Impact of Emotional Regulation Training, Physical Literacy, and Composite Exercise Programs on Psychosocial Well-Being among Juvenile Female: An Experimental Study

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Abstract

Background: Adolescence is a vital developmental stage characterized by emotional, social, and psychological changes. Juvenile females in institutional settings frequently experience higher levels of stress, emotional instability, and psychological difficulties. Interventions such as emotional control training, physical literacy activities, and structured exercise programmes may benefit their mental health and overall well-being. **Aim**: This study aims to explore in depth the effects of emotional regulation techniques, physical literacy, and composite training programs on the psychosocial well-being of female juveniles. **Methodology**: A randomized experimental design with pre-test and post-test phases was adopted. Initially, 80 juvenile females aged 13-18 years were recruited from Gandhi Vanita Ashram in Jalandhar (Punjab); however, only 60 participants finished the study due to health concerns and a lack of motivation. Participants were placed into three experimental groups and one control group (15 each). The experimental groups participated in a 12-week intervention program with four sessions each week. The data were analysed using descriptive statistics, the t-test, and the ANCOVA. **Results**: At the 0.05 level of significance, all experimental groups showed a significant decrease in adolescent girls' health concerns when compared to the control group. The physical literacy group performed somewhat better than the emotional control and composite training groups. **Conclusion**: The findings indicate that structured psychological and physical training programs effectively improve the psychosocial well-being and health of juvenile females and can be used as therapies to manage adolescent girls' health issues.

Keywords: adolescent girls' health problems; composite training; emotional regulation; juvenile females; physical literacy.

Introduction

Children are the foundation of a nation's future, and their growth determines the direction of society. "Early investments in children's development yield significant long-term benefits for individuals and society" (Heckman, 2006). Every child deserves love, protection, and opportunities to develop their full potential in a safe and supportive

environment. “Every child has the right to survive, thrive, and fulfil their potential” (UNICEF, 2021). Children are the driving force of a nation’s growth, carrying its progress forward and shaping a better future. “A nation’s future prosperity depends largely on the development, education, and well-being of its children” (United Nations, 2015).

Adolescence is the stage of life that lies between childhood and adulthood. It is generally considered to occur between the ages of 10 and 19 years, as defined by the World Health Organization. This is a crucial transitional period in which rapid physical, psychological, emotional, and social changes take place. “Adolescence is a formative phase of life characterized by significant biological, psychological, and social transitions, typically occurring between 10 and 19 years of age” (World Health Organization, 2020). During this stage, physical changes are most noticeable due to puberty. There is a rapid increase in height and weight, development of secondary sexual characteristics, such as deepening of the voice and facial hair in boys, and the onset of menstruation in girls. “Puberty is marked by rapid physical growth and the development of secondary sexual characteristics, including changes in body size, shape, and reproductive maturity” (Steinberg, 2014). Along with physical growth, cognitive changes also occur. Adolescents begin to think more logically and critically, develop problem-solving skills, and start forming their own identity and opinions. “Adolescence is marked by significant cognitive development, including the emergence of abstract thinking, logical reasoning, and identity formation” (Piaget, 1972). Emotional changes are very common during adolescence. Mood swings, feelings of confusion, stress, excitement, and sensitivity are frequently experienced due to hormonal changes and new life experiences. “Adolescence is often associated with heightened emotional reactivity, mood variability, and increased sensitivity due to hormonal and psychosocial changes” (Santrock, 2011). In terms of social changes, adolescents become more independent and are strongly influenced by peer groups. They seek acceptance, develop friendships, and gradually move towards forming their own role in society. “During adolescence, individuals experience increasing independence and are significantly influenced by peer relationships, which play a crucial role in social development and identity formation” (Brown & Larson, 2009).

Emotional Regulation Technique

Emotional regulation technique refers to the set of intervention-based strategies used to help participants regulate their emotions effectively, leading to improved well-being and social functioning. “Emotion regulation involves processes and interventions that enable

individuals to manage and modify their emotional responses, thereby enhancing psychological well-being and social functioning" (Gross, 2015).

