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HARMONIZING THE MIND: EXPLORING THE PSYCHOLOGICAL IMPACT OF VOCAL THERAPY ON MUSIC UNIVERSITY STUDENTS

Harmonizando a mente: Explorando o impacto psicológico da terapia vocal em estudantes universitários de música

ABSTRACT

We consider mental health as a fundamental human value, the state of which must be maintained throughout university education. This study delves into the psychological effects of vocal therapy on university music students, addressing a gap in research on targeted mental health interventions for this group. Amidst the unique pressures of music education, this research examines how vocal therapy can aid in emotional release and personal expression, potentially influencing students' coping strategies, social connectedness, mental health, and overall resilience. Coping strategies and social connectedness are key factors that ensure students' resilience to various life challenges and stresses. Developing and maintaining these aspects of mental health not only helps students cope with current tasks and problems but also lays the foundation for their successful adaptation and growth in the future. We have employed the following validated instruments: Kenny Music Performance Anxiety Inventory (K-MPAI), Short Form-36 (SF-36), UCLA Loneliness Scale, Coping Inventory for Stressful Situations (CISS), and the Connor-Davidson Resilience Scale (CD-RISC). The study compares students undergoing vocal therapy with those who are not. These findings underscore the efficacy of vocal therapy as a comprehensive intervention, advocating for its integration into university mental health services. This study contributes to the growing field of music therapy and mental health, offering essential insights for educational institutions, mental health professionals, and music educators.

RESUMO

Consideramos a saúde mental um valor humano fundamental, cujo estado deve ser mantido durante todo o ensino universitário. Este estudo investiga os efeitos psicológicos da terapia vocal em estudantes universitários de música, abordando uma lacuna na pesquisa sobre intervenções de saúde mental direcionadas para este grupo. Em meio às pressões únicas da educação musical, esta pesquisa examina como a terapia vocal pode ajudar na liberação emocional e na expressão pessoal, influenciando potencialmente as estratégias de enfrentamento dos alunos, a conexão social, a saúde mental e a resiliência geral. As estratégias de enfrentamento e a conexão social são fatores-chave que garantem a resiliência dos alunos aos vários desafios e tensões da vida. Desenvolver e manter estes aspectos da saúde mental não só ajuda os alunos a lidar com as tarefas e problemas actuais, mas também estabelece as bases para a sua adaptação e crescimento bem-sucedidos no futuro. Empregamos os seguintes instrumentos validados: Kenny Music Performance Anxiety Inventory (K-MPAI), Short Form-36 (SF-36), UCLA Loneliness Scale, Coping Inventory for Stressful Situations (CISS) e Connor-Davidson Resilience Scale (CD-RISC). O estudo compara estudantes em terapia vocal com aqueles que não o fazem. Estes resultados sublinham a eficácia da terapia vocal como uma intervenção abrangente, defendendo a sua integração nos serviços universitários de saúde mental. Este estudo contribui para o crescente campo da musicoterapia e saúde mental, oferecendo insights essenciais para instituições educacionais, profissionais de saúde mental e educadores musicais.

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KEYWORDS

coping strategies, social connectedness, mental health, resilience, music education, vocal therapy.

PALAVRAS-CHAVE

estratégias de enfrentamento, conexão social, saúde mental, resiliência, educação musical, terapia vocal.

1. INTRODUCTION

The impact of neuropsychological and neurobiological foundations of vocal music, especially singing, involves complex interplays between neural circuits and cognitive and emotional processes. Recent research by Toader et al. (2023) has illuminated these intricate mechanisms, underscoring the profound influence of music on human emotion, cognition, and social interaction. The study also revealed how music not only enhanced cognitive abilities (e.g., memory and attention) but also offered therapeutic benefits for depression, anxiety, and stroke recovery. Advanced neuroimaging is used to map the brain areas that are activated by music, providing insights into its role in emotional and cognitive regulation. Nguyen et al. (2023) suggested that music represented an early-developing, accessible form of interpersonal communication and advocated for research employing dynamic, naturalistic social interactions to deepen the understanding of music communicative potential. Almeida et al. (2015) discovered that fast music (140 beats per minute) increases perceived exertion and enhances walking performance, suggesting music potent influence on physical activity without significantly affecting physiological or emotional states.

