

# The effect of peer counseling-based health education in reducing anxiety among students at University Muhammadiyah Surakarta

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## ABSTRACT

Anxiety is a prevalent psychological issue among university students, particularly nursing students who face intense academic and clinical demands. According to the World Health Organization (WHO, 2024), the global prevalence of anxiety disorders increased by 26% after the COVID-19 pandemic, while national data from Indonesia (Riskesdas, 2019; 2021) reported emotional mental disorders affecting 9.8% of the productive-age population. Unmanaged anxiety can impair concentration, reduce academic performance, and negatively affect mental health. One promising non-pharmacological approach is health education through peer counseling, which utilizes emotional support among students at similar academic levels. This study aimed to analyze the effect of peer counseling-based health education on nursing students' anxiety levels. A quasi-experimental one-group pretest-posttest design was applied, involving 50 sixth-semester nursing students from the Faculty of Health Sciences, Universitas Muhammadiyah Surakarta, selected using purposive sampling. Data were collected using questionnaires measuring knowledge, attitudes, and behaviors, and the State-Trait Anxiety Inventory (STAI-T) to assess anxiety levels. Statistical analysis was performed using the Paired Sample t-test and Wilcoxon Signed Rank Test. The results showed significant improvements in students' knowledge, attitudes, and behaviors after the peer counseling intervention ( $p < 0.05$ ). The mean anxiety score decreased from 50.98 to 46.60 ( $p < 0.05$ ), indicating a substantial reduction in anxiety levels. These findings confirm that peer counseling-based health education effectively enhances student understanding and alleviates anxiety. The study recommends implementing peer counseling as a promotive and preventive strategy to support mental health among nursing students, especially during high-pressure academic periods.

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## INTRODUCTION

Anxiety is one of the most common psychological disorders experienced by students, particularly nursing students who face academic demands, clinical practice, and competency examinations. The World Health Organization (WHO) reported that global anxiety disorders significantly increased after the COVID-19 pandemic, with a prevalence reaching 26% (WHO, 2024). In Indonesia, the Basic Health Research (Riskesdas) recorded a prevalence of emotional mental disorders among the productive age group at 9.8% (Kemenkes RI, 2019; 2021). These figures highlight that anxiety has become a serious public health issue.

Nursing students are considered a vulnerable group due to their exposure to complex academic loads, direct patient interaction, and skills-based examinations. Research shows that anxiety can lead to reduced concentration, sleep disturbances, and even academic burnout (Az-zahrah Putri et al., 2021; Madinah et al., 2023; Tazqiyatus Sudia et al., 2021). Agustian et al. (2023) also found a correlation between anxiety levels and personality factors such as adversity quotient in medical students. Similarly, Aprilya Fransiska et al. (2024) reported that academic anxiety is influenced by various internal and external factors. These findings confirm that student anxiety is a real and multidimensional problem (Simanjuntak & Amir, 2024).

Similar conditions are observed at Universitas Muhammadiyah Surakarta (UMS). Research by Arum Pratiwi et al. revealed that most Nursing professional students experienced mild to moderate anxiety before taking the OSCE (Objective Structured Clinical Examination) (Hanif Thofan Ismail, 2024). Furthermore, Fahrur Nur Rosyid et al. found a significant relationship between OSCE-related anxiety and the sleep quality of nursing students, showing that anxiety affects not only psychological but also physical conditions (Muhammad Syukri Al Amiin, 2023; Mukholil, 2018). This evidence strengthens the case that student anxiety at UMS must be addressed seriously.

Various non-pharmacological interventions have been developed to reduce student anxiety, one of which is peer counseling. Peer counseling utilizes emotional support among students at equal levels, thereby creating closer, more comfortable, and open relationships. This approach has proven effective. Qoyyimah et al. (2021) reported that peer counseling improved mental health and reduced anxiety in orphanage adolescents. Ellis dan Sampe (2022) also demonstrated that peer counseling effectively reduced stress in students undergoing thesis guidance. Furthermore, peer support has been linked to reduced anxiety in final-year students (Gustina et al., 2023) and improved adaptation skills in facing academic challenges (Hapes et al., 2024).

