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A comparative study of the selected psychological and physiological variables of national and international level badminton players

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Abstract
The purpose of the study was to compare selected physiological and psychological factors between National and International level badminton players, a total of 100 male badminton players were purposively selected to act as subjects for the study. The subjects were selected from all over India in different tournaments/clubs/academies based on their ranking at national and International level. The age of the subjects ranged between 17 to 30 years and the mean age of the subjects was found to be 21 (+SD) years. A significant difference has been found between Neuroticism and the total score of the Personality as the values are found to be 3.021 and 3.876, which are significant at 0.05 level, whereas no significant difference has been found between the National and International level badminton players for rest of the sub variables of personality. A significant difference has been found between Body Mass Index, Diastolic Blood Pressure, Systolic Blood Pressure and Vital Capacity as the values are found to be 4.858, 4.102, 2.690 and 6.979 respectively, which are significant at 0.05 level. From the above points it can be concluded that apart from techniques and tactics the psychological, physiological attributes play an important role in badminton performance. Regular monitoring of these variables can help the young badminton players to know their status and the areas to be improved which can help them to achieve excellence in higher level of competition i.e. although the badminton players having similar quality of techniques and skills, but those who are having better psycho-physiological qualities and optimum fitness level can obviously perform better.

Keywords: Systolic blood pressure, personality, vital capacity, body mass index

Introduction
Today the preparation of an athlete for achievement is a complex dynamic state characterized by high level of physical, physiological and psychological efficiency and the degree of perfection of the necessary skills and knowledge, technical and tactical preparation Many other factors are also brought into action in his preparation (means of rehabilitating, strength after loads, special nutrition, organization of general regime in accordance with the conditions of sports activity etc.). Thus athletes' training today is a multi sided process of expedient use of aggregate factors, means method condition so as to influence the development of an athlete and ensure the necessary level of preparation.

Physiological exercise testing is important in Badminton to help identify potential talent but also to provide the players, trainers and coaching staff with some profiles for the players and a measure for evaluating training programs. Testing physiological requirements for Badminton has become more specific over the past decade with further advances in both sports science technology and general understanding of the physiological requirements for testing Badminton. However despite this progress in testing procedures and knowledge there still appears limited research regarding the analysis and critical appraisal of tests used specifically for Badminton. Many laboratory and field tests for physiological assessment do exist, however to be thorough in reviewing physiological status it is important to assess all components of the sport, specifically measuring each energy system. The other main component of the game not covered within this review is skill. These tasks can be assessed with testing procedures that exist but the coaching staff normally specializes in this area and thus generally will devise their own skill assessment.

It is important also to note the musculoskeletal screening assessments involving information regarding the players muscle balance, core stability and general flexibility. This testing is normally done separate to the fitness based testing and is performed by physical educationists, trainers, physiotherapists, coaches and researchers. Together all of this information provides a perfect combination to ensure analysis of every physical component of the game.

Badminton is a sport based on unpredictability. The unpredictability of point length, shot selection, strategy, match duration, weather, and the opponent all influence the complex physiological aspects of badminton play. Designing and implementing training for tennis requires a solid understanding of the many physiological variables critical to optimal performance. Badminton requires short explosive bursts of energy repeated dozens, if not hundreds, of times per match or practice session. Badminton, unlike many other sports, does not have time limits on matches. It can result in matches lasting less than one hour or as long as five hours (in five-set matches). Its variability requires successful badminton athletes to be highly trained both anaerobically for performance, and aerobically, to aid in recovery during and after play. Although badminton is one of the most popular sports worldwide, few extensive reviews have been completed to help provide badminton scientists, coaches, and players with a summary of the badminton research.

Sports and exercise psychology is a relatively new field of research and practice. Its theoretical base and research methods are still in the process of development. Practice in sports and sports psychology often borrows from more established fields. New methods and techniques typically emerge from the need of particular consoling situations. Rather than from theory and research, Reflection on the development of the field during the past thirty or forty years indicated that the paths down which sport and exercise psychology has traveled have not been easy to predict. At the same time the rate of development form show beginnings has increased dramatically (Bandura, 1977) [3].

