

**EFFECT OF STANCE ON VARIOUS JOINT ANGLES AND THE
PERFORMANCE OF STANDING BROAD JUMP. A
BIOMECHANICAL APPROACH**

A dissertation Submitted to the
Department of Physical Education
In partial fulfillment of the requirement for the award of degree of
Master of Physical Education

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DECLARATION

I do hereby declare that the dissertation entitled “*effect of stance on various joint angles and the performance of standing broad jump,*” submitted in partial fulfillment of the requirement for the award of the degree of Masters in Physical Education is entirely my original work, and all ideas and references have been duly acknowledged. It does not contain any work that has been submitted for the award of any other degree or diploma of any university.

Signature

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CERTIFICATE

This is to certify that Mr. Sanamjeet Singh has completed dissertation titled effect of stance on various joint angles and the performance of standing broad jump under my guidance and supervision. To the best of knowledge the present work is the result of his original investigation and study. No part of the dissertation has ever been submitted for any other degree or diploma.

Date:-

Dr. Susanta Kumar Panda
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ABSTRACT

The purpose of the study was to compare effect of stance on various joint angles and the performance of standing broad jump. Total 10 samples were selected from the Lovely Professional University for this study. Sample was selected in randomly. The study was done on the basis of various joint angles of lower and upper extremities such as ankle joint, knee joint, hip joint, shoulder joint, elbow joint and neck joint. The relationship among various joints during stance phase with jumping performance at table one researcher find out that only shoulder and neck joint have a significant relationship on standing broad jump performance during stance phase because the value shown in both case .024 which less than 0.05 which indicate shoulder joint angle and neck angle play a very important role during stance phase, I same case other joint shown less significant because correlation value is less greater than 0.05. All the sports person of Lovely Professional University Phagwara (Punjab) India.

Keywords: various joint, angles and standing broad jump.

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INVESTIGATOR

Sanamjeet Singh

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CHAPTER I

Introduction

Human life is worked around the work either household or authority. Every individual is occupied in some work or action for the duration of the day. He stays occupied thoroughly considered his life even he disregard his physical wellbeing and individual life. As pear go to School College or college with the end goal of study, Adult go to deal with their occupation where as housewife work at home. Each of them is having issues with respect to stationary way of life. Ergonomics is a teach worried with communication of people and machines and with the elements that impact that variables that cooperation. Ergonomics endeavor to change the human machine framework such that can lessen the issue identified with their particular work.

Biomechanics is a field of science which bargains the investigation of the development of living things and the inward and outside powers following up on the human body and their related reactions, utilizing the study of mechanics. Mechanics is branch of Physic Mechanics is a branch of material science that is worried with the portrayal of movement and how drives make movement. Powers following up on living things can make movement, be a sound boost for development and advancement, or over-burden tissues, bringing on damage. Biomechanics gives calculated and numerical instruments are essential for seeing how living thing move and how kinesiology experts may enhance development or make development more secure.

Researchers from various ranges (e.g., kinesiology, designing, material science, science, zoology) are keen on biomechanics. Biomechanics is fascinating on the grounds that many individuals wonder about the capacity and excellence in creature development. A few researchers have simply hypothetical or scholarly interests in finding the laws and rule that represent creature development. Inside kinesiology, numerous biomechanics have been keen on the use of biomechanics game and exercise. The uses of biomechanics to human development can be characterized into two fundamental territories: the change of execution and impoverishment or treatment of damage.

Application: - An assortment of callings is occupied with utilizing biomechanics to alter human development. A man that creates prosthetics (fake appendages) would utilize biomechanics to comprehend the ordinary working of joints, the loadings the prosthetic must withstand, and how the prosthetic can be securely connected to the individual.

Biomechanical procedures can be utilized in side any game and soccer specifically, to characterize the qualities of aptitudes, to pick up a comprehension of the mechanical viability of their execution and to recognize the variables basic their effective execution. This information and comprehension can upgrade the learning and execution of those aptitudes. Biomechanics and ergonomics firmly identified with each different as a few limes it is called as occupation biomechanics. There is numerous energy calculates likewise that influence the work assignments for instance: vibrations and the kinematics of the work errand can be checked to comprehend by the agronomists to evaluate the impact of dynamic variables upon the human machine interface. By concentrate, the finding of biomechanical can characterize distinctive frameworks or thoughts that might be utilized to enhance the human machine framework so the business related can mammies and make human life simpler that much as much it is conceivable. Biomechanical strategies can be utilized in any game and standing broad jump is specific to characterize the attributes of aptitudes. to pick up on comprehension of the mechanical adequacy of their execution and to discover the elements fundamental their fruitful execution. This information and comprehension can improve the learning and execution of those aptitudes.

The standing broad jump world is on Olympic style events occasion. It stays in like manner use as a trial of touchy leg control. The standing broad jump is exceptionally normal and simple to screen or oversee to get unstable leg control. As jumping is those principal developments which require extremely complex engine coordination of both upper and lower appendages or body part or fragments the more elevated amount of engine wellness require going to accomplishment in games is a central truth. The standing long jump is likewise utilized as a practical test to survey leg control however the test may disparage the competitors does not utilize an ideal system. One minor limitation in using the standing broad jump as a physiological or execution test is that it is a sensibly complex development. Portion removes in a standing broad jump the jumper center to wander his body for most prominent level partition past a take-separated. The jumper starts from

