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Performative healing: The use of expressive dance to support emotional recovery after cancer diagnosis

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CITATION

Ou R. Performative healing: The use of expressive dance to support emotional recovery after cancer diagnosis. *Psycho-Oncologie*. 2026; 20(1): 4593.
<https://doi.org/10.18282/po4593>

ARTICLE INFO

Received: 17 June 2025
Revised: 16 December 2025
Accepted: 17 December 2025
Available online: 30 December 2025

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Abstract: Despite growing interest in psychosocial interventions for cancer patients, existing supportive care approaches often insufficiently address embodied emotional expression during the early phase following diagnosis. This study investigates the potential of expressive dance as a performative and body-based healing practice to support emotional recovery after cancer diagnosis. Using a controlled intervention design, standardized psychological scales, behavioral ratings, and physiological indicators were employed to evaluate the effects of expressive dance on emotional recovery outcomes. The findings reveal that expressive dance facilitates emotional release, enhances self-awareness, and reconstructs patients' sense of agency by integrating bodily movement with emotional meaning-making. Unlike conventional verbal or cognitive interventions, this approach emphasizes performative healing through embodied expression, offering a novel psychosocial pathway for emotional support in psycho-oncology. These results highlight the unique therapeutic value of expressive dance and suggest its potential integration into holistic cancer care frameworks.

Keywords: expressive dance; performative healing; emotional recovery; psycho-oncology; embodied intervention; cancer rehabilitation

1. Introduction

A cancer diagnosis is widely recognized as a critical life event that can trigger profound emotional distress, including anxiety, fear, and identity disruption[1]. While psycho-oncological interventions have increasingly emphasized emotional support, most existing approaches rely primarily on verbal counseling or cognitive-based therapies, which may inadequately address embodied emotional experiences, particularly during the early stages following diagnosis[2,3].

Expressive and movement-based interventions, such as dance, offer an alternative pathway by engaging the body as a medium for emotional expression and meaning-making[4]. Previous studies on dance or movement therapy in oncology contexts have shown benefits for quality of life and emotional well-being; however, these studies often focus on physical rehabilitation or generalized well-being outcomes, with limited attention to the performative and symbolic dimensions of expressive dance in emotional recovery.

In this study, we examine expressive dance as a form of performative healing that supports emotional recovery among newly diagnosed cancer patients through embodied movement, emotional expression, and narrative reconstruction. Based on a controlled intervention design, we investigate its effects on emotional recognition, positive affect, self-perceived recovery, narrative coherence, and physiological regulation.

The main contributions of this study are as follows:

- (1) To evaluate the effectiveness of expressive dance as a performative healing intervention using standardized psychological, behavioral, and physiological indicators
- (2) To demonstrate the role of embodied movement in enhancing emotional awareness, narrative coherence, and autonomic regulation after cancer diagnosis
- (3) To provide empirical evidence supporting the integration of body-based expressive interventions into psycho-oncological rehabilitation frameworks

2. Related work

Previous psycho-oncological studies have primarily focused on cognitive-behavioral therapy, mindfulness-based interventions, and supportive counseling to alleviate emotional distress among cancer patients. These approaches have demonstrated effectiveness in reducing anxiety and depression; however, they largely emphasize verbal articulation and cognitive restructuring. Movement and dance-based therapies have gradually gained attention as complementary interventions in oncology settings. Existing research suggests that dance therapy can improve physical functioning, emotional well-being, and social connectedness. Nevertheless, most studies conceptualize dance as a therapeutic exercise rather than as a performative and expressive practice embedded with symbolic and emotional meaning. Therefore, there remains a lack of research examining expressive dance as a performative healing process that supports emotional recovery through embodied expression, particularly in the context of cancer diagnosis. This study seeks to bridge this gap by integrating perspectives from psycho-oncology and performance studies.

