Journal of Infrastructure, Policy and Development 2025, 9(1), 10935.
https://doi.org/10.24294/jipd10935

Article

Strengthening educational support systems through breathing and art therapy: Impacts on college students' well-being

Mengjun Hu, Qiushuo Tian, Tae-Ho Kim*

Daegu University, Gyeongsan-si38453, Korea
*** Corresponding author:** Tae-Ho Kim, ptkimth@daegu.ac.kr

CITATION

Hu M, Tian Q, Kim TH. (2025). Strengthening educational support systems through breathing and art therapy: Impacts on college students' well-being. Journal of Infrastructure, Policy and Development. 9(1): 10935. https://doi.org/10.24294/jipd10935

ARTICLE INFO

Received: 17 December 2024
Accepted: 27 December 2024
Available online: 13 January 2025

COPYRIGHT

Copyright © 2025 by author(s). *Journal of Infrastructure, Policy and Development* is published by EnPress Publisher, LLC. This work is licensed under the Creative Commons Attribution (CC BY) license. https://creativecommons.org/licenses/by/4.0/

Abstract: Background: The prevalence of anxiety among college students is a growing global concern, with a median prevalence of 32%. This study addresses the need for effective interventions within an educational policy framework to alleviate anxiety and promote mental health among college students. **Objective:** The study aims to evaluate the impact of breathing relaxation exercises and tactile art therapy on college students' self-understanding and psychological well-being, providing reference information for policies and practices in mental health education. **Methods:** We enrolled 10 college students from X University in South Korea, dividing them into an experimental group and a control group. The experimental group underwent 10 sessions of breathing exercises and tactile art therapy, while the control group received standard psychological counseling. Pre- and post-tests assessed breathing function, self-understanding, and psychological well-being. **Results:** The experimental group demonstrated significant improvements in breathing function, particularly in forced vital capacity (FVC), and in psychological well-being, as measured by the Psychological Well-Being Scale (PWBS). Sub-factors such as safety, goal orientation, and self-acceptance within self-understanding, self-acceptance, positive relationships, purpose in life, and environmental mastery within psychological well-being, showed notable enhancements. In contrast, the control group did not show significant effects in terms of FVC and FEV1（$p > 0.05$）, and there were no statistically significant differences in the various sub-factors of self-understanding and psychological well-being. **Conclusion:** The study demonstrates that integrating breathing relaxation exercises and tactile art therapy into educational policy can significantly reduce anxiety and enhance the psychological well-being of college students. These findings suggest that such interventions can be effective components of a comprehensive educational policy aimed at improving student mental health.

Keywords: anxiety; psychological well-being; breathing exercises; art therapy; mental health interventions; educational policy

1. Introduction

The issue of anxiety among college students has become increasingly severe. Globally, the median prevalence of anxiety among college students is 32.00% (Liu et al., 2023). In the context of rapid societal development and increasingly fierce competition, college students are confronted with pressures from various aspects, including academics, employment, and interpersonal relationships (Wang et al., 2022). These pressures may lead to a rise in psychological issues, particularly in the absence of an effective social-psychological support system. Such stress can result in mental symptoms like anxiety and depression; persistent feelings of depression not only affect academic performance but can also lead to serious social issues such as suicide (Mofatteh, 2021). According to research by Wang et al. (2022), the social pressures

faced by college students are closely related to their mental health status. These pressures include academic stress, job competition, and interpersonal relationship issues, all of which can lead to increased anxiety and depressive symptoms.

Good social-psychological support is essential, especially if universities offer professional mental health services or innovative psychotherapy programs (Hyseni Duraku et al., 2023), which can greatly enhance the mental health and overall well-being of college students (Sakız and Jencius, 2024). Therefore, addressing college students' mental health and alleviating anxiety is of great importance for maintaining social stability and promoting societal development.

This study aims to propose recommendations for developing a more comprehensive and effective support system, promoting the integration of mental health interventions as a form of soft infrastructure within educational policies. Through this, we can provide stronger support for college students, assisting them in overcoming anxiety, fostering personal growth and social engagement, and ultimately contributing to the creation of a healthier and more harmonious social environment.

2. Literature review

To gain a deeper understanding of the effects of breathing relaxation exercises and tactile art therapy, this study will review relevant literature, examining the relationships among self-understanding, psychological well-being, neuroplasticity, and anxiety, thereby exploring novel therapeutic approaches for alleviating anxiety. The research gaps identified in the literature, particularly the lack of integrated approaches to mental health interventions in educational settings, directly inform the objectives and design of this study. By understanding these gaps, we can better appreciate how the selected interventions of breathing exercises and tactile art therapy aim to address the urgent need for effective mental health support systems within an educational context.

2.1. Educational policies and mental health

Kyriakides et al. (2015) examined the impact of school policies and stakeholders' actions on student learning. The research indicates that school policies significantly affect students' learning outcomes, including mental health policies, which can foster the development of students' fundamental skills, such as mathematics, while also promoting students' psychological health and learning needs.

