

EFFECT OF HATHA YOGA ON ACADEMIC ANXIETY IN SCHOOL CHILDREN

Rajeev Kumar ¹, Dr. Manoj Sharma ², Dr. Surender Singh ³, Dr. Vikram Singh ⁴ , Dr. Parmod Kumar Sethi ⁵

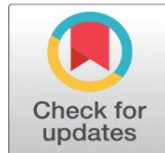
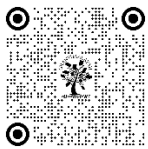
¹ PhD Research Scholar, Nirwan University, Jaipur, India

² Faculty of Yoga, Nirwan University, Jaipur, India

³ Associate Professor, PE, Keshav Mahavidyalaya, University of Delhi, India

⁴ Assistant Director, PE, Jawaharlal Nehru University, New Delhi

⁵ Professor of Physical Education, PGDAV College (E), Delhi University



Corresponding Author

Dr. Vikram Singh,
karanptk88@gmail.com

DOI

[10.29121/shodhkosh.v5.i1.2024.1973](https://doi.org/10.29121/shodhkosh.v5.i1.2024.1973)

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Copyright: © 2024 The Author(s). This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

With the license CC-BY, authors retain the copyright, allowing anyone to download, reuse, re-print, modify, distribute, and/or copy their contribution. The work must be properly attributed to its author.



ABSTRACT

This study investigates the impact of Hatha yoga intervention on academic anxiety levels among secondary school students practicing martial arts. Academic anxiety, a prevalent issue impacting students' well-being and academic performance, was measured using the Academic Anxiety Scale for Students developed by Singh and Sengupta (2009). The study involved a sample of 110 students from five secondary schools in Delhi, India, selected through random purposive sampling. The sample comprised students practicing either Taekwondo or Karate for at least two years and a control group with no martial arts experience. Both the Taekwondo and Karate groups received a 45-minute Hatha yoga intervention, while the control group engaged in their regular sports activities for the same duration. Analysis of covariance indicated that students practicing Taekwondo and Karate, coupled with the Hatha yoga intervention, exhibited lower levels of academic anxiety compared to the control group. The median academic anxiety percentile rank for the Taekwondo group was 45.0, while the Karate group had a median of 46.5. In contrast, the control group showed a significantly higher median percentile rank of 69.5. These findings suggest that engaging in martial arts practices like Taekwondo and Karate, along with Hatha yoga, may have a positive influence on reducing academic anxiety among secondary school students.

Keywords: Hatha Yoga, Academic Anxiety, Martial Arts

1. INTRODUCTION

Academic anxiety is a prevalent issue among school children, significantly impacting their well-being and academic performance. This anxiety stems from various sources, including academic pressure, test-taking anxiety, and social evaluation in the school environment. (Rudd & Rudd, 1986) While traditional approaches to anxiety management exist, exploring complementary and alternative methods like Hatha Yoga is gaining increasing interest. Hatha Yoga, with its emphasis on physical postures, breathing exercises, and mindfulness techniques, offers a holistic approach to address anxiety. This research investigates the effects

of Hatha Yoga on academic anxiety in school children. It examines how Hatha Yoga practices influence academic anxiety in a school setting.

School children engage in regular physical activity is essential for maintaining overall health and well-being. Various forms of exercise, including martial arts practices like Taekwondo and Karate, have been shown to provide numerous physical and mental health benefits. (Bridge et al., 2007). However, the high-intensity and repetitive nature of these martial arts can also lead to musculoskeletal imbalances and injuries if not properly addressed. (Bridge et al., 2007). To mitigate these risks and enhance the overall benefits of Taekwondo and Karate training, the integration of yoga practices can be a valuable addition.

Yoga has emerged as a popular form of exercise and wellness practice, with a growing body of research highlighting its therapeutic effects. Studies have demonstrated that regular yoga practice can improve strength, flexibility, and cardiovascular function, while also reducing stress, anxiety, and improving overall quality of life. (Raub, 2002). Moreover, the meditative and mindfulness aspects of yoga can complement the focus, discipline, and spiritual components inherent in martial arts training. (Turelli et al., 2020).

