



A Peer Reviewed Research Journal

March 2022 Volume- 9, Issue-1 (Conference Special Issue)

**SVKM's Narsee Monjee College of Commerce and Economics.
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Nav Manthan

A Double Blind Peer Reviewed Annual Research Journal

Volume - 9, Issue – 1, March 2022 (Conference Special Issue)

Editorial

Nav Manthan is an annual peer reviewed interdisciplinary journal and ascends a maiden flight across the globe as an academic Journal, distinctive in its experimental area. This is inclusive of a broad spectrum of leading schools of thought. It is independent of its kind that inspires up-to-date research endeavour from research territory, deliberation, and latest nuances in the field of Economics, Psychology, Law, Financial Institution and other field of academics. We encourage all categories of learners and learned from different areas for a cross cultural exploration and subsequent innovation of subjects concerned.

We express our sincere gratitude to all the renowned contributors for this special issue who all had participated and presented papers in the International Conference on ‘Recent Techniques and Innovation in Sports, organised by IQAC and Research Committee of SVKM’s Narsee Monjee College of Commerce & Economics (Autonomous) held on 18th and 19th February, 2022.

There were seven speakers from around the globe and all had spoken on various aspects of innovations in the field of sports and sports related education. The basic objective of the conference was to develop a new thought process in the field of Sports and Physical Education. We would appreciate your worthy inputs for taking Nav Manthan to greater heights.

Guidelines for Authors

‘Nav Manthan’ is a national level interdisciplinary double blind peer review journal focusing on research articles in the field of commerce, accountancy, management, economics, law, social sciences and humanities.

The research article in only of the original research work will be published. The authors are required to give an undertaking that the work is original and not published or sent for publication elsewhere. The authors are advised to submit their details on a separate page along with the article. The article once sent for Peer Review will not be returned back. The reviewer’s instructions will be sent to the main author to make the necessary amendments in their article. The revised article should be sent back within 15 days to the editor for publication. The Editor reserves the rights of editorial amendments required to be made in the article in order to meet the standard of the journal.

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Aims and objectives of the research
Methodology used
Data and interpretation
Conclusion
References

2) For historical research

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Review of literature
Conclusion
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Once the article is accepted by Peer Reviewer the main author will be informed about its publication along with the necessary instructions, if any.

Nav Manthan

A Peer Review Research Journal

Volume - 9, Issue – 1, March 2022 (Conference Special Issue)

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MUSCLE FIBER TYPE ESTIMATION THROUGH MUSCLE ARCHITECTURE: A MINI REVIEW

Ajay Kumar*¹

Dr. Briendra Jhajharia*²

Abstract:

Muscle architecture refers to the macroscopic arrangement of muscle fibres that influences a muscle's mechanical function. Previous research has shown a relationship between muscle architecture (such as fascicle length, muscle thickness, and pennation angle) and muscle fibre types (e.g. slow twitch fibres and fast twitch fibers). This small review attempts to briefly discuss how muscle architecture has been investigated in the realm of sport/exercise performance, as well as how various muscle fibre types have varied muscle architecture characteristics.

Key Words: Muscle Architecture, PCSA, Pennation Angle, Fascicle Length and Muscle Thickness

Introduction:

The mainly two types of skeletal muscle fibers are fast-twitch and slow-twitch muscle fibers. It's critical to understand the functional distinctions between each kind. Individual muscle fibers make up skeletal muscles; not all muscle fibers are the same. Without them, movement and exercise programmes would be incomplete. Mitochondria and myoglobin are abundant in slow-twitch muscle fibers. They are surrounded by more capillaries than fast-twitch fibers, despite being smaller. Slow-twitch muscle fibers produce less force and produce peak tension more slowly (lower myosin ATPase activity), but they can sustain longer-term contractions, which is important

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for postural control and stability.(Stacey Penny, 2021) Fast-twitch muscle fibers produce more force and do so more quickly, which is vital for power sports. When compared to our slow-twitch fibers, they contain lesser amounts of mitochondria, myoglobin, and capillaries, which means they exhaust faster. Fast-twitch muscle fibers promote short, vigorous activity like sprinting or weightlifting, and slow-twitch muscle fibers assist long-distance endurance exercises like marathon running. (Clark M, Lucett S, McGill E, 2018; Powers SK, 2012)

In order to successfully predict human movement and athletic performance, one of the most significant and dependable critical characteristics is muscle architecture.(Abe et al., 2001; Ema, R., Wakahara, T., Yanaka, T., Kanehisa, H. & Kawakami, 2016; Ericson, M. O., Bratt, A., Nisell, R., Arborelius, U. P. & Ekholm, 1986; Kordi, 2017; Lieber, R. L. & Friden, 2001; Nadzalan et al., 2017; Salimin, 2018) Muscle architecture was originally defined by Gans and De Vries. The macroscopic arrangement of muscle fibres that regulates a muscle's mechanical function is referred as the muscle architecture. Ref. Fig. No.1 & 2. Muscle architecture parameters include physiological cross-sectional area (PCSA), Pennation angle (PA), Fiber Length/ Fascicle Length (FL), and Muscle Thickness (MT). (Salimin, 2018)

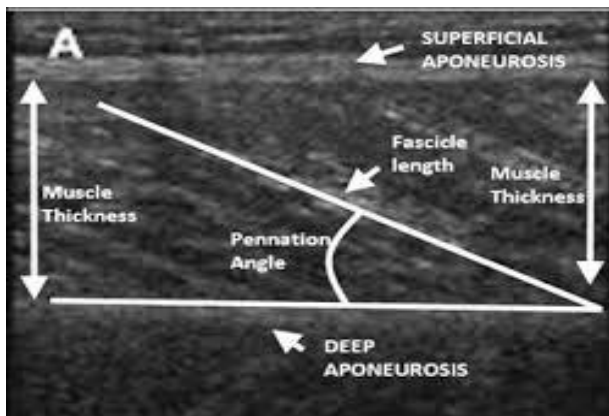


Fig No. 1 Vastus Lateralis muscle architectural parameters.

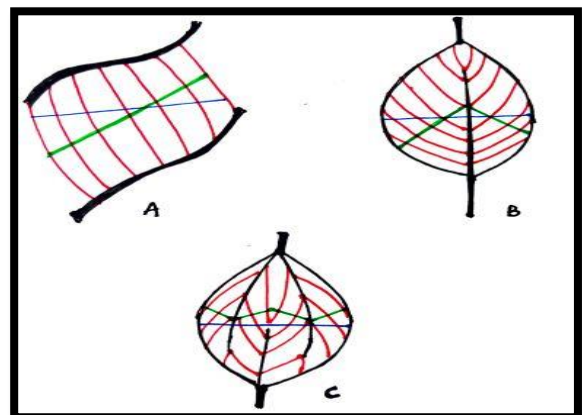


Figure 2 Physiological cross-sectional area (PCSA) and anatomical cross-section area (ACSA).

Physiological cross-sectional area is the area of a muscle's cross section taken perpendicular to its fibers, which is usually the greatest point on the muscle's cross section. "The muscle cross-sectional area (blue line in figure 2, also known as anatomical cross-section area, or ACSA) does not accurately represent the number of muscle fibers in the muscle. A better estimate is provided by the total area of the cross-sections perpendicular to the muscle fibers (green lines in figure 2). This measure is known as the physiological cross-sectional area (PCSA), and is commonly calculated and defined by the following formula, developed in 1975 by Alexander and Vernon."(Maganaris C.N., 2000; Narici M.V., Landoni L., 1992; R. McN. Alexander, 1975) **Physiological Cross-Sectional Area** = $\frac{\text{Muscle Volume}}{\text{Muscle Fiber Length}}$

Pennation angle is defined as the angle between a fascicle's orientation and the tendon axis.(Salimin, 2018) Muscle fiber length is defined as the distance from the origin of the most proximal muscle fibers to the insertion of the most distal muscle fibers.(Kumagai et al., 2000) Muscle thickness is defined as the thickness between two fascias of muscle. In general thickness considered as the main factor for determining muscle size. (Abe et al., 2001) Muscle thickness, muscle volume, pennation angle, and fascicle length are all tightly correlated to maximal muscle strength and power.(Kumagai et al., 2000; Lee et al., 2021; Salimin, 2018)

Muscle Architecture Relationship with Fiber Types:

Scientific studies on muscular architecture are currently trending in this time. Various architectural variables and their relationship with sports are briefly described. Muscle force is directly related to physiological cross-sectional area. Muscle velocity is inversely related to the length of the muscle fibers. Sprinters have longer fascicles than distance runners, and this is reflected in their leg muscle length. Sprinters' leg muscles have a longer fascicle length (vastus lateralis) and a smaller pennation angle than the general population. Greater pennation angle permits a greater quantity of contractile tissue to bind to a given piece of tendon, or aponeurosis, thus increasing the physiological cross-sectional area of a muscle.(Blazevich AJ, Coleman DR, Horne S, 2009; K Albracht , A Arampatzis, 2008; M M Bamman, B R Newcomer, D E Larson-Meyer, R L Weinsier, 2000)

The increment in pennation angle will causes a cross sectional area of muscle to have more number of fibers. This will therefore boost the muscular ability to produce more force.

(Manal K, Roberts DP, 2006) discovered pennation angle to be linked with muscle thickness and improvement in strength. However, an increment of pennation angle with constant cross-sectional area has been reported to cause reduction of strength (Ikegawa S, Funato K, Tsunoda N, Kanehisa H, 2008). This condition was assumed to be influenced by the angle of pull of the fibers that is indirect to the draw of the muscle in total, and thus cause the pull of the muscle in total lowered by the cosine of the pennation angle.

Fascicle length is the distance of fascicle from aponeurosis to another aponeurosis. Mathematically, it is a product of fascicle thickness and pennation angle. Fascicle length will be increased with the increment of muscle thickness and decrement of pennation angle. A difference in muscle thickness in the leg muscles (vastus lateralis, gastrocnemius medialis and lateralis) is a significant element in distinguishing sprinters from long distance runners. (Salimin, 2018)

(Earp, Jacob E; Kraemer, William J; Newton, Robert U; Comstock, Brett A; Fragala, 2014) in contrast to (Abe, T., Kumagai, K. & Brechue, 2000; Kumagai et al., 2000) investigations, observed that greater muscle thickness and pennation, as well as shorter fascicles, were favourable for leaping ability at higher pre-stretch loads. These findings revealed that more pennation and shorter fascicles were linked to improved leaping performance at higher pre-stretch loads, highlighting the importance of training specialisation.

According to (Earp, Jacob E; Kraemer, William J; Newton, Robert U; Comstock, Brett A; Fragala, 2014; Nadzalan et al., 2017) lunge performance improved with larger muscle thickness and pennation angle when determined by 1RM score. These disparate results showed that muscle architecture varies depending on the individual's training and the exercise or skill performed.

Conclusion:

Based on the results of various prior investigations, it can be determined that muscle architecture is an area that should be investigated more in the future. This research will be valuable because it will give a better knowledge of the relationship between muscle architecture

and performance, as well as the importance of differentiating muscle fiber on the basis of muscle architectural parameters.

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RELATIONSHIP BETWEEN QUADRICEPS MUSCLE FIBER ARCHITECTURE AND LEG EXTENSION PERFORMANCE

Ajay Kumar*¹

Dr. Briendra Jhajharia*²

Abstract :

The purpose of this research was to ascertain the relationship between the architectures of the lower body muscles and leg extension performance. Thirty recreationally active, untrained males (mean age: 17±1.25 years) were recruited and participated in two testing sessions: anthropometrics and muscle architecture, and one-repetition maximum (RM) leg extension test. B-mode ultrasonography was used to assess muscle thickness, pennation angle, and fascicle length in the vastus lateralis (VL), vastus medialis (VM), and rectus femoris (RF). The 1RM leg extension performance was estimated using multiple-RM leg extension testing. The relationship between lower body muscle architectures and leg extension performance was studied using correlation analysis. Overall, leg extension performance was positively correlated with muscle thickness and fascicle length of all muscles. Pennation angle, on the other hand, was shown to be inversely associated to leg extension performance. The results of this research suggested that having a thicker, longer fascicle length, and a lower pennation angle of the lower body quadriceps muscle is important for improving leg extension performance, which is one of the most specific motions in lower body strength development and enhanced performance.

Keywords: Muscle Architecture, Vastus Laterialis, Pennation Angle, Fascicle Length, Muscle Thickness, Ultrasound

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Authors' Contribution: **A** – Study design; **B** – Data collection; **C** – Statistical analysis; **D** – Manuscript Preparation; **E** – Funds Collection

Introduction:

In layman's terms, the quadriceps is engaged anytime you straighten a flexed knee. They assist you with your daily activities, such as getting up from a chair, walking, climbing stairs, and squatting. Whenever you kick a ball, run, get up, or do any other activity that requires you to straighten your legs at the knee joint, you extend your knee. The quadriceps is heavily engaged heavily while walking or running downhill. They are used in sports like basketball, football, and handball, as well as cycling etc.

The human body's most voluminous muscle is the quadriceps femoris. The quadriceps femoris is a hip flexor and a knee extensor that is found in the lower leg. It is made up of four separate muscles: three vastus muscles and one rectus femoris (hamstring muscle). They make up the majority of the thigh's mass, and collectively, they are one of the body's most strong muscles. Quadriceps femoris is located in anterior compartment of thigh. The four muscles of quadriceps group are Rectus Femoris, Vastus Medialis, Vastus Lateralis and Vastus Intermedius. **(Lucinda Hampton, 2021)**. Muscle architecture was originally defined by Gans and De Vries. The macroscopic arrangement of muscle fibres that regulates a muscle's mechanical function is referred as the muscle architecture. Ref. Fig. No 1 Muscle architecture parameters include physiological cross-sectional area (PCSA), Pennation angle (PA), Fiber Length/ Fascicle Length (FL), and Muscle Thickness (MT). **(Salimin, 2018)**

Muscle Architectural Parameters:

Physiological cross-sectional area is the area of the cross section of a muscle perpendicular to its fibers, generally at its largest point.**(Brughelli et al., 2010)** Pennation angle is defined as the angle between a fascicle's orientation and the tendon axis.**(Salimin, 2018)** Muscle fiber length is defined as the distance from the origin of the most proximal muscle fibers to the insertion of the most distal muscle fibers.**(Kumagai et al., 2000)** Muscle thickness is defined as the thickness between two fascias of muscle. In general thickness considered as the main factor for determining muscle size. **(Abe et al., 2001)**

Scientific works on muscular architecture are presently trending in this time. Various architectural variables and their relationship with sports are briefly explained.