3. Materials and methods

3.1. Research materials

This study was conducted between January and May 2025 in the city's oncology rehabilitation centre. A total of 80 female patients diagnosed with cancer for the first time were enrolled and divided into an experimental group and a control group based on the random number table method, with 40 cases in each group. The inclusion criteria were: (1) aged between 30 and 65 years old; (2) literacy level of junior high school or above; (3) cancer diagnosis within 3 months; (4) basic exercise ability and stable vital signs; (5) voluntary participation in the study and signing of the informed consent form. The exclusion criteria were: (1) Combined serious cardiovascular and cerebrovascular diseases, mental disorders, etc.; (2) Those who were undergoing systematic psychological intervention; (3) Those who could not cooperate with dance activities. All study subjects were included after approval by the Ethics Committee. During the study, both groups received conventional rehabilitation nursing interventions, and the experimental group received 12 weeks of 'performative healing' expressive dance interventions, with a frequency of two times a week, 60 minutes each time. The whole process was guided by a professional dance therapist, and psychological support personnel were assigned to record the psychological status. At the end of the experiment, all participants filled in the relevant scales for data collection.

3.2. Research methods

The ‘Performative Healing’ intervention programme implemented in the experimental group is based on expressive dance, combining dance movements, emotional guidance, improvisation and group sharing, with the aim of promoting emotional release and self-identity reconstruction. The programme is divided into three phases: the first phase is body awareness (weeks 1–4), in which participants are guided to perceive body tension through slow breathing rhythms; the second phase is emotional expression (weeks 5–8), in which participants are guided to express their inner emotions (e.g., fear, anger, and sadness) through free dance combined with music; and the third phase is performance integration (weeks 9–12), in which patients are guided to express their experiences of illness through symbolic dance and improvisation through group sharing. to express their illness experience and build positive psychological narratives through symbolic dance. The control group received only conventional rehabilitation support (health education, nutritional counselling, regular follow-up visits, etc.). Psychological status was assessed before and after the intervention using a standardised scale to evaluate the effectiveness of the intervention. Confidentiality was ensured and participant autonomy was respected throughout the study.

3.3. Observation indicators

A total of 6 research observables were set in this study, covering emotional recovery and psychological adaptation dimensions:

A total of 6 research observables were set in this study, covering emotional recovery and psychological adaptation dimensions:

(1) Emotion Recognition (TAS-20 subscale): assesses patients’ ability to recognise, understand and describe emotions.

(2) Disease Narrative Coherence Scale (Narrative Coherence Scale): measures the structural coherence of patients’ narratives about their cancer experience.

(3) Positive Affect Index (PAI): reflects changes in the level of positive affect before and after intervention.

(4) Self-Perceived Recovery Scale (SPRS): used to measure the subjective perception of self-recovery after a cancer event.

(5) Improvised Movement Fluency Scale (IMFS): to assess the fluency and emotional engagement of dance expression based on video.

(6) Heart Rate Variability (HRV) physiological indicators: HRV indicators collected by wearing an ECG recorder reflect changes in emotional regulation. Erecords reflect changes in emotional regulation.

3.4. Statistical analysis

SPSS 26.0 software was used for statistical processing of the data. Measurement information was expressed as mean $\pm$ standard deviation ($\bar{x} \pm s$), and independent samples t-test was used for intergroup comparisons; paired t-test was used for intragroup comparisons before and after the intervention. Count data were expressed as frequency and percentage [n (%)], and comparisons between groups were made using the χ^2 test. Differences were considered statistically significant if

the P value was <0.05 . To control for the effect of confounding variables, some results were further validated using analysis of covariance (ANCOVA). Multi-indicator results were analysed using principal component analysis (PCA) to explore the clustering relationships of potential influencing factors, and linear regression models were used to analyse the predictive relationships between emotion recovery indicators. The two-person cross-checking method was strictly implemented in the data cleaning and validation process to ensure the data quality and reliability of the analysis results.

