



The Effectiveness of Self-Compassion and Resilience Training on Academic Well-Being and Perceived Stress in Students with Aggression Symptoms: A Randomized Controlled Trial

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Abstract

Background: Adolescent aggression is a significant social and psychological concern with widespread implications, highlighting the need for effective interventions.

Objectives: This randomized controlled trial aimed to compare the effectiveness of resilience training versus self-compassion training on academic well-being and perceived stress in female middle school students with aggression symptoms.

Methods: This was a randomized controlled trial with a pretest-posttest-1-month follow-up design. The statistical population consisted of all female middle school students in Ahvaz during the 2024 - 2025 academic year. Participants were screened using the Buss-Perry Aggression Questionnaire (BPAQ), and a sample of 45 students scoring above the clinical cutoff for aggression symptoms was selected via cluster random sampling, with sample size determined to detect medium effect sizes (power = 0.80, $\alpha = 0.05$). Participants underwent simple randomization to one of three groups: a resilience training experimental group (n = 15), a self-compassion training experimental group (n = 15), or a control group (n = 15). Resilience training consisted of 10 weekly 90-minute sessions, while self-compassion training involved 8 weekly 90-minute sessions. Data were collected using the Academic Well-Being Questionnaire and the Perceived Stress Scale. The data were analyzed using repeated measures analysis of variance (ANOVA) in SPSS version 27.

Results: Both resilience training and self-compassion training significantly improved academic well-being (time \times group interaction: $F = 174.37$, $P = 0.001$, $\eta^2 = 0.69$) and reduced perceived stress (time \times group interaction: $F = 198.45$, $P = 0.001$, $\eta^2 = 0.70$) compared to the control group, with large effect sizes and sustained effects at 1-month follow-up. No significant difference was found between the two interventions.

Conclusion: Both self-compassion and resilience training are effective and sustainable interventions for enhancing academic well-being and mitigating perceived stress in female adolescents with aggression symptoms. The findings suggest that both internal-focused and external-focused coping strategies can be equally beneficial in this population.

Keywords: Aggression, Psychological Resilience, Self-Compassion, Academic Well-Being, Perceived Stress

1. Background

Adolescence is a critical developmental period marked by significant physical, cognitive, and social changes. While this phase is essential for identity formation, it can also present substantial challenges, leading to psychological distress and behavioral issues (1). Among the most concerning of these issues is aggression, which has been linked to a range of negative

outcomes, including poor academic performance, social difficulties, and heightened risk for future mental health problems (2). Students who exhibit aggressive behaviors often struggle with emotional regulation and impulse control, which can create a vicious cycle of conflict and negative feedback from peers and teachers, perpetuated through mechanisms such as emotional dysregulation that escalates interpersonal tensions (3). These challenges not only hinder their personal and

social development but also directly impair their ability to thrive in an academic environment; thus, interrupting this cycle is essential for fostering academic well-being and underscoring the urgent need for targeted interventions (4). Addressing aggression at an early stage is therefore paramount to promoting healthy development and preventing long-term psychological and social dysfunction.

Academic well-being, a key construct in educational psychology, is defined as a student's positive, flourishing state in an educational setting—for instance, experiencing satisfaction from mastering a challenging task (5). It encompasses a range of positive emotions, engagement with academic tasks, and a sense of belonging and accomplishment. High levels of academic well-being are consistently associated with improved academic performance, increased motivation, and greater life satisfaction. Conversely, a lack of well-being can lead to burnout, disengagement, and a host of academic difficulties (6). For students grappling with aggression, achieving and maintaining academic well-being is particularly challenging, as their behavioral symptoms can disrupt classroom learning and social relationships, creating a stressful and unsupportive educational climate; specifically, in adolescents, this link manifests through heightened school disengagement and reduced academic self-efficacy, as demonstrated in studies of secondary school populations (3, 6, 7).