a static standing position and after that delivers an incomprehensible take-off speed by using. In the standing broad jump, the flight detachment is the greatest piece of the total jumper expel. In the flight time of the standing broad jump, the focal point of mass of the jumper carries on like a shot in free flight. The test is performed by staying with feet to some degree isolated. The contender will bounce very far, with that jumping division being measured as the delayed consequence of the test. In performing out the standing broad jump, the jumper stays at a line set apart on the ground with the feet fairly isolated. The contender takes off and lands using both feet, swinging the arms and bowing the knees to give forward drive. Right when a contender needs to execute the standing long jump, the contender's feet must be settled in a parallel position. The contender shakes the arms back adequately and forward and turns at the knees and hips to set up the fitting beat and body position for a bearable ricochet. To start the jump, the contender swing both arms emphatically forward as one, and pieces or stops them scarcely higher than the shoulders, with a slight yet firm twist at the elbow. Right and left feet must leave the ground in the interim so that a full expansion of the lower legs, knees, and hips besides called triple augmentation must be refined to utilize all potential significance from these joints. So also as the contender will arrive, the feet should be as far before the body as possible without making the contender dis alter and make a backward walk in the wake of landing. To get the feet to impel, the arms whip back to the hips. This kicks the feet out in front. On getting, the contender ought to attempt to ingest the impact by twisting at the knees and hips to jump with any degree jumping pit contender must be wear with spike shoes, having 2 long forward spikes and 2 long heel spikes in every shoe. These spikes help to push the subject against the earth, and if the feet are not held absolutely when pushing the candidate will have no affirmation. The heels are to be thicker than those of regular jumping shoes, for the jumper must meet upon his heel. Moreover, if the ground is hard he can't keep a stone harm coming. Swinging the arms in the midst of the standing broad jump has been seemed to extend expel execution. Considers have in like manner recommended that using straps (hand-held weights) as the old Greek Olympians can further improve jump evacuate by no under 17 cm. Since the joined body and straps system must take after a symbolic heading in the midst of flight, hurling the harnesses backward just before landing could also enhance execution by pushing the body propels. It is one of the wellbeing tests in the NFL Consolidate. The standing broad jump was in like manner once an event at the Olympic Diversions and is also an event in Games Corridor contentions in the UK.

This is an imperative perception on the grounds that many examinations have explored instructional controls advancing an interior versus outer concentration in an assortment of game settings; the findings are fairly hearty in that the bearings that cultivate an outside concentration of consideration inspire preferred execution over directions that prompt an inward concentration of consideration. Despite the fact that this preferred standpoint in execution has been steady in the writing, a greater part of the examination has utilized aptitudes that require the control of a question accomplish the activity point. It was conjectured that subjects who were told to concentrate remotely (i.e., on the impacts of their developments) would bounce more distant than subjects who were told to concentrate inside.

1.1 Statement of the problem

The purpose of the study was to find out the “effect of various joint angles and the performance of standing broad jump” on basic of selection kinematics variable.

1.2 Delimitations

- The study delimited to 10 male players from Lovely Professional University only.
- The study further delimited to the subjects belonging to the age group of 19 to 28 years.
- The study delimited to the effect of various joint angles and the performance of standing broad jump. On basic of selection kinematics variable.

1.3 Angular Kinematics variables will be.

- a) Ankle Joint.
- b) Knee Joint.
- c) Hip Joint.
- d) Shoulder Joint.
- e) Elbow Joint.
- f) Neck joint.

1.4 Limitations

- Researcher have do not further control on diet habit of the subjects.
- Limitation regarding lifestyle of the subjects.
- Limitation regarding subordinate training effect of the subjects.

1.5 Objectives of the study

1. To find out the effect of stance on various joint angles and performance of standing broad jump.

1.6 Hypothesis

The Alternative Hypothesis: H1

It is hypothesized that effect of stance on various joint angles and performance of standing broad jump.

The Null Hypothesis: Ho

It is hypothesized that effect of stance on various joint angles and performance of standing broad jump.

1.7 Definition and explanation of the terms

Kinematics

Kinematics is the branch of classical mechanics that describes the motion of points, bodies (objects) and systems of bodies (groups of objects) without consideration of the causes of motion.

1.8 Significance of the Study

The modern age of sports is the Excellency so in every sports perfection and purification of skill has got its immense importance and research in the field has added allowed in excelling the performance of the present study in may be contributed the following way-

- The findings were providing a model for effect of stance on various joint angles and the performance of standing broad jump.
- The study helped in drawing conclusion and generalization which may be used by physical education teachers and coaches for better teaching and coaching.
- The study was providing knowledge to selection of exercise according to the need of the athlete and which one was best according to the circumstances.
- The finding of the study also helped coaches to identify technical faults while effect of stance on various joint angles and the performance of standing broad jump.
- Similar kind of study was undertaken in another kind of sports to understand the scientific principles involved in it.

Chapter II

Review of Related Literature

Many researchers had done related to standing broad jump. It tries to measure what an individual has learned his or her current level of performance. Effect of various joint angles and the performance of standing broad jump are particularly helpful in locating individual or group status in sports settings.

Ashby, Heegaard (2002) studied by arm advancement on the execution of the standing long jump was investigated. Three individuals played out an improvement of ricochets with free (JFA) and bound (JRA) arm progression to pick whether arm swing updates bobbing section. The subjects bounced off a drive deal with and the headway of the body parts was recorded with a four-camera, isolated change gets structure. Weaving execution was delineated as the notwithstanding dislodging of the toe between the central and landing (TD) positions. The subjects weaved 21.2% further on an ordinary with arm change (2.09 ± 0.03 m) than without (1.72 ± 0.03 m). Seventy-one percent of the change in execution in JFA was inferable from a 12.7% increase in the take-off (TO) speed of the point of convergence of merging of gravity (CG). Extends in the even expulsion of the CG before to and in the level position of the toe concerning the CG at TD tended to the remaining 29% of the change in skipping section. The extra alter and control given by the arms all through the jumping headway added to execution change in JFA. The subjects could cure preposterous forward turn about the CG by swinging the arms backward in the midst of the flight deal with. Without the chance to swing the arms in the midst of flight, the subjects expected that would wipe out any outrageous forward turn while still in contact with the ground. This affection in JRA was show in the ghastly diminishment in the vertical ground reaction drive (VGRF) and the change of a counterproductive in adjusting turning minute about the CG just before to.

Castro-Pinero (2009) studied by motivation behind the present review was to look at the relationship among various measures of lower body solid quality in kids, and the relationship between measures of lower and abdominal area strong quality. The review populace involves 94 (45 young ladies) sound Caucasian youngsters matured 6-17 years. Youngsters played out a few lower body hazardous strong quality tests (i.e., standing long jump [SLJ], vertical jump, squat jump, and countermovement hop) and abdominal area solid quality tests (i.e., toss ball, push-ups, and isometric quality activities). The relationship among the review tests was dissected by various relapse. The SLJ was emphatically connected with other lower body strong quality tests ($R = 0.829-0.864$) and with abdominal area solid quality tests ($R = 0.694-0.851$). The SLJ test may be in this way considered a general record of solid wellness in youth. The SLJ test is useful, time productive, and low in cost and hardware prerequisites.