Physical Literacy training

Physical literacy training refers to a structured intervention designed to enhance participants' self-esteem and reduce Adolescent's girl's health problem, leading to improved well-being. "Physical literacy encompasses the motivation, confidence, physical competence, and knowledge that contribute to improved health, well-being, and active participation in physical activity" (International Physical Literacy Association, 2017).

Composite Training

In the present investigation, composite training refers to a structured program that integrates emotional regulation techniques and physical literacy training to foster holistic psychosocial development among juvenile females residing in Gandhi Vanita Ashram, Jalandhar, and Punjab.

Objective of the study

This study aims to explore in depth the effects of emotional regulation techniques, physical literacy, and composite training programs on the psychosocial well-being of female juveniles.

Methodology

Participants

The present study was conducted on 60 juvenile female participants aged between 13 and 18 years, residing at Gandhi Vanita Ashram, Jalandhar (Punjab). Prior permission was obtained from the ashram authorities before initiating the study, and all participants were properly informed about the purpose and procedure of the research. The participants were selected using a purposive random sampling technique. A medical examination was also conducted to ensure that all participants were physically fit to take part in the training programs. The total sample was equally divided into four groups: emotional regulation group, physical literacy group, composite group, and control group, with 15 participants in each group.

Instrument

A questionnaire was used to assess adolescent girls' health problems and psychosocial well-being among juvenile females. To measure health-related issues, the Adolescent Girls' Health Problems Scale developed by Sharma (2009) was employed. The scale includes items covering physical, emotional, and psychosocial aspects, with responses recorded on a Likert scale ranging from strongly disagrees to strongly agree. The

instrument demonstrates good validity (.87) and high reliability (Cronbach's alpha = .92). The scale has also been used in previous studies to assess health problems among adolescent girls, supporting its applicability and credibility (Sharma, 2009; Kaur & Singh, 2020). The instruments were reviewed by subject experts to ensure content validity, and a pilot study was conducted to confirm reliability and feasibility. Data were collected during pre-test and post-test phases using a structured administration procedure.

Procedure

This study followed a randomized experimental pre-test and post-test design. Data were collected from juvenile female participants residing in Gandhi Vanita Ashram, Jalandhar. Prior permission was obtained from the institutional authorities, and participants were informed about the purpose of the study. Initially, informed consent was obtained from all participants. Those who agreed to participate were included in the study, while those unwilling were excluded. The selected participants were randomly assigned into four groups: emotional regulation, physical literacy, composite training, and control group.Pre-test data were collected using standardized instruments before the intervention. The experimental groups then participated in a 12-week training program conducted four days per week, while the control group did not receive any intervention. After completion of the training period, post-test data were collected using the same instruments. The entire procedure was conducted under proper supervision, ensuring ethical standards and participants' confidentiality throughout the study.

Data Analysis

Descriptive statistics were used to describe the data, including mean and standard deviation for all variables. To examine the effect of emotional regulation, physical literacy, and composite training programs, inferential statistics such as the paired *t*-test and Analysis of Covariance (ANCOVA) were employed. The *t*-test was used to compare pre-test and post-test scores within groups, while ANCOVA was applied to compare adjusted post-test means among experimental and control groups. The level of significance for all statistical tests was set at 0.05. All analyses were performed using appropriate statistical software to ensure accuracy and reliability of the results.

RESULTS

Descriptive Analysis and Group Comparison

The results of the descriptive analysis regarding adolescent girls' health problems are presented in Tables 4.1.1 to 4.1.5. Table 4.1.1 illustrates the pre-test and post-test mean scores along with standard deviations, standard error of difference, and t-values for the Emotional Regulation, Physical Literacy, Composite, and Control groups.

