



Role of Mild Intensity Continuous Training in Managing Aggression and Anxiety among Adolescents

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ABSTRACT

The current study was conducted to investigate the impact of eight-week training of Mild Intensity Continuous Training (MICT) on the levels of anxiety and hostility among adolescents. Forty adolescents from the DPS, Township, Lahore, with ages ranging from 10 to 14 years, were enrolled in a single-group pre-test and post-test experimental design. Purposive sampling technique was employed for selecting the participants who underwent testing for anxiety and aggressiveness prior to the intervention and after it. While the level of anxiety was assessed with Multidimensional Anxiety Scale for Children, Second Edition (MASC-2), aggressiveness was measured through Buss-Perry Aggression Questionnaire (BPAQ). Eight weeks of aerobics classes were conducted at the schools as the intervention. Descriptive statistics, reliability analysis via Cronbach's alpha, the Shapiro-Wilk test for normality, paired-samples t-tests, and Cohen's dz effect sizes were computed for the analysis of data. Reliability (alpha) of research measures varied from .856 to .891 reflecting high internal consistency. There was a decrease in the mean value of aggressiveness between pre-test and post-test from 74.38 (SD = 18.99) to 65.58 (SD = 18.45). Also, the mean level of anxiety was reduced from 41.82 (SD = 10.41) to 35.27 (SD = 9.36). Results of paired-samples t-tests showed a statistically significant reduction in anxiety ($t(39) = 8.66, p < .001$) and aggressiveness ($t(39) = 8.27, p < .001$). Large paired effect sizes were found for aggressiveness ($d_z = 1.19$) and anxiety ($d_z = 1.00$). The results suggest that school-based MICT training may be useful in promoting adolescents' psychological well-being. The absence of a control group in the study suggests that findings should be interpreted as pre-test to post-test changes related to the intervention rather than causal relationships.

Introduction

A wide array of biological, cognitive, emotional, and social changes take place during adolescence – a critical developmental period. The early adolescent years are marked by growing experiences of academic, peer, family, and other social expectations. These changes pose certain challenges for the regulation of emotions and psychological adaptation. The problems with emotional regulation may affect behavior and emotions in such a way as to result in behavioral and emotional problems that prevent school attendance, peer relations, and overall emotional adjustment (Crone & Dahl, 2018; World Health Organization [WHO], 2021).

Aggression is a multi-dimensional behavioral variable that encompasses physical aggression, verbal aggression, anger, and hostility. Emotions, impulsivity, social and academic stress, family or interpersonal conflicts may play a role in adolescent

aggression. Chronic aggression can have an adverse effect on the school and social adjustment. Another major concern of adolescence is anxiety that manifests in worry, fearfulness, irritability, insecurity, avoidance, and concentration problems. Competition at school, exams, peer relations, bullying, and family stressors may cause anxiety in adolescents (Estévez et al., 2018).

Physical exercise is now increasingly viewed as a helpful and accessible method to aid in psychological wellness. Aerobic exercise is beneficial in offering opportunities for emotional regulation, stress relief, positive social engagement, and healthy coping mechanisms. Exercise in particular is important in schools since educational settings offer an organized setting where students can engage in physical exercise without having to invest extra resources into it (Daly-Smith et al., 2020; Guthold et al., 2020).

Mild Intensity Continuous Training (MICT) involves sustained aerobic activity performed at a manageable intensity. In a school setting, activities such as brisk walking, light jogging, rhythmic movement, stretching, and low-impact aerobic exercise can be organized in a continuous and structured manner. Compared with highly demanding training, mild-intensity exercise may be more feasible for younger adolescents because it can be incorporated into routine school activities while reducing excessive fatigue. Evidence from exercise and youth mental-health research supports the potential value of regular physical activity for psychological outcomes, including anxiety and behavioural adjustment (Hoare et al., 2021; Song et al., 2025).

Although international literature has examined physical activity and adolescent mental health, comparatively limited intervention-based evidence has focused specifically on MICT and the combined outcomes of aggression and anxiety among adolescents in Pakistani school settings. The present study therefore examined changes in aggression and anxiety following an eight-week school-based MICT programme among adolescents aged 10–14 years at DPS Township, Lahore. The study addressed two objectives: to examine the effect of MICT on aggression and to investigate its impact on anxiety.