Theoretically, the mechanism by which peer counseling reduces anxiety can be explained through several psychological frameworks. According to the Social Support Theory, emotional and informational support from peers helps individuals reinterpret stressful situations more positively, thereby lowering perceived threat and physiological arousal. The Social Learning Theory Bandura (1977) also suggests that individuals learn coping strategies and adaptive behaviors by observing peers who successfully manage similar stressors. Moreover, the Cognitive Behavioral perspective posits that peer discussions allow students to express and restructure irrational thoughts, which helps reduce maladaptive anxiety responses.

In the context of peer counseling-based health education, this mechanism operates through structured psychoeducation and mutual support. Students not only receive knowledge about stress management and relaxation techniques but also exchange emotional experiences in a safe environment. This combination of cognitive learning and emotional validation strengthens self-efficacy and coping skills, leading to measurable reductions in anxiety levels among nursing students.

International studies further support the effectiveness of this intervention. Richard et al. (2022) in a literature review, concluded that peer support contributes positively to young adults' mental health. Haiyan dan Baki (2024) emphasized that peer counseling can enhance students' psychological well-being. Additionally, Lacosta dan Sarajar (2024) identified a significant

relationship between self-efficacy and anxiety in facing university entrance exams, indicating the importance of peer-based interventions in boosting self-efficacy and reducing anxiety.

Besides peer counseling, research at UMS has also highlighted the effectiveness of other non-pharmacological interventions for managing anxiety. Enita Dewi dkk. (2022) demonstrated that Progressive Muscle Relaxation (PMR) techniques significantly reduced anxiety in asthma patients. This suggests that both relaxation-based and counseling-based interventions hold great potential in addressing anxiety.

Another study by Nurlaila Fitriani dkk. (2022) identified psychosocial predisposing and precipitating factors among schizophrenia clients that influenced violent behavior and hallucinations, affirming the role of psychosocial elements in mental health problems, including student anxiety. Moreover, research by Ni Putu Widya Sulasmi dkk. (2022) showed that online health promotion was effective in adapting to new habits and preventing psychosocial disorders. This aligns with peer counseling, which is also a form of health education based on peer support.

Although many studies support the effectiveness of peer counseling, most still focus on general contexts or clinical practice abroad. Empirical studies on peer counseling-based health education in Indonesia especially for nursing students remain limited. Additionally, few studies have examined the relationship between anxiety and students' knowledge, attitudes, and behaviors after interventions. This is the research gap that this study seeks to address.

This study is unique in using a quasi-experimental one-group pretest-posttest design to evaluate the effect of peer counseling-based health education on nursing students' anxiety at Universitas Muhammadiyah Surakarta. Beyond measuring anxiety levels, the study also assesses changes in knowledge, attitudes, and behaviors post-intervention, providing a more comprehensive picture.

Specifically, this study aims to analyze the effect of peer counseling-based health education on the anxiety levels of nursing students at Universitas Muhammadiyah Surakarta. It is expected to make an academic contribution to the literature on non-pharmacological nursing interventions and provide practical recommendations for educational institutions to support students' mental health.

## RESEARCH METHOD

### Study Design and Setting

This study employed a quasi-experimental design using a one-group pretest-posttest approach, which is appropriate for evaluating intervention effectiveness by comparing participant conditions before and after treatment (Nurba'id et al., 2024). The research was conducted in July 2025 at the Faculty of Health Sciences, Universitas Muhammadiyah Surakarta. Ethical approval was obtained from the Health Research Ethics Committee (KEPK) of the Faculty of Medicine, Universitas Muhammadiyah Surakarta (No. 5689/B.1/KEPK-FK/V/2025).