Significance of the study: The study on “The Effects of Hatha Yoga on Academic Anxiety in School Children” is significant as it can play a pivotal role in integrating yoga with educational practices and promoting a more balanced and healthy approach to student development by empowering the students to cope with stress and anxiety besides developing a balance between academics and sports.

Objectives: This study aims to examine the effect of a martial arts-specific Hatha yoga intervention on academic anxiety in adolescents.

Hypothesis: Based on previous research showing the benefits of yoga on cognitive and emotional outcomes (M, 2017)(Thomas & Centeo, 2020), it is hypothesized that both the Taekwondo and Karate groups will exhibit lower levels of academic anxiety compared to the control group after the intervention period. (Brown et al., 2016) (M, 2017)

2. METHODOLOGY

2.1. RESEARCH DESIGN

This study employs a pretest-posttest experimental design with a control group. Participants are assigned to one of three groups:

- 1) Taekwondo Group:** Receives martial arts-specific Hatha yoga training in addition to their regular Taekwondo practice.
- 2) Karate Group:** Receives martial arts-specific Hatha yoga training in addition to their regular Karate practice.
- 3) Control Group:** Continues with their regular activities without any yoga intervention.

This design allows for the comparison of academic anxiety levels within and between groups before and after the intervention period.

2.2. PARTICIPANTS

The study includes 110 adolescents (60 males, 50 females) aged 13 to 16 years. Participants are recruited from local martial arts schools and are randomly assigned to one of the three groups:

- Taekwondo Group: 34 participants

- Karate Group: 38 participants
- Control Group: 38 participants

Instrument: Academic anxiety was measured using the Academic Anxiety Scale (AASC) by AK Singh and A. Sengupta (2009). This scale is designed to measure the academic anxiety levels of school children. This scale is a reliable and validated instrument widely used in educational research to assess anxiety related to academic performance.

Population and Sample: In this study population of the study consisted of secondary school students of CBSE board of Delhi, India. In the preset study sample of 110 students was taken from five secondary schools from 5 Delhi districts. The students who were practicing Taekwondo and Karate for the last at least 2 years only were selected for the study. Random purposive sampling technique was used for selecting the sample of students.

2.3. PROCEDURE

- 1) Recruitment and Ethical Considerations:** Participants are recruited through flyers and presentations at participating martial arts schools. Informed consent is obtained from both adolescents and their parents/guardians.
- 2) Baseline Data Collection:** All participants complete the Academic Anxiety Scale before the intervention begins.
- 3) Intervention:** The Taekwondo and Karate groups receive 45 minutes of martial arts-specific Hatha yoga training, five days a week, for eight weeks. The control group continues with their regular sports activities.

Martial arts specific Hatha Yoga protocol

Time (minutes)	Pose/Activity	Description
Warm-Up (5 minutes)		
5	Sun Salutations (Surya Namaskar)	Perform 3 rounds to warm up the body and increase blood flow.
Main Sequence (35 minutes)		
1	Mountain Pose (Tadasana)	Focus on grounding and posture.
2	Warrior I (Virabhadrasana I)	Strengthens legs and improves balance. (1 minute each side)
2	Warrior II (Virabhadrasana II)	Enhances stamina and stability. (1 minute each side)
2	Triangle Pose (Trikonasana)	Stretches the legs and torso, improves flexibility. (1 minute each side)
2	Tree Pose (Vrksasana)	Improves balance and concentration. (1 minute each side)
2	Chair Pose (Utkatasana)	Strengthens the thighs and core.
2	Downward-Facing Dog (Adho Mukha Svanasana)	Stretches the hamstrings, calves, and shoulders.
1	Plank Pose (Phalakasana)	Builds core strength.
2	Cobra Pose (Bhujangasana)	Strengthens the spine and opens the chest.
2	Child's Pose (Balasana)	Provides a gentle stretch for the back and relaxes the body.
4	Pigeon Pose (Eka Pada Rajakapotasana)	Opens the hips and stretches the thighs. (2 minutes each side)

3	Seated Forward Bend (Paschimottanasana)	Stretches the hamstrings and lower back.
3	Butterfly Pose (Baddha Konasana)	Opens the hips and groin.
2	Bridge Pose (Setu Bandhasana)	Strengthens the back and glutes.
3	Legs-Up-the-Wall Pose (Viparita Karani)	Relaxes the legs and improves circulation.
5	Corpse Pose (Savasana)	Complete relaxation and mindfulness.
Cool Down (5 minutes)		
3	Breathing Exercise (Pranayama)	Practice deep breathing to calm the mind and body.
2	Meditation	Focus on breath and relaxation.

