

Original article

The effect of group music therapy on perceived stress among international postgraduate students at Mahidol University, Thailand

Received : 13 March 2024

Revised : 13 September 2024

Accepted : 20 September 2024

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Abstract

Objective: To examine the effect of group music therapy on perceived stress among international postgraduate students and to explore their experience of the therapy.

Methods: A mixed-method study with a quasi-experimental design was conducted at Mahidol University, Thailand. International postgraduate students in Master's or Doctorate programs, with self-reported stress and without other active mental health problems, were assigned to either an intervention or a waitlist control group. The intervention group participated in six one-hour music therapy sessions held twice a week, while the control group received the same intervention after the study. Perceived stress was assessed using the 10-item Perceived Stress Scale (PSS-10) pre- and post-intervention, as well as the Visual Analog Scale for Stress (VAS-S) before and after each session. Focus group discussions were conducted to explore participants' experiences regarding changes in perceived stress and stressful conditions during the study. Data were analyzed using the Wilcoxon signed ranked, Mann-Whitney U test, and inductive analysis.

Results: The PSS-10 score of the intervention group ($n = 9$) was significantly lower than that of the control group ($n = 9$) at both baseline and post-intervention. There was no significant reduction in the PSS-10 score within either group following the intervention. However, the VAS-S score of the intervention group showed a significant decrease after each music therapy session compared to their respective pre-test scores. The intervention group reported feeling more relaxed, calm, and comfortable at the end of each session.

Conclusion: Group music therapy tends to provide immediate and temporary relief from perceived stress among postgraduate international students, supporting it as an inclusive option for mental health support services offered by universities.

Keywords: group therapy, international student, music therapy, perceived stress, postgraduate students

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นิพนธ์ต้นฉบับ

ผลของกิจกรรมดนตรีบำบัดแบบกลุ่มต่อการรับรู้ความเครียด ของกลุ่มนักศึกษาต่างชาติระดับบัณฑิตศึกษาในมหาวิทยาลัยมหิดล

วันรับ : 13 มีนาคม 2567

วันแก้ไข : 13 กันยายน 2567

วันตอบรับ : 20 กันยายน 2567

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บทคัดย่อ

วัตถุประสงค์ : เพื่อศึกษาผลของกิจกรรมดนตรีบำบัดแบบกลุ่มต่อการรับรู้ความเครียดของนักศึกษาต่างชาติระดับบัณฑิตศึกษา และสำรวจประสบการณ์จากการเข้าร่วมกิจกรรมดนตรีบำบัด

วิธีการ : การวิจัยแบบผสมวิธี ประกอบด้วย การวิจัยถึงการทดลองแบบกลุ่มควบคุมไม่เท่าเทียมโดยการทดสอบก่อน-หลัง ร่วมกับการสัมภาษณ์กลุ่ม กลุ่มตัวอย่างเป็นนักศึกษาต่างชาติที่กำลังศึกษาในระดับปริญญาโทและปริญญาเอกในมหาวิทยาลัยมหิดล ที่มีความเครียดและไม่มีปัญหาสุขภาพจิตอื่น กลุ่มทดลองได้รับกิจกรรมดนตรีบำบัดแบบกลุ่ม 6 ครั้ง ครั้งละ 1 ชั่วโมง สัปดาห์ละ 2 ครั้ง กลุ่มควบคุมได้รับดนตรีบำบัดหลังจากการวิจัยเสร็จสิ้น วัดระดับความเครียดด้วยแบบประเมินการรับรู้ความเครียด ฉบับ 10 ข้อ (10-item perceived stress scale: PSS-10) ก่อนและหลังสิ้นสุดการบำบัดและแบบประเมินระดับความเครียด (visual analog scale for stress: VAS-S) ก่อนและหลังกิจกรรมแต่ละครั้ง สัมภาษณ์กลุ่มแบบกึ่งโครงสร้างเกี่ยวกับความเครียด และสถานการณ์ตึงเครียดที่เกิดขึ้นระหว่างการวิจัย เปรียบเทียบข้อมูลภายในกลุ่มด้วย Wilcoxon Signed Ranked test และระหว่างกลุ่มด้วย Mann-Whitney U test วิเคราะห์ข้อมูลเชิงคุณภาพด้วยการวิเคราะห์เชิงอนุมาณ

