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Integrative Nadi Sodhana and Self-Hypnosis Mind Body Intervention to Improve Self Esteem and Mindfulness Among Adolescents

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ABSTRACT

Introduction: Adolescents often face psychological challenges such as low mindfulness and self-esteem, which can increase their vulnerability to emotional distress. Nadi Sodhana Pranayama and Self-Hypnosis have been identified as mind–body techniques that may improve emotional regulation and self-perception, yet their combined effect in adolescent populations is understudied. Objective: This study aimed to examine the effectiveness of combined Nadi Sodhana Pranayama and Self-Hypnosis interventions in enhancing mindfulness and self-esteem among female adolescents.

Methods: We used a quasi-experimental nonequivalent control group structure. Purposive sampling identified forty-seven seventh-grade female students from the SMP Negeri Abiansemal; these students were split into treatment (n = 20) and control (n = 20) groups. Twice daily, for three straight days, the intervention consisted in ten minutes of Nadi Sodhana mixed with fifteen minutes of guided self-hypnosis. The five-facet mindfulness questionnaire (FFMQ) and Rosenberg Self-Esteem Scale (RSES) were used in pretest and post-test evaluations. T tests both paired and independent helped to examine the data. The STIKES Bina Usada Bali Ethics Committee (number 081/EA/KEPK-BUB-2025) gave ethical approval.

Results: The treatment group showed significant improvements in mindfulness ($p = 0.004$) and self-esteem ($p = 0.015$) compared with the control group. No significant changes were observed in the control group. The between-group effect size was moderate for mindfulness (Cohen's $d = 0.40$) and large for self-esteem (Cohen's $d = 0.96$), indicating the practical impact of the intervention.

Conclusion: The combination of Nadi Sodhana Pranayama and Self-Hypnosis is effective in enhancing mindfulness and self-esteem in adolescents. This approach is feasible for school-based mental health programmes.

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INTRODUCTION

Adolescence is one of the most important developmental phases in an individual's life and is characterized by significant physical, emotional, and social changes. In this phase, adolescents not only begin to form a self-identity but also learn to manage emotions, establish interpersonal relationships, and build social skills that will become the foundation for adulthood. However, this developmental process does not always occur smoothly. As they age, adolescents also face an increased risk of disease burden, especially related to mental health, sexual and reproductive health, and the risk of injury (1).

Adolescent mental health has become a global concern, mainly because of the low awareness of this issue. It is not uncommon for individuals with mental illness to be negatively stigmatized by their surroundings, which exacerbates their condition and becomes a major barrier to seeking help and recovery (2). Among the various factors that influence mental health, mindfulness and self-esteem are two important components that are closely related to social anxiety, specifically fear of negative evaluation (FNE) (2,3)

Mindfulness, defined as full awareness of the present experience without judgment, has been shown to contribute positively to an individual's psychological well-being. In many studies, the practice of mindfulness has shown a significant impact in reducing various forms of mental distress, such as anxiety, worry, and anger, by transforming maladaptive thought patterns into healthier and more adaptive responses(4). Furthermore, it was found that self-esteem fully mediates the relationship between mindfulness and positive affect in the context of mental health (5).

Self-esteem refers to an individual's assessment of themselves, which includes beliefs about ability and self-worth. A decline in self-esteem generally occurs during adolescence, especially during the transition phase from elementary school to secondary school. This is influenced by the increasing cognitive capacity of adolescents in evaluating themselves and their environment, as well as increasing awareness of the perceptions of others (6,7)

Various methods have been developed to improve mindfulness and self-esteem through psychotherapy, counseling, and interventions based on breathing techniques and hypnosis. One technique that has proven effective is nadi sodhana pranayama, an alternative breathing technique that has been used in yoga practices to reduce anxiety, improve autonomic nervous function, and increase emotional calmness and self-perception (8). Self-hypnosis is an intervention method that focuses on strengthening positive suggestions and relaxation through self-hypnosis techniques, which have proven to be effective in managing stress and improving concentration and self-confidence (9). However, the application of the combination of Nadi Sodhana and Self-Hypnosis in school settings has not been widely explored. While most existing studies have been conducted in clinical and therapeutic environments, evidence on its effectiveness in educational settings particularly among adolescent girls is still limited. Moreover, there is a lack of comparative research across different cultural and social contexts, which restricts the generalizability of current findings. Emphasizing cross-cultural perspectives and conducting replication studies in diverse adolescent populations could help establish the broader applicability and cultural adaptability of this integrative intervention model.

