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A kinematic comparison of male and female soccer players in sprint techniques

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Abstract

Investigation of the most effective in sports, that is to say, the most effective biomechanical resolution process for solving the existing problems of movement in sports. Reduction of the knowledge gained concerning the most effective technique in the individual discipline of sports to general biomechanical principles, which can be development of the methods of biological investigation. Development of special biomechanical methods of investigation for obtaining rapid information for use in technical training. Acquisition on of the biomechanical principles for training practice for developing the necessary physical and psychological prerequisites (particularly with regard to the force capacities).

The purpose of the study was to compare the selected kinematics variables of the technique of male and female soccer players. The subjects of this study were three males and three females Inter-university soccer athletes of Lakshmibai National Institute of Physical Education, Gwalior (M.P.). The age the subjects were between 18-25 years.

The sequence photographic technique was employed to register the Soccer player's technique. A motor driven, Nikon Model EM Camera was used. The subjects were photographed at 40-55 meters marks in sagittal plane. The filming Zone was 15 meters in width only moment take-off was analyzed. From the photographs, the stick figures were prepared by using joint point method and various kinematics variables were obtained. Segmentation methods were employed in order to assess the center of gravity of the body during the moment of take-off. Selected kinematics variables were Angle at Ankle Joint (Supporting Leg), Angle at knee Joint (Supporting Leg), Angle at Ankle Joint (Swinging Leg), Angle at knee Joint (Swinging Leg), Angle at Trunk Inclination (with vertical), Push-up Angle, Height of Center of Gravity at Moment Take-off, Take-off Distance and stride length.

The data were analyzed by 't' test to ascertain the comparison of male and female Soccer players. The results have shown the insignificant values of 't' ratio for all the selected kinematics variables of the study at the significance level of 0.05.

Keywords: Soccer, supporting, leg swinging leg

Introduction

Objective of the study

The purpose of this study is to compare the male and female soccer players on the sprint technique from kinematics point of view.

Methodology

Subjects

Three male and three female soccer players of Lakshmibai National Institute of Physical Education, Gwalior (M.P) participated in the Inter- University Competition in the year 20014-20015. The age of the subjects were between 18-25 years.

Variables

The following selected kinematics variables for analyzing the technique of soccer players:

- Angle at Ankle Joint (Supporting Leg)
- Angle at knee Joint (Supporting Leg)
- Angle at Ankle Joint (Swinging Leg)
- Angle at knee Joint (Swinging Leg)
- Angle at Trunk Inclination (with vertical)
- Height of Center of Gravity at Moment Take-off,

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▪ Push-up Angle

- Take-off Distance
- Stride length.

Collection of Data

The sequential photography was used as a technique of kinematics comparison of male and female Soccer players. A standard motor driven camera i.e. Nikon Model EM, was used to obtain photo sequences of selected movements during the movement take-off.

The subjects were photographed between 40-55 meters in sagittal plane filming zone was 15 meters for obtaining individual photographic sequence the subjects were photographed in controlled condition. The distance of the concern from the subjects was 11.20 meters and fixed 1.20 meters high. The moment take-off was measured manually for each subject. The scholar-developed stick figure utilizes joint-point methods on which the body projections at the joints facing the camera were considered. The inclination of torso was measured by deviation of torso from the vertical axis. The center of gravity of each subject at the moment take-off was located by using segmentation method as suggested by James G. Hay.

Statistical Analysis

The data were analyzed by 't' test to ascertain the comparison of male and female Soccer players. Data were analyzed by using S.P.S.S. (Statically package of Social Science).

Finding

Table 1: Comparison of the Performance of Male and Female Sprinter in Ankle Joint (Supporting Leg)

Means		T-Ratio
Male	Female	
128.3	107.3	0.154

Significant at 0.05 level t-value=4.303

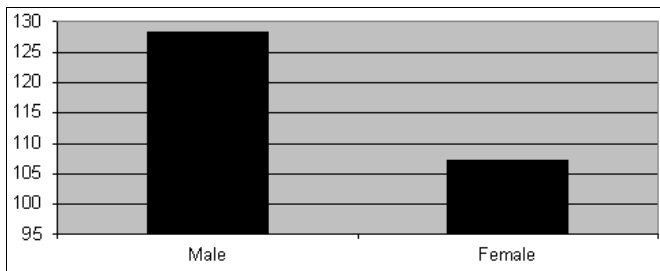


Fig 1: Comparison of performance of male and female soccer players in ankle joint supporting leg

Table-1 clearly indicates that insignificant difference was found between the means of male and female students as the observed T-ratio was 0.154, which was lower value than the required value (4.303) to be significant at 0.05 level of significance.