2.2. The importance of self-understanding in alleviating anxiety

Self-understanding serves as a powerful force for overcoming inner conflicts, such as unease and confusion, among college students, and it plays a vital role in their journey toward maturity (Kim, 2020). It is often regarded as the ultimate goal of life and a key element of happiness. By living in alignment with oneself, self-understanding fosters a positive sense of identity, enhances psychological well-being, and ultimately leads to a happy and fulfilling life (Klussman et al., 2022).

2.3. Psychological well-being and anxiety

Psychological safety can effectively alleviate anxiety, enabling individuals to cultivate trust and reliance while reducing feelings of distress. The psychological well-being of college students is closely related to their capacity to adapt to social life (Lim, 2015). Psychological well-being involves accepting one's authentic self, independently regulating actions, adapting to the environment, and living a meaningful life driven by mature motivations and goals, ultimately achieving happiness and self-fulfillment (Maurer et al., 2023).

2.4. Neural plasticity and anxiety

Neural plasticity refers to the reversible structural and functional changes in the brain under stress and other conditions, which provides possibilities for the treatment of anxiety disorders (Appelbaum et al., 2023).

Research conducted by Professor Zhu Jingning's group found that exercise can activate a cerebellum-centered triadic neural circuit. This neural circuit connects the motor system with the emotional system (Nanjing University, 2024), revealing the neural mechanism through which exercise alleviates anxiety.

Some neural plasticity exercises, such as Cognitive Behavioral Therapy (CBT), mindfulness meditation, breathing exercises, and environmental enrichment, can enhance neural plasticity, improve mental health, and alleviate symptoms of depression and anxiety (Zhao et al., 2020).

Neural plasticity plays a crucial role in the onset, development, and treatment of anxiety. By understanding and harnessing neural plasticity, we can develop innovative therapeutic approaches to help patients overcome anxiety and related emotional disorders.

2.5. New treatment methods for anxiety relief

New treatment plans, such as respiratory relaxation exercises, have been recognized as effective methods for alleviating anxiety (Tavoian and Craighead, 2023; Zhao et al., 2020), The art therapy process can delicately stimulate the senses, enabling individuals to confront and experience their inner emotions and feelings anew (E. Lee, 2020), Prior research has confirmed the importance of sensory stimulation in psychotherapy; however, the field of touch remains understudied. Therefore, based on Penfield's Homunculus theory of touch and respiratory relaxation exercises, we have designed a project integrating respiratory relaxation exercises and tactile experience in art therapy. This project allows participants to engage in external physical movement and internal emotional stimulation, fostering a creative process through interaction among participants and providing opportunities for self-awareness and self-expression.

Consequently, targeting research subjects who experience emotional and psychological challenges, art therapy through respiratory relaxation exercises and tactile experiences can facilitate self-understanding, promote interaction within the group, and cultivate a sense of psychological peace.

3. Method

3.1. Research participants

The participants in this study consisted of 10 college students enrolled at X University in South Korea. The purpose and procedures of the study were announced on online communities and WeChat to recruit members for both the experimental and control groups. Participants were selected through a WeChat-based questionnaire.

Before the study commenced, consent forms and participation applications were collected via email. To ensure the validity of the experiment, we employed a randomization process for participant allocation. Specifically, all participants were randomly assigned to either the experimental group or the control group, which received standard psychological counseling before the start of the experiment. This process was conducted by an independent researcher to ensure the fairness and randomness of the allocation. The composition of the experimental and control groups for the breathing relaxation exercises and tactile art therapy program is as follows (**Table 1**).

The experimental and control groups showed no significant differences in age, body mass index (BMI), forced vital capacity (FVC), or forced expiratory volume in one second (FEV1), thereby ensuring the reliability of the experimental results.

Table 1. Description characteristics of participants in this study.

Baseline characteristics	Intervention Group (mean, sd) n = 5	Control Group (mean, sd) n = 5)
Age (in years)	27.2 (1.64)	27 (3.39)
BMI	22.12 (3.39)	21.8 (1.42)
FVC	4.20 ± 1.11	3.80 ± 1.06
FEV1	3.49 ± 0.88	3.21 ± 0.83

3.2. Research design (research procedure)

1) Participant selection and pre-test. This study recruited 10 college students from a university through online forums and WeChat. Preliminary interviews were conducted face-to-face from 14 August to 18 August 2023.

During the preliminary interviews, participants completed application forms and signed informed consent documents, and links for the pre-test assessments were provided for real-time completion.

The pre-test included questionnaires that gathered basic demographic information, assessed self-understanding and evaluated psychological well-being.