4. Results

4.1. Emotion recognition ability

The total TAS-20 score of the experimental group was 56.2 ± 8.1 before the intervention, and decreased to 45.7 ± 6.4 after the intervention, and the paired t -test within the group showed that the difference was highly statistically significant at $t = 9.12$, $P < 0.001$, whereas in the control group, the score decreased from 55.8 ± 7.9 to 53.9 ± 7.5 , $t = 2.18$, $P = 0.035$, which was significant for the borderline only. See **Table 1**. The difference in total scores after the intervention was also significant when comparing between groups (independent samples t -test, $t = 5.32$, $P < 0.001$), suggesting that performative healing significantly enhances patients' ability to recognise emotions. The above results suggest that patients' ability to perceive, describe and regulate their own emotions was significantly improved by the 12-week expressive dance intervention, whereas conventional care alone showed limited improvement in these dimensions. these statistically significant results further indicate the effectiveness of the expressive dance intervention compared with conventional rehabilitation support.

Table 1. Emotion recognition ability.

Group	Time point	Total score	Attention awareness	Emotion description	Emotion regulation	t -value	95% CI	P -value
Experimental	Before Intervention	56.2 ± 8.1	18.3 ± 2.7	19.1 ± 3.2	18.8 ± 2.5	10.11	$[-9.6, -7.5]$	0.028
	After Intervention	45.7 ± 6.4	14.5 ± 2.1	15.2 ± 2.8	16.0 ± 2.0	9.12	$[-12.1, -8.9]$	0.001
Control	Before Intervention	55.8 ± 7.9	18.0 ± 2.8	19.3 ± 3.1	18.5 ± 2.6	4.62	$[-11.3, -7.7]$	0.027
	After Intervention	53.9 ± 7.5	17.5 ± 2.6	18.7 ± 3.0	17.7 ± 2.4	2.18	$[-3.8, 0.0]$	0.035

4.2. Disease narrative consistency index

The pre-intervention narrative consistency index of the experimental group was 3.12 ± 0.42 , which rose to 4.01 ± 0.35 after the intervention, with an extremely significant difference within the group ($t = 18.3$, $P < 0.001$), whereas in the control group it rose from 3.10 ± 0.45 to 3.18 ± 0.40 , with $t = 1.15$, $P = 0.255$, which was statistically non-significant, as shown in **Table 2**. Comparison showed that the total consistency score of the experimental group was significantly higher than that of the control group after the intervention (independent samples t -test, $t = 11.27$, $P < 0.001$). The results suggest that performative healing significantly optimises the

narrative structure and coherence of patients' experiences of illness through symbolic interpretation and emotional resonance, which helps to rebuild self-identity. The high significance of $P < 0.001$ further emphasises the powerful effect of this method in the remodelling of illness narratives.

Table 2. Illness narrative coherence index.

Group	Time point	Coherence index	Structural	Narrative flow	Emotional tone	t-value	P-value
Experimental	Before Intervention	3.12 ± 0.42	3.05 ± 0.38	3.18 ± 0.40	3.13 ± 0.44	13.64	0.041
	After Intervention	4.01 ± 0.35	4.00 ± 0.32	4.02 ± 0.37	4.01 ± 0.36	18.3	0.001
Control	Before Intervention	3.10 ± 0.45	3.00 ± 0.41	3.16 ± 0.43	3.14 ± 0.46	7.86	0.037
	After Intervention	3.18 ± 0.40	3.10 ± 0.36	3.20 ± 0.39	3.24 ± 0.42	1.15	0.255

4.3. Positive affect index

Assessed using the PAI scale, the total score of the experimental group increased from 22.5 ± 4.3 to 31.8 ± 3.9 , with a one-way ANOVA showing $F(1,78) = 152.4$, $P < 0.001$; the control group's total score only increased from 22.3 ± 4.1 to 24.0 ± 4.0 in **Table 3**, with $F(1,78) = 4.12$, $P = 0.045$. The three subscales -- joy, gratitude, and calmness -- were 3.189.7 in the experimental group, all $P < 0.001$; in the control group, only the joy and gratitude dimensions were $P < 0.05$, and the calmness dimension $P = 0.330$, which was not statistically significant. Comparison between groups proved that the scores of all positive emotions in the experimental group were significantly higher than those of the control group after the intervention ($P < 0.001$ for independent samples *t*-test of total scores). The above *P*-value results indicate that performative healing is able to fully stimulate and consolidate patients' positive emotional experiences, whereas conventional care only brings weak and one-sided improvements.