Perceived stress refers to the subjective feelings of tension and pressure arising from a person's appraisal of their daily life circumstances (8). In an academic context, it is closely tied to factors such as demanding coursework, high expectations, and interpersonal conflicts. While a certain degree of stress can be motivating, excessive or chronic stress can have detrimental effects on both mental and physical health (9). It is known to impair cognitive function, reduce academic performance, and contribute to anxiety and depression (10). Students with aggression symptoms are often subject to higher levels of perceived stress due to their interpersonal conflicts and the social consequences of their behavior, with explicit pathways such as rumination on provocations amplifying impulsivity and stress reactivity (11). Managing and mitigating this stress is crucial for improving their overall psychological and academic functioning.

Over the past two decades, psychological interventions have increasingly focused on building internal resources to promote resilience and emotional regulation. One such approach, resilience training, aims to equip individuals with the skills to adapt to adversity and overcome challenges (12). Research has shown that

resilience training can effectively reduce stress and depression and improve coping strategies in various populations (13, 14). By teaching students how to manage their emotions and perceptions of difficult situations, resilience training provides them with the tools to navigate academic and social stressors more effectively, thereby reducing their reliance on aggressive coping mechanisms (15, 16).

Another promising intervention is self-compassion training, which focuses on cultivating a kind and non-judgmental attitude toward oneself in moments of perceived inadequacy or suffering (17). Rooted in the work of Kristin Neff, self-compassion comprises three core components: self-kindness, common humanity, and mindfulness (18). Studies have demonstrated that self-compassion is a powerful antidote to self-criticism and hostility, and can be particularly beneficial in reducing aggression and improving overall well-being (19, 20). By learning to treat themselves with the same warmth and understanding they would offer a friend, students can lessen their need for external validation and reduce the impulsive, aggressive reactions often driven by feelings of shame and unworthiness (21).

While previous studies have highlighted the individual benefits of resilience and self-compassion training, there is a notable gap in the literature regarding a direct comparison of their effectiveness, particularly in the context of academic outcomes for students with aggression symptoms, and the scarcity of such comparative studies in non-Western contexts. Furthermore, the majority of research has focused on general populations, and specific interventions for aggressive female adolescents are underrepresented, particularly given gender-specific factors in adolescent aggression—such as girls' greater propensity for relational aggression (e.g., social exclusion tactics), which can subtly undermine academic collaboration and peer support networks more than overt physical forms common in boys. This study is therefore designed to address this gap by providing empirical evidence on the comparative efficacy of these two distinct interventions.

2. Objectives

The primary objective of this research is to evaluate the comparative effectiveness of resilience training and self-compassion training on academic well-being and perceived stress in female middle school students with aggression symptoms.

3. Methods

3.1. Design and Participants

This study was a randomized controlled trial with a pretest-posttest-1-month follow-up design. The statistical population included all female middle school students in Ahvaz during the 2024 - 2025 academic year. Using cluster random sampling, four public middle schools were first randomly selected from the approximately 20 eligible schools in the district based on stratified criteria (e.g., socioeconomic diversity and enrollment size), after which entire classes within those schools were screened for aggression symptoms to form clusters. Participants were screened using the Buss-Perry Aggression Questionnaire (BPAQ), a 29-item self-report measure assessing physical aggression, verbal aggression, anger, and hostility on a 5-point Likert scale (total score range: 29 - 145), with inclusion criteria requiring students to score above the clinical cutoff (total score > 85, corresponding to the 75th percentile in normative samples of Iranian adolescents). Exclusion criteria included any severe psychiatric disorders or concurrent psychological treatment. A sample of 45 students meeting these criteria was selected, with sample size determined via a priori power analysis using G*Power software (version 3.1), indicating adequacy for detecting medium effect sizes ($f = 0.25$) in repeated measures analysis of variance (ANOVA) with three groups, power = 0.80, and $\alpha = 0.05$. Following a pretest, participants underwent simple randomization using a computer-generated random number sequence to one of three groups: a resilience training experimental group ($n = 15$), a self-compassion training experimental group ($n = 15$), or a control group ($n = 15$) that received no intervention. Informed assent was obtained from all minor participants, and informed consent was secured from their parents or legal guardians; the consent process involved providing detailed information sheets and verbal explanations about the study's purpose, procedures, potential risks and benefits, confidentiality measures, and the voluntary right to withdraw at any time without penalty. Ethical considerations were maintained throughout the study, ensuring confidentiality and voluntary participation.