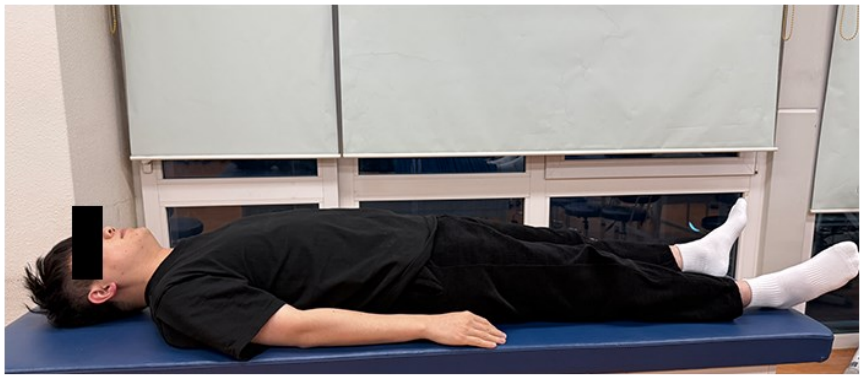
Two male and three female students who expressed a desire to participate in the tactile art therapy program were assigned to the experimental group. Meanwhile, two male and three female students who were unable to participate in the program but agreed to pre- and post-assessments were assigned to the control group.

2) Implementation of breathing relaxation exercises and tactile experience art therapy

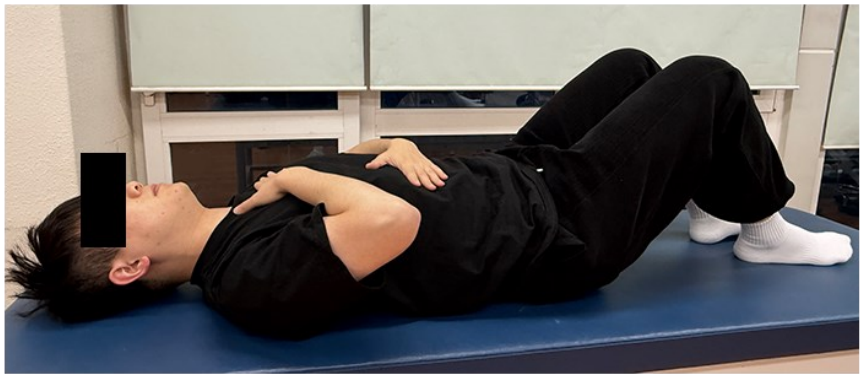
To explore the impact of respiratory relaxation exercises and tactile experience art therapy on college students' self-understanding and psychological peace, the study was conducted face-to-face once a week from 27 September 2023, to 29 November 2023, for a total of 10 sessions, each lasting 90 min.

Before the commencement of the therapy, researchers examined the methodology and environmental setup of the tactile experience art therapy through targeted research subjects with art therapists and physical therapists offering supervision and guidance throughout the process.Breathing relaxation exercises (**Figure 1**) and tactile experience art therapy were conducted in 3 stages, with 10 projects in the introduction phase: Respiratory relaxation exercises (20 min), tactile activity operation phase (50 min), and integration and organization phase (20 min).

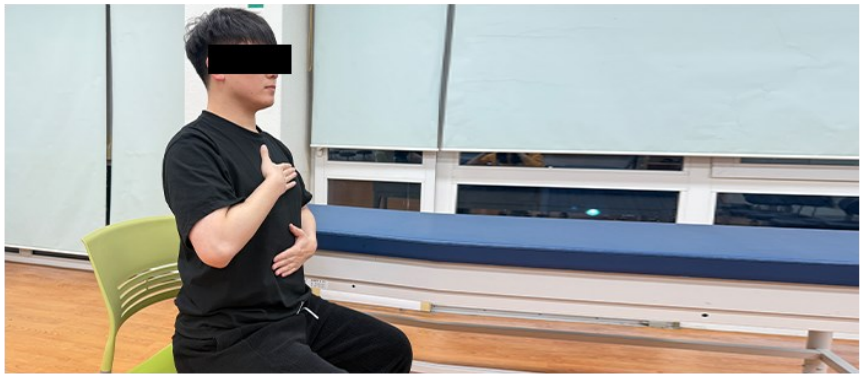
This study's breathing and art therapy program consists of a total of 10 sessions, with pre-interviews and assessments conducted separately before and after the program. The procedural structure is divided into three stages: Initial, middle, and final. Each session is organized into three parts: Introductory activities, main activities, and closing activities. All sessions utilized tactile-related media, such as clay, rubber clay, and plaster, which align with the themes and objectives of each session. Additionally, seven art domains—music, fine arts, exercise, movement, drama, film, photography, and literature—are integrated into more than three domains per session to correspond with the themes and objectives, allowing the unique characteristics of each art domain to blend seamlessly with tactile media. This outlines the plan for the 10-session therapy program.



1) Breathing awareness exercise:



2) Supine diaphragmatic breathing:



3) Seated diaphragmatic breathing:

Figure 1. Breathing relaxation exercises.

