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Reducing Adolescent Communication Apprehension Using Systematic Desensitization: An Exposure-Based Single-Subject Design

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Keywords

Adolescent, Communication Anxiety, Communication Apprehension, Exposure Therapy, Systematic Desensitization

Abstract

This study aims to reduce communication apprehension in adolescents through a systematic desensitization approach using an exposure-based single-subject design. Communication apprehension, characterized by persistent anxiety in various social situations, can hinder adolescents' adaptive functioning both academically and socially. The subject of this study was a female adolescent who reported a high level of communication apprehension and was selected using purposive sampling. The intervention was conducted over six sessions, including assessment feedback, relaxation training, construction of an anxiety hierarchy, and gradual exposure to communication apprehension-inducing situations in a controlled setting. Data were collected through behavioral observations and self-reported communication apprehension scales using an AB framework, which consists of two primary phases: Baseline and intervention, followed by a follow-up phase conducted 1.5 months after the intervention. Descriptive analysis indicated a potential reduction in the subject's communication apprehension following the intervention. A Substantial reduction in communication apprehension was observed, as reflected in the subject's PRCA score, which decreased from 102 (high apprehension) at baseline to 65 (moderate apprehension) after intervention. The findings indicate that systematic desensitization can be an potential, structured, and low-risk approach for psychologist and mental health practitioners in supporting adolescents experiencing communication apprehension.

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INTRODUCTION

Communication is an essential skill that plays a crucial role in helping adolescents express ideas, collaborate with others, and understand people effectively (Ansari et al., 2022). Moreover, communication supports adolescents in accomplishing key developmental tasks, such as the formation of identity and the development of independence (Santrock, 2019). However, a considerable number of adolescents experience issues related to communication apprehension, which refers to fear or anxiety associated with real or anticipated communication with others (Beatty & Gonzalez, 2020; McCroskey, 1984), including feelings of nervousness when required to engage in communication (Aghaz & Salmasi, 2024). The literature indicates that communication apprehension is also referred to as communication anxiety (Chen, 2019; Davis, 2012; Patterson & Ritts, 1997; Zakahi & Duran, 1985). Recent studies have shown that communication apprehension has negative impacts on self-efficacy (Cong & Li, 2022) and is associated with increased levels of depression and loneliness (Rahman & Pinky, 2024), as well as reduced adaptability (Gude et al., 2023).

Individuals can experience communication apprehension across various social contexts and often need to take significant measures to reduce or avoid these feelings (Shi et al., 2015). Communication apprehension induces nervousness during everyday interactions with others or in high-anxiety-provoking situations such as public speaking (Bragg & John, 2017). Communication apprehension has been consistently observed across different educational settings (Albuquerque et al., 2023; Araújo et al., 2022), genders (Diah et al., 2023; Rahman, 2022), and age groups (Marcel, 2019).

Communication apprehension is influenced not only by genetic factors (McCroskey, 2009) but also by various other factors such as the frequency of an individual's presentations, personal experiences, age, occupational background, and the influence of supervisors or seniors (Marcel, 2019). Additional causes include limited vocabulary, low self-confidence, fear of making mistakes, concerns about negative evaluation, and discomfort in certain situations (Pransiska et al., 2024). Significant changes in communication patterns due to the COVID-19 pandemic have also had an impact; for instance, the predominance of online communication during the pandemic limited opportunities for face-to-face interaction, which in turn exacerbated feelings of communication apprehension (Aghaz & Salmasi, 2024)

Communication apprehension manifests in various forms, one of which is trait-like communication apprehension (Araújo et al., 2022; McCroskey, 1984, 2009). This type refers to a condition wherein an individual consistently experiences communication apprehension across most or all social interactions, whether real or imagined (Bragg & John, 2017). Communication apprehension can arise in multiple contexts such as public speaking, meetings, group discussions, and dyadic communication. When an individual scores high across all these contexts, it

indicates a trait-like tendency, considered to reflect a relatively stable personality characteristic of communication apprehension, unless specifically targeted interventions alter the anxiety level or measurement characteristics (Croucher et al., 2024).