Data Analysis: Data is analyzed using a two-way Analysis of Variance to examine the main effects of yoga intervention (experimental vs. control group) and martial arts style on academic anxiety, as well as their potential interaction effect. Post-hoc tests are conducted to further explore significant findings.

Ethical Considerations

This study adheres to ethical guidelines for research involving human subjects. Informed consent, confidentiality, and voluntary participation are prioritized throughout the study.

3. RESULTS AND DISCUSSION

Table 1

Table 1 Dependent Variable: Academic_Anxiety_Percentile_Rank_Post			
Group	Mean	Std. Deviation	N
Taekwondo	47.14	11.68	34
Karate	50.47	10.38	38
Control Group	65.47	12.67	38
Total	54.62	14.03	110

The descriptive statistics table-1 provides information about the academic anxiety percentile rank post-intervention for the three groups: Taekwondo, Karate, and the Control Group. The mean academic anxiety percentile rank post-intervention for the Taekwondo group is 47.14 with a standard deviation of 11.69, for the Karate group it is 50.47 with a standard deviation of 10.39, and for the Control Group it is 65.47 with a standard deviation of 12.68.

The sample size (N) is 34 for the Taekwondo group, 38 for the Karate group, and 38 for the Control Group, for a total of 110 participants.

Table 2

Table 2 Levene's Test of Equality of Error Variancesa			
F	df1	df2	Sig.
0.989	2	107	0.375

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + academic_anxiety_percentile_rank_pre + Group

Levene's Test (table-2) of Equality of Error Variances tests the assumption of homogeneity of variance, which is an important assumption for ANOVA. The null hypothesis was that the error variance of the dependent variable (academic anxiety percentile rank post-intervention) is equal across the three groups. The F-value is 0.989 with 2 and 107 degrees of freedom, and the p-value is 0.375. Since the p-value is greater than the significance level (typically 0.05), we fail to reject the null hypothesis. This means the assumption of homogeneity of variance is met, and the variances across the three groups are not significantly different.

Table 3**Table 3 Tests of Between-Subjects Effects****Dependent Variable: academic_anxiety_percentile_rank_post**

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	7301.249 ^a	3	2433.75	18.2	0	0.34
Intercept	199.686	1	199.686	1.493	0.224	0.014
academic_anxiety_percentile_rank_pre	272.742	1	272.742	2.04	0.156	0.019
Group	6346.478	2	3173.239	23.73	0	0.309
Error	14174.47	106	133.721			
Total	349731	110				
Corrected Total	21475.718	109				

R Squared .340 (Adjusted R Squared = .321)

The Tests of Between-Subjects Effects table-3 provides the results of the ANCOVA (analysis of covariance) analysis.

The Corrected Model row shows that the overall model is statistically significant, with an F-value of 18.200 and a p-value less than 0.001.

The Group row is the key result, showing that the group variable has a significant effect on the academic anxiety percentile rank post-intervention, with an F-value of 23.730 and a p-value less than 0.001.

The partial eta squared value of 0.309 indicates that about 31% of the variance in the dependent variable is explained by the group variable.

1) Grand Mean

Table 4**Table 4 a) Estimated Marginal Means****Dependent Variable: academic_anxiety_percentile_rank_post**

95% Confidence Interval			
Mean	Std. Error	Lower Bound	Upper Bound
54.370	1.104	52.181	56.559

Covariates appearing in the model are evaluated at the following values:
academic_anxiety_percentile_rank_pre = 74.5273.

