

Research paper

Investigating the Impact of Forest-Themed DIY Activities on Mood States: Evidence from Essential Oils, Seed Pendant, and Wood Burning

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ABSTRACT

This study aimed to investigate the effects of participating in forest-themed do-it-yourself (DIY) activities on mood states. Three types of forest-themed DIY activities were examined: Essential oils, Seed pendant, and Wood burning. The Profile of Mood States (POMS) scale was used to assess seven mood dimensions: “confusion,” “vitality,” “fatigue,” “anger,” “self-esteem,” “anxiety,” and “despair.” Paired-sample *t*-tests were conducted to determine whether there were significant changes in participants’ moods before and after each activity. The results indicated that participants in the Essential oils activity showed significant differences in six of the seven mood dimensions, with “despair” being the only exception. Participants in the Seed pendant activity demonstrated significant changes in four dimensions, with no significant differences observed in “anger,” “self-esteem,” and “despair.” By contrast, participants in the Wood burning activity exhibited significant changes across all seven mood dimensions. These findings suggest that engaging in forest-themed DIY activities could enhance positive mood states and reduce negative mood states.

Keywords: POMS, mood changes, psychological benefits, DIY activities

Chan WH, Lin PH, Wu MS, Lin CJ, Lin JC. 2025. Investigating the Impact of Forest-Themed DIY Activities on Mood States: Evidence from Essential Oils, Seed Pendant, and Wood Burning. *Taiwan J For Sci* 40(3): 325-46.

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2025年4月送審，2025年9月通過。Received April 2025, Accepted September 2025.

INTRODUCTION

Urbanization has intensified daily stressors related to family, academic, occupational, and social responsibilities, heightening public concern for mental health and underscoring the need for effective strategies to regulate mood (Gross 2015). Mood states are intricately linked to daily functioning and overall well-being. A substantial body of evidence has indicated that engagement in diverse activities significantly influences mood. For instance, physical exercise (Berger and Motl 2000), exposure to natural environments (Martin et al. 2020), horticultural therapy (Soga et al. 2017, Han et al. 2018), forest therapy (Lee et al. 2011, Yu et al. 2015), and do-it-yourself (DIY) activities (Sandmire et al. 2012, Pöllänen 2013, Bukhave et al. 2025) have all been shown to promote mood stability, alleviate stress, enhance positive emotions, and mitigate negative ones.

In recent years, government agencies and related organizations in Taiwan have increasingly promoted forest-themed DIY activities to encourage public engagement with forests and the utilization of domestic timber resources. DIY activities broadly refer to practices in which individuals design or create functional or artistic items through hands-on participation, including weaving, handicrafts, gardening, woodworking, pottery, and fragrance making (Bukhave et al. 2025). Beyond serving as a medium for creative expression, DIY activities have been reported to foster positive emotions, enhance subjective well-being, and alleviate anxiety and stress (Reynolds 2000, Sandmire et al. 2012, Kaimal et al. 2016). Given their accessibility and ease of participation, forest-themed DIY activities represent a practical means of supporting psychological well-being

(Bukhave et al. 2025).

Mood changes are commonly assessed using the Profile of Mood States (POMS), developed by McNair et al. (1971). The POMS evaluates six mood dimensions: confusion, vitality, fatigue, anger, anxiety, and despair. It demonstrates strong reliability and validity and has been widely applied in sport psychology, clinical psychology, and educational psychology (Shacham 1983, Curran et al. 1995).

Research using the POMS has consistently demonstrated that diverse activities exert significant effects on mood regulation. Berger and Motl (2000) found that regular exercise reduces anxiety and despair while increasing vitality. Hansen et al. (2001) reported that even brief physical activity enhances vitality and lowers confusion and fatigue. In addition, forest-based interventions, including forest bathing, walking, and meditation, have been shown to reduce negative states significantly, such as anxiety, fatigue, and confusion, while enhancing positive states, such as self-esteem and vitality (Park et al. 2010, Lee et al. 2011, Yu et al. 2015).

Building on this evidence, our study investigates mood changes and subjective well-being associated with participation in forest-themed DIY activities. The objectives of this study are as follows:

- (1) Examining whether participation in forest-themed DIY activities improves participants' mood states.
- (2) Comparing the mood regulatory effects of different types of forest-themed DIY activities.

MATERIALS AND METHODS

This study investigated mood changes before and after participation in three types

of forest-themed DIY activities: Essential oils DIY, Seed pendant DIY, or Wood burning DIY. All activities were hosted at the Forest Therapy Pavilion during the Yilan Green Expo in March 2021. Participants in each activity were surveyed and analyzed separately.

Activity descriptions

All three activities were designed around forest-based primary and secondary products. Each activity was introduced and demonstrated by trained instructors, followed by a hands-on session where participants created their own items based on the instructions and their personal creativity. Excluding instructional time, each session lasted approximately 20-40 minutes. In Essential oils DIY, participants blended aromatic massage oils using *Litsea cubeba* (Lour.) Pers. essential oil, known for its relaxing, calming, and anxiolytic properties (Chen et al. 2012, Sattayakhom et al. 2021), and mixed them with carrier oils to create personalized formulations. In Seed pendant DIY, participants crafted pendants from the spherical seed capsules of *Liquidambar formosana* Hance, which are commonly used as natural art materials. Using tools and their own designs, they sculpted unique seed-based pendants. In Wood burning DIY, participants decorated wood coasters using domestic camphor wood. They first sketched patterns in pencil, then used pyrography pens to burn their designs into the wood, creating personalized coasters.

Questionnaire design and procedure

Two questionnaires were administered, one before and one after the activities. The pre-activity questionnaire contained two sections: (1) demographic information, including gender, age, education level,

and average monthly income, and (2) the POMS items. The post-activity questionnaire contained only the POMS items.

The study employed the Chinese version of the POMS revised by Hsu et al. (2003), which contains 37 items across seven dimensions: confusion (7 items), vitality (7 items), fatigue (6 items), anger (6 items), self-esteem (4 items), anxiety (4 items), and despair (3 items). Responses were rated on a five-point Likert scale (1 = not at all, 5 = very much) based on participants' actual feelings.

Following McNair et al. (1971), only participants aged 18 years and above were eligible. The procedure was as follows: participants first completed the pre-test questionnaire, then took part in the DIY activity, and finally completed the post-test questionnaire. Valid responses were obtained from 84 of 124 Essential oils DIY participants, 78 of 120 Seed pendant DIY participants, and 110 of 179 Wood burning DIY participants.

Data analysis

All questionnaire data were coded and statistically analyzed using SPSS software. Analyses included the following:

1. Descriptive statistics of participants' demographic information and POMS items.
2. Reliability analysis of each POMS dimension using Cronbach's α coefficient. An $\alpha \geq 0.70$ was considered acceptable, whereas $\alpha < 0.60$ indicated inadequate internal consistency (Cronbach 1951).
3. Examine changes in participants' mood states before and after each activity.
4. Comparisons of mood changes across demographic subgroups (i.e., gender, age group, education, and income level) to identify potential moderating effects.

RESULTS

Participant characteristics

Table 1 summarizes the demographic profiles of participants across the three DIY activities. The Essential oils DIY group was predominantly female (69.0%), with the largest proportion aged 40-49 years (26.3%). Most held a university degree or higher (66.7%) and reported a monthly income between NT\$20,001 and NT\$60,000 (71.4%). The Seed pendant DIY group also had a female majority (76.9%), primarily aged 40-49 years (34.6%) or 18-29 years (25.6%), with most participants holding a university degree or higher (75.6%). Income distribution was bimodal, concentrated either between NT\$40,001 and NT\$60,000 (34.6%) or below NT\$20,000 (32.1%). Similarly, the Wood burning DIY group was predominantly female (70.9%), with the most common age

cohorts being 18-29 years (29.1%) and 40-49 years (27.3%). The majority held a university degree (64.5%), and most reported a monthly income of NT\$20,001–NT\$60,000 (62.8%). Overall, participants across all three activities were characterized by a female majority, a large proportion of participants aged 40-49 years, high educational attainment, and a typical monthly income of NT\$20,001–NT\$60,000.

Changes in POMS scores before and after DIY activities

Paired-sample *t*-tests with Bonferroni correction were conducted to examine changes in participants' mood states before and after each activity. Effect sizes (Cohen's *d*) were calculated and interpreted as small (0.2), medium (0.5), or large (0.8) (Cohen, 1988). The following presents the POMS results for each DIY activity, including mean scores before and after the experience,

Table 1. Respondent profiles of each DIY activity.