Table 2: Comparison of the Performance of Male and Female Soccer players in Ankle Joint (Swinging Leg)

Means		T-Ratio
Male	Female	
106.6	90	0.145

Significant at 0.05 level t-value=4.303

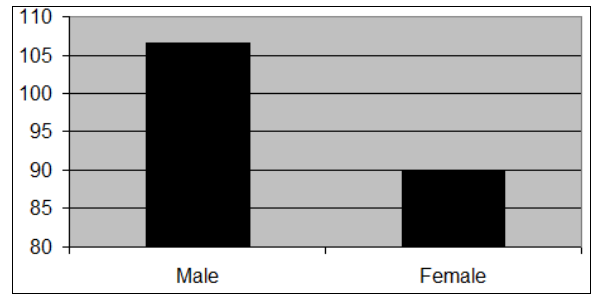


Fig 2: Comparison of Male and Female sprinters Ankle Joint (Swinging Leg)

Table-2 clearly indicates that insignificant difference was found between the means of male and female students as the observed T-ratio was 0.145, which was lower value than the required value (4.303) to be significant at 0.05 level of significance.

Table 3: Comparison of the Performance of Male and Female Soccer players in Knee Joint (Supporting Leg)

Means		T-Ratio
Male	Female	
166.6	166	0.02

Significant at 0.05 level t-value=4.303

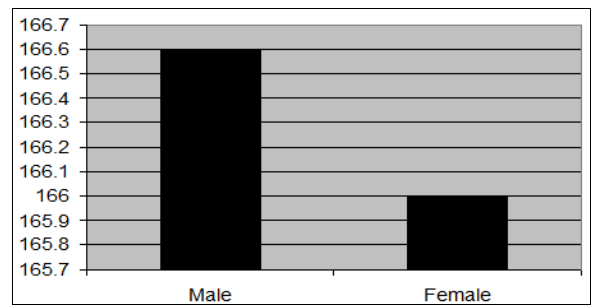


Fig 3: Comparison of Male and Female Sprinters in Knee Joint (Supporting Leg)

Table-3 clearly indicates that insignificant difference was found between the means of male and female students as the observed T-ratio was 0.02, which was lower value than the required value (4.303) to be significant at 0.05 level of significance.

Table 4: Comparison of the Performance of Male and Female Soccer players in Knee Joint (Swinging Leg)

Means		T-Ratio
Male	Female	
81.6	93.3	-0.115

Significant at 0.05 level t-value=4.303

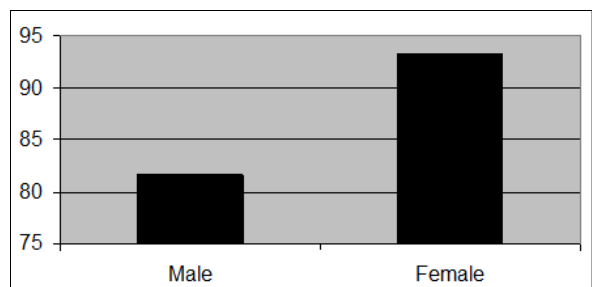


Fig 4: Comparison of Male and Female Sprinters in Knee Joint (Swinging Leg)

Table-4 clearly indicates that insignificant difference was found between the means of male and female students as the observed T-ratio was -0.115, which was lower value than the required value (4.303) to be significant at 0.05 level of significance.

Table 5: Comparison of the Performance of Male and Female Soccer players in Push-up Angle.

Means		T-Ratio
Male	Female	
62.3	64	-0.023

Significant at 0.05 level t-value=4.303

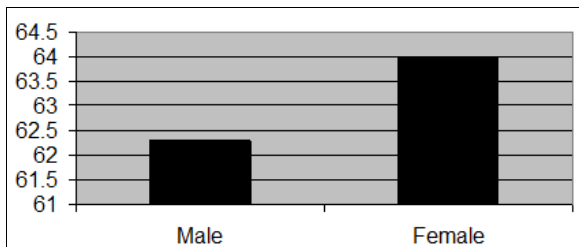


Fig 5: Comparison of Male and Female Sprinters in Push-up Angle

Table-5 clearly indicates that insignificant difference was found between the means of male and female students as the observed T-ratio was -0.023, which was lower value than the required value (4.303) to be significant at 0.05 level of significance.

Table 6: Comparison of the Performance of Male and Female Soccer players in Trunk Inclination.

