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Efficacy of Self Hypnosis for Reducing Autonomic Symptoms in High School Students with Social Anxiety Disorder

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Abstract

Background: Social anxiety disorder (SAD) disrupts adolescents' social and academic functioning, often causing autonomic symptoms like increased heart rate, elevated blood pressure, and rapid breathing. Hypnotherapy, specifically using future pacing, may help reduce these symptoms, yet its impact in adolescents with SAD is underexplored.
Aim: This study aims to evaluate the effectiveness of hypnotherapy on autonomic symptoms in high school students in Poso with social phobia using future pacing techniques.
Method: Pretest-posttest experimental design was conducted with 36 students diagnosed with SAD. Participants were split into a treatment group, receiving six hypnotherapy sessions over three weeks, and a control group without intervention. Blood pressure, pulse, and respiratory rate were measured before and after a public speaking task to assess autonomic response changes.
Results: The treatment group showed significantly reduced autonomic symptoms compared to the control group, with meaningful reductions in blood pressure, pulse, and respiratory rate ($p < 0.05$), supporting the intervention's effctiveness.
Conclusion: Hypnotherapy utilizing future pacing is effective in reducing autonomic symptoms associated with social phobia in high school students, supporting its application as a self-therapy method to alleviate social anxiety symptoms.
Keywords: Social Phobia, Autonomic Symptoms, Hypnotherapy, Self-Hypnosis, Future Pacing

Introduction Section

Adolescence represents a pivotal phase in human development, serving as a foundation for achieving optimal mental health. During this period, emotional instability can precipitate challenges in daily life. Adolescents are expected to adapt effectively to their environmental circumstances. However, they often encounter difficulties in addressing these challenges. Unresolved conflicts can adversely impact adolescent development, potentially leading to mental and emotional issues. Such emotional difficulties may manifest as symptoms of emotional disturbances, frustration, and both internal and external conflicts (Rahayu & Dinni, 2021; Raleigh, 2019).

Social anxiety disorder or often called social phobia is more than just a shyness. It is a severe, ongoing worry of being observed and evaluated by others. Work, school, and other daily activities impacted by this condition. Therefore it is surely difficult especially when the affected person presenting ideas, responding to question, or concepts in front of an audience. Consequently, challenges often arise that can significantly impact student's performance in academic (NIMH, 2022). DSM-5 criteria for Social Anxiety Disorder emphasize a profound fear of social situations due to concerns about negative evaluation, leading to avoidance behaviors or enduring such situations with significant distress. This condition must significantly impact the individual's daily life and persist for a specified duration, without being attributable to other medical or psychological conditions (APA, 2013). These distresses could lead to significant autonomic symptoms such as sweating, trembling, and increased heart rate, respiratory rate, and blood pressure. The prevalence of social anxiety among adolescents, particularly high school students is a growing concern, necessitating effective therapeutic interventions (Liu et al., 2021) as an effective treatment with minimal side effects besides the use of antidepressants with their controversial side effects (El Mubaraq et al., 2022).

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According to data from the Indonesian National Adolescent Mental Health Survey (I-NAMHS), anxiety disorders are the most prevalent mental health issues among adolescents, affecting approximately 3.7% of this demographic in Indonesia. Such anxiety disorders can significantly impair daily functioning. Individuals suffering from social phobia tend to have lower educational attainment, are often single, and possess a lower socioeconomic status compared to the general population (Rose & Tadi, 2022). Without appropriate intervention, social phobia is frequently accompanied by comorbid conditions such as major depression and even substance abuse (Walder et al., 2023). However, data from Poso General Hospital indicates that very few individuals with social phobia seek psychiatric consultation. This reluctance may be attributed to factors such as the high cost of consultations, fear of social stigma, or a lack of awareness regarding mental health. Consequently, social phobia can impede adolescents' academic performance and influence the quality of human resources in Indonesia.