To achieve the objectives and goals of the entire program, specific targets have been established for each episode. Episodes 1–2 are the initial phase, episodes 3–8 are the middle phase, and episodes 8–10 are the final phase, culminating in a total of 10 episodes. During the initial phase (episodes 1–2), the program was introduced, and participants' expectations were assessed, fostering a sense of intimacy between the members and the therapist. Additionally, through psychological and physical relaxation, participants were able to fully engage in the unfamiliar respiratory art therapy program, experience self-acceptance, and express their inner feelings. The middle phase, encompassing episodes 3–8, focuses on exploring and expressing emotions.

Episodes 3–5 involve the process of articulating and releasing various feelings and experiences, which aids in developing self-discipline and enhancing control over one's environment. Episodes 6–8 facilitate an understanding of both personal and others' emotions, promote the discovery of a positive self-image, and encourage the re-examination and re-experiencing of negative self-images. Episodes 9–10 are designed to cultivate a positive self-image by establishing life goals and envisioning a hopeful future. Furthermore, by reflecting on the therapeutic process and gaining self-understanding, participants can achieve a sense of happiness and psychological peace. The overall structure of the 10-episode respiratory art therapy program is outlined in **Table 2** below.

Table 2. 10-Session breathing relaxation exercises and tactile art therapy program.

Stage	Session	Project Name	Objective	Therapeutic Area						
				Exercise	Arts	Music	Theater	Film	Photography	Literature
Initial	1	The Grandeur of My Hands	Rapport Formation, Introspective Expression I Self-Acceptance	○	○	○			○	
	2	Embracing the Inner Self		○	○		○		○	
Middle	3	Imbuing Art with the Heart	Introspective Expression II Reduction of Anxiety, Self-Awareness and Exploration, Other-Awareness and Exploration, Self-Acceptance, Enhancement of Psychological Well-being I	○	○			○	○	○
	4	The Scent of the Soul			○	○				○
	5	In Quest of Elusive Bliss		○	○	○		○	○	
	6	The Healing Banquet		○	○	○	○			
	7	My Cushiony Companion		○	○	○	○		○	
	8	Dreamweaver		○	○	○				○
Late	9	Isle of Dreams	Positive Self-Growth, Enhancement of Psychological Well-being II	○	○	○			○	
	10	Strolling Down the Petal Path		○	○					○

The sequence and objectives of each stage of the integrated respiratory relaxation exercises and tactile experience art therapy were appropriately tailored to the conditions of the research subjects. Additionally, seven artistic fields including sports, fine arts, music, drama, film, photography, and literature were effectively combined to align with the themes and objectives of each issue, involving more than three areas to ensure that the inherent characteristics of each artistic domain, along with breathing relaxation exercises, tactile sensations, and related media, could be seamlessly integrated. The composition plan for the ten treatment sessions is presented in **Table 2**.

Building on previous research projects related to self-understanding and psychological peace, this subject was redesigned into a tactile experience art therapy project tailored to address the unique characteristics and current situation of college students. Expert advice was sought regarding the project's composition, and face-to-face familiarization with the precautions during the process was conducted before initiating the tactile experience art therapy.

3) Post-test to verify the effectiveness of the program, a post-test was conducted within one week following the final session of breathing relaxation exercises and tactile art therapy. The experimental group underwent the same assessments as those conducted during the pre-test under identical conditions.

For the control group, routine psychological counseling was provided during the tactile art therapy sessions of the experimental group, and the post-test was conducted using the same methods as the pre-test.

1) Breathing awareness exercise:

The patient should lie down in a supine position, maintaining their normal breathing pattern while focusing on relaxation. The objective is to become consciously aware of their natural breathing rhythm without the intention to alter it deliberately.

2) Supine diaphragmatic breathing:

Instruct the patient to lie down with both knees bent and feet flat on the surface, ensuring the body is fully relaxed. Place one hand on the chest and the other on the abdomen. The aim is to reduce chest movement and concentrate on diaphragmatic breathing, engaging the abdomen.

3) Seated diaphragmatic breathing:

The patient should sit on a stable chair with both feet flat on the ground and the spine aligned in a neutral posture. Position one hand on the abdomen and the other on the chest. Make an effort to minimize chest movement and breathe primarily by engaging the diaphragm and the abdominal muscles.

These exercises aim to increase patients' awareness of their breathing patterns and enhance the use of abdominal muscles through diaphragmatic breathing, thereby promoting deeper and more effective respiration. Through these exercises, patients can learn to control and optimize their breathing in various positions, which is highly beneficial for improving respiratory function, reducing stress, and relaxing both mind and body, allowing for better engagement in breathing and art therapy.

3.3. Research tools

Spirometer (Omnia software, Cosmed, ItalyItaly)—see **Figure 2**.

