Journal of Community Engagement in Health
https://jceh.org/ https://doi.org/10.30994/jceh.v9i1.788
ISSN: 2620-3758 (print); 2620-3766 (online) Vol. 9 No. 1 March. Page 94-102

Empowering Elementary School Children Through Yoga Pranayama Exercises: An Effort to Improve Emotion Regulation

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ABSTRACT
Adolescence is a transitional period between childhood and adulthood, marked by significant biological, psychological, and socio-cultural changes. One of the common issues during this stage is the inability to manage emotions effectively, which can increase the risk of mental disorders such as depression. Interviews with the principal and homeroom teacher at SDN 5 Dalung revealed that fourth- and fifth-grade students. engage in fights or bullying almost every day, reflecting low emotional regulation skills. One intervention that can be implemented is complementary therapy in the form of pranayama yoga. Pranayama yoga is a breathing technique that stimulates the release of endorphins, provides a calming effect, lowers blood pressure, and improves emotional stability. This community service activity was carried out on April 10-11, 2025, and involved 50 fourth- and fifth-grade students. Evaluation was conducted using the DERS-SF instrument (18 items) before and after the intervention. The results showed that before the intervention, 96% of students were in the high emotional regulation difficulty category. After the intervention, this percentage decreased to 66%, with 34% moving into the moderate category. The average DERS score also dropped significantly from 75.08 to 64.72, with a t-test result of t = 6.698 and p = 0.001, which is statistically significant. In conclusion, pranayama yoga has been proven effective in improving emotional regulation among elementary school students and can be used as a simple, safe, and applicable complementary approach to support mental health in schools.
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Keywords **:** Complementary Therapy, Emotional Regulation, Mental Health, Yoga Pranayama

Received : March 06, 2026
Revised : March 11, 2026
Accepted : March 31, 2026

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INTRODUCTION
Adolescence is a transitional stage from childhood to adulthood. Individuals aged 10 to 12 years are categorized as early adolescents, a critical developmental period marked by increased emotional sensitivity and vulnerability. (Hikmandayani et al., 2023). At this phase, various significant changes occur in the biological, psychological, and socio-cultural aspects according to the World Health Organization. One of the common challenges faced by teenagers

is related to psychological issues. (World Health Organization, 2024). Globally, mental health problems among adolescents represent a major public health concern. It is estimated that one in seven adolescents (10-19-year-olds) experiences a mental disorder, contributing to 15% of the global burden of disease in this age group. Depression, anxiety, and behavioral disorders are among the leading causes of illness and disability, while suicide ranks as the third leading cause of death among individuals aged 15–29 years. Failure to adequately address mental health conditions during adolescence can lead to long-term consequences, including impaired physical and mental health and reduced opportunities for a fulfilling life in adulthood (World Health Organization, 2025).

Indonesian National Adolescent Mental Health Survey (I-NAMHS) 2022 reported that one in three adolescents (34.9%), equivalent to 15.5 million Indonesian adolescents, had one mental health issue in the past 12 months. One in twenty adolescents (5.5%), equivalent to 2.45 million Indonesian adolescents, had one mental disorder in the past 12 months. Anxiety disorders are the most common mental health issues among adolescents (Indonesian National Adolescent Mental Health Survey). These findings indicate that a substantial proportion of adolescents may experience difficulties in emotional regulation, as emotional dysregulation is a key underlying factor in many mental health problems, particularly anxiety. (National Adolescent Mental Health Survey (I-NAMHS), 2022).

Teenagers need to have good emotional control through emotion regulation. Emotion regulation is the individual's ability to manage or control emotions. During adolescence, this ability is still developing, making individuals more vulnerable to emotional instability. Many teenagers cannot manage their emotions effectively, making them vulnerable to depression. (Firdauza & Tantiani, 2021). Poor emotional regulation is associated not only with depression but also with anxiety, interpersonal problems, maladaptive behavior, and difficulties in coping with stress. Teenagers who struggle to express their emotions accurately tend to get involved in problems, leading to suicidal intentions. In more severe conditions, emotional dysregulation may contribute to self-harm behaviors and suicidal ideation. Based on data from the Indonesian National Police (Polri), Bali ranks third in the highest number of suicide cases in Indonesia. From January 1 to July 20, 2023, a total of 61 suicide cases were found in Bali. (Amurwonegoro, 2023). This condition highlights the urgency of early interventions to strengthen emotional regulation in adolescents.