This condition becomes even more relevant when associated with the sociocultural context of Bali. The local culture that prioritizes balance in life through Tri Hita Karana (harmonious relationships between humans and God, others, and nature) provides a unique framework for understanding adolescents' psychological experiences. On the other hand, collectivist values and gender roles that are still strong also influence the self-perception and self-esteem of adolescent girls. Expectations of women's social roles, such as involvement in traditional traditions and family responsibilities, can shape or suppress their self-esteem.

Based on this background, this study was designed as basic research that aims to test the effectiveness of the combination of nadi sodhana and self-hypnosis on increasing mindfulness and self-esteem in adolescent girls at SMP Negeri Abiansemal. The results of this study are expected to make a theoretical contribution to the development of culture-based psychological interventions, and become the basis for designing programs to improve adolescent mental well-being in the school environment.

METHOD

Research Type

This work applied a quantitative methodology using a quasi-experimental design more especially, a non-equivalent control group design. Two nonrandomized groups a treatment group and a control group made up the study: To assess the changes both before and after the intervention, both groups received pre- and post-tests. Whereas the control group did not have any intervention, the treatment group got a mix of Nadi Sodhana Pranayama and Self-Hypnosis. Particularly in a school environment with ethical and pragmatic concerns, this methodology proved suitable to evaluate the impact of the intervention on two psychological variables, mindfulness and self-esteem

Population and Sample/Informants

All seventh-grade female students of SMP Negeri 3 Abiansemal made up the study's subjects. Using particular criteria, a method of purposive sampling was followed. Female teenagers who signed informed consent forms and shown good knowledge and verbal communication abilities were among the inclusion criteria. Participants missing any one of the intervention sessions constituted the exclusion criteria. Forty people in all were chosen and split equally into two groups: twenty for the control group and twenty for the treatment group.

Research Location

This study was conducted at SMP Negeri 3 Abiansemal, located in Badung, Bali. The research took place over athree month period, from March to May 2025.

Instrumentation or Tools

Two standardized and validated psychological instruments were used in this study.

Designed by Baer et al. (2006), the 39 items of the Five Facet Mindfulness Questionnaire (FFMQ) span five dimensions of mindfulness: observing, describing, acting with awareness, non-judging, and non-reactivity. Reliability and validity of this instrument have shown in teenage populations, notably in the Indonesian setting. (10,11)

RSES, or Rosenberg Self-Esteem Scale. Designed by Rosenberg (1965), this 10-item self-perception and global self-worth scale gauged Cross-culturally, the RSES has been verified and modified to fit use among Indonesian teenagers. (12,13)

Both instruments had undergone Bahasa Indonesia adaptation and validation in prior adolescent studies. The Cronbach’s alpha coefficients from Indonesian adolescent validation studies were 0.81 for the FFMQ (11) and 0.84 for the RSES (13), indicating acceptable internal consistency

Intervention Procedure

Under a planned approach, the intervention was given just to the treatment group. Participants were put in either the treatment or control group non-randomly. As baseline (pretest), both groups answered the Five Facet Mindfulness Questionnaire (FFMQ) and the Rosenberg Self-Esteem Scale (RSES). The intervention was carried out over three consecutive days, with participants in the treatment group practicing Nadi Sodhana Pranayama for approximately 10 minutes, followed by guided self-hypnosis using audio instructions for about 15 minutes (14). This practice was conducted twice daily once in the morning after waking and once in the evening before sleep. On the fourth day, all participants, including the control group, completed the posttest by retaking the FFMQ and RSES. The control group did not receive any intervention but participated in both pretest and posttest assessments

Data Collection Procedures

The data gathering went through various ordered phases. Coordination with the health research ethics committee and the school started first. All participants and their guardians then signed informed consent. Both groups finished the pretest applying the Rosenberg Self-Esteem Scale (RSES) and the Five Facet Mindfulness Questionnaire (FFMQ). The intervention was implemented exclusively for the treatment group over three days, while the control group received no treatment. On the fourth day, both groups completed the posttest using the same instruments. All

collected data were anonymized and coded to ensure participant confidentiality. The entire data collection process was directly supervised by the researchers, with assistance from the school's counseling teacher

