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Psychological Resilience as a Pathway Between Community-Engaged Rural Art Practice and University Students' Well-Being and Distress

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ABSTRACT

Purpose: University students face academic pressure, interpersonal challenges, and future uncertainty, making psychological well-being an important concern in higher education. Community-engaged rural art practice may provide opportunities for emotional expression, cultural meaning-making, social connection, and adaptive coping. However, its associations with students' well-being and psychological distress, as well as the underlying mechanism, remain insufficiently examined. This study examined the relationship between community-engaged rural art practice and university students' psychological well-being and distress, focusing on the mediating role of psychological resilience.

Methods: A cross-sectional survey was conducted among university students. Participants completed measures of community-engaged rural art practice, psychological resilience, psychological well-being, depression, anxiety, and stress. Descriptive statistics, reliability analysis, correlation analysis, group comparison, hierarchical regression, and bootstrap mediation analysis were used to examine the relationships among the main variables. **Results:** Community-engaged rural art practice was positively associated with psychological resilience ($r = 0.43$, $p < 0.001$) and psychological well-being ($r = 0.44$, $p < 0.001$), and negatively associated with depression ($r = -0.44$, $p < 0.001$), anxiety ($r = -0.24$, $p < 0.001$), and stress ($r = -0.43$, $p < 0.001$). Students with higher engagement reported stronger psychological resilience, higher well-being, and lower psychological distress. Hierarchical regression showed that rural art practice remained significantly associated with psychological well-being, depression, anxiety, and stress after controlling for demographic and educational variables. Mediation analysis indicated that psychological resilience partially mediated the associations between rural art practice and psychological well-being, depression, and stress, while the association with anxiety operated mainly through resilience. **Conclusion:** These findings provide preliminary cross-sectional evidence that community-engaged rural art practice is associated with more favorable psychological outcomes among university students. Psychological resilience may be an important positive psychological resource linking rural art practice engagement with higher well-being and lower distress. From a positive psychology perspective, socially engaged rural art practice may offer a meaningful educational context for cultivating resilience, adaptive coping, and student well-being. Given the convenience sampling strategy and cross-sectional design, the findings should be interpreted as associations rather than causal effects.

Introduction

Positive psychology has shifted psychological research from an exclusive focus on illness, deficit, and dysfunction toward the study of human strengths, well-being, resilience, meaning, and adaptive functioning^{1,2}. Rather than treating mental health only as the absence of psychological symptoms, positive psychology emphasizes the resources and experiences that enable individuals to maintain well-being, cope with stress, and pursue meaningful development^{3,4}. This perspective is especially relevant to higher education, where student development involves not only academic achievement but also emotional adaptation, identity formation, social connection, and psychological growth⁵⁻⁸. Recent studies in *Frontiers in Psychology* have also emphasized the importance of positive higher education, suggesting that universities should move beyond problem-oriented approaches and pay greater attention to student well-being, engagement, resilience, and flourishing⁵⁻⁸.

University students constitute an important population for positive psychology research because they are situated in a developmental period characterized by academic pressure, interpersonal transition, career uncertainty, and increasing demands for self-regulation. Academic stress has been shown to be closely associated with college students' mental well-being⁹, and international studies have consistently reported that university students are vulnerable to depression, anxiety, stress, loneliness, and reduced psychological well-being^{10–14}. However, from a positive psychology perspective, students' psychological status should not be understood only through negative indicators such as distress or symptoms. It is also necessary to examine positive indicators such as psychological well-being, resilience, meaning, self-efficacy, social connectedness, and adaptive coping^{2,5,8}. Therefore, research on university students should consider both well-being and psychological distress, as these dimensions may coexist and reflect different aspects of students' psychological functioning^{2,28,32}.

Arts engagement has increasingly been discussed as a meaningful context for psychological well-being and positive development. Artistic and cultural activities may include both receptive forms, such as listening to music, visiting exhibitions, watching performances, and reading, and active forms, such as drawing, crafting, singing, dancing, writing, and design practice^{15–18}. Previous studies have suggested that engagement in artistic and creative activities is associated with emotion regulation, subjective well-being, social connection, self-expression, and reduced psychological distress^{15–18}. During the COVID-19 pandemic, arts engagement was also found to be related to mental health and emotional regulation among students and adults^{13,16,24}. These findings indicate that arts engagement may provide psychological resources that are relevant to positive functioning, especially when artistic activities involve emotional expression, meaning-making, and social participation.

Within the broader field of arts engagement, arts education has received increasing attention in relation to student well-being. Studies in *Frontiers in Psychology* have examined the relationship between fine arts education and psychological well-being among higher education students, highlighting the roles of creativity and self-efficacy¹⁹. Other research has suggested that arts education initiatives may have potential for supporting the emotional well-being of Chinese university students²⁰. Broader discussions of arts and health have also emphasized the psychological and social value of arts participation across different contexts^{21–23}. These studies provide an important foundation for understanding artistic practice not only as aesthetic or professional training, but also as a socially and psychologically meaningful form of engagement.

Community-engaged rural art practice represents a more situated and socially embedded form of arts engagement. In the context of higher education, rural art practice often involves field investigation, interaction with rural communities, interpretation of local cultural resources, collaborative design, creative intervention, and reflective learning. Unlike ordinary classroom-based art activities, community-engaged rural art practice places students in real social, cultural, and spatial contexts. Students are required not only to produce visual or design outcomes, but also to communicate with local residents, understand rural cultural meanings, respond to community needs, and reflect on the social value of design. These features suggest that rural art practice may be psychologically meaningful because it combines creative expression, cultural interpretation, social connectedness, problem-solving, and meaning-making. This form of practice is particularly relevant to positive psychology because it may provide students with opportunities to experience several positive psychological processes. First, rural art practice may support emotional expression by allowing students to transform personal experience, uncertainty, and stress into creative forms. Second, it may strengthen social connectedness through interaction with classmates, teachers, rural residents, and local organizations. Third, it may enhance meaning-making because students can perceive their creative work as connected with rural culture, community life, and social responsibility. Fourth, it may foster adaptive coping because students often need to face open-ended tasks, unfamiliar environments, practical constraints, and uncertain community needs. These processes are closely related to resilience, self-efficacy, belonging, purpose, and psychological well-being, which are central constructs in positive psychology^{2,5,19,20,29,34}.

