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# Effectiveness of Group Attachment Based Intervention (GABI) on Improving Emotional Safety and Perceived Stress of Vulnerable Children

Setayesh Sadat. Marghzari[1], Atiyehsadat. Alavinasab Sharabiani[2], Mohadeseh. Asgarpour[3], Azita. Kazemimiraki[4], Zeinab. Ahmadi[5*]

[1] Department of Psychology, Ro.C., Islamic Azad University, Tehran, Iran
[2] Department of Psychology, Aras International Campus Branch, University of Tabriz, Tabriz, Iran
[3] Department of Psychology, To.C., Islamic Azad University, Tonekabon, Iran
[4] Department of Psychology, Marv.C., Islamic Azad University, Marvdasht, Iran
[5] Department of Educational Sciences, Bakhtar University of Ilam, Ilam Branch, Ilam, Iran

*** Corresponding author email address**: zeinabahmadi697@gmail.com

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A B S T R A C T

This study aimed to assess the effectiveness of a group attachment-based intervention in enhancing emotional safety and reducing perceived stress among vulnerable children. The present study was semi-experimental research involving a pre-test-post-test design and a three-month follow-up period, with both a control group and an experimental group. The study focused on vulnerable children in care centers supervised by the Welfare Department in Tehran during the summer and fall of 2023. A total of 30 participants were selected through purposive sampling. The interventions were attachment-based and followed a program designed by the researcher, with eight sessions held twice a week, each lasting 45 minutes. These sessions took place in one of the center's offices for the experimental group. The evaluation tools used were the Belonging and Emotional Security Tool (BEST) and the Perceived Stress Questionnaire (PSQ). The data collected were analyzed using SPSS version 27 software, with descriptive statistics (mean and standard deviation) and statistical methods like Kruskal-Wallis H, repeated measure ANCOVA, and Bonferroni's post hoc test applied at a -value of 0.05. According to the findings of the study, the P-value for the emotional safety variable in the Between-Subjects Effects showed statistical significance ($p<0.001$). Likewise, the Within-Subjects Effects showed significance for the interaction effects between time and group in the emotional safety variable ($p=0.004$). On the other hand, there were no notable variations in the sense of belonging between the different groups. Additionally, the P-value for the perceived stress variable in Between-Subjects Effects was statistically significant ($p<0.001$). The findings of this research demonstrated that an intervention focused on group attachment can successfully lessen perceived stress and enhance emotional safety. It can serve as a beneficial approach for aiding at-risk and vulnerable children in enhancing their mental and emotional well-being.

***Keywords:*** *Group Attachment-Based Intervention (GABI), Emotional Safety, Perceived Stress, Vulnerable Children*

## 1. Introduction

Children's vulnerability represents a multifaceted construct encompassing biological, psychological, and environmental dimensions. While every child is exposed to potential risks such as illness or injury, certain children face amplified vulnerability due to socio-economic hardship, neglect, or instability in their caregiving environments (Soo, 2024). The concept of vulnerability has been increasingly discussed in educational and psychological literature, where it denotes a child's susceptibility to adverse developmental outcomes resulting from structural inequalities, family dysfunction, and exposure to stressors (Faldet & Nes, 2024). Vulnerable children frequently experience limitations in access to social and emotional resources, leading to enduring difficulties in emotional regulation, academic achievement, and mental health (Park et al., 2024). These challenges are particularly severe when the child's social ecology is marked by poverty, abuse, or institutionalization, conditions that erode both perceived safety and the capacity to manage stress adaptively (Nevard et al., 2021).

Empirical research underscores that vulnerability in childhood increases the risk for negative physical, emotional, and psychological outcomes, often perpetuating cycles of marginalization and distress (Takeuchi et al., 2022). Vulnerable children are prone to higher levels of anxiety and depression due to cumulative exposure to adverse conditions such as disrupted attachment, social isolation, and inconsistent caregiving (Zhang et al., 2022). In addition, these children tend to exhibit maladaptive coping strategies, including avoidance or hypervigilance, as mechanisms to manage chronic insecurity (Soruri et al., 2023). The lack of stable attachment figures and limited emotional support networks makes it difficult for them to establish a coherent sense of belonging and emotional safety (Khoemaei et al., 2023).

Emotional safety—a fundamental psychological need—refers to the internalized sense of security that allows children to explore, learn, and form healthy relationships without fear of emotional harm (O'Hara et al., 2024). It is closely tied to the quality of attachment bonds, as stable, responsive caregiving enables children to develop a secure base from which to manage emotions and cope with stressors. Conversely, when children experience relational threats such as parental conflict, neglect, or institutional instability, their emotional security is undermined, leading to maladaptive emotional responses and potential psychopathology (Mills et al., 2021). The deterioration of emotional safety in early life has been linked to various emotional and behavioral problems, including aggression, anxiety, and social withdrawal, all of which impede normative development (Darzi Azadboni et al., 2019).

From a family systems perspective, children interpret environmental signals—especially those related to caregiver relationships—as indicators of safety or danger. Chronic interparental conflict, for example, has been shown to damage emotional security, irrespective of family structure or marital status (O'Hara et al., 2024). Emotional safety is not merely the absence of conflict but the presence of consistent empathy, availability, and responsiveness from caregivers. In adolescence, low emotional security manifests as difficulty in emotional regulation, rumination, and diminished autonomy (Seyed Mousavi et al., 2024). The impairment of emotional safety in family or institutional contexts creates fertile ground for stress-related vulnerabilities and maladaptive cognitive schemas (Steele et al., 2022).