Data Analysis

The data analysis took multiple phases. Starting with the baseline traits of the participants including age and number of siblings a descriptive study was conducted across the treatment and control groups. Normality and homogeneity testing then was conducted. Levene's test revealed that the variances were homogeneous ($p > 0.05$) while the Kolmogorov-Smirnov test verified that the data were generally distributed. These findings guided the later investigations using parametric tests. Within every group, a paired samples t-test was used to evaluate variations in mindfulness and self-esteem scores between the pretest and posttest. An independent samples t-test comparing the posttest scores of the treatment and control groups for both variables helped one ascertain the success of the intervention between groups.

Results were interpreted according to the following standards: if $p < 0.05$, the null hypothesis (H_0) was disproved, so indicating a notable impact of the intervention; if $p > 0.05$, the null hypothesis was accepted, so implying no substantial influence of the intervention. Every data analysis was carried out with SPSS for Windows, version 26.

Ethical Approval

Under protocol number 081/EA/KEPK-BUB-2025 the Health Research Ethics Committee of STIKES Bina Usada Bali approved this study ethically. Over the whole research procedure, several ethical standards were rigorously followed. Participants and their guardians completed informed permission both orally and in writing, therefore guaranteeing that they completely understood the aim and methods of the research. Coding and anonymizing all participant data helped to preserve confidentiality. All participants had the right to stop at any moment without facing any repercussions; participation in the study was totally voluntary. Furthermore, the intervention presented no danger since it was low-cost, noninvasive, and has been demonstrated to have psychological advantages, which makes it morally suitable for usage with teenage subjects.

RESULT

Participant Demographic Data

Table 1. Characteristics of respondents of control and treatment groups

Characteristics of respondents	Group	Mean±std	Data normality	Mann-Whitney
Age	Treatment	12,94 ± 0,373	<0.001	0,375
	Control	12,83 ± 0,453	<0.001	
Number of siblings	Treatment	3,05±0,987	<0.001	0,367
	Control	2,60±0,919	<0.001	

Particularly in terms of age and number of siblings, the demographic traits of the participants in this study were investigated to guarantee homogeneity between the treatment and control groups. The mean age of participants in the treatment group was 12.94 years (SD = 0.373) according to the descriptive analysis; in the control group it was 12.83 years (SD = 0.453). In the treatment group the mean number of siblings was 3.05 (SD = 0.987; in the control group it was 2.60 (SD = 0.919). The Kolmogorov-Smirnov normality test showed that the data in both groups were not normally distributed for both variables ($p < 0.001$); hence, the analysis moved on with the non-parametric Mann-Whitney test. For either the age variable ($p = 0.375$) or the number of siblings ($p = 0.367$), the outcomes revealed no statistically significant variations between the treatment and control groups. These results imply that both groups had similar demographic traits, hence homogeneous and appropriate for comparison to assess the success of the intervention.

Table 2. Comparison of Pretest Scores Between Treatment and Control Groups

Variable	Group	Mean±std	Kolmogorov-Smirnov	Uji Levene's	t score	*Independent Samples t-test*
Mindfulness (FFMQ)	Treatment Pretest	3.23± 0.36	0.083	0,960	0,714	0,478
	Control Pretest	3.19±0.38	0.099			
Self Esteem (RSE)	Treatment Pretest	23.97 ±4.41	0.108	0,491	-1,786	0,478
	Control Pretest	26.26±3.72	0.136			

With significant values ranging from 0.083 to 0.136 ($p > 0.05$), the normality test employing Kolmogorov-Smirnov revealed that the data in every group for the FFMQ and self-esteem measures were normally distributed. Moreover, Levene's test results revealed that for both variables the assumption of equal variance was satisfied with a significance value of 0.960 for FFMQ and 0.491 for self-esteem ($p> 0.05$). The pretest mean value of the treatment group for the FFMQ variable was 3.23 (SD = 0.36); in the control group it was 3.19 (SD = 0.38). With a value of $t (68) = 0.714$ and $p = 0.478$ the Independent Samples t-test findings indicated no appreciable variation between the two groups. With the t-test findings revealing $t (68) = -1.786$ and $p = 0.079$, the pretest mean of the treatment group was 23.97 (SD = 4.41) and the control group was 26.26 (SD = 3.72). It was decided that there was no appreciable variation between the two groups even although means differed; so, the significance value stayed above 0.05. Both groups thus had equal starting conditions before the intervention was started.

