymic and trauma-related distress among nurses, further methodologically rigorous research is required before definitive conclusions can be drawn regarding the generalizability, durability, and system-level applicability of these effects.

Abbreviations

NET	Narrative Exposure Therapy
RCT	Randomized Clinical Trial
MCMI-III	Milon's Clinical Multiaxial Inventory-III

Acknowledgements

Special gratitude is expressed to the officials and nursing staff at Al-Zahra and Amin hospitals in Isfahan, as well as to the officials and psychologist at Qaem Psychological Clinic for their invaluable cooperation in this research.

Author contributions

Project implementation and manuscript draft preparation: Zahra Ebrahimi Hajataghaei. Conceptualization and supervision: Maryam Radmehr. Consultation, Manuscript review and editing: Maryam Moghimi.

Funding

This research did not receive any financial support from governmental or non-governmental public or private funding agencies.

Data availability

The dataset presented in the study is available on request from the corresponding author during submission or after publication. The data are not publicly available to protect participant confidentiality.

Declarations

Ethical approval and consent of participant

This research was conducted following the approval of the ethics committee of Islamic Azad University, Isfahan (Khorasgan) branch (code: IR.IAU.KHUISF.REC.1402.062). All ethical principles in accordance with the Declaration of Helsinki were observed, including obtaining written and verbal informed consent for participation, ensuring participants' right to withdraw from the study at any time, and maintaining the confidentiality of participants' information.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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Received: 3 January 2026 / Accepted: 29 June 2026

Published online: 13 July 2026

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