The table-4.a.1 presents the estimated marginal means for the dependent variable "academic_anxiety_percentile_rank_post" in an SPSS analysis. The grand mean is reported as 54.370, with a standard error of 1.104. The 95% confidence interval for the grand mean is 52.181 to 56.559 (Guetterman, 2019) (Belmonte et al., 2022).

Importantly, the table indicates that the covariate "academic_anxiety_percentile_rank_pre" was included in the analysis, and its value was evaluated at 74.5273 (Morgan, 2006).

The estimated marginal means represent the predicted values of the dependent variable, adjusting for the effect of the covariate. This allows researchers to examine the dependent variable while controlling for the influence of other variables (Morgan, 2006).

2 Group

Table 4

Table 4 b) Dependent Variable: academic_anxiety_percentile_rank_post				
Group	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Taekwondo	47.296 ^a	1.986	43.359	51.234
Karate	50.743	1.885	47.005	54.481
Control Group	65.071 ^a	1.897	61.31	68.832

Covariates appearing in the model are evaluated at the following values: academic_anxiety_percentile_rank_pre = 74.5273.

The second part of the table-4.a.2 presents the estimated marginal means for the dependent variable "academic_anxiety_percentile_rank_post" for the different groups in the study: Taekwondo, Karate, and Control Group.

The table shows that the mean for the Taekwondo group is 47.296, the mean for the Karate group is 50.743, and the mean for the Control Group is 65.071.

Again, these means are adjusted for the effect of the covariate "academic_anxiety_percentile_rank_pre" which was evaluated at a value of 74.5273.

The table also provides the standard errors and 95% confidence intervals for each group mean, allowing for a statistical comparison of the groups.

Taken together, this SPSS table provides valuable insights into the differences in academic anxiety percentile rank between the intervention groups and the Control Group, while accounting for the pre-existing level of anxiety.

Figure 1

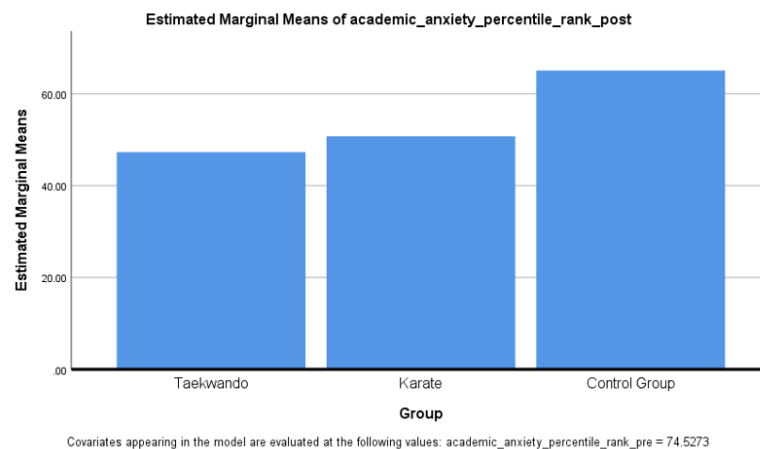


Figure 1 Profile Plot

Figure -1 shows the profile plot for Estimated Marginal Means of Academic Anxiety Percentile Rank Post-Intervention. The profile plot (Figure-1) illustrates the estimated marginal means of academic anxiety percentile ranks post-intervention for three groups: Taekwondo, Karate, and Control Group. The y-axis represents the estimated marginal means, ranging from 0 to 100, while the x-axis lists the three groups.

- **Taekwondo Group:** Shows the academic anxiety percentile rank after the intervention.
- **Karate Group:** Displays the academic anxiety percentile rank post-intervention.
- **Control Group:** Serves as a baseline, indicating the academic anxiety percentile rank without any intervention.

Covariates:

The covariates in the model are evaluated at a pre-intervention academic anxiety percentile rank of 74.5273, ensuring that the comparisons account for initial anxiety levels.