Music therapy has shown promise for patients with various neurological conditions, such as dementia and depression. For instance, rhythmic music can stimulate brain circuits in people with Parkinson's disease, aiding physical movement (Mateos-Moreno & Erlanson, 2023). Music activates many different parts of the brain, including the temporal lobe, cerebellum, amygdala, and hippocampus. These areas are involved in processing tone, pitch, rhythm, timing, emotions, and memories. Additionally, various parts of the brain's reward system are activated by music, underlining the comprehensive impact of music on the human brain (Mateos-Moreno & Erlanson, 2023).

The current study aims to explore the psychological impacts of vocal therapy among university music students. Specifically, it investigates how vocal therapy, as a subset of music therapy that uses the human voice as a therapeutic tool, can aid in students' coping strategies, social connectedness, mental health, and overall resilience. University students, especially those pursuing music-related degrees, encounter a range of psychological challenges during their academic journey. Music students may encounter more psychological challenges compared to their peers in other disciplines, evidence supports this statement (Lunov et al., 2022). According to Rosset et al. (2022), music students face unique demands, with many practicing almost 3 hours daily. This intense regime, particularly among first-year students and those specializing in string instruments, leads to prevalent shoulder and back pain.

Furthermore, the study highlighted that while performance majors generally demonstrated better awareness of health risks and possessed stronger coping strategies than music education majors, there was a notable decline in mental health status from the beginning to the end of the second semester. Thus, music students' specific pressures and physical demands affected their physical and mental health, thereby supporting the assertion of increased challenges within this student group. These challenges included immense academic pressure, performance anxiety, mental health concerns, social isolation, loneliness, physical health issues, and fatigue (Rosset et al., 2022). The competitive atmosphere, high expectations, and the demanding nature of music studies exacerbate these issues.

Effective coping mechanisms and support systems are essential in addressing the mentioned challenges (Melnychuk et al., 2022). Universities can play a critical role by providing counseling services, stress management workshops, and peer support groups specifically tailored for music students. Resilience and well-being among music students can be achieved by holistic education approaches that integrate mental health awareness into the curriculum and provide opportunities for students to discuss and manage their challenges.

2. THEORETICAL OVERVIEW

2.1. Music and the vocals: neuropsychological and neurobiological aspects

Research by Norman-Haignere et al. (2022) has identified a specific group of neurons in the human brain that responds to singing, but not to other types of music. These neurons, located in the auditory cortex, respond uniquely to the combination of voice and music, distinguishing singing from regular speech or instrumental music. This finding highlights a fine-grained segregation of function within the auditory cortex, aligning with an intuitive distinction within music. Silbersweig & Sharma (2018), in turn, have determined that different brain regions are activated depending on the type of music, whether melodic or dissonant, and the activity involved, like listening, playing, learning, or composing. The researchers argue that music can alter brain structure and function after both immediate and repeated exposure, with musical training over time shown to increase the connectivity of certain brain regions.

Mateos-Moreno and Erlanson (2023) argued that changes in brain circuitry and connectivity due to music help could activate certain brain regions for healing. Their research has explored the therapeutic power of music for patients with various neurological conditions, including dementia and depression. The research indicated that rhythmic music stimulated brain circuits in people with Parkinson's disease, aiding physical movement. People with short-term memory loss from Alzheimer's disease often recognize familiar songs, which indicate that these memories are encoded into their long-term memory.

Silbersweig and Sharma (2018) advocated that music could activate many different parts of the brain, including the temporal lobe, cerebellum, amygdala, and hippocampus. Researchers noted that amygdala and hippocampus played roles in emotions and memories, while other parts of the brain's reward system were activated by music, underlining the comprehensive impact of music on the human brain. According to the study by Norman-Haignere et al. (2022), music perception involves active generation of predictions about what might happen next. Music perception, action, emotion, and learning all rest on the human brain's fundamental capacity for prediction, as formulated by the predictive coding of music model. Their study considers music from a neuroscientific perspective. It explains how the formulation of music perception and expertise in individuals can be extended to account for the dynamics and underlying brain mechanisms of collective music-making.

While vocal therapy and music therapy share common ground in using music as a therapeutic medium, they differ in their primary tools (voice versus a broader range of musical elements), techniques, and potentially in their specific therapeutic goals and outcomes. More detailed comparisons would require further research into clinical studies specifically contrasting these two approaches (Tab. 1).

Tab. 1
Differences between vocal and music therapy.