Stress, especially perceived stress, is another major factor influencing the emotional and psychological well-being of vulnerable children. Perceived stress refers to an individual's subjective evaluation of how uncontrollable or overwhelming their life circumstances appear (Kornienko et al., 2024). It goes beyond physiological arousal, capturing the cognitive and emotional interpretation of stressful experiences. For children living in socioeconomically disadvantaged or unstable environments, daily exposure to chronic stressors—such as maltreatment, parental conflict, or institutional neglect—can elevate perceived stress to pathological levels (Takeuchi et al., 2022). This elevated stress perception can alter neural pathways associated with emotional regulation, leading to hyperactivation of the hypothalamic–pituitary–adrenal (HPA) axis and consequent difficulties in managing stress (Gotlib et al., 2021). Over time, these maladaptive physiological and psychological patterns may contribute to the emergence of depressive symptoms and diminished coping efficacy (Stramecki et al., 2022).

Recent studies have emphasized the importance of early relational experiences in mitigating perceived stress and fostering resilience. Early attachment experiences act as critical protective mechanisms that shape the development of self-regulation and stress appraisal (Frey et al., 2008). Secure attachment relationships allow children to internalize a sense of safety and predictability, which serves as a psychological buffer against future stress (Haghiri et al., 2025). Conversely, inconsistent or insensitive caregiving



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compromises this developmental pathway, leaving children vulnerable to emotional dysregulation and chronic stress responses (Ghanbari et al., 2014). Attachment theory provides a robust framework for understanding these processes, emphasizing how early bonds influence emotional functioning and social adaptation throughout life (Kitagawa et al., 2021).

Given these theoretical underpinnings, attachment-based interventions have emerged as promising approaches to strengthen caregiver-child relationships and enhance emotional well-being. These interventions target both the affective and cognitive components of attachment, aiming to increase caregivers' sensitivity and responsiveness while improving children's emotional security (Wittkowski et al., 2024). In particular, manualized attachment-based programs have demonstrated significant efficacy in promoting reflective functioning, empathy, and emotional attunement between parents and children (Steele et al., 2022). A growing body of literature indicates that such interventions not only enhance the emotional bond but also lead to measurable reductions in psychological distress and perceived stress (Nielsen et al., 2025).

The Group Attachment-Based Intervention (GABI) model is one of the most promising applications of attachment theory to vulnerable populations. Originally developed to extend attachment-based therapy to community and institutional settings, GABI integrates group dynamics to promote emotional repair and foster secure attachments within supportive peer contexts (Steele et al., 2022). It allows children to explore feelings of trust, belonging, and autonomy while practicing emotional regulation in a safe, structured environment. GABI sessions emphasize reflective dialogues, emotional validation, and collaborative problem-solving—elements that strengthen the capacity for mutual understanding and stress regulation (Tulloch et al., 2021). By focusing on attachment repair in a group setting, this intervention helps vulnerable children experience corrective emotional encounters that counteract prior relational traumas.

Attachment-based interventions, including GABI, operate on the principle that emotional security can be restored through consistent, empathic interaction. They offer children a reparative experience that compensates for earlier deficits in caregiving and promotes internalized models of safety and care (Seyed Mousavi et al., 2024). Through activities such as storytelling, group reflection, and emotional expression exercises, participants learn to articulate and manage their emotions more effectively, thereby reducing perceived stress. This process aligns with findings that emotional regulation mediates the relationship between attachment and psychological resilience (Haghiri et al., 2025). Furthermore, studies have shown that strengthening emotional safety within caregiving relationships can mitigate the long-term effects of early life stress on depressive and anxiety symptoms (Gotlib et al., 2021).

A review of the existing literature suggests that attachment-based therapy and group interventions produce significant improvements in mental health outcomes across diverse contexts. For instance, a pilot study in Japan found that attachment-based programs enhanced parent-child relationship quality and increased mutual trust (Kitagawa et al., 2021). Similarly, research in cardiovascular patients and their partners demonstrated that attachment-oriented approaches fostered emotional connection and improved relational satisfaction (Tulloch et al., 2021). The universality of these outcomes indicates that attachment-based frameworks can effectively address emotional insecurity beyond familial contexts, including among institutionalized or vulnerable children (Nielsen et al., 2025).

In vulnerable children specifically, attachment-based interventions have been shown to improve social adjustment, self-concept, and coping strategies. A group counseling intervention among orphans and vulnerable children in China, for example, led to significant increases in social support and post-stress growth, emphasizing the transformative role of structured group processes (Zhang et al., 2022). Similarly, evidence suggests that integrating reflective functioning and emotional communication in group-based attachment programs strengthens participants' sense of belonging and reduces behavioral problems (Wittkowski et al., 2024). These interventions work not only by improving relational quality but also by reshaping cognitive appraisals of threat and safety, which directly influence perceived stress (Stramecki et al., 2022).

