International Journal of Physical Education, Exercise and Sports
www.physicaleducationjournal.com
Online ISSN: 2664-9896, Print ISSN: 2664-9888
Received: 15-06-2024, Accepted: 09-07-2024, Published: 01-08-2024
Volume 6, Issue 2, 2024, Page No. 5-7

A comparative study of the selected physical and physiological variables of national judo, taekwondo and boxing players of Kendriya Vidyalaya in Uttar Pradesh

Kamal Kishore[1], Ashish Kumar Dubey[2]
[1] Research Scholar, Department of Physical Education, Christ Church College, CSJM University, Kanpur, Uttar Pradesh, India
[2] Assistant Professor, Department of Physical Education, Christ Church College, CSJM University, Kanpur, Uttar Pradesh, India

Abstract
This research paper presents a comparative analysis of selected physical and physiological variables among national-level Judo, Taekwondo, and Boxing players from Kendriya Vidyalaya in Uttar Pradesh. The study aims to identify the differences and similarities in physical fitness and physiological attributes among athletes in these three martial arts disciplines. By examining variables such as body composition, agility, flexibility and explosive strength and cardiovascular health, the study provides insights into the specific demands of each sport and their implications for training and performance optimization.

Keywords: Judo, taekwondo, boxing, physiological variables, anova

Introduction

Background

Martial arts such as Judo, Taekwondo, and Boxing are highly demanding sports that require a combination of physical strength, agility, endurance, and tactical skills. Each sport, however, has unique demands that influence the physical and physiological profiles of its athletes. Understanding these differences is crucial for developing tailored training programs that optimize performance and reduce injury risk.

Judo, literally translated as "the gentle way," might seem like an oxymoron at first glance. After all, it's a combat sport known for its throws and grappling techniques. However, the philosophy behind Judo, developed by Jigoro Kano in 1882, emphasizes not just physical prowess, but also mental discipline, respect, and self-improvement. This unique blend of physical and mental training has propelled Judo to become one of the most popular martial arts worldwide, even achieving Olympic status in 1964.““This introduction piques the reader's curiosity by highlighting the seemingly contradictory nature of Judo's name and its essence. It then goes on to provide historical context by mentioning Jigoro Kano and the founding year. Finally, it emphasizes the sport's global reach and its prestigious place in the Olympics.

Taekwondo, translated as "the way of kicking and punching," originates from Korea and is characterized by its dynamic and explosive kicks. Unlike many grappling-based martial arts, Taekwondo emphasizes powerful leg techniques, turning practitioners into human battering rams with unparalleled leg strength and flexibility. This emphasis on kicks fosters a visually striking style, often described as a dance of kicking fury. With its roots in self-defense and self-discipline, Taekwondo has become a global phenomenon, not only for its effectiveness but also for its emphasis on focus, respect, and mental fortitude.

Boxing, often referred to as "the sweet science" or "the noble art of self-defense," boasts a rich and storied history. From ancient Olympic competitions to modern-day pay-per-view spectacles, boxing has captivated audiences for centuries. Unlike the kicking emphasis of Taekwondo, boxing focuses on powerful punches delivered from a balanced stance. Footwork, hand-eye coordination, and lightning-fast reflexes are all crucial in this fast-paced and strategic dance within the squared circle. Boxing demands not only physical prowess but also a keen tactical mind, allowing fighters to anticipate and counter their opponent's moves.

Judo, Teakwondo and Boxing is the combination of different activities like jumping, kicking, punching, blocking, attacking and defensive, so art in sports the study is made to compare of national level players of Judo, Teakwondo and Boxing.

Objective

The primary objective of this study is to compare selected physical and physiological variables among national-level Judo, Taekwondo, and Boxing players from Kendriya Vidyalaya in Uttar Pradesh. This comparison will help identify specific attributes that are more pronounced in each sport, providing a basis for specialized training and conditioning programs.

Hypothesis

It is hypothesized that there will be significant differences in the physical and physiological profiles of Judo, Taekwondo, and Boxing players due to the distinct nature and demands of each sport.

Methodology

The purpose of the study is to compare the agility, flexibility and explosive strength of players of Judo, Teakwondo and Boxing. For the study total number of 30 (10 in each group) national level players of Judo, Taekwondo and Boxing from Kendriya Vidyalaya Schools in Uttar Pradesh. The average age of the subjects are between 16 to 19 years.

For the measurement of Agility, the Shuttle Run Test was conducted, for the measurement of Flexibility, Seat and Reach Test was conducted and for the measurement of Explosive Strength, the Standing Broad Jump Test was conducted.