Percentiles

Table 5

Weighted Average (Definition 1)				Tukey's Hinges		
academic_anxiety_percentile_rank_post				academic_anxiety_percentile_rank_post		
Group				Group		
Percentiles	Taekwondo	Karate	Control Group	Taekwondo	Karate	Control Group
5	40.25	39.90	40.95			
10	41.00	40.90	45.00			
25	42.00	42.00	55.75	42.00	42.00	56.00
50	45.00	46.50	69.50	45.00	46.50	69.50
75	55.25	59.75	75.00	55.00	59.00	75.00
90	65.00	65.1	80.00			
95	72.50	71.15	82.00			

The table-5 presents percentile ranks for academic anxiety among three different groups: Taekwondo, Karate, and a Control Group. The percentiles shown are the 5th, 10th, 25th, 50th, 75th, 90th, and 95th, which provide a detailed view of the distribution of academic anxiety levels within each group.

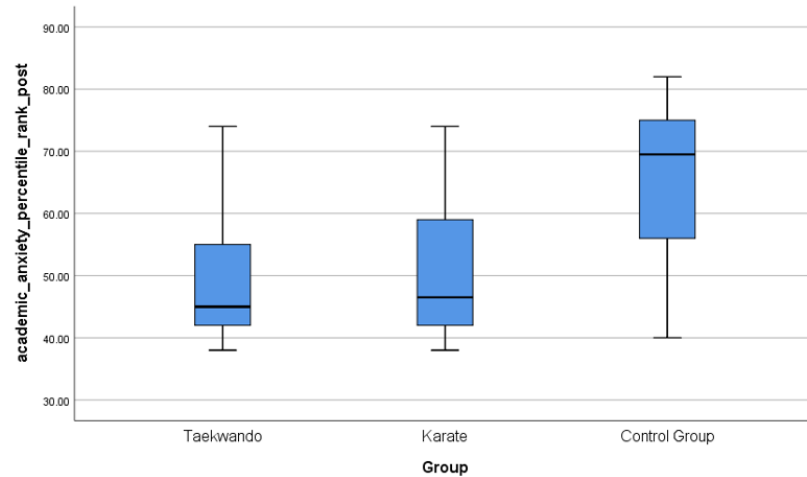
For the Taekwondo group, the 50th percentile (median) is 45.0, indicating that half of the students in this group have an academic anxiety percentile rank below 45. The 75th percentile is 55.25, meaning 75% of the Taekwondo students have a rank below this level.

The Karate group shows a similar pattern, with a 50th percentile of 46.5 and a 75th percentile of 59.75.

In contrast, the Control Group exhibits higher levels of academic anxiety, with a 50th percentile of 69.5 and a 75th percentile of 75.0. This suggests that the Control Group, on average, experiences more academic anxiety compared to the Taekwondo and Karate groups.

The table also includes Tukey's Hinges, which provide additional insights into the distribution of academic anxiety. The 25th, 50th, and 75th percentiles are reported for each group, further highlighting the differences in the anxiety levels across the three groups.

Overall, table-5 offers a detailed statistical analysis of academic anxiety, allowing for comparisons between the different groups and a deeper understanding of the distribution of anxiety within each population.



Existing literature provides compelling evidence for the benefits of hatha yoga in reducing anxiety and promoting overall well-being. A meta-analysis examining the effect of hatha yoga on anxiety found that the practice was associated with a significant reduction in anxiety symptoms.(Hofmann et al., 2016) Furthermore, a systematic review exploring the impact of yoga in school settings revealed that yoga programs can help children recover their self-esteem, restore mental health, and reduce stress and anxiety. (Ferreira-Vorkapic et al., 2015) These findings suggest that hatha yoga may be an invaluable tool in addressing the academic anxiety experienced by school-aged children.

One of the proposed mechanisms underlying the anxiety-reducing effects of hatha yoga is its ability to foster mindfulness and self-regulation. The physical postures, breathing exercises, and meditation practices inherent in hatha yoga can help children cultivate greater present-moment awareness and develop effective coping strategies for managing stress and anxiety.(Kolk et al., 2014) Additionally, the holistic nature of hatha yoga, which integrates the mind, body, and spirit, may contribute to its efficacy in improving mental health outcomes among students.

Despite the promising findings, more well-designed studies are needed to further investigate the specific effects of hatha yoga on academic anxiety in school children. Future research should aim to compare the efficacy of hatha yoga with other established treatments and explore the underlying mechanisms responsible for its potential benefits.

