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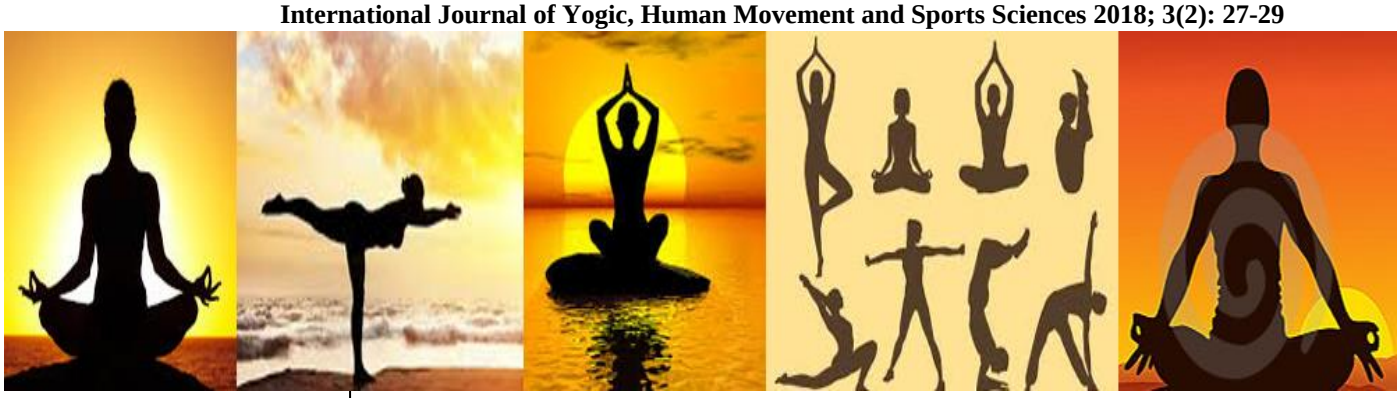

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A comparative analysis of static and dynamic balance between cricket and soccer players

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Abstract
Balance is the key to perform activities of daily living. And also work as a predictor of recovery as it is used by physical therapist to assess patients with different conditions. Balance is classified into two with respect to state of motion or state of rest of the body. Balance may be static when the body is at rest. It may be dynamic when the body is in steady – state motion. Balance conditioning is a way to train the body to make better use of strength you already have. So, better you can balance, less time you need to spend in increasing your strength. If an athlete is having a good balance, then it reduces the need for adding additional effort. This study is done to investigate and compare static and dynamic balance between cricket and soccer players.

Keywords: Balance, cricket, soccer, player

Introduction
Although balancing comes under voluntary task but if external attention is also added to the activity then it can boost the performance. That is, focusing attention on the effects of one's movements rather than on the movement itself will boost performance (Khuman et al., 2014) [1]. When a person stands in such a way that his center of gravity and center of mass lies within his bodies base of support so that he maintains a stable posture is known as balance. Balance helps in maintaining stable posture for performing activities of daily living while counteracting external and internal conflicts. Balance is the key to perform activities of daily living. And also work as a predictor of recovery as it is used by physical therapist to assess patients with different conditions. Balance is classified into two with respect to state of motion or state of rest of the body (Olivier et al., 2015) [2]. Balance may be static when the body is at rest. It may be dynamic when the body is in steady – state motion.

Assessment of postural control is an important measure in the athletic population for establishing levels of balance and neuro-muscular coordination, for the purposes of injury prevention and rehabilitation. So for assessing this low cost or feasible test are performed on athletes commonly known as star excursion test for checking the dynamic postural control (Sawdon-Bea and Nicole, 2017) [3].

Balance conditioning is a way to train the body to make better use of strength you already have. So, better you can balance, less time you need to spend in increasing your strength. If an athlete is having a good balance, then it reduces the need for adding additional effort. Balance is both movement skill that enhances technique and a conditioning element that can be improved. Without stabilization of the spine and trunk during balance conditioning agility will be limited. Therefore balance training facilitates body awareness about relationship of man over the base of support (McCurdy and Langford, 2006) [4].

The ideal balance program of an athlete is the one that challenges both static and dynamic balance with a focus on coordination. Static balance training is stationary training with a solid, predictable surface underfoot. Dynamic balance training is facilitated by adding stimulus underfoot that is unstable. Both the static and dynamic training methods will implicate the athletes static and dynamic balance when tested.

Hypothesis

Experimental hypothesis: There is a significant difference in static and dynamic balance between cricket and soccer players.

Null hypothesis: There is no significant difference in static and dynamic balance between cricket and soccer players.

Statement of the Question

Which group of players has more better static and dynamic balance between cricket and soccer players?

Aim and Objective to Study

To investigate and compare static and dynamic balance between cricket and soccer players.

Materials and Methods

It is a comparative analysis among 30 male collegiate athletes from Noida International University enrolled as per the following criteria:

Inclusion criteria

1. Age = 16-24 years
2. Only male players
3. BMI 19 – 24.9 kg/msq
4. Be in good physical health (assessed using physical activity readiness questionnaire, par – Q (Church, 2006)
5. No injury in last six months

Exclusion criteria

1. Any history of joint stability
2. Any higher motor function impairment
3. Any health condition that would preclude physical activity

Star Excursion Balance Test (SEBT)

SEBT is used for assessing dynamic balance. Before testing participants were given 3min to familiarize themselves with SEBT grids. They were given 5 sec rest in A 2 footed stance between each reach attempts and 2 min of rest between the trials. The single tester recording reaches distance for each direction of SEBT grid in both legs and were arranged over three trials. Each reach distance will be normalized to leg length (reach distance/leg length x 100 = % of leg length) and will be summed for both dominant and non-dominant leg to reduce the number of statistical tests.