Muscle force is directly related to physiological cross-sectional area. Muscle velocity is inversely related to the length of the muscle fibers. Sprinters have longer fascicles than distance runners, and this is reflected in their leg muscle length. Sprinters' leg muscles have a longer fascicle length (vastus lateralis) and a smaller pennation angle than the general population. Greater pennation angle permits a greater quantity of contractile tissue to bind to a given piece of tendon, or aponeurosis, thus increasing the physiological cross-sectional area of a muscle. **(Blazevich AJ, Coleman DR, Horne S, 2009; K Albracht , A Arampatzis, 2008; M M Bamman, B R Newcomer, D E Larson-Meyer, R L Weinsier, 2000)** The increment in pennation angle will causes a cross sectional area of muscle to have more number of fibers. This will therefore boost the muscular ability to produce more force. **(Manal K, Roberts DP, 2006)** discovered pennation angle to be linked with muscle thickness and improvement in strength. However, a increment of pennation angle with constant cross-sectional area has been reported to cause reduction of strength **(Ikegawa S, Funato K, Tsunoda N, Kanehisa H, 2008)**. This condition was assumed to be influenced by the angle of pull of the fibers that is indirect to the draw of the muscle in total, and thus cause the pull of the muscle in total lowered by the cosine of the pennation angle. Fascicle length is the distance of fascicle from aponeurosis to another aponeurosis. Mathematically, it is a product of fascicle thickness and pennation angle. Fascicle length will be increased with the increment of muscle thickness and decrement of pennation angle. A difference in muscle thickness in the leg muscles (vastus lateralis, gastrocnemius medialis and lateralis) is a significant element in distinguishing sprinters from long distance runners. **(Salimin, 2018)**

Muscle architecture has been correlated to running, squatting, lunging and jumping ability in a variety of earlier studies. **(Abe et al., 2001; Kumagai et al., 2000; Salimin, 2018)** The leg extension has been shown to activate thigh muscles especially quadriceps. Leg extensions are usually performed on a lever machine. The rectus femoris and vastus muscles in the front of the thigh are primarily targeted by this exercise. Leg extension is a strength training exercise that is used to improve lower body strength, vertical jump and muscle definition. Leg extension improves squat technique by strengthening and stabilising the quadriceps muscle and knee.

In technical terms, leg extension is "open chain kinetic" exercise, as opposed to a "closed chain kinetic" exercise like a lunges or squat. The difference is that in the squat, the body part you're working on is anchored (feet on the ground), whereas in the leg extension,

you're moving the padded bar, which means your legs aren't stationary as you work, and thus the chain of movement is open.(Bączkiewicz D, Kręcis K, 2019)

The concept of specificity in training has received considerable mention and attention over the past decade.(Fleck, S. J., & Kraemer, 2014) Most movements in sports involve an athlete jumping in air vertically or horizontally and executing skills. To better train the body to become functional in various directions, lunge extension is suggested to be included in the training program.(Sale, 1988; Tippett, S. R., 1995)

This study examines the relationship between leg extension performance of dominating leg and muscle fiber, muscle thickness, fascicle length and pennation angle of dominating leg vastus lateralis (VL), vastus medialis (VM) and rectus femoris (RF).

Material and Methods:

Selection of Subject:

In this work of investigation a total sample comprised of 30 untrained male studying in schools of Gwalior, Madhya Pradesh was considered as sample for present investigation. Purposive sampling technique was employed for selecting sample. The selected subjects' age ranged between 13 to 19 years. Required data was collected after taking consent of concerned subject and parents of selected subject. This study was approved (File No-Academic/PhD/384/964) by Departmental Research Committee (DRC) of Lakshmi Bai National Institute of Physical Education, Gwalior, M.P. India.

1 RM Leg Extension Test:

The subjects performed a quick warm-up with a load that permitted them to complete at least 8 repetitions. The participant was instructed to sit on a leg extension machine. Subject was instructed to place his dominant leg under the pad and his hands on the side bars. This was the starting point for the exercise. The subject was instructed to extend his leg to its utmost extent while exhaling the air. In this contracted (knee extended) position, pause for a second. As the individual inhales, return the weight to its original place. Leg extensions are performed

until the subject is unable to continue. If the number of successful leg extensions reaches eight, the athlete rests for 10 minutes, the assistant increases the resistance by 10%, and the athlete repeats the test until the subject fails to complete one repetition. (Baechele TR, 2008; Clark M, Lucett S, McGill E, 2018; Haff, Greg, Triplett, 2016) The one repetitive maximum was noted down by the assistant as maximum strength score.

Determination of Muscle Architectural Parameters

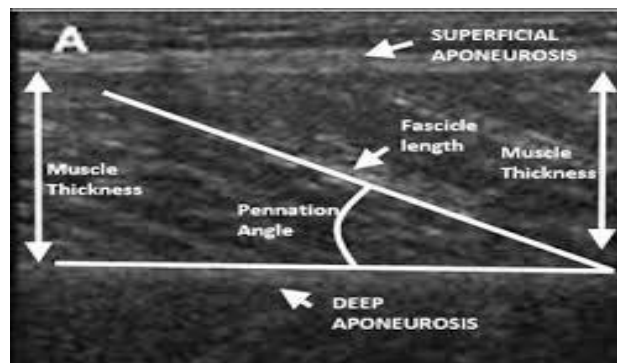


Fig No. 1 Vastus Lateralis muscle architectural parameters.

Before collecting ultrasound images, participants reported to the laboratory and laid supine for 15 minutes to allow fluid shifts to occur. Following that, non-invasive skeletal muscle ultrasound images using B-Mode ultra sonography (Wipro Ge Voluson E) of the quadriceps muscles were obtained. To improve spatial resolution, a 12 MHz linear probe scanning head was coated with water soluble transmission gel and positioned on the skin's surface to create acoustic contact without disturbing the dermal layer to gather the image. All measurements were collected on the dominant leg by the same technician. For each muscle in all individuals, the anatomical position for all ultrasound measurements was standardized. Briefly, Pennation angle (PA) was defined as the angle at which muscle fibre fascicles inserted into the deep aponeurosis. The length of the fascicular path (FL) between the insertions into the superficial and deep aponeurosis was quantified, and the missing component of the fascicle was calculated by extrapolating linearly the fascicular path and the aponeurosis where the fascicular path went beyond the obtained picture. Muscle thickness (MT) was determined by measuring the distance between the subcutaneous adipose tissue and the intermuscular contact. The average of three successive frames was calculated. Repeated scanning of muscle thickness, pennation angle, and fascicle length (Ref. Fig No. 1) measurements yielded intraclass correlation values varying from 0.9 to 0.996 ($p < 0.001$). (Nadzalan et al., 2017)

Muscle	Measurement Site
VL	Midpoint of total length between the greater trochanter and lateral epicondyle of femur on the line parallel to the RF line passing through the lateral border of patella
VM	Midpoint of total length between the greater trochanter and lateral epicondyle of femur on the line parallel to the RF line passing through the medial condyle of femur
RF	Midpoint of total length between greater trochanter and lateral epicondyle of femur on the line connecting the anterior superior iliac spine and center of patella

Statistical Analysis:

Pearson Correlation was performed to determine the relationship between muscle architecture of dominating leg and the 1RM dominating leg extension performance. Statistical significance was considered at an α -level of $p < 0.05$. The statistical analyses were performed using SPSS version 20. In addition, magnitude of effect for the correlations was based on the following scale: trivial <0.10 ; small $0.10-0.29$; moderate $<0.30-0.49$; large $<0.50-0.69$; very large $<0.70-0.89$; and nearly perfect >0.9 . (Hopkins, 2000)

Results:

Table No. 1 Descriptive statistics of physical characteristics of selected subjects.

Age (years)	Body Mass (kilogram)	Height (cm)
17±1.25	66±5.75	171.7±6.20

Table No. 2 Descriptive statistics of RF, VL, VM muscle architecture of selected subjects.

Muscle	Muscle Architecture	Mean	Std. Dev.
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Rectus Femoris	Pennation Angle(⁰)	12.35	1.27
	Fascicle Length(cm)	8.50	0.77
	Muscle Thickness(cm)	1.72	0.90
Vastus Lateralis	Pennation Angle(⁰)	17.42	1.44
	Fascicle Length(cm)	8.66	0.74
	Muscle Thickness(cm)	2.34	0.06
Vastus Medialis	Pennation Angle(⁰)	16.78	0.95
	Fascicle Length(cm)	8.98	0.70
	Muscle Thickness(cm)	2.62	0.07

Table No. 3 Descriptive statistics of 1 RM Leg extension score of selected subjects.

	Minimum	Maximum	Mean	Std. Dev.
1 RM Leg Extension Score(kg)	30	53	43.16	6.75

Table No. 4 Correlation analysis of RF, VL, VM muscle architectures and 1RM leg extension

Muscle	Muscle Architecture	1 RM Leg extension
Rectus Femoris	Pennation Angle	-0.705*
	Fascicle Length	0.671*
	Muscle Thickness	0.688*
Vastus Lateralis	Pennation Angle	-0.771*
	Fascicle Length	0.711*
	Muscle Thickness	0.695*
Vastus Medialis	Pennation Angle	-0.588
	Fascicle Length	0.300
	Muscle Thickness	0.527

Table No. 1 depicts the descriptive statistics of the research participants' age, weight, and height. The selected subject's age mean and standard deviation were 17 and 1.25, respectively. The selected subject's body mass mean was 66 kg, and the standard deviation was 5.75 kg. The selected subject's mean height was 171 cm, and the standard deviation was 6.20 cm.

The descriptive statistics of muscle architecture, including the Pennation Angle, Fascicle Length, and Muscle Thickness of the Rectus Femoris (RF), Vastus Lateralis (VL), and Vastus Medialis (VM), are shown in Table No. 2. The mean and standard deviation of pennation angle for Rectus Femoris (RF), Vastus Lateralis (VL), and Vastus Medialis (VM) were 12.35 ± 1.27 , 17.42 ± 1.44 , and 16.78 ± 0.95 , respectively. The mean and standard deviation of fascicle length for RF, VL, and VM were 8.50 ± 0.77 , 8.66 ± 0.74 , and 8.98 ± 0.70 , respectively. The mean and standard deviation of muscle thickness for RF, VL, and VM were 1.72 ± 0.90 , 2.34 ± 0.06 , and 2.62 ± 0.07 , respectively. Table No. 3 illustrates descriptive data for 1RM single leg extension performance. The 1 RM single leg extension test had a mean and standard deviation of 43.16 and 6.75 respectively.

The correlation analysis between muscle architecture and 1RM score is shown in Table 4. There was a significant negative correlation between 1RM and the Pennation Angle of RF, VL and VM ($p < 0.05$). There was a significant positive correlation between 1RM and the fascicle length of RF, VL and VM ($p < 0.05$). There was a significant positive correlation between 1RM and muscle thickness of RF, VL and VM ($p < 0.05$).

Discussion on Findings:

This study has shown that there are relationships between the RF, VL and VM muscle architectures and leg extension performance. Fascicle Length and Muscle Thickness were shown to be positively correlated with leg extension performance. However, Pennation Angle was found to be negatively correlates performance of leg extension.

The increment in Pennation Angle will causes a cross sectional area of muscle to have more number of fibers. This will therefore boost the muscular ability to produce more force. (Manal K, Roberts DP, 2006) discovered Pennation Angle to be linked with muscle thickness and improvement in strength. However, a increment of pennation angle with constant cross-sectional area has been reported to cause reduction of strength (Ikegawa S, Funato K, Tsunoda N, Kanehisa H, 2008). This condition was assumed to be influenced by the angle of pull of the fibers that is indirect to the draw of the muscle in total, and thus cause the pull of the muscle in total lowered by the cosine of the pennation angle. As a result, this research found

a negative connection between pennation angle and 1 RM leg extension performance, indicating that strength increases as pennation angle decreases.

Fascicle length is the distance of fascicle from aponeurosis to another aponeurosis. Mathematically, it is a product of fascicle thickness and pennation angle. Fascicle length will be increased with the increment of muscle thickness and decrement of pennation angle. **(Salimin, 2018)** reported a difference in muscle thickness in the leg muscles (vastus lateralis, gastrocnemius medialis and lateralis) is a significant element in distinguishing sprinters from long distance runners. As a result, this research revealed a positive correlation between 1 RM leg extension performance and fascicle length, as well as a positive correlation between 1 RM leg extension performance and muscle thickness.

(Earp, Jacob E; Kraemer, William J; Newton, Robert U; Comstock, Brett A; Fragala, 2014) in contrast to **(Abe, T., Kumagai, K. & Brechue, 2000; Kumagai et al., 2000)** investigations, observed that greater muscle thickness and pennation, as well as shorter fascicles, were favourable for leaping ability at higher pre-stretch loads. These findings revealed that more pennation and shorter fascicles were linked to improved leaping performance at higher pre-stretch loads, highlighting the importance of training specialisation.

According to **(Earp, Jacob E; Kraemer, William J; Newton, Robert U; Comstock, Brett A; Fragala, 2014; Nadzalan et al., 2017)** lunge performance improved with larger muscle thickness and pennation angle when determined by 1RM score. These disparate results showed that muscle architecture varies depending on the individual's training and the exercise or skill performed.

Conclusion:

Overall, relationships existed between muscle architecture and 1RM leg extension performance. Findings suggested the significance for having thicker, longer fascicle length and less pennation angle of lower body muscle in boosting leg extension performances. Training might be structured to produce specific changes in muscle architecture to allow for greater performance in this movement which is one of the most performed movements in sport.

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THE INSPIRATIONAL SPIRIT OF INDIAN PARALYMPIANS OF THE 21ST CENTURY

***Dr. Archana Shete**

Abstract:

The participation of Indians in Paralympic Games rose dramatically in the 21st century. The sporting spirit of Indian Paralympians in the 21st century looks very different to that of the earlier period. However, the performance and achievements of Indian paralympians in Tokyo Paralympics, 2020 has set a new precedent for the involvement in Paralympic Games. With a best over medal tally from Tokyo Paralympics, Indian Paralympians lifted India's spirit with impressive performances. The main aim of the paper is to gain the knowledge about the status of Indian athletes' participation, performances and achievements in Paralympic Games of 21st century. It has been stated from the conclusions that there has been progress in the participation as well as performance level and achievements of Indian Paralympians in Paralympic Games of 21st Century.

Keywords: Indian, Paralympic Games, Paralympians, 21st Century

Introduction:

Paralympics are the parallel Games to the Olympics and illustrates how the two movements exist side-by-side. The word "Paralympic" derives from the Greek preposition "para" (beside or alongside) and the word "Olympic". The Paralympic Games is a major international multi-sport event for athletes with physical, mental and sensorial disabilities. It includes mobility disabilities, amputees, visual disabilities and those with cerebral palsy. The Paralympic Games are held every four years, following the Olympic Games. Paralympic Games are governed by the International Paralympic Committee (IPC). IPC organizes the Summer and Winter Paralympic Games which are the ultimate international competitions for

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world class athletes with a physical disability. Today the Paralympic Games is the biggest multi-sport event for disabled athletes in the world. Like the Olympics, the Paralympics attract global sponsors, issue of thousands of media credentials, enforce anti-doping policies and have built infrastructures for the development of disabled athletes.

India in Paralympic Games:

India first participated in Paralympics in 1968 at Tel Aviv, Israel with 10 athletes (8 males and 2 females) and again participated in 1972 Paralympics. After that no Indian athletes participated from 1976 Paralympics to 1980 Paralympics. Then participated in every summer Paralympics. Murlikant Petkar won India's first gold medal in 50 meter freestyle swimming in 1972 Paralympics at Heidelberg, Germany. Again in 1984 Paralympics, Joginder Singh Bedi won silver medal in shotput and bronze medal in discus and javelin throws. In the same Paralympics, Bhimrao Kesarkar won silver medal in Javelin throw. Thus in 1984 Paralympics, India won total 4 medals. India continued to participate in each Paralympic games thereafter, but failed to make an impact till 2004 Summer Paralympics in Athens.

Aim and Objectives of the Study:

The main aim of the paper is to give a brief review about the status of participation, performances and achievements of Indian Paralympians in Paralympic Games of 21st century only.

Methodology:

The data was collected by reference books, official media sources and web based information. The collection of data was relevant of the 21st century from the year 2004 to 2020 Paralympic Games only. The collected data was calibrated for each edition of the Paralympic games 2004 to 2020 in a tabular form of the overall final medals.