Psychological resilience may be a key mechanism linking community-engaged rural art practice with students' psychological outcomes. Resilience is commonly understood as the capacity to adapt positively when facing stress, adversity, or uncertainty^{26,27}. In higher education research, resilience has been associated with positive mental health, lower psychological distress, student engagement, and well-being^{28–31}. A longitudinal study of Chinese college students in *Frontiers in Psychology* showed a reciprocal relationship between resilience and mental health over time, suggesting that resilience is closely related to both positive and negative indicators of mental health²⁸. Other *Frontiers* studies have also emphasized the role of academic resilience and personal resources in university students' engagement and well-being²⁹, as well as the association between resilience and overall well-being in broader contexts³⁰. These findings suggest that resilience is not merely a stable personality trait, but an adaptive psychological resource that may be shaped by educational, social, and experiential contexts. Community-engaged rural art practice may be associated

with psychological resilience for several reasons. Rural art and design projects often require students to enter unfamiliar environments, communicate with diverse groups, negotiate cultural meanings, solve practical problems, and tolerate ambiguity. These experiences may help students develop persistence, flexibility, emotional regulation, and confidence in dealing with uncertainty. At the same time, the collaborative and reflective nature of rural art practice may provide interpersonal support and meaning, both of which are important for adaptive coping and well-being^{29,34}. Therefore, psychological resilience may help explain why students who report higher engagement in rural art practice also report more favorable psychological outcomes.

Despite growing interest in arts engagement, positive psychology, and student well-being, several research gaps remain. First, existing studies have mainly examined general arts engagement, fine arts education, positive psychology courses, mindfulness, physical activity, or counseling-based interventions, while relatively little attention has been paid to community-engaged rural art practice as a specific form of socially engaged learning in higher education^{5–8,19–24}. Second, previous studies on arts and students' psychological outcomes have often focused on general well-being or mental health, but less is known about how rural art practice is associated with both positive well-being and psychological distress. Third, although resilience has been widely discussed as an important positive psychological resource among university students^{28–31}, its mediating role in the relationship between rural art practice and psychological outcomes remains insufficiently examined. Fourth, because many studies in this field use cross-sectional designs, it is necessary to frame findings carefully as associations rather than causal effects.

To address these gaps, the present study examines the associations among community-engaged rural art practice, psychological resilience, psychological well-being, and psychological distress among university students. Rather than treating rural art practice as a clinical intervention or making causal claims about mental health improvement, this study adopts a positive psychology perspective and investigates whether higher engagement in rural art practice is associated with stronger psychological resilience, higher psychological well-being, and lower depression, anxiety, and stress. Psychological resilience is further examined as a mediating factor linking rural art practice engagement with these psychological outcomes.

Based on the above theoretical and empirical background, this study proposes the following hypotheses:

H1: Community-engaged rural art practice is positively associated with psychological well-being.

H2: Community-engaged rural art practice is negatively associated with depression, anxiety, and stress.

H3: Community-engaged rural art practice is positively associated with psychological resilience.

H4: Psychological resilience mediates the associations between community-engaged rural art practice and psychological well-being, depression, anxiety, and stress.

Results

Participant characteristics

Table 1 presents the demographic characteristics of the participants. A total of 800 questionnaires were distributed. After excluding invalid responses, 625 valid questionnaires were retained for analysis, yielding a valid response rate of 78.12%. The sample included 240 males (38.40%) and 385 females (61.60%). Participants ranged in age from 18 to 23 years, with a mean age of 20.19 years ($SD = 1.26$). In terms of academic year, 143 participants were first-year students (22.88%), 181 were second-year students (28.96%), 164 were third-year students (26.24%), and 137 were fourth-year students or above (21.92%). Regarding academic discipline, 324 students (51.84%) were from art-related disciplines, whereas 301 students (48.16%) were from non-art-related disciplines. In addition, 259 participants (41.44%) reported a rural background, and 314 participants (50.24%) had prior experience in rural art or design practice.

Variable	Category	n	%
Gender	Male	240	38.40
Gender	Female	385	61.60
Academic year	First year	143	22.88
Academic year	Second year	181	28.96
Academic year	Third year	164	26.24
Academic year	Fourth year or above	137	21.92

Variable	Category	n	%
Academic discipline	Non-art-related	301	48.16
Academic discipline	Art-related	324	51.84
Family residence	Urban	261	41.76
Family residence	County or town	201	32.16
Family residence	Rural	163	26.08
Rural background	No	366	58.56
Rural background	Yes	259	41.44
Prior rural art or design practice experience	No	311	49.76
Prior rural art or design practice experience	Yes	314	50.24

Table 1. Demographic characteristics of participants (N = 625)

Note. Age: M = 20.19, SD = 1.26, range = 18–23.

Descriptive statistics and reliability

Table 2 reports the descriptive statistics and reliability coefficients of the main variables, including community-engaged rural art practice, psychological resilience, psychological well-being, depression, anxiety, and stress. The mean score of community-engaged rural art practice was 3.44 (SD = 0.48), indicating that participants showed a moderate to relatively high level of engagement in rural art and design practice. The mean score of psychological resilience was 20.34 (SD = 5.76), and the mean score of psychological well-being was 49.96 (SD = 17.25). For psychological distress, the mean scores were 16.44 (SD = 7.79) for depression, 16.37 (SD = 7.80) for anxiety, and 16.21 (SD = 7.65) for stress.

The Cronbach's alpha coefficients ranged from 0.773 to 0.848. Specifically, the reliability coefficient was 0.773 for community-engaged rural art practice, 0.848 for psychological resilience, 0.848 for psychological well-being, 0.839 for depression, 0.837 for anxiety, and 0.829 for stress. These values indicate that all measures demonstrated acceptable to good internal consistency.