Means		T-Ratio
Male	Female	
89	86.3	0.163

Significant at 0.05 level t-value=4.303

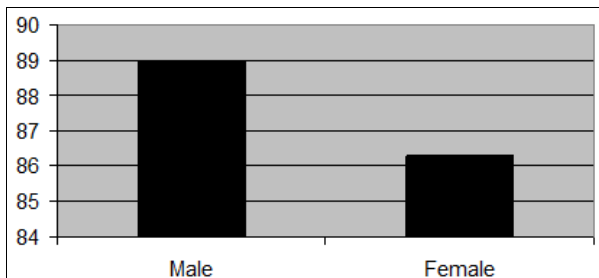


Fig 6: Comparison of Male and Female Sprinters in Trunk Inclination.

Table-6 clearly indicates that insignificant difference was found between the means of male and female students as the observed T-ratio was 0.163, which was lower value than the required value (4.303) to be significant at 0.05 level of significance.

Table 7: Comparison of the Performance of Male and Female Soccer players in Height of C.G. at moment of Take-off.

Means		T-Ratio
Male	Female	
66.6	61.3	0.071

Significant at 0.05 level t-value=4.303

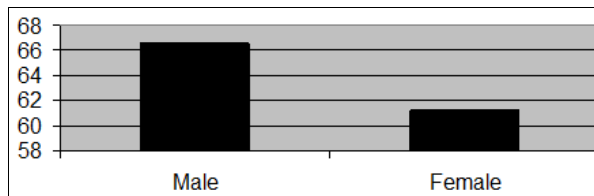


Fig 7: Comparison of Male and Female Sprinters in Height of C.G. at moment of Take-off.

Table-7 clearly indicates that insignificant difference was found between the means of male and female students as the observed T-ratio was 0.071, which was lower value than the required value (4.303) to be significant at 0.05 level of significance.

Table 8: Comparison of the Performance of Male and Female Soccer players in Take-off Distance.

Means		T-Ratio
Male	Female	
48	36.3	0.238

Significant at 0.05 level t-value=4.303

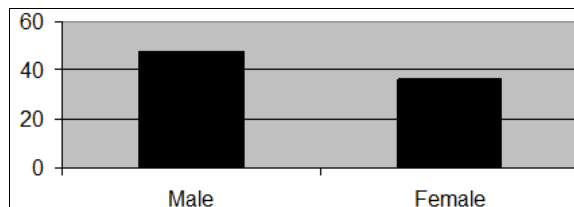


Fig 8: Comparison of Male and Female Sprinters in Take-off Distance.

Table-8 clearly indicates that insignificant difference was found between the means of male and female students as the observed T-ratio was 0.238, which was lower value than the required value (4.303) to be significant at 0.05 level of significance.

Table 9: Comparison of the Performance of Male and Female Soccer players in Stride Length.

Means		T-Ratio
Male	Female	
2.08	1.75	0.49

Significant at 0.05 level t-value=4.303

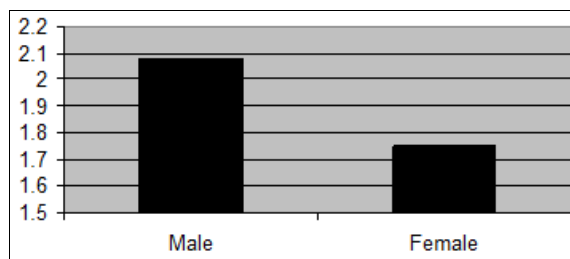


Fig 9: Comparison of Male and Female Sprinters in Stride Length.

Table-9 clearly indicates that insignificant difference was found between the means of male and female students as the observed T-ratio was 0.49, which was lower value than the required value (4.303) to be significant at 0.05 level of significance.

Conclusion

With the limitations and findings of the study the following conclusion may be drawn:

None of the Kinematics variables such as Angles at ankle joint, Angle at knee joint of supporting leg and Angles at ankle joint, Knee joint of swinging leg, Trunk Inclination, Height of the Center of gravity at moment of take-off, Take –off distance and Stride length did not differ significant in case of technique of male and female Soccer players.

Discussion

A kinematics variable also has exhibited the significant difference of the technique of male and female Soccer players. The angular kinematics variable which importance of grater planter flexion at moment of take-off in a sprinting stride. Longer stride length was found related with the batter performance in technique of sprints as also being advocated by James G. Hay.

Since the obtained value of t-ratio was insignificant value might have been due to the small size of the sample. Kinematics variables between male and female sprinter at the selected level of significant 0.05 therefore, the hypothesis as stated that these may not be significant difference in selected kinematics variables of male and female Soccer players in accepted.

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