Table 3. Results of Descriptive Statistics and Paired Samples t-Test for FFMQ and Self-Esteem

Variable	Group	Mean±std	Data normality	Paired Samples t-Test	*Cohen's d*
Mindfulness (FFMQ)	Pretest Treatment	3.23± 0.36	0.083	0.033	0.68
	Posttest Treatment	3.36± 0.40	0.092		
	Pretest Control	3.19±0.38	0.099	0.988	-
	Posttest Control	3.21±0.35	0.134		
Self Esteem (RSE)	Pretest Treatment	23.97 ±4.41	0.108	< 0.001	0.79
	Posttest Treatment	27.49 ±3.06	0.137		
	Pretest Control	26.26±3.72	0.136	0.760	
	Posttest Control	24.37 ±3.42	0.126		

Based on the Kolmogorov-Smirnov test with a significance value over 0.05, the research revealed that every piece of data in every group was usually distributed. To find the variations between the pre-test and post-test in every group, a paired sample t-test was performed. Along with the Self Esteem variable from 23.97 ± 4.41 to 27.49 ± 3.06 ($p = 0.001$), which shows the efficacy of the intervention in enhancing mindfulness and self-esteem, the FFMQ variable in the treatment group showed a notable increase from 3.23 ± 0.36 to 3.36 ± 0.40 ($p = 0.033$). On the FFMQ ($p = 0.988$) and Self-Esteem ($p = 0.760$), the pretest and posttest showed no appreciable variation in the control group, so it can be inferred that substantial changes only occurred in the group that had treatment. The effect size analysis showed that Cohen's d was 0.68 for mindfulness and 0.79 for self-esteem in the treatment group, indicating a moderate to large practical impact of the intervention.

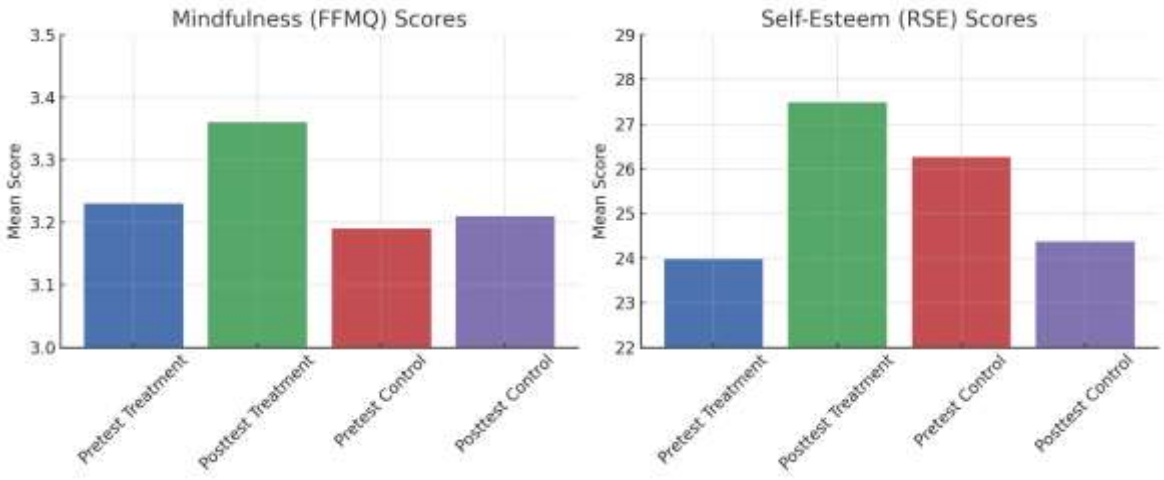

Figure 1 shows the pre-test and post-test scores of mindfulness (FFMQ) and self-esteem (RSE) in both the treatment and control groups. The treatment group exhibited a noticeable improvement in both variables after the intervention, whereas the control group showed minimal changes. This visual representation supports the statistical results indicating the effectiveness of the combined intervention of Nadi Sodhana and Self-Hypnosis in enhancing mindfulness and self-esteem among adolescents.