ผล : คะแนน PSS-10 ของกลุ่มทดลอง ($n = 9$) ต่ำกว่ากลุ่มควบคุม ($n = 9$) อย่างมีนัยสำคัญทางสถิติทั้งก่อนและหลังสิ้นสุดการบำบัด ไม่พบการลดลงอย่างมีนัยสำคัญของคะแนน PSS-10 หลังสิ้นสุดการบำบัดทั้งในกลุ่มทดลองและกลุ่มควบคุม แต่พบว่า คะแนน VAS-S ของกลุ่มทดลองลดลงอย่างมีนัยสำคัญหลังกิจกรรมแต่ละครั้ง โดยให้ความเห็นว่ารู้สึกผ่อนคลาย สงบ และสบายใจมากขึ้น

สรุป : นักศึกษาต่างชาติระดับบัณฑิตศึกษามีการรับรู้ความเครียดลดลงทันทีและชั่วคราวหลังเข้าร่วมกิจกรรมดนตรีบำบัดแบบกลุ่มแต่ละครั้ง ผลการศึกษานับสนุนว่ากิจกรรมดนตรีบำบัดแบบกลุ่มควรเป็นหนึ่งในตัวเลือกการให้บริการทางสุขภาพจิตในมหาวิทยาลัย

คำสำคัญ : การบำบัดกลุ่ม, การรับรู้ความเครียด, ดนตรีบำบัด, นักศึกษาต่างชาติ, นักศึกษาระดับบัณฑิตศึกษา

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Previous knowledge: Music therapy is known to reduce stress for various populations. However, evidence regarding its effectiveness among postgraduate international students remains limited.

New knowledge: This study found that group music therapy can provide immediate and temporary relief from perceived stress in postgraduate international students.

Applications: The findings support the inclusion of music therapy as a mental health support option in universities for reducing stress among international postgraduate students.

Introduction

Studies have demonstrated that chronic stress is linked to adverse health outcomes.¹⁻³ When faced with threats or stressful conditions, the body reacts to preserve the state of equilibrium by producing stress hormones, which have a variety of physiological and psychological effects.⁴ The intensity of stress arises when environmental demands are perceived as overwhelming and detrimental to personal well-being. Individuals can learn to manage stress by understanding emotional boundaries and recognizing when those boundaries are crossed.³ Talk therapy, journaling, exercise, self-talk, and deep breathing exercises are among effective strategies for stress reduction.³ Findings have also shown the physiological and psychological benefits of music in alleviating stress.⁵⁻⁸

Music therapy has been shown to effectively reduce stress and anxiety among the general population as well as specific groups, such as

seriously ill patients.^{7,9} It is the evidence-based use of music in a systematic way which may include singing, instrument playing and improvisation, songwriting, movement with music, and music listening.¹⁰ Group music activities, where group members perform the musical activities in synchronization, can foster feelings of togetherness and bonding, stimulating the production of the endorphin and oxytocin hormones that play a role in anti-stress response in the body.⁷ In addition, qualitative findings noted the social and emotional advantages of weekly group singing therapies for people with Parkinson's disease, including improved mood and the establishment of peer relationships.¹¹

International students studying abroad have to prepare for significant lifestyle changes to adapt to both cultural and academic challenges in the residing country. This includes financial management and maintaining social ties with relatives and friends back home while also establishing new social networks in their new environment.¹²⁻¹⁴ These adjustments can create stressful conditions, including separation from family, facing new responsibilities, financial concerns, challenge of balancing between work, study, and private life, and striving for academic success.^{12,13} In addition, being in an unfamiliar environment could bring social isolation, language barriers, and experiences of racial discrimination.¹⁵ Managing these challenges can lead to psychological burdens.^{12-14,16}

The significance of stress in postgraduate students worldwide is reflected in the high prevalence rates: 52% in postgraduate medical students in India,¹⁷ 48.9% in the Southeastern United States,¹⁸ 55.1% in Pakistan,¹⁹ and 45% in