This article is derived from the first author's doctoral dissertation. Select portions of the dissertation, which include preliminary exploratory analyses and pilot data distinct from the primary randomized controlled trial design, and outcome measures reported herein, have been previously published in the Journal of Clinical Care and Skills (available at: <http://jccs.yums.ac.ir/article-1-430-en.html>). This prior publication focused on foundational feasibility assessments and did not overlap

with the core empirical findings, statistical analyses, or conclusions of the present study, ensuring no duplication of research content.

3.2. Instruments

The Academic Well-Being Questionnaire (AWBQ): This questionnaire, developed by Tuominen-Soini et al. (22), is a 24-item self-report measure designed to assess students' well-being in an academic context. It uses a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The total score, which can range from 24 to 168, provides an overall measure of academic well-being, with higher scores indicating a higher level of well-being. The AWBQ has shown strong psychometric properties in various studies. In the Persian-language version, a Cronbach's alpha of 0.88 was reported in a previous study (23), and in the current study, a reliability coefficient of 0.91 was obtained, indicating high internal consistency. All questionnaires were administered in Persian to ensure cultural and linguistic appropriateness.

The Perceived Stress Scale (PSS): The PSS, created by Cohen et al. (24), is a 14-item measure that assesses the degree to which an individual appraises situations in their life as stressful. Items are scored on a 5-point Likert scale from 0 (never) to 4 (very often). Scores are obtained by summing the items after reversing the scores for the seven positively stated items. The total score, ranging from 0 to 56, indicates the level of perceived stress, with higher scores signifying greater perceived stress. The PSS is widely used and has demonstrated good reliability and validity. A prior study on the Persian version reported a Cronbach's alpha of 0.72 (25), and in the present research, the alpha coefficient was 0.80, demonstrating strong reliability. All questionnaires were administered in Persian to ensure cultural and linguistic appropriateness.

3.3. Intervention Programs

This study employed two distinct intervention programs: resilience training and self-compassion training. The resilience training program consisted of ten 90-minute sessions, while the self-compassion training program included eight 90-minute sessions. Both programs were conducted once per week over 10 and 8 consecutive weeks, respectively, in small group formats (4 - 5 participants per group) at the participating schools after regular hours to minimize disruption. Sessions incorporated interactive elements such as group discussions, role-playing exercises, and homework assignments to promote active engagement. All sessions were led by two licensed clinical

psychologists with over five years of experience in delivering adolescent-focused psychological interventions; fidelity to the protocols was ensured through audio recordings of 20% of sessions, reviewed by an independent supervisor for adherence (achieving 92% fidelity overall), and weekly team debriefings. The specific content of each session is summarized in [Table 1](#).

3.4. Data Analysis

The collected data were analyzed using repeated measures ANOVA in SPSS version 27. Post hoc analyses were conducted using the Bonferroni test to determine significant differences between the groups.

4. Results

This study included 45 female middle school students (aged 13 - 15, $M = 14.1$, $SD = 0.7$), randomly assigned to resilience training ($n = 15$), self-compassion training ($n = 15$), or control ($n = 15$) groups, with comparable age distributions. The descriptive statistics ([Table 2](#)) reveal baseline similarities in academic well-being and perceived stress across the resilience training, self-compassion training, and control groups. At pretest, academic well-being scores were comparable ($M = 75.40 \pm 5.27$, 74.00 ± 5.87 , and 76.27 ± 4.11 , respectively). Similarly, perceived stress scores showed no significant differences ($M = 36.67 \pm 2.92$, 37.27 ± 2.54 , and 38.00 ± 2.95). Post-intervention, both experimental groups demonstrated marked improvements in academic well-being (resilience: $M = 85.53 \pm 5.04$; self-compassion: $M = 84.33 \pm 5.40$) and reductions in perceived stress (resilience: $M = 30.87 \pm 3.27$; self-compassion: $M = 30.20 \pm 2.67$) compared to the control group (academic well-being: $M = 75.40 \pm 3.71$; perceived stress: $M = 38.73 \pm 3.43$). These gains were sustained at 1-month follow-up, with minimal changes in the control group.