The respiratory functions were measured by a PC-based spirometer (Omnia software, Cosmed, Italy) (**Figure 2**). The primary function of this equipment is to facilitate the diagnosis of pulmonary pathologies, conduct research on human physiology, and gather information related to sports

medicine. The Microquark USB standard package comprises the micro Quark USB unit, a nose clip, PC software, a turbine, an adult paper mouthpiece, a pediatric mouthpiece adapter, and a user manual.

Figure 2. Spirometer.

1) Self-understanding scale

This study utilized the Self-understanding Scale developed by Buss and Scheier (1976), which is a reconstruction of the Self-Identity Scale by Hong et al. (2022), modified by Lee et al. (2024). The scale consists of 7 subdomains and a total of 70 items.

The questionnaire was scored using a 5-point Likert scale, with each item rated from 1 to 5. Excluding fictitious scales, the total score ranges from a minimum of 60 to a maximum of 300, where lower scores indicate a higher level of self-understanding.

2) Psychological well-being scale

This study employs the Psychological Well-Being Scale (PWBS) proposed by Ryff and Singer (1998), as appropriately utilized by Kim et al. (2001), to measure the psychological well-being of college students (J. E. Lee, 2020).

This scale consists of 46 items, with sub-factors including positive relationships, self-acceptance, environmental mastery, autonomy, personal growth, and purpose in life, comprising six factors.

Specifically, the sub-factors are outlined as follows:

Positive relationships measure the establishment of warm, trustworthy relationships with others, while self-acceptance measures the acknowledgment of one’s strengths and weaknesses.

Environmental mastery measures the ability to deal with and change problems in a complex environment, while autonomy measures the degree to which one controls their own behavior and makes decisive choices.

Personal growth measures the effort to overcome one's shortcomings for continuous self-improvement, Purpose in life measures whether one has life goals and a clear sense of direction. The items are rated on a 5-point scale,

ranging from “not at all” to “very much so”, with scores varying from 1 to 5. The overall possible score range for psychological well-being is from 46 to 230, with higher scores indicating greater well-being.

4) Statistical methods

Homogeneity Verification Between Experimental and Control Groups To evaluate the effects of breathing relaxation exercises and tactile art therapy on college students’ respiratory function, self-understanding, and psychological well-being, a pre-test Mann-Whitney U test was conducted to confirm the homogeneity of the experimental and control groups before the intervention. The results are presented in the appendix.

The results indicated no significant differences between the experimental and control groups in the homogeneity test, as shown in the appendix. Therefore, it was confirmed that the experimental and control groups were composed of equivalent levels.

To investigate the effects of breathing relaxation exercises and art therapy on college students’ respiratory function, self-understanding, and psychological well-being, we analyzed the differences in pre-test and post-test scores for FVC, FEV1, the Self-Understanding Scale, and the Psychological Well-Being Scale (PWBS), using the Wilcoxon signed-rank test.

4. Results

(See **Table 3**) In this study, FVC within the Breathing Function domain had a significant impact ($z = -2.04$, $p < 0.05$), while FEV1 did not show a significant effect. However, the positive trend in FEV1 improvement is also noteworthy.

Table 3. Breathing function pre- and post-test results.

Breathing Function	**Group**	**Pre**	**Post**	***Z***	***P***
		mean	**mean**		
		sd	**sd**		
FVC	Intervention Group	4.2	4.22	−2.04*	−0.04
		1.11	1.08		
	Control Group	3.8	3.93	−0.27	0.78
		1.06	1.07		
FEV1	Intervention Group	3.49	3.58	−1.75	0.08
		0.88	0.89		
	Control Group	3.21	3.28	−0.4	0.68
		0.83	0.9		

*$p < 0.05$.

In respiratory function, FVC has a significant impact, while FEV1 shows no significant effect, but the positive trend in improvement is also noteworthy.

4.1. Impact on Self-Understanding

To explore the impact of breathing relaxation exercises and haptic art therapy on the self-understanding of college students, self-understanding assessments were conducted for both the experimental and control groups.

To compare the changes in self-understanding before and after the intervention, the Wilcoxon Signed-Rank Test was implemented.

The results of this study are presented in **Table 4**.

In the experimental group, the subfactors of self-understanding—stability ($z = -2.02$, $p < 0.05$), goal orientation ($z = -2.03$, $p < 0.05$), and self-acceptance ($z = -2.02$, $p < 0.05$), showed statistically significant differences.

On the other hand, in the control group, none of the subfactors showed statistically significant differences, indicating no change between the pre-test and post-test data.

In summary, there were no significant changes in self-understanding before and after the intervention in the control group; however, the experimental group exhibited significant differences in self-understanding between the pre-and post-assessments.

Table 4. Self-understanding pre- and post-test results.