Gujarat University in India.²⁰ Additionally, a study in Malaysia reported a prevalence of 54% among international postgraduate students.²¹ One study showed that stress levels among undergraduate and postgraduate students were not significantly different.²² However, postgraduate students received less attention regarding cause and impacts of stress, both short-term and long-term.^{22,23} Furthermore, research on supportive programs and coping strategies for stress among postgraduate students is limited compared to that for undergraduates.^{22,24,25}

Mental health support services at colleges and universities worldwide often provide readily accessible counseling and consultation,¹⁵ while music therapy remains relatively scarce.²⁶ This study aims to explore the stressful conditions experienced by overseas postgraduate students and the potential role of music therapy in addressing these issues. Specifically, it seeks to examine the effects of group music therapy on perceived stress levels among international postgraduate students and to understand their experience with the therapy.

Methods

Study design and setting

An embedded mixed-method study was employed in Mahidol University International College, Thailand, from October to December 2022. The quantitative aspect employed a quasi-experimental design with pre-test and post-test measures, including a waitlist control group. The qualitative part involved focus group interviews to gain an in-depth understanding of the experience of the intervention group in receiving music therapy intervention.

Participants

Participants were international postgraduate students enrolled in Master's or Doctorate programs at the university. They were recruited through a social media announcement. Volunteers were screened based on specific inclusion criteria: 1) self-report stress with a score of 14 or higher on the 10-item Perceived Stress Scale (PSS-10), 2) residency in Bangkok or its metropolitan areas, and 3) no prior diagnosis of mental health issues by a certified clinician. Individuals undergoing any stress-reducing treatment at the time of the study were excluded.

Initial assessments and informed consent were obtained before proceeding to the intervention. Quota sampling was applied to pair participants in the two groups based on their PSS-10 scores, age, and gender, and additionally, their availability for the scheduled sessions. Consistent with previous research on effects of music therapy on mental health outcomes,^{10,27} the number of participants in each group was limited to between 7 and 10 to ensure effective group dynamics. The control group received the music therapy intervention at a later date and were instructed not to seek other stress-reduction treatments during the experimental period.

Intervention

The group music therapy intervention in this study was designed and constructed following reporting guidelines for music-based interventions,²⁸ which outline essential components such as intervention theory, content, delivery schedule, facilitator qualifications, treatment fidelity, setting, and unit of delivery. This framework aids music therapist in systematically planning and reporting the intervention.

Grounded in the cognitive behavioral theory, the intervention encouraged participants to identify and explore their triggering events and factors, understand their belief systems and attitude towards those events, reflect on their consequential emotions and behaviors, restructure their cognition and thoughts, and develop positive coping strategies.²⁹

The intervention comprised six one-hour sessions delivered twice a week, led by the researcher under the supervision of a music therapist advisor (Table 1).

Group singing: The group members sang songs or melodies together while the music therapist played musical instruments and sang with the group. It has been shown that group singing fosters cohesive social bonds, improve mood, and promote a sense of social support and togetherness.^{7,11,30}

Music-assisted relaxation: The music therapist adapted and prepared instrumental compositions and conducted relaxation procedures while the group members followed the instructions

and participated in the activity. Studies indicate that music-based relaxation can effectively reduce perceived stress.^{7,31}

Group drumming: The music therapist led a drumming activity in which the group members expressed their feelings and performed freely together. Group drumming has been shown to improve self-awareness, emotional expressiveness, and social skills, as well as reduce stress.^{32,33}

Songs discussion: The group members were encouraged to project their feelings and ideas via the lyrics of the songs and bring out potential calming effects from favorable responses to the lyrics.³⁰ Previous studies indicate that song-sharing can strengthen social bonds, help in conveying thoughts and emotions, and boost moods through uplifting lyrics.^{7,34}

Movement with music: The activity involved dancing, moving freely, or moving rhythmically to the music. Research has shown that physical movement to music can increase self-awareness and

Table 1 Intervention components

Session number	Interventions
1 and 2	• Group singing • Drawing to music • Movement with music • Relaxation through music
3 and 4	• Group singing • Song sharing and discussion • Group drumming • Relaxation through music
5 and 6	• Group singing • Song writing • Creating a song playlist • Relaxation through music

mindfulness while reducing negative thoughts and emotions.³⁵

Songwriting: The music therapist facilitated the songwriting process by adapting the needs and skills of the group members. Songwriting has been shown to improve concept identification, problem-solving skills, and coping strategies.³⁶

