International Journal of Sciences: Basic and Applied Research (IJSBAR)

ISSN 2307-4531
(Print & Online)

http://gssrr.org/index.php?journal=JournalOfBasicAndApplied

Pilot Study on the Role of Arts Engagement in Reducing Perceived Stress among Chinese Undergraduates

Yan Chang Hao[a]*, Lee Khiam Jin[b]

[a,b]*Malaysia University of Science and Technology (MUST), Block B, Encorp Strand Garden Office, No. 12, Jalan PJU 5/5, Kota Damansara, 47810 Petaling Jaya, Selangor, Malaysia*

[a]*Email: yan.changhao@phd.must.edu.my*, [b]*Email: khiam.lee@must.edu.my*

Abstract

This pilot study examines the psychometric properties of a newly developed survey instrument aimed at measuring the mediating role of arts engagement in reducing perceived stress among undergraduate students in Shaanxi Province, China. Amid growing concerns over student mental health, particularly in competitive academic environments, this research explores arts engagement as a potentially accessible and non-clinical tool for stress mitigation. The instrument integrates items from validated frameworks, including the Perceived Stress Scale (PSS), the Theory of Planned Behavior (TPB), and Self-Determination Theory (SDT), to assess constructs such as intrinsic motivation, subjective norms, perceived behavioral control, and frequency of arts participation. Data were collected from a pilot sample of 278 university students representing both arts and non-arts majors, recruited through convenience sampling. Statistical analyses included internal consistency checks, exploratory factor analysis (EFA), and confirmatory factor analysis (CFA). Cronbach's alpha values for all key constructs ranged from 0.73 to 0.88, indicating high internal consistency. Composite reliability (CR) values and Average Variance Extracted (AVE) also exceeded conventional thresholds, supporting convergent validity. EFA revealed clear factor loadings aligned with theoretical expectations, while CFA confirmed a strong model fit (RMSEA = 0.062, CFI = 0.93, TLI = 0.91). These findings suggest that the instrument is both reliable and valid for capturing the complex interplay between psychological stress and arts engagement. The pilot results justify the implementation of a larger-scale study and offer early empirical support for the integration of creative practices into student well-being strategies in higher education contexts.

Received: *6/10/2025*
Accepted: *7/22/2025*
Published: *8/3/2025*

---

* *Corresponding author.*

Keywords: Arts engagement; stress management; university students; Chinese culture; music therapy; calligraphy; academic stress.

1. Introduction

University students globally are facing escalating psychological stress levels, influenced by academic pressures, social changes, and particularly the lingering impact of the COVID-19 pandemic. This mental health crisis has prompted increased scholarly attention to stress-coping mechanisms in academic environments [1, 2]. In China, competitive educational culture, rigid societal expectations, and rapid modernization compound stressors experienced by undergraduates [3].

Traditional coping strategies—such as time management, counseling, and physical exercise—are commonly promoted, yet research suggests that creative outlets like arts engagement offer equally valuable, if underutilized, tools for stress mitigation. Arts engagement, which encompasses activities such as music, dance, visual arts, and performance, has shown therapeutic and psychological benefits, especially for university students [4,5]. For example, structured participation in music and dance can foster emotional regulation, resilience, and a sense of control over one's academic environment [6,7].

Recent studies highlight that students involved in performing arts report lower levels of perceived stress and improved psychological wellbeing compared to non-participants [8,9]. Even single-session art therapy has proven effective in reducing emotional burdens by providing a non-verbal outlet for students to process stressors [10]. The positive effects of arts engagement are not limited to emotional health—it also enhances social cohesion, motivation, and academic performance [11,12].

Furthermore, the accessibility of arts during pandemic lockdowns via virtual platforms revealed their adaptability and impact as tools for emotional coping [13,4]. In the Chinese context, arts education has been shown to support self-efficacy and emotional intelligence, which are critical in navigating academic stress [3]. The growing empirical consensus underscores the potential of integrating arts into higher education policy and practice for holistic student development [5,14].