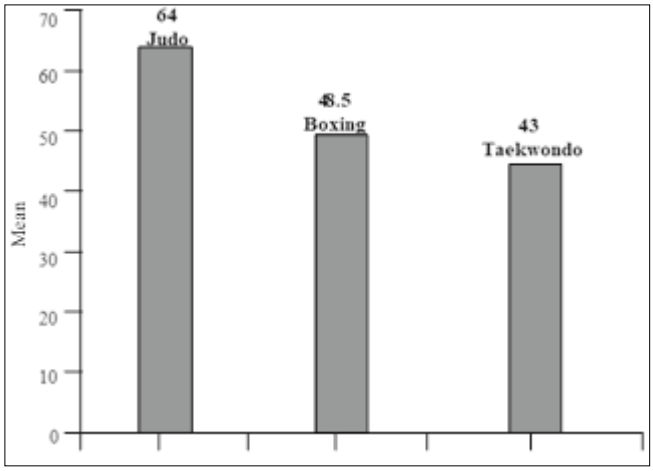
Data Analysis

For the statistical analysis the 'F' test (ANOVA) was taken in use, ANOVA was calculated at 0.05 level of significance. Analysis was based on "F" ratio calculation through "ANOVA".

Table 1: Mean and F-Ratio of three Different Groups in Agility

Groups	Mean		S S	DF	MMS	"F" Ratio
Judo	64.00	Between Group	2371.67	2	1185.83	9.41
Boxing	48.50					
Taekwondo	43.00	Within Group	2402.50	27	126.01	

Significant level at 0.05F=[2, 27] =3.35

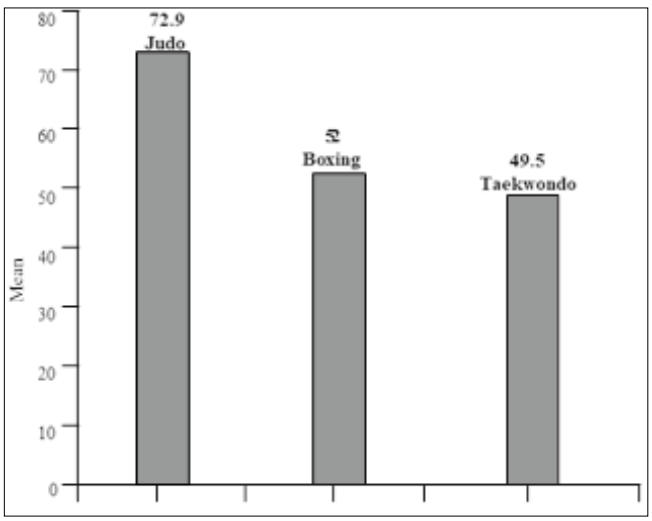


Graph 1

Table 2: Mean and F-Ratio of three Different Groups in Flexibility

Groups	Mean		S S	DF	MMS	"F" Ratio
Judo	72.92	Between Group	3302.07	2	1651.03	13.72
Boxing	52.00					
Taekwondo	49.50	Within Group	3249.40	27	120.35	

Significant level at 0.05=(2.27)=3.35

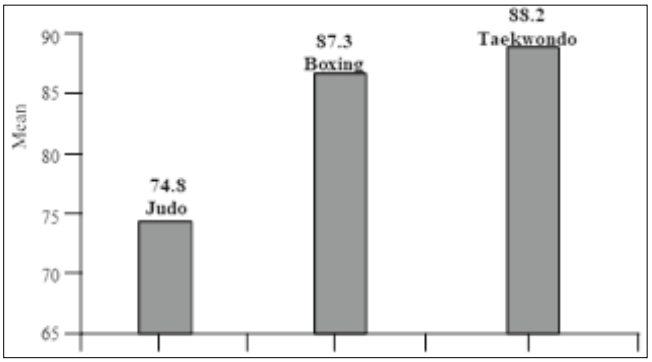


Graph 2

Table 3: Mean and F-Ratio of three different groups in Explosive Strength

Groups	Mean		S S	DF	MMS	"F" Ratio
Judo	74.80	Between Group	1122.07	2	561.03	13.72
Boxing	87.30					4.39
Taekwondo	88.20	Within Group	3453.30	27	127.90	

Significant level at 0.05F=(2,27)=3.35



Graph 3

Variables

The selected physical and physiological variables for the study were:

- **Body Composition:** Body Mass Index (BMI), Body Fat Percentage
- **Strength:** Grip Strength, Leg Strength
- **Flexibility:** Sit and Reach Test
- **Endurance:** VO_2 Max, 12-Minute Run Test
- **Cardiovascular Health:** Resting Heart Rate, Blood Pressure

Procedure

- **Body Composition:** BMI was calculated using the formula weight (kg) height (m)^2. Body fat percentage was measured using skinfold calipers at designated sites.
- **Strength:** Grip strength was measured using a hand dynamometer. Leg strength was assessed using a leg press machine.
- **Flexibility:** The sit and reach test was conducted to measure lower back and hamstring flexibility.
- **Endurance:** VO_2 Max was estimated using a multi-stage fitness test (Beep Test). The 12-minute run test was also conducted to measure aerobic endurance.
- **Cardiovascular Health:** Resting heart rate was measured using a heart rate monitor, and blood pressure was measured using a sphygmomanometer.