Table 4.1.1

Statistical Interpretation of Pre- and Post-Test Scores of Adolescent Girls' Health Problems among Treatment and Control Groups

Group	N	Pre Test		Post Test		Standard error of difference	t- ratio	Sig.
		Mean	SD	Mean	SD			
Emotional Regulation	15	133.13	9.17	104.47	4.53	2.01	14.23	.000
Physical Literacy	15	131.87	7.40	105.8	7.05	1.83	14.20	.000
Composite	15	140.6	6.52	112.26	11.41	2.60	10.868	.000
Control	15	147.60	5.71	148.20	5.90	.375	1.598	.132

Table 4.1.1 presents the a clear reduction in mean scores across all experimental groups following the 12-week intervention programme, reflecting significant improvement in adolescent girls' health-related outcomes. The Emotional Regulation group showed a reduction in mean scores from 133.13 to 104.47, the Physical Literacy group from 131.87 to 105.80, and the Composite group from 140.60 to 112.26. In contrast, the Control group exhibited no meaningful change, with mean scores remaining relatively stable (147.60 to 148.20).The paired t-test results confirmed statistically significant differences between pre-test and post-test scores for all experimental groups: Emotional Regulation ($t = 14.23$, $p < .001$), Physical Literacy ($t = 14.20$, $p < .001$), and Composite group ($t = 10.868$, $p < .001$). However, the Control group did not show a significant difference ($t = 1.598$, $p = .132$), indicating no intervention effect.

Figure 4.1.1

Graphical Representation of Pre- and Post-Test Mean Scores of Emotional Regulation, Physical Literacy, Composite, and Control Groups on the variable Adolescent Girls' Health Problems

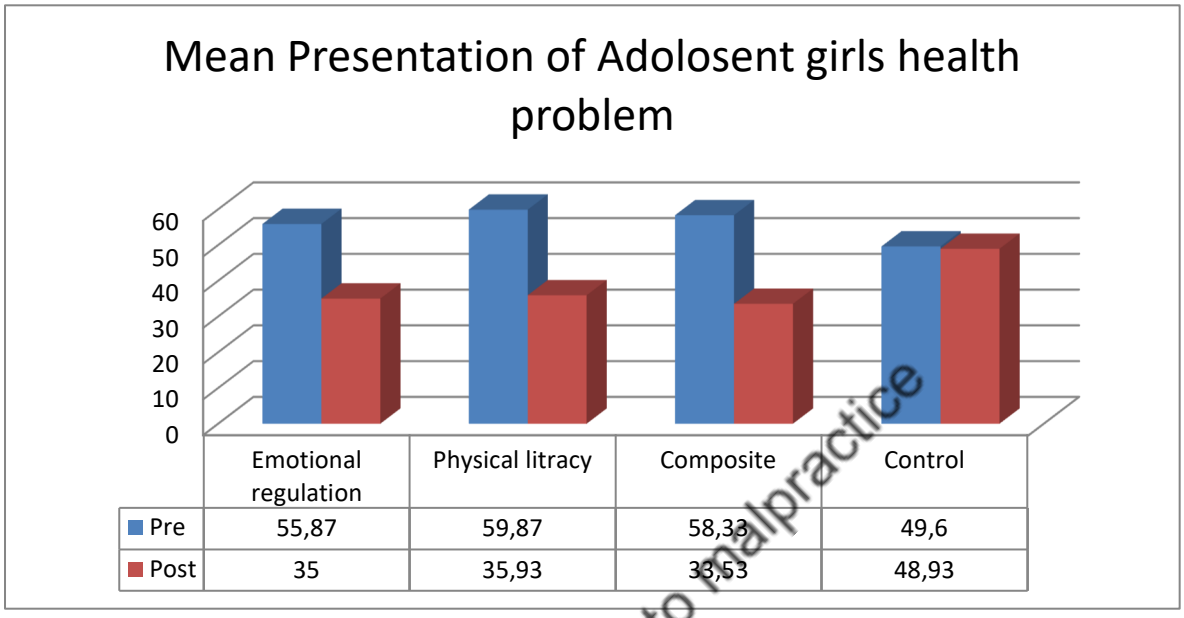

Table- 4.1.2

Assumption Testing

Levene's Test of Equality of Error Variances			
Dependent Variable: Post test			
F	**df1**	**df2**	**Sig.**
2.337	**3**	**56**	**.083**

Table 4.1.2 presents Levene's Test for Equality of Error Variances. The results indicated a non-significant value (F = 2.337, p = .083), confirming that the assumption of homogeneity of variance was satisfied. This validates the suitability of the data for further parametric analysis using ANCOVA.