Efforts that support emotional regulation skills in adolescents need to be prioritized, including education for adolescents and their families on when and how to seek professional help for these issues. (National Adolescent Mental Health Survey (I-NAMHS), 2022). One potential and accessible approach is the use of complementary therapies, particularly pranayama yoga, to support emotional regulation development.

Breath control yoga (pranayama) is a breathing exercise technique that uses the diaphragm muscles, causing the chest to expand and the abdomen to rise slowly. With slow and regular breaths, it can help control emotions and thoughts, making them calmer, and the body more relaxed. (Lukmanulhakim & Agustina, 2018; Widiastini & Karuniadi, 2020, 2021). Physiologically, pranayama practice can stimulate the release of endorphins, which contribute to relaxation and emotional stability. Endorphins are neuropeptides produced by the body when it is relaxed and calm. One of the functions of this hormone is as a natural tranquilizer produced by the body, particularly by the brain, which can stimulate a sense of comfort and increase endorphin levels in the body to reduce blood pressure. (Sindhu, 2014).

This study was conducted at SD N 5 Dalung, located in Dalung, as it represents early adolescents in a structured school setting that allows effective implementation of preventive mental health interventions. Targeting this age group is essential to developing emotional regulation skills early and preventing more severe psychological problems in the future.

Therefore, this community service program focuses on emotional regulation as the primary variable, while anxiety is considered a related outcome. This program aims to evaluate the effectiveness of pranayama yoga in enhancing emotional regulation among early adolescents.

METHOD

This community service activity was conducted at SDN 5 Dalung in April 2025. The tools and materials used included a loudspeaker, laptop, LCD projector, pens, and notebooks. The implementation of this activity consisted of the following phases:

1. Pre-test phase

   A pre-test was administered using the *Difficulties in Emotion Regulation Scale – Short Form* (DERS-SF), which consists of 18 items. The assessment was completed within approximately 15 minutes in a classroom setting under the supervision of the community service team.

2. Implementation phase

   The intervention was conducted over two days, April 10–11, 2025, employing a combination of lectures, demonstrations, and role-playing methods. On the first day, the implementation team delivered educational material on emotion regulation and complementary therapy through yoga pranayama using a lecture format, followed by a question-and-answer session. Subsequently, participants engaged in guided yoga pranayama practice.

   a. The pranayama technique applied in this activity was *Bhramari Pranayama* (bee-buzzing breathing), characterized by the production of a soft humming sound during exhalation.
   b. The sessions were conducted in a quiet and comfortable classroom environment, with students seated in a relaxed position. Each session began with a brief relaxation phase (approximately 5 minutes), followed by the main breathing exercise (approximately 20 minutes), and concluded with a closing relaxation session (approximately 5 minutes), for a total duration of approximately 30 minutes.
   c. The steps of *Bhramari Pranayama* included: (1) sitting comfortably with eyes closed, (2) gently placing the fingers over the ears (or partially closing the ear cartilage), (3) inhaling slowly through the nose, (4) exhaling slowly while producing a soft humming sound resembling a bee, and (5) maintaining focus on the resulting sound and vibration. This cycle was repeated for approximately 5–10 rounds, depending on the students' comfort level.
   d. The instructor guided participants step-by-step, emphasizing slow breathing patterns, physical relaxation, and concentration to promote emotional calmness.

   On the second day, participants practiced yoga pranayama again through demonstrations and role-playing activities. Students performed *Bhramari Pranayama* independently in small groups, while facilitators provided corrections and feedback to ensure proper technique. This session also lasted approximately 30 minutes.

3. Post-test phase

A post-test evaluation was conducted on the second day following the pranayama practice, using the same DERS-SF questionnaire. The assessment was completed within approximately 15 minutes and administered immediately after the intervention.

The indicators for the questionnaire assessment include:

The *Difficulties in Emotion Regulation Scale – Short Form* (DERS-SF) consists of 18 items, with responses rated on a five-point Likert scale: Never (1), Rarely (2), Sometimes (3), Often (4), and Always (5). The total score is categorized into three levels: low (≤ 40), moderate (41–59), and high (≥ 60).