However, despite this evidence, arts engagement remains underexplored in stress-related studies in Asia. Most existing literature is concentrated in Western contexts, leaving a gap in understanding how cultural factors shape the role of arts in stress regulation [12]. This study addresses that gap by conducting a pilot test of an instrument aimed at measuring how arts engagement mediates perceived stress among Chinese undergraduates.

This preliminary investigation lays the foundation for a larger-scale study, seeking to validate instrument reliability while providing early insights into how creative engagement may act as a psychological buffer for students.

2. Research Methodology

The pilot study recruited undergraduate students from public universities located in Shaanxi Province, China.

These institutions were selected based on their diverse academic offerings and large undergraduate populations. A convenience sampling method was employed due to its feasibility for rapid data collection and its appropriateness for preliminary exploratory research.

Participants were drawn from a variety of general education courses, ensuring that both arts majors (e.g., music, visual arts, performing arts) and non-arts majors (e.g., science, engineering, business, and humanities) were represented. This diversity enabled the exploration of differences in arts engagement and perceived stress across academic disciplines. The inclusion criteria required that participants be full-time undergraduate students, aged between 18 and 25, and enrolled in the current academic semester.

A total of 312 students initially responded to the survey. After a thorough data cleaning process (described in Section 2.3), 278 complete and valid responses were retained for analysis. The sample was comprised of 60.8% female and 39.2% male participants, with an average age of 20.3 years (SD = 1.4). Approximately 45% of the participants reported having regular engagement in arts-related activities, either as part of their academic curriculum or extracurricular interests.

2.2 Instruments

The pilot survey instrument was carefully designed to assess two overarching domains: (1) perceived stress levels, and (2) engagement in the arts and related psychosocial factors. The instrument consisted of several validated and adapted scales, presented in both English and Chinese after rigorous translation and back-translation procedures to ensure semantic consistency.

Perceived Stress Scale (PSS)

The core measure of psychological stress was the Perceived Stress Scale (PSS-10) developed by Cohen and his colleagues (1983), which has been widely used and validated across cultures, including Chinese student populations. The 10-item version was employed for brevity and psychometric robustness. Participants were asked to indicate the frequency of specific stress-related feelings or thoughts over the past month, using a 5-point Likert scale (0 = Never to 4 = Very Often). The PSS demonstrated high internal consistency in the current sample (Cronbach's $\alpha = 0.85$).

Arts Engagement Items

Arts engagement was measured using a custom-designed set of items capturing both frequency and diversity of participation in artistic activities. These included music practice or listening, drawing, painting, dance, theater, photography, and digital media. Items assessed both formal engagement (e.g., enrolled in arts courses) and informal engagement (e.g., personal hobbies). Respondents were asked how often they participated in these activities on a weekly basis, also rated on a 5-point scale (1 = Not at all to 5 = Daily).

Theoretical Constructs: TPB and Motivation

To explore potential psychosocial mediators and moderators of arts engagement, the survey included constructs derived from the Theory of Planned Behavior (TPB) and Self-Determination Theory (SDT):

- Intrinsic Motivation: Adapted from the Intrinsic Motivation Inventory (IMI), these items assessed the degree to which participants engaged in arts activities for inherent satisfaction and enjoyment.
- Subjective Norms: Measured perceptions of social approval or disapproval from peers and family regarding arts participation.
- Perceived Behavioral Control: Captured participants' self-efficacy and perceived autonomy in accessing and continuing arts engagement.

All items were rated using a consistent 5-point Likert scale, facilitating cross-scale comparisons and structural modeling. Preliminary tests of internal reliability showed acceptable Cronbach's alpha values ranging from 0.72 to 0.89 for the psychosocial subscales.

2.3 Procedure

The study was conducted entirely online due to logistical and health-related considerations amid the lingering effects of the COVID-19 pandemic. Survey dissemination was facilitated via class mailing lists and WeChat academic groups with permission from course instructors. Participation was voluntary, and informed consent was obtained electronically prior to beginning the survey.

The data collection window spanned two weeks, during which responses were automatically captured via an encrypted online platform (Wenjuanxing). Ethical clearance was obtained from the host university's Research Ethics Committee, and all data were anonymized prior to analysis.

