

THE EFFECTIVENESS OF ADOLESCENT ANXIETY MANAGEMENT EDUCATION: MICRO-CLASSROOM AND AUDITORIUM COMPARISON

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ABSTRACT

Middle adolescence is highly vulnerable to academic stressors that precipitate anxiety, overthinking, and sleep disturbance. A school-based screening at a public junior high school in Bandung revealed that 58.8% of ninth-grade students experienced mild-to-severe anxiety, characterized by persistent worry (48.8%), cognitive rumination (34.1%), and insomnia (37.4%). This study evaluated a youth-centered anxiety management intervention, emphasizing how physical spatial configuration may influence cognitive absorption and knowledge retention. A quasi-experimental, one-group pre-test/post-test design was conducted with 212 ninth-grade students. The 60-65-minute intervention integrated education on uncertainty-induced anxiety with immediate psychomotor training in grounding and deep breathing exercises. Data were analyzed using the Wilcoxon Signed-Rank Test, stratified by intervention setting. Overall knowledge scores improved significantly from 85.66 to 91.13. However, stratification by intervention setting revealed divergent outcomes: micro-classroom cohorts (Classroom 9C: $p = 0.018$; Classroom 9D: $p < 0.001$) demonstrated statistically significant improvements, whereas the large auditorium cohort ($n = 101$, all female) showed statistical stagnation ($p = 0.410$). This stagnation was strongly influenced by a ceiling effect, reflected in 77.2% unchanged scores among female students with high baseline knowledge (mean = 90.69), compounded by acoustic constraints and class congestion. Conversely, micro-classroom settings may have supported psychological safety and engagement among male cohorts. Physical spatial configuration may influence the effectiveness of school-based mental health education. Future school-based mental health protocols should prioritize micro-classroom clustering where feasible and transition advanced cohorts from written cognitive assessments toward longitudinal psychomotor and clinical outcome metrics.

Keywords: Adolescent Mental Health, School Health Nursing, Spatial Configuration, Anxiety Management, Youth-Centered Approach, Grounding Exercises.

1. INTRODUCTION

Adolescence represents a critical developmental transition characterized by rapid bio-psycho-social-spiritual changes that render this population uniquely vulnerable to psychological distress (Backes & Bonnie, 2019; Lerner et al., 2018; Mastorci et al., 2024; World Health Organization,

2025). Globally, the prevalence of adolescent anxiety exhibits a documented upward trend, with UNICEF (2021) reporting that anxiety disorders affect more than 13% of adolescents worldwide. In Indonesia specifically, this trajectory is further influenced by contemporary digital socio-environmental pressures and post-pandemic learning parameters, which correlate with elevated academic stress (Miko et al., 2024; Muassomah et al., 2025; Sinaulan et al., 2026). Chronic, unmitigated anxiety impairs executive cognitive functions, reduces academic performance, and increases vulnerability to depressive disorders in adulthood (Songco et al., 2020; Walter et al., 2020). These trajectories necessitate implementation of structured, evidence-based mental health frameworks directly within school ecosystems.

The execution of these preventive frameworks, however, is frequently limited by institutional resource constraints within school-based mental health infrastructures (Brown & Carrington, 2025; Doğan, 2026; Kessel Schneider et al., 2026). School guidance and counseling personnel often manage disproportionate student-to-staff workload ratios, which structurally restricts their operational scope to reactive disciplinary intervention rather than proactive, systematic mental health programming (Khamala et al., 2025; Whitaker et al., 2019). Furthermore, existing school-based health education initiatives often rely on conventional, lecture-based methods that are seldom evaluated using standardized, empirically validated instruments (Dapari et al., 2022; Lu et al., 2026). This operational gap leaves adolescents without practical coping knowledge despite high symptom recognition.

Ninth-grade students represent a particularly critical cohort within secondary education due to the convergence of developmental transitions with immediate academic stressors, including graduation requirements, standardized examinations, and secondary school admission transitions (Blossom et al., 2020; Grummitt et al., 2025). These circumstances underscore the importance of school-based interventions that can provide adolescents with actionable knowledge and coping strategies within their existing educational environment.