Table 4. Comparison of Posttest Scores Between Treatment and Control Groups

Variable	Group	Mean±std	Kolmogorov-Smirnov	uji Levene's	t score	*Independent Samples t-test*	*Cohen's d*
Mindfulness (FFMQ)	Posttest Treatment	3.36± 0.40	0.092	0.561	3.008	0.004	0.40
	Posttest Control	3.21±0.35	0.134				
Self Esteem (RSE)	Posttest Treatment	27.49 ±3.06	0.137	0.797	2.506	0.015	0.96
	Posttest Control	24.37 ±3.42	0.126				

The Kolmogorov-Smirnov test with a significance value > 0.05 revealed that the data on both variables, namely the Five Facet Mindfulness Questionnaire (FFMQ) and Self-Esteem, were normally distributed, thus satisfying the assumption of homogeneity of variance based on Levene's test (FFMQ = 0.561; Self-Esteem = 0.799). The independent t-test produced findings indicating notable variations between the treatment and control groups in both categories. With a significant value of p = 0.004, the treatment group for the FFMQ variable had a higher mean score (3.36 ± 0.40) than the control group (3.21 ± 0.35), with a Cohen's d of 0.40, indicating a moderate effect size. Similarly, with a significant value of p = 0.015, the treatment group also demonstrated a higher mean self-esteem score (27.49 ± 3.06) compared to the control group (24.37 ± 3.42), with a Cohen's d of 0.96, reflecting a large effect size. Consequently, the intervention proved successful in raising both awareness and self-esteem among adolescents in the treatment group.

DISCUSSION

Respondent characteristics

Examination of the demographic traits revealed that age and number of siblings were not significantly different between the treatment and control groups. Respondents in the treatment group averaged 12.94 ± 0.373 years; those in the control group averaged 12.83 ± 0.453 years. The treatment group had an average of 3.05 ± 0.987 persons for the number of siblings; the control group had 2.60 ± 0.919. The Mann-Whitney nonparametric test was carried out since the Kolmogorov-Smirnov normality test revealed that the data were not normally distributed ($p < 0.001$); so, age had $p = 0.375$ and number of siblings had $p = 0.367$. These results indicate that both groups were

demographically homogeneous. The quality of these baseline characteristics is important for ensuring the internal validity of the research results. A meta-analysis by (15,16) confirmed that the effectiveness of mindfulness-based interventions in adolescents is strongly influenced by equality variables such as age and social background. (17) also noted that family support and developmental age are critical success factors in mindfulness-based approaches. Similarly, (18) stated that the similarity in age between the control and treatment groups can strengthen the reliability of the intervention results.

Conceptually, 12-13 years of age is a transition period from late childhood to early adolescence, which is characterized by the development of self-reflection and introspection, which are important aspects for the acceptance of mindfulness interventions (16). Meanwhile, an equal number of siblings reflects similarity in family social support, which studies (19) have shown plays a role in the development of self-esteem and the effectiveness of psychological interventions.

Improvement in Mindfulness (FFMQ)

The results showed that the treatment group experienced a significant increase in Five Facet Mindfulness Questionnaire (FFMQ) scores compared to the control group (3.36 ± 0.40 vs. 3.21 ± 0.35; $p = 0.004$). This indicates that the combined intervention of Nadi Sodhana Pranayama (NSP) and Self-Hypnosis (SH) is effective in increasing mindfulness among adolescents. Increased mindfulness in this context can be explained through two main approaches: physiological regulation through breathing techniques, and cognitive-affective regulation through hypnosis.

Effectiveness of Pranayama on Emotion Regulation and Focus

Pranayama, particularly NSP or alternate-nostril breathing (ANB), has been shown to improve attentional function and reduce anxiety (20), showed that a pranayama intervention conducted during a short session at school could improve concentration and lower anxiety levels in elementary school-aged children. This study demonstrated the acute effects of simple and effective mindful breathing exercises.

Alternate-nostril breathing (ANB), such as Nadi Sodhana, has been shown to improve attention and reduce anxiety in adolescents by enhancing parasympathetic activity and promoting autonomic nervous system balance (21). In addition, a meta-analysis by (22,23), found that various breathing techniques, including ANB, have moderate effects on reducing stress and anxiety in the general population, including adolescents. By raising parasympathetic tone and lowering sympathetic activity, this exercise helps to balance the autonomic nervous system and therefore encourage a calmer physiological state (24).