Analysis of the Data:

Total 98 Indian Paralympians participated in different sports in Paralympic games of the 21st century at 2004 Athens Paralympics, 2008 Beijing Paralympics, 2012 London Paralympics, 2016 Rio Paralympics and 2020 Tokyo Paralympics.

Table No.1: No. of Participation of Indian Paralympians in the 21st Century

Games	Number of Participation
Athens Paralympics, 2004	10
Beijing Paralympics, 2008	5
London Paralympics, 2012	10
Rio Paralympics, 2016	19
Tokyo Paralympics, 2020	54
Total	98

Table No. 2: Medals in Paralympics Games in the 21st Century

Games	Gold	Silver	Bronze	Total
Athens Paralympics, 2004	1	0	1	2
Beijing Paralympics, 2008	0	0	0	0
London Paralympics, 2012	0	1	0	1
Rio Paralympics, 2016	2	1	1	4
Tokyo Paralympics, 2020	5	8	6	19

Conclusions:

The above mentioned table No. 1 shows that there is a progress in the participation of Indian Paralympians in the 21st century from Athens Paralympics, 2004 to Tokyo Paralympics, 2020. Table No. 2 shows that there is an improvement in the performance of Indian Paralympians in the 21st century. Tokyo Paralympics, 2020 is India's most successful Paralympic season with 5 golds, 8 silvers and 6 bronzes. With a best over medal tally from Tokyo Paralympics, Indian Paralympians lifted India's spirit with impressive performances.

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A CRITICAL ANALYSIS OF COMPETITION LAW IN SPORTS ENTERTAINMENT

***Arti Sharma**

Introduction:

Earlier sports were considered different from business activities, and little attention was paid to their internal affairs. Applicability of competition law/ antitrust law in the field of sports was virtually unknown. However, with the changing of time, sports have been commercialised because of its demand by the people as an entertainment. Because of this commercialization, sports authorities are getting huge amount of revenue by broadcasting rights, Media rights, sponsorships, selling tickets and organizing sports events etc. To regulate the economic activities of these authorities and to avoid the conflict of interest between their monopoly right and consumer welfare, competition law plays very important role in this area. As we have already seen that the purpose of competition law is to preserve the competition process, to promote competition, and to encourage competition in markets so as to optimise efficiency and maximize consumer welfare. Consumer welfare in a competitive market can be achieved by allocating resources most efficiently and making variety of choices available to the consumers. In catena of cases, it has been discussed whether competition law would be applicable in sporting events. However, when it comes to the applicability of competition law in sponsorship agreement this issue is yet to be decided by the court or legislature. In India, Competition Act lays down the scheme that no enterprise shall abuse its dominant position. However, it is to be kept in mind that mere exercising 'dominant position' in the market is not considered as Anti-competitive activities rather abuse of such dominant position is hit by the Act.

This research paper examines how antitrust/ competition law has played an imminent role in shaping the financial operations of the sports industries in India.

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Commercialization Aspects of Sports

Since the inception, sport is essential to human development and now, it also contributes to economic development. According to 'Economic Theory' markets are constituted of two different Parts: Suppliers and Demander. Applying this distinction, two methods can be used for approximating the value of economic activities in sports industry. Either combine the value of output or revenues of all of the producers in the sports market, or combine the total spending of all consumers in the sports market.¹ As we know that, earlier sport was not an area in which excessive economic activities were involved. However, by virtue of the evolution of economic science experts found out new ways for economic evolution and thus a new market was created known as, the sports market. That was the beginning of the commercialization of sport.²

The economic importance of sports has increased by its economic weight, generating from revenue received through sports events, media and sports related services. In UK, the value of sports activities is approximately 1.7% of GDP added of sports activities is estimated to be 1.7 per cent of GDP, with comparable to that of the automotive and food industries.³ Sports have an inherent economic force in itself, and also a latent facilitator for economic development.⁴ According to Professor Carter, the historical conception of sports law was confined into the boundaries of field and participants. Sports were considered as a means of mere entertainment and it had no relation with business.⁵ However, Prof Carter himself agreed in later stages of the research that notwithstanding the historical notion of sports 'is now a business.'⁶ In 1998, first time a magazine was published on sports, assigned a figure of \$350 billion to what the editor characterized as the gross national sports product.⁷

¹ Brad R. Humphreys, 'The Size and Scope of the Sports Industry in the United States' (August 2008) IASE/NAASE Working Paper Series, No. 08-11,

² Marios Papaloukas, 'Policy, European Sports Law and Lex Sportiva' (27-29 November 2008) Presented at the 14th World I.A.S.L. Congress Athens

³ R. Lalka ka (1999), "The Role of Sporting Goods Manufacture in Economic Development ", study prepared for the United Nations Development Programme, presented at the International Olympic Forum for Development, June 1999, p. 12

⁴ Joanna Dochevska, 'Research "Sport values in Europe" "Sport values for better Europe"' Bulgarian sports development association. A physically active population is a healthier population, improving the productivity of the workforce and increasing economic output. Sport and physical activity also provide one of the most cost effective forms of preventive medicine, with the potential to cut health-care costs dramatically.

⁵ Why Sports?, Nation, Aug. 10, 1998, available at 1998 WL 11637697

⁶ Burlette Carter, Introduction: What Makes a "Field" a Field?, (1999)1 Va. J. Sports & Law 234, 245

⁷ Why Sports(n 43)

It is very much evident from different sources that sports have emerged as one of the biggest industry in the world comprising 3% of the world trade. If we see Chinese economy, it was double benefited from the Beijing Olympics than that of the soft power and diplomacy in last two decades.⁸ It has been found out through data that out of the most recent sports events, TV viewership of Cricket World Cup 2007 was highest (113 mn) followed by Olympics 2004 (65 mn) and FIFA World Cup 2006 (39 mn). The latest entrant to the sports leagues was the WSH league. It attracted the cumulative TV viewership of 10.43 million (Source – TAM, CS 4+). The tennis viewership (Grand slam events) was 42.4 million in 2007 as per KPMG- FICCI report on Media and entertainment industry.⁹

Judicial Pronouncements on applicability of Competition law on Sports Enterprises:

In light of the above stated scheme of the Act, it is pertinent to answer the applicability of the Act to sporting authorities like BCCI. The issue was brought up before the Supreme Court [Hereinafter as ‘SC’] in the case of *Board for Control of Cricket in India*.¹⁰ It was contended by the Board for Control of Cricket in India [Hereinafter as ‘BCCI’] that it is a ‘not-for profit’ society for the promotion of cricket and hence, the activities performed by BCCI is outside the purview of the Act. Further, the commitments of BCCI are not driven by commercial considerations and the revenue obtained is utilized in the game of cricket.¹¹ Reliance was also placed on the case of *Secretary, Ministry of Information and Broadcasting, Government of India and Others v. Cricket Association of Bengal and Others*¹², where the SC declared that sporting authorities like BCCI cannot be treated at par with other profit making organisations and hence, it does not fall within the purview of the definition of an enterprise as given under section 2(h) of the Act.

However, in the BCCI Case, the SC while rejecting the contention of BCCI stated that the activities related to IPL involve huge revenues and fall in the commercial sphere making

⁸ Francis Kuriakose & Deepa Kylasam Iyer, ‘Need for Sports Law in India’

⁹ *Surinder Bermin v BCCI*, (Case No.61/2010) http://www.cci.gov.in/sites/default/files/612010_0.pdf

¹⁰ Sh. Surinder Singh Barmi v. Board For Control Of Cricket in India , Case No. 61 of 2010.

¹¹ id

¹² *Secretary, Ministry of Information and Broadcasting, Government of India and Others v. Cricket Association of Bengal and Others* (1995) 2 SCC 161

them different from the so-called non-profit activities¹³. Hence, the contention of BCCI falls foul on such ground and sporting authorities very well fall within the definition of an enterprise as given in the Act. Hence, the Act is applicable on sporting authorities like BCCI as well. In another case Chess Federation was also considered as an enterprise for the purpose of the Act.¹⁴

Conclusion:

The sporting bodies often face challenges posed by competition law authorities. CCI has clarified the position, time and again, that the commission has jurisdiction to entertain the violation of competition law norms by the governing bodies.

It is interesting to note that while heavy penalty was imposed upon BCCI for abuse of its dominant position, in the similar situation Hockey India got off lightly on the ground that no substantial evidence has been provided that it has abused its dominant position (Hockey India Judgement, 2013). In such a scenario, it is required that the sporting bodies should clearly demarcate between their regulatory and commercial activities. In a country like India, where sports administration is often dominated by venal political interests, such a position would require maturity from the administrators, and freedom to sportsmen to form their own associations to protect their self-interests.¹⁵

¹³ *Id.*

¹⁴ Hemant Sharma & Others v. Union of India and Others, WP (C) 5770/2011

¹⁵ Nihal Zachariah, *Hockey or Hookey? Case Review: Dhanraj Pillai & Ors v. M/S Hockey India (Case No. 732011)* available at <https://lawnk.wordpress.com/2013/07/22/hockey-or-hookey-case-review-dhanraj-pillai-ors-v-ms-hockey-india-case-no-732011/>

A COMPARATIVE STUDY OF VARIOUS FITNESS PARAMETERS ON UNIVERSITY TEACHING AND NON-TEACHING STAFF OF GURU GHASIDAS VISHWAVIDYALAYA (CHHATTISGARH).

***¹ Debabrata Sarkar**

***² Dr. Mahesh Singh Dhapola**

Abstract:

The purpose of the study was to compare the selected health related physical fitness variables between teaching and non-teaching staff in Ghasidas Vishwavidyalaya, Bilaspur (C.G.), India. The total of 545 subjects was taken for the study, consisting of subjects two Hundred fifty-eight (N=258) from teaching staff and two Hundred eighty-seven (N=287) from non-teaching staff. The age groups of the subjects were ranged 25-69 years. Strength dynamometer: i) Grip Strength & ii) Back and Leg Strength test for Strength and sit and reach test for lower back and hamstring flexibility was employed in this study to collect the data. The t test was used to analyse the data for finding the difference between teaching and non-teaching staff in selected fitness parameters. The level of significant was fixed at 0.05. After analysis of data it was found that statistically there was insignificant differences in selected fitness parameters between the teaching and non-teaching staff of Ghasidas Vishwavidyalaya.

Keyword: physical fitness, Strength, flexibility.

Introduction:

Presently a day's kin are more mindful of actual Physical Fitness. Physical Fitness is dynamic quality that permits one to fulfill all necessities in regards to mental and enthusiastic

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solidness, social awareness and adoptability, otherworldly and moral fiber and natural wellbeing reliable with the singular heredity, Physical Fitness has turned into a public concern. Essentially Physical Fitness implies being in great state of being and having the option to work at one's best level. Actual Physical fitness is to the human body what calibrating is to a motor. It empowers us to perform up to our possibilities. Physical Fitness can be depicted as a condition to helps us for better look, lovely feel and give a valiant effort.

Health related actual Physical Fitness incorporates this part of physiological capacity that offers insurance from illnesses coming about because of stationary way of life. It very well may be improved or kept up with through customary program of proactive tasks that clings to the standards of activity. Explicit parts of wellbeing related actual Physical Fitness incorporate muscular strength, power, speed, agility, equilibrium, adaptability and endurance etc. The takeoff from the conventional thought of Physical Fitness accordingly in an unmistakable separation between actual Physical Fitness identified with useful wellbeing and prosperity. There is a developing accentuation on looking great, feeling better and living longer. clear differentiation between physical fitness related to functional health and well-being.

Methodology:

Total Five hundred forty-five (545) teaching staff and non-teaching staff was selected from Ghasidas Vishwavidyalaya, Bilaspur (C.G.) as a subject for the purpose of the study. The subjects two Hundred fifty-eight (N=258) from teaching staff and two Hundred eighty-seven (N=287) from non-teaching staff. The subjects were ranging between 25 to 69 years of age.

Variables:

For teaching and non-teaching staff, only the following fitness parameters were selected: Strength, Flexibility

Statistical Technique Employed:

To determine the significant differences t-test was employed to analyze the data of selected fitness parameters between teaching and non- teaching staff in Guru Ghasidas Vishwavidyalaya and for testing the hypothesis the level of significance was set at 0.05.

Criterion Measures:

To collect the data, Strength dynamometer: i) Grip Strength & ii) Back and Leg Strength test for Strength and sit and reach test for lower back and hamstring flexibility were used to take the performance of the subjects.

Results and Discussion:

Results are given in table-1,

	STAFF	Mean	Std. Deviation	Std. Error Mean
GRIP	TEACHING	23.9883	7.23836	2.95505
	NON-TEACHING	22.6983	8.10559	3.30909

	t	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
					Lower	Upper
GRIP	.291	.777	1.29000	4.43648	-8.59510	11.17510
	.291	.777	1.29000	4.43648	-8.61214	11.19214

Table-1 revealed that there was an insignificant difference in Hand Grip Strength between teaching and non-teaching staff. The obtained Sig. (2-tailed) 0.777 was more than at 0.05 level of significance

Table-2

	STAFF	Mean	Std. Deviation	Std. Error Mean
BACK	TEACHING	63.7900	18.69219	7.63105
	NON-TEACHING	67.5300	21.87774	8.93155

	t	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
					Lower	Upper
BACK	-.318	.757	-3.74000	11.74758	-29.91523	22.43523
	-.318	.757	-3.74000	11.74758	-30.00192	22.52192

Table-2 revealed that there was an insignificant difference in Back Strength between teaching and non-teaching staff. The obtained Sig. (2-tailed) 0.757 was more than at 0.05 level of significance

Table-3

	STAFF	Mean	Std. Deviation	Std. Error Mean
LEG	TEACHING	66.1850	25.03444	10.22027
	NON-TEACHING	71.2933	23.16231	9.45598

	t	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
					Lower	Upper
LEG	-.367	.721	-5.10833	13.92370	-36.13226	25.91560
	-.367	.721	-5.10833	13.92370	-36.15759	25.94092

Table-3 revealed that there was an insignificant difference in Leg Strength between teaching and non-teaching staff. The obtained Sig. (2-tailed) 0.721 was more than at 0.05 level of significance

Table-4

	STAFF	Mean	Std. Deviation	Std. Error Mean
FLEXIBILITY	TEACHING	14.3417	2.25365	.92005
	NON-TEACHING	18.8117	4.79295	1.95671

t		Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
					Lower	Upper
FLEXIBILITY	-2.067	.066	-4.47000	2.16223	-9.28774	.34774
	-2.067	.077	-4.47000	2.16223	-9.56717	.62717

Table-4 revealed that there was an insignificant difference in Flexibility between teaching and non-teaching staff. The obtained Sig. (2-tailed) 0.066 was more than at 0.05 level of significance

Discussion on findings:

On the basis of the data interpretation, result showed that there were insignificant differences in selected fitness parameters between teaching and non-teaching staff of Guru Ghasidas Vishwavidyalaya. The difference may not be seen in both the teaching and non-teaching staff, it may be attributed to the fact that due to the daily life style and the physical activities they performed are quite similar.

Conclusion:

With considering the limitation of the study and the result of the findings, it was concluded that there were no significant differences of selected fitness parameters between teaching and non-teaching staff of Guru Ghasidas Vishwavidyalaya.