In Iran, studies exploring attachment-based training have highlighted its potential to enhance maternal caregiving quality and children's socio-emotional competence (Ghanbari et al., 2014). Another Iranian study found that the perception of emotional safety plays a mediating role between psychological vulnerability and social anxiety among adolescents (Darzi Azadboni et al., 2019), suggesting that interventions that strengthen emotional safety could have far-reaching benefits for child and adolescent mental health. Likewise, recent Iranian studies have reported that attachment-based therapy reduces rumination and improves



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emotion regulation and autonomy in adolescents with depression (Seyed Mousavi et al., 2024). These findings underline the adaptability of attachment-based frameworks in diverse cultural contexts and their effectiveness in addressing emotional disturbances in youth.

Despite growing international interest, few empirical studies have examined how attachment-based group interventions influence emotional safety and perceived stress among vulnerable children living in institutional care. Most existing interventions focus on parent-infant dyads or family-based contexts (Nielsen et al., 2025; Wittkowski et al., 2024). However, children residing in welfare institutions often lack consistent caregiver figures, making traditional attachment-based models difficult to implement. The GABI approach, with its group-centered design, represents a flexible alternative capable of fostering emotional connection, stress regulation, and relational trust within such settings (Steele et al., 2022).

Moreover, understanding how attachment-oriented interventions reduce perceived stress is essential in light of evidence linking chronic childhood stress to long-term neuropsychological consequences (Gotlib et al., 2021; Stramecki et al., 2022). As early stress shapes future stress perception and coping behavior, interventions that enhance emotional safety could interrupt maladaptive cycles of hypervigilance and emotional reactivity (Kornienko et al., 2024). Such interventions are especially critical in institutional environments, where children are at heightened risk of emotional deprivation and chronic stress exposure (Nevard et al., 2021).

Implementing group-based attachment interventions also aligns with global policy initiatives emphasizing participatory approaches that amplify vulnerable children's voices and experiences (Faldet & Nes, 2024). These interventions promote inclusivity and empower children to articulate their needs in emotionally supportive spaces, reinforcing their sense of agency and belonging. In this sense, the integration of attachment-based principles within institutional care supports the dual goal of psychosocial rehabilitation and emotional empowerment.

To ensure the cultural and contextual validity of such interventions, it is important to consider local adaptations and methodological rigor. For instance, psychometric tools such as the Emotional Security Scale and the Perceived Stress Scale have demonstrated satisfactory reliability and validity among Iranian adolescents (Khoemaei et al., 2023), confirming their appropriateness for use in assessing emotional and stress-related outcomes in the present study. This psychometric evidence supports the empirical foundation for evaluating GABI's effects within the Iranian context.

The current study builds upon this growing body of international and national research that identifies attachment-based group interventions as a viable approach for promoting emotional health and resilience among vulnerable children. By focusing on the interplay between emotional safety and perceived stress, it bridges two critical but often separately examined dimensions of child well-being. The findings of such an investigation are expected to contribute to both theoretical development in attachment and stress research and to practical frameworks for psychosocial intervention within child welfare systems (Haghiri et al., 2025; Nielsen et al., 2025).

Therefore, the aim of this study was to examine the effectiveness of a Group Attachment-Based Intervention (GABI) in improving emotional safety and reducing perceived stress among vulnerable children under the supervision of the Welfare Department in Tehran.

## 2. Methods and Materials

### *2.1. Study Design and Participants*

The current research was an applied and quasi-experimental study that included pre-test–post-test and follow-up phases over three months. The control and experimental groups involved in the study underwent a group attachment-based intervention. The statistical population consisted of vulnerable children who experienced maltreatment in childcare centers under the supervision of the Welfare Department in Tehran during the summer and fall of 2023. A sample of 30 vulnerable children (15 in the experimental group and 15 in the control group) was selected using purposive sampling and random assignment by coin tossing. Sample size adequacy was determined using G-Power software with parameters set at $\alpha$=0.05, effect size=1.11, and power test=0.90 (Kang, 2021). The calculated sample size for each group was 26 individuals, but to account for potential sample loss during the research, the researcher decided on a sample size of 30. Eligibility criteria for participation included being at least 13 years old, having the necessary physical and mental health to engage in the research training sessions, being affiliated with Tehran Welfare, providing informed consent, and not having previously taken part in similar training programs. Exclusion criteria comprised having a psychological disorder that hindered regular attendance at training