A recent systematic review (25) also emphasized that ANB has the potential to reduce anxiety, especially when performed consistently over a period of time. They highlighted the importance of intensity and duration in achieving significant effects (26). Research by (27,28), showed that yoga, including pranayama, significantly improved emotion regulation and mindfulness in adolescents aged 13-18 years. This combined intervention produced synergistic physiological and psychological effects in strengthening nervous system balance as well as emotional responses (29).

Research in the US (30) also showed that 18 minutes of high-frequency yoga breathing can improve focus and reduce anxiety in pre-adolescent children (aged 11-12 years), strengthening the evidence for the effectiveness of pranayama. In addition, a meta-analysis (31,32) of yoga and mindfulness programs in school-aged children concluded consistent improvements in emotional control and cognitive aspects, particularly in students aged 10-17 years.

Effectiveness of Self-Hypnosis on Stress and Emotion Management

Self-hypnosis is a suggestion-based intervention that can be used to increase self-control, reduce stress, and overcome anxiety.(33), in an open-access article in the journal Pediatrics, stated that hypnosis is a safe and effective mind-body method for use in children and adolescents. This technique is useful for reducing the symptoms of psychosomatic disorders, improving sleep patterns, and increasing emotional resilience.

Furthermore, a meta-analysis by (34,35) showed that hypnosis has significant effects on addressing various psychological problems in children and adolescents, including anxiety, pain, and stress. The effects are medium-to long-term and can be maximized with structured approaches such as self-hypnosis.

Neuroscience Support: De-Automatization Process

In neuroscience, the combination of mindfulness, pranayama, and hypnosis supports the concept of de-automatization, which is a cognitive process in which automatic responses (such as emotional reactivity) are dismantled and replaced with more adaptive patterns of awareness.(36)emphasized that meditation and hypnosis can improve cognitive-emotional flexibility through this mechanism, which is in line with the improvement in mindfulness dimensions, such as acting with awareness and non-reactivity in the FFMQ.

Improved SelfEsteem

The results revealed that the self-esteem score in the treatment group (27.49 ± 3.06) was considerably higher than the control group (24.37 ± 3.42; p = 0.015), so verifying the efficacy of the combination of Nadi Sodhana Pranayama (NSP) and Self Hypnosis (SH) in boosting teenage self-esteem. Lack of notable changes in the control group confirms that the intervention directly caused this rise.

Effectiveness of Pranayama in Emotion Regulation and Focusing

The parasympathetic autonomic balance has been demonstrated to be improved and stress reactivity lowered by the NSP, or alternate-nostril breathing, approach. ANB sessions reportedly raised heart rate variability and lowered heart rate and blood pressure, therefore activating the parasympathetic system (37,38), This induces a sense of relaxation that helps one to accept themselves.

Empirical Support: Integrated Yoga & Mindfulness

These findings are in line with the results of a study(39)that reported improved self-esteem through integrated yoga modules including breathing exercises and self-acceptance.(40)also found that an online yoga and mindfulness program can improve adolescents' self-esteem by strengthening their self-acceptance and emotion regulation.

Controlled Trial: Pranayama and Mindfulness

Controlled trial studies by (27,41)reported that pranayama and mindfulness can strengthen self-concept and improve psychological and social balance.(41) also noted that combining pranayama and positive affirmations increases body awareness and self-acceptance.

Physiological Mechanisms & Clinical Hypnosis

The absence of significant changes in the control group reinforces the assumption that improvement was a direct result of the intervention. In terms of mechanisms, clinical hypnosis has been shown to strengthen self-esteem through ego-strengthening techniques and positive suggestions, which allows adolescents to build a healthy internal narrative and increase their self-confidence (42).

In addition to the suggestion effect, Nadi Sodhana helps calm the nervous system and activates the vagus nerve, which plays a role in relieving stress. This combination creates optimal conditions for internalization of positive suggestions from self-hypnosis. (41) also noted that the combination of pranayama and positive affirmations increases body awareness and self-acceptance. Similar findings were obtained (42) in a study on orphanage adolescents, where two weeks of yoga and Pranayama practice significantly improved self-esteem. (27) also emphasized that activation of the vagus nerve through pranayama supports emotional stability and a sustained increase in self-esteem.