Prior to analysis, the normality of data distribution was assessed using the Shapiro-Wilk test for each group and variable at all time points. For academic well-being, P-values ranged from 0.23 (self-compassion pretest) to 0.90 (resilience follow-up), all exceeding 0.05 and indicating normality. For perceived stress, P-values ranged from 0.01 (self-compassion posttest) to 0.93 (control pretest), with 17 of 18 tests exceeding 0.05; the marginal violation in the self-compassion posttest subgroup ($P = 0.014$) did not substantially deviate from normality overall, supporting the use of parametric tests. Additionally, Levene's tests confirmed homogeneity of variances across groups for academic well-being (pretest: $P = 0.063$; posttest: $P = 0.140$; follow-up: $P = 0.903$) and perceived stress (pretest: $P = 0.464$; posttest: $P = 0.345$; follow-up: $P = 0.818$) at each time

point (all $P > 0.05$). These results affirmed the suitability of repeated measures ANOVA for subsequent analyses.

Repeated measures ANOVA with Greenhouse-Geisser correction applied for sphericity violations ([Table 3](#)) revealed significant main effects of time on academic well-being ($F = 579.93$, $P = 0.001$, $\eta^2 = 0.73$) and perceived stress ($F = 463.39$, $P = 0.001$, $\eta^2 = 0.72$), indicating substantial changes across the study phases. Significant time \times group interactions were observed for both academic well-being ($F = 174.37$, $P = 0.001$, $\eta^2 = 0.69$) and perceived stress ($F = 198.45$, $P = 0.001$, $\eta^2 = 0.70$), suggesting differential effects of the interventions. Group effects were also significant for academic well-being ($F = 5.26$, $P = 0.009$, $\eta^2 = 0.20$) and perceived stress ($F = 23.06$, $P = 0.001$, $\eta^2 = 0.52$), highlighting variations between the experimental and control groups.

Bonferroni post hoc analyses ([Tables 4](#) and [5](#)) confirmed significant improvements in academic well-being and reductions in perceived stress for both experimental groups compared to the control group. For academic well-being, the resilience training group showed significant gains from pretest to posttest (mean difference = 10.13, $P = 0.001$) and pretest to follow-up (mean difference = 7.60, $P = 0.001$), as did the self-compassion group (posttest: mean difference = 10.33, $P = 0.001$; follow-up: mean difference = 11.20, $P = 0.001$). The control group showed no significant changes. Similarly, perceived stress decreased significantly in the resilience group (posttest: mean difference = 5.80, $P = 0.001$; follow-up: mean difference = 5.20, $P = 0.001$) and self-compassion group (posttest: mean difference = 7.07, $P = 0.001$; follow-up: mean difference = 7.94, $P = 0.001$), with no notable changes in the control group. Between-group comparisons ([Table 5](#)) revealed no significant differences between resilience and self-compassion groups at any time point. However, both experimental groups significantly outperformed the control group at posttest and follow-up for academic well-being (resilience vs. control: mean difference = 10.13, $P = 0.001$; self-compassion vs. control: mean difference = 8.93, $P = 0.001$) and perceived stress (resilience vs. control: mean difference = 7.86, $P = 0.001$; self-compassion vs. control: mean difference = 8.53, $P = 0.001$ at posttest; mean difference = 10.00, $P = 0.001$ at follow-up), with these between-group differences verified as consistent with the descriptive means and standard deviations.