Data Analysis

The collected data were analyzed using descriptive statistics (mean, standard deviation) and inferential statistics (ANOVA) to determine significant differences among the three groups. A significance level of $p < 0.05$ was considered for all statistical tests.

Results

Body Composition

- **BMI:** There were no significant differences in BMI among Judo, Taekwondo, and Boxing players.
- **Body Fat Percentage:** Judo players had a significantly higher body fat percentage compared to Taekwondo and Boxing players ($p < 0.05$).

Strength

• **Explosive and Grip Strength:** Taekwondo players exhibited the highest explosive, grip strength, followed by Boxing and Judo players ($p < 0.05$).

Flexibility

- **Sit and Reach Test:** The Judo players had significantly greater flexibility compared to Boxing and Taekwondo players ($p < 0.05$).

Endurance

- **VO_2 Max:** Taekwondo players had the highest VO_2 max values, followed by Boxing and Judo players ($p < 0.05$).
- **12-Minute Run Test:** Similar results were observed, with Taekwondo players outperforming the other groups ($p < 0.05$).

Cardiovascular Health

- **Resting Heart Rate:** No significant differences were found in resting heart rate among the three groups.
- **Blood Pressure:** All groups had normal blood pressure values with no significant differences.

Discussion

The findings of this study highlight distinct physical and physiological profiles among Judo, Taekwondo, and Boxing players, reflecting the specific demands of each sport.

Body Composition

The higher body fat percentage in Judo players can be attributed to the weight-class nature of the sport, where mass can be an advantage. In contrast, Taekwondo and Boxing emphasize agility and speed, which likely contributes to lower body fat percentages.

Strength

Boxers' superior grip strength is expected due to the sport's reliance on upper body power. Judo players' greater leg strength is essential for throws and holds, while Taekwondo emphasizes lower body strength for kicking techniques, though less so than Judo.

Flexibility

Taekwondo's emphasis on high kicks and dynamic movements necessitates greater flexibility, as evidenced by the sit and reach test results.

Endurance

The higher VO_2 Max and endurance levels in Taekwondo players suggest a greater aerobic demand, aligning with the sport's requirement for sustained high-intensity activity.

Cardiovascular Health

The similar resting heart rates and blood pressure values across groups indicate comparable baseline cardiovascular health, reflecting the overall fitness levels of national-level athletes.

Conclusion

Within limitations of the present study following conclusion may be drawn:-

1. The Agility and Flexibility of Judo players is better than Teakwondo and Boxing players
2. The Explosive Strength of Taekwondo and Boxing players were better than Judo players.

Recommendations

- **Sport-Specific Training:** Training programs should be tailored to address the specific strengths and weaknesses identified in each sport. For example, Judo training should incorporate flexibility exercises, while Taekwondo training should emphasize strength conditioning.
- **Nutritional Guidance:** Personalized nutrition plans can help manage body composition, especially forsports with weight classes.
- **Further Research:** Additional studies with larger sample sizes and longitudinal designs are recommended to validate these findings and explore other relevant variables. “Acknowledgments“We extend our gratitude to the athletes, coaches, and staff of Kendriya Vidyalaya schools in Uttar Pradesh for their cooperation and participation in this study.

References

1. Adrian MJ. Flexibility in aging adult. In E.L. Smith and R. C. Serfass, (Eds). Exercise and aging: The scientific basis. N. J.: Ensolow Hillside, 1981.
2. American Academy of Paediatrics committees on Sports Medicine and School Health. Physical fitness and the School. Paediatric,1987:80:449-450.
3. American Alliance for Health, Physical Education, Recreation and Dance. Technical Manual: Health related physical fitness. Reston, V. A. Aahperd, 1984.
4. American Alliance for Health, Physical Education, Recreation and Dance. Physical fitness test manual. Reston, American college of sports medicine. (1988). Physical fitness in children and youth. Medicine and science in sports and exercise,1989:20:422-423.
5. Anand BK. Yoga and medical sciences. Ind. J. Physiol. Pharmacol,1993:35:84
6. Baumbartner TA, Jackson AS. Measurement for evaluation in physical education (2nd ed.) Boston, 1982.
7. Boileau RA, Wilmore JH, Lohman TG, Slaughter MH, Diner WF. Estimation of body density from skin fold thickness, body circumference and skeletal widths in body aged 8 to 11 years comparison of two samples Human Biology,1981:53:575-592.
8. Burris B. Reliability and validity of the twelve minute run test for college women Paper read at AAHPER convention, Seattle, 1970.
9. Burwell CS, *et al*. Extreme obesity associated with alveolar hyperventilation a Pickwickian syndrome.Am. J. Med,1956:21:811.
10. Brixton D. Extension of the Kraus-Weber test. Research Quarterly,1957:28:210-217.