Limitations and Cautions

Although this study shows how well an integrated intervention combining Nadi Sodhana Pranayama and Self-Hypnosis improves mindfulness and self-esteem among teenagers, many limits should be admitted. First, the study was carried out in a single school environment (SMP N Abiansemal), which limits the generalizability of findings to adolescents from broader and more diverse socio-cultural settings. Second, the brief duration of the intervention may affect the long-term sustainability of its psychological benefits. Third, although validated self-report instruments were used, reliance on subjective measures such as the FFMQ and Rosenberg Self-Esteem Scale may introduce bias, especially due to social desirability among adolescents. Lastly, the absence of long-term follow-up limits the understanding of the durability of outcomes. Future research should incorporate longitudinal designs and objective

physiological markers, such as cortisol levels or heart rate variability (HRV), to triangulate self-report findings and enhance the robustness of the evidence.

Recommendations for Future Research

To improve generalizability, future studies should take multi-site investigations taking different teenage groups under consideration. Furthermore advised are long-term benefits of integrated mind-body treatments using longitudinal designs with longer follow-up times. Moreover, objective physiological markers (e.g., heart rate variability, cortisol levels) should be included into next research to augment self-reported psychological results and enhance the knowledge of the fundamental processes. Examining the effectiveness of several combinations of breathing and suggestion-based techniques—e.g., pranayama against guided imagery or self-hypnosis against meditation—could also help one to maximize intervention strategies. Finally, including teachers or parents into the intervention process can improve its ecological validity and sustainability inside educational systems.

CONCLUSION

The treatment group's statistically significant higher mindfulness and self-esteem than the control group revealed in the analysis. Comparatively to the control group (3.21 ± 0.35; $p = 0.004$), the Five Facet Mindfulness Questionnaire (FFMQ) score in the group that got the combined intervention of Nadi Sodhana Pranayama and Self-Hypnosis was substantially higher (3.36 ± 0.40); This result suggests that, particularly in terms of mindfulness and emotional control in teenagers, the intervention is successful in enhancing emotional regulation and metacognitive awareness. Similar findings were also observed in the self-esteem variable, in which the treatment group obtained a considerably higher mean score (27.49 ± 3.06) than the control group (24.37 ± 3.42; $p = 0.015$). This suggests that the intervention enhanced individuals' positive self-perceptions. The lack of notable changes in the control group reinforces the conclusion that the improvements observed were a direct result of the combined intervention. Furthermore, the between-group effect size was moderate for mindfulness (Cohen's $d = 0.40$) and large for self-esteem (Cohen's $d = 0.96$), indicating that the intervention had not only statistical significance but also a meaningful practical impact**.**

Based on the findings of this study, it is suggested that the Nadi Sodhana Pranayama and Self-Hypnosis interventions should be considered complementary approaches in adolescent mental health promotion programs, particularly those focused on improving mindfulness and self-esteem. This practice can be integrated into school curricula or guidance and counseling programs as an inexpensive, easy, and evidence-based emotion-regulation technique.

In addition, further longitudinal research is needed to evaluate the long-term effects of the intervention and to explore its effects on other psychological variables such as social anxiety, academic stress, and emotional resilience. The development of digital or audio-guided modules is also recommended to expand the accessibility and sustainability of this exercise among adolescents.

AUTHOR'S CONTRIBUTION STATEMENT

Luh Putu Widiastini contributed to the study conception and design, data collection, analysis and interpretation, and drafting and finalizing the manuscript.

Putu Ayu Dina Saraswati contributed to the methodological framework, statistical analysis, and critical revision of the manuscript.

Ni Luh Putu Dian Yunita Sari contributed to the literature review, data interpretation, statistical analysis, and critical revision of the manuscript.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest regarding the publication of this manuscript.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

In the process of preparing this manuscript, the author utilized artificial intelligence (AI) tools, specifically ChatGPT and DeepL, to assist with syntactic structuring, lexical refinement, and sentence clarity, particularly in the Abstract, Introduction, and Discussion sections. These tools were used selectively and under the full supervision of the author to enhance readability and linguistic precision, without altering the originality of the research ideas, analysis, or interpretation. This disclosure reflects the authors' commitment to academic integrity, ethical publishing practices, and transparency in the responsible use of AI-assisted technologies in scientific writing.

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