However, an underexplored dimension in school health nursing literature concerns how physical spatial configurations may influence educational absorption and knowledge retention. Existing interventions rarely compare outcomes across different environmental settings, representing a critical gap given that adolescents' cognitive engagement, psychological safety, and peer interaction dynamics vary substantially between intimate classroom settings and large, congested auditoriums. This study was designed to evaluate the efficacy of a Youth-Centered anxiety management protocol among ninth-grade adolescents at a public junior high school in Bandung by examining pre- and post-intervention changes in cognitive knowledge and whether outcomes differed between homogeneous micro-classrooms and a large, heterogeneous auditorium setting. Through this comparative paradigm, the study aims to deliver a distinct empirical contribution to the advancement of School Health Nursing practices and spatial intervention designs in Indonesia.

2. PROBLEM AND RESEARCH QUESTIONS

Ninth-grade students represent a particularly critical cohort within secondary education due to the convergence of developmental transitions with immediate academic stressors, including graduation requirements, standardized examinations, and secondary school admission transitions (Blossom et al., 2020; Grummitt et al., 2025). A baseline community health assessment conducted among ninth-grade students at a public junior high school in Bandung utilizing the Mini Mindhear Youth Scale (N = 211) provided empirical evidence of these vulnerabilities. The diagnostic screening indicated that 31.3% of the assessed population experienced mild anxiety, while 27.5% met the criteria for severe anxiety.

Analysis of the screening data indicates that this widespread psychological distress occurs within a context of transitional stressors and intolerance of uncertainty. Specifically, 48.8% of the respondents reported persistent somatic and psychological manifestations of anxiety, including chronic worry, muscle tension, restlessness, and acute palpitations regarding future events. These manifestations directly interfere with functional outcomes; 34.1% of the students reported pervasive overthinking loops, and 37.4% experienced subjective insomnia alongside diminished concentration during academic activities. Cross-tabulation further revealed a reinforcing cycle: 82.3% of the students within the anxious cohort reported daytime somnolence due to sleep fragmentation, with 68.4% of that subgroup exhibiting secondary emotional distress and heightened irritability.

The assessment data also identified a distinct behavioral paradox: 77.2% of the students within the anxious cohort possessed high critical self-awareness, explicitly recognizing that their degraded sleep quality compromised their physical and cognitive health. This finding demonstrates that although the target population maintains high symptom recognition, they lack the actionable capacity or adaptive coping strategies required to disrupt the cycle of anxiety. To address this specific capacity deficit, the parameters of this study were intentionally directed toward the domain of cognitive anxiety management literacy, rather than the measurement of transient anxiety scores. Therefore, this study sought to examine changes in cognitive knowledge before and after the Youth-Centered anxiety management intervention and to determine how physical spatial configurations, specifically homogeneous micro-classrooms versus a large auditorium setting, may influence educational absorption and knowledge retention among ninth-grade adolescents.

3. LITERATURE REVIEW

Under the PRECEDE-PROCEED framework formulated by Lawrence Green, the cognitive knowledge domain operates as a primary predisposing factor required to initiate and sustain health behavior modification. School-aged adolescents remain vulnerable to prolonged anxiety cycles largely due to a lack of actionable health literacy regarding adaptive coping mechanisms. Optimizing cognitive comprehension and integrating structured psychomotor simulations establishes a foundation for adaptive coping, which supports long-term, self-directed reductions in anxiety levels. Consequently, this study prioritizes cognitive literacy as the measurable intermediate outcome that precedes sustained behavioral change. This study prioritizes cognitive literacy outcomes over transient anxiety scores because: (1)

knowledge shifts represent stable, immediately measurable outcomes, whereas clinical anxiety downregulation demands weeks of longitudinal behavioral practice; and (2) measuring anxiety immediately post-education introduces confounding bias from daily environmental triggers (academic testing, grading schedules), which obfuscates true intervention efficacy.