Variable	Mean	SD	Skewness	Kurtosis	Cronbach's α
Community-engaged rural art practice	3.44	0.48	-0.10	-0.16	0.773
Psychological resilience	20.34	5.76	-0.01	-0.35	0.848
Psychological well-being	49.96	17.25	-0.02	-0.28	0.848
Depression	16.44	7.79	0.18	-0.36	0.839
Anxiety	16.37	7.80	0.26	-0.17	0.837
Stress	16.21	7.65	0.20	-0.25	0.829

Table 2. Descriptive statistics and reliability of the main variables

Note. Higher scores indicate higher levels of the corresponding construct.

Correlation analysis

Table 3 presents the Pearson correlation matrix among community-engaged rural art practice, psychological resilience, and psychological outcomes. Community-engaged rural art practice was positively correlated with psychological resilience ($r = 0.43$, $p < 0.001$) and psychological well-being ($r = 0.44$, $p < 0.001$). It was negatively correlated with depression ($r = -0.44$, $p < 0.001$), anxiety ($r = -0.24$, $p < 0.001$), and stress ($r = -0.43$, $p < 0.001$). Psychological resilience was positively associated with psychological well-being ($r = 0.55$, $p < 0.001$) and negatively associated with depression ($r = -0.51$, $p < 0.001$), anxiety ($r = -0.49$, $p < 0.001$), and stress ($r = -0.51$, $p < 0.001$). These results suggest that higher engagement in community-engaged rural art practice was associated with stronger psychological resilience, higher psychological well-being, and lower psychological distress.

Variable	1	2	3	4	5	6
1.Community-engaged	—					

Variable	1	2	3	4	5	6
rural art practice						
2. Psychological resilience	0.43***	—				
3. Psychological well-being	0.44***	0.55***	—			
4. Depression	-0.44***	-0.51***	-0.36***	—		
5. Anxiety	-0.24***	-0.49***	-0.30***	0.26***	—	
6. Stress	-0.43***	-0.51***	-0.38***	0.30***	0.23***	—

Table 3. Correlations among community-engaged rural art practice, psychological resilience, psychological well-being, and psychological distress

Note. *** $p < 0.001$.

Differences across levels of community-engaged rural art practice

Table 4 shows the differences in psychological resilience, psychological well-being, depression, anxiety, and stress across low, moderate, and high levels of community-engaged rural art practice. Participants were divided into three groups according to their total scores for community-engaged rural art practice. One-way analysis of variance showed significant group differences in psychological resilience, $F(2, 622) = 53.01$, $p < 0.001$, $\eta^2 = 0.146$; psychological well-being, $F(2, 622) = 60.26$, $p < 0.001$, $\eta^2 = 0.162$; depression, $F(2, 622) = 61.76$, $p < 0.001$, $\eta^2 = 0.166$; anxiety, $F(2, 622) = 21.51$, $p < 0.001$, $\eta^2 = 0.065$; and stress, $F(2, 622) = 55.66$, $p < 0.001$, $\eta^2 = 0.152$.

Students in the high engagement group reported the highest level of psychological resilience and psychological well-being, as well as lower levels of depression, anxiety, and stress. However, the difference in anxiety between the low and moderate engagement groups was not significant. These findings suggest that higher engagement in community-engaged rural art practice was associated with a more favorable psychological profile, although the cross-sectional design does not allow causal interpretation.

Variable	Low engagement M(SD)	Moderate engagement M(SD)	High engagement M(SD)	F	p	η^2	Post-hoc summary
Psychological resilience	16.98 (5.18)	19.79 (5.39)	23.01 (5.35)	53.01	<0.001	0.146	High > Moderate > Low
Psychological well-being	39.42 (16.84)	48.17 (15.08)	58.44 (16.17)	60.26	<0.001	0.162	High > Moderate > Low
Depression	21.60 (7.04)	16.97 (7.23)	12.77 (7.04)	61.76	<0.001	0.166	High < Moderate < Low
Anxiety	18.21 (7.60)	17.62 (7.46)	13.65 (7.66)	21.51	<0.001	0.065	High < Moderate/Low; Low vs. Moderate n.s.
Stress	21.24 (7.26)	16.52 (6.91)	12.88 (7.14)	55.66	<0.001	0.152	High < Moderate < Low

Table 4. Differences in psychological resilience and psychological outcomes across levels of community-engaged rural art practice

Note. n.s. = non-significant.

Hierarchical regression analysis

Table 5 presents the hierarchical regression results for psychological well-being, depression, anxiety, and stress. In the first step, demographic and educational variables were entered as control variables, including gender, age, academic year, academic discipline, place of family residence, rural background, and prior experience in rural art or design practice. In the second step, community-engaged rural art practice was entered as the main independent variable. In the third step, psychological resilience was added to examine whether it statistically accounted for part of the associations between rural art practice and psychological outcomes.

For psychological well-being, community-engaged rural art practice showed a significant positive association after controlling for demographic and educational variables ($\beta = 0.420$, $p < 0.001$), explaining an additional 13.4% of the variance. After psychological resilience was entered into the model, community-engaged rural art practice remained

positively associated with psychological well-being ($\beta = 0.240$, $p < 0.001$), and psychological resilience also showed a significant positive association with psychological well-being ($\beta = 0.444$, $p < 0.001$).

For depression, community-engaged rural art practice showed a significant negative association with depression after the control variables were entered ($\beta = -0.438$, $p < 0.001$). After psychological resilience was added, the association remained significant but decreased in magnitude ($\beta = -0.277$, $p < 0.001$), while psychological resilience was also negatively associated with depression ($\beta = -0.399$, $p < 0.001$).

For anxiety, community-engaged rural art practice was significantly associated with lower anxiety in the second step ($\beta = -0.246$, $p < 0.001$). However, after psychological resilience was added to the model, the direct association between community-engaged rural art practice and anxiety became non-significant ($\beta = -0.050$, $p = 0.247$), whereas psychological resilience remained a significant negative predictor of anxiety ($\beta = -0.484$, $p < 0.001$). This result indicates that psychological resilience may play a particularly important role in explaining the relationship between community-engaged rural art practice and anxiety.

For stress, community-engaged rural art practice was significantly associated with lower stress in the second step ($\beta = -0.446$, $p < 0.001$). After psychological resilience was entered, the association remained significant but decreased in magnitude ($\beta = -0.285$, $p < 0.001$), while psychological resilience was also negatively associated with stress ($\beta = -0.396$, $p < 0.001$).