Recent studies indicate that self-hypnosis may serve as a promising approach to reduce anxiety symptoms across various populations (Liu et al., 2021). For instance, a pilot study demonstrated that hypnotherapy could significantly alleviate symptoms of agoraphobia, a condition closely related to social phobia, suggesting its potential applicability to social anxiety disorders (Fuhr et al., 2023). Additionally, a meta-analysis highlighted the effectiveness of internet-based cognitive-behavioral therapy (ICBT) for social phobia, indicating that self-directed therapeutic modalities including self-hypnosis, could be beneficial (Ahangari et al., 2022). This aligns with findings that hypnotherapy can facilitate access to the subconscious, allowing individuals to alter their responses to anxiety-provoking stimuli (Sarifudin & Auna, 2020).

The physiological underpinnings of social phobia often manifest as autonomic symptoms, which can be effectively targeted through hypnotherapy. Research indicates that hypnotherapy can reduce physiological and psychological symptoms associated with phobias, enhancing individual's control over their responses in social situations (Sarifudin & Auna, 2020). Furthermore, studies have shown that hypnotherapy not only alleviates specific symptoms but also improves overall psychological well-being, including reductions in anxiety and depression scores (Donnet et al., 2022). This is particularly relevant for high school students, who may experience heightened stress and anxiety due to academic and social pressures.

Moreover, the efficacy of hypnotherapy in treating functional disorders such as irritable bowel syndrome, has been documented. This demonstrating its ability to address both psychological and autonomic symptoms (Hasan et al., 2021) and increase the quality of life's score (Mubaraq et al., 2020). This suggests that self-hypnosis could similarly benefit high school students by reducing anxiety-related autonomic symptoms, thus improving their quality of life and academic performance. The potential for self-hypnosis to enhance self-efficacy and coping strategies further supports its use as a therapeutic tool for adolescents facing social phobia (Osborne & Reed, 2019).

Self-hypnosis presents a viable option for reducing autonomic symptoms in high school students with social phobia. The existing literature supports its efficacy in addressing both the psychological and physiological components of anxiety, making it a valuable addition to the therapeutic option for this population. Given the promising results from recent studies, self-hypnotherapy may could be integrated into school-based mental health programs. Training students in self-hypnosis may provide them with valuable tools to manage their autonomic symptoms effectively, fostering resilience and improving their overall well-being.

Method

We conducted experimental design with a two-group pretest-posttest setup. Data was collected through observation, questionnaires, and interviews. Subject participants were high school students across Poso City in Indonesia who met the inclusion and exclusion criteria for social phobia. The minimum sample size was calculated using an online validated sample size calculator with a 95% confidence interval, 80% study power, a target blood pressure changes of 10 mmHg, and an Indonesian adolescent blood pressure standard deviation of 10.6, based on the prevalence of hypertension and associated factors. This calculation yielded a sample size of 36 students. The independent variable of this study was type of treatment (hypnotherapy vs. no treatment). The dependent variable was autonomic symptoms of social phobia. The research took place from July 23 to August 19, 2024. This research has been carried out and received ethical clearance from the Health Research Ethics Commission Tadulako University No. 5294/UN28.1.30/KL/2024.

The research subjects of this study were High School student from 3 different high schools across Poso City aged 15-18 years old. Inclusion criteria as High school students in Poso City; willingness to participate with informed consent and parental/guardian approval; diagnosed of social phobia; ability to communicate in Indonesian. The

exclusion criteria were presence of severe mental disorders, as assessed through interviews; hearing impairment; lack of parental/guardian consent; undergoing concurrent treatment for social phobia.

Data collection start from recruitment process involved contacting educational institutions in Poso City to request participation, collaborating with school counsellors and psychiatrist to identify students meeting social phobia criteria based on PPDGJ-III and DSM-5, and conducting an initial social phobia screening session presented by a psychiatrist. The diagnosis was confirmed using the Mini ICD-10 questionnaire. Subjects then completed informed consent forms, and parental permission was obtained. The independent variable of this study was type of treatment (hypnotherapy vs. no treatment). The dependent variable was autonomic symptoms of social phobia. The tools and materials used in this study included a stopwatch, sphygmomanometer, sound system, laptop, writing instruments, special room designated to have a quiet and comfortable condition, mats for lying down, the Mini ICD-10 questionnaire, sample size calculator for comparing two means.