Sports performers are leaving no stone unturned to gain that extra edge to help them achieve success and as a result the application of psychology in sport is becoming increasingly prevalent. This unit develops learners' knowledge of sport psychology and how psychological techniques can be applied to influence the performance of individuals and teams (Cohns, 1991) [11].

Many Badminton players are good in the physical aspect but not tough enough mentally. A badminton player can have all the fitness, power, agility and skills but without the presence of mental toughness, he or she can be affected mentally anytime, anywhere. Marathon runners are good examples. Normally most of the marathon runners reach their stamina limits in the last 12 KM over 42 KM. But their strong mental ability allows them to keep running at the same pace to finish the race. Some runners even increase their speed to finish the race although they are already exhausted (Alderman, 1974) [13].

Objectives and Hypothesis

Following objectives were framed for the study

- To compare the Psychological Profile of National and International level Badminton Players.
- To compare the Physiological Profile of National and International level Badminton Players.

Based on the objectives following hypothesis were framed

- There would be no significant difference in the Psychological profile of National and International level Badminton Players.
- There would be no significant difference in the Physiological profile of National and International level Badminton Players.

Procedure and Methodology

The purpose of the study was to compare selected physiological and psychological factors between National and International level badminton players, a total of 100 male badminton players were purposively selected to act as subjects for the study. The subjects were selected from all over India in different tournaments/clubs/academies based on their ranking at national and International level. The age of the subjects ranged between 17 to 30 years and the mean age of the subjects was found to be 21 (+SD) years.

Results and Discussions

Table 1: Descriptive Analysis of the Personality its sub-variables of International level badminton players

S. No.	Variable	Mean	Standard Deviation
1	Extraversion	27.08	4.237
2	Agreeableness	33.90	4.441
3	Conscientiousness	30.82	5.181
4	Neuroticism	24.12	5.363
5	Openness	34.44	4.381
6	Total	150.36	11.039

Table No. 1 clearly depicts the values of the descriptive analysis of the Personality scores for the International level badminton players, which shows that the mean and standard deviation of the selected sub variables Extraversion, Agreeableness, Conscientiousness, Neuroticism, Openness and the total are found to be 27.08±4.237, 33.90±4.441, 30.82±5.181, 24.12±5.363, 34.44±4.381 and 150.36±11.039 respectively.

Table 2: Descriptive Analysis of the Personality its sub-variables of National level badminton players

S. No.	Variable	Mean	Standard Deviation
1	Extraversion	25.68	4.123
2	Agreeableness	31.44	5.080
3	Conscientiousness	29.22	6.494
4	Neuroticism	21.06	5.028
5	Openness	32.58	4.937
6	Total	139.58	15.024

Table No. 2 clearly depicts the values of the descriptive analysis of the Personality scores for the National level badminton players, which shows that the mean and standard deviation of the selected sub variables Extraversion, Agreeableness, Conscientiousness, Neuroticism, Openness and the total are found to be 25.68±4.123, 31.44±5.080, 29.22±6.494, 21.06±5.028, 32.58±4.937 and 139.58±15.024 respectively.

Table 3: Independent Sample‘t’ test of Personality and its sub variables between the National and International level badminton players

		t-test for Equality of Means		
		T	**df**	**Sig. (2-tailed)**
Extraversion	Equal variances assumed	1.541	98	.126
	Equal variances not assumed	1.541	97.786	.126
Agreeableness	Equal variances assumed	2.297	98	.024
	Equal variances not assumed	2.297	96.704	.024
Conscientiousness	Equal variances assumed	1.121	98	.265
	Equal variances not assumed	1.121	92.621	.265
Neuroticism	Equal variances assumed	3.021	98	.003
	Equal variances not assumed	3.021	97.601	.003
Openness	Equal variances assumed	2.044	98	.044
	Equal variances not assumed	2.044	96.411	.044
Total	Equal variances assumed	3.876	98	.000
	Equal variances not assumed	3.876	90.658	.000

Table no. 3 clearly indicates the values of independent sample ‘t’ test for Personality between National and International level badminton players, which shows that a significant difference has been found between Neuroticism and the total score of the Personality as the values are found to be 3.021 and 3.876 against the tabulated value of 2.024, which is significant at 0.05 level, whereas no significant difference has been found between the high and low level badminton players for rest of the sub variables of personality.

