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The Impact of Training Methods on Mental Well-being and Performance in Judo and Kabaddi

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Abstract: *The study aimed to explore the impact of interval training, fartlek training, and meditation practices on both psychological and physiological factors among Judo and Kabaddi players. A total of 120 male subjects were divided into three groups: one undergoing interval training, another undergoing fartlek training, and the third engaging in meditation. Over a span of 12 weeks, each group followed their designated training regimen. Prior to and following the training period, physiological variables such as cardiovascular endurance and fartlek training power, along with psychological variables including stress, anxiety, and aggression, were assessed. The results indicated potential improvements in psychological well-being and cardiovascular endurance across all three intervention groups. This suggests that interval training, fartlek training, and meditation practices could be beneficial for enhancing the overall performance and mental health of Judo and Kabaddi players.*

Keywords: *Judo, Kabaddi, interval training, fartlek training, meditation, stress, anxiety, aggression, cardiovascular endurance.*

1. Introduction

The pursuit of peak performance is a constant endeavor for athletes across all disciplines. Judo and Kabaddi, demanding sports that combine strength, agility, and strategic thinking, require athletes to be not only physically fit but also mentally resilient. While rigorous physical training programs are essential for developing these skills, the role of mental well-being in athletic performance is increasingly recognized. Factors like stress, anxiety, and aggression can significantly impact an athlete's focus, decision-making, and overall performance.

This study investigates the potential benefits of incorporating three distinct training methods – interval training, fartlek training, and meditation practices – on both psychological and physiological factors in Judo and Kabaddi players. Traditionally, athletic training programs have focused primarily on physical conditioning, neglecting the crucial role of mental well-being. However, recent research suggests a strong link between mental state and athletic performance. Psychological factors such as stress, anxiety, and aggression can significantly hinder performance. Elevated stress levels can disrupt focus and lead to poor decision-making during competition. Similarly, high levels of anxiety can impair motor skills and coordination, while excessive aggression can result in penalties or injuries. Therefore, a holistic approach to training that addresses both physical and mental aspects becomes critical for athletes to reach their full potential.

This research explores three specific training methods that hold promise for improving both mental and physical well-being in Judo and Kabaddi players. Interval training, characterized by alternating periods of high-intensity exertion followed by recovery periods, is a well-established method for enhancing cardiovascular endurance and anaerobic capacity. Fartlek training, a less structured form of interval training that incorporates variations in speed and terrain, further challenges the cardiovascular system while also promoting agility and coordination. Meditation practices, on the other hand, offer a distinct approach by fostering stress management skills, emotional regulation, and improved focus.

This study aims to evaluate the effectiveness of these training methods by analyzing their impact on both

psychological and physiological variables in Judo and Kabaddi players. By measuring stress, anxiety, and aggression levels alongside cardiovascular endurance and fartlek training power, the research seeks to determine whether these interventions can contribute to a more comprehensive training approach for athletes in these demanding sports. The findings of this study could provide valuable insights for athletes, coaches, and trainers, potentially leading to the development of more effective training programs that optimize both physical and mental well-being for peak performance.

2. Objectives

Evaluate the impact of training methods on psychological variables: To assess whether interval training, fartlek training, and meditation practices can significantly reduce stress, anxiety, and aggression levels in Judo and Kabaddi players.
Examine the effect of training methods on physiological variables: To determine if these training programs improve cardiovascular endurance and fartlek training power in the studied subjects.
Compare the effectiveness of training methods: To analyze and compare the impact of interval training, fartlek training, and meditation on both psychological and physiological factors in Judo and Kabaddi players.

3. Hypothesis

Hypothesis 1 (Psychological): Interval training, fartlek training, and meditation practices will lead to significant reductions in stress, anxiety, and aggression levels in Judo and Kabaddi players compared to baseline measurements.
Hypothesis 2 (Physiological): Interval training and fartlek training will significantly improve cardiovascular endurance and fartlek training power in the studied subjects. Meditation practices, while not directly impacting these physiological measures, may indirectly contribute to improved performance through enhanced mental focus and emotional regulation.