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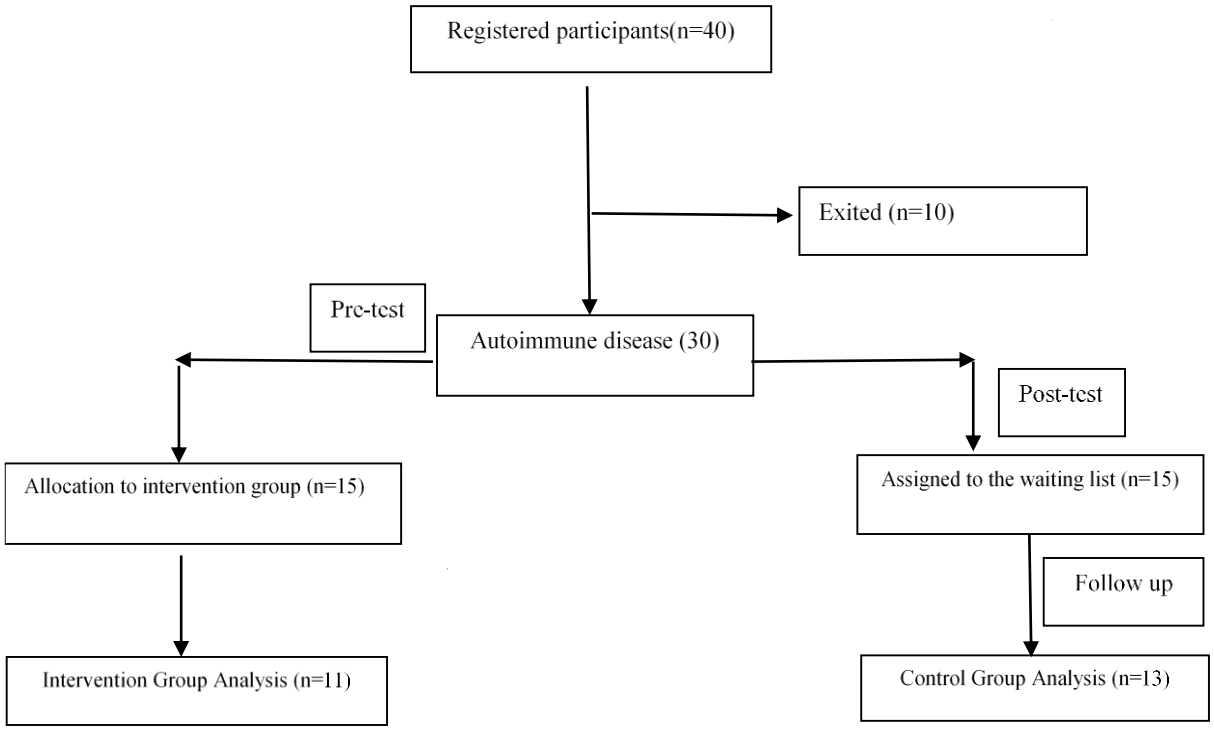
sessions, participating in other concurrent treatment programs, or failing to attend training sessions (missing more than two in-person sessions) resulting in withdrawal from the study.

The researchers received the necessary approval from the university they attended before initiating the study. They then contacted the General Welfare Department of Tehran Province and were directed to a care center for vulnerable children to conduct their research. The researchers intentionally chose children from this center for the first round of interviews, following specific criteria. Among those interviewed, 40 vulnerable children were selected to participate in the research to anticipate any possible dropouts. During the initial interview at the center's office, the researchers explained the objectives and ethical principles of the study to the children, addressing any concerns they had. Children who did not meet the study requirements were excluded at this stage, and some participants opted to withdraw from the study. Ultimately, 30 participants were selected to proceed with the research. A pre-test was administered to these participants using research tools to gather information. Following the pre-test phase, the participants were randomly assigned to groups and prepared to receive training.

The researcher conducted group attachment-based intervention using a program that they developed. These interventions followed attachment training methods from scientific research and the researcher's educational background. The training sessions were designed based on the study conducted by Ghanbari et al. on the effectiveness of attachment theory-based training in increasing caregiving quality (Ghanbari et al., 2014). The group training consisted of eight sessions, held twice a week for 45 minutes each. Sessions occurred in one of the center's offices for the experimental group, while the control group did not receive any program. After the sessions, both groups underwent a post-test, and three months later, the researcher assessed the research variables once more and compared the results between the two groups. To adhere to ethical standards, the control group also received two training sessions after the study ended. Three participants from the experimental group and two from the control group dropped out during the study. Ethical considerations included obtaining informed consent from participants and ensuring the confidentiality of information. The CONSORT flow chart is displayed in Figure 1.

**Figure 1**

*The flow diagram of the study*



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### 2.2. Measures

**Belonging and Emotional Security Tool (BEST):** Bruner et al. developed a self-report questionnaire in 2008 to assess emotional safety (Frey et al., 2008). The questionnaire consists of 25 items measured on a 5-point Likert scale. It includes two dimensions: emotional safety with 13 items and emotional attachment with 12 items. Scores for the emotional safety dimension range from 13 to 65. The questionnaire creators reported high reliability with Cronbach's alpha values of 0.89 overall and 0.86 and 0.87 for each factor (Shadaei et al., 2016). The questionnaire demonstrated strong reliability in Iran with a Cronbach's alpha value of 0.90 (Darzi Azadboni et al., 2019). In this specific study, the Cronbach's alpha coefficient for the scale was 0.74.

**Perceived Stress Questionnaire (PSQ):** The self-report questionnaire created by Cohen et al. in 1983 was developed to assess stress (Cohen et al., 1983). It consists of 16 items measured on a 5-point Likert scale ranging from "always" to "never," with a total score range of 16 to 80. Questions in the questionnaire inquire about feelings of tension, discomfort, and inefficacy in the past month, as well as the extent of problems piling up beyond coping abilities and being upset by uncontrollable issues. The questionnaire's creators achieved a Cronbach's alpha value of 0.87. In Iran, the questionnaire demonstrated a reliability of 0.72 using Cronbach's alpha method (Khalili et al., 2017). The researcher in this study calculated a Cronbach's alpha coefficient of 0.84 for the scale.