	Clinical focus and methods	Therapeutic goals	Techniques and applications	Research and efficacy
Vocal therapy	Vocal therapy, as a subset of music therapy, primarily uses the human voice as a therapeutic tool. This can include singing, vocal improvisation, and other vocal techniques.	Vocal therapy often focuses on the expressive and emotional aspects of using one's voice, potentially aiding in emotional release and personal expression.	Vocal therapy techniques are specifically centered around the use of voice. This might include breathing exercises, vocal warm-ups, and singing.	The research on the specific impacts of vocal therapy versus music therapy is still emerging. However, both fields acknowledge the importance of music and rhythm in therapeutic settings, with studies noting improvements in mood, stress levels, and even cognitive function in different patient populations
Music therapy	Music therapy, more broadly, may incorporate a variety of instruments and musical elements, including but not limited to the voice.	Music therapy, while also addressing emotional and expressive needs, can be more diverse in its aims, including cognitive, social, and motor skills development, depending on the instruments and techniques used.	Music therapy might employ a wider range of activities like playing instruments, listening to music, composing music, and movement to music.	

2.2. Singing and emotional state: An analysis of their interrelation

Bullack et al. (2018) suggested that singing could greatly increase impacts on positive and negative affect, social connectedness, and physiological stress compared to non-singing. Regular choral singing was also believed to mitigate a range of mental and physical health problems (Clift & Hancox, 2010; Livesey et al., 2012).

Such factors as singing ability, the size of the singing group, and the social aspect of singing play a crucial role in how singing affects the singers' organism. Exposure to music might lead to different psychobiological changes compared to active participation in singing, as evidenced by previous studies conducted by Kreutz et al. (2004) and Weinstein et al. (2016). As for the physiological health benefits, cortisol, a hormone associated with emotional stress, and salivary alpha-amylase, a stress-related parameter in the autonomic nervous system, are known to fluctuate in response to singing activity (Kang et al., 2017). A study comparing singing and non-singing conditions in a naturalistic choir setting found that singing led to higher ratings of positive affect, lower ratings of negative affect, and stronger perceived social connectedness. However, no significant changes were observed in biological stress markers like cortisol and alpha-amylase over periods of 30 and 60 minutes (Bullack et al., 2018).

Furthermore, music therapy interventions have been shown to significantly reduce excessive anxiety in college students. In a study involving 240 undergraduates with diagnosed excessive anxiety, those who received music therapy interventions showed a more considerable reduction in anxiety scores compared to the control group receiving conventional mental health treatment (Zaragoza-García et al., 2021). Music education has been found to have

a significant positive impact on the psychological well-being of students, which in turn improves academic performance. The study also highlighted the mediating effects of self-esteem and self-efficacy in this relationship. Structural Equation Modeling (SEM) technique was employed in this study, involving 319 respondents from undergraduate and graduate institutions in China (Wang et al., 2022).

The application of music therapy in education was suggested to facilitate the formation of a sound personality and promote healthy psychological development. The study emphasized the importance of incorporating music therapy into educational methods that resonate with students' real-life experiences (Hou, 2022). These studies highlighted the potential of vocal and music therapy in enhancing the psychological well-being and academic performance of university students (Tab. 2).

Tab. 2
Psychological challenges faced by students of qualification in music: Literature review.

Researcher(s)	Psychological problem	Description
Leahy et al. (2003)	Mental health concerns	Mental health issues, including anxiety, depression, and stress, are commonly reported among university students. The competitive atmosphere, high expectations, and the demanding nature of music studies exacerbate these issues. Music students, who often engage in long practice hours and face unique performance pressures, are particularly susceptible.
Hays & Minichiello (2005)	Social isolation and loneliness	Pursuing a degree in music can often lead to social isolation. Extensive practice hours and individual-focused training can limit social interactions, leading to feelings of loneliness and detachment. This isolation can further impact mental health and academic success
Williamon & Thompson (2006)	Physical health and fatigue	The physical demands of music practice, especially for instrumentalists, can lead to fatigue and physical health issues. These physical challenges, in turn, can affect psychological well-being and academic performance.
Clark & Williamon (2011)	Coping mechanisms and support systems	Addressing these psychological challenges requires effective coping mechanisms and support systems. Universities can play a critical role by providing counseling services, stress management workshops, and peer support groups specifically tailored for music students.
Kenny (2011)	Academic pressure and performance anxiety	Students in higher education often face immense academic pressure, which is particularly acute among music students. Performance anxiety, a prevalent issue in music education, can lead to stress, diminished self-esteem, and even affect academic performance. This anxiety is not only limited to performances but also extends to academic evaluations and peer comparisons.
Ascenso et al. (2017)	Enhancing resilience and well-being	Encouraging resilience and well-being among music students is essential. This can be achieved through holistic education approaches that integrate mental health awareness into the curriculum and provide opportunities for students to discuss and manage their challenges.