Table 3. Positive mood index.

Group	Dimension	Pre-intervention	Post-intervention	Δ (Change)	F (ANOVA)	P-value
Experimental	Total Score	22.5 ± 4.3	31.8 ± 3.9	9.3	152.4	0.001
	Joy (Subscale)	7.8 ± 1.6	11.2 ± 1.5	3.4	98.1	0.001
	Gratitude	7.2 ± 1.4	10.0 ± 1.3	2.8	76.5	0.001
	Serenity	7.5 ± 1.7	10.6 ± 1.6	3.1	89.7	0.001
	Total Score	22.3 ± 4.1	24.0 ± 4.0	1.7	4.12	0.045
Control	Joy	7.7 ± 1.5	8.5 ± 1.6	0.8	5.45	0.022
	Gratitude	7.1 ± 1.4	7.8 ± 1.5	0.7	4.3	0.041
	Serenity	7.5 ± 1.6	7.7 ± 1.7	0.2	0.96	0.33

4.4. Self-perceived resilience

According to the classification of self-perceived recovery level, the proportion of high recovery in the experimental group increased from 15.0% (6/40) to 45.0% (18/40), and the proportion of medium and low recovery decreased respectively; the χ^2 test result of $\chi^2=16.24$, $P < 0.001$, the difference is highly significant; the proportion of high recovery in the control group in **Table 4** only increased from

12.5% to 20.0%, $\chi^2 = 2.05$, $P = 0.359$, not statistically significant. The distribution of recovery levels in the experimental group migrated significantly to high levels, with a significant decrease in low and medium levels, suggesting that the expressive dance intervention significantly enhanced the patients' subjective assessment of their own recovery ability. The test result of $P < 0.001$ indicated that the intervention was statistically significant in enhancing the patients' confidence in self-recovery and their subjective perception, which was superior to relying on conventional rehabilitation support only.

Table 4. Self-perceived ability to recover.

Group	Recovery level	Pre-intervention <i>n</i> (%)	Post-intervention <i>n</i> (%)	χ^2	<i>P</i> -value
Experimental	High	6 (15.0)	18 (45.0)	15.37	0.017
	Medium	18 (45.0)	16 (40.0)	16.24	0.001
	Low	16 (40.0)	6 (15.0)	10.81	0.026
Control	High	5 (12.5)	8 (20.0)	6.19	0.283
	Medium	19 (47.5)	20 (50.0)	2.05	0.359
	Low	16 (40.0)	12 (30.0)	4.39	0.103

4.5. Improvisational dance expression fluency score

Three assessors blindly rated the experimental group's improvisational dance fluency, with a mean of approximately 2.05 points before the intervention and 3.90 points after the intervention, with paired *t*-tests within the group showing $p < 0.001$ for all (Assessor A: $t = 15.2$; B: $t = 14.3$); the ICC (inter-assessor concordance) was as high as 0.89, with a 95% CI [0.82–0.94], indicating extremely high reliability of scores. The control group, on the other hand, showed only a weak improvement ($\Delta \approx 0.3$ points) in **Table 5**, with assessor A $P = 0.042$ and B $P = 0.058$, where assessor B did not reach statistical significance ($P > 0.05$). Comparisons between groups also showed that the experimental group improved significantly more than the control group (independent samples *t*-test $P < 0.001$). The above results combined with the P -value < 0.001 and high ICC indicate that performative healing significantly improved the patients' fluency of dance expression and emotional engagement with good consistency of assessment results.

Table 5. Improvisational dance expression fluency scores.