Literature Review

Adolescence, Aggression and Anxiety

Early adolescence is a period in which emotional, cognitive, and social capacities continue to develop. Adolescents are increasingly expected to manage academic demands, social relationships, and personal responsibilities while emotional regulation skills are still developing. This developmental context can increase vulnerability to emotional difficulties. Aggression may function as an inappropriate response to frustration, conflict, or emotional strain, whereas anxiety may arise from persistent worry and perceived threats related to academic, social, or family experiences (Crone & Dahl, 2018; Estévez et al., 2018).

The school environment is especially relevant because adolescents spend a substantial proportion of their daily lives in educational settings. Opportunities for structured physical activity can therefore be integrated into school routines and may provide both physiological and psychosocial benefits. School-based interventions also have the practical advantage of reaching students within an established setting and allowing consistent supervision (Daly-Smith et al., 2020).

Physical Activity and Psychological Well-being

Frequent exercise has been linked to better mental health among young people. Proposed pathways include improved mood, stress regulation, enhanced self-confidence, opportunities for positive social interaction, and changes in physiological responses to stress. Evidence also indicates that insufficient physical activity is widespread among adolescents, highlighting the importance of accessible programmes that can increase opportunities for movement (Guthold et al., 2020).

Exercise-Based therapies for children and adolescents' anxiety and other emotional outcomes have been studied. Evidence from systematic reviews suggests that exercise helps lessen psychological suffering and anxiety-related outcomes, although the magnitude of effects can vary according to intervention characteristics, participant characteristics, and adherence (Hoare et al., 2021; Song et al., 2025). Research on aggressive behaviour has likewise reported beneficial effects of structured physical exercise among young people and teenagers (Trajković et al., 2020; Zhao & Wang, 2025).

Research Gap

The literature available for the thesis showed that several previous studies had concentrated on either physical activity in general, involvement in sports or high intensity exercise. Fewer studies, however, investigated mild-intensity continuous training (MICT). Also, the variables of aggression and anxiety were usually researched independently of each other. The literature available for

Pakistan and its educational system is quite less as compared to other countries, especially for the age group of 10-14 years old. Therefore, in order to fill this research gap, the current research investigated anxiety and aggressiveness together.

Material and Methods

Research Design and Participants

The type of experimental design used in the research was pretest-post-test single group design. Before the implementation of the treatment, the same people carried out the baseline test and after eight weeks, the post-intervention test of MICT was performed. Forty participants, ranging in age from 10-14 years were involved in the research. Purposeful sampling was done to select the participants in DPS Township, Lahore. The total number of boys and girls participating in the research were twenty in number.

Instruments

Aggressiveness was measured using the Buss-Perry Aggression Questionnaire (BPAQ), a 29-question scale that measures verbal, physical, hostility, and anger aggression (Buss & Perry, 1992). Anxiety was measured using the Multidimensional Anxiety Scale for Children, Second Edition (MASC-2), which assesses anxiety dimensions among children and adolescents (March et al., 1997; Multi-Health Systems, 2020). These tools have demonstrated high internal reliability.

Intervention

The intervention was an eight-week school-based “Mild Intensity Continuous Training” program. Each session involved a warm up, continuous mild intensity aerobic exercise, and a cool down. Examples of activities given in the thesis include jogging at a slow pace, brisk walking, rhythmic exercises and deep breathing exercises. The programme was designed to be feasible, structured, and sustainable for adolescents and was implemented using the facilities available at the school.

Procedure and Ethical Considerations

Permission was obtained from the school administration before data collection. Parents or guardians provided written consent, and participants provided assent. Eligible students were aged 10–14 years, enrolled at DPS Township, physically able to participate in mild-intensity exercise, and willing to participate with parental or guardian consent. Students with chronic medical conditions, current psychiatric medication, professional sports training outside school, or irregular attendance during the intervention were excluded. Pre-test questionnaires were administered before the programme and after the eight-week intervention was over, the same outcome measures were given.

