INTERNATIONAL RESEARCH JOURNAL OF PHYSICAL EDUCATION AND SPORTS SCIENCES
ISSN: 2394 –7985 PEER REVIEWED PRINTED & ONLINE
VOLUME: XIII ISSUE: II FEBRURAY-2024
Bi –Annual
International Peer Reviewed, Refereed & Indexed Research Journal
INDEXED BY:
INTERNATIONAL SCIENTIFIC INDEXING (ISI) -UAE
ADVANCED SCIENCES INDEX (ASI) -GERMANY
INTERNATIONAL SOCIETY FOR RESEARCH ACTIVITY (ISRA) -INDIA
SCIENTIFIC JOURNAL IMPACT FACTOR (SJIF)–INDIA@FEBRUARY2024IRJPESS
IRJPESS Research Journal Impact Factor (ISRA & SJIF): 7.436
Research Unique Number (RUN): 16.09.2022.2034

Website: www.sportjournals.org.in

A COMPARATIVE STUDY OF MOTOR FITNESS BETWEEN FEMALE SPRINTERS AND LONG-DISTANCE RUNNERS[p.p.18-28]




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ABSTRACT

Fitness today is also called wellness and covers the physical, mental, emotional aspects of a human being. For the purpose of this study 5 female sprinters and 5 female long-distance runners were selected as the subjects at random and their age was between 15 to 23 years. Two experimental groups were formed in which the first group consisted of 5 female sprinters called SG group and second group consisted of 5 female long long-distance runners called LG group. Motor fitness was measured through speed, agility, explosive strength, and endurance tests of both the group. The statistical finding revealed that there were significant differences in the variables selected between adolescent long distance and sprint runners. It was hypothesised that there will be a significant difference in selected motor fitness variables between female adolescent sprinters and long distance runners. As per the results of the study the hypotheses was true and accepted.

Keywords: Motor Fitness between Female Sprinters & Long-Distance Runners.

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INTRODUCTION

Fitness is the capacity of an individual to have a useful, productive, and healthy life. A completely fit individual has a positive and healthy attitude on life. The interaction between the muscles and the central nervous system is referred to as the "motor" relationship. This is also known as neuromuscular coordination, and as such, it is a neuromuscular component of fitness that allows an individual to effectively participate in a given motor skill game. This is a motor fitness component that is specific to an activity and includes agility, balance, coordination, power, reaction time, and speed. Skill-related fitness, also known as motor fitness, is necessary for performing any movement-related task. Strength, speed, endurance, and agility are the constituents of motor fitness and are regarded as its conditional component. Coordination skills including orientation, balance, adaptability, reaction time, coupling, rhythm, and differentiation ability are also included in the contemporary definition of motor fitness.

The synchronised operation of a muscle or group of muscles during the performance of an action is known as motor coordination, also sometimes referred to as hand-eye coordination. Essentially, coordination is the capacity to combine all elements of fitness to produce successful movement in rhythm, spatial orientation, and response to both visual and aural stimuli. Gross motor coordination and fine motor coordination are the two categories into which motor coordination can be separated. Gross motor skills include walking, running, climbing, jumping, and other similar activities. Drawing, writing, typing, and other fine motor skills are examples of fine motor coordination. The capacity to blend multiple unique movement patterns into one unique movement is known as athletic coordination.

Running promotes weight loss, a strong immune system, strong bones, and a healthy mind. It also helps to breathe easier, sleep better, maintain heart health, and stay

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young. Not only does sprinting require higher levels of explosiveness, but it also involves different biomechanics, such as variations in stride length.

Bala Krishna et al. (2015) compared the selected psychological variable such as anxiety, among university men sprinter, throws, jumper and long-distance runner. 160 university athletes, aged between 18 and 25, who were divided into 40 sprinters, 40 jumpers, 40 throwers, and 40 long distance runners, were randomly chosen as study subjects. The purpose of the study was to compare the psychological variable of anxiety in university men who sprint, jump, throw, and run great distances. The researcher examined the body of scientific literature that was available for the study. Based on this review, expert consultation, and consideration of the study's viability, the researcher selected the study's flowing variables while taking equipment availability, among other factors, into account. The following results were reached while keeping the study's boundaries and limitations in mind. Conclusion: Among university males who ran sprints, jumps, throws, and long-distance races, there were significant differences in psychological variables like anxiety. Long-distance runners reported feeling more worried than jumpers and throwers. Kumar Sanjay, and Kumar Praveen's (2012) The purpose of the study was to examine and compare the somatic stress, cognitive anxiety, and self-confidence of intervarsity competitors in specific track and field events. The examination was restricted to specific track and field event sprinters and jumpers. The investigation's focus was on determining the competitive inventory-2's competitive anxiety level. Using the same methodology as the usual sports competition anxiety test, data on somatic tension, cognitive worry, and self-confidence were collected from 27 questionnaire items. The confidence levels of track and field athletes' sprinters and jumpers did not significantly differ from one another. The cognitive anxiety of sprinters and jumpers did not differ considerably, and their competitive anxiety was comparable. University-level