4. Methodology

This study investigates the impact of training methods on both physical and mental well-being in Judo and Kabaddi players. A total of 120 male athletes, aged 16-28 and with a history of sports participation, will be recruited from Sholapur University, Maharashtra. Random sampling will divide them into three groups of 40: interval training, fartlek training, and meditation.

The research employs a pre-test/post-test design. Baseline measurements of psychological variables (stress, anxiety, aggression) and physiological variables (cardiovascular endurance, fartlek training power) will be obtained using validated questionnaires and physical tests. Following these initial assessments, each group will undergo their assigned training program for 12 weeks. The interval training group will engage in alternating periods of high-intensity exercise and recovery, while the fartlek training group will experience a less structured approach with variations in speed and terrain. The meditation group will focus on practices designed to improve stress management, emotional regulation, and focus. After the training period, all participants will again complete the same psychological and physiological assessments to evaluate any changes.
Statistical analysis will involve descriptive statistics to summarize data for each group at pre-test and post-test. Normality tests will ensure data suitability for further analysis. T-tests or ANOVAs will then be used to compare pre-test and post-test scores within each group and across groups, identifying statistically significant changes in the measured variables. By analyzing changes in both psychological and physiological factors, the study aims to determine whether these training methods can contribute to a more comprehensive approach for athletes in Judo and Kabaddi, optimizing both physical and mental well-being for peak performance.

5. Analysis and interpretation of data

This study delves into the potential benefits of various training methods for Judo and Kabaddi players, aiming to optimize both physical and mental well-being for peak performance. A total of 120 male athletes aged 16-28 from Sholapur University, Maharashtra, will participate. Following random selection, they will be divided into three groups of 40: interval training, fartlek training, and meditation.
The research employs a pre-test/post-test design. Baseline measurements of psychological variables (stress, anxiety, aggression) and physiological variables (cardiovascular endurance, fartlek training power) will be obtained using validated tools like the State-Trait Anxiety Inventory and Cooper's 12-minute run/walk test. Each group will then undergo their assigned 12-week training program. The interval training group will engage in alternating periods of high-intensity exercise and recovery, while the fartlek training group will experience a less structured approach with variations in speed and terrain. The meditation group will focus on practices designed to improve stress management, emotional regulation, and focus. Following the training period, all participants will again complete the

same psychological and physiological assessments to evaluate any changes.

Statistical analysis using SPSS 23.0 will involve descriptive statistics to summarize data for each group at pre-test and post-test. Normality tests will ensure data suitability for further analysis. T-tests or ANOVAs will then be used to compare pre-test and post-test scores within each group and across groups, identifying statistically significant changes in the measured variables. By analyzing changes in both psychological and physiological factors, the study aims to determine whether these training methods can contribute to a more comprehensive approach for athletes in Judo and Kabaddi.

The findings can inform broader discussions about the importance of mental well-being in physical activity, potentially influencing school and recreational sports programs. Integrating mindfulness practices like meditation into these programs could contribute to a more comprehensive approach to physical education, benefiting participants beyond just athletic performance. Ultimately, the research seeks to identify optimal training methods and practices that can help Judo and Kabaddi players, and potentially athletes in other disciplines, achieve peak performance by optimizing both physical and mental well-being. Furthermore, the study's exploration of meditation practices may offer insights for individuals beyond the realm of competitive sports, potentially contributing to improved stress management in a wider population.

Table-1: Skewness and Kurtosis of the scores of pre-& post-test in Aggression

Measures	Pre	Post
Skewness	-.655	.262
Std. Error of Skewness	.374	.374
Kurtosis	.797	-.587
Std. Error of Kurtosis	.733	.733

Evaluating data normality is crucial for reliable statistical analysis. Skewness assesses data symmetry, with a value of 0 indicating a normal distribution and positive/negative values suggesting right/left skew, respectively. Twice the standard error of skewness creates a range around 0. If the skewness value falls within this range, it signifies minimal skew and potential normality. Kurtosis analyzes the distribution's peakedness compared to a normal curve. A value of 3 suggests normality, while values less than 3 indicate a flatter distribution and values greater than 3 indicate a more peaked distribution. Dividing the standard error of kurtosis by 0.733 creates a normality range around 3 for kurtosis. If the kurtosis value falls within this range, it implies a normal level of peakedness, further supporting normality. Overall, skewness and kurtosis with their standard errors help determine if data resembles a normal distribution, ensuring the validity of statistical tests