Table 4: Descriptive Analysis of the selected physiological variables of International level badminton players

S. No.	Variable	Mean	Standard Deviation
1	Body Mass Index	21.64	3.876
2	Diastolic Blood Pressure	72.06	8.203
3	Systolic Blood Pressure	118.16	17.367
4	Vital Capacity	4274.00	532.154

Table No. 4 clearly depicts the values of the descriptive analysis of the Physiological variables for the International level badminton players, which shows that the mean and standard deviation of the selected variables Body Mass Index, Diastolic Blood Pressure, Systolic Blood Pressure and vital capacity are found to be 21.64±3.876, 72.06±8.203, 118.16±17.367 and 4274.00±532.154 respectively.

Table 5: Descriptive Analysis of the selected physiological variables of National level badminton players

S. No.	Variable	Mean	Standard Deviation
1	Body Mass Index	24.51	1.917
2	Diastolic Blood Pressure	79.00	7.853
3	Systolic Blood Pressure	130.28	8.569
4	Vital Capacity	3566.00	473.204

Table No. 5 clearly depicts the values of the descriptive analysis of the Physiological variables for the National level badminton players, which shows that the mean and standard deviation of the selected variables Body Mass Index, Diastolic Blood Pressure, Systolic Blood Pressure and vital capacity are found to be 24.51±1.917, 79.00±7.853, 130.28±8.569 and 3566.00±473.204 respectively.

Table 6: Independent Sample‘t’ test of selected physiological variables between the National and International level badminton players

		t-test for Equality of Means		
		T	**df**	**Sig. (2-tailed)**
Body Mass Index	Equal variances assumed	-4.858	98	.000
	Equal variances not assumed	-4.858	72.114	.000
Diastolic Blood Pressure	Equal variances assumed	-4.102	98	.000
	Equal variances not assumed	-4.102	97.952	.000
Systolic Blood Pressure	Equal variances assumed	-2.690	98	.008
	Equal variances not assumed	-2.690	68.382	.009
Vital Capacity	Equal variances assumed	6.979	98	.000
	Equal variances not assumed	6.979	96.770	.000

Table no. 6 clearly indicates the values of independent sample 't' test for Physiological variables between National and International level badminton players, which shows that a significant difference has been found between Body Mass Index, Diastolic Blood Pressure, Systolic Blood Pressure and Vital Capacity as the values are found to be 4.858, 4.102, 2.690 and 6.979 respectively, against the tabulated value of 2.024, which is significant at 0.05 level.

Conclusions

- A significant difference has been found between Neuroticism and the total score of the Personality as the values are found to be 3.021 and 3.876, which are significant at 0.05 level, whereas no significant difference has been found between the National and International level badminton players for rest of the sub variables of personality.
- A significant difference has been found between Body Mass Index, Diastolic Blood Pressure, Systolic Blood Pressure and Vital Capacity as the values are found to be 4.858, 4.102, 2.690 and 6.979 respectively, which are significant at 0.05 level.
- From the above points it can be concluded that apart from techniques and tactics the psychological, physiological attributes play an important role in badminton performance. Regular monitoring of these variables can help the young badminton players to know their status and the areas to be improved which can help them to achieve excellence in higher level of competition i.e. although the badminton players having similar quality of techniques and skills, but those who are having better psycho-physiological qualities and optimum fitness level can obviously perform better.

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