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sprinters' physical complaints, cognitive anxiety, and self-assurance. Brechue et al. (2010) examined velocity, acceleration and sprinter strategy patterns in college football players, a total of sixty-one football players were randomly selected as subject for the study. After each and every sprinter acceleration and velocity were determined, one repetition max.(1-RM). Jerk, power clean. Standing long jump. Standing triple jump and vertical jump is used to identify the power and lower body strength. A significant different was found the lower – body strength acceleration, velocity and sprint performance but it takes place only in the presence of corrected body mass of the lineman is found to be lower in comparison with line-backer and backs, the patterns for the vel0city and accelerationwas found same for every groups. At 9.1 and 18.3m magnitude of acceleration and velocity found the different in sprinters time. For increasing and rapid speed acceleration and a high velocity was maintained throughout the sprint. This method was used to determine the sprint performance in football players. Zagorac N. (2008) the impact of bio motor changes brought about by structured physical education on the relationships between the set of morphological and motor variables, as well as the athletic variable measuring the ability to throw and sprint, in females. 310 girls in the first grade of elementary school from the split area, ages six to eight, made up the study sample. They were split into two groups: the experimental group (n = 172) attended physical education classes that were designed with an athletics component, apparatus gymnastic games, and general preparatory exercises, and the control group (n = 138) attended regular physical education classes. Regression correlation studies were used to establish the relationship between the predictor set of variables, which included four morphological measures and six motor tests, and the sprint and ball throw criteria at the start and finish of the academic year. Between the two measurement points, both groups had a favourable improvement in their quantitative results. While trunk strength, explosive strength, and movement frequency as

motor abilities were the best result predictors in sprint in the study sample, overall, explosive strength and trunk strength were identified as the best predictors as the ball throw as a criterion variable. However, the improvement was noticeably more pronounced in the experimental groups, particularly in the abilities of coordination flexibility, movement frequency, and explosive repetitive and static strength. On final measurement, the number of significant predictors for the criterion variable of sprint and ball throws increased from the initial measurement both experimental and control group. This result was accompanied in the experimental group by those found in earlier investigations. Bavcevic T. (2008) investigated the effects of specifically designed physical education lessons on boys' biomotor development and the relationship between the set of morphological and motor variables and athletic variables for the evaluation of sprint and throw abilities. To this end, a total sample of 325 first-grade students from primary schools in the Split area, aged 6 to 8 years, was divided into two groups: the experimental group, which attended specially designed physical education lessons centred on general preparatory exercises and sports, gymnastics, and games, and the control group, which attended regular physical education classes.

DESIGN OF THE STUDY

For the purpose of this study 5 female sprinter and 5 female long-distance runners were selected as the subjects at random and their age was between 15 to 23 years Two experimental groups were formed in which the first group consisted of 5 female sprinters called SG group and second group consisted of 5 female long long-distance runners called LG group.

Motor fitness was measured through speed, agility, explosive strength and endurance tests of both the group. Speed was measured in 50m dash using stopwatch and recorded in seconds. Agility was measured by 4x10 shuttle run test and scored in seconds

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using stopwatch. Explosive strength was measured through standing broad jump and measured in meters. Endurance was measured in 800m run and measured in seconds / min using stopwatch.

RESULT AND DISCUSSION

The random group design was used as the experimental design. The significant difference among sprinter and long-distance runner separately for each variable descriptive and t ratio was used. The level of significance was set at 0.05.