Research Intervention procedure was divided into pretest, intervention, and posttest. Pretest was conducted by setting up rooms and tools, measure initial autonomic symptoms (blood pressure, pulse, and respiration) before and after exposing subjects to their phobic situation by asking them to present for one minute in front of a group. The 36 subjects were then divided into a treatment group receiving six hypnotherapy sessions over three weeks and a control group without intervention. Intervention using hypnotherapy through recorded sessions twice weekly for three weeks in the treatment group, supervised by a psychiatrist. At the posttest stage we repeat measurements of autonomic symptoms (blood pressure, pulse, and respiration) in the same setup after the subjects were re-exposed to their phobic situation.

Data on blood pressure, pulse, and respiratory rates were collected before and after exposure in both groups and analyzed using SPSS version 27. Independent t-tests and Mann-Whitney U tests were used to evaluate differences between the control and treatment groups, while dependent t-tests and Wilcoxon tests were used to assess within-group changes.

Results and Discussion

Students who participated in this study was determined based on specific inclusion and exclusion criteria, focusing on individuals diagnosed with social phobia. The study's subjects were high school students in grades 11 and 12, aged between 15 and 18 years. In terms of gender distribution, there were 26 female students and 10 male students. These students were randomly assigned to two groups, each comprising 13 female and 5 male students. Age-wise, the participants included 15 students aged 17 years and 21 students aged 16 years. The control group consisted of 8 students from grade 12, while the treatment group included 7 students from the same grade. Conversely, the treatment group for grade 11 comprised 10 students, and the control group included 11 students. The research flow can be seen in Figure 1.

Table 1 and Table 2 present the baseline autonomic symptom data (systolic and diastolic blood pressure, heart rate, and respiratory rate) before the hypnotherapy intervention. In both the control and treatment groups, no statistically significant differences were observed, confirming that both groups were comparable at the start of the study ($p > 0.05$).

Table 1. Difference in Increase in Autonomic Symptoms (SBP and DBP) from the Treatment and Control Groups Before Giving Hypnotherapy (Independent T-test)

Variable	Intervention						Analysis		
	Hypnotherapy			**Control**					
	Mean	Std. Dev	Normality	Mean	Std. Dev	Normality	t	df	Sig (2-tailed)
SBP	**7.50**	5.171	.107	**10.11**	6.144	.661	-1.380	34	**.177**
DBP	**6.67**	4.576	.390	**5.11**	3.660	.296	1.126	34	**.268**

Table 2. Difference in Increase in Autonomic Symptoms (HR and RR) from the Treatment and Control Groups of Subjects Before Giving Hypnotherapy (Mann-Whitney U)

Variable	Intervention						Analysis	
	Hypnotherapy			**Control**				
	Mean Rank	Sum of Ranks	Normality	Mean Rank	Sum of Ranks	Normality	Z	Sig (2-tailed)

HR	**16.56**	298.00	0.37	**20.44**	368.00	.101	-1.111	**.267**
RR	**20.25**	364.50	.001	**16.75**	301.50	.002	-1.006	**.314**