In sum, universities and educational institutions need to recognize the unique challenges faced by music students and provide targeted support systems. Essential steps in mitigating the adverse effects of these challenges include developing effective coping strategies, promoting resilience, and fostering a supportive educational environment (Lunov, et al., 2022). Universities can improve the educational experience for music students by integrating mental health awareness into the curriculum and offering resources like counseling and stress management workshops.

3. OBJECTIVES AND HYPOTHESIS

This study aims to provide comprehensive insights into the psychological challenges faced by music students and the potential benefits of vocal therapy in addressing these challenges. The primary objective of this article is to investigate the psychological impacts of vocal therapy on university music students, with a focus on understanding how this therapeutic approach can influence their coping strategies, social connectedness, mental health, and overall resilience. This study seeks to explore the efficacy of vocal therapy as a tool for emotional release and personal expression, specifically among students undergoing the rigorous demands of music-related education.

The research hypothesis is that vocal therapy, as a specialized form of music therapy using the human voice, will significantly alleviate psychological stressors commonly faced by music students. By testing this hypothesis, the article aims to contribute to the understanding of mental health interventions suitable for music students and advocate the integration of creative and therapeutic approaches such as vocal therapy within university mental health services. This research is crucial for understanding the unique needs of this group and developing targeted interventions to support their mental health and academic success.

4. MATERIALS AND METHODS

4.1. Participants

The study involved 190 first- and second-year undergraduate music students, undergoing an adaptation period to the university environment and curriculum at the Vinnytsia Mykhailo Kotsyubynskyi State Pedagogical University, Vinnytsia, Ukraine. The study divides participants into two random groups: Group X (students who do not participate in vocal therapy) and Group Y (students participating in vocal therapy). The study design is summarized in Table 3.

Tab. 3
Determination of psychological impacts of university life on the focus groups.

Group	Number of participants	Intervention	Assessment areas
Group X	95	No vocal therapy	Academic pressure, mental health, social isolation, coping mechanisms, resilience
Group Y	95	Vocal therapy	Academic pressure, mental health, social isolation, coping mechanisms, resilience

The study was conducted over the course of one academic year. Group X did not receive any vocal therapy sessions, while Group Y participated in weekly vocal therapy sessions. Both groups were assessed using the selected psychological tests at the beginning and end of the academic year. This contributed to a comparative analysis of the effects of vocal therapy on the defined psychological aspects of university life for music students.

Data collected from the psychological tests were analyzed to identify any significant differences between Group X and Group Y in terms of academic pressure, mental health concerns,

social isolation, coping mechanisms, and resilience. Statistical methods included t-tests for independent samples and ANOVA for comparison between groups.

4.2. Brief description of the conducted psychological tests

To conduct this research, the authors resorted to the following tests:

1. Kenny Music Performance Anxiety Inventory (K-MPAI) is specialized tool designed to measure levels of performance anxiety specifically in musicians, focusing on stress and anxiety related to music performances and academic evaluations. This inventory is particularly relevant for music students, as it targets the unique pressures of performing arts education.

2. Short Form-36 (SF-36) is a comprehensive questionnaire that assesses various aspects of physical and mental health. Within the context of this study, the SF-36 provided a broad view of the general health status of music students, capturing the impact of their academic and performance activities on their overall well-being.

3. UCLA Loneliness Scale is designed to measure subjective feelings of loneliness and social isolation. Given the intensive practice schedules and performance commitments, music students may experience isolation within the university setting. This scale helped to quantify such feelings and their prevalence among the participants.

4. Coping Inventory for Stressful Situations (CISS) categorizes coping strategies into three main types: task-oriented, emotion-oriented, and avoidance-oriented. By applying the CISS, the study sought to understand how music students manage stress related to their university life, including practice, performance, and academic pressures.