### Population and Sampling Technique

The population consisted of all sixth-semester nursing students enrolled at the Faculty of Health Sciences, Universitas Muhammadiyah Surakarta. The sample included 50 respondents selected through purposive sampling based on the following inclusion criteria: (1) active sixth-semester student status, (2) self-reported experience of anxiety related to academic activities, and (3) willingness to participate and attend all intervention sessions. Exclusion criteria included students who did not complete the full intervention or failed to submit posttest data. However, all 50 participants completed the study.

### Peer Facilitator Selection and Training

Peer facilitators were selected from final-year nursing students with strong interpersonal communication skills and good academic standing, as recommended by faculty mentors. To ensure consistency and quality of delivery, all facilitators attended a two-day basic counseling workshop

conducted by a certified mental health nursing lecturer. The training covered principles of peer support, empathy, active listening, stress management, and confidentiality. Standardized materials and session outlines were used to ensure the intervention was implemented uniformly across all groups.

### **Intervention Procedure**

The intervention was implemented as a peer counseling-based health education program conducted over a two-week period. Participants were divided into five small groups consisting of 8–10 students, each facilitated by one trained peer counselor and supervised by a faculty member. The program consisted of three structured sessions, each lasting approximately 90 minutes: a) Session 1 – Psychoeducation: Understanding anxiety, identifying stressors, and recognizing physiological responses; b) Session 2 – Coping and Relaxation Strategies: Discussion of adaptive coping methods, deep breathing techniques, and sharing experiences among peers; c) Session 3 – Reflection and Peer Support: Reinforcement of emotional regulation, reflection on personal progress, and group encouragement. Educational leaflets were distributed to strengthen retention of key concepts. One week after the final session, a follow-up evaluation was conducted to assess continuity of effects and provide additional emotional support.

To minimize external influences, all intervention activities were scheduled during a non-exam period to prevent confounding effects of academic stress. Participants were advised not to engage in other psychological or relaxation interventions during the study.

### **Instruments and Pilot Study**

Data were collected using validated questionnaires measuring knowledge, attitude, and behavior (KAP framework), along with the State-Trait Anxiety Inventory-Trait (STAI-T) (1983) developed by Spielberger (1983) and adapted for Indonesian students (Pratiwi & Ningsih, 2022; Sahirah et al., 2024).

A pilot study involving 10 students with similar characteristics (excluded from the main study) was conducted to test the clarity and feasibility of the instruments and procedures. Feedback from this pilot helped refine the questionnaire wording and facilitator guide.

All instruments demonstrated strong psychometric properties: Cronbach's alpha values were 0.906 for knowledge, 0.884 for attitude, 0.949 for behavior, and 0.912 for anxiety—indicating high reliability.

### **Data Collection and Analysis**

Pretest data were collected one day before the first intervention session, while posttest data were obtained one week after the final session. Data were analyzed using SPSS version 25. Descriptive statistics were applied to summarize demographic characteristics. Prior to inferential analysis, the Shapiro-Wilk test was performed to assess normality. If the data were normally distributed ( $p > 0.05$ ), the Paired Sample t-test was used; otherwise, the Wilcoxon Signed Rank Test was applied. The significance level was set at  $p < 0.05$ . No missing data were found, and all 50 respondents' results were included in the final analysis.

Ethical Considerations, ethical procedures adhered to the principles of autonomy, beneficence, nonmaleficence, and justice. Participants provided written informed consent after receiving a clear explanation of the study objectives, procedures, potential benefits, and their right to withdraw at any time without penalty.

Anonymity and confidentiality were ensured by coding participants' data and storing them securely. During peer counseling sessions, all participants were reminded to maintain the privacy of shared experiences. A licensed mental health nursing lecturer supervised all sessions to safeguard participants' psychological well-being and to intervene if any emotional distress arose (Ellis & Diantara Sampe, 2022; Qoyyimah et al., 2021).