Sub-factor	Group	Pre	Post	*Z*	*P*
		mean	mean		
		sd	sd		
Stability	Intervention Group	24.4	36.4	−2.02*	−0.04
		2.88	3.2		
	Control Group	24.4	24.6	−0.57	0.56
		3.64	4.2		
goal orientation	Intervention Group	24.8	38.8	−2.03*	0.04
		3.96	1.48		
	Control Group	24.6	25	−0.44	0.65
		4.15	4.82		
uniqueness	Intervention Group	36.2	37.2	−0.73	−0.46
		1.64	3.7		
	Control Group	36.2	36.6	−0.36	0.71
		5.35	3.13		
Role Perception	Intervention Group	36.4	38.2	−0.73	0.46
		4.09	3.56		
	Control Group	36.2	36.4	−0.36	0.71
		5.35	5.17		
self−acceptance	Intervention Group	23.2	39	−2.02*	0.04
		3.11	1.58		
	Control Group	23.4	23.6	−0.37	0.705
		3.36	3.78		

Table 4. (*Continued*).

Sub-factor	Group	Pre mean sd	Post mean sd	*Z*	*P*
self−assertion	Intervention Group	29 6.04	29.6 4.61	−0.82	0.408
	Control Group	29 4.52	29.2 3.63	−0.18	85
Self−understanding	Intervention Group	174 14.01	219.2 8.42	−2.02*	0.04
	Control Group	173.8 10.68	175.4 16.22	−0.73	0.46

*$p < 0.05$.

4.2. Impact on psychological well-being

To investigate the impact of breathing relaxation exercises and haptic experience art therapy on the psychological peace of college students, psychological peace assessments were conducted for both the experimental and control groups.

To compare the changes in psychological peace before and after the intervention, the Wilcoxon Signed-Rank Test was conducted. The results of this study are as follows:

In the experimental group, the subfactors of psychological peace—self-acceptance ($z = -2.03$, $p < 0.05$), positive interpersonal relationships ($z = -2.02$, $p < 0.05$), purpose in life ($z = -2.02$, $p < 0.05$), and control over the environment ($z = -2.03$, $p < 0.05$), showed statistically significant differences.

On the other hand, in the control group, none of the subfactors showed statistically significant differences, indicating no change between the pre-test and post-test data.

In summary, there were no significant changes in psychological peace before and after the intervention in the control group. However, meaningful differences were observed in the experimental group's psychological peace pre-and post-intervention.

For the results of the analysis, please refer to **Table 5**.

Table 5. Psychological well-being pre- and post-test results.

Subordinate Factor	**Group**	**Pre**	**Post**	***Z***	***P***
		M	M	*z*	*p*
		(SD)	(SD)	*z*	*p*
Self-Acceptance	Intervention Group	18.0	25.4	−2.02*	0.04
		0.83	4.56	−2.02*	0.04
	Control Group	18.80	19.00	−0.44	0.12
		1.78	1.00	−0.44	0.12
Positive Interpersonal Relationships	Intervention Group	18.00	25.00	−2.06*	0.03
		2.07	2.00	−2.06*	0.03
	Control Group	17.60	17.80	−0.57	0.56
		2.30	2.28	−0.57	0.56
Autonomy	Intervention Group	23.60	24.00	−0.27	0.78
		4.27	4.00	−0.27	0.78
	Control Group	23.20	23.40	−0.37	0.7
		4.32	4.03	−0.37	0.7
Purpose in Life	Intervention Group	16.40	26.00	−2.02*	0.04
		2.07	2.73	−2.02*	0.04
	Control Group	16.20	16.40	−0.57	0.56
		3.34	3.71	−0.57	0.56
Control over Environment	Intervention Group	17.6	24.6	−2.03*	0.04
		1.581	2.70	−2.03*	0.04
	Control Group	17.60	17.80	−1.84	0.85
		1.64	1.64	−1.84	0.85
Personal Growth	Intervention Group	20.4	21.00	−0.68	0.49
		3.43	1.58	−0.68	0.49
	Control Group	20.40	20.60	−0.57	0.56
		3.28	3.04	−0.57	0.56
Psychological Well-being	Intervention Group	114.4	146.0	−2.02*	0.04
		14.01	8.42	−2.02*	0.04
	Control Group	113.8	115.0	−0.13	0.89
		6.42	9.30	−0.13	0.89

*$p < 0.05$.

5. Discussion

The results of this study indicate that breathing relaxation exercises and art therapy not only improve university students' respiratory function but also significantly enhance their self-understanding and psychological sense of peace. These interventions were effective in alleviating symptoms of anxiety.

University students participating in the study gained opportunities to deeply explore their personal identities and character traits through breathing relaxation exercises and tactile experiential art therapy, thereby enhancing their self-understanding and self-acceptance.

According to participant feedback, as the therapy progressed, they engaged in deep reflection and exploration of their personality, abilities, weaknesses, life goals, and direction, which promoted greater self-understanding and facilitated positive changes in their lives.