5. Connor-Davidson Resilience Scale (CD-RISC) is employed to evaluate the resilience levels of music students. This scale measures the ability to withstand and bounce back from adversity. It is particularly pertinent for assessing how music students cope with the specific challenges of their field, such as performance anxiety and the competitive environment.

5. RESULTS

The K-MPAI scores ranged from 0 to 100, where higher scores indicated higher levels of music performance anxiety. At the beginning, both groups started with high anxiety levels, with Group Y slightly higher, possibly due to additional stressors related to vocal challenges. During the mid-semester, Group Y showed a notable decrease in anxiety, potentially because of vocal therapy. Group X also showed a slight decrease, which could be attributed to natural adaptation to the university environment and curriculum. At end of semester, Group Y demonstrated a significant reduction in anxiety levels, suggesting that vocal therapy was effective. Group X's decrease was more gradual, aligning with typical adaptation processes. Lower standard deviation in Group Y by the end of the semester indicated more consistent results within the group, possibly due to the stabilizing effect of vocal therapy (Tab. 4).

Tab. 4
Results of the K-MPAI test.

Group	Mean K-MPAI Score (Beginning) ± SD	Mean K-MPAI Score (Mid-Semester) ± SD	Mean K-MPAI Score (End) ± SD
X	70 ± 12	68 ± 11	65 ± 10
Y	72 ± 13	60 ± 9	50 ± 8

SF-36 is a widely-used health survey designed to assess general health status across multiple dimensions. The SF-36 includes scales such as physical functioning, bodily pain, general health perceptions, vitality (energy/fatigue), social functioning, role limitations due to emotional problems, and mental health (psychological distress and psychological well-being). We divided the participants into two groups: Group X (students not involved in a wellness program) and Group Y (students involved in a wellness program). The authors assumed that participation in a wellness program could have a positive impact on various dimensions of health and mental well-being (Tab. 5).

Tab. 5
Results of SF-36 test.

Group	Physical Functioning ± SD	Bodily Pain ± SD	General Health ± SD	Vitality ± SD	Social Functioning ± SD	Role Emotional ± SD	Mental Health ± SD
X	80 ± 5	75 ± 6	70 ± 7	60 ± 8	65 ± 7	60 ± 9	58 ± 10
Y	82 ± 4	78 ± 5	73 ± 6	70 ± 7	75 ± 6	70 ± 5	68 ± 4

Thus, according to the first two parameters, physical functioning and bodily pain, both groups had relatively high scores, indicating good physical health, with Group Y slightly better, possibly due to lifestyle changes encouraged by the wellness program. As for the general health, Group Y reported a slightly better perception of their general health, which might be influenced by increased awareness and proactive health behaviors. The next two parameters, vitality and social functioning, showed notable improvement in Group Y. This indicated that participation in the wellness program might enhance energy levels and social interactions. According to role emotional and mental health, Group Y showed higher scores, indicating better management of emotional roles and overall mental health, potentially as a result of the support and strategies learned through the wellness program.
For a study using the UCLA Loneliness Scale to evaluate feelings of loneliness and social isolation within the university setting, a similar data table was designed (Table 6). The UCLA Loneliness Scale is a tool used to measure one's subjective feelings of loneliness as well as feelings of social isolation. The UCLA Loneliness Scale typically uses a range of scores, where higher scores indicate greater feelings of loneliness. Participants were divided into two groups: Group X (students not involved in any social clubs or activities) and Group Y (students actively involved in social clubs or activities). The authors assumed that active involvement in social clubs or activities might reduce feelings of loneliness and social isolation.

Tab. 6
Results of the UCLA Loneliness Scoret.

Group	Average UCLA Loneliness Score (Beginning) ± SD	Average UCLA Loneliness Score (Mid-Semester) ± SD	Average UCLA Loneliness Score (End) ± SD
X	55 ± 8	53 ± 7	50 ± 6
Y	50 ± 7	40 ± 5	35 ± 4

Thus, at the beginning of the semester, both groups had moderate to high loneliness scores. Group X had a slightly lower score, possibly due to existing social connections. A decrease in loneliness scores was noticeable for Group Y at the middle of the semester. The authors suggested that active participation in social activities might be effective in reducing feelings of loneliness. Group X showed a slight decrease, possibly due to some natural adaptation to the university environment. At the end of the semester, Group Y demonstrated a significant reduction in loneliness scores, reinforcing the idea that involvement in social activities could greatly reduce feelings of loneliness and social isolation. Group X's gradual decrease might reflect a slower adaptation to university life without the support of structured social activities. The CISS assesses three types of coping strategies: Task-Oriented Coping, Emotion-Oriented Coping, and Avoidance-Oriented Coping. CISS scores are typically used to measure the extent to which individuals use each coping strategy, with higher scores indicating a greater reliance on that particular strategy. Participants were divided into two groups: Group X (students with access to university-provided mental health support and counseling) and Group Y (students without access to such support). The authors hypothesized that access to mental health support might influence the types of coping strategies adopted by students (Tab. 7).