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ISOKINETIC ASSESSMENT OF MUSCLE IMBALANCES AND BILATERAL DIFFERENCES BETWEEN THE STRENGTH OF KNEE EXTENSORS AND FLEXORS AMONG BASKETBALL PLAYERS

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Abstract:

The purpose of study was to analyze whether there are any unilateral or bilateral muscular imbalances present in female basketball players. For this study twelve female university level basketball players were selected purposively from Lakshmibai National Institute of Physical Education, their age ranging between 18 to 25 years (reference values included).

Subjects were tested for knee flexion and knee extension as per the role of these movements in basketball game; for every movement measurement of the peak torque production was taken at velocities of 60 deg/sec and 180 deg/sec using HUMAC NORMS System. Subjects were instructed to do proper warm-up and stretching exercises for 12 minutes before the test, for each movement 3 to 5 repetitions were conducted with rests of 15 seconds between sets and 2 minutes between both extremities. When the test started the subject attempted to flex and extent the leg with maximum force.

Mean and standard deviation was used as Descriptive Statistic of study. In order to ascertain significant difference, independent t-test was used to compare means at 0.05 level of significance.

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The finding showed significant bilateral differences in all cases, significant unilateral difference in case of 180 deg/sec and no significant differences in other cases of unilateral comparisons at 0.05 level of significance. Findings also revealed that the bilateral asymmetry and the unilateral ratio fall in category of normal range except bilateral asymmetry at 180 deg/sec which calls for immediate attention. Majorly, one can understand these results by observing playing pattern and dominating movements in basketball.

Keywords: Isokinetic, Peak Torque, Knee flexors, Knee extensors, Unilateral difference and Bilateral difference

1. Introduction

Admittedly, a certain amount of physical activity is considered an important element in health promotion and thus public interest in health enhancing physical activities, including sports, is increasing. Interest in sporting activities has also grown because of a general increase in leisure time and the availability of various forms of recreational and competitive sports.

On the other hand, training and competition in professional sports have intensified with trending modern techniques and new researches. Basketball is not apart from this changing trend. Basketball has gained worldwide popularity, fascinated players and spectators with its dynamic characteristics as a team sport. In this sport, players cover about 4500–5000m during a 40-minute game with a variety of multidirectional movements such as running, dribbling, and shuffling at variable velocities and jumping¹.

The consequent upsurge in sporting activity and the intensity of training has caused a corresponding increase in sports injuries, both from acute and overuse trauma. More specifically, the sport of basketball exposes the athlete to injury as a result of the running, jumping, cutting, pivoting, and explosive movements that occur during acceleration and deceleration. The majority of the musculoskeletal injuries are to the lower extremity. In basketball, knee injuries are the second most common injury, after ankle injury². It involves meniscal injuries, knee ligament injuries, quadriceps tendinitis, hamstring strains, thigh contusions.

Among others, hamstring strains can occur from large eccentric forces. They are often the result of training errors. Excessive quadriceps training to increase vertical jump height and running speed can contribute to a quadriceps-hamstring strength imbalance. The recommended ratio is 3:2 (Charles Bull, R. [1999])³. Large concentric quadriceps forces can lead to hamstring strains. Most often the strain occurs at the proximal origin, but it can occur at the semimembranosus with discomfort along the posterior medial knee capsule.

Generally, these injuries result from a complex interaction of identifiable risks factors at a given point in time. Since many factors, extrinsic or intrinsic by nature, are involved, the prevention of sports injuries is a complex problem, and a continuing challenge to preventive medicine. Intrinsic factors are lower extremity malalignments, leg length discrepancy, muscle weakness or imbalance, decreased flexibility etc. While extrinsic factors involve training errors, environmental mal-conditions, poor equipment etc. In acute sports injuries, extrinsic factors play a major role, while in overuse injuries the reasons are more multifactorial, and interaction between these two categories is common. However, in order to achieve effective injury prevention, it is vital to be able to affect these predisposing risk factors⁴.

Most importantly, the respective sports practice may lead to a bigger request of specific muscles groups, mainly in asymmetric sports. However, this muscle specialization may result in an imbalance of the forces applied and the joint being able to expose the athletes to injuries, which carries major economic damages for the teams. Besides the economic damages, the decline of sports performance is also a consequence of these kinds of injuries and the departure resulting of the same. For these reasons, the evaluation of muscular strength in Quadriceps and Hamstrings muscles assumes a major importance in a sooner perception of this type of imbalances.

The most used method to establish the functional standard and muscular balance is the isokinetic evaluation. This method shows an increasing utilization in sports to identify athletes with a high risk of injuries, allowing to reduce their incidence and recurrence, being also useful to provide a proper rehabilitation after an injury.

The muscular imbalances are one of the predisposing factors most cited in literature about sports injuries. These can be observed through the differences of strength between

agonist/antagonist muscles and the bilateral differences. In knee joint, the relationship among agonist/antagonist used is the ratio of Hamstrings/Quadriceps (RH/Q) (Croisier, J. [2008])⁵.

Although there is a low consensus on normative values for the RH/Q, the value between 50-69% to the angular velocity of 60 deg/s and the value concerning 70-80% to the velocity of 180 deg/s seems to have gained some general acceptance². Furthermore, the existence of Bilateral Differences (BD) between the dominant limb and the non-dominant still remains controversial. However, the asymmetrical character of some modalities makes the bilateral comparison of strength, a good indicator of possible deficits in muscular system. Some authors suggest that BD of strength between 10 to 15% are considered significant asymmetries. A bigger deficit may indicate a muscular imbalance⁶.

In sports to detect the muscular imbalance and to identify a regular adaptation to sports versus a pathological condition, after an injury, is very important, making the studies that aboard this subject quite pertinent. Thereby, the purpose of the present study was to identify the existence of muscular imbalances in the Isokinetic profile of the thigh muscles of professional basketball athletes through the analysis of bilateral and unilateral ratio of flexors and extensors of left and right knees.

2. Methodology:

In order to assess the muscular imbalances and bilateral differences, 12 female basketball players age ranging from 18-25 years (extreme values inclusive), who got selected for the All-India Inter-University Basketball Championship 2019-20 were purposively selected from Lakshmibai National Institute of Physical Education, Gwalior. It was ensured that subjects are healthy and had not acquired injury in recent past. All the subjects voluntarily agreed to cooperate in the testing procedures explained to them in the interest of promotion of the knowledge.

2.1. Instruments:

In order to measure knee flexor/extensor muscular strength, CSMI or Cybex Norm Isokinetics machine and Humac 2009 software was used. This machine facilitates testing at

any given angle and speed for any group of muscle. It has a special feature of correcting the effects of gravity which is necessary for error free data. The Humac Norm Testing and Rehabilitation system has a positioning chair which assures complete stability during testing and have independent adjustable seats. It has dynamometer with integral limit device providing controlled testing. The dynamometer's rotation, height and tilt can be changed to properly position it for the testing or rehab pattern being used. The computer attached to the machine has the testing procedure memory which records data during test and simultaneously displays the data in the form of graphs.

2.2. Procedure:

The test for the measurement of the following variables, was conducted at the laboratory of Department of Exercise Physiology at Lakshmibai National Institute of Physical Education, Gwalior. Subjects were instructed to do proper warm-up which includes stretching exercise, jogging for 5 minutes and 3-4 short sprints before the test. All of the subjects were instructed about the basic functioning of machine and the sequence in which different test items will be conducted. The basic information of the subject was entered in the Humac 2009 software and according to this the software provided the perfect setting for that particular subject. The procedure was adopted at right side first followed by left side. The movement was performed at the speed of 60 degree/sec (3 reps) first and then at 180 degree/sec (5 reps) at both sides. The sequence of the movement was as follows-

1. Concentric Knee extension
2. Concentric Knee flexion

Before the main test 3 trial exercises and 10 seconds rest were given to the subject to understand the exercise properly after that they performed the main exercises. Rest between sets was of 15 seconds and between both extremities was of 2 minutes. When the test started the subject tried to flex and extent the leg with maximum force. The scores were recorded in the software in the form of peak torque and peak torque ratio. The same procedure was given to the opposite leg.

2.3. Statistical technique:

Mean and standard deviation were used as a Descriptive Statistic of study. For comparison, independent t-test was used as statistical technique with the help of data analysis software SPSS at 0.5 level of significance.

3. Results & Findings:

3.1 Bilateral Asymmetry:

Table 1 reveals that the mean difference between peak torque values of left and right flexors' and extensors' at 60 deg/sec and 180 deg/sec were found significant. Thus, null hypothesis is rejected at 0.05 level of significance in all the cases. Nevertheless, the bilateral asymmetry lies in normal range i.e., below 10% except that in case of 180 deg/sec which is between 10-15% for flexors and extensors at 180 deg/sec (significant asymmetries according to literature).

Table 1. Statistics & Bilateral Asymmetry for Knee Flexors and Extensors

Muscles	Velocity	Left Leg	Right Leg	Bilateral Asymmetry (%)	Sig. (2-tailed)
Flexors	60 deg/sec	60.08(±18.38)	59.58(±15.61)	0.83	0.943*
	180 deg/sec	39.16(±9.02)	33.08(±10.95)	15.52	0.152*
Extensors	60 deg/sec	100.66 (±24.30)	103.33 (±29.94)	2.58	0.813*
	180 deg/sec	53.83(±14.47)	45.83 (±19.38)	14.86	0.265*

*- Significant at 0.05 level of significance

$$\text{Bilateral Asymmetry \%} = (1 - \text{PT of Left Leg} / \text{PT of Right Leg}) * 100$$

3.2 Unilateral Asymmetry:

Table 2 reveals that the mean difference between peak torque values of flexors' and extensors' of left leg at 60 deg/sec and 180 deg/sec were not significant. Similarly, the mean

difference between peak torque values of flexors' and extensors' of right leg at 60 deg/sec was not significant but that at 180 deg/sec showed significant difference. Thus, failed to reject null hypothesis at 0.05 level of significance in both cases of left leg and in case of 60 deg/sec of right leg. Although, the null hypothesis is rejected at 0.05 level of significance in case of right leg at 180 deg/sec. However, the unilateral ratio lies in normal range i.e., between 50-69% for the angular velocity of 60 deg/s and the value concerning 70-80% to the velocity of 180 deg /s.

Table 2. Statistics & Unilateral Ratio (H:Q) % of Peak Torque of Both Knees

Extremity	Velocity	Flexors	Extensors	Unilateral Ratio (%)	Sig. (2-tailed)
Left Leg	60 deg/sec	60.08 (± 18.38)	100.66(± 24.30)	59.68	0.001
	180 deg/sec	39.16(± 9.02)	53.83(± 14.47)	72.74	0.008
Right Leg	60 deg/sec	59.58(± 15.61)	103.33(± 29.94)	57.65	0.001
	180 deg/sec	33.08(± 10.95)	45.83(± 19.38)	72.17	0.063*

*- Significant at 0.05 level of significance

4. Discussion of Findings:

The mean differences in bilateral comparison of leg extremities showed significant differences but bilateral asymmetry percentage of flexors and extensors at 60 deg/sec were found below the range of 10% which is considered the normal range. While bilateral asymmetry percentage of flexors and extensors at 180 deg/sec went above the normal values. The higher asymmetry at higher speeds noticed may be attributed to the reason that although the basketball is a bilateral sport but at speeds which resembles the actual game movements, players generally prefer a particular side (preferred side). With long term training senior players probably master their ability to perform movements from preferred leg which in turn leads to the bilateral strength asymmetry of the muscles involved. Nonetheless, attention needs to be shifted to bring it in normal range before it proceeds towards bigger deficits (above 15%). A study conducted by *H.Vedran (2013)*⁷ supports the current results and says that bilateral strength symmetry is noticeable in senior basketball players at higher speeds.

Further, the mean differences of unilateral comparison of leg extremities showed no significant differences at 60 deg/sec as well as at 180 deg/sec in left extremity and at 60 deg/sec in right extremity. Nevertheless, the mean differences between flexor and extensor of right leg at 180 deg/sec showed significant differences. Moreover, the statistics shows that the unilateral ratio was found in normal range in the all above mentioned instances and as a result there exist no unilateral asymmetry. Also, as the velocity increased the value of con(H:Q) ratio also increased which is implicit in the theory of Isokinetic machine that says with increasing velocities the efforts being put gets declined. The finding gets supported by the study underwent by *Anthony Theoharopoulos (2000)*⁸. He conducted the study on basketball athletes and found that the hamstring to quadriceps ratio of professional players stays in normal range.

5. Conclusion:

Ultimately it could be hold true by this study and by assimilating the results of similar researches that Basketball players do not show huge bilateral asymmetries. nonetheless due attention is to be paid towards minor asymmetries which may prove treacherous in the long run. Additionally, the unilateral ratio (H;Q)% of these players are in the range of 50%-80%, which is the normal range. Further, the values of bilateral asymmetry percentage and unilateral ratio increases with the increasing velocities. Therefore, the training of basketball does not seem to induce muscular imbalances exclusively.

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EFFECT OF CRICKET SPECIFIC FITNESS DRILL TRAINING PROGRAMME ON MUSCULAR STRENGTH OF CRICKET PLAYERS

***Dr. Manohar Mahadeo Mane**

Abstract:

The purpose of the present study was to determine the effect of cricket-specific fitness drill training programmes on the Muscular Strength of cricket players. For this study, a single group experimental study was designed. 20 cricketers from St. Thomas School boys were randomly selected as subjects. The selected subjects were considered as only one experimental group. The experimental training group underwent cricket-specific fitness drill training for fifteen weeks for five days per week. The Shoulder Muscular strength and handgrip muscular strength was taken as a criterion variable for the present study and they were measured by pull-up test and handgrip test. The data were collected before and after the training period with the standardized Muscular Strength tests and were analyzed by paired 't' ratio. The level of significance for the study was chosen as 0.05. it was found that there was a significant improvement on selected physical fitness variables due to the cricket-specific fitness drill training.

Keywords: fitness drill training, cricket, shoulder strength, handgrip strength

Introduction:

The game of cricket is described by experts as a game of chance with infinite uncertainties. There exists always an element of doubt in the game at all the stages and it is because of this reason that no one can predict the result of any match until the last ball is bowled.

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Three important constituents of cricket are Batting, Bowling and Fielding. To become an outstanding cricketer, one should learn the skills of batting and fielding. It is optional for the players to learn the skill of bowling with utmost zest as it is required only for those players who want to establish themselves as bowlers in their team. In the same manner, however, all the players should know how to stop the ball, but still, the art of wicket-keeping is learned only by those players who want to establish themselves as wicket-keepers in their team.

Fitness helps a person to control body and mind and use it when necessary for their functioning. Setting goals and maintaining them depends on how self-disciplined a person is and how religiously he follows a fitness routine.

Objectives of the study:

1. To find out the effect of cricket-specific fitness drill training on the shoulder muscular strength of cricket players.
2. To find out the effect of cricket-specific fitness drill training on the handgrip muscular strength of cricket players.

Method:

For this study, a single group experimental study was designed. 20 cricketers from St. Thomas School boys were selected as subjects. The selected subjects were considered as only one experimental group. The experimental training group underwent cricket-specific fitness drill training for fifteen weeks for five days per week. The Shoulder Muscular strength and handgrip muscular strength was taken as a criterion variable for the present study and they were measured by pull-up test and handgrip test. The data were collected before and after the training period with the standardized Muscular Strength tests and were analyzed by paired 't' ratio. The level of significance for the study was chosen as 0.05.