Outcome	Step	R ²	ΔR^2	CE-RAP β	CE-RAP p	Resilience β	Resilience p
Psychological well-being	Step 1: Controls	0.072	—	—	—	—	—
Psychological well-being	Step 2: + CE-RAP	0.205	0.134	0.420	<0.001	—	—
Psychological well-being	Step 3: + Resilience	0.365	0.160	0.240	<0.001	0.444	<0.001
Depression	Step 1: Controls	0.055	—	—	—	—	—
Depression	Step 2: + CE-RAP	0.201	0.146	-0.438	<0.001	—	—
Depression	Step 3: + Resilience	0.330	0.129	-0.277	<0.001	-0.399	<0.001
Anxiety	Step 1: Controls	0.014	—	—	—	—	—
Anxiety	Step 2: + CE-RAP	0.060	0.046	-0.246	<0.001	—	—
Anxiety	Step 3: + Resilience	0.249	0.189	-0.050	0.247	-0.484	<0.001
Stress	Step 1: Controls	0.052	—	—	—	—	—
Stress	Step 2: + CE-RAP	0.203	0.151	-0.446	<0.001	—	—
Stress	Step 3: + Resilience	0.330	0.127	-0.285	<0.001	-0.396	<0.001

Table 5. Hierarchical regression analysis for psychological outcomes

Note. CE-RAP = community-engaged rural art practice. Control variables included gender, age, academic year, academic discipline, place of family residence, rural background, and prior rural art or design practice experience.

Mediation analysis

Table 6 presents the statistical mediation analysis for psychological resilience in the associations between community-engaged rural art practice and psychological outcomes. The mediation model was tested using PROCESS Model 4 with 5,000 bootstrap resamples. Community-engaged rural art practice was positively associated with psychological resilience.

For psychological well-being, the indirect effect through psychological resilience was significant, $ab = 6.479$, 95% CI [5.008, 8.071]. The direct effect of community-engaged rural art practice on psychological well-being remained positive, $c' = 8.628$, indicating partial mediation. For depression, the indirect effect was also significant, $ab = -2.628$, 95% CI [-3.384, -1.956], while the direct effect remained significant, $c' = -4.495$. For stress, the indirect effect was significant, $ab = -2.563$, 95% CI [-3.297, -1.904], and the direct effect also remained significant, $c' = -4.552$.

For anxiety, the indirect effect through psychological resilience was significant, $ab = -3.193$, 95% CI [-4.061, -2.404]. However, the direct effect of community-engaged rural art practice on anxiety became relatively weak after psychological resilience was included, $c' = -0.813$. This pattern suggests that the association between community-engaged rural art practice and anxiety may operate mainly through psychological resilience rather than through a strong direct pathway.

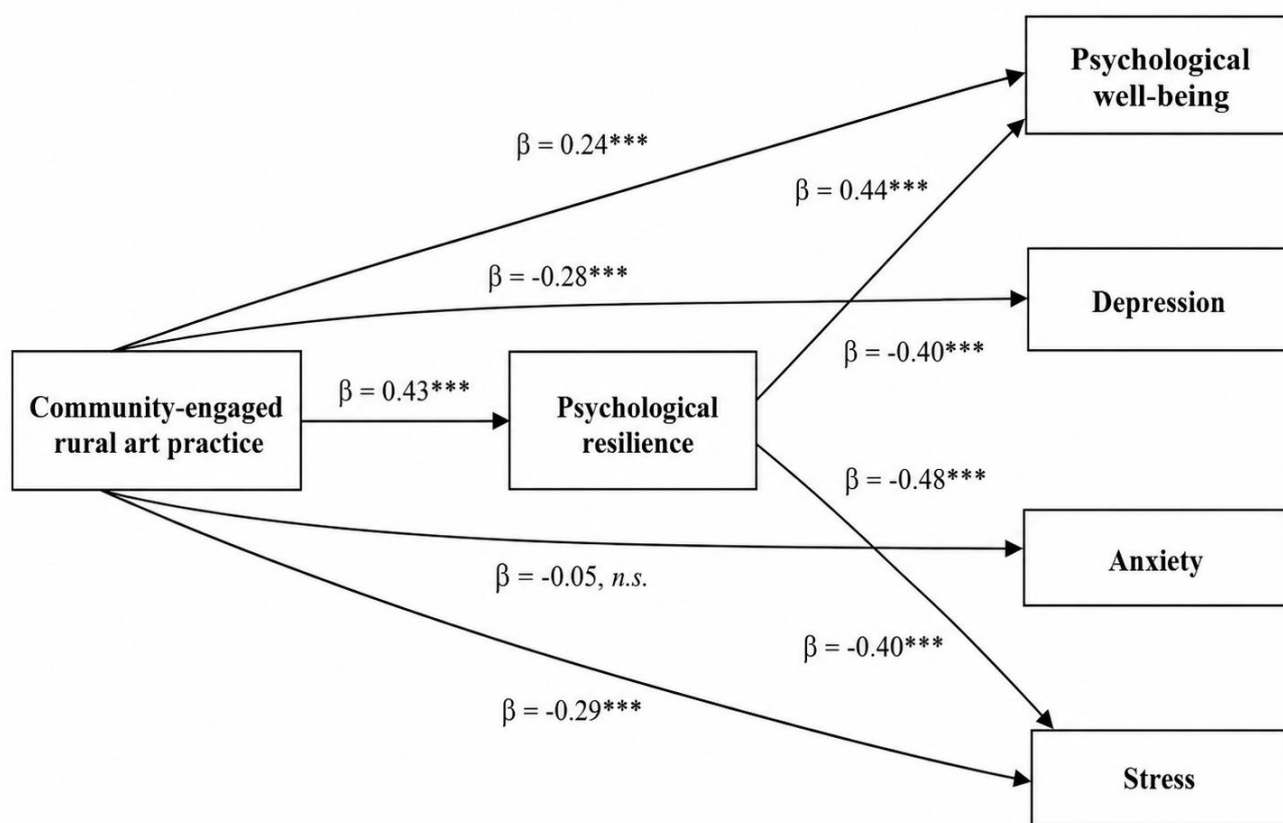
Overall, the mediation results supported the proposed statistical model. Community-engaged rural art practice was associated with higher psychological well-being and lower psychological distress among university students, and

psychological resilience statistically accounted for part of these associations. Given the cross-sectional design, these mediation results should be interpreted as indirect associations rather than evidence of temporal or causal mediation.