Davies (1990) studied by twenty-three young ladies and 19 young men played out the handgrip and standing long jump (SLJ) tests. Their aggregate lower arm and leg volumes were computed from outline and length estimations and the fit volumes (bone + muscle) were ascertained by making stipend for skinfold thickness. Despite the fact that the young men were more established than the young ladies (12.8 and 12.4 years), there was no huge contrast in their statures or body masses. The outright exhibitions of the young men were better than those of the young ladies in both tests (handgrip 234 and 205 N and SLJ 1.53 and 1.34 m), yet when jumping execution was communicated as separation \times body mass, there was no huge contrast. In both tests, execution as far as unit lean appendage volume demonstrated no huge sexual orientation contrast. At the point when execution was identified with lean appendage volume, both young men and young ladies demonstrated a straight relationship in the two tests, with no critical contrast between them. This nonappearance of a sexual orientation distinction stands out from the consequences of a past review on youthful grown-ups and examination demonstrates that the connections between lean appendage volume and execution in the two tests for both young men and young ladies lie just underneath those of the youthful, grown-up females. The distinction between the young ladies and the youthful grown-up females was quite recently critical in the handgrip ($p < 0.05$), yet not noteworthy in the SLJ ($p > 0.25$), though the contrasts between the young men and youthful grown-up guys were huge ($p < 0.01$) in both tests. Along these lines no doubt a sex distinction in

the execution of skeletal muscle creates amid puberty and conceivable contributory components are talked about.

Komi (1992) studied the leg muscles expect fundamental parts in the productive execution of aptitudes in numerous beguilements and games. Albeit, aside from soccer, battle games, running and jumping events in games, coordinate use of the leg is not ordinary to most different games. In any case, a large portion of these different games, which depend basically on the arm and diverse parts of the body, still require quality and steadiness of the leg muscle to make drive and help them through the nervousness and traverse of their development.

Ravi (2001) studied main goal of plyometric training is to change the relies on upon the scope of the improvement of the uncommon vitality that relies on upon the adaptability come about for the physical capacities to perform such enrollments, for example, body and gravity all through muscle constriction by execution is regularly measured by the level of the player extending to an identical compel in amount and opposite between both trial gathering and control assembly toward the path all through muscle compression by in the post –test of the review factors for the shortening gathering and control a mass toward the path all through the shortening. it takes to be fruitful player quality preparing is an essential piece of soccer molding due to the requirement for leg quality and power for jumping there is presently question that physical wellness assumes a critical part a physical fit competitor is better and a molding gives a triumphant edge in soccer.

Miller et al, (2002) studied dynamic stretching and also plyometric exercises is conventionally used to redesign vertical jump and spryness. Diverse surveys have been done to see the impact of dynamic expanding and plyometric on vertical hop and status in different recreations and age social events. The Bigger piece of research composing end up being intense and recognized

globally, yet not a lot of have talked about their comparable and joined impact on these components.

Vinodh, Kumar (2015) studied the data of three sorts of standing broad jump were gathered from 10 subjects (individuals = 7. females= 3) who have been honing no under 2 - 3 times every week since latest six months and in like way had a place with dissimilar countries like India, Spain, Australia, and Israel. Each one of the subjects was allowed to skip with shoes and each one of the hops done on wooden ground surface with a stature scale (measuring 0 to 205 cm) kept even to stamp the motivation driving take-off and landing. No under three shots were given for each sway and strong verbal encouragement was given to remove the best ricochets from the subjects in light of the way that the best bounced were taken for honest to goodness examinations. In the wake of get-together the ricocheted execution data, attempts were made to make conceivable unexplored interfaces between these three sorts of standing long bobs. An astonishing trigonometric connection between DLFL DLSF and SLFJ was a startling conclusion and in like way, a method were conceptualized the prelude of Pythagorean theory; $DLFJ = (\text{mean DLSJ2} + \text{mean SLFJ2})$. Pearson relationship coefficient test was done to understand the level of connection between this condition predicted DLFJ and ensured DLFJ looked by the subjects, through it was found that $r = 0.9987$. His theory for standing long hop shown by this review using a despicable framework has been exhibited particularly unequivocally interfacing with genuine twofold leg standing long jump. This speculation can be conveyed as 'twofold leg forward standing long jump is comparing to or inside and out that truly matters vague to the square establishment of the aggregate of the squares of standing broad jump (mean of right and left side ricochets) and single leg forward standing broad jump(mean of correct and left-hand single leg forward bounces)'. This review continues investigating more basic inter-connections of different sorts of one leg and twofold leg sways to both other than moved bits of making sense of how to the field of biomechanics and exercise.

Glencross (1964) studied the jump achieve test and standing broad jump were inspected as trial of muscle power. The establishment used was the power lever. An examination of the distinction portions of the two jump tests revealed that each test incorporated a sweeping degree of specific change. Of the general component contrast, muscle control appeared, in every way, to be only a

solitary part. A multi-dimensional part, jumping limit, was fundamental to both the bounce accomplish test and standing broad jump. These tests appeared to have compelled application as measures of muscle power.

Chauhan (2005) studied was on 40 volleyball players in connection to their touchy arm quality and anthropometric factors. Item minute strategy for connection and numerous relationship, and creating relapse condition, were utilized. Straight estimation, I.e. tallness, sitting stature, trunk length, leg length, bring down leg length, add up to a safe distance upper and for a safe distance, foot length; body circumference, i.e. bear, trunk, abs do men, hip, thigh; body width, i.e. acromial, trochanteric, femur bicondylar; and skin organizer, i.e. biceps, triceps, sub scapular, supra iliac, mid assistant, total of four skin overlap and body mass shows positive and noteworthy connections with unstable arm quality of volleyball players numerous relationship of stature, criminal and elbow distance across, slender body mass brought together with hazardous arm quality has been discovered huge at 1% level.