Data Cleaning

Following data collection, initial inspection revealed a small percentage of incomplete responses or patterned answers (e.g., straight-lining). These were excluded based on the following criteria:

- Incomplete survey completion (>25% missing data)
- Unrealistic response times (e.g., <2 minutes for a 10-minute survey)
- Identical responses across all Likert items

Outliers were identified via Mahalanobis distance and boxplot visualization. After this cleaning process, 278 high-quality responses remained.

2.4 Statistical Analyses

The cleaned dataset was subjected to both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to evaluate the construct validity of the scales used, especially those adapted or newly developed.

- EFA was conducted on a randomly split half of the dataset (n = 139) using principal axis factoring with oblique rotation. This helped identify latent dimensions and item loadings for constructs such as intrinsic motivation, perceived norms, and arts engagement frequency.
- CFA was then performed on the remaining half (n = 139) using AMOS software to confirm the factor structure identified in the EFA. Goodness-of-fit indices such as the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA) were assessed. Acceptable model fit was defined as CFI and TLI > 0.90, and RMSEA < 0.08.
- Reliability analyses using Cronbach's alpha and Composite Reliability (CR) further confirmed internal consistency for each subscale.

The final survey instrument demonstrated sound psychometric properties, suitable for use in future full-scale studies. Furthermore, preliminary descriptive statistics and correlation matrices were generated to explore relationships between perceived stress and various predictors, including frequency of arts engagement and intrinsic motivation.

3. Results

3.1 Reliability and Validity

To evaluate the measurement properties of the pilot study instrument, an internal consistency analysis was conducted using Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) for all core constructs. These metrics are widely accepted in psychometric evaluation to assess the reliability and validity of multi-item scales, particularly in social sciences.

The Cronbach's alpha coefficients for all primary constructs ranged from 0.73 to 0.88. These values exceed the generally accepted threshold of 0.70 for exploratory research, indicating that the items within each construct were highly consistent and reliable in measuring their respective latent variables. Specifically, the Perceived Stress Scale (PSS-10) yielded a Cronbach's alpha of 0.85, suggesting strong internal coherence among its items. This reinforces the appropriateness of the PSS-10 for assessing stress levels in Chinese undergraduate students, aligning with prior validations in diverse populations. The Intrinsic Motivation scale demonstrated the highest reliability, with a Cronbach's alpha of 0.88. This high value reflects a strong alignment among items related to students' personal interest and enjoyment in engaging with the arts. The Arts Engagement Frequency scale showed a Cronbach's alpha of 0.76, while Subjective Norms and Perceived Behavioral Control scored 0.79 and 0.81, respectively. These results collectively affirm that each scale within the instrument is internally consistent and suitable for further analysis.

To complement Cronbach's alpha and address potential limitations related to the assumption of tau-equivalence, Composite Reliability (CR) was also calculated. Both rho_A and rho_C values were examined, and all constructs achieved CR values exceeding the recommended cutoff of 0.70. This provides additional evidence of the scales' reliability. The PSS-10 registered a composite reliability of 0.86, while Intrinsic Motivation scored 0.89. Arts Engagement reached a value of 0.77, Subjective Norms 0.80, and Perceived Behavioral Control 0.83.

These results are consistent with the Cronbach's alpha findings and further confirm the stability and dependability of the measurement model.

In assessing convergent validity, Average Variance Extracted (AVE) values were calculated for each construct. AVE measures the proportion of variance captured by a construct relative to the variance due to measurement error, with values above 0.50 indicating adequate convergent validity. All constructs in this study met or surpassed this threshold. The PSS-10 achieved an AVE of 0.57, Intrinsic Motivation 0.65, and Arts Engagement 0.54. Subjective Norms and Perceived Behavioral Control had AVE values of 0.56 and 0.60, respectively. These findings demonstrate that a substantial proportion of the variance in observed indicators is accounted for by their corresponding latent variables, thus supporting the construct validity of the scales used.

3.2 Factor Analysis

To further assess the construct validity of the measurement instrument, both Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were conducted. These analyses were essential in verifying that the items in the survey accurately reflected their intended theoretical constructs and that the overall structure of the measurement model was sound.