### 2.3. Intervention

The group attachment-based intervention (GABI) in this study consisted of eight structured sessions conducted twice a week, each lasting approximately 45 minutes, designed to strengthen emotional safety, improve attachment understanding, and reduce perceived stress among vulnerable children. In the first session, participants were introduced to one another, the researcher, and the core principles of attachment theory, followed by a discussion on confidentiality, parental behaviors, and obtaining informed consent. The second session focused on differentiating attachment-based and exploratory behaviors, using role-play to help children recognize insecure attachment patterns and practice adaptive responses. During the third session, participants reflected on their prior meeting and explored how mental attachment to abusive or inconsistent caregivers influences their behavior, with group discussions linking early experiences to current relational patterns. The fourth session emphasized self-awareness and behavioral regulation, guiding children to balance attachment needs, assess home stress levels, and express their feelings about being in daycare. In the fifth session, the group engaged in exercises to foster positive connections with caregivers, improve emotional expression, and develop conflict management skills through demonstrations and interactive activities addressing stress in adult–child interactions. The sixth session targeted communication and empathy-building by teaching participants how to discuss their needs, understand disability and rejection behaviors, and explore the concept of emotional safety through real-life examples. The seventh session promoted perspective-taking and group discussion, encouraging participants to appreciate different viewpoints and engage in role-play scenarios that reinforced emotional security. Finally, the eighth session was dedicated to reviewing and integrating previous lessons, consolidating learning outcomes, and administering the post-test to evaluate changes in emotional safety and perceived stress following the intervention.

### 2.4. Data Analysis

The study utilized descriptive measures such as mean and standard deviation for descriptive statistics and employed repeated measures analysis of covariance for inferential statistics. The collected data was analyzed using Kruskal-Wallis H, Repeated Measures ANCOVA, and Bonferroni's post hoc test with a p-value of 0.05, which was deemed the threshold for all statistical analysis conducted with SPSS.27 and JASP software version 18.1.0. The Shapiro-Wilk test was used to examine if the data followed a normal distribution, while Levene's test was applied to determine if the variances were homogeneous.

## 3. Findings and Results

The study involved collecting data on participants at three stages: re-test, post-test, and during follow-up in both the experimental and control groups, totaling 24 individuals. Initially, the variables of the study were examined and documented by the researcher (see Table 1).



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**Table 1**

*Description of Research Variables*

| Variable | Time | Groups | M | Std. Deviation | Shapiro-Wilk | P-value of | Min | Max |
|---|---|---|---|---|---|---|---|---|
| Emotional safety | Pre-test | GABI | 42.364 | 1.567 | 0.950 | 0.645 | 40 | 45 |
| | | Control | 42.462 | 1.561 | 0.939 | 0.440 | 40 | 45 |
| | Post-test | GABI | 45.364 | 1.027 | 0.879 | 0.100 | 44 | 47 |
| | | Control | 42.462 | 1.561 | 0.939 | 0.440 | 40 | 45 |
| | Follow up | GABI | 46.545 | 1.293 | 0.792 | 0.007 | 45 | 48 |
| | | Control | 42.000 | 1.472 | 0.891 | 0.100 | 40 | 44 |
| Belonging | Pre-test | GABI | 38.818 | 1.079 | 0.920 | 0.321 | 37 | 41 |
| | | Control | 38.692 | 1.109 | 0.908 | 0.175 | 37 | 41 |
| | Post-test | GABI | 39.091 | 1.446 | 0.922 | 0.333 | 37 | 42 |
| | | Control | 38.769 | 1.301 | 0.907 | 0.164 | 37 | 41 |
| | Follow up | GABI | 38.909 | 1.514 | 0.867 | 0.071 | 37 | 41 |
| | | Control | 39.077 | 1.188 | 0.929 | 0.329 | 37 | 41 |
| Perceived Stress | Pre-test | GABI | 47.455 | 3.387 | 0.882 | 0.109 | 41 | 51 |
| | | Control | 47.615 | 2.434 | 0.853 | 0.031 | 41 | 51 |
| | Post-test | GABI | 39.909 | 1.446 | 0.915 | 0.281 | 38 | 42 |
| | | Control | 46.154 | 3.648 | 0.904 | 0.153 | 41 | 51 |
| | Follow up | GABI | 38.818 | 1.601 | 0.852 | 0.046 | 37 | 41 |
| | | Control | 45.923 | 3.818 | 0.872 | 0.056 | 41 | 51 |

Based on Table 1, the mean of the emotional safety variable did not show a significant difference between the experimental and control groups pre-test. However, there was a noticeable variance in the mean between the two post-test and follow-up times for the control and test groups. In general, the mean scores in the Post-test and Follow-up stages in the experimental group increased compared to the control group. However, there was no significant variation among groups and stages in terms of the belonging variable. The mean of the perceived stress variable was not significantly different between the test and control groups before the test. However, there was a disparity in the mean between the two post-test and follow-up times for the control and test groups. The experimental group showed lower scores on perceived stress in the Post-test and Follow-up stages compared to the control group, on mean. In Table 2, the researcher analyzed the outcomes of the repeated measurements analysis of the covariance test.