Dewes et.al (2005) studied pilot information proposes that tricky leg increase control, particular asymmetry leg development power is a reliable measure and is related to walking execution after stroke. Earlier audits have shown that it is achievable for get ready programming specialists to extend muscle quality and power examination of leg extension control get ready of the more grounded or weaker leg in both the serious understanding the factors that impact on walking execution taking after stroke, therefore, help oversee future mediations.

Montesinos, (1997) studied the point of this review was to recognize huge factors that add to standing broad jump (SLJ) execution in young men and young ladies. Standing broad jump (SLJ), vertical counter development jump (CMJ), 10 m and 20 m time were measured in 59 young men and 66 young ladies matured 9-12 years. Procedure amid the SLJ (SLJtech) was appraised by an accomplished agent. Two-way ANOVA uncovered increments in anthropometric and execution parameters by age, however, no contrasts amongst young men and young ladies. SLJ was contrarily related with 30 m sprint time ($r = - 0.68$, $p < 0.01$) and emphatically associated with CMJ execution ($r = 0.58$, $p < 0.01$), while SLJ tech had a high connection coefficient with SLJ execution ($r = 0.68$, $p < 0.01$). Stepwise various direct relapse examination

with SLJ execution as the needy variable, demonstrated that 74.9% of the difference of SLJ execution could be clarified by CMJ, SLJtech, 30 m sprint time, body tallness and pinnacle leg control communicated per kg body mass, with CMJ, SLJtech and 30 m time contributing for the most part (71.2%). Other anthropometric factors that were esteemed to impact SJJ, for example, leg length, weight, and BMI were not found to add to SLJ execution in this age gathering. Because of the expansive commitment of system to SLJ execution, this test may not create substantial outcomes when the point is to survey leg control in kids matured 9-12 years.

Wu, et al. (2003) studied Played out a standing broad jump education to pick the effect of arm improvement and beginning knee edge on execution utilizing ground response oblige examination, what's more, three-dimensional advancement examination. In this study, 34 females played out a development of bobbed with and without arm improvement and moreover fluctuating beginning knee centers (45 and 90°). Works out as expected indicated again that arm advancement ricochets were longer. It likewise demonstrated that the jump with a 90° introductory knee edge was 1.2 times longer than hops with a 45° starting knee point. This study found that take-off edge did not play a gigantic figure ricochet execution and anthropometric parts did not all around direct execution (i.e. having longer legs upgraded execution). It was accepted that genuine coordination and system for utilizing preliminary countermovement and arm improvement was more essential than mass and stature. Fundamentally, humbler individuals who sufficiently utilize their arms can ricochet farther away than taller more grounded individuals who don't utilize their arms.

Stodólka (2013) studied the motivation behind this review was to research the impact of the distinctive foot development (position) amid take-off and the underlying knee joint edge utilized as a part of standing long jump by the ground response powers examination and 3 dimensional movement examination (BTS SMART action) and (b) explore how the hop exhibitions of various foot situation is identified with the electromyography (EMG) action (Noraxon) of 3 chose muscle gatherings (m. gastrocnemius, m. gluteus Maximus, m. rectus femora's, m. tibias foremost, m. biceps femora's, and m. vast us medial). Six high gauge sprinters (100 m 10.87 ± 0.38 seconds and 400 m: 46.75 ± 1.05 seconds) played out a progression of jumps from parallel

and straddle foot position at take-off on a 2 compel stage (Kistler demonstrate 9286B) to decide whether an alternate example of take-off enhances jumping separation. Utilizing kinematic and active information, the knee joint point, the directions of focus of mass (COM), size of take-off pinnacle constrain, and drive amid take-off stage were figured. Normal standing long jump exhibitions with straddle foot situation were 13.58 cm (5.18%) over that from parallel feet arrangement. The bring off speed with 90° knees beginning edge start of take-off was not distinctive (1.18 and 1.17 m·s, individually) between the 2 hops. The take-off points on the COM direction likewise demonstrated contrasts (69.87 and 66.8°, separately) between each other. The commitment (EMG enactment) made by the 6 muscles were nearly the same amid all stages for the 2 jump; in any case, a few contrasts can be found, in either one-sided (single leg) or aggregates of both legs (respective) estimations. A proposal can be defined that the commitment of straddle foot situation amid take-off can fundamentally expand the estimation of energy estimation particularly when the assessment requires an unpredictable development structure with the division on the left and right legs, for instance, sprint begins from square.

Vlietstra, (2014) studied the great iterative Newton-Euler strategy for reverse flow connected to ascertaining net joint torques in biomechanics investigation has various downsides. Many wellsprings of blunder incorporating imprecision in video movement catch information estimations can prompt noteworthy mistakes in computed net joint torques. Including ground, response constrains information over constrains the arrangement. This review analyzed the viability of different opposite flow investigation strategies on a full body examination of the standing broad jump movement. These techniques included varieties in which conditions for portions of the link segment model were expelled to ease over requirement. Additionally considered were examination strategies applying minimum squares advancement, which incorporated all the deliberate information weighted in a slightest squares sense to fit an over-constrained framework. Movement catch information of 48 aggregate standing long jump trials was gathered and broke down. Traditional iterative arrangements with and without including measured ground response powers and minimum squares streamlined opposite progression arrangements were inferred and connected to the kinematic information in a 2-dimensional,

seven-fragment, connected portion model of the full body. Net joint torques were ascertained at six joints for a 1.5 s period quickly before take-off of each standing long jump, and joint power and aggregate work performed at each joint was figured over the sum of each hop. The advanced minimum squares arrangement was appeared to be fundamentally the same as the regular iterative arrangement utilizing ground response constrains and evacuating the conditions of movement at the storage compartment fragment. Net mean torques at the elbow and shoulder were profoundly factor.