	Essential oil	Seed pendant	Wood burning
Gender			
Male	26 (31.0%)	18 (23.1%)	32 (29.1%)
Female	58 (69.0%)	60 (76.9%)	78 (70.9%)
Age			
18-29	16 (19.0%)	20 (25.6%)	32 (29.1%)
30-39	17 (20.2%)	12 (15.5%)	22 (20.0%)
40-49	22 (26.3%)	27 (34.6%)	30 (27.3%)
50-59	17 (20.2%)	16 (20.5%)	15 (13.6%)
≥ 60	12 (14.3%)	3 (3.8%)	11 (10.0%)
Education			
Junior high school	4 (4.8%)	3 (3.8%)	4 (3.6%)
Senior high school	12 (14.3%)	7 (9.0%)	11 (10.0%)
College	12 (14.3%)	9 (11.5%)	14 (12.7%)
University	34 (40.5%)	42 (53.8%)	71 (64.5%)
Graduate school	22 (26.2%)	17 (21.8%)	10 (9.2%)
Personal income			
< 20,000	9 (10.7%)	25 (32.1%)	27 (24.5%)
20,001-40,000	30 (35.7%)	16 (20.5%)	39 (35.5%)
40,001-60,000	30 (35.7%)	27 (34.6%)	30 (27.3%)
> 60,001	15 (17.9%)	10 (12.8%)	14 (12.7%)

percentage changes, Cronbach's α for internal consistency, paired-sample t -test results, and effect sizes.

(1) Essential oils DIY

Table 2 presents the POMS results for the Essential oils DIY activity. Cronbach's α values ranged from 0.80 to 0.93, indicating good internal consistency and reliability. Mean scores across the seven mood dimensions changed as follows: confusion scores decreased from 12.8 to 10.0 (-21.9%), vitality increased from 23.2 to 27.0 (+16.4%), fatigue decreased from 12.1 to 9.2 (-24.0%), anger decreased from 9.4 to 8.3 (-11.7%), self-esteem increased from 14.2 to 15.9 (+12.0%), anxiety decreased from 7.3 to 6.0 (-17.8%), and despair decreased slightly from 4.7 to 4.3 (-8.5%).

Paired-sample t -tests revealed significant changes in six of the seven mood dimensions: confusion ($p < 0.001$), fatigue ($p < 0.005$), anger ($p < 0.001$), and anxiety ($p < 0.001$) decreased significantly, whereas vitality ($p < 0.001$) and self-esteem ($p < 0.001$) increased significantly. No significant change was observed for despair. Effect sizes (Cohen's d)

for the significant mood dimensions indicated medium to large effects for confusion ($d = 0.69$), vitality ($d = 0.56$), fatigue ($d = 0.66$), and anxiety ($d = 0.59$), and small to medium effects for anger ($d = 0.31$) and self-esteem ($d = 0.38$).

(2) Seed pendant DIY

Table 3 presents the POMS results for the Seed pendant DIY. Cronbach's α values ranged from 0.80 to 0.93, indicating satisfactory internal consistency. Mean scores changed as follows: confusion decreased from 11.8 to 9.6 (-18.6%), vitality increased from 24.5 to 26.7 (+9.0%), fatigue decreased from 11.5 to 8.6 (-25.2%), anger decreased from 8.9 to 7.4 (-12.4%), self-esteem increased from 14.9 to 15.3 (+2.7%), anxiety decreased from 7.0 to 5.7 (-18.6%), and despair decreased slightly from 4.4 to 4.1 (-6.8%).

Paired-sample t -tests indicated significant changes in four mood dimensions: confusion ($p < 0.001$), fatigue ($p < 0.001$), and anxiety ($p < 0.001$) decreased significantly, while vitality ($p < 0.001$) increased significantly. Anger, self-esteem, and despair showed no significant changes. Effect sizes (Cohen's d) showed a medium to

Table 2. Results of the POMS comparison for Essential oils DIY.

Factor	pre/post-test	Mean (SD)	Cronbach's α	$\Delta\%$	t -value	Cohen's d
Confusion	pre	12.8 (5.7)	0.91	-21.9%	6.35**	0.69
	post	10.0 (4.7)	0.93			
Vitality	pre	23.2 (7.0)	0.93	16.4%	-5.15**	0.56
	post	27.0 (6.6)	0.92			
Fatigue	pre	12.1 (5.7)	0.92	-24.0%	6.08**	0.66
	post	9.2 (4.5)	0.91			
Anger	pre	9.4 (4.0)	0.87	-11.7%	2.85*	0.31
	post	8.3 (3.9)	0.92			
Self-esteem	pre	14.2 (3.9)	0.89	12.0%	-3.44**	0.38
	post	15.9 (3.8)	0.90			
Anxiety	pre	7.3 (3.1)	0.82	-17.8%	5.43**	0.59
	post	6.0 (2.8)	0.86			
Despair	pre	4.7 (2.1)	0.80	-8.5%	1.60	0.17
	post	4.3 (2.3)	0.80			

$\Delta\% = (\text{post} - \text{pre})/\text{pre} \times 100\%$, * $p < 0.005$, ** $p < 0.001$

large effect for fatigue ($d = 0.64$), and small to medium effects for confusion ($d = 0.42$), vitality ($d = 0.38$), and anxiety ($d = 0.39$).

(3) Wood burning DIY

The POMS scale analysis results for participants in the Wood burning DIY activity are presented in Table 4. Cronbach's α coefficients for pre- and post-test scores

ranged from 0.75 to 0.93, demonstrating satisfactory internal consistency and reliability. Mean scores for all seven mood dimensions showed significant improvements: confusion decreased from 11.9 to 9.2 (22.7% reduction); vitality increased from 24.4 to 26.4 (8.2% increase); fatigue decreased from 11.6 to 8.6 (25.9% reduction); anger

Table 3. Results of the POMS comparison for Seed pendant DIY.

Factor	pre/post-test	Mean (SD)	Cronbach's α	$\Delta\%$	<i>t</i> -value	Cohen's <i>d</i>
Confusion	pre	11.8 (5.7)	0.91	-18.6%	3.67**	0.42
	post	9.6 (4.4)	0.93			
Vitality	pre	24.5 (5.6)	0.90	9.0%	-3.32**	0.38
	post	26.7 (6.8)	0.93			
Fatigue	pre	11.5 (5.5)	0.92	-25.2%	5.65**	0.64
	post	8.6 (3.9)	0.89			
Anger	pre	8.9 (4.7)	0.92	-12.4%	2.22	0.25
	post	7.8 (3.5)	0.92			
Self-esteem	pre	14.9 (3.2)	0.82	2.7%	-1.16	0.13
	post	15.3 (3.8)	0.85			
Anxiety	pre	7.0 (3.3)	0.88	-18.6%	3.48**	0.39
	post	5.7 (2.5)	0.80			
Despair	pre	4.4 (2.4)	0.92	-6.8%	0.73	0.08
	post	4.1 (2.2)	0.80			

$\Delta\% = (\text{post} - \text{pre})/\text{pre} \times 100\%$, ** $p < 0.001$

Table 4. Results of the POMS comparison for Wood burning DIY.

Factor	pre/post-test	Mean (SD)	Cronbach's α	$\Delta\%$	<i>t</i> -value	Cohen's <i>d</i>
Confusion	pre	11.9 (5.0)	0.88	-22.7%	6.46**	0.62
	post	9.2 (3.5)	0.86			
Vitality	pre	24.4 (5.9)	0.91	8.2%	-3.84**	0.37
	post	26.4 (6.7)	0.93			
Fatigue	pre	11.6 (5.0)	0.89	-25.9%	7.22**	0.69
	post	8.6 (3.5)	0.88			
Anger	pre	8.8 (4.1)	0.92	-17.0%	4.46**	0.43
	post	7.3 (2.6)	0.87			
Self-esteem	pre	14.7 (3.1)	0.78	8.2%	-3.74**	0.36
	post	15.9 (3.4)	0.84			
Anxiety	pre	7.2 (2.9)	0.80	-22.2%	5.60**	0.53
	post	5.6 (2.6)	0.87			
Despair	pre	4.6 (2.4)	0.83	-15.2%	3.20*	0.30
	post	3.9 (1.9)	0.75			

$\Delta\% = (\text{post} - \text{pre})/\text{pre} \times 100\%$, * $p < 0.005$, ** $p < 0.001$

decreased from 8.8 to 7.3 (17.0% reduction); self-esteem increased from 14.7 to 15.9 (8.2% increase); anxiety decreased from 7.2 to 5.6 (22.2% reduction); and despair decreased from 4.6 to 3.9 (15.2% reduction).