Breathing relaxation exercises can quickly calm individuals and help them fully engage in art therapy activities (Lai et al., 2020), making it an effective complementary practice. Meanwhile, group art psychotherapy utilizing artistic media promotes positive self-awareness and emotional development, enhancing self-concept and identifying inner strengths. This approach assists in overcoming the psychological crises faced by university students (Choi and Eun-kyung, 2021), A. Choi (2017) also supports this perspective, stating, "An integrative approach to art therapy can reduce the defense mechanisms of university students, allowing them to easily express their beneficial and substantive internal goals through simple artistic media, which yields meaningful results".

The findings on psychological well-being align with the research by (Cui Anna, 2017), who stated: "Engaging in artwork helps to continuously support and encourage spontaneous self-expression and the process of self-exploration, inducing the motivation for inner psychological exploration and enhancing self-acceptance".

Furthermore, Choi's (2017) research findings confirm that comprehensive art therapy positively impacts improving interpersonal relationships, and Lee's (2020) research also points out that collective art therapy, from the perspective of psychological well-being, positively affects the formation of self-acceptance and enhances positive interpersonal relationships.(A. N. Choi, 2017)

Breathing exercises and tactile art therapy provide participants with a psychologically safe space. This secure environment allowed for a deeper level of self-exploration and expression, which is essential for the therapeutic process. Feedback from participants indicates that this safe space significantly contributes to their comfort and willingness to engage in both breathing exercises and art therapy activities. Participants have the opportunity to explore their roles in society from various perspectives, leading to a positive impact on their psychological well-being.

These findings suggest that we can design workshops and group activities that allow students to explore personal identity and character traits through artistic creation and breathing exercises. For college students experiencing anxiety, incorporating breathing relaxation exercises and art therapy into university courses can help alleviate anxiety while enhancing self-understanding and psychological health. Tactile experience art therapy allows individuals to express emotions and experiences that are difficult to articulate verbally through various forms of art. This approach not only helps participants

to recognize their own challenges but also fosters understanding and support among peers, empowering them to overcome difficulties together.

Educational policies should encourage the incorporation of mental health strategies into the comprehensive health promotion framework of schools. This approach capitalizes on the role of educational institutions in fostering positive mental health and well-being, preventing psychological disorders, and addressing the mental health needs of students. By establishing schools as environments that prioritize mental health, we can achieve the fundamental goal of education.

6. Conclusion

The study demonstrates that incorporating breathing relaxation exercises and tactile art therapy into educational policy can significantly reduce anxiety and enhance the psychological well-being of college students. These findings suggest that such interventions can serve as effective components of a comprehensive educational policy designed to improve student mental health.

7. Recommendations and significance

This study conducted a 10-week Breathing and Art Therapy intervention, which significantly improved lung function in college students and enhanced their self-understanding and psychological well-being. A telephone follow-up conducted three months later confirmed that the long-term effects of breathing and art therapy are superior to those of conventional psychotherapy. In this small-scale study, we concentrated our resources on timely adjustments and optimization of the Breathing and Art Therapy protocol, facilitating a more in-depth assessment and intervention. This approach ensured the effectiveness of the experiment while allowing for the potential of innovative large-scale research.

This study has several limitations, including a small sample size and a short treatment duration. These factors may affect the generalizability and robustness of the results. Therefore, it is recommended that future research be conducted on a national scale, with a larger sample size and longer treatment periods, to further validate the effectiveness of breathing relaxation exercises and tactile experiential art therapy. By conducting long-term follow-up studies, we can assess the durability of these improvements and explore the potential long-term impact of breathing and art therapy on the mental health of college students.

Despite these limitations, the significance of this study lies in its potential to influence educational policies, enhance college students' self-awareness and psychological well-being, alleviate the social issue of student anxiety, and offer new perspectives and resources for educational policymakers and practitioners.

Author contributions: Conceptualization, MH; methodology, MH; software, MH; validation, MH, QT and THK; formal analysis, MH; investigation, MH; resources, MH and QT; data curation, MH and QT; writing—original draft preparation, MH; writing—review and editing, MH; visualization, MH and QT; supervision, MH and

THK; project administration, MH and QT. All authors have read and agreed to the published version of the manuscript.

Conflict of interest: The authors declare no conflict of interest.

References

Appelbaum, L. G., Shenasa, M. A., Stolz, L., et al. (2023). Synaptic plasticity and mental health: Methods, challenges and opportunities. Neuropsychopharmacology, 48(1), 113–120. https://doi.org/10.1038/S41386-022-01370-W

Buss, D. M., & Scheier, M. F. (1976). Self-consciousness, self-awareness, and self-attribution. Journal of Research in Personality, 10(4), 463–468. https://doi.org/10.1016/0092-6566(76)90060-X

Choi, A. (2017). The impact of integrated art therapy on college students' self-understanding and interpersonal relationships. Art Psychotherapy Research, 13(4), 215–229.

Choi, A. N. (2017). The effect of integrated art therapy on self-understanding and interpersonal relationships of college students. Art Psychotherapy Research (Korean), 13(4), 215–229.