To address these operational and methodological constraints, a School Health Nursing model utilizing a Youth-Centered Approach provides an intervention framework that integrates cognitive literacy with immediate psychomotor skill acquisition (Akbari et al., 2025; Morgado et al., 2022; Vogelaar et al., 2024). Designed as a direct countermeasure to the somatic palpitations, overthinking, and insomnia identified in the Bandung cohort, this program pairs conceptual education on uncertainty-induced anxiety with practical training in Deep Breathing Exercises and Grounding Exercises. Neurobiologically, these dual modalities are shown to stimulate vagal pathways, inducing a parasympathetic shift that reduces heart rates and disrupts active overthinking circuits (Harvard Edu, 2021; Koniver, 2024).

However, an underexplored dimension in school health nursing literature concerns how physical spatial configurations may influence educational absorption and knowledge retention. Existing interventions rarely compare outcomes across different environmental settings; a critical gap given that adolescents' cognitive engagement, psychological safety, and peer interaction dynamics vary substantially between intimate classroom settings and large, congested auditoriums.

Through this comparative paradigm, the study aims to deliver a distinct empirical contribution to the advancement of School Health Nursing practices and spatial intervention designs in Indonesia.

4. METHODS

This study applied a comprehensive community nursing process framework operationalized through a quasi-experimental, one-group pre-test and post-test design. Due to institutional scheduling constraints and school-based logistics, the single anxiety management intervention was delivered across three distinct physical settings: one large auditorium (female students) and two micro-classrooms (male students). Post-hoc analysis revealed differential effectiveness across settings, driven by baseline data characteristics and spatial configuration variables. Conducted at a public junior high school in Bandung, Indonesia, from May 18 to May 25, 2026, the investigation explicitly analyzed how physical spatial configurations and temporal sequencing may influence cognitive absorption and immediate knowledge retention regarding adolescent anxiety management. The target population encompassed all ninth-grade students at the institution, yielding a final sample of 212 respondents through a total sampling technique that included all individuals present for both the baseline screening and the active intervention phases. The initial anxiety screening included 211 students, while 212 students were present and participated in the subsequent educational intervention.

The structural evaluation within this design examined the relationship between a manualized independent intervention and its immediate cognitive outcomes. The independent variable consisted of a standardized adolescent anxiety education protocol integrated with immediate psychomotor simulations of somatic relaxation techniques, specifically Deep Breathing

Exercises and a 5-senses Grounding Exercise. The dependent variable was defined as the students' cognitive anxiety management literacy, evaluating four core domains: conceptual definitions, somatic-cognitive symptom identification, psycho-physical impacts, and adaptive coping mechanisms. To ensure alignment between the educational content and the evaluative metrics, the pre-test and post-test questionnaires were investigator-developed based on the educational material delivered during the intervention. The questionnaire items were reviewed and approved by faculty with expertise in community health nursing prior to field implementation.

The field protocol began with an initial situational assessment involving school counselor interviews, followed immediately by an objective screening utilizing the standardized Mini Mindhear Youth Scale via digital forms. The resulting dataset confirmed a community nursing diagnosis of an anxiety-coping knowledge deficit across the ninth-grade cohort. To eliminate inter-educator bias and maintain high intervention fidelity, a uniform curriculum was established, and all field facilitators underwent intensive briefing to align pedagogical delivery and psychomotor instruction methods. The active intervention was subsequently executed across a uniform 60 to 65-minute session, allocating 10 minutes for pre-test completion, 30 minutes for didactic instruction on anxiety and the intolerance of uncertainty, 10 to 15 minutes for an interactive Q&A, and 10 minutes for post-test evaluation. During the psychomotor grounding simulation, candy was distributed to provide tactile and gustatory stimuli for immediate sensory anchoring.