The EFA was carried out using Principal Axis Factoring with Promax rotation, which is appropriate when assuming that factors are correlated. Prior to conducting EFA, the suitability of the data for factor analysis was evaluated. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.84, exceeding the recommended threshold of 0.60, and Bartlett's Test of Sphericity was significant at $p < .001$, confirming that the correlations among items were sufficiently large for factor analysis. The results of the EFA revealed a clear and interpretable factor structure, consistent with the hypothesized theoretical model. Each item loaded significantly—typically above 0.60—on its designated factor, with minimal cross-loadings. These results provided strong empirical support that the instrument's items clustered logically under five core constructs: perceived stress, intrinsic motivation, arts engagement frequency, subjective norms, and perceived behavioral control.

Following EFA, a Confirmatory Factor Analysis was conducted using AMOS software to validate the factor structure obtained and assess the goodness-of-fit of the measurement model. CFA is a more rigorous test, as it requires the researcher to specify a hypothesized model and then statistically test how well the data fit that model. Several indices were used to evaluate model fit. The Root Mean Square Error of Approximation (RMSEA) was 0.062, which is below the commonly accepted threshold of 0.08, indicating an acceptable fit between the hypothesized model and the observed data. Additionally, the Comparative Fit Index (CFI) was 0.93, and the Tucker-Lewis Index (TLI) was 0.91, both exceeding the recommended cutoff of 0.90. These results collectively suggest that the proposed five-factor model demonstrated a strong fit to the data.

All standardized factor loadings were statistically significant ($p < .001$) and above the 0.60 threshold, confirming that the observed variables were appropriate indicators of their respective latent constructs. Furthermore, the modification indices were minimal and did not indicate a need for substantial model revision,

reinforcing the theoretical robustness of the instrument.

4. Discussion

The pilot test results substantiate the reliability and validity of the newly developed survey instrument designed to assess the mediating role of arts engagement in perceived stress among university students. The findings confirm that core psychological constructs—such as intrinsic motivation, perceived behavioral control, subjective norms, and arts engagement—were measured with strong psychometric rigor.

First, the consistency of the instrument across constructs was confirmed through high internal reliability. Cronbach's alpha values for all constructs ranged from 0.73 to 0.88, surpassing the widely accepted 0.70 threshold, with intrinsic motivation scoring the highest at 0.88. These findings suggest that items within each subscale effectively capture the underlying construct and are sufficiently homogeneous. For example, high reliability in the intrinsic motivation construct indicates that students who engage in the arts do so with a coherent sense of enjoyment and personal interest, aligning with previous studies showing that intrinsic interest in artistic activities contributes positively to well-being [15].

Furthermore, composite reliability (CR) measures—rho_C values above 0.70 across all constructs—provided additional support for the reliability of the instrument. These results address potential limitations of relying solely on Cronbach's alpha, particularly when scale items may differ slightly in their factor loadings. This robustness is vital when examining latent psychological constructs like perceived stress and motivation, which are subject to contextual variability, especially in high-pressure academic environments like those in China [16].

Convergent validity was also supported by Average Variance Extracted (AVE) values above 0.50 for all constructs, confirming that a substantial portion of variance in observed variables is attributable to their respective latent constructs. For example, the AVE for perceived behavioral control was 0.60, affirming that this construct is meaningfully captured through items about students' perceived ability to engage in artistic activities amid academic stress. This aligns with broader evidence suggesting that perceived control and self-efficacy are critical mediators in how individuals engage in stress-buffering behaviors like art-making [17].

These robust psychometric indicators validate the intended use of the survey in the main study. Moreover, they provide empirical justification for the inclusion of arts engagement as a potential mediator of stress reduction. The use of exploratory and confirmatory factor analysis confirmed that the constructs were not only statistically reliable but also conceptually sound. Clear factor loadings indicate that items clustered appropriately under their theoretical dimensions, while model fit indices from the confirmatory analysis (RMSEA < 0.08, CFI and TLI > 0.90) demonstrate the model's empirical fit, consistent with standards in psychological measurement [4].