Outcome	a path	b path	Total association c	Direct association c'	Indirect association ab	Bootstrap 95% CI	Statistical mediation pattern
Psychological well-being	4.871	1.330	15.107	8.628	6.479	[5.008, 8.071]	Partial mediation
Depression	4.871	-0.539	-7.122	-4.495	-2.628	[-3.384, -1.956]	Partial mediation
Anxiety	4.871	-0.656	-4.006	-0.813	-3.193	[-4.061, -2.404]	Full mediation pattern for the direct anxiety path
Stress	4.871	-0.526	-7.116	-4.552	-2.563	[-3.297, -1.904]	Partial mediation

Table 6. Statistical indirect associations through psychological resilience

Note. The indirect association was considered statistically significant when the bootstrap 95% confidence interval did not include zero.



Note. Standardized coefficients are shown. *** $p < 0.001$; n.s. = non-significant.

Figure 1. Standardized mediation model linking community-engaged rural art practice, psychological resilience, and psychological outcomes.

Discussion

This study examined the associations among community-engaged rural art practice, psychological resilience, psychological well-being, and psychological distress among university students. The findings generally supported the proposed model. Students with higher levels of engagement in community-engaged rural art practice reported stronger psychological resilience, higher psychological well-being, and lower levels of depression, anxiety, and stress. The group comparison results further showed that students in the high engagement group demonstrated the most favorable

psychological profile. These findings suggest that rural art practice may be meaningfully associated with positive psychological resources and well-being among university students.

The mediation results provided a more specific explanation of these associations. Psychological resilience statistically mediated the associations between community-engaged rural art practice and psychological well-being, depression, and stress. For anxiety, the direct association between rural art practice and anxiety became non-significant after psychological resilience was included, while the indirect association through resilience remained significant. This pattern indicates that the link between rural art practice and anxiety may depend more strongly on psychological resilience. However, because the study used a cross-sectional design, these findings should be interpreted as associations rather than causal effects. The association between community-engaged rural art practice and students' psychological outcomes can be understood through the distinctive nature of this form of positive educational engagement. Unlike ordinary classroom-based art activities, rural art practice places students in real social, cultural, and spatial contexts. Students are required to conduct field investigation, communicate with local residents, interpret rural cultural resources, collaborate with peers and teachers, and translate local cultural meanings into visual, spatial, or design outcomes. These experiences extend art learning beyond individual expression and situate it within social interaction, cultural understanding, and community engagement.

From a positive psychology perspective, such practice may be linked to well-being through several interconnected processes. First, rural art practice offers opportunities for emotional expression and reflective thinking. Students may use creative forms to organize personal experience, uncertainty, and stress in a more meaningful way. Second, it may strengthen social connectedness. Interaction with rural communities, classmates, teachers, and local organizations may provide students with a sense of belonging and interpersonal support. Third, it may support meaning-making. When students perceive that their design work is connected with rural culture, public space, or community needs, they may develop a stronger sense of purpose, self-worth, and responsibility. Psychological resilience statistically mediated the associations between community-engaged rural art practice and psychological outcomes. This finding suggests that rural art practice may be related not only to positive emotional experience, but also to adaptive psychological resources. In rural art and design practice, students often face open-ended tasks, unfamiliar environments, uncertain community needs, and practical constraints. These situations require them to adjust expectations, solve problems, communicate with different groups, and tolerate ambiguity. Such experiences may be associated with stronger resilience, which in turn is linked to higher psychological well-being and lower psychological distress.

The partial mediation patterns for psychological well-being, depression, and stress indicate that psychological resilience accounted for part of the associations between rural art practice and these outcomes. For anxiety, the direct association between rural art practice and anxiety became non-significant after psychological resilience was included, while the indirect association through resilience remained significant. This pattern suggests that resilience may be particularly relevant for understanding the link between rural art practice and anxiety. However, because the data were cross-sectional, these findings should be interpreted as statistical mediation rather than causal evidence. The findings have implications for positive psychology in higher education. University students' psychological development should not be understood only through the lens of distress reduction, but also through the cultivation of resilience, meaning, belonging, and adaptive coping. Community-engaged rural art practice may provide a meaningful educational context in which students connect creative expression with social participation, cultural interpretation, and reflective learning. In this sense, rural art practice can be viewed as a socially embedded learning experience associated with positive psychological resources. The findings also contribute to design education. In many art and design programs, rural practice is often understood mainly as professional training, including field research, cultural translation, visual design, and community-based creation. The present study suggests that its value may be broader. Community-engaged rural art practice may also be associated with students' resilience and well-being. Therefore, art-based rural practice should not be treated only as a method for improving design skills, but also as an educational environment that may support emotional development, social responsibility, and adaptive capacity.

For curriculum development, universities may consider designing rural art practice in a more structured and reflective way. Effective practice should not be limited to short-term visual production or symbolic decoration. It should include field investigation, community dialogue, collaborative design, local cultural interpretation, and post-practice reflection. These elements may help students experience rural art practice as a socially meaningful process, thereby strengthening its relevance to positive psychological development in higher education. Several limitations should be acknowledged. First, this study used a cross-sectional survey design, which limits causal interpretation. Although significant associations were found among community-engaged rural art practice, psychological resilience, psychological well-being, and psychological distress, the findings cannot confirm that rural art practice directly causes

improvements in well-being or reductions in distress. Future studies could adopt longitudinal, experimental, or quasi-experimental designs to examine changes before and after rural art practice.

Second, the participants were recruited through university course groups, student communities, and campus-based online networks. Therefore, the sample was a non-probability convenience sample and may not be representative of all university students. The findings should be generalized with caution. Future research could use multi-site sampling, stratified sampling, or larger samples from different regions and types of universities to improve representativeness.