To maximize psychological safety zones and accommodate institutional scheduling, the intervention was structurally segregated by gender and integrated with an adolescent reproductive health curriculum, which directly established the physical and temporal spatial contrast of the study. The female cohort ($n = 101$) was assigned to a large, mass heterogeneous auditorium setting where, due to macro-environment sequencing, an ice-breaking session and the reproductive health lecture were delivered immediately post-anxiety module, introducing a mandatory post-intervention time delay buffer before the post-test was administered. Conversely, the male cohort ($n = 111$) was partitioned into a homogeneous micro-classroom configuration, divided into Classroom 9C ($n = 61$) and Classroom 9D ($n = 50$). In these micro-settings, the male respondents completed the post-test immediately following the anxiety discussion, entirely eliminating any post-intervention time-delay buffers. The educational content and core delivery protocol were standardized across settings, while the physical environment, gender composition, and temporal sequencing differed between groups.

Following data collection, analysis was executed using SPSS software through a two-stage statistical matrix. Given the sample size ($N = 212$), data distribution normality for the pre-to-post score differentials was evaluated using the Kolmogorov-Smirnov test with a Lilliefors significance correction. The diagnostics indicated that the global score differentials were non-normally distributed ($D(212) = 0.358, p = 0.000$), a pattern consistent across isolated spatial sub-groups for the Auditorium ($D(101) = 0.398, p = 0.000$), Classroom 9C ($D(61) = 0.320, p = 0.000$), and Classroom 9D ($D(50) = 0.320, p = 0.000$). Consequently, hypothesis testing was shifted to non-parametric inferential statistics utilizing the Wilcoxon Signed-Rank Test. Efficacy and

spatial variance were analyzed by isolating the dynamics of value shifts; categorized into Negative Ranks, Positive Ranks, and Ties; allowing for the precise detection of potential statistical ceiling effects across the environmental cohorts. The entire study adhered strictly to nursing research ethics by fulfilling the principles of autonomy through informed consent, beneficence through the utility of the intervention, and confidentiality through an anonymous data-logging system.

5. RESULTS AND DISCUSSION

a. Results

Demographic analysis of the 212 ninth-grade respondents at a public junior high school in Bandung confirmed equal and homogenous sample representation across all classroom origins (9A to 9G), with percentages ranging tightly between 13.2% and 15.1% per class. The baseline epidemiological and sociological characteristics of the respondents, categorized by age and biological sex, are presented in detail in Table 1.

Table 1. Frequency Distribution of Respondents' Demographic Characteristics (n = 212)

Demographic Characteristic	Frequency (f)	Percentage (%)
Age		
14 Years Old	17	8,0
15 Years Old	158	74,5
16 Years Old	35	16,5
17 Years Old	2	0,9
Biological Sex		
Male	111	52,4
Female	101	47,6
Total	212	100

The epidemiological manifestation in Table 1 indicates a profound concentration within the middle adolescent developmental phase, where 15-year-olds constitute the absolute majority (74.5%). From a developmental psychology perspective, this age dominance signifies that the vast majority of respondents are navigating an emotional transition period that renders them highly vulnerable to academic stressors and institutional adaptation challenges. Concurrently, the biological sex parameter exhibits a well-balanced distribution between male (52.4%) and female (47.6%) cohorts.

In field implementation, these demographic parameters of sex and age were closely intertwined with the spatial and temporal logistics of the intervention setup. All female students (n = 101) were clustered macroscopically in the main Auditorium (Ruang Aula), which introduced a time-delay buffer during administration. Conversely, male students (n = 111) were distributed into smaller, homogenous classroom environments: Classroom 9C (n = 61) and Classroom 9D (n = 50). This dualistic spatial configuration forms the analytical foundation for evaluating the youth-centered anxiety education intervention, measured through the shift between pre-test and post-test scores detailed in Table 2.