Various intervention alternatives have been utilized to address communication apprehension, including group counseling based on cognitive restructuring (Asiah & Batubara, 2019), educational entertainment through film (Razak et al., 2021), sociodrama, and exposure therapy (Banakou et al., 2024; Solikin et al., 2023). However, reviews of studies over the past five years indicate that exposure therapy holds distinct advantages over other approaches. Its strength lies in its ability to directly target and modify the root causes of fear while enhancing an individual's tolerance to communication situations that provoke apprehension. Furthermore, this approach has demonstrated sustained long-term reductions in anxiety responses (Reeves et al., 2021).

Exposure therapy, a behavioral therapeutic approach, aims to help individuals overcome anxiety through gradual exposure to anxiety-inducing situations. The core principle of this approach is to reduce fear responses via habituation and relearning processes (American Psychological Association, 2020). Exposure takes various forms, including in vivo exposure, imaginal exposure, virtual reality exposure, and interoceptive exposure. A commonly applied variation is systematic desensitization, which combines relaxation training with gradual exposure to an anxiety hierarchy, arranged from low to high intensity (Teunisse et al., 2022). Systematic desensitization is a step-by-step intervention method that incorporates physical and psychological relaxation techniques to help individuals graduallu manager or reduce anxiety under the guidance of a therapist (Chen et al., 2024).

Although numerous studies have addressed communication apprehension in adolescents, most intervention approaches tend to be group-based, general, or primarily focused on public speaking anxiety (Haryanto et al., 2023; Niga et al., 2020; Utama et al., 2021). To date, there remains a paucity of research specifically investigating the effectiveness of interventions on individuals exhibiting trait-like communication apprehension. Additionally, studies integrating comprehensive psychological assessments such as interviews, observations, and psychometric testing as the basis for intervention are scarce.

A single-subject approach is particularly suited for addressing trait-like communication apprehension due to its persistent nature and deep roots in personality structure, necessitating a thorough understanding of the individual's unique characteristics. Single Subject Research methodology offers the advantage of rapidly detecting intervention effectiveness and monitoring day-to-day behavioral changes, allowing for timely and precise intervention adjustments. Unlike large group studies, which require longer durations and yield more generalized data, this approach provides strict experimental control and facilitates in-depth analysis of

causal relationships between interventions and individual-level changes (Prahmana, 2021). Based on these considerations, the single-subject design was selected to evaluate the effectiveness of exposure therapy in reducing trait-like communication apprehension among adolescents, supported by comprehensive psychological assessments.

This study addresses the identified gap by offering a more structured and in-depth intervention approach through a single-subject research design. It combines comprehensive psychological assessment with exposure therapy to achieve a deeper understanding and more accurate outcomes in managing communication apprehension, especially the trait-like type. The hypothesis of this study is that exposure therapy, specifically systematic desensitization, has the potential to reduce trait like communication apprehensio in individual. This research is expected to make a significant theoretical contribution to the understanding of trait-like communication apprehension while providing practical implications for designing more effective and targeted intervention programs.

METHOD

Design

This study employed an A-B design within a single-subject research approach, consisting of two primary phases: a baseline phase (A) and an intervention phase (B). This design enables systematic observation and evaluation of behavioral changes in the subject before and after the administration of the intervention (Prahmana, 2021). Single-subject research facilitates close monitoring of the subject's behavior in a controlled environment, allowing for direct observation of the intervention's effects and enabling timely adjustments if necessary. Additionally, a follow-up assessment was conducted using self-report measures to provide insight into the sustained impact of the intervention and its application in daily situations.

Participants

This study involved a single participant, a 19-year-old female university student who exhibited a tendency toward trait-like communication apprehension a persistent form of communication apprehension that manifests across various interaction contexts, including group communication, meetings, dyadic interactions, and public speaking. The apprehension experienced by the participant was not limited to emotional aspects, such as feelings of anxiety and discomfort, but also included physical symptoms such as heart palpitations, sweaty palms, and muscle tension during communicative situations.

Psychological assessment results confirmed that the participant exhibited high levels of communication apprehension, characterized consistently across four main dimensions: internal discomfort, communication avoidance, communication

disruption, and overcommunication. Additionally, several factors were identified as contributors to the participant's communication apprehension. First, hereditary and environmental influences were evident, as the participant's parents also experienced communication-related anxiety, particularly in formal settings. Second, reinforcement factors were present, wherein the participant's environment neglected to address her communication apprehension and lacked positive reinforcement to enhance her communication skills. Third, situational factors were relevant, especially in the post-pandemic context, which limited opportunities for the participant to develop and practice communication skills.

