Psychological Thought
psyct.swu.bg | 2193-7281
South-West University "Neofit Rilski"

Research Article

The Effect of Progressive Muscular Relaxation on Managing Anger

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Abstract

The aim of this study was to investigate the effectiveness of Progressive Muscular Relaxation on managing anger. A quasi-experimental one-group Pre-test and Post-test research design was employed with twenty participants (12 men and 8 women, aged 18-35) who scored high on the Novaco Anger Scale-Provocation Inventory (NAS-PI). All of them completed ten group anger management sessions, which included Progressive Muscle Relaxation. The paired sample t-test was used to compare the average scores before and following the relaxing sessions. Results showed a significant reduction in anger scores from pre-intervention (M=81.10, SD=3.19) to post-intervention (M=68.35), SD=3.66), t (19) =17.67, p< .001). These findings suggest that Progressive Muscle Relaxation is an effective and accessible non-pharmacological intervention for anger management. In addition to community and clinical use, this technique can also be used in forensic settings as an affordable strategy to manage anger, which often contributes to aggression, violence and recidivism.

Keywords: anger; progressive muscular relaxation; anger management, forensic setting, correctional rehabilitation

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Psychological Thought, 2025, Vol. 18(2), 583-600, https://doi.org/10.37708/psyct.v18i2.1168
Received: 2025-08-05. Accepted: 2025-10-05. Published (VoR): 2025-11-03.
Handling Editor: Emelina Zaimova-Tsaneva, South-West University "Neofit Rilski", Blagoevgrad, Bulgaria.
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Anger is a basic emotion that is primarily experienced in day-to-day living. It is an intense emotional reaction to a particular excitement. People get upset when others criticize their character, treat them unfairly, hold them responsible for an unreasonable conduct, prevent them from achieving their goals, or defy social norms (Dodge et al., 1997). Anger and its accompanying behaviors are undesirable because they cause problems for both individuals and society at large. It is described as an "emotional state that varies in intensity from mild irritation to intense fury and rage" (Spielberger et al., 1983). It is frequently seen as a typical occurrence in daily life (Averill, 1982).

Anger is a normal emotion that is inclusive and universal, despite popular belief that it is only a negative emotion like violence and hostility (Önder, 2003). However, when it goes out of control and becomes harmful, it can cause issues in a variety of spheres of life, including workplaces, interpersonal relationships, social interactions, life satisfaction, and potentially both social and personal productivity levels (APA, 2013). Even though anger can be constructively expressed and is thought to be a healthy emotion, it can also be extremely harmful to the individual and the environment around them (Ozyeshil, 2012).

A person who is angry will also activate emotional literacy to any negative disruptions that affect the various body systems, causing changes in physiological conditions, such as elevated blood pressure, tense muscles, and elevated levels of adrenaline and noradrenalin due to sympathetic discharge, which is physiologically matched to cover up body systemic balance to feelings of fear, hurt, or sadness (Harris et al., 1964; Digiuseppe & Tafrate, 2006). Anger is viewed as an emotion that initiates the fight or flight response (Bopp & Smith, 2000). According to Potegal & Stemmler, (2010), two things can make someone angry-Insidious and external, the first one is caused by low frustration and illogical views of reality.

Despite the fact that men and women seem to experience anger to the same degree, women typically show their anger in less overt ways, such as through relational or interpersonal aggression (Smith, 2008). Because they are less likely to display overt signs of anger, women may be less likely to be referred to school-based anger management programs (Smith et al., 2012). Therefore, it may be claimed that anger management programs might be gender-specific, yet the majority of them seem to be made for men and are mainly taught at the secondary level (Smith, 2008). Three elements can be distinguished in anger: conditions, behaviors, and feelings (Smith, 2008). Consequently, anger management is also complicated and typically takes into account all three facets of rage (Smith et al., 2012). Students who participate in anger management classes learn techniques to help them manage their rage during a disagreement. Sometimes these programs operate alone, and other times they are part of bigger social skills programs. The majority of programs employ a mix of methods and approaches, such as teaching stress reduction skills, raising awareness of the physiology of anger, problem-solving tactics, and cognitive restructuring, even though the precise components employed in anger management vary (Smith et al., 2012).