Ashby and Delp, (2006) studied arm development examination in the standing long jump has in like way been dissected in a reenactment consider In the Ashby and Dell separate, immaculate control enlargements were made to find the joint torque endorsements that uplift execution for jumps with free and limited arm movement. The objective was to use these redirections to explore the instruments of the execution change gotten from free arm headway while jumping. From the results, it was found that each one of the three oversees speculations (keep down, present centrality (generally called pull theory), and joint torque extension) were kept up by the incitements. The keep down theory was kept up in that joint establishments must be obliged in the midst of the propulsive stage to connect with the fragments to be truly engineered landing. Joint torque increment occurred in that the arm swing recognized diminished augmentation paces of the lower body joints and thusly strengthened the most remote purpose of the lower body joint torque actuators to make torque and perform work. The yield centrality speculation (or constrain hypothesis) was what's more kept up as in the midst of the free arm change skipped, the total importance of the structure was extended by the extra work done on the shoulder. Each one of the three of the speculations was seemed to build up the level and vertical paces of the point of convergence of merging of mass of the system at taking away with the most central commitment starting from the additional essentialness allowed to the structure by the work done by the shoulder actuator.

Chapter III

Method and procedure

In this chapter the selection of Research approach, Sampling technique, Selection of subject, Selection of variables, describe study, criterion measure, tools, Procedure of Data Collection, Administration of the test and collection data, Marked selection, Analysis of the Film, Purpose, Variations, and the techniques employed for data analysis have been described.

3.1 Research Approach: Descriptive

3.2 Sampling Technique: Random Sampling

3.3 Selection of the Sample

The subject for this study was 10 male players from Lovely Professional University of different games will be subjects for this present study. The age of the subjects will be 19-28 years.

3.4 Selection of variables

Effect of stance on various joint angles and the performance of standing broad jump.
Investigation ankle joint, knee joint, hip joint, shoulder joint, elbow joint. And neck joint.

3.5 Criterion Measure

The criterion measures for the study was the performance of the subjects in standing broad jump test.

3.6 Tools

Tape measure to measure distance jumped, the starting line marked the clearly. Standing broad jump landing pit are also available. Frictionable surface for takeoff, and soft landing area required. Digital camera.

3.7 Procedure of Data Collection

The subject stands behind a take off line with his feet several inches apart. Before jumping the student dips at the swing the arms backward. He then jumps forward by simultaneously extending the knee and swinging the arms forward two trials permitted. The measurement was from the closest heel marks to the take off line.

3.8 Administration of Tests

The performance of the subjects in the technique of standing broad jump, filming protocol and analysis are described as under:

The test for performance of the technique of standing broad jump will be conducted on the long jump pit field in lovely professional university, Phagwara.

3.9 Marked selection

Markers were placed on the bony protrusions of the body corresponding to places close to joint centers of subjects. The chosen places were the lateral malleolus (ankle), the lateral femoral condyle (knee), the greater trochanter (hip), the acromion (shoulder), the lateral epicondyle of the humerus (elbow) the cervical (neck).

3.10 Analysis of the Film

After obtaining the photographs by any specific sequential camera which analyzing the movements, from the photograph will calculate various angles of segment of body.

3.11 Purpose: to check the various angle of stance position and the impact of performance.

3.12 Variations/modifications: A long jump landing pit is little bit soft so, we can use a comfortable landing area e.g. Landing pit, due to this subject tries to jump more and feel comfortable. This method also permits those with greater skill to score longer jumps, which is unwanted if you are trying to test for leg power only. Generally, longer distances should be attained with this technique, so the norm table above would not be accurate.

3.13 Statistical technique

To compare the effect of various joints angles on the performance of standing broad jump, Analysis of product movement correlation was used.

Chapter IV

Result and Data Analysis

The table no. 4.1 Show the angles of different joints during stance on standing broad jump and performance.

Subject number	Angles of ankle joint	Angles of knee joint	Angles of hip joint	Angles of shoulder joint	Angles of elbow joint	Angles of neck joint	Performance
1	68°	112°	115°	64°	165°	125°	2.15m
2	76°	111°	85°	67°	166°	124°	2.12m
3	84°	138°	112°	51°	175°	142°	1.84m
4	70°	110°	105°	44°	177°	165°	1.80m
5	93°	150°	120°	42°	160°	120°	1.94m
6	76°	107°	103°	60°	149°	110°	2.20m
7	76°	128°	102°	42°	161°	143°	1.90m
8	79°	124°	107°	55°	167°	133°	1.82m
9	86°	135°	98°	61°	150°	130°	1.97m
10	83°	134°	113°	55°	168°	144°	2.05m

Show the angles of ankle, knee, hip, shoulder, elbow, neck joints during stance on standing broad jump and performance.



The table no. 4.2 Show the correlation between Performance and Ankle of standing broad jump

Method of teaching	N	Mean	Std. Deviation	Df	Correlation
Performance (M/s)	10	1.97	19.79	18	0.54
Ankle	10	79.1	7.56		

Tabulated value at DF 18= 0.44

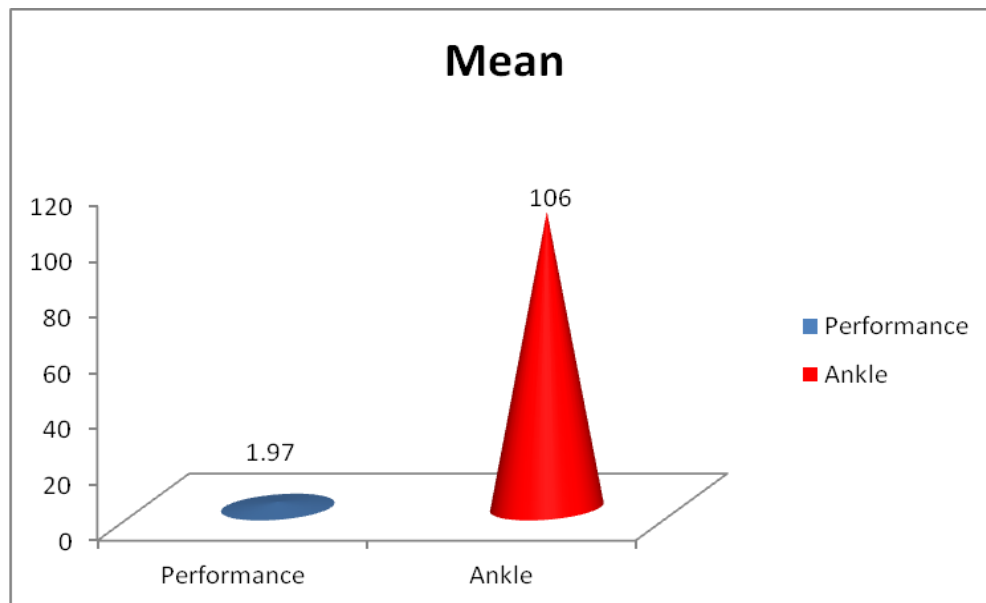
* significant at 0.05level

The table no. 4.2 shows the correlation of effect of ankle joint on the performance of the standing broad jump. The mean score of the Performance and Ankle of standing broad jump, which was

1.97 and 79.1 respectively and standard deviation was 19.79 and 7.56 respectively. The value of 'r' is 0.54 which shows positive correlation and significant relationship between performance and Ankle of standing broad jump.