Creating a song playlist: The group members collaborated with the music therapist to select, sequence, and discuss a playlist. This activity has been linked to increased self-awareness, the development of coping mechanisms, and the creation of a self-help playlist for stress management.³⁷

Drawing to music listening: The group members listened to the selected music while drawing freely without judgment or limitation to reflect their feelings and thoughts. Prior studies suggest that the activity can elicit emotional expression, reduce perceived tension, and enhance positive emotions.^{38,39}

Measurements

Stress was measured as the primary outcome using the 10-item Perceived Stress Scale (PSS-10) for pre and post-measurements of both the intervention and control group and the Visual Analog Scale for Stress (VAS-S) before and after each music session of the intervention group. The Perceived Stress Scale is a Likert-like questionnaire with total scores ranging from 0 - 13 for low stress, 14 - 26 for moderate stress, and 27 - 40 for high stress. It has a Cronbach's alpha of 0.78 and 0.71 based on a two-factor analysis in university students.⁴⁰ The VAS-S is a horizontal dotted line scaling from least to most stress. It has demonstrated good reliability and validity in measuring

perceived stress, comparable to the PSS-10 in a correlational study.⁴¹ Semi-structured focus group interviews of both groups, each lasting about one hour, were conducted by the researcher before and after the intervention. The intervention group was asked to share their experience with the group music therapy, while the control group was asked to review their stressors and response to stress compared with the initial period.

Statistical analysis

For the quantitative analysis, the non-parametric tests were applied to the PSS-10 and VAS-S scores due to non-normal distribution. The Wilcoxon Signed Ranked test was used to compare the pre- post-test results within each group, while the Mann-Whitney U test was used to compare results between the groups. Qualitative data from focus group interviews were analyzed using inductive analysis.

Ethical considerations

Participants had the right to withdraw from the study at any time without needing permission from the researcher. At the beginning of each focus group interview, the importance of confidentiality and the necessity of keeping information shared within the group private were emphasized. Verbal consent for confidentiality was obtained from the participants, with a request not to disclose discussion outside the session.

Results

Twenty eligible individuals applied to participate in the study. Two applicants voluntarily withdrew due to scheduling conflicts that made full participation inconvenient. The remaining eighteen participants

were equally divided into an intervention (n = 9) and a control group (n = 9), with mean ages of 29.33 (SD = 3.78) and 28.44 (SD = 4.09), respectively. The demographic information of both groups were presented in Table 2.

The mean pretest PSS-10 score of the intervention group (mean = 19.89, SD = 11.28) was lower than of the control group (mean = 23.44, SD = 11.28). The mean post-test PSS-10 score of the intervention group (mean = 17.00, SD = 11.24) was also significantly lower than of the control group

(mean = 22.22, SD = 11.24). These indicate a significant difference in pre- and post-scores between the groups (table 3). However, the pre- and post-test T-PSS-10 scores did not show significant difference within either group (table 4). On the other hand, the intervention group experienced a significant decrease in perceived stress levels as measured by the VAS-S immediately after each music therapy session (Table 5 and Diagram 1).

Qualitative interviews revealed that participants in the intervention group felt more

Table 2 Demographic information of participants

	Frequency		Total	Percentage
	Intervention group (n = 9)	Control group (n = 9)		
Gender				
Male	6	3	9	50.0
Female	3	6	9	50.0
Age (years)				
23 – 25	2	1	3	16.7
26 – 30	1	6	7	38.9
31 – 36	6	2	8	44.4
Nationality				
Indonesian	5	2	7	38.9
Myanmar	1	5	6	33.3
American	1	0	1	5.6
Bhutanese	1	0	1	5.6
Cambodian	1	0	1	5.6
Nepali	0	1	1	5.6
Vietnamese	0	1	1	5.6
Area of Study				
Pharmaceutical Science	1	4	5	27.8
Public Health Science	0	3	3	16.7
Engineering	2	1	3	16.7
Nutritional Science	2	0	2	11.1
Environmental Science	1	0	1	5.6
Human Rights Studies	1	0	1	5.6
Music Performance	1	0	1	5.6
Nursing Science	1	0	1	5.6
Science in IT	0	1	1	5.6