Anger management involves understanding the nature of one's anger, focusing on conceptualizing anger in relation to other people, situations, and angry occurrences, as well as thoughts, images, and physical indicators that suggest heightened anger (Reilly et al., 1990). In mental health practice, problematic anger has been addressed by a variety of psychosocial interventions. Relaxation, progressive muscle relaxation, systematic desensitization, meditation, stress inoculation are a few examples of such interventions (DiGiuseppe & Tafrate, 2003). In forensic and penal setting, anger management issues are a major risk factor for criminal behavior, violence and aggression. Research shows that, violence, crimes, interpersonal conflicts, and an increased chance of reoffending are associated with the high level of anger among criminals (DiGiuseppe & Tafrate, 2006; Kim & Son, 2024). Therefore, implementing efficient anger management programs has substantial consequences for community safety and criminal rehabilitation.

Relaxation is thought to be one of the most important abilities to acquire and utilize in daily life. Many people use it to manage stress-related issues, such as reducing tension, anger, and anxiety (Gift et al., 1992). The advantages of relaxation have been established over the past three decades, and studies have shown that relaxation techniques are consistently and significantly effective (Manzoni et al., 2008). Two additional studies have examined the efficacy

of relaxation techniques; one examined aggression in elementary school students with emotional or behavioral disorders (Lopata, 2003), while the other examined ways to prevent aggression in students with these conditions (Lopata et al., 2006). The efficacy of the relaxation approach in lowering aggression and boosting self-control is supported by both investigations. Relaxation techniques were found to have superior long-term effects than pharmacological treatments in studies comparing pharmacotherapy with relaxation therapy for anxiety (Sultanoff & Zalaquett, 2000). Experimental studies have shown that regular relaxation practice can enhance pleasant feelings and a sense of purpose in life, as well as reduce symptoms related to physical and mental health (Fredrickson et al., 2008).

Muscle tension is one of the body's responses to anxiety, anger, and fear. In addition to making some people feel worn out, this might cause them to feel "tense" or cause aches and pains in their muscles (Kent, 1998). Backaches and tension headaches are also linked to tense muscles. In situations where anger is primarily linked to tense muscles, muscular relaxation might be especially beneficial. PMR is a technique that has been demonstrated to be effective in lowering muscle tension (Carlson & Hoyle, 1993). This procedure produces physiological and emotional calmness (Meyer et al., 2016).

PMR is a behavioral therapy that alleviates both physical and psychological symptoms using repetitive tension and relaxation to relax the muscles (Jacobson, 1938). Progressive muscle relaxation (PMR) is an exercise that helps us de-stress both mentally and physically by gradually tensing and relaxing muscle groups throughout the body. This relaxation technique takes more time and is somewhat less covert than breathing relaxation technique, but having quite potent benefits (Ghoncheh & Smith, 2004). One study conducted with college students revealed that, students who performed PMR once a week for five weeks showed significantly higher scores on measures of physical relaxation, mental quiet, and joy as compared to who engaged in a deep breathing exercise (Lopata et al., 2006). Correctional rehabilitation programs use structured anger management interventions, such as relaxation-based techniques, to lessen institutional violence and facilitate reintegration (Deffenbacher et al., 2000). Additionally, these interventions have also shown effectiveness in reducing anger among young offenders in correctional facilities (Ireland, 2004). According to these findings, PMR is a simple and cost-effective intervention that might be especially helpful in forensic settings when anger management is important but resources are limited.

Progressive muscle relaxation (PMR) is considered to be useful for health promotion, including easing insomnia, lowering blood pressure, gastrointestinal and pulmonary issues (Gift et al., 1992; Sheu et al., 2003). Numerous researchers have found that PMR relieves physiological tension, lowers blood pressure (Edelman, 1970), activates the parasympathetic nervous system, and lowers heart rate (Pawlow & Jones, 2005). PMR is frequently used to treat a number of syndromes, including chemotherapy-induced nausea and vomiting (Molassiotis et al., 2002), anxiety in patients with circulatory diseases (Li et al., 2015), and migraines (Meyer et al., 2016).