Paired-sample *t*-tests confirmed significant changes across all seven mood dimensions. Confusion ($p < 0.001$), fatigue ($p < 0.001$), anger ($p < 0.001$), anxiety ($p < 0.001$), and despair ($p < 0.001$) showed significant reductions, whereas vitality ($p < 0.001$) and self-esteem ($p < 0.005$) significantly increased.

Effect size analysis further revealed medium to large effects for confusion ($d = 0.62$), fatigue ($d = 0.69$), and anxiety ($d = 0.53$). By contrast, vitality ($d = 0.37$), anger ($d = 0.43$), self-esteem ($d = 0.36$), and despair ($d = 0.30$) exhibited small to medium effects.

Differences in mood state changes by participant characteristics

To assess whether changes in POMS mood dimensions varied according to demographic characteristics, participants were grouped by demographic characteristics. For gender differences, the Mann–Whitney U test was used for the Essential oils DIY and Seed pendant DIY activities, while an independent-samples *t*-test was applied for the Wood burning DIY activity. For other characteristics (age, education level, and income), the Kruskal–Wallis H test was used to evaluate differences in change scores across the POMS subscales. As shown in Table 5, no significant subgroup differences were observed in mood changes across gender, age, education, or income groups for any of the three DIY activities.

Table 5. Results of difference testing for POMS of each DIY activity between different respondent attributes.

	Confusion	Vitality	Fatigue	Anger	Self-esteem	Anxiety	Despair
Gender							
Essential oil ¹	-0.24	-1.63	-2.26	-1.64	-1.77	-1.09	-0.43
Seed pendant ¹	-1.21	-2.01	-0.45	-0.59	-0.78	-1.11	-0.48
Wood burning ²	-2.23	-1.30	-0.60	-2.90	0.90	-1.80	-2.00
Age							
Essential oil ³	1.89	1.69	2.71	0.42	5.29	2.52	3.72
Seed pendant ³	3.11	5.74	2.52	3.96	2.88	3.70	3.14
Wood burning ³	1.24	5.87	0.18	4.84	3.69	1.29	3.17
Education							
Essential oil ³	1.21	5.54	2.77	6.62	2.87	10.50	2.69
Seed pendant ³	0.35	6.58	2.38	3.24	6.47	5.05	0.90
Wood burning ³	6.22	8.26	2.95	4.94	4.91	2.16	4.42
Personal income							
Essential oil ³	1.60	5.13	0.51	2.80	0.83	2.79	3.68
Seed pendant ³	3.90	4.13	0.26	0.23	4.01	2.77	0.53
Wood burning ³	4.83	1.87	4.64	5.41	4.94	0.48	3.48

¹ Z-value, ² T-value, ³ H-value

DISCUSSION

Mood regulation effects of forest-themed DIY activities

This study employed the POMS scale to evaluate mood changes following participation in three forest-themed DIY activities: Essential oils, Seed pendant, and Wood burning. Results indicated that Wood burning produced significant changes across all seven mood dimensions. Essential oils and Seed pendant activities significantly influenced six and four mood dimensions, respectively. Overall, all three activities effectively reduced negative mood states, particularly confusion, fatigue, and anxiety while significantly enhancing vitality. These findings support the role of forest-themed DIY activities in promoting psychological benefits and mood regulation. The results are consistent with those of previous studies showing that hands-on creative engagement requires focused attention, thereby facilitating emotional stability and stress reduction (Reynolds 2000, Kaimal et al. 2016).

Regarding activity-specific outcomes, participation in the Essential oils DIY activity significantly reduced confusion, fatigue, anger, and anxiety while increasing vitality and self-esteem. Participation in the Seed pendant DIY activity significantly decreased confusion, fatigue, and anxiety, and increased vitality. Participation in the Wood burning DIY activity resulted in significant improvements across all negative and positive mood dimensions. These findings align with those of studies by Kaimal et al. (2016), Pöllänen (2013), and Sandmire et al. (2012), indicating that DIY activities can enhance concentration, promote positive mood, and mitigate negative affect. Thus, the process of participating in forest-themed DIY activities

can help reduce stress and promote mental well-being.

It should be noted that not all activities produced significant changes across every mood dimension. Nevertheless, significant changes in specific dimensions still indicate mood regulatory effects (McNair 1971). Similar patterns have been observed in other POMS-based studies. For example, Yu et al. (2015) found that exposure to forest environments significantly improved overall mood compared to urban settings and reduced negative moods, though no significant change was observed in self-esteem.

Differences in mood regulatory effects across activity types

This study investigated the mood regulation effects of three forest-themed DIY activities, revealing differences across specific mood dimensions. All three activities significantly improved confusion, vitality, fatigue, and anxiety. However, some effects were activity-specific: Essential oils DIY did not significantly reduce despair, while Seed pendant DIY had no significant effects on anger, self-esteem, or despair.

These differences are likely attributable to the characteristics of each activity, particularly the type and intensity of sensory stimulation and the duration of sustained engagement. Olfactory stimulation, for example, can rapidly influence mood (Herz 2009). Chaiyasut et al. (2020) found that inhaling *Lit. cubeba* essential oil significantly reduced confusion as measured by the POMS. In addition, even short activities (less than 30 minutes) can positively affect mood, though longer durations generally produce more stable effects (Pretty et al. 2005).

Different mood dimensions also vary in sensitivity to external stimuli (McNair et al. 1992). Dimensions, such as confusion,

vitality, and anxiety, are more sensitive to short-term interventions, consistent with our findings that all three DIY activities significantly improved these states with medium or higher effect sizes. By contrast, anger, self-esteem, and despair are relatively stable and require prolonged or more intensive stimuli to achieve significant changes (Watson and Clark 1997, Pöllänen 2013).

Analyzing each activity individually clarified these patterns. The Essential oils DIY activity combined olfactory stimulation with hands-on blending, which resulted in significant improvements in mood. In comparison, the Seed pendant DIY activity was relatively short in duration, simple in execution, and low in sensory stimulation. As a low-intensity, sedentary creative task with limited challenge and focus, it produced minimal effects on anger, self-esteem, and despair (Stuckey and Nobel 2010). The Wood burning DIY activity required the longest participation time and involved focused manipulation of the tool while also providing olfactory stimulation. By engaging multiple senses over an extended duration, the activity facilitated significant improvements in all POMS mood dimensions.

Selection of forest-themed DIY activities

The results of this study indicated that participation in forest-themed DIY activities has a positive effect on mood states, with different types of activities producing distinct regulatory outcomes. These findings provide practical guidance for the design and implementation of related programs. Traditionally, forest therapy is conducted in outdoor settings and involves such activities as walking, deep breathing, meditation, and sensory engagement, which contribute to both psychological and physiological regulation (Park et al. 2010, Lee et al. 2011). However,

outdoor programs are often limited by weather and other environmental conditions. Recent studies have shown that indoor adaptations of forest therapy, including exposure to photographs, videos, or virtual reality (VR) experiences, can similarly enhance participants' psychological and physiological well-being (Song et al. 2017, Clemente et al. 2024). Based on the present findings, forest-themed DIY activities offer a viable indoor approach for mood regulation and may be integrated with outdoor interventions to create more comprehensive forest therapy programs.

CONCLUSIONS

This study aimed to investigate the effects of forest-themed DIY activities on participants' mood states. Using the POMS, mood changes were assessed before and after participation in each activity. The results indicated that all three forest-themed DIY activities significantly improved participants' mood states by enhancing positive moods and reducing negative ones. Among the activities, the Wood burning DIY showed significant effects across all mood dimensions. Due to limitations in sample size, this study did not conduct subgroup analyses based on participants' demographic or baseline characteristics. Future research should include larger and more diverse samples and include information on participants' prior experience, frequency of participation, and duration of engagement in each activity. Such data would allow for tracking the effects of repeated participation on mood regulation and examining potential differences in the effectiveness of each activity across participants with varying characteristics, providing a basis for further investigation.