Analysis of data and findings:

Table No. 1: The following table shows that the Mean, Standard Deviation and ‘t’ ratio of cricket-specific fitness drill training on the Shoulder Muscular strength of cricket players.

Group	Mean	SD	SEM	DF	‘t’ ratio	Table Value
Pre test	1.9	0.96	0.21	19	6.53	2.093
Post test	3.5	1.43	0.32			

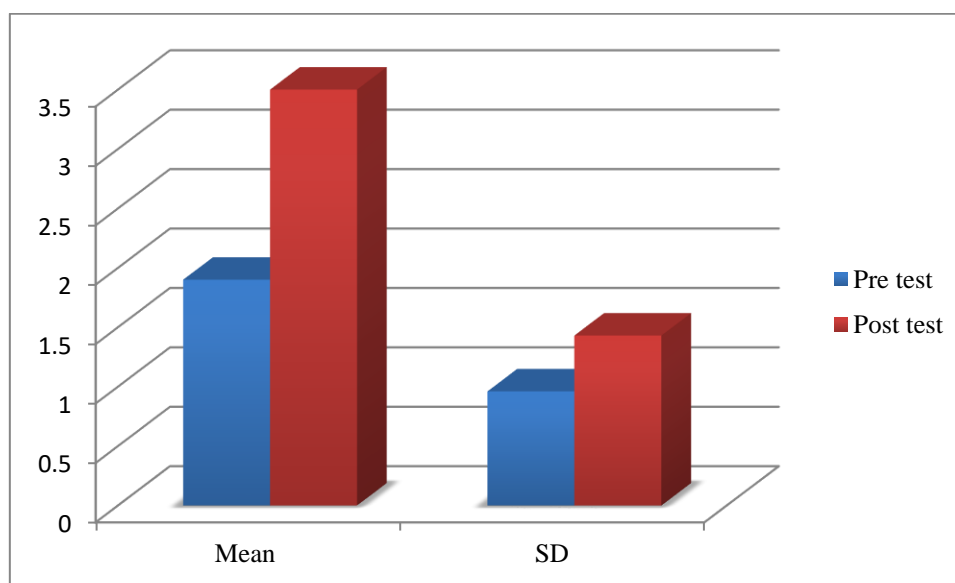


Fig. 1 showing the Mean and Standard Deviation result of pre and post- test of cricket-specific fitness drill training on the Shoulder Muscular strength of cricket players.

To find out the significant effect of cricket-specific fitness drill training group on shoulder muscular strength ‘t’ test was employed to analyze the significant difference between pre-test and post-test and the level of significance was set at 0.05. The cricket-specific fitness drill training group's pre-test Mean value was 1.9 and the post-test Mean value was 3.5 respectively. The cricket-specific fitness drill training group SD and SEM values were 0.96, 0.21, and post-test SD and SEM values were 1.43, 0.32 respectively. The difference of mean value is 1.6 and cricket specific fitness drill training group obtained ‘t’ ratio of 6.53 was greater than the table value of 2.09. It shows that the cricket-specific fitness drill training had a significant effect on the shoulder muscular strength of the cricket playing group.

Table No. 2: The following table shows that the Mean, Standard Deviation and ‘t’ ratio of cricket-specific fitness drill training on the Handgrip Muscular Strength of cricket players.

Group	Mean	SD	SEM	DF	‘t’ ratio	Table Value
Pre test	23.6	8.14	1.77	19	6.95	2.093
Post test	27.15	8.36	1.82			

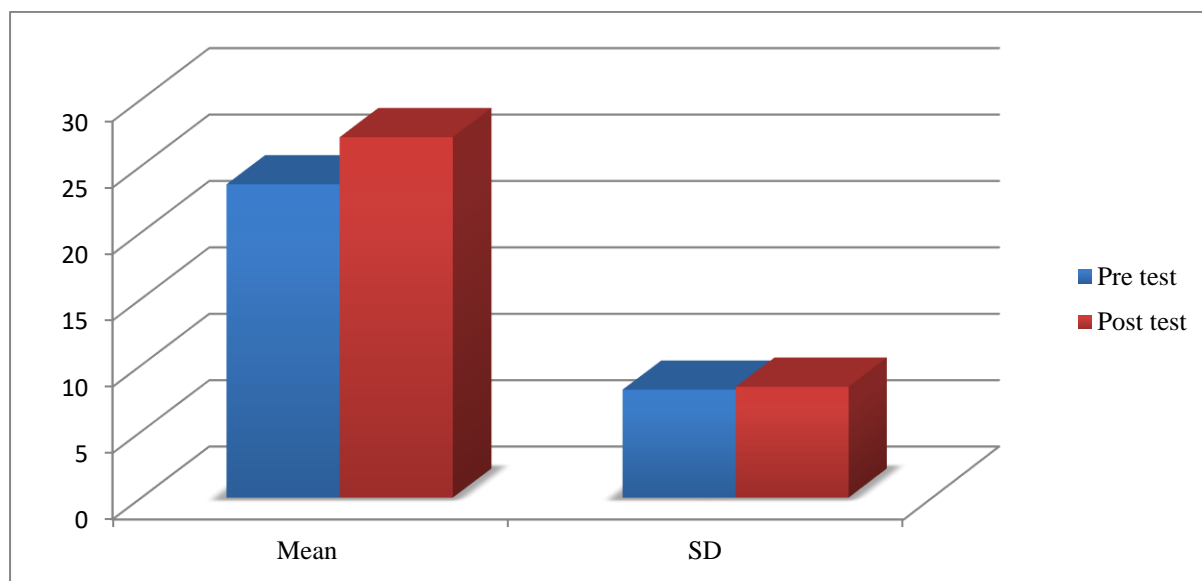


Fig. 2 showing the Mean and Standard Deviation result of pre and post- test of cricket-specific fitness drill training on the Handgrip Muscular Strength of cricket players.

To find out the significant effect of cricket-specific fitness drill training group on handgrip muscular strength, ‘t’ ratio was employed to analyze the significant difference between pre-test and post-test and the level of significance was set at 0.05. The cricket-specific fitness drill training group's pre-test Mean value was 23.6 and the post-test Mean value was 27.15 respectively. The cricket-specific fitness drill training group’s pre-test SD and SEM values were 8.14, 1.77 and post-test SD and SEM values were 8.36, 1.82 respectively. The difference of mean value is 3.55 and cricket specific fitness drill training group obtained ‘t’ ratio of 6.95 was greater than the table value of 2.09. It shows that the cricket-specific fitness drill training had a significant effect on the Handgrip Muscular Strength of the cricket playing group.

Discussion:

The result of the present study pointed out that there was a significant difference in shoulder muscular and handgrip strength due to fifteen weeks cricket-specific fitness drill training programmes on cricket players. The findings are also in agreement with the findings of Bhat, Z. A. and Sreedhar K (2018) that cricket specific fitness training program improved explosive strength and speed of college level men cricketers of J&K state. Srinivasan and Bhowmik K. (2014) studies result shows that cricket drill training leads to positive improvement on the selected skill performance of school boys.

Conclusion:

The result of the present study revealed that the training programme has significant improvement in Muscular Strength of cricket players after the cricket specific fitness drill training programme. It was also concluded that this cricket specific fitness drill training methods for increasing the shoulder muscular strength and handgrip strength of cricket players.

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COMPARISON OF ANXIETY BETWEEN PHYSICAL EDUCATION STUDENTS AND OTHER STUDENTS IN KASHMIR

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Abstract:

The purpose of present study was Comparison of anxiety between physical education students of Kashmir and other students who are not taking participation in physical activities and sports. Physical education programmes and sports are a necessary part of our education system; if students who will not participate in physical activities they will remain dull and lazy. Hence it is the duty of government, and different organizations to indulge the youths in physical activities and sports, so that they will remain free from stress, anxiety, and depression. Students may be affected with obsessive compulsive disorder if they do not indulge themselves with physical activities. When students take participation in physical activities and games, mind releases serotonin which protects us from anxiety. Thus, physical activities are necessary to keep us free from anxiety, stress and depression.

Key words: Anxiety, stress, depression, physical activities

Introduction:

At present in all world especially in developing countries about 150 million people, suffer from anxiety. The relationship between exercise and anxiety has been extensively examined over the 15 years. The results confirm the acute effect of exercise i.e. the reductions in anxiety even after single sessions of exercise. (Guszkowska,2004) and also exercise as means to prevent and treat anxiety, (Martinsen,2008) on the other hand Anxiety scores have

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different predictive effects on mortality in patients referred for exercise testing. These effects are independent of a highly effective physical risk index, suggesting that psychological screening of cardiology patients might improve risk stratification (Herrmann C, 2000). Although Aerobic voluntary exercise has been shown to reduce generalized anxiety, and may also reduce anxiety sensitivity (Joshua J. Broman-Fulks, 2004), influence of forced exercises such as exercises in which physical education students have to pass them is under question and the purpose of present study is comparison of anxiety in physical education and non physical education students.

Material and Methods:

The Subjects were selected from university of Kashmir. A Simple random sampling technique was used in which 42 students were selected from physical education department and 28 students were selected from different departments of university of Kashmir which were selected randomly to participate in this study, (with no age limit). Students fulfilled anxiety; Beck questionnaire which included 21 questions with 5 likert scale, physical education students had high intensity exercises, (3 days a week 6 hours, different mode of exercises) and students of other department did not participate in any kind of regular exercise at present or previously. Measurement was just based on Beck questionnaire; all the data was analyzed using SPSS version 16 software, descriptive statistics including mean, standard deviation, frequency and percentage were used for describing the result, the Manwitney U test and Chi-square were used to analyze difference in department of physical education students and students of other department.

Results:

Findings of this study as shown in table 1 indicate a significant difference between total score of anxiety in two groups of physical education students and students of other departments ($P=0.05$), and total anxiety of students of other departments is higher than physical education students. But, the number of students who suffer from severe anxiety is higher in physical education students than other department students.

Table 1 Comparison of total anxiety score between two groups

GROUP STATISTICS					
Total anxiety	Subjects	N	MEAN	S.D	P
	Trained	42	27.12	12.18365	0.05
	Untrained	28	35.93	10.22881	

Table 2 Numbers of students suffers from severe anxiety

	Observed N	Expected N	Sig
Physical education students	13	9	0.04
Other Students	5	9	
Total	18		

Conclusion:

The result of this study shows the comparison between students of physical education department and students of other departments of university of Kashmir. Although total score of anxiety were lower on physical education students, but frequency of severe anxiety was higher in physical education students than other students. During our study we found that there is much needed attention to pay towards the quality of research in the area of anxiety. We conclude that it is not possible to determine from the available evidence the effectiveness of exercise in the management of anxiety. However, exercise may be efficient in reducing the symptoms of anxiety in some volunteers in the short or long-term. In this study, it is probable that because of over training in physical education students, forced exercises or poor environmental conditions or not being talent for participation in exercise was not effective in reducing anxiety, in such situations exercise is not appropriate solution for reduction of anxiety and even in some cases can increase anxiety.

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ACUTE EFFECTS OF EXERCISE ON BLOOD UREA NITROGEN, CREATININE AND IONIZED CALCIUM: A REVIEW

***¹ Gopal Kumar**

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Abstract:

Increasing competitiveness in sports has led to the development in every aspect which could aid in the enhancement of athletic performance. Monitoring of internal or physiological load and adaptation process is very crucial for manipulating the load indices. Biochemical testing of different variables that depict the physiological stress of training are focused for accurate monitoring. Blood Urea Nitrogen (BUN), Creatinine and Ionized Calcium (iCa) are such biochemical variables whose analysis help in the monitoring of internal load. So, the purpose of the study was to analyze the acute effects of exercise on BUN, Creatinine and iCa. For this purpose, various research databases were searched for published articles and conclusions were drawn. BUN increases during and after the exercise as a result of increased protein utilization. Creatine also increases after the exercise because of increased creatine production and utilization. iCa decreases as a result of exercise due to increased parathyroid hormone secretion. The study concludes that BUN, Creatine and iCa are helpful in analyzing the physiological load of athletes and should be monitored during the training.

Keywords: Blood Urea Nitrogen, Creatinine, Ionized Calcium, physiological loading

Introduction:

The increase in the professionalization of competitive youth sports is associated with an increase in the training load, in terms of exercise intensity and volume. Specialization in

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high-performance sports starts early currently and children may be at risk of overload subsequently affecting their development. As recently stated by the International Olympic Committee consensus statements, load management is crucial for athletes [1, 2]. Therefore, there is a high need to monitor and examine the external training load on the one hand, but on the other hand, and even more important, to investigate the internal training load. Due to the different time courses of physiological, biochemical, performance, and psychological reactions in response to periods of high training load, monitoring of the external and internal training load should be performed in a multilevel approach [3].

The external training load, defined as the work completed by an athlete, can be determined simply by the measurement of speed, distance, altitude difference, and power output [4]. However, especially in group training where often the same external training load is performed by all athletes, the internal training load of each individual athlete to a training stimulus might differ extensively. Therefore, the internal training load should be measured using different methods. Easy measures include the mean heart rate (HR), rating of perceived exertion (RPE), session RPE (s-RPE) [6], training impulse (TRIMP) [7], measurements of performance, psychological questionnaires [8], the assessment of the autonomous nervous system balance (HR and heart rate variability (HRV)) [5, 9, 10], and sleep [4]. More complex measures for monitoring the training load and the training status include biomarkers.

Biomarkers are attractive parameters for quantifying exercise-induced stress and fatigue in different tissues, as each biomarker has a clear physiological link to the tissue being stressed [11]. To study the internal load of different tissues, it is therefore important to analyse a whole set of blood markers. With the integration of biochemical studies in the field of sports, physiological loading has been quantified enormously. With the inclusion of new biomarkers such as biomarkers of oxidative stress – malondialdehyde, oxidized low-density lipoproteins, protein carbonyls, and inflammatory markers – interleukin-6 etc., sports scientists are monitoring the physiological status of athletes and thus helping them to recover and ultimately enhancing their performance.

The present study focuses on three biomarkers, namely – Blood Urea Nitrogen (BUN), Creatinine and Ionized Calcium (iCa). The purpose of this review article is to analyse the immediate effects of exercise on the selected biomarkers.

Blood Urea Nitrogen (BUN):

The liver produces urea in the urea cycle as a waste product of the digestion of protein. Exercise increases energy expenditure, resulting in promotion of amino acid catabolism, especially the oxidation of certain amino acids.

The normal range of urea nitrogen in blood or serum is 5 to 20 mg/dl, or 1.8 to 7.1 mmol urea per litre. The range is wide because of normal variations due to protein intake, endogenous protein catabolism, state of hydration, hepatic urea synthesis, and renal urea excretion. A BUN of 15 mg/dl would represent significantly impaired function for a woman in the thirtieth week of gestation. Her higher glomerular filtration rate (GFR), expanded extracellular fluid volume, and anabolism in the developing foetus contribute to her relatively low BUN of 5 to 7 mg/dl. In contrast, the rugged rancher who eats in excess of 125 g protein each day may have a normal BUN of 20 mg/dl.

Light to moderate exercise results in an increase in net protein catabolism and urea and creatinine excretion. Foran et al. showed that short-term effects of exercise lead to an increase in glucose, total protein, albumin, uric acid, calcium, phosphorous, blood urea nitrogen (BUN), creatinine, total and direct bilirubin, alanine aminotransferase (ALT), aspartate aminotransferase (AST), and alkaline phosphatase levels 4 hours after marathon. BUN, creatinine, uric acid, ALT, AST, and direct bilirubin levels remained elevated 24 hours after the race [12]. An increase in urea concentration may be related to a reduction in renal blood flow (and glomerular filtration rate) secondary to fluid volume deficiency, increased protein catabolism, and/or bleeding into the intestine, all of which may occur after prolonged strenuous exercise [13].