**Table 2**

*Covariance Analysis Test*

| Variable | Source | SS | MS | F | P-value | Eta Squared |
|---|---|---|---|---|---|---|
| Emotional Safety | TIME | 2.554 | 2.554 | 3.206 | 0.088 | 0.132 |
| | TIME ✻ Pre-test | 2.700 | 2.700 | 3.389 | 0.080 | 0.139 |
| | TIME ✻ Group | 8.343 | 8.343 | 10.471 | 0.004 | 0.333 |
| | Group | 167.383 | 167.383 | 63.371 | < .001 | 0.751 |
| Belonging | TIME | 0.013 | 0.013 | 0.005 | 0.943 | $2.463\times10^{-4}$ |
| | TIME ✻ Pre-test | 0.014 | 0.014 | 0.006 | 0.940 | $2.727\times10^{-4}$ |
| | TIME ✻ Group | 0.723 | 0.723 | 0.291 | 0.595 | 0.014 |
| | Group | 0.082 | 0.082 | 0.060 | 0.809 | 0.003 |
| Perceived Stress | TIME | 5.164 | 5.164 | 1.205 | 0.285 | 0.054 |
| | TIME ✻ Pre-test | 4.590 | 4.590 | 1.071 | 0.313 | 0.049 |
| | TIME ✻ Group | 2.023 | 2.023 | 0.472 | 0.500 | 0.022 |
| | Group | 536.160 | 536.160 | 41.958 | < .001 | 0.666 |

Based on the findings of the covariance analysis presented in Table 2, the P-value for the Between-Subjects Effects related to the emotional safety variable was found to be significant ($p<0.001$). Consequently, a notable difference



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was observed in the research groups while controlling for the effects of the pre-test phase. Similarly, the within-subjects results for the emotional safety variable indicated a significant interaction between time and group (p=0.004). On the other hand, there was no significant difference in the belonging component between the groups. Moreover, the P-value for the Between-Subjects Effects related to the perceived stress variable was also significant (p<0.001). Similar to the emotional safety variable, a significant difference was observed in the research groups while keeping the effects of the pre-test stage constant. The pairwise interaction effects between stages and groups for the emotional safety component were analyzed in Table 3 by the researcher.

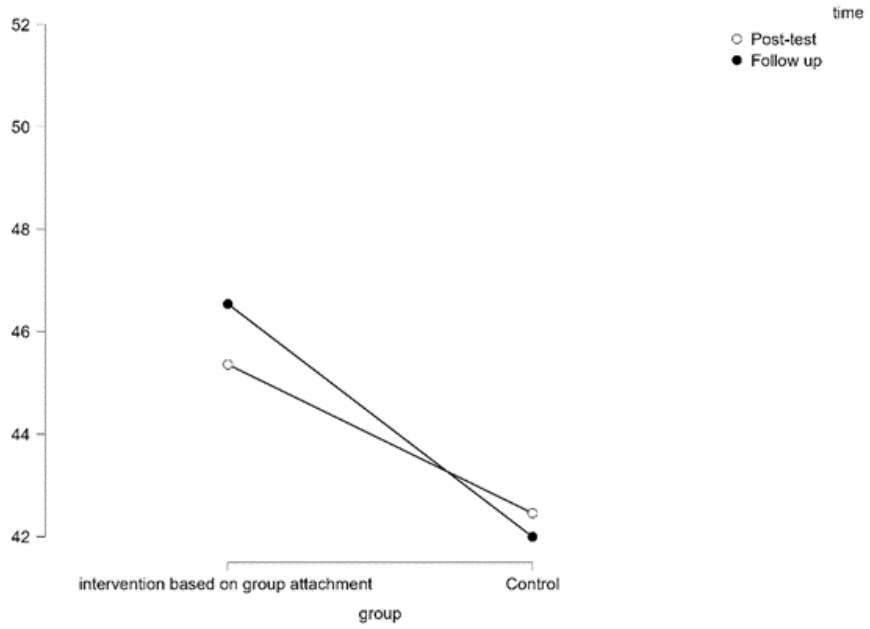
**Table 3**

*Post Hoc Comparisons - Group ✲ TIME*

| | Variable | | MD | SE | t | pbonf |
|---|---|---|---|---|---|---|
| Emotional Safety | GABI -Post-test | Control- Post-test | 2.913 | 0.537 | 5.420 | < .001 |
| | | GABI -Follow up | -1.199 | 0.381 | -3.148 | 0.010 |
| | | Control, Follow up | 3.388 | 0.537 | 6.306 | < .001 |
| | Control- Post-test | GABI -Follow up | -4.111 | 0.537 | -7.651 | < .001 |
| | | Control- Follow up | 0.476 | 0.350 | 1.358 | 0.189 |
| | GABI -Follow up | Control- Follow up | 4.587 | 0.537 | 8.535 | < .001 |

**Figure 2**

*Pairwise analysis of the interaction effects between TIME and groups for the emotional safety variable*




Based on Table 3 and Figure 2, the emotional safety variable in the intervention group differed significantly from the control group across all stages (p<0.001). The increase in mean scores for this variable confirms the effectiveness of the intervention approach based on group attachment to emotional safety. Similarly, a significant difference was observed between the emotional safety group in the Post-test stage and the Follow-up stage (p=0.010), indicating stable effects.



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**Table 4**

*Bonferroni's post hoc test to examine differences between three groups*

| Variables | Time | (I) Group | (J) Group | MD | SE | P-value | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower Bound | Upper Bound |
| Perceived Stress | Post-test | Experimental Group | Control | -6.298* | 1.131 | p<0.001 | -8.651 | -3.945 |
| | Follow up | Experimental Group | Control | -7.123* | 1.259 | p<0.001 | -9.742 | -4.503 |

Based on Table 4, the intervention group showed a noticeable contrast in the perceived stress variable compared to the control group (P<0.001). The difference between the groups and the decrease in mean scores in this factor during two Post-test and follow-up stages in the experimental group, in comparison to the control group, indicates that the intervention strategy focused on group attachment in this study was successful in reducing perceived stress. This impact was consistent throughout the study period.