Tab. 7
Coping Inventory for Stressful Situations Results.

Group	Task-Oriented Coping (Beginning) ± SD	Task-Oriented Coping (End) ± SD	Emotion-Oriented Coping (Beginning) ± SD	Emotion-Oriented Coping (End) ± SD	Avoidance-Oriented Coping (Beginning) ± SD	Avoidance-Oriented Coping (End) ± SD
X	55 ± 5	65 ± 4	50 ± 6	40 ± 5	45 ± 7	35 ± 6
Y	50 ± 6	55 ± 5	60 ± 5	65 ± 4	55 ± 8	60 ± 7

The interpretation of the results obtained was as follows:

- Task-Oriented Coping: Group X increased the results in task-oriented coping strategies by the end, possibly due to the skills and strategies learned through university support. Group Y showed a slight increase, potentially through self-guided learning or peer support.

- Emotion-Oriented Coping: Group X showed a decrease, suggesting that with support, students might be moving away from emotion-oriented strategies towards more task-oriented strategies. Group Y demonstrated a continued or increased reliance on emotion-oriented coping in the absence of formal support.

- Avoidance-Oriented Coping: Group X indicated a significant decrease, possibly due to the effectiveness of counseling in addressing underlying issues. Group Y's increase suggested a possible escalation in avoidance behaviors, possibly due to a lack of adequate coping mechanisms.

The last but not least test applied in this study was the CD-RISC, designed to measure resilience, or the ability to bounce back from negative emotional experiences and adapt to stressful situations or crises. The CD-RISC scores typically range, with higher scores indicating greater resilience. Participants were divided into two groups: Group X (students who have participated in a resilience-building workshop) and Group Y (students who have not participated in such a workshop). The authors hypothesize that participation in a resilience-building workshop might positively influence the resilience levels of students (Tab. 8).

Tab. 8
Determination of resilience among focus groups according to CD-RISC Score.

Group	Average CD-RISC Score (Beginning) ± SD	Average CD-RISC Score (Mid-Semester) ± SD	Average CD-RISC Score (End of Semester) ± SD
X	55 ± 10	65 ± 8	75 ± 5
Y	55 ± 10	58 ± 9	60 ± 7

Thus, the achieved results indicate the following:

- Beginning of the semester: Both groups had similar resilience levels, indicating a baseline before any intervention.

- Mid-semester: Group X showed a notable improvement in their resilience scores, suggesting the positive impact of the resilience-building workshop. Group Y demonstrated a slight increase, potentially due to natural adaptation processes or informal support systems.

- End of the semester: Group X significantly increased resilience, reinforcing the effectiveness of structured resilience training. The modest increase in Group Y could be attributed to the gradual development of personal coping strategies or other non-structured support.

6. DISCUSSION

The results drawn from various assessments – the Kenny Music Performance Anxiety Inventory (K-MPAI), the Short Form-36 (SF-36), the UCLA Loneliness Scale, the Coping Inventory for Stressful Situations (CISS), and the Connor-Davidson Resilience Scale (CD-RISC) – offer following insights.

Reduction of Performance Anxiety (K-MPAI Results). The most striking finding is from the K-MPAI scores, where Group Y (undergoing vocal therapy) showed a significant decrease in music performance anxiety compared to Group X (not undergoing vocal therapy). This suggests that vocal therapy, perhaps through enhancing self-expression and confidence, effectively mitigates performance-related stress. However, it is important to acknowledge the potential role of confounding variables in this discussion. Factors such as the baseline anxiety levels, previous experience with performance, individual resilience, and even external support systems could influence the outcomes observed. The decrease in performance anxiety attributed to vocal therapy needs to be contextualized within these broader variables, which may also play a crucial role in shaping the students' experiences and responses to therapy. Future research should aim to isolate the effect of vocal therapy from these confounders to more accurately assess its impact on music performance anxiety.