Table 2. Descriptive Distribution of Pre-test and Post-test Knowledge Scores by Intervention Setting (n = 212)

Intervention Setting	Evaluation Stage	Mean	Minimum Score	Maximum Score
Auditorium (n=101)	Pre-test	90,69	40	100
	Post-test	91,49	20	100
Classroom 9C (n=61)	Pre-test	81,64	20	100
	Post-test	87,67	40	100
Classroom 9D (n=50)	Pre-test	80,40	20	100
	Post-test	94,40	40	100
Overall Aggregate (n=212)	Pre-test	85,66	20	100
	Post-test	91,13	20	100

Referring to the descriptive overview in Table 2, the macro-level data demonstrates an overall aggregate increase in mean cognitive knowledge from a baseline of 85.66 to a post-intervention score of 91.13. However, deconstructing this data by setting reveals a stark baseline variance across groups prior to the intervention. The female cohort in the Auditorium already possessed remarkably high initial pre-test scores (mean = 90.69), sitting significantly above the baseline averages of their male peers in Classroom 9C (81.64) and Classroom 9D (80.40). Following the intervention, all settings exhibited upward trajectories in mean scores, with Classroom 9D demonstrating the most dramatic surge; a 14.00-point jump; to secure the highest post-test average (94.40).

To determine the statistical significance of these cognitive shifts, a non-parametric *Wilcoxon Signed-Rank Test* was executed. This analysis was strictly stratified by room configuration to isolate and eliminate the confounding effect of the skewed baseline data. The comparative inferential outcomes are structured in Table 3.

Table 3. Wilcoxon Signed-Rank Test Results of Knowledge Scores by Setting (n = 212)

Intervention Setting	Z-score	Asymp. Sig. (2-tailed)	Interpretation
Auditorium	-0,823	0,410	Not Significant ($p > 0,05$)
Classroom 9C	-2,370	0,018	Significant ($p < 0,05$)
Classroom 9D	-3,563	< 0.001	Highly Significant ($p < 0,001$)

As shown in Table 3, the negative sign of the Z-values consistently establishes the statistical directionality of the data, confirming that cognitive knowledge ranks were higher post-intervention. The comparative analysis validates that the educational intervention yielded a statistically significant knowledge expansion in Classroom 9C ($p = 0.018$) and a highly significant expansion in Classroom 9D ($p < 0.001$). Conversely, the cognitive trajectory within the Auditorium was statistically negligible ($p = 0.410$). Methodologically, these significance values strictly reflect

shifts within the domain of anxiety management literacy, rather than an immediate, direct clinical reduction in adolescent anxiety levels.

To dissect the statistical stagnation observed in the Auditorium, the analysis was diverted toward the underlying rank matrix distribution (Negative Ranks, Positive Ranks, and Ties), which is delineated in Table 4.

Table 4. Distribution of Pre-test and Post-test Score Shifts (Ranks) by Setting (n = 212)

Intervention Setting		Rank Shift Category	Frequency (f)	Mean Rank	Sum of ranks
Auditorium (n=101)		Negative Ranks	8	14,06	112,50
		Positive Ranks	15	10,90	163,50
		Ties	78		
Classroom (n=61)	9C	Negative Ranks	6	12,75	76,50
		Positive Ranks	19	13,08	248,50
		Ties	36		
Classroom (n=50)	9D	Negative Ranks	1	15,50	15,50
		Positive Ranks	20	10,78	215,50
		Ties	29		

The empirical matrix in Table 4 provides strong evidence that the statistical insignificance in the Auditorium was influenced by a ceiling effect. This phenomenon is clearly evidenced by the massive concentration of respondents within the Ties (unchanged scores) category in the Auditorium, encompassing 78 female students or 77.2% of that room's total sample. Because the majority of the Auditorium participants had already mastered the material at baseline (pre-test mean of 90.69), the statistical capacity to detect a meaningful upward deviation post-intervention was heavily constrained. This pattern stands in sharp contrast to Classroom 9C (36 Ties) and Classroom 9D (29 Ties), where lower baseline scores provided a broader margin for measurable growth. Consequently, the observed post-educational cognitive gains were more readily detected by the inferential analysis.

b. Discussion

On an aggregate level, the youth-centered health education initiative demonstrated positive outcomes, as evidenced by the increase in the overall mean knowledge scores from 85.66 to 91.13. However, when the data is stratified by physical environment, a stark divergence in operational efficacy emerges. While statistically significant improvements in knowledge were recorded within Classroom 9D ($p < 0.001$) and Classroom 9C ($p = 0.018$), the female cohort in the Auditorium exhibited no statistically significant change ($p = 0.410$). This finding does not imply that the intervention failed in the macro-setting; rather, it

highlights a critical interaction between baseline data capacity, gender-based developmental timelines, and the physical constraints of the educational environment.