Statistical Analysis

Version 26 of IBM SPSS Statistics was used for data analysis. The study variables were subjected to descriptive statistical calculations. To gauge internal consistency, Cronbach's alpha was employed. To check for normalcy, the Shapiro-Wilk test was employed. The pre-test and post-test ratings for anxiety and aggressiveness were compared using paired-samples t-tests. To calculate the amount of within-participant change, Cohen's d_z was employed. At $p < .05$, statistical significance was established.

Results

Table 1: Age-Wise Distribution of Participants (N = 40)

Age (years)	n	%
10	7	17.5
11	8	20.0
12	9	22.5
13	10	25.0
14	6	15.0
Total	40	100.0

Note. N = total sample size; n = number of participants; % = percentage of participant

The largest age group was 13 years (25.0%, $n = 10$), followed by 12 years (22.5%, $n = 9$). Participants aged 11 years represented 20.0% ($n = 8$), while 10-year-old and 14-year-old participants represented 17.5% ($n = 7$) and 15.0% ($n = 6$), respectively.

Table 2. Institute-wise Distribution of Participants ($N = 40$)

Institute	n	%
DPS Girls Wing	20	50.0
DPS Boys Wing	20	50.0
Total	40	100.0

Participants were equally represented across the two participating school wings, with 20 students (50.0%) from each.

Table 3. Reliability Analysis of Study Instruments ($N = 40$)

Instrument	Assessment	Items	Cronbach's α
BPAQ	Pre-test	29	.870
BPAQ	Post-test	29	.891
MASC-2	Pre-test	15	.857
MASC-2	Post-test	15	.856

All alpha coefficients exceeded .80, indicating good internal consistency within the present sample. The BPAQ showed $\alpha = .870$ at pre-test and .891 at post-test. The MASC-2 showed $\alpha = .857$ at pre-test and .856 at post-test.

Table 4. Shapiro-Wilk Test of Normality ($N = 40$)

Variable	W	df	p	Decision
Pre-test Aggression	.971	40	.402	Normal
Post-test Aggression	.978	40	.590	Normal
Pre-test Anxiety	.965	40	.310	Normal
Post-test Anxiety	.980	40	.645	Normal

All Shapiro-Wilk p-values were greater than .05, indicating no statistically considerable divergence from the usual. Therefore, the use of paired-samples t-tests was justified by the normalcy assumption.

Table 5: Descriptive Statistics for Anxiety and Aggression ($N = 40$)

Outcome	Time	M	SD	Minimum	Maximum
Aggression	Pre-test	74.38	18.99	43	116
Aggression	Post-test	65.58	18.45	33	105
Anxiety	Pre-test	41.82	10.41	22	63
Anxiety	Post-test	35.27	9.36	18	56

Mean aggression decreased by 8.80 points, from 74.38 at pre-test to 65.58 at post-test. Mean anxiety decreased by 6.55 points, from 41.82 to 35.27.

Table 6. Paired-Samples t-Test and Effect Sizes ($N = 40$)

Outcome	Mean reduction	SD difference	95% CI	t(39)	p	Cohen's dz
Aggression	8.80	6.73	[6.66, 10.94]	8.27	< .001	1.19
Anxiety	6.55	4.82	[5.01, 8.09]	8.66	< .001	1.00

The paired-samples A statistically significant decrease in aggressiveness was shown by the t-test, with a mean drop of 8.80 points ($t(39) = 8.27$, $p < .001$). With a mean drop of 6.55 points, anxiety also considerably decreased ($t(39) = 8.66$, $p < .001$). Both aggressiveness ($dz = 1.19$) and anxiety ($dz = 1.00$) had significant paired effect sizes. Therefore, the observed pre-test to post-test confirmed both hypotheses comparisons.

Discussion

The present research looked at changes in aggression and anxiety following an eight-week school-based MICT programme among adolescents aged 10–14 years. The findings showed significant pre-test to post-test reductions in both outcomes. Aggression decreased from $M = 74.38$ ($SD = 18.99$) to $M = 65.58$ ($SD = 18.45$), while anxiety decreased from $M = 41.82$ ($SD = 10.41$) to $M = 35.27$ ($SD = 9.36$). The corresponding paired-samples t-tests were statistically significant, and the large within-participant effect sizes indicate that the observed changes were substantial in standardized terms.