Studies have shown that PMR helps students and other clinical and nonclinical populations avoid negative effects, anxiety, and depression (Carlson & Hoyle, 1993; Khasky & Smith, 1999). According to a meta-analysis, relaxation was recommended as an adjunct to antidepressants or structured brief psychological treatments in cases of moderate to severe depression because it was more effective at reducing depressive symptoms than no treatment or very little treatment (Jorm et al., 2008). In patients with chronic health issues, regular PMR has also been shown to improve quality of life (Cheung et al., 2003; Hui et al., 2006; Ghafari et al., 2009). Additional research on individuals with health issues revealed that PMR strengthened internal locus of control (Baider et al., 1994).

However, this study aimed to measure the effectiveness of Progressive Muscle Relaxation technique for managing anger and is very relevant in our present life. Review of literature on this topic revealed no studies conducted in Bangladesh on using PMR to manage anger. Progressive muscular relaxation therapy may be considered a straightforward, secure, easily accessible, and cost-effective non-pharmacological therapeutic treatment if its efficacy in lowering anger is statistically significant. Additionally, recent studies found that aggression can be reduced by using non-pharmacological intervention that are focused on emotion regulation (Kim & Son, 2024; Bruinsma et al., 2020). In community, progressive muscular relaxation is a non-coercive technique that targets physiological arousal and may serve as a preventative strategy for anger management.

Method

Objective

The objective of the study is to explore the effect of progressive muscular relaxation on anger management.

Design and Participants

A quasi-experimental Pre-test and Post-test research design was used to assess the effectiveness of the anger management skills training. This design was based on quantitative self-report data. For this study, 60 participants from various locations in Rajshahi City, Bangladesh, were chosen using a non-probability convenience sampling technique. The Novaco Anger Scale-Provocation Inventory (NAS-PI) was initially completed by all 60 participants. Those who scored higher than 75 (>75), indicating the highest levels of anger (significantly more irritable than the average person), were invited to participate in an anger management program. 25 of those invited agreed to join in the program, and 20 of them finished the anger management group sessions, which included Progressive Muscle Relaxation. Ultimately, the data of 20 participants (12 men and 8 women), ages 18 to 35 (mean age of 24), were included in the data analysis.

Measures

1. Personal Information Form. Demographic information such as age, and gender were collected from the samples using a Personal Information Form.
2. Novaco Anger Scale- Provocation Inventory (NAS-PI). The Novaco Anger Scale-Provocation Inventory (NPI) is made up of 25 items about anger intensity and its generalization into five kinds of provocation. These are disrespectful treatment, unfairness/injustice, frustration/interruption, unpleasant characteristics, and irritations. Respondents would rate their level of anger in each event using a four-point Likert scale (from "not at all" to "very much") (Novaco & Gonzales, 2009). Cronbach's alpha for the NAS-PI reliability studies is 0.95 for the NAS and PI components and 0.85 to 0.98 for all NAS-PI subscales (Hornsveld et al., 2011). The NAS-PI has demonstrated its validity through its 82% correlation with the BDHI (Buss & Durkee, 1957) and 84% correlation with the STAXI (Novaco, 2010). The Cronbach's alpha for the military standardization of the NAP-SI on US soldiers during the Iraq War was.91 for both the NAS and PI scales, and.79 to.93 for the NAS-PI subscales. This tool seems to have the intended potential for assessing the actions of individuals in crises and during combat, as well as to assess anger in military settings

(Novaco et al., 2012). NAS-PI has been applied to a wide range of populations, including military populations, healthy and non-clinical, clinical and pathological (Hornsveld et al., 2011).

3. Progressive Muscle Relaxation (PMR). Progressive muscle relaxation (PMR) is a two-step relaxation technique that helps to reduce stress and increase awareness of tension and deep relaxation sensations in different muscle groups. The initial phase of this exercise involves applying tension to particular muscle groups and starting to observe how this portion of the body feels when under tension. The second stage is to let go of the tension in your muscles and start to observe how a relaxed muscle feels as the tension goes away. By alternating between tensing and relaxing certain muscle groups in a specific order as one moves around the body, one gains awareness of how to distinguish between the related sensations of a fully relaxed muscle and a tensed one. In 1938, Dr. Jacobson developed Progressive Relaxation, a relaxation technique that involves alternating between tensing and releasing sixteen distinct muscle groups. The PMR script utilized in this investigation was approved and applied in a prior clinical population by Isa et al. (2013). Starting with the fingers and hands, the alternate tensing and releasing muscle movement progressed to the elbow, arms, chin, eyebrows, eyes, jaws, teeth, tongue, lips, head, neck, shoulder, back, abdominal, buttocks, feet, and toes. Every major muscle group, including the arms and abdomen, was worked twice, while the others were only worked once. Constant deep breathing was instructed during the session, particularly in between muscle alterations. The setting was calm and cool, and the participants were seated comfortably. The duration of each session was approximately sixty minutes.