Table 4.1.3

Analysis of Covariance (ANCOVA)

Dependent Variable: Post test

Source	Type III Sum of Squares	df	Mean Square	F	(p-value) Sig.
pre	**897.938**	**1**	**897.938**	**20.582**	**.000**
group	**8535.626**	**3**	**2845.209**	**65.216**	**.000**

Note: p-value < .05 indicates significant difference

The ANCOVA results presented in Table 4.1.3 demonstrate a statistically significant effect of both the covariate (pre-test scores) and group differences on post-test outcomes. The covariate (pre-test) was found to significantly influence post-test scores ($F = 20.582$, $p < .001$), indicating baseline differences among participants. More importantly, the group effect was highly significant ($F = 65.216$, $p < .001$), confirming that the intervention programmes produced statistically significant differences in adolescent girls' health problem outcomes after controlling for pre-test scores. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted.

Table 4.1.4

Post Hoc Analysis

Pair wise Comparisons: Adolescents Girls Health Problem			
(I)Treatment	**J(Treatment)**	**Mean Difference (I-J)**	**Sig. (p)**
Emotional Regulation	Physical Literacy	2.026	1.000
	Composite	3.715	.928
	Control	35.820*	<.001
Physical Literacy	Emotional	2.026	1.000
	Composite	-1.689	1.000
	Control	-33.793*	<.001
Composite	Emotional Regulation	3.715	.928

	Physical Literacy	1.689	1.000
	Control	32.104*	<.001
Control	Emotional Regulation	35.820*	<.001
	Physical Literacy	33.793*	<.001
	Composite	32.104*	<.001

Since the ANCOVA results were significant, a post hoc comparison was conducted (Table 4.1.4) to determine pairwise differences among groups. The results revealed that all experimental groups differed significantly from the Control group ($p < .001$), while no significant differences were observed among the three experimental groups.

Specifically:

- Emotional Regulation vs. Control: Significant ($p < .001$)
- Physical Literacy vs. Control: Significant ($p < .001$)
- Composite vs. Control: Significant ($p < .001$)
- Emotional Regulation vs. Physical Literacy: Not significant ($p > .05$)
- Emotional Regulation vs. Composite: Not significant ($p > .05$)
- Physical Literacy vs. Composite: Not significant ($p > .05$)

Table 4.1.5

Adjusted Mean Scores

	Dependent Variable: Post-test			
Groups	**Mean**	**Std. Error**	**95% Sureness Interval**	
			Lower Bound	**Upper Bound**
Emotional regulation	**107.29[a]**	**1.87**	**103.65**	**110.93**
Physical literacy	**109.31[a]**	**1.87**	**105.56**	**113.07**

Composite	**111.08[a]**	**1.72**	**107.54**	**114.47**
Control	**143.11[a]**	**2.04**	**139.02**	**147.20**

Table 4.1.5 presents adjusted post-test mean scores of all groups. The Emotional Regulation group recorded the lowest adjusted mean score (107.29), followed by Physical Literacy (109.31) and Composite group (111.08), while the Control group recorded the highest mean score (143.11).Lower mean scores indicate better improvement in adolescent girls' health-related outcomes. The findings clearly show that all intervention groups performed significantly better than the Control group. Among the experimental conditions, the Emotional Regulation group demonstrated the most favourable outcomes, followed by Physical Literacy and Composite training.

Discussion

This study explores the effect of emotional regulation training, physical literacy, and composite exercise programs on adolescent girls' health problems and psychosocial well-being among juvenile females. Briefly, the study findings **were grouped** into two categories: those related to the effectiveness of intervention programs (emotional regulation, physical literacy, and composite training) and those related to differences between the experimental and control groups. The first finding showed that all three intervention programs emotional regulation, physical literacy, and composite training had a significant effect on improving adolescent girls' health problems at 0.05 level of confidence. This result is consistent with several previous studies indicating that structured psychological and physical interventions positively influence adolescents' mental health and psychosocial well-being. For example, previous studies conducted in China (Li, Wang, Zhao, Li, & Zhang, 2024; Chen, Wang, Wei, Xu, & Guo, 2026; Yang, Jing, He, & Wang, 2024) have shown that physical activity and emotional regulation significantly improve psychological resilience, reduce negative emotions, and enhance overall well-being among adolescents.