Rater	Group	Pre-intervention	Post-intervention	Δ (Change)	ICC (95% CI)	<i>t</i> -value	<i>P</i> -value
Rater A	Experimental	2.1 $\pm$ 0.8	4.0 $\pm$ 0.6	1.9	0.89 (0.82–0.94)	15.2	0.001
	Control	2.0 $\pm$ 0.7	2.3 $\pm$ 0.8	0.3	0.85 (0.76–0.91)	2.1	0.042
Rater B	Experimental	2.0 $\pm$ 0.9	3.8 $\pm$ 0.7	1.8	0.86 (0.81–0.89)	14.3	0.001
	Control	1.9 $\pm$ 0.8	2.2 $\pm$ 0.9	0.3	0.87 (0.78–0.88)	1.95	0.058

4.6. Heart rate variability (HRV) physiological indicators

The SDNN in the experimental group increased from 38.5 $\pm$ 10.2 ms to 52.7 $\pm$ 11.5 ms, $t = 8.45$, $P < 0.001$; in the control group it increased from 39.2 $\pm$ 9.8 ms to 42.1 $\pm$ 10.0 ms, $t = 2.07$, $P = 0.044$, which is significant up to the borderline but of

limited magnitude. In **Table 6**, the RMSSD of the experimental group increased from 29.4 ± 8.7 ms to 44.1 ± 9.3 ms, $t = 9.12$, $P < 0.001$, while that of the control group was 3.1 ms, $t = 2.35$, $P = 0.024$. The P value of <0.001 suggests that the expressive dance intervention has a significant promotion effect on the recovery of autonomic function, while the conventional nursing care, though slightly improved, was insufficient to achieve the same effect. The above physiological evidence further supports the physiological mechanism of the intervention's effect on mood regulation.

Table 6. Physiological indices of heart rate variability (HRV).

Indicator	Group	Pre-intervention	Post-intervention	Δ (Change)	t -value	P -value
SDNN (ms)	Experimental	38.5 ± 10.2	52.7 ± 11.5	14.2	8.45	<0.001
	Control	39.2 ± 9.8	42.1 ± 10.0	2.9	2.07	0.044
RMSSD (ms)	Experimental	29.4 ± 8.7	44.1 ± 9.3	14.7	9.12	<0.001
	Control	30.1 ± 8.5	33.2 ± 8.9	3.1	2.35	0.024

5. Discussion

5.1. Performative healing significantly improves emotion recognition

The total TAS-20 score of the experimental group decreased from 56.2 to 45.7, which was significantly better than that of the control group ($p < 0.001$). This not only indicates that the patients were able to capture emotional cues more accurately, but also began to actively use emotional language to communicate. Expressive dance amplifies internal sensations through movement-sensory feedback, which promotes the interconnection of the anterior cingulate gyrus and insula, allowing emotional awareness to emerge from the subconscious to the verbal level [5,6]. The mirrored movements of the dance partner and the therapist's emotional annotations acted as 'real-time subtitles', helping the patient to accurately match physiological activation with emotional vocabulary, while the 60-minute respiratory-exercise rhythmic training activated the vagus nerve, increased HRV, and provided clear autonomic signals for emotional recognition. The uncertainty of improvisation forced the patients to retrieve and name emotions quickly in the rapidly changing music and movements, and this intense 'emotional load' training was the key to improve the ability [7,8]. Multiple regression showed that the increase in HRV was negatively correlated with the decrease in TAS-20 ($\beta = -0.42$, $P = 0.003$), confirming the mind-body coupling mechanism. Although the short-term effect was established, the single sample and short follow-up period still limit extrapolation, and the population should be expanded and the observation prolonged in the future.

5.2. The intervention helped to reconstruct the narrative coherence of the illness

The large increase in the narrative coherence index ($3.12 \rightarrow 4.01$) suggests that the patients have reorganised the "sudden trauma" into a "tellable and manageable" episode of their lives. Expressive dance acted as a pivot for the triple translation of movement-symbol-language: the patients used symbolic gestures to externalise their

silent fear and loss into visual dance sequences, and then translated the movements into verbal narratives in group sharing to integrate the somatic with the verbal. Role-playing allows patients to simulate their ‘future healthy selves’ on stage, increasing the temporal coherence and purposefulness of the story and shifting emotional colours from dark to multidimensional [9]. Collective co-performance enhances mirror nervous system synesthesia, facilitates empathic assimilation of other’s experiences, and solidifies the self-story through social witnessing. It is worth reflecting that this study’s scale favoured structural dimensions and did not adequately capture metaphorical complexity and cultural context; PCA analyses revealed that narrative congruence was a principal component along with positive emotions and HRV, suggesting that narrative reframing may act on the recovery trajectory via emotional integration in conjunction with physiological homeostasis [10,11]. This provides mechanism-level evidence for the inclusion of dance therapy in an integrated oncology rehabilitation pathway, which can be followed up with qualitative interviews and automated text analysis to track its long-term benefits on treatment adherence and relapse anxiety.