Choi, J. I., & Eun-kyung, P. (2021). The effect of group art therapy using Korean painting media on college students' self-efficacy and job anxiety. Art Therapy Research, 28(2), 489–516.

Hong, M., Dyakov, D. G., & Zheng, J. (2022). Risk factors and methods of reconstruction of self-identity: A scoping review. The Open Psychology Journal, 15, 1–9. https://doi.org/10.2174/18743501-v15-e2201060

Hyseni Duraku, Z., Davis, H., & Hamiti, E. (2023). Mental health, study skills, social support, and barriers to seeking psychological help among university students: A call for mental health support in higher education. Frontiers in Public Health, 11, 1220614. https://doi.org/10.3389/FPUBH.2023.1220614

Kim, H. (2020). Effects of a picture book creation program as art therapy education on the self-understanding and self-efficacy of university students [MSc thesis], CHA University Art Therapy Graduate School.

Kim, M. S., Kim, H. W., & Cha, K. H. (2001). Construct analysis of psychological well-being: Targeting Korean adult men and women. Korean Journal of Psychology: Society and Personality (Korean), 15(2), 19–39.

Klussman, K., Curtin, N., Langer, J., et al. (2022). The importance of awareness, acceptance, and alignment with the self: A framework for understanding self-connection. Europe's Journal of Psychology, 18(1), 120–131. https://doi.org/10.5964/EJOP.3707

Kyriakides, L., Creemers, B. P. M., Antoniou, P., et al. (2015). The impact of school policy and stakeholders' actions on student learning: A longitudinal study. Learning and Instruction, 36, 113–124. https://doi.org/10.1016/J.LEARNINSTRUC.2015.01.004

Lai, K. S. P., Watt, C., Ionson, E., et al. (2020). Breath regulation and yogic exercise an online therapy for calm and happiness (BREATH) for frontline hospital and long-term care home staff managing the COVID-19 pandemic: A structured summary of a study protocol for a feasibility study for a randomised controlled trial. Trials, 21(1), 648. https://doi.org/10.1186/S13063-020-04583-W

Lee, E. (2020). Interpretation of the necessity and meaning of convergence art therapy. Art and Humans, 6, 63–64.

Lee, J., Baek, H., Oh, E., et al. (2024). Development and validation of the self-consciousness type scale. Frontiers in Psychology, 15, 1362324. https://doi.org/10.3389/FPSYG.2024.1362324

Lee, J. E. (2020). The relationship between college students' pursuit of meaning in life, meaning finding, and psychological well-being: The moderated mediating effect of social interest [MSc thesis], Pusan National University.

Lim, S. A. (2015). Differential association of motives and goal contents with psychological well-being: Regression mixture modeling approach [MSc thesis], Kyungpook National University.

Liu, X. Q., Guo, Y. X., & Xu, Y. (2023). Risk factors and digital interventions for anxiety disorders in college students: Stakeholder perspectives. World Journal of Clinical Cases, 11(7), 1442–1457. https://doi.org/10.12998/WJCC.V11.I7.1442

Maurer, M. M., Maurer, J., Hoff, E., et al. (2023). What is the process of personal growth? Introducing the personal growth process model. New Ideas in Psychology, 70, 101024. https://doi.org/10.1016/J.NEWIDEAPSYCH.2023.101024

Mofatteh, M. (2021). Risk factors associated with stress, anxiety, and depression among university undergraduate students. AIMS Public Health, 8(1), 36–65. https://doi.org/10.3934/PUBLICHEALTH.2021004

Nanjing University. (2024). Zhu Jingning's research group reveals the neural circuit mechanism of exercise improving anxiety. Available online: https://www.nju.edu.cn/info/1067/355761.htm (accessed on 24 December 2024).

Ryff, C. D., & Singer, B. (1998). The contours of positive human health. Psychological Inquiry, 9(1), 1–28. https://doi.org/10.1207/S15327965PLI0901_1

Sakız, H., & Jencius, M. (2024). Inclusive mental health support for international students: Unveiling delivery components in higher education. Cambridge Prisms: Global Mental Health, 11, e8. https://doi.org/10.1017/GMH.2024.1

Tavoian, D., & Craighead, D. H. (2023). Deep breathing exercise at work: Potential applications and impact. Frontiers in Physiology, 14, 1040091. https://doi.org/10.3389/FPHYS.2023.1040091

Wang, C., Yan, S., Jiang, H., et al. (2022). Socio-demographic characteristics, lifestyles, social support quality and mental health in college students: A cross-sectional study. BMC Public Health, 22(1), 1583. https://doi.org/10.1186/S12889-022-14002-1

Zhao, J. L., Jiang, W. T., Wang, X., et al. (2020). Exercise, brain plasticity, and depression. CNS Neuroscience and Therapeutics, 26(9), 885–895. https://doi.org/10.1111/CNS.13385