It is methodologically important to underscore that all 212 respondents across the three settings received a completely uniform curriculum, manualized media, and practical simulations. Beyond the didactic exposition of the intolerance of uncertainty concept and somatic anxiety symptoms, all students actively participated in uniform psychomotor training. This involved evidence-based psychosocial coping strategies, specifically Deep Breathing Exercises and the 5-4-3-2-1 Grounding Exercise, which was augmented with commercial candy as an immediate sensory stimulus. According to Stuart's (2012) psychiatric nursing framework, anxiety triggers an immediate sympathetic nervous system response that induces physical symptoms such as palpitations, impaired focus, and insomnia. This pattern was reflected in the initial assessment, in which 77.2% of students in the anxious group demonstrated high self-awareness regarding the adverse effects of reduced sleep quality on their health.

Providing deep breathing and grounding exercises helps students develop adaptive coping mechanisms that stimulate the parasympathetic nervous system, which works to downregulate the autonomic stress response. Directly practicing these skills during the session helps lock the information into the students' long-term memory. These body-based coping strategies align with recent findings by Frausing et al. (2025), which show that deep breathing and grounding are the most practical, helpful, and low-barrier techniques for students managing school-related stress. Similarly, Khng (2023) notes that deep breathing exercises are easy to teach in a school setting and provide an immediate way for students to regulate their emotional and cognitive stress. Furthermore, a quasi-experimental study by Mahalakshmi (2024) proved that structured, daily deep breathing exercises lead to a significant drop in student stress levels compared to control groups. Aside from the physical benefits of the exercises, keeping the session interactive and student-focused creates a sense of psychological safety. This is supported by Lin & Chen (2024), who found that interactive learning activities designed for stress relief create a positive academic environment that promotes calm and reduces school anxiety. By combining active learning with practical applications, the program effectively optimized knowledge retention.

Despite the identical content delivered across all groups, the significant score increases in Classroom 9C and 9D highlight the clear advantages of a micro-classroom setup, particularly for male adolescents. This finding matches the results of school-based mental health programs by Anttila et al. (2021) and Onnela et al. (2021), where interactive, localized education effectively boosted student understanding. From a psychological standpoint, male adolescents often neglect mental health topics due to social barriers or traditional masculine norms (Barkley et al., 2026; Gwyther et al., 2019; Sheikh et al., 2025). However, delivering the standardized protocol within a smaller classroom scale effectively lowers these psychosocial barriers (Lisk et al., 2023).

The micro-spatial arrangement naturally promotes a comfortable, bidirectional communication loop, making it easier for the facilitator to maintain student engagement. The utility of flexible, student-centered

classroom spaces is supported by Kariippanon et al. (2019), who demonstrated that adaptive learning environments significantly increase peer interaction, collaboration, and active engagement compared to traditional, teacher-led setups. This interaction quality is further emphasized by Webb & Cullian (1983), who identified active interaction in small groups as a powerful predictor of learning achievement. They noted that unaddressed student inquiries within a large group can rapidly impede content retention. Within Classroom 9C and Classroom 9D, the small room size allowed the speaker to ensure every student query was thoroughly addressed, which optimized knowledge retention and drove the notable 14.00-point mean score increase observed in Classroom 9D.