LITERATURE CITED

- Berger BG, Motl RW. 2000.** Exercise and mood: A selective review and synthesis of research employing the Profile of Mood States. *J Appl Sport Psychol* 12(1):69-92. <https://doi.org/10.1080/10413200008404214>
- Bukhave EB, Creek J, Linstad AK, Frandsen TF. 2025.** The effects of crafts-based interventions on mental health and well-being: A systematic review. *Aust Occup Ther J* 72(1):e70001. <https://doi.org/10.1111/1440-1630.70001>
- Chaiyasut C, Sivamaruthi BS, Wongwan J, et al. 2020.** Effects of *Litsea cubeba* (Lour.) Persoon essential oil aromatherapy on mood states and salivary cortisol levels in healthy volunteers. *Evid Based Complement Alternat Med* 4389239. <https://doi.org/10.1155/2020/4389239>
- Chen CJ, Tseng YH, Chu FH, et al. 2012.** Neuropharmacological activities of fruit essential oil from *Litsea cubeba* Persoon. *J Wood Sci* 58:538-43. <https://doi.org/10.1007/s10086-012-1277-3>
- Clemente D, Romano L, Zamboni E, Carrus G and Panno A. 2024.** Forest therapy using virtual reality in the older population: A systematic review. *Front Psychol* 14:1323758. <https://doi.org/10.3389/fpsyg.2023.1323758>
- Cohen J. 1988.** *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). New York: Routledge. 567 p. <https://doi.org/10.4324/9780203771587>
- Cronbach LJ. 1951.** Coefficient alpha and the internal structure of tests. *Psychometrika* 16(3):297-334. <https://doi.org/10.1007/BF02310555>
- Curran SL, Andrykowski MA, Studts JL. 1995.** Short Form of the Profile of Mood States (POMS-SF): Psychometric information. *Psychol Assessment* 7(1):80-3. <https://doi.org/10.1037/1040-3590.7.1.80>
- Gross JJ. 2015.** Emotion regulation: Current status and future prospects. *Psychol Inq* 26(1):1-26. <https://doi.org/10.1080/1047840X.2014.940781>
- Han AR, Park SA, Ahn BE. 2018.** Reduced stress and improved physical functional ability in elderly with mental health problems following a horticultural therapy program. *Complement Ther Med* 38:19-23. <https://doi.org/10.1016/j.ctim.2018.03.011>
- Hansen CJ, Stevens LC, Coast JR. 2001.** Exercise duration and mood state: How much is enough to feel better? *Health Psychol* 20(4):267-75. <https://doi.org/10.1037//0278-6133.20.4.267>
- Herz RS. 2009.** Aromatherapy facts and fictions: A scientific analysis of olfactory effects on mood, physiology and behavior. *Int J Neurosci* 119(2):263-90. <https://doi.org/10.1080/00207450802333953>
- Hsu P, Chang Y, Lu J. 2003.** The revision of Profile of Mood State questionnaire. *J Phys Educ High Educ* 5(1):85-95. [in Chinese with English abstract].
- Kaimal G, Ray K, Muniz J. 2016.** Reduction of cortisol levels and participants' responses following art making. *Art Ther* 33(2):74-80. <https://doi.org/10.1080/07421656.2016.1166832>
- Lee J, Park BJ, Tsunetsugu Y, Ohira T, Kagawa T, Miyazaki Y. 2011.** Effect of forest bathing on physiological and psychological responses in young Japanese male subjects. *Public Heal* 125(2):93-100. <https://doi.org/10.1016/j.puhe.2010.09.005>
- Martin L, White MP, Hunt A, Richardson M, Pahl S, Burt J. 2020.** Nature contact, nature connectedness and associations with health, wellbeing and pro-environmental behaviours. *J Environ Psychol* 68:101389. <https://doi.org/10.1016/j.jenvp.2020.101389>
- McNair DM, Lorr M, Droppleman LF. 1971.** *Profile of Mood States Manual*. San

Diego, CA: Educational and Industrial Testing Service.

McNair DM, Lorr M, Droppleman LF. 1992. Manual for the Profile of Mood States. San Diego, CA: Educational and Industrial Testing Service.

Park BJ, Tsunetsugu Y, Kasetani T, Kagawa T, Miyazaki Y. 2010. The physiological effects of Shinrin-yoku (taking in the forest atmosphere): Evidence from field experiments in 24 forests across Japan. *Environ Health Prev* 15:18-26. <https://doi.org/10.1007/s12199-009-0086-9>

Pöllänen S. 2013. The meaning of craft: Craft makers' descriptions of craft as an occupation. *Scand J Occup Ther* 20:217-27. <https://doi.org/10.3109/11038128.2012.725182>

Pretty J, Peacock J, Sellens M, Griffin M. 2005. The mental and physical health outcomes of green exercise. *Int J Environ Health Res* 15(5):319-37. <https://doi.org/10.1080/09603120500155963>

Reynolds F. 2000. Managing depression through needlecraft creative activities: A qualitative study. *Art Psychother* 27(2):107-14. [https://doi.org/10.1016/S0197-4556\(99\)00033-7](https://doi.org/10.1016/S0197-4556(99)00033-7)

Sandmire DA, Gorham SR, Rankin NE, Grimm DR. 2012. The influence of art making on anxiety: A pilot study. *Art Ther*

29(2):68-73. <https://doi.org/10.1080/07421656.2012.683748>

Sattayakhom A, Songsamoe S, Yusakul G, Kalarat K, Matan N, Koomhin, P. 2021. Effects of Thai local ingredient odorants, Litsea cubeba and garlic essential oils, on brainwaves and moods. *Molecules* 26(10):2939. <https://doi.org/10.3390/molecules26102939>

Shacham S. 1983. A shortened version of the Profile of Mood States. *J Pers Assess* 47(3):305-6.

Soga M, Gaston KJ, Yamaura Y. 2017. Gardening is beneficial for health: A meta-analysis. *Prev Med Rep* 5:92-9. <https://doi.org/10.1016/j.pmedr.2016.11.007>

Song C, Ikei H, Kobayashi M, et al. 2017. Effects of viewing forest landscape on middle-aged hypertensive men. *Urban For Urban Green* 21:247-52. <https://doi.org/10.1016/j.ufug.2016.12.010>

Stuckey HL, Nobel J. 2010. The connection between art, healing, and public health: A review of current literature. *Am J Public Health* 100(2):254-63. <https://doi.org/10.2105/AJPH.2008.156497>

Yu CP, Chao YC, Chen WJ. 2015. Physiological and psychological effects of forest environment. *Q J For Res* 48(4):363-76. [in Chinese with English abstract].

研究報告

森林手作DIY體驗活動對心情狀態之影響 —以舒緩精油、種子吊飾、木材電燒活動為例

詹為巽¹、林柏亨²、吳孟珊¹、林振榮²、林俊成³

摘要

本研究為探討參與森林手作DIY活動後對於心情狀態之影響，分別針對「舒緩精油」、「種子吊飾」以及「木材電燒」等3種不同森林手作DIY活動之參與民眾進行調查。本研究採用盤斯心情量表(Profile of Mood States, POMS)調查參與者之「困惑」、「活力」、「疲勞」、「憤怒」、「自尊」、「緊張」及「沮喪」等7項心情構面，並使用成對樣本T檢定分析於活動體驗前與體驗後之變化是否有顯著差異。結果顯示「舒緩精油」活動參與者共6項心情構面有顯著差異，其中僅「沮喪」構面無顯著差異；「種子吊飾」活動參與者共4項心情構面有顯著差異，其中「憤怒」、「自尊」與「沮喪」構面無顯著差異；而「木材電燒」活動參與者則於7項心情構面均具有顯著差異，顯示參與森林手作DIY活動可提升正面心情並降低負面心情。

關鍵詞：盤斯心情量表、心情變化、心理效益、DIY活動

詹為巽、林柏亨、吳孟珊、林振榮、林俊成。2025。手作DIY體驗活動對心情狀態之影響。台灣林業科學 40(3): 325-46。

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2025年4月送審，2025年9月通過。Received April 2025, Accepted September 2025.