Third, the data were collected through self-report questionnaires. Although the measures showed acceptable reliability, self-report data may still be influenced by social desirability, recall bias, or individual response tendencies. Future research could combine questionnaire data with interviews, reflective journals, observation records, or teacher evaluations to obtain a more comprehensive understanding of students' rural art practice experiences.

Fourth, the mediation analysis was based on cross-sectional data. Therefore, the mediation results should be understood as statistical indirect associations rather than evidence of temporal or causal mediation. Future longitudinal studies are needed to test whether rural art practice engagement predicts later changes in psychological resilience and subsequent changes in well-being or distress.

This study examined the associations among community-engaged rural art practice, psychological resilience, psychological well-being, and psychological distress among university students. The findings showed that higher engagement in rural art practice was associated with stronger psychological resilience, higher psychological well-being, and lower levels of depression, anxiety, and stress. Psychological resilience further served as a statistical mediating factor linking rural art practice engagement with these psychological outcomes. These findings provide preliminary cross-sectional evidence that community-engaged rural art practice is associated with more favorable psychological outcomes among university students. From a positive psychology perspective, socially engaged rural art practice may offer a meaningful educational context for cultivating resilience, meaning-making, social connectedness, and adaptive coping. However, because this study used a non-probability convenience sample and cross-sectional design, the findings should be interpreted as associations rather than causal effects. Future research should further examine these relationships through longitudinal, experimental, and mixed-method designs.

Methods

Ethics approval

All methods were carried out in accordance with relevant guidelines and regulations for research involving human participants, including the Declaration of Helsinki and applicable institutional requirements. The study protocol and all experimental protocols, including participant recruitment, the informed consent procedure, the online questionnaire, and the data collection process, were reviewed and approved by the Ethics Committee of Ningbo University of Finance and Economics before data collection.

Informed consent

Informed consent was obtained electronically from all participants prior to their participation in the study. Before accessing the main questionnaire, participants read the study information and informed consent statement and indicated their agreement by selecting “agree to participate” on the first page of the online questionnaire. Participation was voluntary, responses were anonymous, and participants were free to withdraw from the survey at any time without any negative consequences.

Participants and procedure

This study adopted a cross-sectional survey design to examine the associations among community-engaged rural art practice, psychological resilience, psychological well-being, and psychological distress among university students in China. Participants were recruited through an online questionnaire platform, and the survey link was distributed mainly through university course groups, student communities, and campus-based online networks. Therefore, the sample should be understood as a non-probability convenience sample rather than a representative sample of all university students. Given the cross-sectional nature of the data, the study aimed to examine associations among variables rather than to establish causal relationships.

A total of 800 questionnaires were distributed. After data screening, 175 invalid responses were removed, resulting in 625 valid questionnaires and a valid response rate of 78.12%. Participants ranged in age from 18 to 23 years, with a mean age of 20.19 years ($SD = 1.26$). The sample included 240 males (38.40%) and 385 females

(61.60%). In terms of academic year, 143 participants were first-year students, 181 were second-year students, 164 were third-year students, and 137 were fourth-year students or above. Participants came from both art-related and non-art-related academic backgrounds, allowing further examination of potential differences in rural art practice engagement and mental health across disciplinary groups.

Before the formal survey, the questionnaire was reviewed and pilot-tested to ensure clarity of wording, appropriateness of structure, and reasonable completion time. The formal survey was administered anonymously. The first page of the questionnaire provided information about the study purpose, survey content, estimated completion time, confidentiality of data, and participants' right to take part voluntarily. Only participants who read the informed consent statement and selected "agree to participate" were allowed to proceed to the main questionnaire. Participants were free to withdraw from the survey at any time without any negative consequences.

The questionnaire consisted of four sections. The first section collected demographic information, including gender, age, academic year, academic discipline, place of family residence, and frequency of participation in rural art practice. The second section assessed community-engaged rural art practice, including students' involvement in rural field investigation, community interaction, cultural interpretation, collaborative design, and reflective learning. The third section measured psychological resilience, reflecting students' adaptive capacity when facing stress and difficulties. The fourth section assessed psychological outcomes, including psychological well-being, perceived stress, anxiety, or depressive symptoms. All data were used solely for academic research purposes and were anonymized before analysis.

Measures

The questionnaire consisted of four sections: demographic information, community-engaged rural art practice, psychological resilience, and psychological outcomes. Except for demographic information, all core variables were measured using self-report scales. All items were completed anonymously, with higher scores indicating higher levels of the corresponding constructs. For scales originally developed in English, validated Chinese versions were used when available. When no established Chinese version was available, a translation and back-translation procedure was adopted, followed by a pilot test to ensure that the wording was clear and appropriate for university students.

Demographic information

Demographic information included gender, age, academic year, academic discipline, place of family residence, and frequency of participation in rural art practice. Academic discipline was categorized into art-related and non-art-related fields. Frequency of participation in rural art practice was collected to provide a preliminary understanding of participants' everyday involvement in artistic activities and was also used as a basis for subsequent group comparison analyses.

Community-engaged rural art practice

Community-engaged rural art practice was used to assess the extent to which university students participated in rural art and design activities embedded in community and cultural contexts. In this study, community-engaged rural art practice referred to students' involvement in field investigation, interaction with rural residents or local organizations, interpretation of local cultural resources, collaborative design, creative intervention, and reflective learning related to rural revitalization and design education.

Participants were asked to report their level of involvement in these activities during the past three months or during relevant rural art and design courses or projects. Items were rated on a 5-point Likert scale ranging from 1 = very low involvement to 5 = very high involvement. A total score was calculated by averaging the item scores, with higher scores indicating a higher level of engagement in community-engaged rural art practice. For group comparison analyses, participants were categorized into low, moderate, and high engagement groups according to their total scores.