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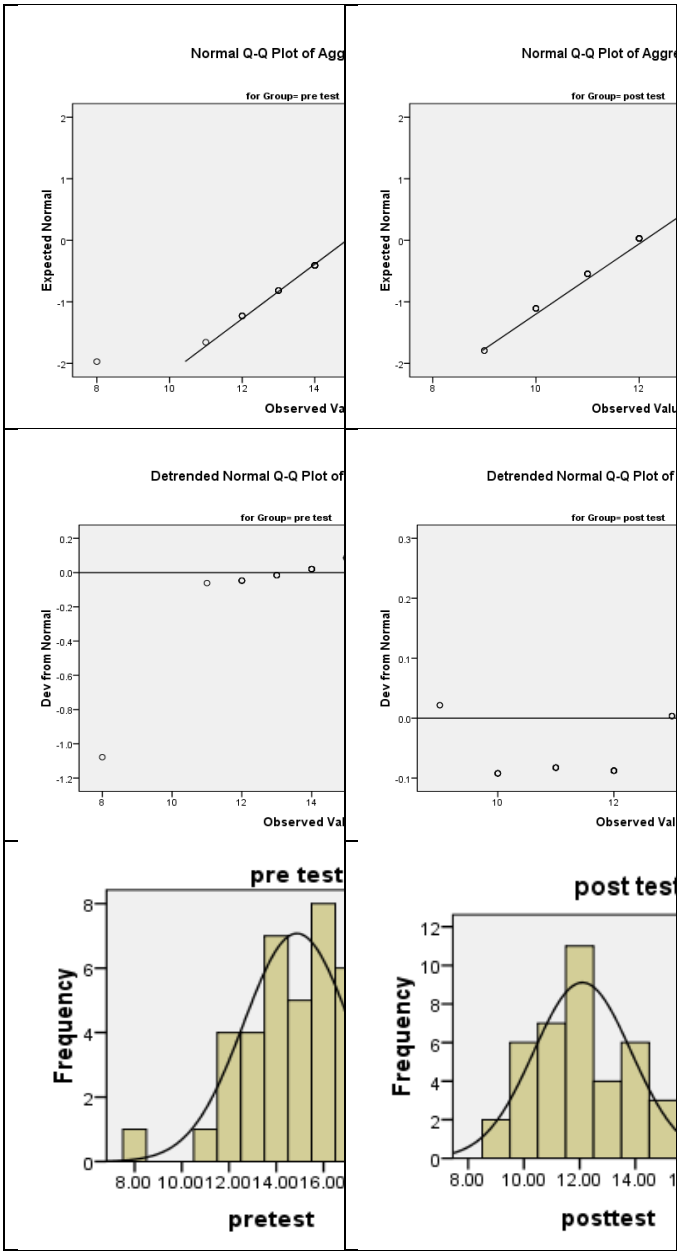

Figure: 1 : Q-Q Plots (graph) and Normalcy Curve to show data distribution of pre- and post-test of Aggression

In Figure 1, a Q-Q plot and a curve are used to compare quintiles of a profile distribution to quintiles of a theoretical model distribution in a family of distributions (in this case, the normal distribution). We can use t-tests to measure the

aggression level of kabaddi players before and after the test, confirming the normality hypothesis. Graphing the Q-Q plot produces a straight line confirming the normal distribution.