## RESULTS AND DISCUSSIONS

This study involved 50 sixth-semester nursing students from Universitas Muhammadiyah Surakarta. The respondents were aged between 20 and 22 years, with the majority being 21 years old on average. In terms of gender distribution, 33 respondents (66%) were female and 17 respondents (34%) were male.

### Respondent Characteristics

A total of 50 sixth-semester students from the Nursing Study Program at Universitas Muhammadiyah Surakarta participated in this study. All respondents were aged between 20 and 22 years (100%), and the majority were female (66%). This is consistent with findings by Amalia et al. (2023) who reported a predominance of female students among final-year nursing cohorts.

**Table 1.** Respondent characteristics (n=50)

| Characteristic  | Frequency (n) | %   |
|-----------------|---------------|-----|
| Age 20-22 years | 50            | 100 |
| Female          | 17            | 34  |
| Male            | 33            | 66  |

### Pretest and Posttest Results

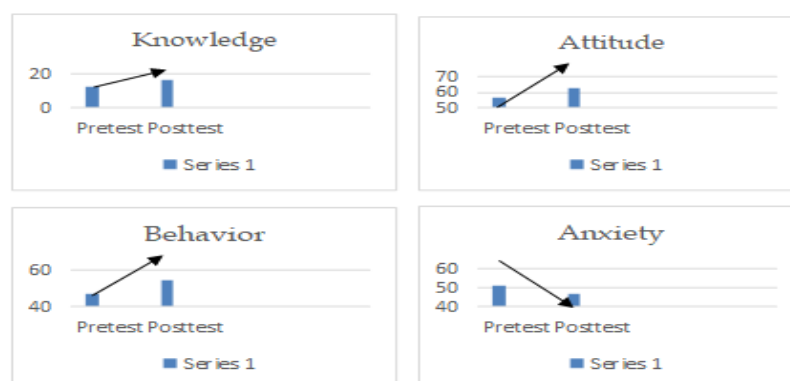
The average scores for students' knowledge, attitudes, and behaviors significantly increased after receiving health education through peer counseling. In addition, the anxiety scores, measured using the State-Trait Anxiety Inventory - Trait (STAI-T), showed a significant decrease from the pretest to the posttest phase.

**Table 2.** Mean pretest-posttest scores and statistical test results (n = 50)

| Variabel         | Pretest (Mean $\pm$ SD) | Posttest (Mean $\pm$ SD) | p-value |
|------------------|-------------------------|--------------------------|---------|
| Knowledge        | 12.72 $\pm$ 4.4         | 16.74 $\pm$ 2.5          | 0,001   |
| Attitude         | 56.92 $\pm$ 8.4         | 63.18 $\pm$ 6.6          | 0,001   |
| Behavior         | 47.32 $\pm$ 13.0        | 54.40 $\pm$ 14.3         | 0,001   |
| Anxiety (STAI-T) | 50.98 $\pm$ 4.15        | 46.60 $\pm$ 18.24        | 0,001   |

Source: Paired Sample t-Test and Wilcoxon Signed Rank Test, significance at  $p < 0.05$

All improvements were statistically significant ( $p < 0.05$ ). In practical terms, the mean anxiety reduction of 4.38 points corresponds to a shift from severe to moderate anxiety levels for most participants, while knowledge scores improved by approximately 32%, indicating enhanced cognitive understanding of coping strategies. Attitude and behavior scores also rose by 11% and 15%, respectively, showing positive affective and behavioral adaptation after the intervention.



**Figure 1.** Attitude and behavior scores also rose by 11% and 15%, respectively, showing positive affective and behavioral adaptation after the intervention

### Anxiety Level Categories

The distribution of respondents based on anxiety level categories also changed after the intervention. Before the intervention, most students fell into the moderate to severe anxiety categories. After the peer counseling sessions, the proportion of students in the moderate anxiety category increased, while those in the severe category decreased indicating a shift toward better emotional regulation.