Table 3 Mann-Whitney U test analysis comparing the stress levels between groups measured by T-PSS-10

	Mean		Mean rank		SD	Mann-Whitney U test	Asymptotic Sig.	Exact Sig.
	Intervention group	Control group	Intervention group	Control group				
Pre across group	19.89	23.44	6.94	12.96	11.28	63.50	.041	.040
Post across group	17.00	22.22	6.56	12.44	11.24	67.00	.018	.019

SD = standard error

Table 4 Wilcoxon signed rank test analysis of pre-and post-stress levels within groups measured by T-PSS-10

	N	Min	Max	Wilcoxon signed ranked test	
				Standard Error	Asymptotic Sig.
Intervention Group				8.426	.154
Pre	9	16	29		
Post	9	10	24		
Control Group				7.124	.400
Pre	9	19	30		
Post	9	17	26		

SD = standard error

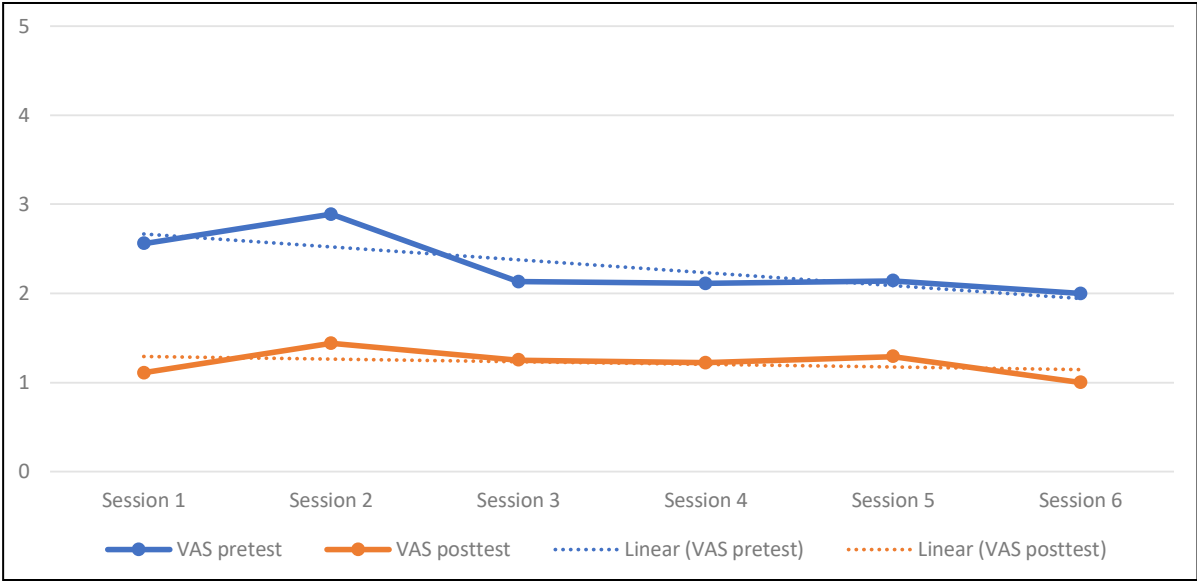


Diagram 1 Average VAS-S scores for the music therapy sessions in the intevention group

Table 5 Wilcoxon signed rank test analysis of VAS-S for the music therapy sessions in the intervention group

	N	Mean	SD	p-value
Session 1				.003
Pretest	9	2.56	0.88	
Posttest	9	1.11	0.33	
Session 2				.008
Pretest	9	2.89	0.93	
Posttest	9	1.44	0.73	
Session 3				.008
Pretest	8	2.13	0.64	
Posttest	8	1.25	0.46	
Session 4				.004
Pretest	9	2.11	0.78	
Posttest	9	1.22	0.44	
Session 5				.009
Pretest	7	2.14	0.69	
Posttest	7	1.29	0.49	
Session 6				< .001
Pretest	9	2	0.71	
Posttest	9	1	0.00	

relaxed, calm, and comfortable at each session. They also noted that the sessions fostered social connectedness and helped develop a support network. Many viewed the sessions as a helpful, convenient, and accessible option for stress reduction. Selected participant feedback included:

"...after finishing the session, I feel more relaxed. Also, I feel happy because I get to meet new people and do some activities..."