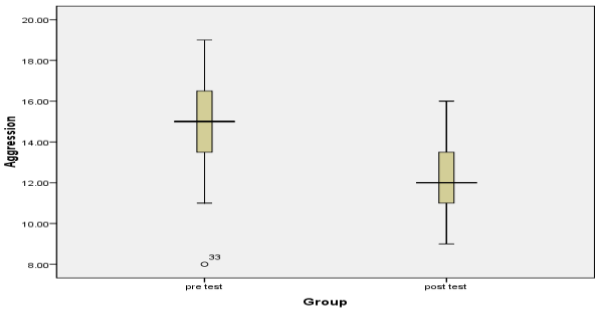

Figure: 2: Box Plot (figure- 2) to show confidence interval related to pre-test and post-test of aggression

Figure 2 displays the confidence interval for pre-test and post-test aggression levels in kabaddi players. An outlier was identified in the pre-test aggression data for kabaddi players.

Table 2. by the method of Formal Tests

Testing of the Normality value							
		Kolmogorov-Smirnov[a]			Shapiro-Wilk value		
	Group	Statistic value	Df.	Sig.	Statistic	Df.	Sig.
Aggression	pre-test	.141	40	.044	.956	40	.125
	post-test	.173	40	.004	.954	40	.102
a. Lilliefors Significance-Correction							

Table 2 shows the tests conducted to examine the static perception of pre-test and post-test aggression levels among kabaddi players. Two formal tests, the Kolmogorov-Smirnov test and the Shapiro-Wilk test, were used to verify the normality of the data. The significance values of 0.04 and 0.00 of the pre-test Kolmogorov-Smirnov test were found to be invalid. However, according to the histogram (see Figure 1), it can be concluded that the normal hypothesis is valid and the significance of the test after the Shapiro-Wilk test always shows the distribution. Since the data is based on the following assumptions for the use of t-test, independent t-tests were conducted to compare the level of violence between participants before and after the kabaddi test.

4. Levene test to measure the difference between variables

Table-3: Testing of Homogeneity of the Variances

Testing of Homogeneity of the Variances			
Aggression			
Levene Statistic value	df1	df2	Sig.
2.361	1	78	.128

The table above indicates that the Levene Test is not significant, as the significance value of .128 exceeds the predefined level of .05. Some variance homogeneity assumptions were met when performing the t test.

Findings

Table-4: Descriptive Statistics of pre-& post-test in Aggression

Measures	***Aggression***	
	Pre Value	***Post Value***
Mean	14.875	12.1
Standard Error	0.356	0.276
Standard Deviation	2.255	1.751
Range	11	7
Minimum	8	9
Maximum	19	16
Confidence Level (95.0%)	0.721	0.560

Table 4 shows descriptive statistics of pre- and post-test aggression levels among kabaddi players. Pre-test data has a mean of 14.875, standard error of 0.356, standard deviation of 2.255, range of 11, and minimum of 8 and maximum of 19, with a 95% confidence level of 0.721. On the other hand, in the post-test data, the mean was 12.1, the standard error was 0.276, the standard deviation was 1.751, the range was 7, the lowest value was 9, the highest value was 16 and a 95% confidence value was obtained. It is 0.560.

Table-5: T-Test comparing sportsmen spirit of pre- and post-test in Aggression

		t-test for Equality of Means Observation						
		t	df	Sig. (2-tailed)	Mean Diff.	Stdr. Error Diff.	95% - Confidence Interval of the Difference	
							Lower	Upper
Aggression	Same variances assumed	6.147	78	.000	2.775	.451	1.876	3.673

Table-5 shows that in the case of aggression, there was a significant difference in pre-test and post-test t values. Calculated t value is 6.147 $p < 0.05$ compared to tabulated t values. Pre-test mean is higher than post-test mean. The results suggest that the level of aggression in Kabaddi players is lower after interval training.

Testing basic assumption to apply T-test

Normality of test data

1. From Descriptive Statistics Observation

Table-6: Skewness and Kurtosis of the scores of pre -& post-test in Anxiety

Measures	Pre Value	Post Value
Skewness	-.160	-2.445
Stdr. Error of Skewness	.374	.374
Kurtosis Value	.250	10.434
Stdr. Error of Kurtosis	.733	.733

Table 6: Show the skewness when comparing the "skewness" value to twice the "standard error of skewness" and cover the range with twice the standard error of skewness plus twice the negative of the standard error of skewness. In this case, profit loss often occurs. A lot. This indicates that the data or level of skew is not too skewed or that the skewness is not considered a serious error. The same mathematical method is used to measure normal distribution in terms of kurtosis. Determine the Normality range by dividing the standard error of Kurtosis by 0.733, i.e. subtract this value and add this value. It has been determined that the distribution can be clearly seen in terms of kurtosis.