Studies conducted by many researchers [14, 15] had shown that Blood Urea Nitrogen increases significantly during the exercise. Similar results has also been seen in studies conducted on rats [16].

Creatinine:

Creatinine is produced from the decomposition of creatine, a nitrogen compound used by muscle cells to store energy. The serum concentration of creatinine varies according to

creatinine synthesis and the amount of muscle tissue of the animal [4]. The quantity of creatinine formed each day depends on the body content of creatine, which in turn depends on dietary intake, rate of synthesis of creatine, and muscle mass. For the adult male, the normal range is 0.6 to 1.2 mg/dl, or 53 to 106 $\mu\text{mol/L}$ by the kinetic or enzymatic method, and 0.8 to 1.5 mg/dl, or 70 to 133 $\mu\text{mol/L}$ by the older manual Jaffe reaction. For the adult female, with her generally lower muscle mass, the normal range is 0.5 to 1.1 mg/dl, or 44 to 97 $\mu\text{mol/L}$ by the enzymatic method.

Severe prolonged exercise in humans caused an increase in serum creatinine concentration of approximately 60% [5], and the increased serum creatinine concentration was attributed to increased creatinine production [6]. Factors influencing muscle mass, such as disease of muscle, tissue wasting, and character of muscle as influenced by physical training, also may affect the size of the creatinine pool and thus the daily production of creatinine [6]. Creatinine concentration also generally increases after prolonged strenuous exercise including events such as a half Ironman triathlon [17], a short triathlon [18], an ultra-triathlon [19], a marathon [20], a 160 km run [21], and a modified triathlon (28 km canoe, 90 km cycle, and 42.2 run) [22]. The increase in plasma creatinine concentration is probably the result of release of creatinine from the working muscles, dehydration, and/or a reduction in renal blood flow and glomerular filtration rate.

Ionized Calcium:

Ionized calcium is calcium in your blood that is not attached to proteins. It is also called free calcium. Exercise can cause a decrease in serum total and ionized calcium (iCa) during prolonged moderate-to-vigorous endurance exercise, which is a trigger for parathyroid hormone (PTH) secretion [23, 24, 25, 26]. PTH defends serum calcium (Ca) by increasing intestinal Ca absorption, inhibiting renal Ca excretion, and stimulating the mobilization of skeletal Ca. If exercise induces an increase in bone resorption that is not accompanied by stimulation of bone formation, the repeated disruption of Ca homeostasis during exercise training may contribute to bone loss.

Consuming a Ca-enriched beverage before and during endurance exercise has been found to be effective in reducing the disruption in Ca homeostasis during exercise. The

decrease in iCa and increase in PTH were attenuated when a Ca-enriched beverage or meal was consumed before and/or during exercise (23, 25, 26, 27).

The availability of Ca in the small intestine for absorption may reduce the extent to which skeletal Ca is mobilized during exercise to defend serum Ca. The optimal dose and timing of Ca supplementation to minimize the disruption of Ca homeostasis during exercise are not known. The minimal dose that has been demonstrated to be effective in attenuating PTH was 1000 mg, but lower doses have not been evaluated.

Although the exercise-induced increase in PTH leads to an activation of bone resorption, resulting in what appears to be a catabolic response, it remains possible that PTH could have an anabolic effect on bone. Paradoxically, PTH has both anabolic and catabolic actions on bone, whereby transient increases in PTH are anabolic and chronic elevation is catabolic [28].

Conclusion:

The purpose of the study was to analyse the effects of exercise Blood Urea Nitrogen (BUN), Creatinine and Ionized Calcium (iCa). In this era of sports training and athletic performance, monitoring of physiological loading has become very crucial for analysing the effect of training on the athlete and adaptation process thereafter. The variables selected for the study, i.e. BUN, Creatinine and iCa are very fruitful in fulfilling this objective.

Urea Nitrogen is analysed through serum as well as urine samples. Urea is produced by kidneys as a waste product utilization. On the basis of the studies conducted on the effect of exercise on BUN, it can be concluded that BUN increases during and after the exercise as a result of increased protein catabolism. Also, similar results are found for creatinine. But, exercise can cause decrease in the iCa levels. So, the researcher recommends the use of these biochemical variables for monitoring of the physiological load as well as adaptation phenomenon of athletes during the training.

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A STUDY OF FAT-RELATED DIET HABITS AMONG MALE ADULTS OF LIWACHANGNING VILLAGE, CHANDEL DISTRICT, MANIPUR

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Abstract:

The purpose of this paper is examined fat-related dietary habits differed on Liwachangning Village of Chandel district, Manipur as a consequence of the involvement. The purposive study was conducted on the young male adults of Liwachangning Village of Chandel District, Manipur. Among this tribe people, randomly 50 participants were selected of the age ranging from 30 - 40 years old. To analyze dietary fat intake in the earlier 2 months, the study subjects filled out the Fat-related Diet Habits Questionnaire consists of 22 questions with sub-questions. The responses to the questions were marked on a four-point scale [1 (Usually), 2 (often), 3 (sometimes), 4 (rarely or never)], with a high score corresponding to higher fat intake. By Descriptive statistic and Statistical significance was considered at $P < 0.05$. The study was concluded that 60% sometime preferred vegetarian meals also. "Avoid frying" subscale revealed the most favourable scores while "modify meat" subscale was the least favourable among the age group of 30-40 years males.

Keywords: Liwachangning, Chandel, Fat-related Diet Habits

Introduction:

Numerous adult ailments have their beginning, and extreme weight gain is a sign to a extensive assortment of physiologic peculiarities that eventually influence to morbidity and

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mortality. Our contemporary eating atmosphere has had an outcome on the technique eat. Diets become an important part of the individuals.

Diets low in dietary fat mainly saturated fat, are accompanying with lower risk for obesity and many chronic illnesses. The purpose of this paper is examined fat-related dietary habits differed on Liwachangning Village of Chandel district, Manipur as a consequence of the involvement. Outcomes can be used to healthier comprehend how to strategy interferences for socially assorted inhabitants.

The prevalence of obesity in people is increasing. Although treatment has been relatively successful, many treated people also regain weight. Given difficulties in changing established eating and exercise behaviors, research is needed to prevent obesity especially in young male of Liwachangning Village. Primary prevention may involve modifying intake and/or increasing expenditure, but the biggest effect on energy balance will come from modifying intake, because research suggests that obese and non-obese people have similar activity levels. Most dietary approaches for obesity treatment or prevention attempt to limit intake of high-fat, low-nutrient dense foods. This may be perceived as a dietary restriction by people who find these foods reinforcing. The perceived restriction can lead to increases in preference for these foods, thereby increasing the probability of relapsing to previous eating habits when structured interventions are removed. An alternative approach would be to teach people to increase intake of healthy high-nutrient dense foods, such as fruits and vegetables, which has been the target of large public health interventions. Components of programs to prevent obesity in at-risk people can include modifying environmental cues leading to positive energy balance, changing healthy eating habits, thereby providing healthy models for people to observe, and teaching new healthy lifestyle that reduce using food as a reward, Because obesity represents one of the major risk factors for the young males of Liwachangning Village. The inclusion of people behavior change as a target for obesity prevention programs may have benefits beyond prevention of obesity, because a change in the eating habits related to obesity may result in a reduction in obesity. If obese people reduce access to low-nutrient dense foods available in the shared family environment, model healthier eating and activity habits, and share positive food-related family experiences that reinforce eating high-nutrient dense foods, the parents may reduce the risk of people becoming obese as well as modify their own body weight. This study was designed to test a new approach for modifying eating behavior in at-risk people and their families. Young males of Liwachangning Village in Chandel District were

instructed to modify their behavior and the familial environment to reduce their obesity and were taught parenting skills for promoting and reinforcing behavior change in the at-risk people. The dietary changes suggested for the parents would also result in a secondary goal of reducing weight of at-risk people. People with obese were randomized to groups that targeted either a decrease in consumption of high-fat, high-sugar foods or an increase in consumption of fruits and vegetables. The targeted behavior was a change in the eating habits for people, leading to a decrease in weight for people and to stabilization of relative weight for themselves and for their families.

Materials and Methods:

The purposive study was conducted on the young male adults of Liwachangning Village of Chandel District, Manipur. Among this tribe people, randomly 50 participants were selected of the age ranging from 30 - 40 years. To analyze dietary fat intake in the earlier 2 months, the study subjects filled out the Fat-related Diet Habits Questionnaire consists of 22 questions with sub-questions. The responses to the questions were marked on a four-point scale [1 (Usually), 2 (often), 3 (sometimes), 4 (rarely or never)], with a high score corresponding to higher fat intake. The Five fat intake subscales featuring 2–7 items each: “modify meat to be low in fat”, “avoid fat as flavouring”, “replace high-fat meat with low-fat alternatives”, “substitute specially manufactured low-fat foods”, “replace high-fat foods with fruits and vegetables” were grouped for the questions. By Descriptive statistic and Statistical significance was considered at $P < 0.05$.

Results:

Table 1: Items of the Fat-related Diet habits of Young Male Adults among Liwachangning Village of Chandel District, Manipur

How often did you	Usually n (%)	Often n (%)	Sometime n (%)	Rarely or never n (%)
Eat chicken by fried	5 (10)	30 (60)	15 (30)	0
Remove the skin from the chicken	5 (10)	0	12 (24)	33 (66)

Eat meat by trimming all the visible fat	30 (60)	5 (10)	15 (30)	0
Eat ground meat by extra lean	0	3 (6)	22 (44)	25 (50)
Eat fish by fried	5 (10)	15 (30)	30 (60)	0
Have vegetarian dinner	5 (10)	15 (30)	30 (60)	0
Eat spaghetti or noodles plain or with a red or tomato sauce without meat	8 (16)	9 (18)	21 (42)	12 (24)
Eat cooked vegetables with butter, margarine or other fat	1 (2)	6 (12)	11 (22)	32 (64)
Eat fried vegetables	8 (18)	20 (40)	10 (20)	10 (20)
Eat potatoes fried - French fries or harsh browns	3 (6)	8 (16)	29 (58)	10 (20)
Eat baked or boiled potatoes without any butter, margarine or sour cream	20 (40)	0	5 (10)	25 (50)
Eat green salads without dressing	20 (40)	8 (16)	15 (30)	7 (14)
Eat green salads with low-fat or non-fat dressing	10 (20)	0	29 (58)	11 (22)
Eat bread, rolls or muffins without butter or margarine	15 (30)	4 (8)	25 (50)	6 (12)
Drink milk 1% or non-fat	7 (14)	3 (6)	10 (20)	30 (60)
Eat low-fat cheese	0	0	27 (54)	23 (46)
Eat only fruit	4 (8)	4 (8)	27 (54)	15 (30)
Eat cookies, cake or pies with less butter, margarine or oil	5 (10)	2 (4)	25 (50)	18 (36)
Eat frozen yogurt, sherbet or low -fat or non-fat ice cream	0	5 (10)	25 (50)	20 (40)
Eat raw vegetables or fresh fruit	0	5 (10)	35 (70)	10 (20)
Use pan or non-stick spray instead of oil, margarine or butter	0	8 (16)	20 (40)	22 (44)
Use mayonnaise or non-mayonnaise type spread	0	0	27 (54)	23 (46)

Table 1 explored the eating behaviours in relation to fat-related diet of young adult male among Liwachangning Village of Chandel District, Manipur. There were 60% sometime

preferred vegetarian meals also. In Table 1 revealed the participant’s responses to the fat-related diet habits. By overall analysis, the young adults’ male ate more or less fat cooked food items.

Table 2: Scales of the Fat-related Diet habits of Young Male Adults among Liwachangning Village of Chandel District, Manipur

Scale	Mean ± Std. Dev.	Std. error	P-value
Substitute (n=50)	12.5 ± 4.87	1.84	0
Modify meat (n=50)	12.5 ± 10.23	5.91	0.4105
Avoid frying (n=50)	12.37 ± 6.77	3.38	0.0167
Replace fruit and vegetables (n=50)	12.5 ± 5.1	2.94	0.0011
Avoid fat for flavouring (n=50)	12.5 ± 7.81	3.49	0.1903

*significant level at 0.05

Results from Fat-related Diet Habits of young adults among Liwachangning Village of Chandel District, Manipur highlighted the information about significance differences In Table 2. “Avoid frying” subscale revealed the most favourable scores while “modify meat” subscale was the least favourable among the age group of 30 - 40 years males.

Conclusion:

The current findings may provide young male adults of Liwachangning Village a clear message that participation in physical activity or striving for physical fitness and proper intake of diet will lead to the bright sight of life. They should constantly monitor the diet intake of the client and modify their diet according to their needs and requirement, which is very essential for a fitness centre as machines and exercise are not the only criteria to decide the success or failure of a fitness centre. This notion would be even more important when promoting active lifestyles to their families, which has long held wrong beliefs, traditions and customs. They need to be recommended the right kind of diet intake that will lead to better standard of living as well as to be healthy. As a result, the dispute of physical activity participation along with proper diet will enhance their working ability and freedom from sickness.

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A COMPARATIVE STUDY OF NUTRITIONAL PROFILE AMONG FEMALE SPORTS AND NON SPORTS PLAYERS

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***² Prof. Dr. R.P Garg**

Abstract:

The present study has been designed to investigate the nutritional profile among female sports and non sports players. For accomplish the study total 50 samples (25 female sports players and 25 non sports female players) were selected through random sampling as subjects of this study. All the samples were selected from Haryana state only.all the samples taken which are studying in different School, Colleges and Universities. For accomplish the study we used self prepared nutritional profile questionnaire. The nutritional profile questionnaire requires participants to rate their liking of 56 nutrition related questions on a 5-point Likert scale, ranging from “strongly disagree” to “strongly agree.” Out of total 56 items, 43 items scored accordingly while 13 items scored reversely. SPSS version 20 was used to apply all statistical terms and t test was applied to compare the results. The level of significance was set at 0.05. We find out that female sports players are more aware in comparison of non sports players regarding nutritional profile.

Key words: Nutritional Profile, Sports Players, Non Sports Female Players.

Introduction:

Success in sports depends on three factors - genetic endowments, the state of training and nutrition. Genetic make-up cannot be changed. Specialized exercise training is the major

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means to improve athletic performance and proper nutrition is an important component of the total training program. Athletes and Fitness Enthusiasts need the same essential nutrients that non-active people need with varied increases in their caloric needs as well as some increase in macro and micronutrients. Therefore, it is essential to explore and assess these increased nutritional needs of athletes before, during, and after competition for achieving optimal sports performance. Nutrition is the study of foods and nutrients and their effect on growth, health, and mental development of the individual. Sports Nutrition applies nutritional principles to sport with the intent of maximizing performance. Nutrition is a very important part of many sports training processes, being popular in strength sports (such as shot put, weightlifting and bodybuilding) and endurance sports. Sports Nutrition focuses its studies on the type, as well as the volume of fluids and food taken by an athlete. In addition, it deals with the dispersion of nutrients such as vitamins, minerals, subsidiary and organic substances that include carbohydrates, proteins and fats.

Objectives of the Study:

- To compare the nutritional profile among female sports and non sports players

Hypothesis of the Study:

- There would be no significant difference in nutritional profile among female sports and non sports players.