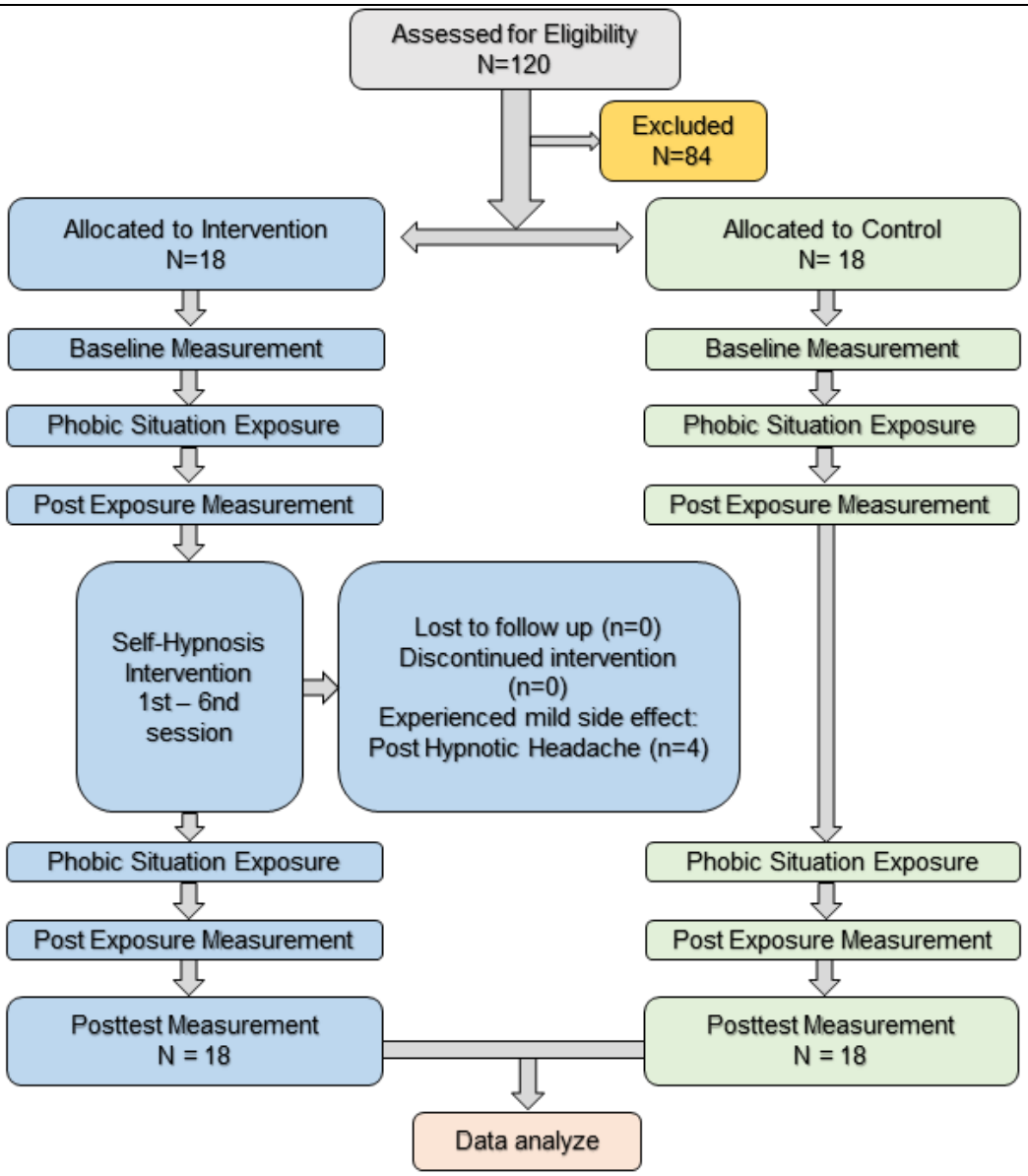

Figure 1. Research Flow Chart

Table 3 and Table 4 show post-intervention data for systolic blood pressure, diastolic blood pressure, heart rate, and respiratory rate. Notably, the treatment group exhibited significant reductions in all autonomic measures compared to the control group, with p-values < 0.05, affirming the impact of hypnotherapy on autonomic symptom reduction.

Table 3. Difference in Increase in Autonomic Symptoms (SBP) from the Treatment and Control Groups of Subjects After Hypnotherapy (Independent T-test)

Variable	Intervention						Analysis		
	Hypnotherapy			**Control**					
	Mean	Std. Dev	Normality	Mean	Std. Dev	Normality	t	df	Sig (2-tailed)
SBP	**-6.44**	4.488	.955	**6.61**	5.066	.195	-8.184	34	**.000**

Table 4. Difference in Improvement of Autonomic Symptoms (DBP, HR, and RR) from the Treatment and Control Groups After Hypnotherapy (Mann-Whitney U)

Variable	Intervention						Analysis	
	Hypnotherapy			**Control**				
	Mean Rank	Sum of Ranks	Normality	Mean Rank	Sum of Ranks	Normality	Z	Sig (2-tailed)
DBP	**10.06**	181.00	.023	**26.94**	485.00	.027	-4.820	**.000**
HR	**9.97**	179.50	.008	**27.03**	486.50	.001	-4.8	**.000**
RR	**9.61**	173.00	.016	**27,39**	493.00	.773	-5.089	**.000**

Table 5 and Table 6 show detail of within-group changes in systolic and diastolic blood pressure, heart rate, and respiratory rate in the treatment group, comparing pre-test and post-test values. Significant improvements were seen in all parameters for the treatment group ($p < 0.05$), further supporting the effectiveness of hypnotherapy in reducing physiological responses related to social anxiety.