## 4. Discussion and Conclusion

The present study aimed to assess the effectiveness of a Group Attachment-Based Intervention (GABI) on emotional safety and perceived stress among vulnerable children under welfare supervision. The findings demonstrated that children who participated in the GABI sessions exhibited significant improvements in emotional safety and a marked reduction in perceived stress compared with the control group. These results underscore the importance of attachment-based, group-oriented approaches for enhancing emotional well-being and stress regulation in socioeconomically and emotionally at-risk children.

The first major finding revealed that GABI significantly enhanced children's emotional safety. This outcome aligns with prior research emphasizing that secure emotional connections formed through supportive and consistent relationships foster resilience and positive affective functioning in children (Frey et al., 2008; Ghanbari et al., 2014). Emotional safety reflects a child's capacity to perceive the caregiving environment as predictable, accepting, and protective, which enables self-disclosure, emotional regulation, and the development of trust (O'Hara et al., 2024). The current findings indicate that even in institutional contexts—where caregiver turnover and instability are common—structured attachment-based group experiences can help children internalize a sense of belonging and protection. This suggests that the mechanisms of emotional security proposed by attachment theory remain operative even outside traditional family structures (Mills et al., 2021).

The improvement in emotional safety found in this study can be interpreted through the lens of attachment repair. GABI provides participants with opportunities to re-experience and reinterpret relational dynamics in a safe, structured environment. In these settings, consistent empathic engagement by facilitators mirrors the sensitive responsiveness characteristic of secure attachment relationships. Similar effects were observed in prior attachment-focused programs, such as the Circle of Security and Group Attachment-Based Intervention studies, which showed increased emotional attunement and reduced interpersonal anxiety among participants (Nielsen et al., 2025; Steele et al., 2022). The present results extend these findings to vulnerable children in welfare care, confirming that group-based attachment interventions can meaningfully enhance emotional safety across diverse social and cultural contexts.

Moreover, these findings corroborate the theoretical assumptions that emotional safety mediates the relationship between early adversity and psychological outcomes. As suggested in Iranian research, perceived emotional safety serves as a protective factor against social anxiety and emotional vulnerability (Darzi Azadboni et al., 2019). The GABI program appears to have strengthened this protective factor by offering experiences of validation, mutual empathy, and reflective dialogue. These interactive components fostered a shift in the children's internal working models—from insecurity and mistrust toward stability and acceptance—thus reducing the tendency toward hypervigilance and defensive coping (Soruri et al., 2023).

The observed reduction in perceived stress in the experimental group further supports the efficacy of GABI. Stress perception is largely determined by cognitive appraisal processes that are shaped by early attachment patterns (Kornienko et al., 2024). Children who lack secure relational experiences often interpret ambiguous situations



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as threatening, resulting in heightened physiological arousal and persistent anxiety. The GABI sessions may have helped participants reinterpret stress cues through the consistent modeling of emotional containment and reflective discussion. Similar findings were reported in studies that examined perceived stress among vulnerable children during environmental disruptions, such as the COVID-19 pandemic (Gotlib et al., 2021; Takeuchi et al., 2022). In those studies, children with stronger relational supports demonstrated lower perceived stress levels, highlighting the buffering role of secure emotional contexts.

The present findings also align with research showing that perceived stress is not merely an individual cognitive phenomenon but is intertwined with relational and environmental stability (Nevard et al., 2021). For children in institutional or impoverished environments, chronic unpredictability undermines their sense of control, amplifying stress perception. Through its focus on group cohesion, empathy, and peer support, GABI may reduce perceived helplessness by creating an emotionally coherent social field in which children can safely express distress and receive validation. Group reflections and structured sharing exercises foster mutual recognition, a factor previously associated with reductions in stress and loneliness among vulnerable populations (Zhang et al., 2022).

The mechanism underlying this reduction in stress may be explained by the development of emotion regulation skills. Several attachment-based interventions emphasize enhancing reflective functioning and awareness of affective states as pathways to stress reduction (Steele et al., 2022; Wittkowski et al., 2024). Within GABI, children are encouraged to identify and verbalize emotions, practice perspective-taking, and learn adaptive coping strategies. Such processes are consistent with evidence that emotion regulation mediates the link between attachment security and psychological well-being (Seyed Mousavi et al., 2024). The present findings, therefore, reinforce the idea that fostering reflective and regulatory capacities through attachment-informed group work can attenuate perceived stress and promote emotional stability.

Another notable implication of this research lies in the confirmation that attachment-based approaches remain effective even when implemented in a group rather than dyadic format. Traditionally, attachment interventions have been conceptualized within caregiver–child dyads, such as in parent-infant training programs or home-based therapy (Haghiri et al., 2025; Kitagawa et al., 2021). However, this study demonstrates that the group environment itself can function as a corrective emotional context. The shared experiences and interactions among peers in GABI sessions may compensate for the absence of a primary caregiver by fostering collective empathy and social learning. This group dynamic mirrors what some scholars describe as "communal attachment," where peer and facilitator relationships co-create a network of emotional safety (Tulloch et al., 2021).

The emphasis on group processes also aligns with international trends toward participatory interventions that value children's agency and voice in shaping their experiences (Faldet & Nes, 2024). Through structured group dialogue, children are not only recipients of emotional support but active contributors to one another's sense of belonging. This participatory feature likely enhanced the effectiveness of the intervention, consistent with studies that link empowerment and perceived autonomy with improved emotional regulation (Soo, 2024).