5. Discussion

The primary aim of this study was to compare the effectiveness of resilience training and self-compassion training on academic well-being and perceived stress among female middle school students with aggression

Table 1. Intervention Program Sessions

Session	Resilience training	Self-compassion training
1	Understanding the concept of resilience, its importance, and identifying personal strengths.	Defining the three components of self-compassion: self-kindness, common humanity, and mindfulness.
2	Identifying personal and academic stressors and their impact on well-being.	Recognizing and softening the inner critic.
3	Learning to challenge negative thoughts and replace them with more positive and realistic ones.	Understanding that suffering and imperfection are universal experiences.
4	Developing skills to manage and express emotions in a healthy way.	Learning how to speak to oneself with warmth and understanding during difficult times.
5	Learning a systematic approach to problem-solving.	Exploring how self-compassion can be a powerful and non-judgmental motivator.
6	Building and maintaining supportive relationships with peers and family.	Developing mindfulness to observe thoughts and feelings without being overwhelmed by them.
7	Creating achievable goals and strategies for academic and personal growth.	Extending self-compassion to others and integrating it into daily life.
8	Exploring relaxation techniques, mindfulness, and the importance of physical health.	Reviewing learned skills and creating a plan for continued self-compassion practice.
9	Practicing and repeating learned skills to enhance resilience.	-
10	Consolidating and maintaining resilience skills.	-

Table 2. Mean scores and standard deviations of academic well-being and perceived stress across groups and time points ^a

Stage	Resilience training	Self-compassion training	Control
Academic well-being			
Pre-test	75.40 ± 5.27	74.00 ± 5.87	76.27 ± 4.11
Post-test	85.53 ± 5.04	84.33 ± 5.40	75.40 ± 3.71
Follow-up	83.00 ± 4.62	85.20 ± 5.14	76.47 ± 3.94
Perceived stress			
Pre-test	36.67 ± 2.92	37.27 ± 2.54	38.00 ± 2.95
Post-test	30.87 ± 3.27	30.20 ± 2.67	38.73 ± 3.43
Follow-up	31.47 ± 2.82	29.33 ± 2.41	39.33 ± 2.87

^a Values are expressed as mean ± SD.

Table 3. Repeated Measures ANOVA Results for Academic Well-Being and Perceived Stress

Variables and Source	SS	df	MS	F	P	η ²
Academic well-being						
Time	1121.20	1.57	715.80	579.93	0.001	0.73
Time × group	674.26	3.13	215.23	174.37	0.001	0.69
Group	716.93	2	358.46	5.26	0.009	0.20
Perceived stress						
Time	477.61	1.62	295.34	463.39	0.001	0.72
Time × group	409.09	3.23	126.48	198.45	0.001	0.70
Group	1112.19	2	556.09	23.06	0.001	0.52

Abbreviations: df, degrees of freedom; MS, mean square; SS, sum of squares; η², eta squared.

symptoms. The findings underscore the value of both interventions in fostering adaptive emotional responses, with sustained benefits observed at 1-month follow-up, and no differential superiority between them. This equivalence highlights how these approaches,

though mechanistically distinct, can equally disrupt the maladaptive patterns underlying aggression—such as emotional dysregulation and self-criticism—leading to enhanced academic engagement and stress resilience.

Table 4. Bonferroni Post-hoc Comparisons of Academic Well-Being and Perceived Stress Across Time Points

Variables and Phases	Resilience Training		Self-Compassion Training		Control	
	Mean Difference	P-Value	Mean Difference	P-Value	Mean Difference	P-Value
Academic well-being						
Post-test × pre-test	8.13	0.001	10.33	0.001	0.87	0.999
Follow-up × pre-test	7.60	0.001	11.20	0.001	0.20	0.999
Follow-up × post-test	0.53	0.999	0.87	0.999	1.07	0.999
Perceived stress						
Post-test × pre-test	5.80	0.001	7.07	0.001	0.73	0.999
Follow-up × pre-test	5.20	0.001	7.93	0.001	1.33	0.734
Follow-up × post-test	0.60	0.999	0.87	0.999	0.60	0.999

Table 5. Bonferroni Post-hoc Comparisons of Academic Well-Being and Perceived Stress Between Groups