Psychological resilience

Psychological resilience was assessed to evaluate students' capacity for positive adaptation when facing stress, difficulties, and uncertainty. Psychological resilience was measured using the 10-item Connor-Davidson Resilience Scale, namely the CD-RISC-10. The scale consists of 10 items and mainly assesses recovery ability, persistence, adaptability, and positive coping tendencies under stressful conditions. Participants rated each item according to their actual experiences on a 5-point Likert scale ranging from 0 = not true at all to 4 = true nearly all of the time. Higher total scores indicate higher levels of psychological resilience. Previous studies have demonstrated that the CD-RISC-10 has good internal consistency and construct validity and is suitable for assessing psychological resilience among

university students. The internal consistency coefficient of the scale in the present study will be reported in the Results section.

Psychological outcomes

Psychological outcomes were assessed to capture both positive well-being and psychological distress. First, psychological well-being was assessed using the World Health Organization Five Well-Being Index, namely the WHO-5. The scale consists of five items and measures positive mood, vitality, and general psychological well-being during the past two weeks. Participants rated each item on a 6-point scale ranging from 0 = at no time to 5 = all of the time. Higher total scores indicate higher levels of psychological well-being.

Second, psychological distress was assessed using the 21-item Depression Anxiety Stress Scales, namely the DASS-21. The scale consists of 21 items and includes three subscales: depression, anxiety, and stress, with seven items for each dimension. Participants rated each item according to their experiences over the past week on a 4-point scale ranging from 0 = did not apply to me at all to 3 = applied to me very much or most of the time. Higher scores indicate higher levels of depression, anxiety, or stress. For ease of interpretation, this study reports psychological well-being, depression, anxiety, and stress separately.

Control variables

Considering that demographic and educational factors may influence university students' psychological outcomes, gender, age, academic year, academic discipline, place of family residence, rural background, and prior experience in rural art or design practice were included as control variables in subsequent statistical analyses. Because students from art-related disciplines or rural backgrounds may differ in their exposure to rural culture, design practice, and modes of emotional expression, these variables were controlled to reduce potential confounding effects on the relationship between community-engaged rural art practice and psychological outcomes.

Data analysis

Data were analyzed using SPSS 26.0 and the PROCESS macro. Before the formal analyses, the dataset was screened to exclude invalid responses, including questionnaires with unusually short completion times, substantial missing data, patterned responses, failed attention-check items, or duplicate submissions. Descriptive statistics were then used to summarize participants' demographic and educational characteristics.

Means, standard deviations, and Cronbach's alpha coefficients were calculated for the main variables, including community-engaged rural art practice, psychological resilience, psychological well-being, depression, anxiety, and stress. These analyses were conducted to describe the general distribution of the variables and to assess the internal consistency of the measurement instruments.

Pearson correlation analysis was used to examine the associations among community-engaged rural art practice, psychological resilience, and psychological outcomes. To further compare differences across levels of rural art practice engagement, participants were divided into low, moderate, and high engagement groups according to their total scores. One-way analysis of variance was then conducted to examine whether psychological resilience and psychological outcomes differed across these groups.

Hierarchical regression analysis was performed to test whether community-engaged rural art practice was associated with psychological outcomes after controlling for demographic and educational factors. Gender, age, academic year, academic discipline, place of family residence, rural background, and prior experience in rural art or design practice were entered as control variables. Community-engaged rural art practice was then entered as the main predictor, followed by psychological resilience to examine its explanatory role.

Finally, the mediating role of psychological resilience in the associations between community-engaged rural art practice and psychological outcomes was tested using PROCESS Model 4. Bootstrap analysis with 5,000 resamples was used to estimate the indirect association and its 95% confidence interval. The indirect association was considered statistically significant when the confidence interval did not include zero. All statistical tests were two-tailed, with the significance level set at $p < 0.05$. Because the data were cross-sectional, the mediation results were interpreted as statistical indirect associations rather than evidence of temporal or causal mediation.

References

1. Seligman MEP, Csikszentmihalyi M. Positive psychology: An introduction. *American Psychologist*. 2000;55:5–14. doi: 10.1037/0003-066X.55.1.5