Procedure

The effectiveness of the relaxation approach was investigated using a repeated measurement (pre-test and post-test). All chosen participants who scored highly on perceived anger are invited to take part in an anger management program. The anger management program for the participants comprised ten sessions; during the first session, participants only responded the Novaco Anger Scale; no relaxing method was used. Baseline scores that represented the anger level of the participants were determined after this testing session. Following the relaxation sessions, participants again completed the Novaco Anger Scale for the second time at the tenth session. It should be noted that participants were free to ask any questions they had about any of the items on the scale. Thus, data might have been collected and statistically compared to

data obtained prior to the first application of the relaxing approach. There were eight one-hour group relaxation sessions held between the first and tenth meetings. The goal of the relaxing sessions was to reduce anger or aggression by allowing participants to relax and let go of everyday tensions while also improving their ability to control their emotions and feelings.

Data Analysis

The data generated from the implementation was analyzed using the Statistical Package of Social Science (SPSS) Version 26. The results were inferred using statistical techniques like descriptive and inferential statistical methods like mean, standard deviation, and paired t test.

Ethical Issues

The study was carried out in accordance with ethical guidelines and principles outlined in the declaration of Helsinki. All participants were informed about the aim and purpose of the study, their right to withdraw at any time and confidentiality. They willingly participated in the study after signing the consent form.

Results

Among the 20 participants, 60% were male (*n* = 12) and 40% were female (*n* = 8). The majority of participants were unmarried (80%), while only a small proportion were married (20%). The participants' ages ranged from 18 to 35 years, with a mean age of 22.75 years (SD = 4.54), indicating that most individuals in this study were young adults (Table 1). Overall, the demographic characteristics suggest a relatively homogeneous sample composed mainly of young, unmarried males.

Table 1.
Characteristics of participants in this study (N = 20).

Characteristic	*N (%)* or M±SD
Gander	
Male	12 (60.0)
Female	8 (40.0)
Age (Years)	22.75±4.54
Age range (years)	18-35
Marital status	
Married	4 (20.0)
Unmarried	16 (80.0)

Note. Values represent frequency (percentage) or mean ± standard deviation where applicable

A paired-samples t-test was conducted to evaluate the effectiveness of progressive muscular relaxation (PMR) in reducing anger levels among participants. Descriptive statistics and inferential results are presented in Tables 2 and 3. The mean pre-test anger score (M = 81.10, SD = 3.19) was substantially higher than the post-test anger score (M = 68.35, SD = 3.66), suggesting an overall decrease in anger levels after the intervention.

The t-test results confirmed that this difference was statistically significant, $t(19) = 17.67$, $p < .001$, 95% CI [11.24, 14.26]. The mean difference of 12.75 points indicates a large effect size, implying that PMR training was highly effective in managing anger among the participants. The narrow confidence interval further supports the consistency and reliability of this reduction.

Table 2.
Means and Standard Deviations of Anger Scores Before and After PMR (N=20).

Time point	M	SD
Pre-Test	81.1000	3.19
Post Test	68.3500	3.66

Note. Higher scores indicate greater levels of anger.

Table 3.
Paired-Samples t Test for Anger Scores.

Comparison	M_{diff}	SD	95% CI	t (19)	p
Pre-test vs. Post-test Anger Score	12.75	3.23	[11.24, 14.26]	17.67	<.001

Note. Mdiff = mean difference; CI = confidence interval

Discussion

The present study explored the effectiveness of Progressive Muscular Relaxation (PMR) in managing anger among young adults in Bangladesh. Findings revealed a statistically significant reduction in anger scores following the intervention. Findings of this study are consistent with the previous studies supporting the utility of PMR as a useful technique to manage anger.