The findings also highlight the cross-cultural adaptability of attachment-based interventions. Although attachment theory originated in Western contexts, its core principles—empathy, responsiveness, and mutual regulation—are universally relevant. Prior research in Iran has confirmed the effectiveness of attachment-based parent training in improving caregiving quality and children's socio-emotional development (Ghanbari et al., 2014). The present study extends this line of evidence to group interventions among institutionalized children, suggesting that culturally sensitive adaptation of attachment principles can yield significant emotional benefits even in collectivist societies.

In interpreting these outcomes, it is essential to consider the theoretical integration of attachment and stress models. According to contemporary perspectives, early relational experiences shape the physiological stress-response systems through repeated patterns of co-regulation (Stramecki et al., 2022). When caregivers consistently help children manage arousal, the child's stress system develops adaptive flexibility; when caregivers are inconsistent or absent, dysregulation ensues. The observed decrease in perceived stress among participants implies that GABI may have facilitated new co-regulatory experiences, recalibrating participants' appraisal of stressors as less threatening. This interpretation is consistent with the scoping review of stress measurement among children, which emphasized the interplay between attachment and perceived stress as a critical determinant of developmental trajectories (Kornienko et al., 2024).

Furthermore, the findings correspond with empirical evidence that secure attachment moderates the impact of



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adverse childhood experiences. Early interventions that promote emotional safety can mitigate the downstream effects of trauma and chronic stress (Gotlib et al., 2021). The improvement in emotional safety and the concomitant reduction in perceived stress observed here support the view that attachment-based group programs constitute both preventive and reparative strategies for vulnerable youth. The emotional containment and reflective dialogue within GABI likely restored a sense of predictability and control, counteracting learned helplessness and fear responses.

Another important dimension of this study involves its methodological contribution to assessing emotional and stress-related constructs among vulnerable Iranian children. By employing validated instruments such as the Emotional Security Scale and the Perceived Stress Scale, whose psychometric reliability has been confirmed in Iranian samples (Khoemaei et al., 2023), the study provides a solid empirical basis for evaluating the efficacy of psychosocial interventions. This methodological rigor strengthens the interpretability and cross-study comparability of the findings.

The current research also provides implications for understanding developmental pathways among vulnerable children in institutional care. Exposure to chronic insecurity often leads to maladaptive internal working models characterized by fear of abandonment and mistrust (O'Hara et al., 2024). GABI's emphasis on stable group relationships and collaborative problem-solving may help revise these internal representations, fostering a renewed capacity for trust and reciprocity. Over time, these changes are expected to extend beyond the therapeutic context to improve interpersonal functioning and academic engagement.

Taken together, the results affirm that attachment-based interventions—particularly group formats like GABI—are effective mechanisms for enhancing emotional security and reducing stress among vulnerable children. They operate by promoting empathy, reflective awareness, and consistent co-regulation in a supportive community. This aligns with the theoretical synthesis proposed by integrative attachment and stress models, which highlight that fostering secure relationships is among the most effective strategies for mitigating the psychosocial impact of vulnerability and trauma (Nielsen et al., 2025; Wittkowski et al., 2024).

This study was conducted with a relatively small sample of children drawn from a single welfare institution, which limits the generalizability of the findings to broader populations. The absence of long-term follow-up beyond three months restricts understanding of the intervention's sustained effects. Additionally, group dynamics—such as individual differences in participation, peer influence, and facilitator rapport—may have influenced outcomes but were not systematically controlled. Self-report measures of emotional safety and perceived stress could be influenced by social desirability or limited introspective capacity among younger participants. Lastly, the research did not examine potential moderating variables such as gender, type of adversity, or previous attachment experiences, which could offer further insight into differential treatment responses.

Future investigations should employ larger, more diverse samples from multiple welfare and community centers to enhance external validity. Longitudinal designs spanning several years would help determine the persistence of GABI's benefits. Comparative studies evaluating GABI against other psychosocial interventions—such as mindfulness-based or cognitive-behavioral programs—could illuminate the specific mechanisms of change linked to attachment repair. Further exploration of biological correlates, such as cortisol or heart-rate variability, could elucidate how attachment-based co-regulation influences physiological stress systems. Researchers are also encouraged to investigate the role of group cohesion, facilitator training, and cultural adaptation in optimizing outcomes for children with varying types and intensities of vulnerability.

Practitioners working in child welfare, education, and mental health should consider incorporating GABI principles into routine care programs. Training facilitators in attachment-informed group techniques can enhance their ability to create emotionally safe environments that encourage openness and mutual support. Welfare institutions can integrate GABI modules as preventive interventions to promote resilience before behavioral or emotional problems escalate. Additionally, embedding attachment-based reflective practices within schools and community programs can strengthen children's coping resources and reduce perceived stress across developmental stages. Such applications would contribute to a more holistic, relationship-centered model of care for vulnerable youth.

## Authors' Contributions

Conceptualization: All authors; Methodology, analysis, and supervision: Setayesh Sadat Marghzari, and Zeinab Ahmadi; Investigation: Setayesh Sadat Marghzari,



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Atiyehsadat Alavinasab Sharabiani; Validation and writing: Mohadeseh Asgarpour and Azita Kazemimiraki

## Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

## Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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## Declaration of Interest

The authors report no conflict of interest.

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## Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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