The reduction in aggression is in line with research indicating that children's and teenagers' behavioural outcomes can be enhanced by organised physical activity. Exercise has positive according to a comprehensive review and meta-analysis conducted by Zhao and Wang (2025).

Similarly, Trajković et al. (2020) reported reductions in aggression following a structured after-school impacts on aggressive behaviour, including physical aggressiveness, rage, and hostility, volleyball programme. The present findings extend this general evidence to a school-based MICT programme focused on early adolescents.

One possible explanation is that structured exercise provides adolescents with a regular opportunity to practise behavioural control, follow instructions, manage frustration, and interact within an organized social environment. Physical activity may also support emotional regulation and positive psychological functioning. However, these pathways should be viewed as probable interpretations rather than proven mediators because they were not actually assessed in this work.

Anxiety also decreased significantly following the intervention. This finding is broadly consistent with systematic-review evidence indicating that engaging in physical activity might lessen psychological discomfort and anxiety among children and young people (Hoare et al., 2021). Recent evidence on aerobic exercise strategies for children and adolescents also supports the potential value of structured aerobic activity for anxiety and depression outcomes (Song et al., 2025). The present study adds school-based evidence from Pakistan and suggests that a relatively accessible aerobic programme may be associated with improvements in anxiety scores.

It is important to consider the fact that the eight-week long programme was implemented. It created repeated opportunities to engage in physical activity in a consistent school setting. Consistency in physical activity could help form some kind of routine and allow experiencing positive movement and socialization. However, the design of the research cannot prove which of the changes happened due to the exposure to MICT, repeating tests, maturation or other experiences during the eight-week period.

The research has some practical strengths as well. The programme was conducted in a real school environment with the use of exercise approach, and the outcome was measured through standardized measurements. The coefficients of reliability were acceptable, and the normality data made it possible to conduct parametric analysis. Both the p-values and effect sizes were presented, thus providing information about the significance and magnitude of change.

On the other hand, caution should be applied when interpreting the results. No causal inferences can be made due to the design of the research as it included only one group with pre- and post-tests and had no control group. There is a possibility of self-report bias regarding the questionnaires used, and the sample size included only 40 teenagers from one school. No follow-up assessment was conducted during the eight weeks.

Implications for Practice in Pakistani Educational Settings

There are some practical applications of the findings with regard to the schools, physical education teachers, school administration and others who are responsible for the welfare of teenagers in Pakistan. There can be incorporation of mild intensity aerobic exercises during physical education classes or any other designated class time of the school. As the program utilizes activities that do not require sophisticated equipment and are quite easily done, the program may be executed even in the schools that lack adequate facilities.

Physical education teachers could think of including activities like walking, jogging, rhythmic movements, controlled aerobic exercise and breathing exercises during classes. Programs of such kind must supplement the efforts made in psychological, counselling or clinical programs whenever the teenagers are faced with serious behavioural and emotional problems.

Limitation

Some of the restrictions need to be taken into account as well. Firstly, since there was no control group in the single-group pre-test and post-test design, MICT cannot be attributed to all changes that occurred. Secondly, the sample of participants was made up of 40 adolescents from DPS Township, Lahore only. This restriction makes it impossible to generalize the findings to other locations and schools. Thirdly, the results were collected by using questionnaires, which might be affected by the social desirability and response bias. Fourthly, the duration of the intervention was eight weeks without a follow-up evaluation in the future. Finally, the study did not examine any mechanisms that might influence the findings.

Conclusion

The current study revealed that there was a significant reduction in aggression from the pre-test to the post-test as well as anxiety after an eight week school based Mild Intensity Continuous Training program on a sample of 40 adolescent students aged 10-14 years. Reduction in aggression was 8.80 and reduction in anxiety was 6.55 and both were found to be significantly different using paired samples t-test and showed large effect sizes.