Instruments

In this study, several instruments were employed to measure the participant's communication apprehension before and after the intervention. The primary instrument used was the Personal Report of Communication Apprehension-24 (PRCA-24), developed by McCroskey and adapted for use in Indonesia by Aisyah et al. (2019). The PRCA demonstrated strong internal reliability, with a Cronbach's alpha above 0.8 and all item-total correlations (CITC) exceeding 0.3. It also showed a significant positive correlation with the RAS ($r=0.638$, $p \leq 0.01$), supporting its construct validity.

The PRCA-24 scale assesses the participant's level of communication apprehension across four contexts: group communication, meetings, dyadic communication, and public speaking. Additionally, projective graphic tests such as BAUM, DAP, HTP, and Wartegg were utilized to evaluate the participant's personality dynamics and interactions with their environment.

The Edwards Personal Preference Schedule (EPPS) was administered to assess the participant's needs related to self-confidence and adjustment. To measure the participant's anxiety during the desensitization process, the Subjective Units of Distress Scale (SUDS) was employed, enabling the participant to rate their anxiety level in each communication situation encountered. Data collection also included individual interviews with the participant and significant others to explore their experiences and perceptions concerning the participant's communication apprehension.

Procedure

Before designing and implementing an intervention tailored to the participant's issues, the researcher first conducted an initial assessment. This initial assessment involved collecting baseline data regarding the participant's condition and obtaining informed consent as a formal indication of the participant's willingness to engage in the research process. The participant was also provided with a clear explanation of the intervention procedures, including the voluntary nature of participation, with the understanding that they could withdraw from the study at any time without any consequences.

After securing consent and gaining a preliminary understanding of the participant's communication apprehension, the researcher developed a comprehensive follow-up assessment plan to gather more detailed information. The assessment was then conducted, revealing that the participant exhibited trait-like communication apprehension. Additionally, the assessment included a psychological profile of the participant based on selected psychological tests.

Based on these findings, the researcher designed an intervention suited to the participant's characteristics and needs. The intervention implemented was exposure therapy, emphasizing the systematic desensitization technique, originally conceptualized by Wolpe (1961). This approach has been widely and effectively applied in treating phobias and anxiety disorders (Brown et al., 2023; Bunnell et al., 2018; Teunisse et al., 2022). The intervention was delivered over six sessions, detailed as follows (Table 1):

Table 1
Intervention Phase

Session	Intervention Objective	Implementation Proses
1	Presentation of Assessment Results, Intervention Goals, and Process	a. Building rapport b. Communicating a general overview of the assessment results c. Explaining the objectives and structure of the intervention d. Discussing the participant's active role and the flow of subsequent sessions
2	Identification of the hierarchy of situations that elicit tension and training in relaxation techniques.	a. Determining the hierarchy of anxiety-provoking situations based on assessment and the subject's report. b. Using a 0–100 anxiety scale to evaluate the anxiety level associated with each situation. c. Constructing a hierarchy from the least to the most anxiety-inducing situations. d. Training in muscle relaxation techniques (Jacobson, 1938, as cited in Wolpe, 1961; Mukhran et al., 2021).
3	Mapping the hierarchy of situations that elicit tension and practicing relaxation techniques.	a. Reviewing the hierarchy of situations and selecting a low-anxiety situation for practice. b. Conducting in-depth training of progressive muscle relaxation techniques. c. Integrating relaxation techniques while imagining the selected situation. d. Evaluating the participant's emotional response and readiness.
4 – 6	Eliciting anxiety-provoking situations from the anxiety hierarchy and counteracting them with relaxation.	a. Continuing gradual imaginative exposure based on the hierarchy of anxiety-provoking situations. b. Guiding the subject to perform relaxation while sequentially imagining the situations. c. Conducting evaluations after each exposure to monitor reductions in anxiety. d. Adjusting the exposure according to the subject's readiness and feedback.

Data Analysis

The data from this study were analyzed using descriptive analysis by comparing scores before and after the intervention, specifically during the baseline and post-intervention phases. In a single-case experimental design, data from one subject are compared to themselves to observe changes following the intervention. The researcher will examine numerical data obtained from the PRCA-24 as well as qualitative interview results collected before and after the intervention to assess the effectiveness of the intervention provided to the participant. All analyses are conducted with consideration of external factors that may influence the outcomes, such as social support and environmental conditions.