Importantly, these findings provide preliminary yet compelling support for the broader hypothesis that arts engagement can serve as a protective psychological mechanism. Research during and after the COVID-19 pandemic has shown that participation in arts—especially music, visual arts, and writing—can reduce anxiety, enhance coping strategies, and foster resilience among young adults [18], [19]. These effects are consistent across different populations and cultural contexts, including college students in China, who often face unique

academic and familial stressors.

In conclusion, the pilot study confirms the utility of the newly developed instrument in assessing the interplay between arts engagement and perceived stress. The high internal consistency, strong composite reliability, and valid construct representation affirm that the instrument is ready for use in the main study. These findings are particularly timely given growing global interest in non-pharmacological interventions for mental health, and they add to a growing body of literature supporting arts-based engagement as a feasible, accessible tool for emotional regulation and stress mitigation in academic contexts [20].

5. Limitation

Despite the promising findings from this pilot study, several limitations must be acknowledged to contextualize the results and inform future research. First and foremost, the sample size, while sufficient for preliminary psychometric testing, was modest and may not adequately represent the full diversity of undergraduate students across China. The total number of valid responses retained after data cleaning was 278, which limits the generalizability of the findings, particularly for multigroup or cross-cultural comparisons.

Additionally, the sample was drawn exclusively from public universities in Shaanxi Province using convenience sampling, a non-probability method. This approach, though practical and commonly used in exploratory research, introduces potential sampling bias. Students who opted to participate may differ in meaningful ways from those who did not—such as possessing higher intrinsic motivation, stronger interest in arts-related activities, or greater availability—thereby limiting the external validity of the results.

Furthermore, while the psychometric indicators—such as Cronbach's alpha, composite reliability, and factor loadings—were strong, these results should be interpreted with caution until they are replicated in a larger and more diverse dataset. The use of a cross-sectional survey design also precludes any conclusions about causality between arts engagement and stress reduction. Longitudinal studies would be necessary to establish the direction and durability of such relationships.

Finally, while efforts were made to ensure the cultural and linguistic appropriateness of the instrument through translation and back-translation, the instrument has not yet undergone comprehensive cross-cultural validation. Nuances in how students perceive stress and interpret arts engagement may differ across regions, ethnic groups, or academic disciplines, and such differences were not explored in this pilot.

In light of these limitations, the findings from the pilot study should be seen as preliminary but encouraging. They provide a strong foundation for proceeding with the full-scale study, which will aim to recruit a more diverse, representative sample and explore the mediating role of arts engagement in greater depth and breadth.

6. Conclusions

The findings of this pilot study provide strong evidence supporting the psychometric soundness of the survey instrument developed to examine the relationship between arts engagement and perceived stress among

undergraduate students. The high levels of internal consistency, robust composite reliability, and acceptable convergent validity across all constructs indicate that the measurement model is both theoretically coherent and empirically reliable. Factor analysis further validated the structural integrity of the instrument, with clear factor loadings and a strong model fit supporting its use in future research. Importantly, the study offers preliminary empirical support for the hypothesis that arts engagement may serve as a protective factor against psychological stress in academic settings. Constructs such as intrinsic motivation, subjective norms, and perceived behavioral control were effectively captured, suggesting that student engagement in artistic activities is shaped not only by individual preferences but also by environmental and social influences. These insights align with a growing body of international literature emphasizing the role of creative expression in promoting student well-being and emotional resilience. While the results must be interpreted within the limitations of sample scope and methodology, they nonetheless justify proceeding confidently with the full-scale study. By expanding the sample size and geographic coverage in the next phase, the research can build on these initial findings to deepen our understanding of how arts-based interventions may be strategically incorporated into mental health promotion efforts on university campuses. In conclusion, this pilot study not only validates the methodological approach but also provides a timely and relevant contribution to the broader discussion on non-clinical, accessible interventions for stress reduction among young adults. Arts engagement, as this study begins to demonstrate, holds significant potential as a culturally adaptable and psychologically meaningful tool for fostering student well-being in Chinese higher education settings.