Research Process and Methodology:

- For accomplish the study total 50 samples (25 female sports player and 25 non sports player) were selected through random sampling as subjects of this study.
- All the samples were selected from Haryana state only.
- Female sports player who are playing in different School, Colleges and Universities tournaments will be selected as samples.
- Non sports female player those who don't playing any game will be selected as sample.
- For accomplish the study we used self prepared nutritional profile questionnaire.

Tools and Techniques:

The nutritional profile questionnaire requires participants to rate their liking of 56 nutrition related questions on a 5-point Likert scale, ranging from “strongly disagree” to “strongly agree.” Out of total 56 items, 43 items scored accordingly while 13 items scored reversely. Participants are instructed to select numbering i.e.

TABLE 3.3

STRONGLY DISAGREE	DISAGREE	NETHER AGREE OR DISAGREE	AGREE	STRONGLY AGREE
1	2	3	4	5

Statistical Method:

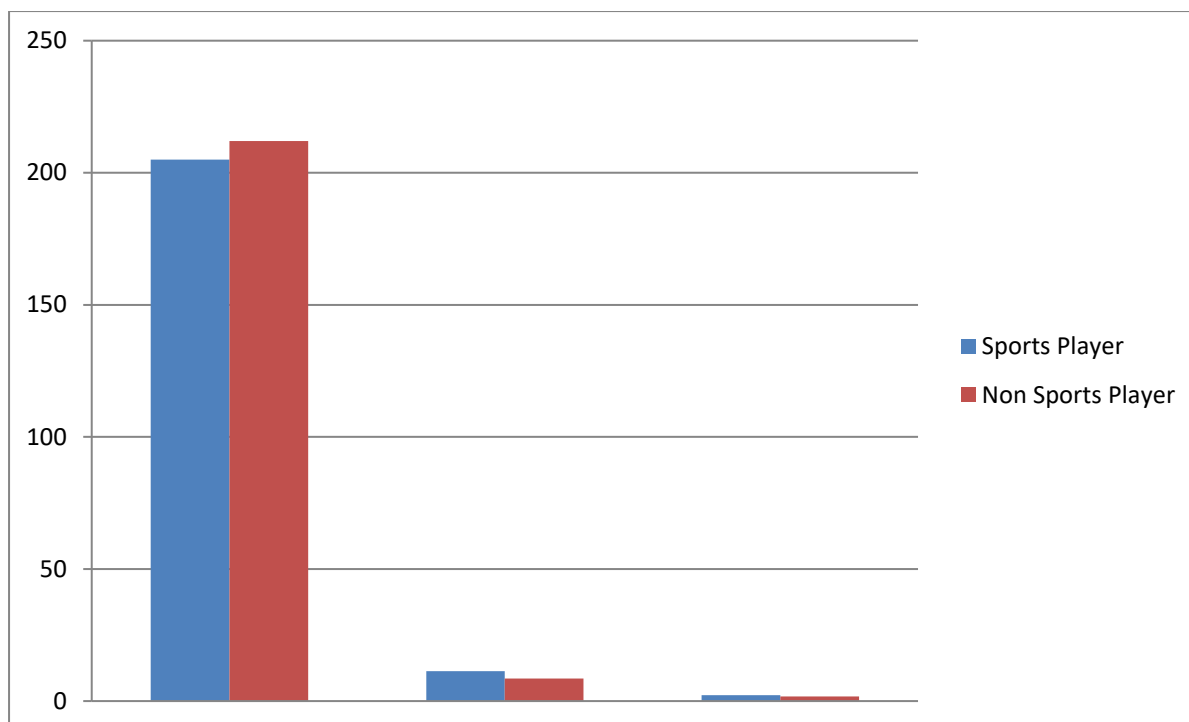
- The obtained data were analyzed by applying t test in order to determine the food preference among female sports and non sports player.
- The level of significance was set at 0.05.

Table 1 : mean difference of nutritional profile among female sports and non sports players (N = total numbers of players)

S. No	Group	Variable	N	Mean Score	SD	Sem	DF	T-Value
1	Female sports player	Nutritional profile	25	205.48	11.32	2.26	48	2.39*
2	Non sports female player		25	212.28	8.56	1.71		

**significant at 0.05 level*

Table no 1 Shows that ‘t’ value (2.39). The mean score of female sports player regarding nutritional profile is 205.48 and the mean score of non sports female players is 212.28. Calculated value is higher than the table value 0.05. So a significant difference was observed between female sports player and non sports player regarding nutritional profile.



Colum:-1 shows mean score of sports (205.48) and non sports player (212.28).

Colum:-2 shows std. Of sports player (11.32) and non sports player(8.56).

Colum:-3 shows standared error of sports player (2.26) and non sports player (1.71).

Conclusion: Hypothesis which was formulated earlier that “*There would be no significant difference in nutritional profile among female sports and non sports players*” was rejected. A significant different was observed regarding nutritional profile among female sports player and non sports player. Significantly Sports player are more aware than non sports player.

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- (Abdallah Ismail 2018) When most of us think about calories, we think about how fatty food is. In dietary terms, calories are the amount of energy supplied by food. If we constantly consume more energy than necessary, we gain weight. If we consume too much energy, we will lose weight, fat and ultimately muscle mass. Caloric determination is the amount of energy required to increase the water temperature by 1 gram (g) by 1 ° Celsius.

A COMPARATIVE STUDY ON THE TOTAL ARM LENGTH OF HIGH AND LOW PERFORMANCE VOLLEYBALL PLAYERS.

*** Dr. Mohd Khalid Khan**

Abstract:

Structural differences in body segments affect the quality and quantity of movements. The segmental length and breadth determines force outcome from the lever formed by these segments. we see that the size and shape play a significant role in the performance of volleyball players. The purpose of this research work was to compare the Total Arm Length of high and low performance Indian volleyball players. 50 subjects each from High and low performance volleyball players were selected, from Senior national, All India inter-varsity, State, North zone Inter-varsity, District tournaments .Z-test analyses revealed the mean Total Arm Length, of high performance volleyball players to be significantly greater ,than the mean Total Arm Length of low performance volleyball players.

Introduction:

Structural differences in body segments affect the quality and quantity of movements. The segmental length and breadth determines force outcome from the lever formed by these segments. **Sodhi et al.** (1990) conducted a study on the north Indian junior volleyball players aged between 16 to 18 years. The results were based on the cross-sectional data of 90 volleyball players and 94 control subjects. The data were divided age-wise into three subgroups of each category. The results of the study revealed that the volleyballers in each age group were significantly taller and heavier than the controls. The volleyballers in each age group possessed considerably greater length of their trunk, broader shoulders and hips, wider humerus and femurs, greater size of hand span, larger chest, upper arm, thigh and calf circumference than the controls. **Sodhi and Sidhu (1984)** noted that the players in the Indian national volleyball team dominated other groups in all anthropometric measurements. They were lighter in proportion to stature with proportionately shorter trunks, longer lower extremities, smaller chest, and narrow hips. The rating of endomorphic and mesomorphic components was lower,

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but that of ectomorphic component was higher in their case. They had greater musculo-skeletal tissue in the thigh relative to the upper arms and possessed wider knees relative to the elbows than players of lower standards however; the amount of body fat was least in them. The state level volleyballers, when matched with the controls, showed almost the typical body characteristics as those of the national team players, but with a smaller degree of pronouncement than the latter.

Hirata (1966) studied 116 Olympic volleyball players who were found to be tall and lean. Their average height was 183.8cm and weight 79kg respectively. Less rating of endomorphic component than the controls, considerably greater length of the trunk, broad shoulders and hips, greater size of hand span, larger chest, upper arm, thigh and calf circumference than the control. All the above characteristics mechanically help for better performance. **Mokha and Sidhu** (1988) took anthropometric measurements of Indian female volleyball players having International level of participation. They found that the volleyballers were taller and heavier than the controls. The taller stature of volleyball players was mainly due to the longer lower extremity because the mean values of the sitting height in both the groups were almost comparable. Upper extremities were also longer for volleyball players and they also possessed broader shoulders, wider knees and wrist.

Thus we see that the size and shape of the athletes play a significant role in the performance. Numerous factors are responsible for the performance of volleyball players. Fundamental skills of volleyball like servicing, passing, setting, smashing and blocking, requires a specific type of physique having specific proportions. The Hand length is a very significant factor in the performance structure of volleyball. The purpose of this research work was to assess the difference existing in the Wrist Width, Hand length and Total Arm Length of high and low performance volleyball players.

Procedure:

Keeping in view the objectives of our study 50 subjects each from high and low performance volleyball players of our country were selected.

High performance volleyball players were selected from:

- Senior national tournament held at “Choutala”, Haryana in Nov. 2002
- All India inter-varsity championship finals held at “Ajmer” 17th to 22 Nov., 2002.
- East & Northeast zone championship held at “Agra” from 16th to 21 Nov., 2002.

Low performance volleyball players were selected from;

- State championship held at “Moradabad” in October, 2002.
- North zone championship held at “Gadhwal” Uttranchal University, October, 2002.
- Inter-varsity tournament held at “Ajmer” in Nov., 2002.
- District tournament Moradabad, 2002.

Collection of Data:

Total arm length:

The subject was made to stand normally with arms hanging down. Right arm with hand (Palm and Fingers) was made straight. Distance from Acromion to Dactylion 3, with the help of measuring tape was measured in cms.

Statistical Procedure:

Z- Test was used to test the significant difference in Total Arm Length of high and low performance volleyball players at 0.05 level of significance.

Analysis of Data:

Table - Total arm length

Total arm length in ‘Centimeter’ of High and Low performance volleyball players

Total arm length	High performance volleyball players	Low performance volleyball players
Mean	85.70	78.18
Standard Deviation	4.61	4.39
Obtained value $ Z $	8.26*	
The mean of High performer is > than mean of Low performer $\bar{X}_1 > \bar{X}_2 = 9.62\%$		

* Significant at 0.05 level

** Z value for one tail test to be significant at 0.05 level 1.64

Table Shows significant obtained Z value for one tail test, which leads us to conclude that the mean total arm length of high performance volleyball players is significantly greater (9.62%), than the mean total arm length of low performance volleyball players.

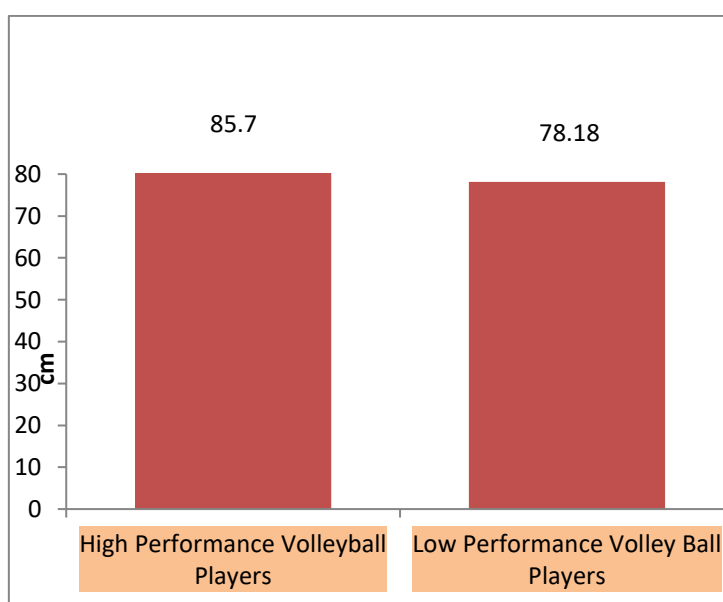


Fig.: The mean Total arm length of High and Low performance volleyball players

Discussion on Findings:

Discussion of findings for Total Arm Length of the High and Low performance volleyball players is presented. Z test was used to test the significant difference between the chosen variables of high and low performance volleyball players

It is observed that the mean total arm length of high performance volleyball players is significantly greater (9.62%), than the mean total arm length of low performance volleyball players.

Hirata (1966) studied 116 Olympic volleyball players who were found to be tall and lean. Their average height was 183.8cm and weight 79kg respectively. Less rating of endomorphic component than the controls, considerably greater length of the trunk, broad shoulders and hips, greater size of hand span, larger chest, upper arm, thigh and calf circumference than the control. All the above characteristics mechanically help for better performance.

Sodhi et al. (1990) conducted a study on 116 Olympic volleyball players and observed that they had greater hand length than the controls.

Greater Total Arm Length is directly proportional to strength, which helps in spiking, lifting, blocking and defense. It gives them advantage in flicking the ball in various directions, giving spin to the ball and also will provide greater area and stability for defense.

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COMPARATIVE EFFECT OF CALISTHENICS EXERCISE & RESISTANCE EXERCISE ON UPPER BODY STRENGTH AND LOWER BODY STRENGTH OF SENIOR CITIZEN

***Mukesh Narwariya**

Abstract:

The goal of this study was to assess the effects of Calisthenic and Resistance exercise training on upper and lower body strength in Senior Citizens. 120 senior citizens aged 60 to 72 years old were chosen at random and placed into three groups, each with 40 subjects. Squats, Pushups, Curls, Lunges, and Front Raises were chosen for Group A (Calisthenic exercise Group). Biceps Curl, Shoulder Press, Leg Curl, Chest Press, Front Raise, Bent over row are among the exercises performed by group B (Resistance Exercise Group), whereas the control group did not participate in any program other than their everyday routine. The exercise was modified as per the age level of subjects; for example, modified pushups reverse dips, etc. For a period of 12 weeks, experimental groups received 50 to 60 minutes of training three times a week. The participants' Upper body strength and lower body strength were measured before and after the twelve-week intervention. The Biceps curl was used to assess upper body strength, while the 30 Seconds chair stands were used to assess lower body strength. To examine the data, descriptive statistics and analysis of covariance (ANCOVA) were used at the 0.05 level of significance, revealing a significant difference between calisthenic and resistance exercise. A post hoc mean comparison revealed that the Calisthenic group differed significantly from the Resistance and Control groups, while the Resistance Exercise group differed insignificantly from the Control group.

Key Words: Calisthenic Exercise, Resistance exercise, Strength

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Introduction:

Most physiological systems gradually decline as we age. It may cause frailty, a syndrome characterized by a reduction in the body's ability to endure and perform, leading to a vicious cycle of physiological decline and vulnerability to negative effects. Aging is typically linked to both physiological and social issues. Loss of production capabilities and dependency on retirement income typically leads to increased expenses, particularly medications, and decreased income. However, the Indian family has changed considerably, especially since women's entry into the workforce, making home care more difficult and increasing demand for long-term care institutions. However, the lack of stimulation in existing long-term care facilities (LTCFs) may create functional decline and physical dependence. Frailty impairs functional capacity by weakening the muscles required to walk, stand up from a chair, and maintain balance. It raises the risk of falls, disability, hospitalization, and death. The prevention of frailty could reduce both public and individual costs, which are increasing proportionally as the global population ages. Exercise training could help prevent or treat frailty without drugs. Muscular strength appears to be linked to a range of comorbidities as well as the incapacity to complete daily activities. Studies on multicomponent training programs found benefits for senior citizens beyond strength training. But a solution with greater benefits has yet to be found.