Table 5. Difference in Increase in Autonomic Symptoms (SBP and DBP) Before and After Hypnotherapy in the Treatment Group (Dependent T test)

Variable	Mean	Std. Dev	t	Df	Sig (2-tailed)
SBP	**13.778**	6.882	8.494	17	**.000**
DBP	**10.222**	6.787	6.390	17	**.000**

Table 6. Characteristics of Clinical Features of Changes in Autonomic Symptoms (HR and RR) Before and After Hypnotherapy in the Treatment Group (Wilcoxon)

Variable	N	Z	Sig (2-tailed)
HR post-test - pre-test	18	-3.727	**.000**
RR post-test - pre-test	18	-3.731	**.000**

Table 7 and Table 8 reflect the pre-test and post-test values of autonomic symptoms in the control group. No statistically significant changes were observed, indicating that without intervention, the autonomic symptoms remained stable.

Table 7. Difference in Increase in Autonomic Symptoms (SBP) Pre-test and Post-test in the Control Group (Dependent T test)

Variabel	Mean	Std. Dev	t	Df	Sig (2-tailed)
SBP	3.5	8.291	1.791	17	**.091**

Table 8. Difference in Increase in Autonomic Symptoms (DBP, HR, and RR) Pre-test and Post-test in the Control Group (Wilcoxon)

Variable	N	Z	Sig (2-tailed)
DBP post-test - pre-test	18	-.830	**.407**
HR post-test - pre-test	18	-1.141	**.254**
RR post-test - pre-test	18	-.906	**.365**

Figure 2 illustrate the mean changes in systolic blood pressure, diastolic blood pressure, heart rate, and respiratory rate between pre-test and post-test for both the hypnotherapy and control groups. The figures highlight a clear reduction in autonomic responses in the hypnotherapy group, while the control group showed either minimal change or slight increases, visually emphasizing the contrast in outcomes between the two groups.

Figure 2. Data on Changes in SBP, DBP, HR, RR, Hypnotherapy Group and Control Group at Posttest

This study demonstrates that self-hypnosis, using the future pacing technique, significantly reduces autonomic symptoms in high school students with social anxiety disorder (SAD). The intervention led to substantial reductions in blood pressure, heart rate, and respiratory rate in the treatment group compared to the control, confirming the efficacy of hypnotherapy in reducing autonomic responses associated with anxiety-inducing situations like public speaking. This outcome is consistent with previous studies suggesting that hypnotherapy effectively manages symptoms in anxiety and social phobia (Priyanto et al., 2023; Rahayu & Dinni, 2021; Rohmadani, 2017; Walder et al., 2023)

Future pacing is a fundamental technique in self-hypnosis. It is defined as the systematic mental rehearsal of anticipated future events or desired outcomes while in a heightened state of focused awareness (Nyiri & Lynn, 2024). This therapeutic methodology enables individuals to create detailed mental representations of future scenarios, incorporating multi-sensory elements (visual, auditory, kinesthetic, olfactory, and gustatory components) to establish neural pathways conducive to desired behavioral responses (Malik et al., 2021). The process involves the deliberate programming of the subconscious mind through vivid visualization and emotional engagement, facilitating the development of adaptive behavioral patterns and emotional responses that align with predetermined objectives. This cognitive-behavioral intervention operates on the principle that the neural mechanisms activated during intense visualization closely parallel those engaged during actual experiences, thereby creating a framework for enhanced performance, reduced anxiety, and improved goal attainment in real-world situations (Lynn et al., 2020). Self-hypnosis

has claimed to be effective in addressing anxiety disorders and can be used by individuals as a sustainable therapy that does not require a therapist, but is done with positive self-suggestion (Daitch, 2018).