緒言

由於現代都市化生活壓力的增加，人們每日面臨各種壓力來源，例如家庭、學業、工作與社會責任等，大眾對於身心健康的關注也日益提升，如何有效管理與改善心理健康為重要課題(Gross 2015)。而人們的心情狀態與日常生活以及身心健康有著密切的關係，過去相關研究顯示，參與不同類型的活動，對於人們的心情狀態將會產生顯著影響，例如從事體育運動(Berger and Motl 2000)、接觸自然環境(Martin et al. 2020)、參與園藝療癒(horticultural therapy)(Han et al. 2018, Soga et al. 2017)或森林療癒(forest therapy)活動(Lee et al. 2011, Yu et al. 2015)，以及進行手作DIY(do-it-yourself)活動(Bukhave et al. 2025, Pöllänen 2013, Sandmire et al. 2012)等各項活動，都具有促進心情穩定與緩解壓力的效果，有助提升人們的正面心情以及緩解負面心情。

近年來，為提倡與鼓勵民眾接觸森林與運用國產木材資源，相關單位常舉辦與森林相關之手作DIY活動，其中手作DIY活動係指個體透過自我設計或實作方式，製作具有實用性或藝術性之作品，包含如編織、手工藝、園藝、木工、陶藝以及香氛製作等多種形式(Bukhave et al. 2025)。而手作DIY活動不僅作為創造性展現的媒介，亦有相關研究指出手作DIY活動具有促進正向心情、提升幸福感、減少焦慮與壓力等有益個人身心健康的效果(Kaimal et al. 2016, Reynolds 2000, Sandmire et al. 2012)，加上手作DIY活動具有方便參與及進行的特性，因此可以做為調節個人心理健康的一種方法(Bukhave et al. 2025)。

針對心情狀態變化調查部分，目前常透過McNair et al. (1971)所發展出之盤斯心情量表(Profile of Mood States, POMS)進行評估，POMS量表為用於評估人類心情狀態之自評量表，原始設計共有六個心情構面，包含了困惑(confusion)、活力(vitality)、疲勞(fatigue)、憤怒(anger)、緊張(anxiety)以及抑鬱(despair)等，POMS量表已被證明具有良好的信度和效度，並被廣泛應用於各種研究領域，包括運動心理學、臨床心理學及教育

心理學等(Shacham 1983, Curran et al. 1995)。

已有許多研究採用POMS量表評估個體在參與不同類型活動前後的心情變化，以探討參與活動對於心理之影響，例如Berger and Motl (2000)應用POMS量表評估運動對於心情狀態的影響，結果顯示規律參與運動有助於降低緊張與抑鬱之心情，並且可提升活力；Hansen et al. (2001)亦指出短時間的運動也能有效改善受試者的心情狀態，可以提升活力，並降低困惑以及疲勞等負面心情。除運動之外，Lee et al. (2011)、Park et al. (2010)以及Yu et al. (2015)等人亦應用POMS量表研究發現，進行森林浴、漫步與冥想等森林療癒活動，能讓參與者之焦慮、疲勞與困惑等負面心情顯著降低，而自尊(self-esteem)與活力等正面心情顯著提升。

綜合上述，本研究嘗試運用POMS量表調查參與森林手作DIY活動前後對於心情狀態變化之影響，以及各項活動之體驗幸福感，本研究之目的如下：

- (1) 調查參與森林手作DIY活動，是否具有調節參與者心情之效果。
- (2) 探討不同類型森林手作DIY活動，對於參與者心情調節之影響效果。

材料與方法

為調查不同類型森林手作DIY活動參與者於體驗前後之心情狀態變化，本研究以前往2021年3月於宜蘭所舉辦之「2021宜蘭綠色博覽會」，參加其中森林療癒館辦理之「舒緩精油DIY」、「種子吊飾DIY」以及「木材電燒DIY」等3種森林手作DIY活動之參與者，本研究分別針對參與上述3種不同森林手作DIY活動之民眾進行調查與分析，各項活動內容與調查方法說明如後。

森林手作DIY活動內容

前述3項DIY活動均以森林主副產物為主題，各項活動經專業老師引導講解後，由參與者以老師講解作為基礎搭配自我創意進行實作，各種活動體驗扣除老師講解時間後約20-40分鐘。其

中「舒緩精油DIY」係調製芳香按摩油，本次活動主要使用具有放鬆、鎮靜及抗焦慮效果之馬告 *Litsea cubeba* (Lour.) Pers.精油(Chen et al. 2012, Sattayakhom et al. 2021)，再搭配植物油讓參與者依自身喜好調配成舒緩按摩油；「種子吊飾DIY」係使用以楓香之球型蒴果為材料，為自然藝術創意常使用元素，利用工具以及參與者之創意，進行種子雕塑製作個人吊飾；「木材電燒」則是使用國產樟木杯墊為底，由參與者先以鉛筆進行圖案設計描繪後，再使用電燒筆進行電燒製作個人專屬杯墊。

問卷設計與調查

首先問卷設計部分，本研究分別於參與者實際「體驗前」以及「體驗後」進行問卷設計，其中「體驗前」問卷包含兩部分，第一部份為參與者之性別、年齡、教育程度及平均收入等個人基本資訊，第二部份為POMS量表題項；「體驗後」問卷僅有POMS量表之題項。

本研究問卷採用之POMS量表為Hsu et al. (2003)所修訂編製之中文版POMS量表，共包含「困惑」(7題)、「活力」(7題)、「疲勞」(6題)、「憤怒」(6題)、「自尊」(4題)、「緊張」(4題)及「沮喪」(3題)等7個構面共37個題項，並以李克特5點尺度量表，由1至5分(依序為非常不符合至非常符合)，由參與者依實際感受圈選。

調查對象與方法部分，本研究依McNair et al. (1971)進行POMS量表調查之建議，針對年齡18歲以上之活動參與者進行調查，於各種DIY活動開始前請參與者填寫前測問卷，並接續進行各項所參與之手作DIY活動，再於DIY活動結束後請參與者填寫後測問卷以完成調查。最終各DIY活動參與人數及回收之有效問卷分別為「舒緩精油DIY」活動共124人參加，回收有效問卷84份；「種子吊飾DIY」活動共120人參加，回收有效問卷78份；以及「木材電燒DIY」活動共179人參加，回收有效問卷110份。

資料分析

針對本研究收集之問卷調查結果資料，使用SPSS軟體進行資料建檔以及統計分析作業，分析項目包含：

1. 參與者基本資料以及POMS量表各項目之敘述統計。
2. 針對POMS量表各構面進行信度分析，並以Cronbach's α 係數檢驗各構面之內部一致性，一般認為Cronbach's α 值大於0.7即代表有良好之信度，若低於0.6表示項目須再進行調整(Cronbach 1951)。
3. 分析不同森林手作DIY活動參與者於活動前後之心情狀態變化。
4. 針對性別、年齡、教育程度與收入等基本特性，比較不同特性之參與者間心情狀態變化是否具有差異。

結果

參與者基本資料

經統計各DIY活動參與者基本資料詳如Table 1。首先「舒緩精油DIY」之參與者以女性較多(69.0%)，主要年齡層介於40-49歲(26.3%)，在學歷方面以大學學歷以上人數最多(66.7%)，個人月所得多介於20,001-60,000元(71.4%)；「種子吊飾DIY」參與者以女性為主(76.9%)，年齡介於40-49歲(34.6%)，其次為18-29歲(25.6%)，學歷主要為大學學歷以上(75.6%)，個人月所得介於40,001-60,000元人數最多(34.6%)，其次為20,000元以下(32.1%)；「木材電燒DIY」參與者同樣以女性較多(70.9%)，年齡層以介於18-29歲(29.1%)，其次為40-49歲(27.3%)，學歷部分大學學歷為主(64.5%)，個人月所得方面主要介於20,001-60,000元(62.8%)。整體而言本次調查三項DIY活動之參與者均以女性較多，參與者年齡分佈方面多為40-49歲，就學歷而言主要為大學以上學歷的參與者最多，個人月所得方面則主要介於20,001-60,000元。

Table 1. Respondent profiles of each DIY activity

	Essential oil	Seed pendant	Wood burning
Gender			
Male	26 (31.0%)	18 (23.1%)	32 (29.1%)
Female	58 (69.0%)	60 (76.9%)	78 (70.9%)
Age			
18-29	16 (19.0%)	20 (25.6%)	32 (29.1%)
30-39	17 (20.2%)	12 (15.5%)	22 (20.0%)
40-49	22 (26.3%)	27 (34.6%)	30 (27.3%)
50-59	17 (20.2%)	16 (20.5%)	15 (13.6%)
≥ 60	12 (14.3%)	3 (3.8%)	11 (10.0%)
Education			
Junior high school	4 (4.8%)	3 (3.8%)	4 (3.6%)
Senior high school	12 (14.3%)	7 (9.0%)	11 (10.0%)
College	12 (14.3%)	9 (11.5%)	14 (12.7%)
University	34 (40.5%)	42 (53.8%)	71 (64.5%)
Graduate school	22 (26.2%)	17 (21.8%)	10 (9.2%)
Personal income			
< 20,000	9 (10.7%)	25 (32.1%)	27 (24.5%)
20,001-40,000	30 (35.7%)	16 (20.5%)	39 (35.5%)
40,001-60,000	30 (35.7%)	27 (34.6%)	30 (27.3%)
> 60,001	15 (17.9%)	10 (12.8%)	14 (12.7%)