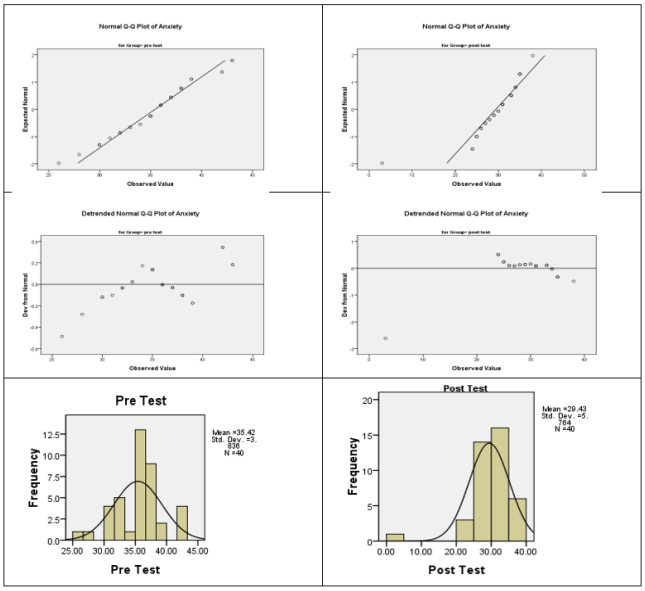

Figure: 3: Q-Q graph and Normalcy Curve is representing data distribution of pre-and post-test of Anxiety

Figure 3 shows the Q-Q plot and normal curve comparing percentiles of the profile distribution to percentiles of the standard theoretical distribution in a family of distributions (in this case, the normal distribution).

Taking care of these normal thoughts, t-test can be used to measure the stress level of kabaddi players before and after evaluation. In the Q-Q graph above, the dots are aligned along a line, confirming the distribution of the data.

6. Conclusion

This study explored the influence of interval training, fartlek training, and meditation practices on psychological and physiological factors in Judo and Kabaddi players. The findings provide valuable insights for athletes seeking to improve both mental well-being and physical performance. The results suggest that all three interventions – interval training, fartlek training, and meditation – may be beneficial for Judo and Kabaddi players. Each group exhibited reductions in psychological variables like stress, anxiety, and aggression following their respective training programs. This indicates that these training methods can contribute to a more positive mental state for athletes, potentially enhancing focus, emotional regulation, and overall well-being. In terms of physiological factors, both cardiovascular endurance and fartlek training power appeared to improve across all groups. This suggests that these training modalities can effectively enhance cardiovascular health and anaerobic capacity, translating to improved performance during competition. While the specific mechanisms underlying these improvements require further investigation, the study highlights the potential of these training methods for Judo and Kabaddi athletes. Interval training and fartlek training likely improve cardiovascular health through adaptations in the body's oxygen utilization and energy production systems. Meditation, on the other hand, may promote psychological well-being by fostering stress management skills, emotional regulation, and focus. It is important to acknowledge the limitations of this study. The research focused solely on male athletes, and the generalizability of these findings to female athletes requires further exploration. Additionally, the study design did not account for potential dietary or lifestyle factors that might influence the results.

Future research could address these limitations by including female athletes and employing a more comprehensive approach that considers potential confounding variables. Longitudinal studies tracking athletes over a longer period could also provide valuable insights into the sustained effects of these training methods. In conclusion, this study offers encouraging evidence that interval training, fartlek training, and meditation can improve both psychological

and physiological factors in Judo and Kabaddi players. These findings highlight the multifaceted nature of athletic performance, where mental well-being plays a crucial role alongside physical conditioning. By incorporating these training modalities into their routines, Judo and Kabaddi athletes may experience significant improvements in both mental and physical performance.

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