Conversely, the non-significant statistical trajectory observed among the female students in the Auditorium ($p = 0.410$) represents an intriguing methodological paradox. This outcome initially appears to contradict standard macro-level school mental health initiatives, which typically yield robust knowledge improvements across adolescent cohorts (Heizomi et al., 2020; Zare et al., 2021). This statistical stagnation was strongly influenced by a ceiling effect, rather than an intervention failure. The Auditorium group entered the study with an exceptionally high baseline pre-test score (90.69). Because their starting scores were already close to perfect (100), the statistical margin to detect a post-test increase was inherently restricted. This ceiling is mathematically visible in the rank matrix, where 78 of the 101 Auditorium participants (77.2%) were classified as Ties (unchanged scores). This methodological explanation aligns perfectly with a meta-analysis by Traut et al. (2021) on cognitive training dynamics, which established a clear negative correlation between baseline ability and training gains; individuals who start with high baseline scores naturally show very narrow margins of improvement after an intervention.

The high initial knowledge observed among the female students may also be partly explained by differences in developmental timing and mental health literacy reported in previous research. Neurobiologically, female adolescents may experience earlier structural maturation of the prefrontal cortex, an area involved in emotional regulation and executive functioning, compared with male peers of the same age (Guazzelli Williamson et al., 2025; Roeske et al., 2025). This earlier maturity means that adolescent girls often possess better emotional literacy and mental health awareness from the start (Ahmed et al., 2024). This aligns with a study by Coles et al. (2016), which showed that female adolescents score significantly higher in mental health literacy than males, especially in identifying social anxiety and depression symptoms. One possible explanation is that female adolescents may have greater prior exposure to mental health terminology such as overthinking and anxiety through various media. Consequently, the foundational concepts delivered in the intervention were largely a reinforcement of existing knowledge, causing post-test scores to stabilize at the upper limit of the measurement scale.

Beyond gender and the ceiling effect, the physical environment of the Auditorium introduces an important structural variable. Gathering 101 students within a large, sprawling environment carries an inherent risk of acoustic distraction and dilutes the proximity of facilitator-student interactions. This environmental limitation is consistent with findings by Shalakha (2022), which show that high class congestion and crowded

physical environments disrupt how well students take in scientific information and reduce the smooth execution of practical curriculum components, ultimately capping cognitive outcomes.

Therefore, for future school community nursing interventions involving groups that already exhibit high baseline scores, the evaluation focus should shift away from written knowledge tests. Success indicators should instead prioritize psychomotor evaluation; such as tracking how correctly and frequently students practice relaxation techniques independently; along with long-term clinical outcomes, such as tracking actual reductions in chronic anxiety scores over time.

6. CONCLUSION

The implementation of a youth-centered health education initiative successfully enhanced overall student knowledge regarding anxiety management, as demonstrated by the increase in the aggregate mean score from 85.66 to 91.13. However, a localized analysis reveals that the program's cognitive efficacy differed across intervention settings, baseline data constraints, and gender-based developmental timelines. The intervention achieved statistically significant knowledge expansions within the micro-classroom settings of Classroom 9D ($p < 0.001$) and Classroom 9C ($p = 0.018$), where smaller student clusters may have supported bidirectional, student-focused communication. Conversely, the statistical stagnation observed in the Auditorium setting ($p = 0.410$) was not necessarily indicative of a failure of the curriculum, but was strongly influenced by a ceiling effect. The female cohort entered the study with an exceptionally high baseline score (90.69); potentially related to higher baseline mental health literacy and developmental differences reported in previous research; leaving minimal statistical margin for detectable post-test improvement. Additionally, physical crowdedness and acoustic challenges within the Auditorium further constrained the delivery of macro-level education.

Consequently, future school-based community nursing practices should abandon traditional, mass-lecture formats in favor of localized, micro-classroom configurations to mitigate psychosocial barriers and optimize student-focused engagement. Furthermore, for target populations demonstrating advanced baseline knowledge or exhibiting a ceiling effect, evaluative frameworks must shift away from basic written cognitive assessments. Success indicators for these advanced cohorts should instead prioritize psychomotor metrics; such as the objective accuracy and long-term frequency of self-directed relaxation practices; alongside the longitudinal tracking of actual clinical anxiety reductions over time.

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