Results of this study align with earlier studies suggesting that PMR is effective in reducing not only anger but also related symptoms such as stress, muscle tension, and anxiety (Carlson &

Hoyle, 1993; Gift et al., 1992; Khasky & Smith, 1999). The mechanism underlying this effect may be the physiological shift PMR induces - from sympathetic nervous system arousal, which is commonly associated with anger and stress, to a state of parasympathetic dominance marked by calmness and relaxation (Pawlow & Jones, 2005). Additionally, clinical uses of PMR in various contexts support the findings. While Ghafari et al. (2009) discovered that PMR enhanced quality of life in individuals with multiple sclerosis, Cheung et al. (2003) revealed that it dramatically decreased anxiety and improved the quality of life among patients with colorectal cancer.

Findings of this study are also consistent with results reported by Snyder et al. (1999) and Deffenbacher et al. (2000), who found that structured psychological interventions can significantly reduce anger levels among adolescents and university students. The observed changes may reflect both the physiological benefits of PMR and its ability to increase emotional self-awareness and self-regulation. Furthermore, the results of this study are particularly important given the context of mental health care in Bangladesh, where stigma and limited access to services persist. As a low-cost, non-pharmacological intervention, PMR is an accessible and culturally adaptable technique that can be implemented in both clinical and community settings. Moreover, it offers a less stigmatizing alternative for individuals who are hesitant to pursue psychotherapy or psychiatric treatment (Jorm et al., 2008). Importantly, these findings are equally applicable to forensic and criminal psychology. PMR is consistent with wider forensic rehabilitation strategies that aim to reduce risk factors for violence and modify behavior (Howells, et al., 2004). Since PMR addresses the physiological and emotional regulatory deficiencies in offender populations, it could potentially strengthen conventional forensic treatments.

Taken together, the idea that PMR improves emotional regulation while simultaneously lowering physiological arousal is supported by these results. People can better control the physical manifestation of anger by developing voluntary muscle control and body awareness, which improves behavioral results. Affordability, minimum side effects and emphasis on self-control make PMR an effective approach for programs that prevent and treat aggression in those who are at risk. In correctional settings, this could result in reduced violent occurrences, better relationships between staff and inmates, and eventually fewer cases of recidivism. Thus, the current study adds to the increasing amount of data demonstrating the efficacy of PMR as an intervention for managing anger in a variety of demographics..

Limitations and future research suggestions

The present study has a few limitations. First, the sample size is relatively small, which may limit the generalizability of the findings. Second, all participants were selected only from one city of the country, so the results may not reflect the situation in other regions. Third, the Novaco Anger Scale used in the study was not translated into Bengali, making it difficult for participants to complete the questionnaire with full attention. Lastly, the study did not include an analysis of data from dropouts or non-participants, which could have provided valuable insights. A definitive conclusion cannot be drawn due to these constraints. Only two variables were compared in this study.

Future studies should consider using a randomized controlled design with a larger and more diverse sample across multiple regions. Translation and validation of assessment tools in the local language would also help improve the reliability of data. Moreover, investigating the long-term effects of PMR and comparing it with other anger management techniques (e.g., mindfulness or CBT-based approaches) could yield more comprehensive insights. Additionally, there has been few research on the levels of anger among university students and professors; thus, it is important to study anger levels and develop better programs and training strategies for dealing with anger. Educators, university administrators, university counselors, and anyone who work with these folks should be trained and informed on Progressive Muscular Relaxation techniques.

Conclusion

The current study demonstrated that Progressive Muscle Relaxation significantly reduce anger among participants. In low-resource setting, PMR can show strong potential for integration into mental health intervention as a low-cost, no-invasive technique. Additionally, it can be utilized to get caretakers ready at home. Families and medical professionals should support Progressive Muscle Relaxation to offer better ways for caring of individuals who are very angry. For further validation of its utility and scalability, future research with more diverse and larger samples is encouraged. Beyond its community and clinical applications, PMR has potential as a forensic and correctional system rehabilitation tool that can help reduce violence, rehabilitate offenders, and increase institutional safety.

Funding/Financial Support

The authors have no funding to report

Other Support/Acknowledgement

A heartfelt thanks to all of the research participants for their volunteer involvement in this research.

Competing Interests

The authors have declared that no competing interests exist.

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