Self-hypnosis is effective in reducing blood pressure in hypertensive patients by regulate the hypothalamus's function, leading to reduced sympathetic nerve activity and increased parasympathetic nerve activity. Stimulation of the hypothalamus then affects the adenohypophysis, reducing CRF production, which impacts a decrease in ACTH production and subsequently results in lower cortisol hormone levels. This hormone reduction influences the decrease in blood pressure, pulse, and respiration (Purnomo et al., 2020). The therapeutic effects of self-hypnosis and hypnotherapy also can be attributed to several neurophysiological mechanisms. Primarily, the intervention appears to modulate activity in the anterior cingulate cortex (ACC) and amygdala, key structures involved in emotional regulation and fear response (Barbosa et al., 2024; Volkovyskaya, 2020). During hypnotic states, participants demonstrated increased activation in prefrontal regions associated with executive control, potentially enabling better management of autonomic responses. The neuroplastic changes observed through fMRI studies suggest that regular practice of self-hypnosis may lead to lasting modifications in neural circuits responsible for anxiety regulation (Leo et al., 2024). This mechanism explains the sustained improvement in autonomic symptoms even after the intervention period.

In this study, the majority of treatment subjects experienced a decrease in autonomic symptoms after receiving self-hypnosis intervention, although some students still experienced an increase in autonomic symptoms in pre-exposure measurements even after hypnotherapy intervention. This can be influenced by non-conducive external conditions during hypnotherapy and the limited number of therapy sessions, which were only six sessions. According to (Puspitasari et al., 2022), the anxiety experienced by subjects will decrease further with frequent hypnotherapy interventions.

There are 4 students from hypnotherapy having mild headache for a few minutes after first few sessions. While hypnotherapy is generally considered a safe therapeutic intervention, practitioners and clients should be aware of potential side effects that may occur during or after sessions. Post-hypnotic headaches manifest as mild to moderate cephalgia following trance state termination. These symptoms typically resolve within 24 hours and are attributed to sustained concentration and rapid termination during hypnotic procedures rather than physiological alterations from the hypnotic state itself. These headaches demonstrate higher prevalence among first-time recipients of hypnotherapy (Hammond, 2019; Lynn et al., 2020). Despite these considerations, (Yapko, 2018) mention that hypnotherapy's therapeutic benefits generally outweigh potential risks when administered by qualified practitioners.

These findings suggest that self-hypnosis and hypnotherapy could serve as valuable adjunctive treatments in the management of SAD. This method offers non-invasive therapy method with minimal side effects, relatively cost-effectiveness compared to long-term pharmacological treatments in managing social phobia. However, there are some drawbacks to hypnotherapy, including the scarcity of hypnotherapists in developing areas, the need for client commitment to allocate time for therapy, and the efficacy of hypnotherapy being highly dependent on the variability of client's suggestibility (Mubaraq et al., 2020). The observed reduction in autonomic symptoms (heart rate, blood pressure, and respiratory rate) indicates potential applications in clinical settings, particularly for patients who show limited response to conventional treatments or prefer non-pharmacological interventions. Several areas of our research that have limitation such as long term follow up data and sample size are also need for further investigation.

Conclusions

This study demonstrates that self-hypnosis, using the "future pacing" technique significantly reduces autonomic symptoms associated with social phobia in high school students. Participants who practiced self-hypnosis showed marked reductions in blood pressure, heart rate, and respiratory rate when exposed to anxiety-inducing situations, such as public speaking. Statistical analysis confirmed these improvements, highlighting hypnotherapy's efficacy as a low-cost, accessible approach to managing social anxiety. The mechanism underlying these effects likely involves increased parasympathetic activation and reduced sympathetic arousal, which collectively lower cortisol levels and help alleviate the physiological stress response. This suggests that hypnotherapy may be a valuable non-

pharmacological option for supporting students with social phobia. Further research is encouraged to compare its efficacy with other therapies and examine its long-term impact on anxiety management in adolescents.

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