The table above shows that the r value for performance and ankle of standing broad jump 0.54, whereas the table value for the same is found to be 0.44 at 0.05 level of significant. The calculated value of r being more than the table value, correlation product movement is significant

The Graph no. 4.2 correlation between Performance and Ankle of standing broad jump



The table no. 4.3 Show the correlation between Performance and knee of standing broad jump

Method of teaching	N	Mean	Std. Deviation	Df	Correlation
Performance (M/s)	10	1.97	19.79	18	.23
Knee	10	124.9	14.52		

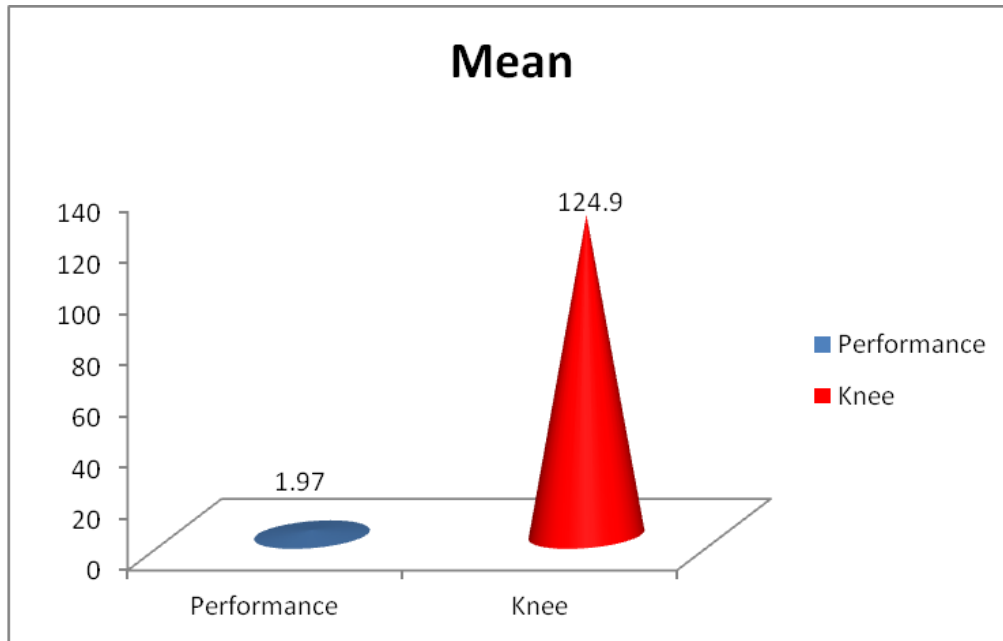
Tabulated value at df 18= 0.44

*** significant at 0.05 level**

The table no. 4.3 shows the correlation of effect of knee joint on the performance of the standing broad jump. The mean score of the Performance and knee of standing broad jump, which was 1.97 and 124.9 respectively and standard deviation was 19.79 and 14.52 respectively. The value of 'r' is 0.23 which shows positive correlation and insignificant relationship between performance and knee of standing broad jump.

The table above shows that the r value for performance and ankle of standing broad jump 0.23, whereas the table value for the same is found to be 0.44 at 0.05 level of significant. The calculated value of r being more than the table value, correlation product movement is insignificant.

The Graph no. 4.3 correlation between Performance and knee of standing broad jump



The table no. 4.4 Show the correlation between Performance and hip of standing broad jump

Method of teaching	N	Mean	Std. Deviation	Df	Correlation
Performance (M/s)	10	1.97	19.79	18	0.58
Hip	10	106	9.96		

Tabulated value at df 18= 0.44

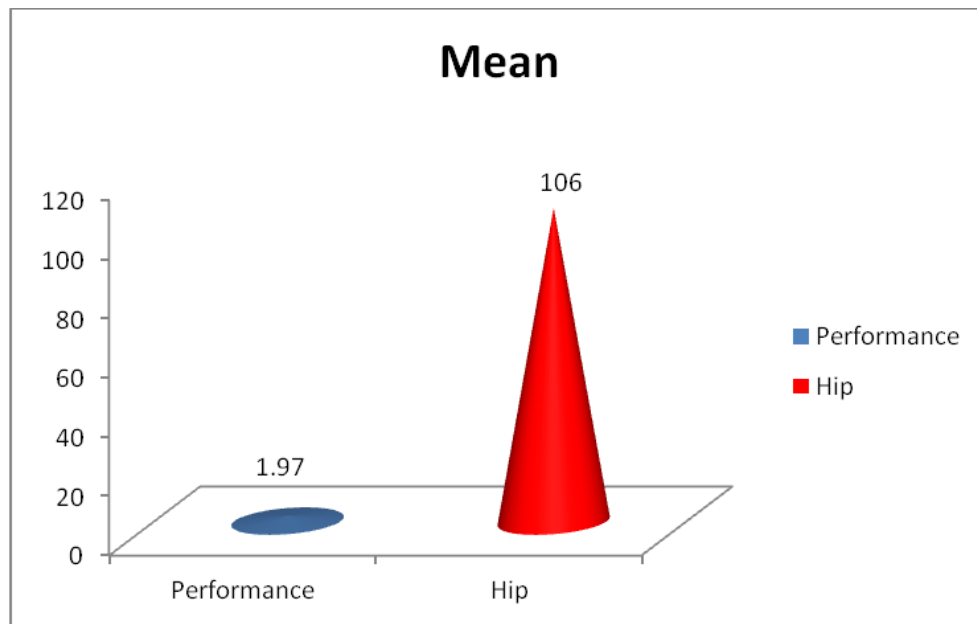
*** significant at 0.05 level**

The table no. 4.4 shows the correlation of effect of hip joint on the performance of the standing broad jump. The mean score of the Performance and hip of standing broad jump, which was 1.97 and 106 respectively and standard deviation was 19.79 and 9.96 respectively. The value of 'r' is

0.58 which shows positive correlation and significant relationship between performance and hip of standing broad jump.