2. Ryff CD. Positive psychology: Looking back and looking forward. *Frontiers in Psychology*. 2022;13:840062. doi: 10.3389/fpsyg.2022.840062
3. Deci EL, Ryan RM. Hedonia, eudaimonia, and well-being: An introduction. *Journal of Happiness Studies*. 2008;9:1–11. doi: 10.1007/s10902-006-9018-1
4. Martela F, Sheldon KM. Clarifying the concept of well-being: Psychological need satisfaction as the common core connecting eudaimonic and subjective well-being. *Review of General Psychology*. 2019;23:458–474. doi: 10.1177/1089268019880886
5. Zhao GX, et al. Well-being interventions in U.S. colleges: A scoping review from a positive higher education perspective. *Frontiers in Psychology*. 2025;16:1601955. doi: 10.3389/fpsyg.2025.1601955
6. Hobbs C, et al. A systematic review of the effect of university positive psychology courses on student psychological wellbeing. *Frontiers in Psychology*. 2022;13:1023140. doi: 10.3389/fpsyg.2022.1023140
7. Fält-Weckman S, et al. Using evidence-based applied positive psychology to increase well-being and study engagement. *Frontiers in Psychology*. 2024;15:1415519. doi: 10.3389/fpsyg.2024.1415519
8. Torrelles-Nadal C, et al. The impact of psychological well-being on university students. *Frontiers in Psychology*. 2025;16:1684619. doi: 10.3389/fpsyg.2025.1684619
9. Barbayannis G, Bandari M, Zheng X, Baquerizo H, Pecor KW, Ming X. Academic stress and mental well-being in college students: Correlations, affected groups, and COVID-19. *Frontiers in Psychology*. 2022;13:886344. doi: 10.3389/fpsyg.2022.886344
10. Auerbach RP, Alonso J, Axinn WG, Cuijpers P, Ebert DD, Green JG, et al. Mental disorders among college students in the World Health Organization World Mental Health Surveys. *Psychological Medicine*. 2016;46:2955–2970. doi: 10.1017/S0033291716001665
11. Sheldon E, Simmonds-Buckley M, Bone C, Mascarenhas T, Chan N, Wincott M, et al. Prevalence and risk factors for mental health problems in university undergraduate students: A systematic review with meta-analysis. *Journal of Affective Disorders*. 2021;287:282–292. doi: 10.1016/j.jad.2021.03.054
12. Li W, Zhao Z, Chen D, Peng Y, Lu Z. Prevalence and associated factors of depression and anxiety symptoms among college students: A systematic review and meta-analysis. *Journal of Child Psychology and Psychiatry*. 2022;63:1222–1230. doi: 10.1111/jcpp.13606
13. Li Y, Wang A, Wu Y, Han N, Huang H. Impact of the COVID-19 pandemic on the mental health of college students: A systematic review and meta-analysis. *Frontiers in Psychology*. 2021;12:669119. doi: 10.3389/fpsyg.2021.669119
14. Ochnik D, Rogowska AM, Kuśnierz C, Jakubiak M, Schütz A, Held MJ, et al. Mental health prevalence and predictors among university students in nine countries during the COVID-19 pandemic: A cross-national study. *Scientific Reports*. 2021;11:18644. doi: 10.1038/s41598-021-97697-3
15. Fancourt D, Garnett C, Spiro N, West R, Müllensiefen D. How do artistic creative activities regulate our emotions? Validation of the Emotion Regulation Strategies for Artistic Creative Activities Scale. *PLoS ONE*. 2019;14:e0211362. doi: 10.1371/journal.pone.0211362
16. Mak HW, Fluharty M, Fancourt D. Predictors and impact of arts engagement during the COVID-19 pandemic: Analyses of data from 19,384 adults in the COVID-19 Social Study. *Frontiers in Psychology*. 2021;12:626263. doi: 10.3389/fpsyg.2021.626263
17. Tymoszuk U, Spiro N, Perkins R, Mason-Bertrand A, Gee K, Williamon A. Arts engagement trends in the United Kingdom and their mental and social wellbeing implications: HEartS Survey. *PLoS ONE*. 2021;16:e0246078. doi: 10.1371/journal.pone.0246078
18. Wheatley D, Bickerton C. Subjective well-being and engagement in arts, culture and sport. *Journal of Cultural Economics*. 2017;41:23–45. doi: 10.1007/s10824-016-9270-0
19. Jin XJ, Ye Y. Impact of fine arts education on psychological wellbeing of higher education students through moderating role of creativity and self-efficacy. *Frontiers in Psychology*. 2022;13:957578. doi: 10.3389/fpsyg.2022.957578
20. Guo Y, et al. Potentials of arts education initiatives for promoting emotional wellbeing of Chinese university students. *Frontiers in Psychology*. 2024;15:1349370. doi: 10.3389/fpsyg.2024.1349370
21. Karkou V, et al. Editorial: The psychological and physiological benefits of the arts. *Frontiers in Psychology*. 2022;13:840089. doi: 10.3389/fpsyg.2022.840089

22. Davies CR, Clift S, Pescud M, et al. Arts and health glossary: A summary of definitions for use in research, policy and practice. *Frontiers in Psychology*. 2022;13:949685. doi: 10.3389/fpsyg.2022.949685
23. Kelly MB, et al. The use of social media art challenges to encourage engagement with arts and creativity. *Frontiers in Psychology*. 2023;14:1113280. doi: 10.3389/fpsyg.2023.1113280
24. Chen Y, Zeng X, Tao L, Chen J, Wang Y. The influence of arts engagement on the mental health of isolated college students during the COVID-19 outbreak in China. *Frontiers in Public Health*. 2022;10:1021642. doi: 10.3389/fpubh.2022.1021642
25. Keyes H, Gradidge S, Forwood SE, Gibson N, Harvey A, Kis E, et al. Creating arts and crafting positively predicts subjective wellbeing. *Frontiers in Public Health*. 2024;12:1417997. doi: 10.3389/fpubh.2024.1417997
26. Connor KM, Davidson JRT. Development of a new resilience scale: The Connor-Davidson Resilience Scale. *Depression and Anxiety*. 2003;18:76–82. doi: 10.1002/da.10113
27. Campbell-Sills L, Stein MB. Psychometric analysis and refinement of the Connor-Davidson Resilience Scale. *Journal of Traumatic Stress*. 2007;20:1019–1028. doi: 10.1002/jts.20271
28. Wu Y, Sang ZQ, Zhang XC, Margraf J. The relationship between resilience and mental health in Chinese college students: A longitudinal cross-lagged analysis. *Frontiers in Psychology*. 2020;11:108. doi: 10.3389/fpsyg.2020.00108
29. Bagdziūnienė D, et al. Study and personal resources of university students' academic resilience and the relationship with positive psychological outcomes. *Frontiers in Psychology*. 2025;16:1517359. doi: 10.3389/fpsyg.2025.1517359
30. Sayed T, et al. Exploring the associations between resilience and overall well-being during the COVID-19 pandemic. *Frontiers in Psychology*. 2024;15:1323466. doi: 10.3389/fpsyg.2024.1323466
31. Wang M, et al. The relationship between psychological resilience, neuroticism, attentional bias, and depressive symptoms in college Chinese students. *Frontiers in Psychology*. 2022;13:884016. doi: 10.3389/fpsyg.2022.884016
32. Craig F, et al. From psychological wellbeing to distress: The role of academic engagement and psychological counseling among university students. *Frontiers in Psychology*. 2025;16:1602009. doi: 10.3389/fpsyg.2025.1602009
33. Wan J, et al. Psychological well-being and its associated factors among university students. *Frontiers in Psychology*. 2025;16:1473871. doi: 10.3389/fpsyg.2025.1473871
34. Fu W, et al. Social connectedness, optimism, and adaptive coping: The mediating role of perceived social support. *Frontiers in Psychology*. 2025;16:1693258. doi: 10.3389/fpsyg.2025.1693258

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Author contributions statement

WZ: Conceptualization, Investigation, Formal analysis, Writing – original draft, Visualization, Validation, Resources, and Project administration. LL: Methodology, Writing – review and editing, Supervision, Software, Data curation, and Funding acquisition.

Additional information

Data availability

The datasets generated and analyzed during the current study are not publicly available due to privacy and confidentiality considerations involving student participants, but are available from the corresponding author upon reasonable request.

Competing interests

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declared that generative AI was not used in the creation of this manuscript. If you identify any issues, please contact us.