RESULT

The subject has completed the entire intervention aimed at addressing communication apprehension through a situational hierarchy approach. Each intervention session lasted between 60 to 90 minute, depending on the initial agreement with the participant. Session 1 focused on presenting the results of prior assessments. Additionally, the subject demonstrated an understanding of the intervention's purpose, namely to help reduce the subject's communication apprehension. The subject also understood the counseling process and committed to adhering to the counseling procedures until completion.

Session 2 aimed to identify the hierarchy of tension-inducing situations and to provide training in relaxation techniques. The subject successfully constructed and identified a hierarchy of tension-provoking situations. In this session, 60 situations that triggered tension were identified, and the subject was assigned homework to rank the hierarchy cards using the Subjective Units of Distress Scale (SUDS) ranging from 0 to 100. The researcher provided direct training to the subject on relaxation techniques to assist in managing the arising tension. Subsequently, the subject practiced self-administered relaxation targeting body areas that typically react during anxiety related to communication situations.

The goal of Session 3 was to map the hierarchy of tension-inducing situations and to practice relaxation techniques. After completing the homework to arrange the hierarchy cards from low to high tension, the researcher asked the subject to add additional notes on the cards regarding feelings or physical symptoms experienced in each depicted situation (see example in Figure 1). The subject then practiced relaxation techniques to help manage tension. A trial exposure was conducted using 10 situations with the lowest levels of communication apprehension. This trial aimed to observe the subject's reactions and confirm that the situations could be adequately imagined and that procedures were followed correctly.

Sessions 4 to 6 focused on gradually eliciting anxiety from the hierarchy and counteracting it through relaxation in a desensitization phase. By the end of this

phase, the subject was able to eliminate the negatively reinforced anxiety behavior by conditioning an opposing response to maintain a state of comfort. Evaluation was conducted at the end of each session through self-reports provided by the subject. The subject demonstrated the ability to condition a new response that contradicted anxiety, remaining comfortable when facing situations previously perceived as tension-inducing (see excerpts of self-reports in Table 2).

Tabel 2

Example of Intervention Process Evaluation Through Hierarchy Cards

No. Card	Hierarchy Card	Explanation Card	SUDS	Process Evaluation
7.	Initiating conversation with a new person (female adolescent)	When the conversation is more relaxed, there is no nervousness or trembling	6	Can be handled well, no tension felt, proceed to the next card
35.	Giving responses related to feedback in a small group (new person)	If the response or discussion is more relaxed, just confident	35	Feels tension in the body, repeatedly imagines the anxiety-inducing situation 3 times. Researcher asks the subject to rest and ensures each scenario can be managed well to avoid future anxiety, proceed to the next card
58.	Presentation with preparation in a large group (>10 people)	Although prepared, those who see me still seem afraid	77	Feels tension in the body, repeatedly imagines the anxiety-inducing situation 3 times, proceed to the next card
60.	Presentation with spontaneous responses in front of an authority figure (lecturer)	If unprepared, still feels unable, nervous, trembling, thoughts wandering	80	Feels tension in the body, repeatedly imagines the anxiety-inducing situation 4 times

In addition to self-reports collected after each session (Figure 1.), the results of the PRCA-24 scale administered one week after the intervention are presented in Table 3, showing a decrease in communication apprehension across all dimensions. The greatest reduction occurred in the dyadic dimension, where the score decreased from 21 (high category) to 8 (low category), representing a 13-point reduction. The other dimensions group, meeting, and public speaking, each showed an 8-point decrease. However, the meeting dimension remained in the high category, while the group and public speaking dimensions moved to the moderate category. The total PRCA-24 score at baseline was 102, classified as high anxiety, and after the intervention, it decreased to 65, falling within the moderate category.