**Table 3.** Distribution of student anxiety levels (n = 50)

| Anxiety Level | Pretest (n, %) | Posttest (n, %) |
|---------------|----------------|-----------------|
| Mild          | 1 (2%)         | 1 (2%)          |
| Moderate      | 18 (36%)       | 37 (74%)        |
| Severe        | 31 (62%)       | 12 (24%)        |

These findings strengthen the results from Pratiwi et al. (2024), which showed that nursing students at UMS typically experience mild to moderate anxiety before clinical exams. They also support research by Rosyid et al. (2023) which demonstrated the significant impact of anxiety on students' sleep quality.

Overall, the results of this study indicate that peer counseling is effective in improving students' knowledge, attitudes, and behaviors while simultaneously reducing their anxiety levels both in terms of average scores and anxiety category distribution. These findings are consistent with those of Qoyyimah et al. (2021) and Ellis & Sampe (2022) which highlighted the effectiveness of peer counseling in supporting student mental health. They also align with international evidence that reports the contribution of peer counseling to psychological well-being (Haiyan & Baki, 2024; Richard et al., 2022).

### Gender Differences

When analyzed by gender, both male and female students demonstrated improvements across all variables; however, female students exhibited slightly greater reductions in anxiety scores (mean difference = 4.55) compared to males (mean difference = 3.90). Although this difference was not statistically significant ( $p = 0.114$ ), the trend suggests that female students may respond more strongly to emotional and social support-based interventions, consistent with findings by Gustina et al. (2023), who noted gender-based variation in coping styles and emotional openness.

### Relationship between Variables

Correlation analysis revealed significant relationships between knowledge, attitude, behavior, and anxiety levels. Higher knowledge was positively correlated with more adaptive attitudes ( $r = 0.62$ ,  $p < 0.01$ ) and behaviors ( $r = 0.58$ ,  $p < 0.01$ ). Moreover, improved behavior scores were inversely correlated with anxiety levels ( $r = -0.55$ ,  $p < 0.01$ ), suggesting that students who practiced more positive coping behaviors experienced lower anxiety. This supports the theoretical framework of peer counseling, in which psychoeducation enhances cognitive understanding, leading to behavioral regulation and emotional stability.

### Discussion

The results of this study indicate that health education through peer counseling has a significant impact on improving the knowledge, attitudes, and behaviors of nursing students, as well as reducing their levels of anxiety. The improvements in cognitive and affective domains demonstrate that peer counseling not only helps students understand information but also fosters positive changes in attitudes and behaviors. The reduction in the average anxiety score from 50.98 to 46.60, along with the decrease in the proportion of students with severe anxiety from 62% to 24%, reinforces the effectiveness of this intervention as a non-pharmacological strategy for supporting students' mental health.

These findings are in line with the study by Amalia et al. (2023) which found high anxiety levels among final-year nursing students. Similarly, Aprilya Fransiska et al. (Aprilya Fransiska et al., 2024) identified various internal and external factors influencing academic anxiety. Madinah et al. (2023) also reported a connection between anxiety and academic fatigue among medical students, highlighting the broad impact of anxiety on academic well-being. Therefore, interventions targeting students' psychological aspects, such as peer counseling, are particularly relevant (Wakhyudin et al., 2020).

According to Social Support Theory (Cohen, S., & Wills, 1985), the emotional and informational support exchanged in peer counseling acts as a *buffer* against stress by altering cognitive appraisals of threat. Students reinterpret academic challenges as manageable rather than overwhelming, reducing physiological arousal and anxiety. Meanwhile, Social Learning Theory (Bandura, 1977), explains that students model adaptive coping strategies observed from their peers. Witnessing successful stress management among fellow students fosters self-efficacy and behavioral change. From a Cognitive Behavioral perspective (Beck, 1976), peer discussions facilitate the restructuring of irrational beliefs—such as fear of failure or perfectionism—into more balanced thoughts, thus directly reducing anxiety responses.