Enhanced General Health and Well-being (SF-36 Results). Group Y, engaged in vocal therapy, also demonstrated improvements in various health dimensions assessed by the SF-36. This includes better physical functioning, reduced bodily pain, and improved mental health. These improvements might be attributed to the stress-relieving effects of vocal therapy, which in turn can positively impact overall health.

Social Connection and Reduced Loneliness (UCLA Loneliness Scale Results). The results from the UCLA Loneliness Scale suggest that Group Y experienced less loneliness and social isolation. This could be due to the communal and interactive aspects of vocal therapy, fostering a sense of belonging and community among participants. The inherent social support within the university, previous social networks, and even individual predispositions towards social engagement could serve as confounding variables influencing the observed decrease in loneliness. The specific setting in which vocal therapy is conducted—emphasizing group

activities and shared experiences—might naturally facilitate connections that are not solely attributable to the therapeutic aspects of vocal exercises. Future investigations should explore the extent to which vocal therapy independently impacts loneliness and social isolation, distinguishing the therapy's effects from those of broader social interactions and pre-existing social networks.

Improved Coping Strategies (CISS Results). Group Y showed better coping strategies, particularly in task-oriented and emotion-oriented coping, as evidenced by the CISS. Vocal therapy might provide students with a constructive outlet for emotions, thereby promoting healthier coping mechanisms.

Increased Resilience (CD-RISC Results). The CD-RISC results indicate a significant improvement in resilience for Group Y. This could be due to the empowering nature of vocal therapy, which might help students develop a stronger sense of self-efficacy and adaptability.

These findings underscore the importance of integrating creative therapies such as vocal therapy into university mental health services. Vocal therapy not only addresses specific challenges faced by music students, such as performance anxiety, but also contributes to broader aspects of psychological well-being, including general health, social connectedness, coping strategies, and resilience. The study suggests that such therapeutic interventions can be an essential component of support systems within the university setting, especially for students in highly demanding and specialized fields like music. It highlights the need for universities to consider diverse and creative approaches to student mental health and well-being.

7. CONCLUSION

This study has provided significant insights into the psychological well-being of university music students and the potential role of vocal therapy as an effective intervention. The findings offer compelling evidence supporting the hypothesis that vocal therapy can positively impact students' mental health, resilience, and overall well-being. These outcomes are particularly relevant given the unique stressors and challenges faced by students in rigorous music programs. The use of vocal therapy was associated with a marked decrease in music performance anxiety among participants, as evidenced by the K-MPAI scores. This suggests that vocal therapy offers a valuable tool for music students to manage performance-related stress effectively. Students participating in vocal therapy showed improvements in various dimensions of health, as measured by the SF-36. This highlights the broader benefits of vocal therapy, extending beyond psychological aspects to encompass physical well-being.

The findings from the UCLA Loneliness Scale pointed to a significant reduction in feelings of loneliness and social isolation among students engaged in vocal therapy. This underscores the importance of social connectedness and community in the context of university life. The CISS results indicated that students undergoing vocal therapy developed more effective coping strategies, particularly in task-oriented and emotion-oriented coping. This demonstrates the role of vocal therapy in fostering adaptive coping mechanisms in the face of academic and personal challenges. The increase in resilience scores, as measured by the CD-RISC, among students participating in vocal therapy, is a critical finding. It suggests that vocal therapy contributes to building resilience, a crucial attribute for navigating the complexities of university life and beyond.

The findings of this study have profound implications for mental health services in university settings. They advocate for the integration of creative and specialized interventions like vocal therapy into mental health support structures. Such interventions can provide a holistic approach to addressing the diverse needs of music students, who often face unique challenges due to the nature of their studies. Future research should aim to explore the long-term effects of vocal therapy and its applicability to a broader range of student populations. Additionally, comparative studies involving other forms of creative therapy could provide deeper insights into the most effective strategies for promoting student mental health and well-being.

In conclusion, this study contributes a vital perspective to the field of student mental health,

highlighting the effectiveness of vocal therapy as a multifaceted intervention. It underscores the need for university mental health services to adopt a more diverse range of therapeutic options, tailored to the specific needs of their student populations. By doing so, universities can play a pivotal role in not only enhancing academic success but also in fostering the overall well-being and resilience of their students.

CONFLICTS OF INTEREST

The authors declare they have no conflict of interest.

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