DIY活動前後POMS量表變化

為了解參與前後各項心情構面是否具有顯著差異，本研究採用成對樣本T檢定(paired sample *t*-test)分析，並採用Bonferroni多重比較校正以避免高估顯著性，同時針對各檢定結果計算Cohen's *d*效果量指標(effect size)，而效果量之大小依據Cohen (1988)之建議分別為效果量小(0.2)、效果量中(0.5)及效果量大(0.8)。

本部分針對各項DIY活動之POMS量表統計結果進行說明，包含各項DIY活動參與者於體驗前與體驗後POMS量表7項構面之平均得分、前後測得分變化比率、內部一致性信度分析之Cronbach's α 值以及成對樣本T檢定分析結果，下列分別針對「舒緩精油DIY」、「種子吊飾DIY」以及「木材電燒DIY」等3項活動之調查結果依序說明。

(一) 舒緩精油

首先舒緩精油DIY活動參與者之POMS量表分析結果如Table 2，各心情構面前後測之

Cronbach's α 係數介於0.80-0.93，顯示調查結果具有內部一致性，調查結果具有信度。而各心情構面前、後測平均得分結果部分，首先「困惑」前測為12.8分，體驗結束後測為10.0分，下降21.9%；「活力」前測為23.2分，體驗結束後測為27.0分，上升16.4%；「疲勞」前測為12.1分，體驗結束後測為9.2分，下降24.0%；「憤怒」前測為9.4分，體驗結束後測為8.3分，下降11.7%；「自尊」前測為14.2分，體驗結束後測為15.9分，上升12.0%；「緊張」前測為7.3分，體驗結束後測為6.0分，下降17.8%；最後「沮喪」前測為4.7分，體驗結束後測為4.3分，下降8.5%。

再經成對樣本T檢定分析各心情構面之前、後測差異，結果顯示舒緩精油DIY活動參與者有6項心情構面於參與前後之變化達統計上之顯著差異，包括「困惑」($p < 0.001$)、「疲勞」($p < 0.005$)、「憤怒」($p < 0.001$)與「緊張」($p < 0.001$)等4項心情構面顯著降低，以及「活力」($p < 0.001$)與「自尊」($p < 0.001$)等2項心情構面顯著提升，而「沮喪」構面於活動前後則沒有統計

Table 2. Results of the POMS comparison for Essential oil DIY

Factor	pre/post-test	Mean (SD)	Cronbach's α	$\Delta\%$	<i>t</i> -value	Cohen's <i>d</i>
Confusion	pre	12.8 (5.7)	0.91	-21.9%	6.35**	0.69
	post	10.0 (4.7)	0.93			
Vitality	pre	23.2 (7.0)	0.93	16.4%	-5.15**	0.56
	post	27.0 (6.6)	0.92			
Fatigue	pre	12.1 (5.7)	0.92	-24.0%	6.08**	0.66
	post	9.2 (4.5)	0.91			
Anger	pre	9.4 (4.0)	0.87	-11.7%	2.85*	0.31
	post	8.3 (3.9)	0.92			
Self-esteem	pre	14.2 (3.9)	0.89	12.0%	-3.44**	0.38
	post	15.9 (3.8)	0.90			
Anxiety	pre	7.3 (3.1)	0.82	-17.8%	5.43**	0.59
	post	6.0 (2.8)	0.86			
Despair	pre	4.7 (2.1)	0.80	-8.5%	1.60	0.17
	post	4.3 (2.3)	0.80			

$\Delta\% = (\text{post} - \text{pre})/\text{pre} \times 100\%$, * $p < 0.005$, ** $p < 0.001$

上之顯著差異。另觀察各項具顯著變化之心情構面之效果量Cohen's *d*值，參與舒緩精油DIY活動後對於「困惑」($d = 0.69$)、「活力」($d = 0.56$)、「疲勞」($d = 0.66$)以及「緊張」($d = 0.59$)等4項心情構面具有中偏大之影響效果，而對於「憤怒」($d = 0.31$)及「自尊」($d = 0.38$)等2項心情構面則是有中偏小之影響效果。

(二) 種子吊飾

種子吊飾DIY活動參與者之POMS量表分析結果如Table 3，各心情構面前後測之Cronbach's α 係數介於0.80-0.93，顯示調查結果具有內部一致性，調查結果具有信度。POMS量表各心情構面之前、後測平均得分結果部分，首先「困惑」前測為11.8分，體驗結束後測為9.6分，下降18.6%；「活力」前測為24.5分，體驗結束後測為26.7分，上升9.0%；「疲勞」前測為11.5分，體驗結束後測為8.6分，下降25.2%；「憤怒」前測為8.9分，體驗結束後測為7.4分，下降12.4%；「自尊」前測為14.9分，體驗結束後測為15.3分，上升2.7%；「緊張」前測為7.0分，體驗結束後測為5.7分，下降18.6%；最後「沮喪」前測為4.4分，體驗結束後測為4.1分，下降6.8%。

再經成對樣本T檢定分析各心情構面之前、後測差異，結果顯示種子吊飾DIY活動參與者有

4項心情構面於參與前後之變化達統計上之顯著差異，包括「困惑」($p < 0.001$)、「疲勞」($p < 0.001$)與「緊張」($p < 0.001$)等3項心情構面顯著降低，以及「活力」($p < 0.001$)心情構面顯著提升，而「憤怒」、「自尊」與「沮喪」構面於活動前後則沒有統計上之顯著差異。而4項具顯著變化心情構面之效果量Cohen's *d*值部分，參與種子吊飾DIY活動對於「疲勞」($d = 0.64$)心情構面具有中偏大之影響效果，而對於「困惑」($d = 0.42$)、「活力」($d = 0.38$)以及「緊張」($d = 0.39$)心情構面則為中偏小之影響效果。

(三) 木材電燒

木材電燒DIY活動參與者之POMS量表分析結果如Table 4，各心情構面前後測之Cronbach's α 係數介於0.75-0.93，顯示調查結果具有內部一致性，調查結果具有信度。POMS量表各心情構面之前、後測平均得分結果部分，首先「困惑」前測為11.9分，體驗結束後測為9.2分，下降22.7%；「活力」前測為24.4分，體驗結束後測為26.4分，上升8.2%；「疲勞」前測為11.6分，體驗結束後測為8.6分，下降25.9%；「憤怒」前測為8.8分，體驗結束後測為7.3分，下降17.0%；「自尊」前測為14.7分，體驗結束後測為15.9分，上升8.2%；「緊張」前測為7.2分，體驗結束後測為

Table 3. Results of the POMS comparison for Seed pendant DIY

Factor	pre/post-test	Mean (SD)	Cronbach's α	$\Delta\%$	<i>t</i> -value	Cohen's <i>d</i>
Confusion	pre	11.8 (5.7)	0.91	-18.6%	3.67**	0.42
	post	9.6 (4.4)	0.93			
Vitality	pre	24.5 (5.6)	0.90	9.0%	-3.32**	0.38
	post	26.7 (6.8)	0.93			
Fatigue	pre	11.5 (5.5)	0.92	-25.2%	5.65**	0.64
	post	8.6 (3.9)	0.89			
Anger	pre	8.9 (4.7)	0.92	-12.4%	2.22	0.25
	post	7.8 (3.5)	0.92			
Self-esteem	pre	14.9 (3.2)	0.82	2.7%	-1.16	0.13
	post	15.3 (3.8)	0.85			
Anxiety	pre	7.0 (3.3)	0.88	-18.6%	3.48**	0.39
	post	5.7 (2.5)	0.80			
Despair	pre	4.4 (2.4)	0.92	-6.8%	0.73	0.08
	post	4.1 (2.2)	0.80			

$\Delta\% = (\text{post} - \text{pre})/\text{pre} \times 100\%$, ** $p < 0.001$

Table 4. Results of the POMS comparison for Wood burning DIY

Factor	pre/post-test	Mean (SD)	Cronbach's α	$\Delta\%$	<i>t</i> -value	Cohen's <i>d</i>
Confusion	pre	11.9 (5.0)	0.88	-22.7%	6.46**	0.62
	post	9.2 (3.5)	0.86			
Vitality	pre	24.4 (5.9)	0.91	8.2%	-3.84**	0.37
	post	26.4 (6.7)	0.93			
Fatigue	pre	11.6 (5.0)	0.89	-25.9%	7.22**	0.69
	post	8.6 (3.5)	0.88			
Anger	pre	8.8 (4.1)	0.92	-17.0%	4.46**	0.43
	post	7.3 (2.6)	0.87			
Self-esteem	pre	14.7 (3.1)	0.78	8.2%	-3.74**	0.36
	post	15.9 (3.4)	0.84			
Anxiety	pre	7.2 (2.9)	0.80	-22.2%	5.60**	0.53
	post	5.6 (2.6)	0.87			
Despair	pre	4.6 (2.4)	0.83	-15.2%	3.20*	0.30
	post	3.9 (1.9)	0.75			