Nonetheless, the results should not be viewed as conclusive evidence that MICT alone is responsible for the improvement observed because no control group was present in the study. Future studies should use randomized controlled trials, large and diverse sample sizes, extended treatment, follow-up studies, and different methods for measuring anxiety and aggressiveness. The best possible method of training for teenagers' psychological well-being can also be determined using comparative studies on different levels of intensity of exercises.

Conflict of Interest

The author has not declared any conflict of interest.

References

1. Buss, A. H., & Perry, M. (1992). The aggression questionnaire. *Journal of Personality and Social Psychology*, 63(3), 452–459.
2. Crone, E. A., & Dahl, R. E. (2018). Understanding adolescence as a period of social-affective engagement and goal flexibility. *Nature Reviews Neuroscience*, 19(9), 636–650. <https://doi.org/10.1038/s41583-018-0033-2>
3. Daly-Smith, A., Quarmby, T., Archbold, V. S. J., Routen, A. C., Morris, J. L., Gammon, C., Bartholomew, J. B., Resaland, G. K., McKenna, J., & Dorling, H. (2020). Using a multi-stakeholder experience-based design process to improve school-based physical activity interventions. *International Journal of Behavioral Nutrition and Physical Activity*, 17, Article 135. <https://doi.org/10.1186/s12966-020-0918-8>
4. Estévez, E., Jiménez, T. I., & Moreno, D. (2018). Aggressive behavior in adolescence as a predictor of personal, family, and school adjustment problems. *Frontiers in Psychology*, 9, Article 2008. <https://doi.org/10.3389/fpsyg.2018.02008>
5. Guthold, R., Stevens, G. A., Riley, L. M., & Bull, F. C. (2020). Global trends in insufficient physical activity among adolescents: A pooled analysis of 298 population-based surveys with 1.6 million participants. *The Lancet Child & Adolescent Health*, 4(1), 23–35. [https://doi.org/10.1016/S2352-4642\(19\)30323-2](https://doi.org/10.1016/S2352-4642(19)30323-2)
6. Hoare, E., Callaly, E., Berk, M., & Jacka, F. N. (2021). Can depression, anxiety and psychological distress be reduced by physical activity? A systematic review. *Mental Health and Physical Activity*, 20, Article 100378. <https://doi.org/10.1016/j.mhpa.2021.100378>
7. Imran, N., Aamer, I., Sharif, M. I., Bodla, Z. H., & Naveed, S. (2022). Psychological burden of children and adolescents in Pakistan during COVID-19. *Pakistan Journal of Medical Sciences*, 38(2), 1–7.
8. Kandola, A., Ashdown-Franks, G., Hendrikse, J., Sabiston, C. M., & Stubbs, B. (2020). Physical activity and depression: Towards understanding the antidepressant mechanisms of physical activity. *Neuroscience & Biobehavioral Reviews*, 107, 525–539. <https://doi.org/10.1016/j.neubiorev.2019.09.040>

9. March, J. S., Parker, J. D. A., Sullivan, K., Stallings, P., & Conners, C. K. (1997). The Multidimensional Anxiety Scale for Children (MASC): Factor structure, reliability, and validity. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36(4), 554–565.
10. Multi-Health Systems. (2020). MASC 2: Multidimensional Anxiety Scale for Children, Second Edition—Technical summary. Multi-Health Systems.
11. Pallant, J. (2020). *SPSS survival manual: A step-by-step guide to data analysis using IBM SPSS Statistics* (7th ed.). McGraw-Hill Education.
12. Song, H., Ge, S., Wang, Y., Ran, L., & Zhang, H. (2025). Aerobic exercise strategies for anxiety and depression among children and adolescents: A systematic review and meta-analysis. *Frontiers in Public Health*, 13, Article 1555029.
13. Trajković, N., Pajek, M., Sporiš, G., Petrinović, L., & Bogataj, Š. (2020). Reducing aggression and improving physical fitness in adolescents through an after-school volleyball program. *Frontiers in Psychology*, 11, Article 2081.
14. World Health Organization. (2020). *WHO guidelines on physical activity and sedentary behavior*. World Health Organization.
15. Zhao, H., & Wang, Y. (2025). Effects of physical exercise on aggressive behavior in children and adolescents: A systematic review and meta-analysis. *BMC Public Health*, 25, Article 3977.



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