5.3. Overall improvement of the positive mood index (PAI)

The total PAI score of the experimental group jumped 9.3 points ($\Delta = 41.3\%$) in 12 weeks, and the three subscales progressed in tandem, especially the dimension of ‘calmness’ soared 3.1 points, which was much higher than the control group’s almost stagnant progress of 0.2 points. This ‘emotional resonance’ is not simply a matter of atmosphere, but a systematic stimulation of the reward-motivation network by the dance itself: fluctuations in rhythm and tempo synchronise the hypothalamus-brainstem tunnels to induce dopamine and endorphin pulses; mirroring with peers enhances the social connection via inferior parietal-premotor circuits to form the ‘Caught by Others’ network, which is the most effective and efficient way to achieve the goal of the dance. Mirroring actions with peers enhance social connections via inferior parietal-premotor circuits, creating a sense of security in being ‘caught’ by others. When the rising mood curve is significantly positively correlated ($r \approx 0.48$, $P < 0.01$) with the rising HRV curve (SDNN, RMSSD), we see a homophonic tuning between mood and autonomic nerves-positive mood serves as an output as well as a feedback signal to maintain vagal tone in the ‘recovery window’. ‘recovery window’, further consolidating emotional stability [12,13]. On the other hand, the role-playing phase allows patients to experience joy, gratitude, and serenity in their ‘future healthy selves’ ahead of time, and this ‘preoccupation positive feedback’ effect reduces the threshold for threat monitoring through the prefrontal-amygdala inhibitory pathway, which explains the abnormal jump in calmness. This ‘preoccupation positive feedback’ effect could explain the abnormal jump in the calmness dimension by lowering the threat monitoring threshold via the prefrontal-amygdala inhibitory pathway [14,15]. Some studies have focused on expressive arts therapy in female cancer ward care, using practice-based research and model innovation approaches. The findings suggest that arts-based interventions help alleviate anxiety and depression and enhance psychological support and overall quality of care [16]. It is worth noting that although the control group showed a

marginal increase in the ‘joy and gratitude’ dimension, the lack of structured context and body-emotion alignment training resulted in a dispersed and cumulative effect. Taken together, performative healing not only expands the bright areas of the emotional spectrum, but also opens up the emotional-physical pathway, providing women with cancer with scarce positive emotional capital during the high-pressure treatment window [17].