4. CONCLUSION

In conclusion, the existing evidence suggests that the incorporation of hatha yoga into school curricula may hold significant promise in addressing the academic anxiety faced by school-aged children. By empowering students with effective coping strategies and promoting holistic well-being, hatha yoga has the potential to transform the educational landscape and positively impact the lives of young learners.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

REFERENCES

- Belmonte, Z J A., Cruz, C A., Castro, P A P D., Estoesta, L A., Mitra, E J A., & Lira, P E V R. (2022, July 1). Factors Influencing Technopreneurial Intention among Undergraduate Engineering Students in the Philippines. , 36(1), 148-157. <https://doi.org/10.16920/jeet/2022/v36i1/22146>
- Bridge, C A., Jones, M., Hitchen, P., & Sánchez, X. (2007, January 1). Heart Rate Responses to Taekwondo Training in Experienced Practitioners. Lippincott Williams & Wilkins, 21(3), 718-718. <https://doi.org/10.1519/r-19255.1>
- Brown, J L C., Eubanks, C., & Keating, A. (2016, August 11). Yoga, quality of life, anxiety, and trauma in low-income adults with mental illness: A mixed-methods study. Taylor & Francis, 15(3), 308-330. <https://doi.org/10.1080/15332985.2016.1220441>
- Ferreira-Vorkapic, C., Feitoza, J M., Marchioro, M., Simões, J F F L., Kozasa, E H., & Telles, S. (2015, January 1). Are There Benefits from Teaching Yoga at Schools? A Systematic Review of Randomized Control Trials of Yoga-Based Interventions. Hindawi Publishing Corporation, 2015, 1-17. <https://doi.org/10.1155/2015/345835>
- Guetterman, T C. (2019, March 1). Basics of statistics for primary care research. BMJ, 7(2), e000067-e000067. <https://doi.org/10.1136/fmch-2018-000067>
- <https://dx.doi.org/10.29121/shodhkosh.v5.i2.2024.1973>
- Kolk, B A V D., Stone, L S., West, J., Rhodes, A M., Emerson, D., Suvak, M K., & Spinazzola, J. (2014, June 15). Yoga as an Adjunctive Treatment for Posttraumatic Stress Disorder. Physicians Postgraduate Press, Inc., 75(06), e559-e565. <https://doi.org/10.4088/jcp.13m08561>
- M, R R. (2017, January 3). Effects of a Yoga Program on Health, Behaviour and Learning Ability in School Children: A Single Arm Observational Study. MedCrave Group, 5(1). <https://doi.org/10.15406/ijcam.2017.05.00138>
- Morgan, S. (2006, January 1). Book Review: Interpreting Data: A Guide to Understanding Research. SAGE Publishing, 34(1), 87-87. <https://doi.org/10.1177/0092055x0603400109>
- Raub, J A. (2002, December 1). Psychophysiologic Effects of Hatha Yoga on Musculoskeletal and Cardiopulmonary Function: A Literature Review. Mary Ann Liebert, Inc., 8(6), 797-812. <https://doi.org/10.1089/10755530260511810>
- Rudd, J., & Rudd, M J. (1986, July 1). Coping with Information Load: User Strategies and Implications for Librarians. Association of College and Research Libraries, 47(4), 315-322. https://doi.org/10.5860/crl_47_04_315
- Singh, A. K., & Gupta, A. S. (2009). Manual for Academic Anxiety Scale for Children (AASC). Agra, National Psychological Corporation.
- Thomas, E M., & Centeio, E E. (2020, January 1). The benefits of yoga in the classroom: A mixed-methods approach to the effects of poses and breathing and relaxation techniques. Medknow, 13(3), 250-250. https://doi.org/10.4103/ijoy.ijoy_76_19

Turelli, F C., Tejero-González, C M., Vaz, A F., & Kirk, D. (2020, November 13). Sport Karate and the Pursuit of Wellness: A Participant Observation Study of a dojo in Scotland. *Frontiers Media*, 5. <https://doi.org/10.3389/fsoc.2020.587024>