Table -1 Group Statistics of Sprinters and long-distance female runners

Variables	Group	N	Mean	Std. Deviation	Std. Error
Speed	**Sprinter**	5	7.38	0.32	0.14
	Long distance	5	7.62	0.31	0.13
Agility	**Sprinter**	5	10.49	0.26	0.11
	Long distance	5	10.95	0.10	0.04
Endurance	**Sprinter**	5	2.50	0.12	0.05
	Long distance	5	2.43	0.13	0.05
SBJ	**Sprinter**	5	2.07	0.11	0.05
	Long distance	5	1.97	0.06	0.03

Table-1 presents the descriptive statistics for speed, agility, endurance, and standing broad jump (SBJ) across two distinct groups: sprinters and long-distance runners. Upon analysis of the table, it becomes evident that sprinters exhibit a mean speed of 7.38±0.32 with a standard deviation (SD) and standard error (S.E) of 0.14, while long-distance runners display a mean speed of 7.62±0.31 with an SD of 0.13 and S.E of 0.13. This observation indicates a marginal superiority in speed among sprinters compared to their long-distance counterparts. In terms of agility, the mean and SD for sprinters are

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10.49±0.26 with an S.E of 0.11, whereas long-distance runners show values of 10.95±0.10 with an S.E of 0.04. Consequently, it is apparent that sprinters possess superior agility compared to long-distance runners. Moving on to endurance, sprinters demonstrate a mean and SD of 2.50±0.12 with an S.E of 0.12, while long-distance runners exhibit values of 2.43±0.13 with an S.E of 0.05. This reveals a slight advantage in endurance for long-distance runners over sprinters. Finally, considering the standing broad jump (SBJ), sprinters showcase a mean and SD of 2.07±0.11 with an S.E of 0.05, whereas long-distance runners present values of 1.97±0.06 with an S.E of 0.03. Thus, sprinters exhibit a superior performance in the SBJ compared to their long-distance counterparts.

Table-2

Independent Samples Test

		Equality Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig.(2-tailed)	Mean Difference	Std. Error Difference	Interval of the Lower	Interval of the Upper
Sprint	Equalvariances Assumed	.110	.748	-1.218	8	.258	-.24400	.20035	-.70	.21
	Equalvariancesnot Assumed			-1.218	7.995	.258	-.24400	.20035	-.70	.21
Agility	Equal variancesassumed	6.288	.037	-3.632	8	.007	-.46400	.12775	-.75	-.16

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	Equalvariancesnot Assumed			-3.632	5.225	.014	-.46400	.12775	-.78	-.13
Endurance	Equal	.447	.523	.868	8	.411	.07200	.08295	-.11	.26
	Equal			.868	7.986	.411	.07200	.08295	-.11	.26
Sbj	Equal variancesassumed	1.009	.345	1.739	8	.120	.10600	.06096	-.03	.24
	Equalvariancesnot Assumed			1.739	6.430	.129	.10600	.06096	-.04	.252

Table 2 presents the discernible distinctions between sprinters and long-distance runners. The statistical analysis, as indicated by the p-values, reveals a noteworthy dissimilarity solely in the domain of agility, where the p-value is less than 0.05. Conversely, for the other variables under consideration, no statistically significant differences were observed, as the p-values exceeded the threshold of 0.05. This outcome suggests that, within this comparative study, the two groups significantly differ in terms of agility, while no statistically significant disparities are evident in the remaining variables.

In summary, the statistical analysis delineates nuanced differences in physical attributes between sprinters and long-distance runners, highlighting distinct strengths in speed and agility for sprinters, while long-distance runners demonstrate superior endurance. The standing broad jump also favors sprinters in terms of performance.

The statistical finding revealed that there were significant differences in the variables selected between adolescent long distance and sprint runners.

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It was hypothesized that there will be a significant difference in selected motor fitness variables between female adolescent sprinters and long distance runners. As per the result of the study the hypotheses was true and accepted.

Appendix I

SPRINTERS

sn.	sprint50 M(secs)	strength(meters)	agility(secs)	endurance(mins.)
1.00	7.95	1.90	10.34	2.50
2.00	7.25	2.10	10.89	2.50
3.00	7.31	2.22	10.64	2.30
4.00	7.20	2.04	10.35	2.64
5.00	7.20	2.12	10.25	2.58

average	7.38	2.08	10.49	2.50
s.d	0.320734	0.117813	0.265575	0.128374

Appendix II

LONG DISTANCE RUNNERS

Sn.	sprint50m(sec)	strength(meters)	agility(sec)	endurance800M(mins).
1.00	7.76	2.01	10.89	2.30
2.00	8.00	2.04	11.12	2.58
3.00	7.77	1.98	11.01	2.28
4.00	7.29	1.96	10.89	2.50
5.00	7.31	1.86	10.88	2.50

Average	7.63	1.97	10.96	2.43
SD	0.312778	0.068557	0.105214	0.133866

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