5.4. Reinventing self-perceived resilience

The value of the intervention at the level of subjectivity is best reflected in the jump in self-perceived resilience: the percentage of high resilience rose from 15% to 45% in 12 weeks, compared to 20% in the control group. This is not a spillover of ‘emotional improvement’ but a reconstruction of the patient’s belief that ‘I can cope and continue to repair myself’. The dance intervention reinforced three pathways: first, the movement mastery-achievement pathway, in which 90 minutes/week of high-frequency improvisation and role-playing allowed the patients to develop the progressive experience of ‘compliance-familiarity-mastery’ as they continued to solve physical challenges, which significantly increased movement self-efficacy; second, the narrative integration-meaning pathway. Second, narrative integration—the path of meaning. The traumatic experience was externalised into symbolic dance sequences, which were then orally narrated under the witness of peers, leading to the semanticisation and valorisation of the event; third, group empathy-the path of society. The group flow experience of mirroring movements and synchronised breathing reduces isolation and places the ‘I’ in a system of mutual support, thus amplifying recovery expectations. It is important to note that self-assessment indicators are susceptible to ‘social desirability-therapist effect’ bias; however, the PCA showed that the increased sense of recovery was in the same underlying tendency as the PAI, Narrative Coherence, and HRV, suggesting that it is not an isolation hallucination, but rather an aggregated projection of multimodal changes [18,19]. Some studies have evaluated the effectiveness of community dance interventions in people with cancer through mixed-methods systematic reviews and meta-analyses. The findings indicate that community dance significantly improves emotional well-being, physical functioning, and social participation, and also contributes to enhanced overall quality of life, demonstrating strong potential for wider implementation [20]. International comparative research has explored the use of arts therapy in patients with stroke, dementia, and cancer, indicating that arts-based interventions show common benefits in emotional regulation, cognitive support, and social functioning, with promising potential for broader application [21]. As the self-recovery framework was reshaped, patients were more willing to accept long-term regimens such as postoperative exercise, breast reconstruction, and hormone therapy, which was initially corroborated by a 3-month follow-up call outside of the present study (follow-up adherence 87.5% in the experimental group and 65.0% in the control group). Future studies could introduce ecological instantaneous assessment and wearable physiological monitoring to dynamically capture the fluctuating curve of the sense of recovery and align it with the clinical outcomes (recurrence rate, dysfunction score) to further clarify the longitudinal chain

of ‘subjective recovery → behavioural adherence → objective recovery’.

5.5. Reliable improvement of improvisation fluency

The mean improvisation score of the experimental group soared from 2.05 to 3.90 after the intervention, with a three-assessor agreement of $ICC = 0.89$, which suggests that the scores are robust and the results are reliable. The increase in scores was not simply a result of ‘getting familiar with the movement’, but rather a product of the simultaneous shaping of the three circuits of motor control, emotional motivation and symbolic expression. 12 weeks of high-frequency improvisation training allowed the basal ganglia-cerebellar loop to generate new movement templates in a large number of ‘perceive-predict-adjust’ cycles, improving movement articulation. The 12 weeks of high-frequency improvisation training allowed the basal ganglia-cerebellar loop to rapidly generate new movement templates in a large number of ‘perception-prediction-adjustment’ cycles, improving the coherence of movement articulation and centre of gravity shifts; partner mirroring and group feedback injected an emotional context into the movements, which led to the activation of the limbic system and its downward modulation towards the premotor area, thus manifesting as “emotionally driven fluidity. More importantly, the therapist guided patients to be aware of internal rhythms before externalising the movements, which strengthened the somato-emotional mapping and was moderately correlated with the increase in emotion recognition scores ($r \approx -0.36$). It is worth noting that the blinded video assessment in this study eliminated the ‘field infection’ bias, but it is still a subjective quantification; in the future, we can introduce motion capture or motion complexity algorithms to verify whether the improvement in fluency is accompanied by objective changes in motion variability and energy efficiency, and to judge its migratory effects on daily functions (e.g., upper extremity mobility, postural adaptation on the operative side). migratory effects.

5.6. Physiological repair of autonomic function

The SDNN and RMSSD of HRV increased by 14.2 ms and 14.7 ms, respectively, which were about one-third of the baseline, and far exceeded the slight elevation of the control group. This result suggests that the vagal tone rebounded significantly and the sympathetic-parasympathetic ‘pendulum’ regained dynamic elasticity. At the mechanistic level, the slow breathing-extension movement created a rhythmic closed loop of ‘inhale-extend-release-exhale’ within 60 min, which triggered the reflex pathway of the detrusor receptor-solitary tract nucleus-dorsal medullary vagal nucleus, and directly enhanced the parasympathetic output; the medium-intensity dance steps led to a transient activation of sympathetic sensation, and then gave way to parasympathetic sensation when the music beat slowed down, forming a ‘sympathetic-parasympathetic dominance’. The moderate-intensity dance steps led to a brief sympathetic activation, followed by a rapid transition to parasympathetic dominance when the music beat slowed down, resulting in a ‘sympathetic pulse-parasympathetic overdrive’ training effect. This alternating stimulation not only improved SDNN, but also improved the sensitivity of RMSSD

to high-frequency rhythms, providing clear psychosomatic feedback signals for emotion regulation [22,23].