The table above shows that the r value for performance and hip of standing broad jump 0.58, whereas the table value for the same is found to be 0.44 at 0.05 level of significant. The calculated value of r being more than the table value, correlation product movement is significant.

The Graph no. 4.4 correlation between Performance and hip of standing broad jump



The table no. 4.5 Show the correlation between Performance and shoulder of standing broad jump

Method of teaching	N	Mean	Std. Deviation	Df	Correlation
Performance (M/s)	10	1.97	19.79	18	0.24
Shoulder	10	54.1	9.14		

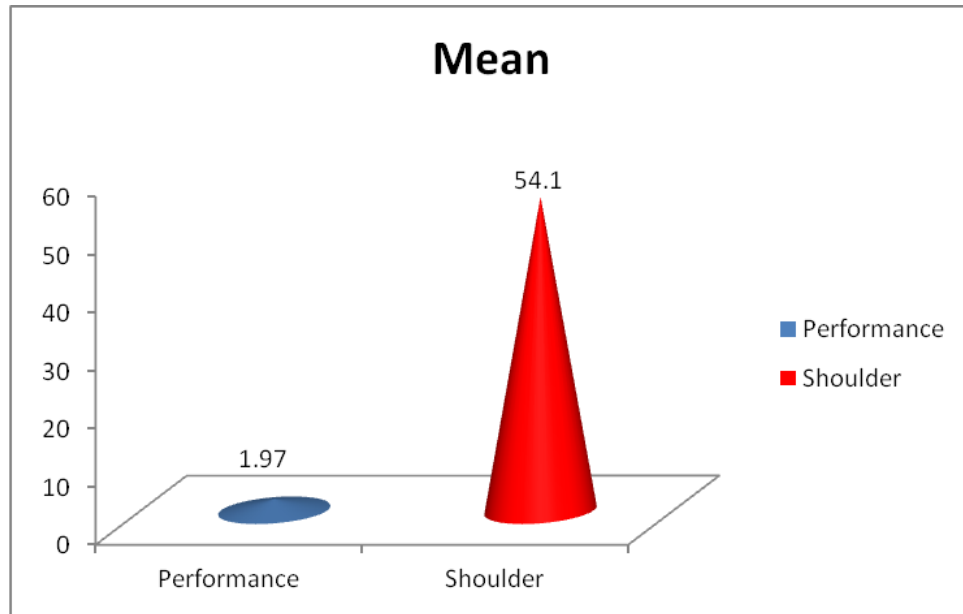
Tabulated value at df 18= 0.44

*** significant at 0.05 level**

The table no. 4.5 shows the correlation of effect of shoulder joint on the performance of the standing broad jump. The mean score of the Performance and shoulder of standing broad jump, which was 1.97 and 54.1 respectively and standard deviation was 19.79 and 9.14 respectively. The value of 'r' is 0.44 which shows positive correlation and insignificant relationship between performance and shoulder of standing broad jump.

The table above shows that the r value for performance and ankle of standing broad jump 0.24, whereas the table value for the same is found to be 0.44 at 0.05 level of significant. The calculated value of r being more than the table value, correlation product movement is insignificant.

The Graph no. 4.5 correlation between Performance and shoulder of standing broad jump



The table no. 4.6 Show the correlation between Performance and elbow of standing broad jump

Method of teaching	N	Mean	Std. Deviation	Df	Correlation
Performance (M/s)	10	1.97	19.79	18	0.11
Elbow	10	163.8	9.22		

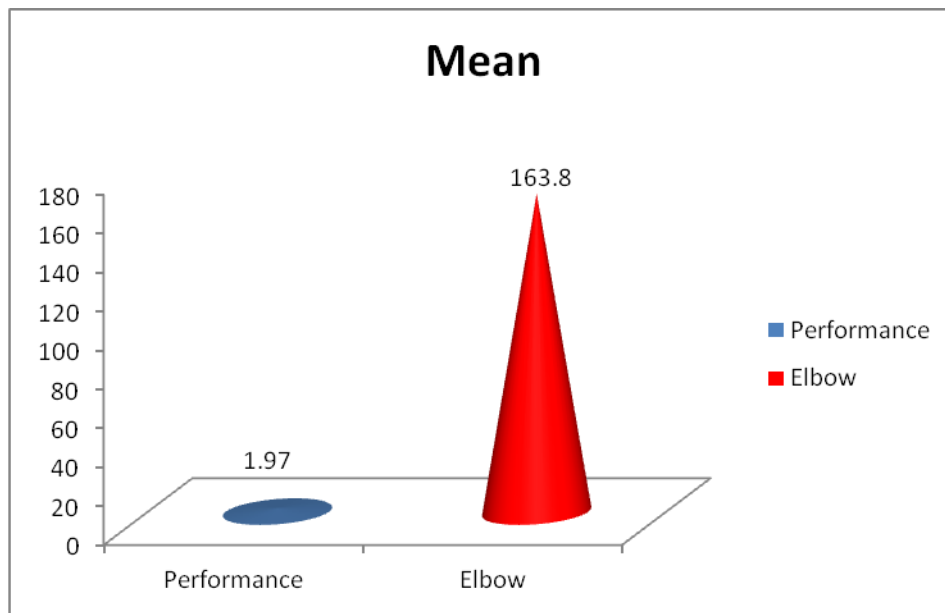
Tabulated value at df 18= 0.44

*** significant at 0.05 level**

The table no. 4.6 shows the correlation of effect of elbow joint on the performance of the standing broad jump. The mean score of the Performance and elbow of standing broad jump, which was 1.97 and 163.8 respectively and standard deviation was 19.79 and 9.22 respectively. The value of 'r' is 0.11 which shows positive correlation and insignificant relationship between performance and elbow of standing broad jump.