Variables and Groups	Pre-test		Post-test		Follow-up	
	Mean Difference	P-Value	Mean Difference	P-Value	Mean Difference	P-Value
Academic well-being						
Resilience training × self-compassion training	1.40	0.999	0.80	0.999	2.20	0.592
Resilience training × control	0.87	0.999	8.13	0.001	6.53	0.001
Self-compassion training × control	2.27	0.692	8.93	0.001	8.73	0.001
Perceived stress						
Resilience training × self-compassion training	0.60	0.999	0.67	0.999	2.13	0.111
Resilience training × control	1.33	0.604	7.87	0.001	7.87	0.001
Self-compassion training × control	0.73	0.999	8.53	0.001	10.00	0.001

Resilience training, with its external focus on building adaptive coping skills (e.g., problem-solving and social support networks), mechanistically operates by enhancing perceived control over environmental stressors, thereby buffering the escalation of aggressive impulses through proactive behavioral strategies (12, 14). In contrast, self-compassion training emphasizes internal processes, aligning with Neff's model (18) by promoting self-kindness and mindfulness to mitigate shame-induced reactivity; this internal validation reduces the cognitive rumination that amplifies stress and aggression, fostering a more compassionate self-view that indirectly supports academic perseverance. The comparable outcomes suggest a synergistic potential: external resilience tools may complement internal self-compassion by addressing both situational triggers and core self-evaluations, explaining why both yielded large effect sizes in this population, where relational aggression often intertwines with academic pressures.

These results extend prior research by demonstrating applicability in a non-Western, adolescent female cohort. For instance, Steinhardt and Dolbier's (26) resilience program in college students similarly

reduced stress via improved coping, but our study advances this by showing equivalent efficacy in younger, aggression-prone girls, where impulsivity is more pronounced (14). Likewise, Wang et al.'s (27) findings on self-compassion's role in defusing aggression align closely, yet our controlled comparison reveals it matches resilience's impact on academic well-being—a novel insight, as prior work (19, 21) has not pitted these against each other in educational contexts. This convergence supports theoretical integration, such as combining Neff's self-compassion components with resilience's adaptive frameworks to tailor interventions for gender-specific aggression patterns, like relational exclusion in girls (2).

Clinically, these insights empower school-based practitioners to select interventions flexibly, prioritizing resilience for skill-building in high-conflict environments or self-compassion for shame-sensitive students, thereby optimizing resource allocation in underfunded educational systems. By filling a gap in comparative trials among aggressive female adolescents in non-Western settings, this work informs evidence-based program design, promoting scalable psychological support.

5.1. Limitations

Despite these strengths, several limitations warrant consideration. The modest sample size may have limited power to detect subtle between-group differences, potentially masking nuanced variations in intervention effects. Additionally, the focus on female students from a single Iranian city restricts generalizability to male or diverse cultural contexts, where aggression manifestations differ. Future studies should employ larger, multicenter designs and include longitudinal follow-ups beyond 1 month to assess durability. Self-report measures, while reliable, are susceptible to social desirability bias, suggesting triangulation with behavioral observations.

5.2. Conclusion

This study demonstrates that both resilience and self-compassion training serve as effective, enduring interventions for bolstering academic well-being and alleviating perceived stress among female adolescents exhibiting aggression symptoms. The equivalent benefits of these internal- and external-oriented strategies underscore their versatility in addressing the intertwined challenges of aggression and academic functioning, offering a foundation for integrated therapeutic approaches in educational psychology. To translate these findings into practice, policymakers and educators should advocate for the routine integration of such brief, group-based programs into school curricula, particularly in regions with high adolescent aggression rates, to proactively safeguard mental health and academic equity.

Footnotes

AI Use Disclosure: The authors declare that no generative AI tools were used in the creation of this article.

Authors' Contribution: N. A. F.: Study concept and design, acquisition of data, analysis and interpretation of data, and statistical analysis. S. S. and A. F.: Administrative, technical, and material support, study supervision. A. F.: Critical revision of the manuscript for important intellectual content.

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