Low scores indicate good emotion regulation abilities, reflecting the capacity to recognize, accept, and effectively manage emotions without becoming easily overwhelmed. Moderate scores indicate some difficulties in emotion regulation, where individuals may occasionally struggle to understand or accept their emotions and have not yet developed stable coping strategies, particularly in stressful situations. High scores indicate significant difficulties in emotion regulation, characterized by emotional overwhelm, impulsivity, limited emotional awareness, and ineffective coping strategies, which may increase the risk of more serious psychological problems.

Data were analyzed using descriptive statistics to describe respondent characteristics and the Wilcoxon signed-rank test to compare pre-test and post-test results.

RESULTS

Table 1. Characteristics of respondents based on Age, Number of siblings, Birth order, pretest, and posttest scores

Variable		F (%)	Min-Max	Mean±Std
Age	10	9 (16%)	10-12	110±0.685
	11	30 (60%)		
	12	12 (24%)		
Number of Siblings	1	4 (8%)	1-5	2.56±0.861
	2	21 (42%)		
	3	19 (38%)		
	4	5 (10%)		
	5	1 (2%)		
Birth order	1	18 (36%)	1-4	2.04±0.947
	2	15 (30%)		
	3	14 (28%)		
	4	3 (6%)		
Pretest	Low	0	52-90	75.08±10.398
	Medium	2 (4%)		
	High	48 (96%)		
Posttest	Low	0	44-84	64.72±10.043
	Medium	17 (34%)		
	High	33 (66%)		

Based on Table 1, the majority of respondents are aged 11–12 years, have 2–3 siblings, and are the first or second child, with pretest results showing that 96% fall into the high emotional regulation difficulty category, which decreased to 66% in the posttest after the intervention, indicating an improvement in emotional regulation ability.

Table 2. Comparison of pretest and posttest scores on the Emotion Regulation Scale Short Form (DERS-SF)

	Min-Max	Mean±Std	t	p-value
Pretest	52-90	75.08±10.398	6.698	0.001
Posttest	44-84	64.72±10.043		

Based on Table 2, the analysis results show a significant decrease in DERS-SF scores from pretest (mean = 75.08, SD = 10.398) to posttest (mean = 64.72, SD = 10.043) with a t-value of 6.698 and p = 0.001, indicating that the intervention successfully improved the participants' emotion regulation abilities significantly.

Figure 1. Providing education through lecture methods on emotion regulation and complementary therapy, Yoga Pranayama

Figure 2. Implementation of Pranayama Yoga therapy.

DISCUSSION

a. Respondent Characteristics

Based on the age distribution, most respondents fall within the 11–12-year age range. The highest proportion was 11 years old, with 30 respondents (60%), followed by 12-year-old respondents with 12 individuals (24%). Meanwhile, 8 respondents (16%) were aged 10 years. This suggests that the majority of children are in early adolescence, which, in terms of psychosocial development, is a transitional period from dependence to emotional independence. At this stage, emotional regulation abilities are not yet optimal due to the limitations of the brain's developing executive functions. (Sahithya et al., 2019). Most respondents come from families with 2–3 siblings and are either the first or second child. This birth order affects the emotional dynamics; firstborn children often bear greater responsibilities and receive intense parental attention, thus their potential for emotional control development is higher. (Fukuya et al., 2021). Daily interactions with siblings also

play an important role in shaping the ability to regulate and socialize emotions. (Okano et al., 2019).

In the initial measurement (pretest) using the Difficulties in Emotion Regulation Scale–Short Form (DERS-SF), 96% of respondents were in the " great difficulty in emotion regulation category. However, after the intervention, there was a significant decrease, with only 66% of respondents remaining in that category, and the remaining 34% showing improvement toward the moderate category. This indicates an improvement in emotion regulation ability after the intervention was provided. This is in line with the meta-analysis by Eadeh et al., (2022), which reported that emotion regulation interventions—including cognitive strategies and mindfulness—showed moderate to large positive effects in improving emotional control and reducing internalizing symptoms in children and adolescents.

b. Comparison of Pretest and Posttest Scores of DERS-SF

The results of the paired sample t-test analysis show that there is a significant difference between the pretest and posttest scores of the DERS-SF. The average pretest score was 75.08 ± 10.398, while the average posttest score decreased to 64.72 ± 10.043, with a t-value of 6.698 and a p-value of 0.001 ($p < 0.05$). This means that the intervention conducted on the respondents was effective in improving their emotional regulation abilities.