The table above shows that the r value for performance and elbow of standing broad jump 0.11, where was the table value for the same is found to be 0.44 at 0.05 level of significant. The calculated value of r being more than the table value, correlation product movement is insignificant.

The Graph no. 4.6 correlation between Performance and elbow of standing broad jump



The table no. 4.7 Show the correlation between Performance and neck of standing broad jump

Method of teaching	N	Mean	Std. Deviation	Df	Correlation
Performance (M/s)	10	1.97	19.79	18	0.24
Neck	10	133.6	15.54		

Tabulated value at df 18= 0.44

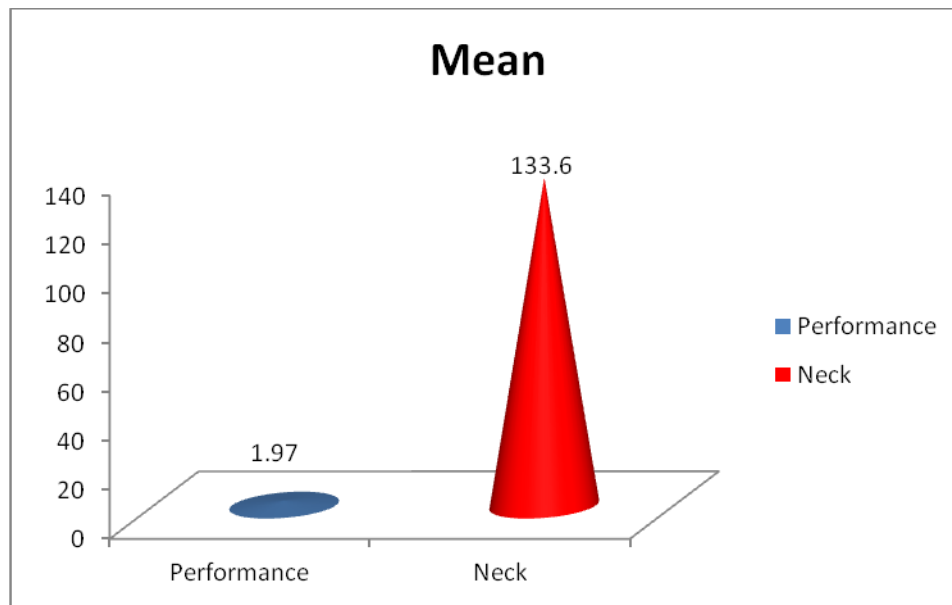
*** significant at 0.05 level**

The table no. 4.7 shows the correlation of effect of neck joint on the performance of the standing broad jump. The mean score of the Performance and Ankle of standing broad jump, which was 1.97 and 133.6 respectively and standard deviation was 19.79 and 15.54 respectively. The value

of 'r' is 0.44 which shows positive correlation and insignificant relationship between performance and neck of standing broad jump.

The table above shows that the r value for performance and neck of standing broad jump 0.24, where was the table value for the same is found to be 0.44 at 0.05 level of significant. The calculated value of r being more than the table value, correlation product movement is insignificant.

The Graph no. 4.7 correlation between Performance and neck of standing broad jump



4.1 Discussion

The findings mean score of the Performance and Ankle of standing broad jump, which was 1.97 and 79.1 respectively, as well as mean score of the Performance and knee of standing broad jump, which was 1.97 and 124.9 respectively, as well as mean score of the Performance and hip of standing broad jump which was 1.97 and 106 respectively, as well as mean score of the Performance and shoulder of standing broad jump which was 1.97 and 54.1 respectively, as well as mean score of the Performance and elbow of standing broad jump, which was 1.97 and 163.8 respectively well as mean score of the Performance and Ankle of standing broad jump, which was 1.97 and 133.6 respectively.

The Stance Phase of Standing Broad jump only analyzes in this case. After collecting the data through photographic method and all selected joint angles calculated through the software named Kinovea after that Pearson product moment correlation was applied to find out the relationship among various joints during stance phase with jumping performance at table one researcher find out that only ankle and hip joint have a significant relationship on standing broad jump performance during stance phase because the value shown in both case .044 which less than 0.05 which indicate ankle joint angle and hip joint angle play a very important role during stance phase, I same case other joint shown less significant because correlation value is less greater than 0.05.

Chapter V

Summery and Conclusion

Summery

Hypotheses

- There exists significant Performance and Ankle of standing broad jump.
- There exists insignificant Performance and knee of standing broad jump.
- There exists significant Performance and hip of standing broad jump.
- There exists insignificant Performance and shoulder of standing broad jump.
- There exists insignificant Performance and elbow of standing broad jump.
- There exists insignificant Performance and neck of standing broad jump.

The selection of subjects

The subject for this study was 10 male players from Lovely Professional University of different games will be subjects for this present study. The age of the subjects will be 19-28 years.

Tools

Tape measure to measure distance jumped, the starting line marked the clearly. Standing broad jump landing pit are also available. Friction able surface for takeoff, and soft landing area required. Digital camera.

5.1 Conclusion

The relationship among various joints during stance phase with jumping performance at table one researcher find out that only ankle and hip joint have a significant relationship on standing broad jump performance during stance phase because the value shown in both case .044 which less than 0.05 which indicate ankle joint angle and hip joint angle play a very important role during stance phase, I same case other joint shown less significant because correlation value is less greater than 0.05.

5.2 Suggestions and recommendations

The present investigation was conducted on sports player of university to determine the effect of stance on various joint angles and performance of standing broad jump. The finding of this study would be helpful and provide a direction for future researcher in the field of Biomechanics as related to sports and games, following suggestion are being forward for future research.

1. The similar study can be conducted on male subjects.
2. The study can be conducted on Lovely professional university.
3. The similar study can be conducted on different age groups.
4. The similar study can be conducted by increasing number of subjects.

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