$\Delta\% = (\text{post} - \text{pre})/\text{pre} \times 100\%$, * $p < 0.005$, ** $p < 0.001$

5.6分，下降22.2%；最後「沮喪」前測為4.6分，體驗結束後測為3.9分，下降15.2%。

再經成對樣本T檢定分析各心情構面之前、後測差異，結果顯示木材電燒DIY活動參與者於7項心情構面於參與前後之變化均具統計上之顯著差異，包括「困惑」($p < 0.001$)、「疲勞」($p < 0.001$)、「憤怒」($p < 0.001$)、「緊張」($p < 0.001$)與「沮喪」($p < 0.001$)等5項心情構面顯著降低，而「活力」($p < 0.001$)及「自尊」($p < 0.005$)心情

構面顯著提升。

各心情構面之效果量Cohen's *d*值，參與木材電燒DIY活動後對於「困惑」($d = 0.62$)、「疲勞」($d = 0.69$)以及「緊張」($d = 0.53$)等3項心情構面具有中偏大之影響效果，而對於「活力」($d = 0.37$)、「憤怒」($d = 0.43$)、「自尊」($d = 0.36$)以及「沮喪」($d = 0.30$)心情構面則是有中偏小之影響效果。

不同特性參與者心情狀態變化差異

為了解參與各項森林手作DIY活動前後POMS量表心情構面之變化量，是否會因不同參與者基本特性而有差異，本研究依各基本特性分組之樣本數，於性別部分針對「舒緩精油DIY」以及「種子吊飾DIY」活動之參與者使用Mann-Whitney U檢定進行分析，而針對「木材電燒DIY」活動使用獨立樣本T檢定分析；另外針對不同年齡、教育程度以及收入等其他基本特性均使用Kruskal-Wallis H檢定進行分析，以探討不同基本特性參與者於各POMS量表心情構面之變化量差異。詳細不同基本特性參與者，於各項活動前後心情構面變化差異分析結果如Table 5，結果顯示不同性別、年齡、教育程度與收入等不同基本特性之參與者，於3項DIY活動前後之POMS量表心情構面變化量均沒有顯著差異，

討論

森林手作DIY活動調節心情之效果

經本研究以POMS心情量表調查參與「舒緩精油DIY」、「種子吊飾DIY」及「木材電燒DIY」等3種森林手作DIY活動前後之心情狀態變化，結果顯示「木材電燒DIY」活動對於7項心情構面均有顯著之調節效果，而「舒緩精油DIY」及「種子吊飾DIY」活動分別對6項以及4項心情構面具有顯著之調節效果。整體而言不論參與何項森林手作DIY活動均可顯著降低參與者負面之「困惑」、「疲勞」及「緊張」心情狀態，並顯著提升正面之「活力」心情狀態，也因此3種森林手作DIY活動均可作為有效的心情調節方法。此結果呼應相關研究指出藉由DIY活動之親手製作過程，參與者需集中注意力並投入心神，可以促進參與者心情穩定與緩解壓力(Kaimal et al. 2016, Reynolds 2000)。

Table 5. Results of difference testing for POMS of each DIY activity between different respondent attributes.

	Confusion	Vitality	Fatigue	Anger	Self-esteem	Anxiety	Despair
Gender							
Essential oil ¹	-0.24	-1.63	-2.26	-1.64	-1.77	-1.09	-0.43
Seed pendant ¹	-1.21	-2.01	-0.45	-0.59	-0.78	-1.11	-0.48
Wood burning ²	-2.23	-1.30	-0.60	-2.90	0.90	-1.80	-2.00
Age							
Essential oil ³	1.89	1.69	2.71	0.42	5.29	2.52	3.72
Seed pendant ³	3.11	5.74	2.52	3.96	2.88	3.70	3.14
Wood burning ³	1.24	5.87	0.18	4.84	3.69	1.29	3.17
Education							
Essential oil ³	1.21	5.54	2.77	6.62	2.87	10.50	2.69
Seed pendant ³	0.35	6.58	2.38	3.24	6.47	5.05	0.90
Wood burning ³	6.22	8.26	2.95	4.94	4.91	2.16	4.42
Personal income							
Essential oil ³	1.60	5.13	0.51	2.80	0.83	2.79	3.68
Seed pendant ³	3.90	4.13	0.26	0.23	4.01	2.77	0.53
Wood burning ³	4.83	1.87	4.64	5.41	4.94	0.48	3.48

¹ Z-value, ² T-value, ³ H-value

各項森林手作DIY活動對於心情之調節效果部分，參與「舒緩精油DIY」活動後，對於「困惑」、「疲勞」、「憤怒」及「緊張」等4項屬負面之心情構面均顯著降低，而「活力」與「自尊」等2項屬正面之心情構面則顯著提升。而參與「種子吊飾DIY」活動後，對於「困惑」、「疲勞」與「緊張」等3項負面心情構面顯著下降，對正面之「活力」心情構面顯著提升；參與「木材電燒DIY」活動後，參與者對於各項負面心情構面均顯著降低，並可提升各項正面心情構面。本結果與Kaimal et al. (2016)、Pöllänen (2013)以及Sandmire et al. (2012)等研究結果相似，參與者透過手工DIY創作的投入能顯著增強專注力及正向心情，並進一步減少負面心情，即參與森林手作DIY活動的過程能幫助參與者減少壓力並促進心情健康。

然而根據本次調查結果也可以發現，並非各項森林手作DIY活動對於參與者之各項心情構面皆具有顯著之影響，但即便僅部分心情構面具顯著之變化，仍表示具有調節心情狀態之效果(McNair 1971)。過去亦有以POMS量表評估心情狀態變化之研究結果亦有類似結果，例如Yu et al. (2015)調查受訪者身處於森林環境與都市環境比較，森林環境具有提升正面心情之效果，並且可降低負面心情，但其中對於「自尊」構面即沒有顯著之變化，

不同類型活動心情調節效果差異

根據本研究調查3項森林手作DIY活動對於參與者心情調節效果可以發現，參與不同類型之森林手作DIY活動後，具有顯著調節效果之心情構面有部分差異，其中3項活動均對於「困惑」、「活力」、「疲勞」以及「緊張」心情構面有顯著之調節效果。然而「舒緩精油DIY」活動於「沮喪」構面，以及「種子吊飾DIY」活動於「憤怒」、「自尊」與「沮喪」等3項構面之調節效果未達顯著。

探討不同森林手作DIY活動對參與者心情調節效果之差異之原因，應與各項活動之特性有關，主要因不同類型森林手作DIY活動所涉及之

感官刺激類型與強度不同，例如嗅覺之刺激即具有迅速調節心情之效果(Herz 2009)，Chaiyasut et al. (2020)透過POMS量表，評估僅讓受測者吸入馬告精油後之心情變化，結果顯示可顯著降低「困惑」心情之效果。同時活動參與之專注時間長度也是可能影響原因之一，Pretty et al. (2005)曾指出30分鐘以下之短時間之活動即對心情具正向影響，但持續時間越長、效果更穩定。

此外，不同心情構面受外在活動影響之敏感程度亦有所差異(McNair et al. 1992)，例如「困惑」、「活力」與「緊張」屬於較容易可短期調整之心情狀態，較易受到當下活動影響，本研究結果亦顯示參與各項森林手作DIY活動後，均可顯著調節此3項心情構面，且多具有中等以上之效果。而「憤怒」、「自尊」與「沮喪」則為屬相對較穩定之心情，需要較長時間或較高強度之刺激產生顯著之調節效果(Pöllänen 2013, Watson and Clark 1997)，

以本研究調查之3種森林手作DIY活動而言，「舒緩精油DIY」活動參與者於過程中會吸入馬告精油，藉由精油對於嗅覺之刺激再搭配參與者動手調配之過程，因此產生顯著調節心情之效果；相較之下「種子吊飾DIY」活動則屬於相對所需時間較短，操作簡單且感官刺激較少之活動，屬低強度且靜態之創作活動，過程中挑戰性與投入之專注度相對較低，對於心情之調節效果較不明顯(Stuckey and Nobel 2010)，因此對「憤怒」、「自尊」與「沮喪」心情構面產生之影響較低；「木材電燒DIY」為3項活動中所需時間最長，且需要參與者進行圖案創作並專注於電燒筆之操作，同時木材電燒過程亦會產生嗅覺之刺激，於活動過程涉及多種感官參與且活動時間較長，因此對於POMS各項心情構面均有顯著之調節效果。