From a medical humanities perspective, some studies have critically reassessed the scope and sustainability of arts-based interventions in cancer care, emphasizing the need for stronger evidence-based research to enhance scientific rigor and long-term effectiveness [24]. Within the field of integrative cancer care, researchers have proposed models that combine artistic healing practices with conventional medical treatment, highlighting the role of arts interventions in promoting holistic recovery and improving patients' overall care experiences [25]. This supports the hypothesis of a positive cycle of 'good mood-high HRV-better mood'. The clinical significance lies in the fact that the increase in HRV is highly correlated with the decrease in chemotherapy-related fatigue, sleep disorder, and inflammation level, which may lay the foundation for physiological resilience for subsequent treatment [26]. Epidemiological studies based on long-term follow-up data have investigated cancer incidence among professional artists, suggesting a possible association between artistic occupations and cancer risk, while noting that the underlying mechanisms remain unclear [27]. Other research, drawing on dance education and narrative approaches, has examined cancer survivors' experiences in dance participation, finding that dance practices support the reconstruction of self-identity and resilience, and contribute to emotional and social recovery [28].

However, the present study has not yet tracked the HRV follow-up curve, and we cannot rule out the possibility that the effect may be attenuated after the end of the intervention; the follow-up should be monitored continuously for 6–12 months by wearable devices, and linked with long-term indicators such as recurrence anxiety and quality of life, in order to elucidate the continued value of autonomic nerve repair and the optimal 'window of reinforcement' in the rehabilitation pathway for patients with cancer.

5.7. Limitations

Several limitations of this study should be acknowledged. First, although a randomized controlled design was adopted, the sample size was relatively small and limited to female patients from a single rehabilitation center, which may restrict the generalizability of the findings. Second, some outcome measures, such as narrative coherence and improvisational fluency, relied partly on subjective assessments, which may be influenced by evaluator bias despite acceptable inter-rater reliability. Third, the follow-up period was relatively short, and long-term sustainability of emotional and physiological improvements remains unclear. Future studies with larger samples, multi-center designs, and longer follow-up durations are warranted to further validate and extend these findings.

6. Conclusion

The study demonstrated that 12 weeks of expressive dance for 'performative healing' significantly improved emotion recognition, positive emotions, disease narrative coherence, and sense of self-recovery, as well as autonomic functioning and motor fluency in newly diagnosed cancer patients, suggesting that the integration

of body-emotion-narrative can be a safe, cost-effective, and replicable non-pharmacological solution for cancer recovery. This suggests that body-emotion-narrative integration may provide a safe, cost-effective, and easily replicable non-pharmacological solution for cancer recovery. A larger sample, longer follow-up, and objective motor and biomarker monitoring should be used to validate the long-term benefits and optimise the intervention prescription. The intervention complements traditional rehabilitation models and provides a rationale for integrative medicine; the difficulty and contextual design of the dance still needs to be refined to improve efficacy and compliance.

Author Contributions: R O was responsible for all aspects of this work, including conceptualization, study design, methodology, data collection and analysis, writing—original draft, writing—review and editing, and final approval of the manuscript. The implementation of the study, resource acquisition, project administration, and funding acquisition (if applicable) were also carried out independently by the author. The author has read and agreed to the published version of the manuscript.

Funding: None.

Ethical approval: This study was reviewed and approved by the Institutional Ethics Committee (as stated in the “3.1 Research Materials” section of the main text, the inclusion of all subjects was approved by the Ethics Committee). All procedures performed were in accordance with the Declaration of Helsinki and relevant ethical guidelines.

Informed consent statement: Written informed consent was obtained from all subjects involved in the study.

Acknowledgments: The author thanks Yonsei University for providing the academic platform and support. Sincere gratitude is also extended to the patients and their families who participated in this study for their cooperation and trust, as well as to the medical staff of the cooperating hospital's rehabilitation center for their assistance during the implementation of the study.

Conflict of interest: The author declares no conflict of interest.

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