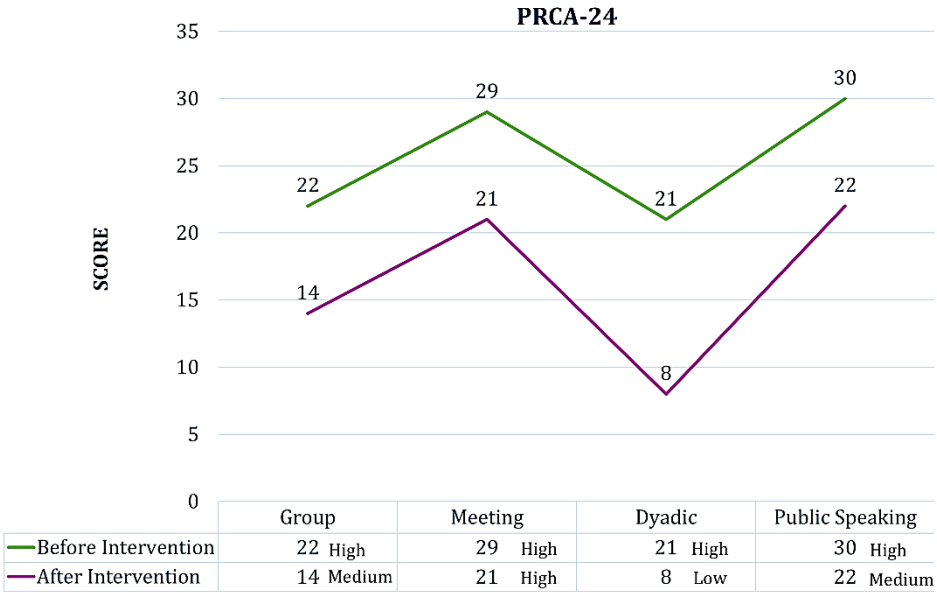

Figure 1. PRCA-24 Results Before and After Intervention

A follow-up interview was conducted 1.5 months after the intervention (Table 3). The subject reported experiencing a reduction in communication apprehension in certain situations. This study's findings align with similar research by Marantini et al. (2014), who investigated 10 junior high school students with communication apprehension and provided systematic desensitization counseling. Their results also demonstrated a significant decrease in communication apprehension during classroom activities.

Tabel 3
Follow Up Evaluation After Intervention

Intervention Baseline	*Follow Up*
Based on the initial assessment conducted at the beginning of the semester, the subject participated in a student organization selection process. However, according to the subject, their responses did not meet expectations. The subject reported experiencing nervousness, anxiety, palpitations, and difficulty concentrating. As a result, the subject was unsuccessful in passing the organization selection during their first year.	The subject demonstrated increased self-confidence during the student organization selection process in the second year. The subject felt capable of responding to questions clearly and appropriately. Although some tension was still experienced, the subject was able to manage anxiety through relaxation techniques prior to the interview session. This had a positive impact, resulting in the subject successfully passing the student organization selection in the second year.
The subject consistently experiences anxiety when speaking and engaging in discussions with others, whether with acquaintances or strangers. The subject also experiences fear and reluctance to speak during meetings, accompanied by feelings of inadequacy in expressing their opinions.	The subject began to feel more comfortable when speaking with others. While maintaining eye contact remained challenging, the subject was able to express opinions clearly. The excessive tension and nervousness previously experienced were no longer present.

Furthermore, the subject refuses to speak in public, even when it involves simply introducing themselves.	1. The subject served as a moderator for an online student organization event with approximately 100 participants. 2. The subject served as a moderator for an in-person student organization event with approximately 20 participants.

DISCUSSION

The results of the present study indicate that the application of exposure therapy, with a primary focus on systematic desensitization, effectively reduces communication apprehension in a subject exhibiting a trait-like profile. The reduction in communication apprehension scores between the initial baseline phase and the post-intervention phase suggests that the intervention mechanism operates through a habituation process to anxiety-provoking stimuli. The decrease was observed not only in the overall score but also across all subcomponents of communication apprehension, namely dyadic, meeting, public speaking, and group dimensions.

In this context, the subject was gradually exposed to communication stimuli, starting from situations eliciting the lowest levels of anxiety to those inducing the highest, while employing relaxation techniques to regulate physiological responses. This exposure was accompanied by relaxation training aimed at regulating physiological arousal, such as muscle tension and heart rate. As the subject repeated these exposures, physical symptoms (e.g., trembling, palpitations) began to subside, indicating the onset of habituation. This process reflects the mechanism of gradual desensitization, grounded in classical conditioning principles, to reduce anxiety through reconditioning. Systematic desensitization is considered the core component of Exposure Therapy (Teunisse et al., 2022). This process demonstrated that habituation required close monitoring of subjective readiness and consistent adjustment of stimulus intensity across sessions.

Several factors appeared to contribute to the success of the intervention. These included the participant's high levels of motivation, consistent session attendance, and active engagement in practicing relaxation techniques outside of sessions. Additionally, the flexible nature of the single-subject design allowed the researcher to adjust session content and pacing in real-time based on the participant's emotional and psychological responses, thereby enhancing intervention efficacy.