References

[1] C. Archbell, C. Coplan, A. Weeks, and L. Owens, “Profiles of university student mental health: A person-centered examination of distress, academic concerns, and coping,” *Canadian Journal of School Psychology*, vol. 35, no. 4, pp. 266–283, 2020.

[2] M. Fernández-Barradas and L. Espinosa, “Stress, coping strategies, and academic achievement in university students: A systematic review,” *Sustainability*, vol. 16, no. 1, pp. 1–18, 2024.

[3] Y. Guo, “The role of emotional intelligence and self-efficacy in academic stress among Chinese university students,” *Asian Journal of Education and Social Studies*, vol. 35, no. 2, pp. 123–132, 2024.

[4] H. Mak, C. Fluharty, and D. Fancourt, “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*, vol. 12, pp. 626263, 2021.

[5] A. Saif, “Effectiveness of arts-based interventions in improving mental health among university students,” *International Journal of Arts and Humanities*, vol. 13, no. 4, pp. 72–80, 2024.

[6] Y. Kim, H. Lee, and S. Kim, “Dance intervention for college students’ mental health: A randomized trial,” *Journal of American College Health*, vol. 68, no. 8, pp. 797–805, 2020.

[7] J. Han and M. Han, “The impact of music engagement on college students' psychological well-being

during COVID-19," *Arts in Psychotherapy*, vol. 79, pp. 101848, 2022.

[8] A. Kausar and S. Ahmad, "Performing arts participation and stress resilience among college students," *Journal of Creative Arts Therapy*, vol. 15, no. 2, pp. 33–45, 2021.

[9] Z. Tu, J. Lin, and Y. Li, "Engaging in performing arts improves psychological wellbeing in Chinese college students," *Asian Journal of Psychiatry*, vol. 61, pp. 102672, 2021.

[10] L. Wilson, "The effect of single-session art therapy on stress relief in undergraduate students," *The Arts in Psychotherapy*, vol. 72, pp. 101750, 2021.

[11] J. Lee, M. Park, and S. Kim, "Arts-based education and its psychological benefits for university students," *Journal of Positive Psychology and Wellbeing*, vol. 7, no. 2, pp. 120–134, 2023.

[12] Y. Noguchi, K. Saito, and N. Hara, "Cultural participation and mental health in Asia: A meta-review," *Cultural Studies Review*, vol. 30, no. 1, pp. 87–103, 2024.

[13] H. Mak, "Digital arts consumption and mental health during lockdown," *Journal of Mental Health and Social Inclusion*, vol. 25, no. 2, pp. 125–135, 2021.

[14] J. Azagra-Caro, L. Barberá-Tomás, and T. Turrión, "Arts education in universities and its impact on well-being and soft skills," *Studies in Higher Education*, vol. 47, no. 9, pp. 1761–1774, 2022.

[15] Z. Zhang, L. Zhang, and Y. Lin, "Intrinsic motivation and academic performance among arts students in China," *Journal of Educational Psychology*, vol. 115, no. 3, pp. 541–553, 2023.

[16] X. Chen, L. Wang, and H. Liu, "Perceived behavioral control and stress management in Chinese undergraduates," *Journal of Behavioral Health*, vol. 11, no. 4, pp. 211–220, 2022.

[17] A. Kausar and S. Ahmad, "Self-efficacy and arts-based coping strategies in students' mental health," *Psychology Research and Behavior Management*, vol. 14, pp. 1095–1105, 2021.

[18] M. O'Donnell, L. Reynolds, and K. Watson, "Arts engagement and youth mental health post-COVID: A longitudinal review," *Youth & Society*, vol. 55, no. 1, pp. 85–106, 2023.

[19] J. Bone, H. Bu, and D. Fancourt, "General arts engagement and mental health outcomes in young adults," *British Journal of Psychiatry Open*, vol. 8, no. 6, pp. e197, 2022.

[20] C. Rodriguez, R. Tan, and S. Ainsworth, "The role of expressive arts in emotional regulation in higher education," *Arts & Health*, vol. 15, no. 2, pp. 98–112, 2023.