The decrease in DERS-SF scores indicates a reduction in the difficulty of emotion regulation. This supports previous research stating that emotion-based skill intervention programs, such as mindfulness training or cognitive-based emotion regulation training, can enhance emotional awareness, reduce emotional reactivity, and improve self-control strategies in children and adolescents. (Lee & Chen, 2022; Region & Officer, 2020).

The effectiveness of the Yoga Pranayama intervention can be further explained through neuropsychological mechanisms. Controlled breathing practices directly influence the autonomic nervous system by increasing parasympathetic activity and reducing sympathetic overactivation. This shift promotes physiological calmness, lowers heart rate, and reduces cortisol levels, which are closely associated with emotional reactivity. From a brain-based perspective, slow breathing and humming (as in Bhramari Pranayama) are associated with modulation of the limbic system—particularly the amygdala, which is responsible for emotional responses—and strengthening of prefrontal cortex activity, which plays a key role in executive control and emotional regulation. (Krempel et al., 2025; Zaccaro et al., 2018)

Furthermore, the humming component in Bhramari Pranayama is believed to stimulate the vagus nerve through vibratory resonance, thereby enhancing vagal tone and supporting emotional stability. Increased vagal activity is linked to improved capacity for self-regulation, attentional control, and resilience to stress. This mechanism is particularly relevant in children, whose regulatory systems are still developing, making them more responsive to body-based interventions such as breathing exercises. (Gerritsen & Band, 2018).

From the perspective of the Process Model of Emotion Regulation, this intervention operates at multiple stages of emotion regulation. First, during the attentional deployment stage, students are guided to focus on their breath and internal sensations, which helps shift attention away from stressors. Second, at the response modulation stage, slow and

controlled breathing directly reduces physiological arousal, thereby modifying emotional responses after they arise. Additionally, repeated practice and psychoeducation contribute to cognitive change, as students begin to reinterpret emotional experiences as manageable and controllable. This multi-level engagement explains why Yoga Pranayama can effectively reduce difficulties in emotion regulation as measured by DERS-SF (Gross, 2020)

Moreover, the integration of lecture, demonstration, and role play strengthens learning through cognitive, behavioral, and experiential pathways. According to social learning theory, children acquire self-regulation skills not only through instruction but also through observation and guided practice. The structured repetition across two days enhances neural plasticity and habit formation, making the breathing techniques more accessible as coping strategies in real-life situations. (Diamond & Ling, 2020; Poon, 2018)

The reliability and sensitivity of the DERS SF as a measure of intervention response have also been tested and confirmed locally by (Danasasmita et al., 2024) In the Indonesian version, showing high reliability and validity for the Indonesian adolescent population. This is consistent with foreign validation findings by (Gouveia et al., 2022) (Hallion et al., 2018) which affirms the high correlation of DERS SF ($r = 0.90–0.98$) with its longer version and the measurement stability in diverse populations.

Furthermore, the meta-regression by (Paul & Vijayan, 2024) reinforces that psychosocial interventions (CBT, DBT, parent training) have moderate effects ($d \approx 0.37–0.39$, $p < 0.001$) on improving emotional regulation and mental well-being in children and adolescents, with no significant differences between approaches emphasizing acceptance or cognition. Your findings also support digital and school-based approaches: a review of digital interventions found positive effects and high acceptance among children aged 8–14 years. (Reynard et al., 2022), and school-based mindfulness interventions improved emotion regulation and reduced mild stress (Pedrini et al., 2022).

CONCLUSION

Community service was conducted on April 10-11, 2025, and attended by 50 fourth- and fifth-grade students from SDN 5 Dalung, with an evaluation carried out on April 11, 2025. During the activity, all participants appeared enthusiastic about following each session provided. The evaluation results using the DERS-SF (18-item) instrument showed that before the intervention, 96% of the children were in the high emotional regulation difficulty category. However, after the intervention, this percentage decreased to 66%, with 34% moving to the moderate category. This indicates that the community service activity successfully provided significant improvement in the children's emotional regulation abilities, as evidenced by the decrease in the average score from 75.08 to 64.72, with a t-test result of 6.698 and $p = 0.001$, which is statistically significant.

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