Exposure therapy, particularly the use of systematic desensitization, also proved effective in enhancing the subject's courage and readiness to communicate. This finding aligns with Syafryadin et al. (2017), who reported that systematic desensitization helps students improve public speaking skills by gradually and systematically reducing tension. Furthermore, interview data revealed increased self-confidence and initiative in communication, indicating that the intervention not only reduced anxiety but also improved social skills.

Regarding implementation, the intervention proceeded according to the initial plan, largely due to its adaptation to the subject's unique characteristics an approach enabled by the single-subject research design. This design permits flexible, real-time adjustments of the intervention in response to the subject's daily reactions. The researcher was able to promptly modify strategies when the subject's responses deviated from expectations, thereby enhancing intervention effectiveness.

Quantitative changes were also observed in the subject's PRCA scores which dropped from 102 at baseline (high apprehension) to 65 at after intervention (moderate apprehension). While this decrease is statistically meaningful, it also clinically significant, as it represents a shift in the participant's functional ability to communicate. The participant reported less avoidance, greater comfort, and more initiative in real-life communication settings.

A primary challenge encountered during assessment and intervention was the subject's difficulty in visualizing anxiety-provoking social situations. The subject faced challenges when asked to imagine various communication scenarios, which elicited physical reactions such as palpitations and trembling. These reactions underscore that communication apprehension manifests not only cognitively and affectively but also physiologically (Schulenberg et al., 2023). This made the anxiety hierarchy mapping particularly challenging, especially in the initial stages. Nonetheless, with relaxation technique training, the subject adapted and began to demonstrate progress in managing physical responses. This finding is consistent with prior research on the function and benefits of relaxation techniques in mitigating physical responses induced by anxiety-provoking situations (Jacobson, 1938, as cited in Wolpe, 1961; Mukhran et al., 2021).

Concerning external validity, the single-subject approach inherently limits the generalizability of findings to broader populations. However, its principal strength lies in providing in-depth understanding of individual-level change processes, which is especially valuable for addressing psychological disorders associated with relatively stable personality traits such as trait-like communication apprehension. Additionally, findings from single-subject studies can serve as a foundation for future intervention replications, thereby contributing to the ongoing development of empirically testable scientific evidence (Walker & Carr, 2021).

Research by Madoni et al. (2018) further supports the efficacy of systematic desensitization in a group counseling context for reducing public speaking anxiety. In their study, systematic desensitization combined with Emotional Freedom Techniques (EFT) produced significant reductions in student anxiety levels, illustrating the technique's flexibility across therapeutic settings. Similarly, Izzah and Sa'idah (2023) corroborate these findings, demonstrating that systematic desensitization effectively reduces public speaking anxiety among high school students. Their study showed a significant difference in anxiety scores before and

after intervention ($p < 0.05$), confirming the technique's effectiveness in educational contexts.

Nonetheless, this study has several limitations. Besides the limited sample size and absence of mediating variables (e.g., self-efficacy or emotion regulation capacity), the study did not include a formal effect size calculation. Although the behavioral improvements suggest clinical significance, future research should assess both statistical and clinical relevance using comprehensive design.

CONCLUSION

Based on measurements taken during the initial and final baseline phases, it can be concluded that the systematic desensitization intervention was effective in reducing communication apprehension among university students exhibiting trait-like communication apprehension. The systematic desensitization process implemented in this study operated by repeatedly presenting items arranged in an anxiety hierarchy, which gradually decreased the subject's anxiety levels until no anxiety responses were elicited. The application of this technique enabled the subject to adapt to situations that previously induced anxiety, leading to significant behavioral change. With the support of progressive muscle relaxation and guided visualization techniques organized hierarchically, the subject was able to continue practicing independently, which is expected to support long-term management of communication apprehension.

As a recommendation, future research could expand understanding of the effectiveness of systematic desensitization by involving third parties, such as significant others, to provide support and conduct follow-up assessments using repeated PRCA-24 scoring to monitor the subject's progress post-intervention. This approach could enhance external validity and strengthen the sustainability of the intervention's impact. Furthermore, additional studies are encouraged to examine the effectiveness of this technique across a broader population, considering factors such as gender, age, and socio-cultural background, to obtain a more comprehensive understanding of the application of systematic desensitization in addressing communication apprehension among diverse groups.

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