森林手作DIY活動選擇

最後，本研究調查結果可以發現，於參與森林手作DIY活動後對於參與者之心情狀態具有正面之影響，且不同類型之活動均具有調節效果，本結果可提供未來規劃或舉辦相關活動之參考，

例如近年國內逐漸發展之森林療癒活動，而傳統之森林療癒活動通常係於戶外森林環境，進行包括如漫步、深呼吸、冥想與感官體驗等活動，可以調節參與者之心理與生理狀態等(Lee et al. 2011, Park et al. 2010)，然而戶外環境需受限於氣候或其他自然因素，有相關研究透過室內活動融入森林療癒活動，如觀賞照片、影片或使用虛擬實境體驗(VR)，亦可提升參與者身心心理效益(Song et al. 2017, Clemente et al. 2024)。而根據本研究結果，進行森林手作DIY活動亦具有調節參與者心情狀態之效果，可作為於室內進行森林療癒活動之參考，結合戶外與室內之活動進行整體森林療癒活動規劃。

結論

本研究旨在探討森林手作DIY活動對參與者心情狀態之影響，透過POMS量表完成活動前後之比較，評估各項活動對參與者心情變化之影響，結果顯示參與3種森林手作DIY活動對參與者之心情狀態具有調節效益，可顯著提升正面之心情並降低負面之心情。其中又以「木材電燒DIY」對於各項心情構面均具有顯著之調節效果。而本研究因樣本數限制，並未針對不同基本特性參與者進行資料分組，探討各項DIY活動對不同基本特性參與者之心情調節效果是否不同，因此未來可再進一步針對各項活動持續蒐集調查樣本，增加調查是否曾經體驗或體驗次數，並且記錄各參與者體驗之時間等資訊，將可追蹤分析參與次數對心情調節效果之影響，以及各項活動對不同特性參與者之心情調節效果差異等，為後續研究可再進一步探討之方向。

引用文獻

Berger BG, Motl RW. 2000. Exercise and mood: A selective review and synthesis of research employing the Profile of Mood States. *J Appl Sport Psychol* 12(1):69-92. <https://doi.org/10.1080/10413200008404214>

Bukhave EB, Creek J, Linstad AK, Frandsen TF. 2025. The effects of crafts-based interventions on mental health and well-being: A systematic review. *Aust Occup Ther J* 72(1):e70001. <https://doi.org/10.1111/1440-1630.70001>

Chaiyasut C, Sivamaruthi BS, Wongwan J, et al. 2020. Effects of *Litsea cubeba* (Lour.) Persoon essential oil aromatherapy on mood states and salivary cortisol levels in healthy volunteers. *Evid Based Complement Alternat Med* 4389239. <https://doi.org/10.1155/2020/4389239>

Chen CJ, Tseng YH, Chu FH, et al. 2012. Neuropharmacological activities of fruit essential oil from *Litsea cubeba* Persoon. *J Wood Sci* 58:538-43. <https://doi.org/10.1007/s10086-012-1277-3>

Clemente D, Romano L, Zamboni E, Carrus G and Panno A. 2024. Forest therapy using virtual reality in the older population: A systematic review. *Front Psychol* 14:1323758. <https://doi.org/10.3389/fpsyg.2023.1323758>

Cohen J. 1988. *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). New York: Routledge. 567 p. <https://doi.org/10.4324/9780203771587>

Cronbach LJ. 1951. Coefficient alpha and the internal structure of tests. *Psychometrika* 16(3):297-334. <https://doi.org/10.1007/BF02310555>

Curran SL, Andrykowski MA, Studts JL. 1995. Short Form of the Profile of Mood States (POMS-SF): Psychometric information. *Psychol Assessment* 7(1):80-3. <https://doi.org/10.1037/1040-3590.7.1.80>

Gross JJ. 2015. Emotion regulation: Current status and future prospects. *Psychol Inq* 26(1):1-26. <https://doi.org/10.1080/1047840X.2014.940781>

- Han AR, Park SA, Ahn BE. 2018.** Reduced stress and improved physical functional ability in elderly with mental health problems following a horticultural therapy program. *Complement Ther Med* 38:19-23. <https://doi.org/10.1016/j.ctim.2018.03.011>
- Hansen CJ, Stevens LC, Coast JR. 2001.** Exercise duration and mood state: How much is enough to feel better? *Health Psychol* 20(4):267-75. <https://doi.org/10.1037//0278-6133.20.4.267>
- Herz RS. 2009.** Aromatherapy facts and fictions: A scientific analysis of olfactory effects on mood, physiology and behavior. *Int J Neurosci* 119(2):263-90. <https://doi.org/10.1080/00207450802333953>
- Hsu P, Chang Y, Lu J. 2003.** The revision of Profile of Mood State questionnaire. *J Phys Educ High Educ* 5(1):85-95. [in Chinese with English abstract].
- Kaimal G, Ray K, Muniz J. 2016.** Reduction of cortisol levels and participants' responses following art making. *Art Ther* 33(2):74-80. <https://doi.org/10.1080/07421656.2016.1166832>
- Lee J, Park BJ, Tsunetsugu Y, Ohira T, Kagawa T, Miyazaki Y. 2011.** Effect of forest bathing on physiological and psychological responses in young Japanese male subjects. *Public Heal* 125(2):93-100. <https://doi.org/10.1016/j.puhe.2010.09.005>
- Martin L, White MP, Hunt A, Richardson M, Pahl S, Burt J. 2020.** Nature contact, nature connectedness and associations with health, wellbeing and pro-environmental behaviours. *J Environ Psychol* 68:101389. <https://doi.org/10.1016/j.jenvp.2020.101389>
- McNair DM, Lorr M, Droppleman LF. 1971.** Profile of Mood States Manual. San Diego, CA: Educational and Industrial Testing Service.
- McNair DM, Lorr M, Droppleman LF. 1992.** Manual for the Profile of Mood States. San Diego, CA: Educational and Industrial Testing Service.
- Park BJ, Tsunetsugu Y, Kasetani T, Kagawa T, Miyazaki Y. 2010.** The physiological effects of Shinrin-yoku (taking in the forest atmosphere): Evidence from field experiments in 24 forests across Japan. *Environ Health Prev* 15:18-26. <https://doi.org/10.1007/s12199-009-0086-9>
- Pöllänen S. 2013.** The meaning of craft: Craft makers' descriptions of craft as an occupation. *Scand J Occup Ther* 20:217-27. <https://doi.org/10.3109/11038128.2012.725182>
- Pretty J, Peacock J, Sellens M, Griffin M. 2005.** The mental and physical health outcomes of green exercise. *Int J Environ Health Res* 15(5):319-37. <https://doi.org/10.1080/09603120500155963>
- Reynolds F. 2000.** Managing depression through needlecraft creative activities: A qualitative study. *Art Psychother* 27(2):107-14. [https://doi.org/10.1016/S0197-4556\(99\)00033-7](https://doi.org/10.1016/S0197-4556(99)00033-7)
- Sandmire DA, Gorham SR, Rankin NE, Grimm DR. 2012.** The influence of art making on anxiety: A pilot study. *Art Ther* 29(2):68-73. <https://doi.org/10.1080/07421656.2012.683748>
- Sattayakhom A, Songsamoe S, Yusakul G, Kalarat K, Matan N, Koomhin, P. 2021.** Effects of Thai local ingredient odorants, *Litsea cubeba* and garlic essential oils, on brainwaves and moods. *Molecules* 26(10):2939. <https://doi.org/10.3390/molecules26102939>
- Shacham S. 1983.** A shortened version of the Profile of Mood States. *J Pers Assess* 47(3):305-6.

Soga M, Gaston KJ, Yamaura Y. 2017. Gardening is beneficial for health: A meta-analysis. *Prev Med Rep* 5:92-9. <https://doi.org/10.1016/j.pmedr.2016.11.007>

Song C, Ikei H, Kobayashi M, et al. 2017. Effects of viewing forest landscape on middle-aged hypertensive men. *Urban For Urban Green* 21:247-52. <https://doi.org/10.1016/j.ufug.2016.12.010>

Stuckey HL, Nobel J. 2010. The connection between art, healing, and public health: A review of current literature. *Am J Public Health* 100(2):254-63. <https://doi.org/10.2105/AJPH.2008.156497>

Yu CP, Chao YC, Chen WJ. 2015. Physiological and psychological effects of forest environment. *Q J For Res* 48(4):363-76. [in Chinese with English abstract].