Previous studies also support the effectiveness of peer counseling. Qoyyimah et al. (2021) reported that peer counseling played a role in enhancing the mental health of adolescents in orphanages by increasing their self-confidence. Ellis dan Sampe (2022) found that peer counseling helped reduce stress among students undergoing thesis supervision. Hapes et al. (2024) emphasized that student participation in peer mentoring programs could reduce academic anxiety, while Gustina et al. (2023) identified a significant relationship between peer support and anxiety levels among final-year students. Internationally, Richard et al. (2022) in their literature review confirmed that peer support effectively improves young adults' mental health, and Haiyan & Baki (2024) underscored the potential of peer counseling in enhancing student well-being.

The integration of peer counseling based health education within university programs can systematically support student mental health. Universities can train selected senior students as *peer facilitators* in collaboration with counseling units or mental health lecturers. Regular group sessions especially before high-stress periods such as examinations or clinical practice can serve as preventive measures to maintain psychological well-being. Implementing such peer-led support systems is cost-effective, culturally acceptable, and sustainable in academic environments, as demonstrated in previous studies (Haiyan & Baki, 2024; Richard et al., 2022).

Local findings from Universitas Muhammadiyah Surakarta further strengthen the results of this study. Arum Pratiwi dkk. (2024) reported that most nursing profession students at UMS experienced mild to moderate anxiety before facing the OSCE examination. Fahrur Nur Rosyid dkk.(2023) added that student anxiety was closely related to sleep quality. This research complements those findings by demonstrating that peer counseling interventions can reduce anxiety among nursing students, particularly in the UMS environment.

Furthermore, the present study aligns with several findings from the *Berita Ilmu Keperawatan* (BIK) journal at UMS. Dewi et al. (2022) showed that Progressive Muscle Relaxation effectively reduced anxiety in asthma patients, proving the effectiveness of non-pharmacological interventions in clinical settings. Fitriani et al. (2022) identified that psychosocial predisposing and precipitating factors influence the emergence of mental health problems in schizophrenia patients, supporting the crucial role of psychosocial elements in mental health interventions. Sulasmi et al. (2022) highlighted that online health promotion was effective in boosting mental immunity and preventing psychosocial disorders. Together, these studies support the value of educational and psychosocial support strategies, such as peer counseling, as viable alternative interventions for students (Paputungan et al., 2018).

The uniqueness of this study lies in its use of a one-group pretest-posttest quasi-experimental design, which not only assessed anxiety but also measured students' knowledge,

attitudes, and behaviors after the intervention. This provides a more comprehensive understanding of the benefits of peer counseling. In addition, this research contributes to enriching the literature in Indonesia, where empirical studies on peer counseling for nursing students are still limited.

Practically, the findings recommend that peer counseling be included as part of academic support programs in nursing higher education institutions. This intervention can serve as both a promotive and preventive strategy to support student mental health, especially during high-pressure academic periods such as clinical practice and OSCE examinations. Academically, this study strengthens the empirical evidence for the effectiveness of peer counseling and opens opportunities for further research with more robust designs, such as the inclusion of control groups or larger sample sizes.

## CONCLUSION

This study concludes that peer counseling-based health education effectively enhances knowledge, attitudes, and behaviors while significantly reducing anxiety levels among nursing students at Universitas Muhammadiyah Surakarta. The improvements observed were both statistically and practically meaningful, demonstrating that peer counseling can serve as a promotive and preventive mental health strategy in academic settings.

The mechanism underlying these effects is supported by psychological theories, suggesting that peer counseling fosters emotional support, cognitive restructuring, and social learning, which collectively decrease anxiety. However, this study has several limitations, including the absence of a control group, reliance on self-reported data that may introduce response bias, and the relatively short intervention duration without long-term follow-up. Future studies are recommended to employ randomized controlled designs, larger and more diverse samples, and longitudinal follow-up assessments to validate and expand the present findings. Despite these limitations, the results strongly indicate that structured peer counseling-based health education can be systematically applied in universities to promote student well-being and resilience in facing academic challenges.

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