Stork Stand Balance Test (SSBT)

SSBT is used for assessing static balance. Before testing participants were given instructions to familiarize with SSBT scoring rules. Then the subjects were asked to put their hands on their hips and uninvolved foot against the medial side of the knee of the stance leg. Each subject maintained this position until the uninvolved limb touched the ground or the hands came off the hips. Each subject maintained the position for the maximum possible time. The best of three trials was recorded for the analysis.

Results

All results are reported in mean ± SD. There was no significant difference found between soccer players and cricketers in age, weight, height, BMI, dominant limb length and non-dominant limb length ($p>0.05$) (table 1).

Table 1: Demographic characteristics of soccer players and cricketers

S. No.	Variables	Soccer players	Cricketers	t-value	p-value
1	Age	20.67±1.49	19.67±1.54	1.802	0.082
2	Weight	174.67±4.56	175.80±4.98	0.649	0.521
3	Height	64.07±5.54	67.67±8.60	1.361	0.184
4	BMI	20.96±1.40	21.86±2.02	1.405	0.171
5	DLL	35.42±1.72	35.61±1.18	0.358	0.723
6	NDLL	35.41±1.55	35.74±1.23	0.637	0.529

No significant difference was found between soccer players and cricketers in dominant and non-dominant leg on any direction of SEBT ($p>0.05$) shown in table 2.

Table 2: Comparison of star excursion balance test (m) in soccer players and cricketers

Variables	Soccer players	Cricketers	t-value	p-value
Dominant leg SEBT				
Anterior	23.43±3.44	24.00±3.19	0.468	0.644
Antero-medial	23.45±3.79	25.26±3.44	1.364	0.183
Medial	19.78±4.85693	20.44±3.11	0.443	0.661
Postero-medial	22.88±3.78	22.76±3.91	0.085	0.933
Posterior	21.54±3.62	22.90±3.36	1.059	0.299
Postero-lateral	23.47±3.73	24.93±3.51	1.103	0.279
Lateral	25.21±5.43	26.88±5.85	0.808	0.426
Antero lateral	24.22±3.75	26.64±4.90	1.518	0.140
Non-dominant leg SEBT				
Anterior	23.34±3.51	24.60±4.28	0.876	0.389
Antero-medial	23.73±4.84	25.73±4.07	1.223	0.232
Medial	22.32±5.40	23.59±4.95	0.673	0.507
Postero-medial	22.49±3.68	22.86±3.68	0.278	0.783
Posterior	22.54±3.92	22.56±3.12	0.021	0.984
Postero-lateral	22.98±3.86	22.68±4.46	0.197	0.845
Lateral	22.15±5.06	23.19±5.22	0.554	0.584
Antero lateral	23.50±3.59	24.61±3.53	0.850	0.403

No significant difference was found in SEBT direction after normalize to the leg length in dominant and non-dominant leg between soccer players and cricket players ($p>0.05$) (table3).

Table 3: Comparison of star excursion balance test (normalized to leg length=% leg length) in soccer players and cricketers

Variables	Soccer players	Cricketers	T-value	P-value
Dominant leg SEBT				
Anterior	66.11±8.58	68.69±8.62	0.824	0.417
Antero-medial	66.25±10.28	70.89±8.94	1.320	0.197
Medial	55.90±13.36	57.33±7.76	0.360	0.722
Postero-medial	62.95±7.97	63.88±10.36	0.275	0.785
Posterior	60.75±8.71	64.31±9.21	1.087	0.286
Postero-lateral	65.05±8.80	72.51±15.51	1.618	0.117
Lateral	69.24±12.93	76.06±12.96	1.443	0.160
Antero lateral	68.36±9.53	76.23±13.00	1.890	0.069
Non-dominant leg SEBT				
Anterior	65.74±7.96	68.70±10.74	0.858	0.398
Antero-medial	66.79±11.63	71.88±10.18	1.275	0.213
Medial	62.90±13.94	65.86±12.67	0.608	0.548
Postero-medial	63.42±9.02	63.87±9.26	0.133	0.895
Posterior	60.69±8.74	64.07±9.19	1.031	0.311
Postero-lateral	64.76±9.53	63.33±11.43	0.373	0.712
Lateral	62.52±13.70	64.82±13.89	0.456	0.652
Antero lateral	66.28±8.90	68.86±9.54	0.765	0.451

No significant difference was found between soccer players and cricket players in SSBT of dominant as well as non-dominant leg (p.0.05) (table 4).

Table 4: Comparison of SSBT (sec) in soccer players and cricketers

Variables	Soccer players	Cricketers	t-value	p-value
SSBT				
Dominant leg	15.80±8.36	17.87±5.45	0.803	0.429
Non-dominant leg	10.62±6.32	13.80±4.77	1.550	0.132

Discussion

The present study was designed to investigate and compare the difference in static and dynamic balance between cricket and soccer players in colligates level. It was hypothesized that whether there is a significant difference in the static and dynamic balance between cricket and soccer players. Our primary findings were that there was little to no difference between cricket and soccer players in terms of balancing. So the results do not support the hypothesis that there is significant difference in static and dynamic balance between cricket and soccer players. Moreover, this leads to null hypothesis as there is no significant difference in between cricket and soccer players regarding their static and dynamic balance. However, visual information seems to be more important for the higher level athletes, which helps in suggesting that the level of competition influences the sensory levels involved in balance (Gribble et al., 2012) [5]. Static and dynamic balance performances are significantly different for soccer or cricket players involved in regional or national activities, suggesting that higher level player posses a greater sensitivity of sensory receptors or better integration of information than colligate players (Rasool and George, 2007) [6].

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