Similar findings have been reported in studies conducted in Indonesia (Kumalasari, 2023), China (Zeng, Wen, & Guo, 2025), Malaysia (Choo & Prihadi, 2019), Saudi Arabia (Almulla, 2024), and Kenya (Mwangi et al., 2015), which suggest that physical activity is significantly associated with psychological and social factors that are, in turn, linked to

academic resilience and performance. Additionally, other supportive studies conducted in China (Zeng, Wen, & Guo, 2025), Spain (Piñeiro-Cossio et al., 2021), and Poland (Jadwiszczak, Wawrzyniak, & Pezdek, 2025) indicate that physical activity has a significant relationship with adolescents' emotional, social, and psychological development, thereby supporting its association with improved academic outcomes.

More specifically, research from China (Zeng, Wen, & Guo, 2025) highlights that physical activity improves social-emotional competence and strengthens peer relationships. Similarly, findings from Spain (Piñeiro-Cossio et al., 2021) indicate that physical education and school sports enhance psychological well-being, including better mental health and cognitive functioning. In addition, research from Poland (Jadwiszczak, Wawrzyniak, & Pezdek, 2025) emphasizes that physical activity contributes to moral and social development, such as teamwork and interpersonal skills.

Among the experimental groups, the emotional regulation group demonstrated the most favourable outcomes, followed by the physical literacy and composite training groups. This suggests that emotional regulation techniques may play a more direct role in managing psychological and emotional issues in juvenile females. One possible explanation is that emotional difficulties are a primary concern during adolescence, particularly among institutionalized juveniles, and interventions targeting emotional control directly address these challenges. This finding is supported by Gross (2015), who emphasized that emotion regulation is a key determinant of psychological well-being.

However, the post hoc analysis indicated no statistically significant differences among the three experimental groups ($p > .05$), even though their mean scores differed. This suggests that, while all interventions were effective, none was statistically superior to the others. Such findings are consistent with studies highlighting the importance of both physical and psychological interventions in improving adolescent health outcomes, indicating that multiple approaches can be equally beneficial depending on the context.

Another important finding from the ANCOVA analysis showed that pre-test scores significantly influenced post-test outcomes ($p < .001$), indicating the presence of baseline differences among participants. After adjusting for these differences, the intervention effect remained highly significant, confirming the robustness of the training programs. This supports the idea that structured interventions can produce meaningful improvements regardless of participants' initial conditions.

Limitations and Future Research Directions

Although this study examined the effects of emotional regulation training, physical literacy, and composite exercise programs on adolescent girls' health problems and psychosocial well-being, several limitations should be noted. External factors such as environment, peer influence, and socio-economic conditions, along with individual differences in motivation, physical fitness, and prior experiences, may have influenced the outcomes. Additionally, prior trauma, social pressure, and institutional regulations within the juvenile setting may have affected participants' responses, while the researcher had limited control over their daily routines. The relatively small sample size (n = 60) and short duration of the intervention limit the generalizability and long-term applicability of the findings. Furthermore, reliance on self-report measures may introduce subjectivity and response bias, and although the intervention programs were validated by experts, their effectiveness may vary across different contexts. Future research should include larger and more diverse samples, adopt mixed-method approaches, and incorporate additional psychological variables such as self-efficacy, resilience, and social support. Longitudinal studies are also recommended to better understand the sustained impact of such interventions.

Conclusion

- It was found that emotional regulation training is effective in improving adolescent girls' health among juvenile female. The intervention not only enhanced their overall well-being but also significantly reduced various health-related problems. This improvement may be attributed to the development of better emotional coping mechanisms, which enable adolescents to manage stress, anxiety, and negative emotions more effectively. Furthermore, emotional regulation training fosters greater self-awareness and resilience, contributing to healthier psychological and physical outcomes.
- It was found that physical literacy training is effective in reducing adolescent girls' health problems. The program contributed to improvements in overall physical fitness, coordination, and functional movement skills, which in turn supported better health outcomes. Participants also showed increased levels of physical activity and awareness about healthy lifestyle practices. Furthermore, regular engagement in physical literacy activities helps in preventing lifestyle-related issues, enhances energy levels, and promotes long-term physical and mental well-being.

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