"For me, another part or thing that's very interesting or a special experience is when we listen to another idea or another field, because in this pandemic situation, we cannot get around with our friends, and when we have a session with a group like you made... it's kind of umm... make us human again. We try to connect within the group because we come from different backgrounds. Thank you so much for bringing us together."

"I really enjoyed learning about other people, especially from different countries because I've rarely ever experienced that. And then after the sessions, umm... I just generally felt better."

"I listen to music to relax after spending a lot of time doing assignments and all. It was good to meet others, the rest of the friends during the sessions."

"For me, from my perspective, music therapy is not only just to handle or cope with stress. So, we can understand our feelings because when we do music therapy, we need to really analyze our feelings, we need to be aware of how we feel and what are our emotions when we listen to music. And by doing that, we are like... acknowledge our feelings."

In contrast, most participants in the control group reported that their stress regarding thesis

and studies remained unchanged. A few noted an increase in stress levels as exams deadlines approached. However, some stated that stress related to food and cultural adjustments had decreased as they adapted to their new environment. Overall, participants said that their responses to stressful conditions remained more or less the same compared to the pre-assessment interview.

Discussion

This study examined the effect of group music therapy on perceived stress among international postgraduate students. The results showed that the intervention group experienced decreased VAS-S scores after each session. However, after completing six sessions, it is noted that there was no significant reduction in the PSS-10 scores of the intervention group compared to baseline and that of the control group. The small sample size and incomplete matching of participants in the intervention and control groups could limit the statistical power, impact the pre- and post-test scores, and introduce selection bias in the study. Although the main results are not statistically significant, they suggest that the group music therapy has a favorable influence on stress, indicating immediate and temporary benefits. These coincide with a systematic review and meta-analysis which revealed that even a single session of music therapy can lead to a short-term reduction in stress levels.⁷

Increased exposure to music therapy beyond just one session enhances the therapy's effectiveness by allowing participants to build stronger bonds with one another and with the music, producing more fruitful results.⁴² for example, one study found significant alleviation of perceived stress levels

among university students receiving total twelve weekly relaxation music therapy sessions, while the control group showed no significant changes in baseline stress levels.²⁷ The music therapy in this study was conducted over six sessions, based on the participants' availability and their willingness and appreciation for participation. These findings, alongside with the previous studies, suggest the need to implement music therapy programs that extend beyond six sessions. They also indicate the necessity for an intervention design tailored for this population, which should be brief yet produce long-lasting benefits.

Thesis works, financial concerns, time management constraints, and interpersonal issues were among the most common stressors reported by the participants. Their coping strategies included listening to music, socializing with friends, engaging in physical activities, and practicing relaxation techniques. These findings emphasize the potential benefits of music therapy as a stress management strategy for overseas postgraduate students dealing with a variety of academic and personal challenges. The study identified several recommendations for future research in the field of stress reduction through music therapy. Future investigation should focus on developing more extensive music therapy sessions tailored specifically to the needs of international postgraduate students to ensure lasting positive effects. Furthermore, researchers should explore how factors such as tempo and song selection impact stress reduction. Incorporating these features into music therapy sessions may improve stress reduction outcomes for postgraduate students.

Summary

This study highlights the potential role of music therapy in a comprehensive approach to stress reduction among international postgraduate students, providing valuable insights for stress management interventions in academic settings.

Acknowledgment

The author would like to thank Asst. Prof. Dr. Treetip Boonyam, Asst. Prof. Dr. Natee Chiengachana, Asst. Prof. Dr. Kyle Fyr, and Asst. Prof. Dr. Pornpan Kaenampornpan for supervision and scientific recommendations. The author is also grateful to Ms. Wiputh Kehasuwan and Mr. Gritsada Huncharoen for their instruction in music therapy.

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