Methodology:

The current study included 120 senior males from Gwalior aged 60 to 72. Only individuals who were physically fit to engage in the training program were chosen for the study. The calisthenics and resistance exercises were chosen as functional capacity criteria based on the literature available, expert suggestions, and the researchers' understanding. Both kinds of exercises contain some of the yogic activities listed below:

Yogic training protocols for experimental groups

Training Protocol-1	Training Protocol-2
1. Suryanamaskar	1. Tadasana or palm tree pose
2. Tadasana (Mountain Pose)	2. Naukasana
3. BaddhaKonasana (Butterfly pose)	3. Marjariasana or cat cow pose
4. Bhujangasana	4. Kapalbhati

The subjects were trained in Gwalior. Before the real training program, all subjects were properly briefed about the test technique and given the requisite number of practice trials to develop proficiency with the exam. The morning sessions were devoted to training. Separately, a 12-week calisthenic and resistance training regimen was established. The effects of both phases of training on chosen physical characteristics of Senior Citizens were compared using a pre-post random group approach.

The guidance helped build a 12-week data gathering training program. The subjects had a physical pre-test before the training began. After the 12-week training program, each group received post-data on selected physical qualities. The test instruments were all of acceptable quality and calibrated.

The mean, SD, minimum, maximum, and variation were calculated using descriptive statistics. ANCOVA was used to compare the means of different groups and find significant differences. The Post Hoc Test (LSD) was also utilized to compare group means and find significant differences. All statistical procedures used SPSS version 20.

Result and Discussion:

Various descriptive-analytical measures were used for the selected tests of functional capacity parameters were calculated and presented in Table-1

Table 1: Descriptive Analysis of Physical Variables

Test items	Groups		Mean	Min. Score	Max. Score	Range	SD	Variance
Arm curl	Calisthenic exercise	Pre	10.75	8	14	6	1.77	3.12
		Post	16.78	14	19	5	1.29	1.67
	Resistance Exercise	Pre	10.90	8	14	6	1.68	2.81
		Post	16.30	13	19	6	1.57	2.47
	Control	Pre	11.25	8	15	7	2.03	4.14
		Post	10.18	7	14	7	2.23	4.97
	Calisthenic Exercise	Pre	8.15	6	12	6	1.56	2.44
		Post	14.98	12	18	6	1.48	2.18

30 seconds chair stand	Resistance	Pre	9.90	7	12	5	1.15	1.32
	Exercise	Post	14.68	12	18	6	1.42	2.02
		Control	Pre	10.93	8	13	5	1.58
	Post	10.08	7	15	8	2.38	5.66	

According to table 1, the pre mean values for the calisthenic exercise group, resistance exercise group, and control groups on the arm curl test item were 10.75, 10.90, 11.25, 8.15, 9.90, and 10.93, respectively, while the standard deviation values were 1.77, 1.68, 2.03, 1.56, 1.15, 1.58. The post mean values for calisthenic, resistance and the control group on 30 seconds chair stand were 16.78, 16.30, 10.18, 14.98, 14.68, and 10.08, respectively, while the standard deviation was 68.37, 85.76, 66.17, 1.14, 2.02, 1.64.

Table 2 shows the results of the post hoc test (LSD) performed to determine the paired mean difference where the F ratio is significant.

Table No. 2: Critical Differences between Calisthenics Group, Resistance Exercise Group and Control Group in Arm Curl

Test Item	Adjusted means			CD
	Callisthenics Group	Resistance Group	Control Group	
Arm Curl	16.94	16.35		.059
	16.94		9.95	6.99
		16.35	9.95	6.4

CD .05= 0.4356 *Significant

Table-2 revealed that in the arm curl test for measuring upper body strength, there were significant differences between the calisthenics, resistance exercise, and control groups of senior citizens. The callisthenic and resistance exercise groups, on the other hand, showed a significant difference. Even though the difference was only .059 compared to the critical value of 0.4356 at the .05 level, it was significant. The mean value indicates that resistance exercise outperforms both the Callisthenic and control groups.

When the F ratio was significant, the post hoc test (LSD test) was employed to assess the paired mean difference, and the findings are shown in Table-3.

Table No. 3: Critical Differences between Calisthenics Group, Resistance Exercise Group and Control Group in 30-Seconds Chair Stand

Test Item	Adjusted means			CD
	Callisthenics Group	Resistance Group	Control Group	
30-Second	16.42	14.44		1.98
Chair Stand	16.42		8.85	7.57
		14.44	8.85	5.59

CD .05 = 0.495 *Significant

Table-3 revealed that there were significant differences between the calisthenics, resistance, and senior citizen control groups. The critical difference between the Callisthenic and Resistance groups was 1.98, the critical difference between the Callisthenic and control groups was 7.57, and the critical difference between the resistance and control groups was 5.59. This clearly shows that the resistance group improved more than the Calisthenics Group in the 30-second chair stand.

Conclusion:

In the functional capacity features of the Arm curl, the data revealed a significant difference between the Calisthenic Exercise Group, Resistance Exercise Group, and Control groups. There were significant differences between the Calisthenic Exercise Group, Resistance Exercise Group, and Control Group of a senior citizen, according to the least significant difference test. The group doing Calisthenic Exercises exceeds the other two. The Resistance Exercise Group, on the other hand, outperforms the Control group.

The calisthenic Exercise Group, Resistance Exercise Group, and Control group all had significantly different functional capacity metrics for 30 seconds chair stand (Table 4). When the F ratio is significant, the post hoc test (LSD test) was used to find the paired mean difference. The LSD test revealed significant differences between the senior Citizen in the Calisthenic

Exercise Group, Resistance Exercise Group, and Control Groups. The Calisthenic exercise group outperformed the Control Group, with the resistance exercise group having the smallest mean difference, indicating more training for 30 seconds chair stand test.

The study shows a significant improvement in upper body strength and lower body strength while performing calisthenic exercises. So, it can be said that calisthenic exercises are effective means to improve the working strength of senior citizens and to maintain a healthy lifestyle.

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COMPARISON OF PROBLEM SOLVING ABILITY AMONG INDIVIDUAL AND TEAM ATHLETES AT SCHOOL LEVEL

***¹ Neelkamal Boro**

***² Dr. Gaurav Pant**

Abstract:

The purpose of the study was to compare the problem solving ability between Individual Athletes and Team Athletes at school level. For this study the investigator selected fifty (50) individual athletes and fifty (50) team athletes. The subjects were between the age group of 16-19 years and the level of significance 0.05. The subjects were randomly selected for the study. To measure problem solving ability between individual athletes and team athletes, a questionnaire developed by L.N. Dubey and Dr. C.P. Mathur was employed. For statistical analysis and interpretation of data 't' test was conducted. It was observed that there was no significant difference in Problem solving ability among Individual athletes and Team athletes.

Keywords: Problem Solving, Team Athletes, Individual Athletes

1. Introduction:

Problem Solving is the frame-work or pattern within which creative thinking and reasoning take place. It is the ability to think and reason on given levels of complexity. People who have learned effective problem solving techniques are able to solve problems at higher levels of

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complexity then more intelligent people who have not such training.

In general, the state of tension is created in mind when an individual faces a problem. He exercises his greatest effort and uses all his abilities, intelligence, thinking, imagination observation etc. Some individuals are able to solve problems sooner than others. That indicates that there are levels of problem solving ability- ranging from average ability to highest ability depending upon the difficulty level of the problem. A simple problem can be solved by the person having average problem solving ability, while high level of ability is required to solve complex problems.

The problem solving is a process of overcoming difficulties that appear to interfere with the attainment of a goal. Simple problems can well be solved by instinctive and habitual behaviours. More difficult problems require a series of solution attempts, until the successful solution is reached problems still required a more difficult degree of understanding, a perception of the relationships between the significant factors of a problem. It has been found that persons having higher intelligence and reasoning ability, can solve the complex problem quickly. Therefore, it is necessary that on one hand we try to develop intelligence and reasoning ability and on the other hand we should also develop the problem solving ability through proper education and training of our young boys and girl.

2. Methodology:

2.1 Selection of subject

In order to compare the problem solving ability between individual athletes and team athletes at school level. For this study the investigator selected fifty (50) individual athletes and fifty (50) team athletes from different schools of Pune. Thus the total numbers of subjects were 100 only. The age Group of the subjects was ranged from (16-19) years.

2.2 Criterion Measures

To measure problem solving ability between individual and team athletes, a questionnaire Problem Solving Ability Test develop by L.N. Dubey and Dr. C.P. Mathur was employed. The data were collected from the various school students who used to take part in

different games and sports in schools tournaments or other tournaments. The questionnaire consists of twenty items with four alternative answers and only one answer was correct was used. The score range from 00 to 20. The higher the score, the greater is the ability.

2.3 Administration of Questionnaire

Respondents will be given a questionnaire with necessary instructions. Necessary instructions will be passed on the subject before providing the questionnaire.

2.4 Statistical Techniques

For the present study, the mean value, standard deviation and independents 't' test were applied to analyze the data.

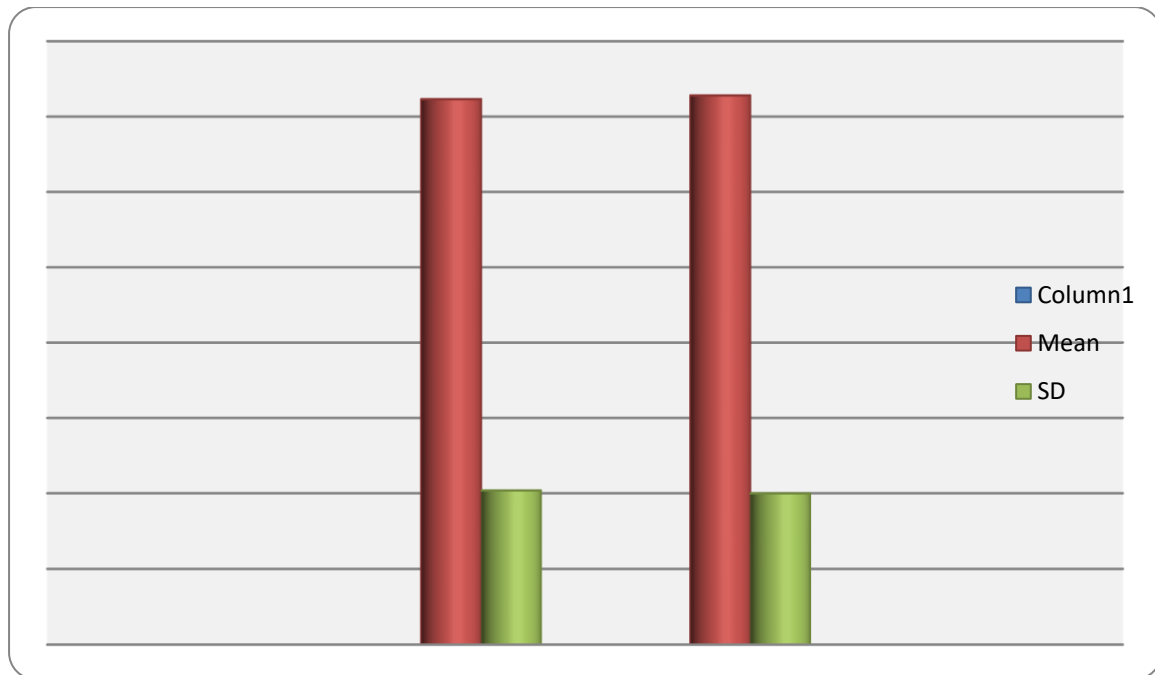
3. Results:

Table No. 1 Comparative statistics of problem solving ability of team athletes and individual athletes, Age 16-19 years (boys and girls)

Test	N	Mean	SD	DF	MD	t- Value
Team athletes	50	14.46	4.075	49	0.1	-0.1239
Individual athletes	50	14.56	3.996			

Significance level at 0.05 level

Table-1 Gives information regarding Problem Solving Ability of Individual and Team Athletes. Table shows that there were no significant differences in Problem Solving Ability between Individual and Team Athletes. The Mean of Problem Solving Ability of Individual and Team athletes were 14.46 and 14.56 respectively. 't' test was applied and t-value (-0.1239) appeared no significant. Graphical representation (Fig.1) also indicates similar trend of this study.



4. Discussion:

It is documented from the table that calculated 't'(-0.1239) was smaller than tabulated 't' (2.008) which indicated that there was no significant difference in Problem Solving ability between Individual Athletes and Team Athletes at 0.05 level of significance.

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COMPARISON OF COMPETITION ANXIETY BETWEEN NATIONAL AND STATE LEVEL MEN BASKETBALL PLAYERS OF MANIPUR

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*² Dr. Ksh. Birbal Singh

Abstract:

The purpose of the study was to compare the competition anxiety between national and state level men basketball players of Manipur. For this study, total 40 (N=40) players, 20 from national level men basketball players and 20 from state level men basketball players each between 18 to 25 years who have participated at the national and state level competitions were selected randomly. Sports Competition Anxiety Test Questionnaire by R. Martens, (1977) was administered to obtain the data. To find out the characteristics and mean difference among the two groups, descriptive analysis, independent t-test was employed and tested at 0.05 level of confidence. The finding of the data reveals that, there was no significant difference in the mean comparison among national level men basketball players and state level men basketball players of Manipur as the obtained value 't' = 0.51 were less than the tabulated 't' = 2.086 at 0.05 level of confidence.

Keywords: Anxiety, Basketball, Sports Competition Anxiety Test

Introduction:

Today performance in sports not only demand systematic training to develop physical, physiological variables and technical aspects of sports, but also demands training and

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consideration of psychological characteristics for success in this field. The origin of anxiety may be either psychic or somatic or even both. The most point in each case is the intensity of a bathing: that triggers off psycho-chemical reaction in the body and creates a vicious circle. Anxiety is an emotion that is difficult to define and even more to detract in performers. We would never want to be part of athletic environment. It is a condition in which the anxiety has become so great that the person has a complete control of himself and situation. The over anxious individual has a higher level of cerebral and emotional activity with a neuro-muscular tension, that may eventually lead the individual to the exhibition stage and perhaps the psychometric disorder. When an athlete gets anxious, the heart rate increases. The blood pressure becomes elevated. The breathing becomes more rapid and oxygen consumption increase. Anxiety is one of the most common determinates of good performance. Anxiety may be motivating force or it may interfere with successful athletic performance. The level of anxiety may differ from individual to individual in a game like football etc. the result of competition is also responsible for the level of anxiety experienced and its positive and negative effect on the performance.

Objective of the study:

The objective of the study was to investigate the effect of anxiety level among national and state level men basketball players of Manipur.

Hypotheses:

It was hypothesized that there might be significant differences of anxiety level among national and state level men basketball players of Manipur.

Methodology:

For this study, Forty (N=40) Subjects, 20 national men basketball players and 20 state level men basketball players each. The age of the subjects were ranged between 18 to 25 years were selected randomly as subjects of this study those who participated at the national and state level competitions. The pertaining data was collected by administering the Sports Competition Anxiety Test (SCAT) Questionnaire by R. Martens, (1977). Descriptive,

Independent ‘t’ test statistical techniques were employed to find out the characteristics of data and significant differences of anxiety level among national level men basketball players and state level men basketball players of Manipur. The level of significance was set at $P < 0.05$.

Results:

The pertaining data of anxiety level were treated by using the descriptive analysis to find out the means (M), standard deviations (SD) further, independent ‘t’ test were employed to find out the significant difference of anxiety level among players of national and state level men basketball players of Manipur as shown in table.

Table - Comparison of mean difference between national and state level men basketball players of Manipur on anxiety

Experimental Group	N	Mean	SD	df	t-value
National Basketball Players	20	13.63	3.32	20	0.51
State Basketball Players	20	16.81	16.07		

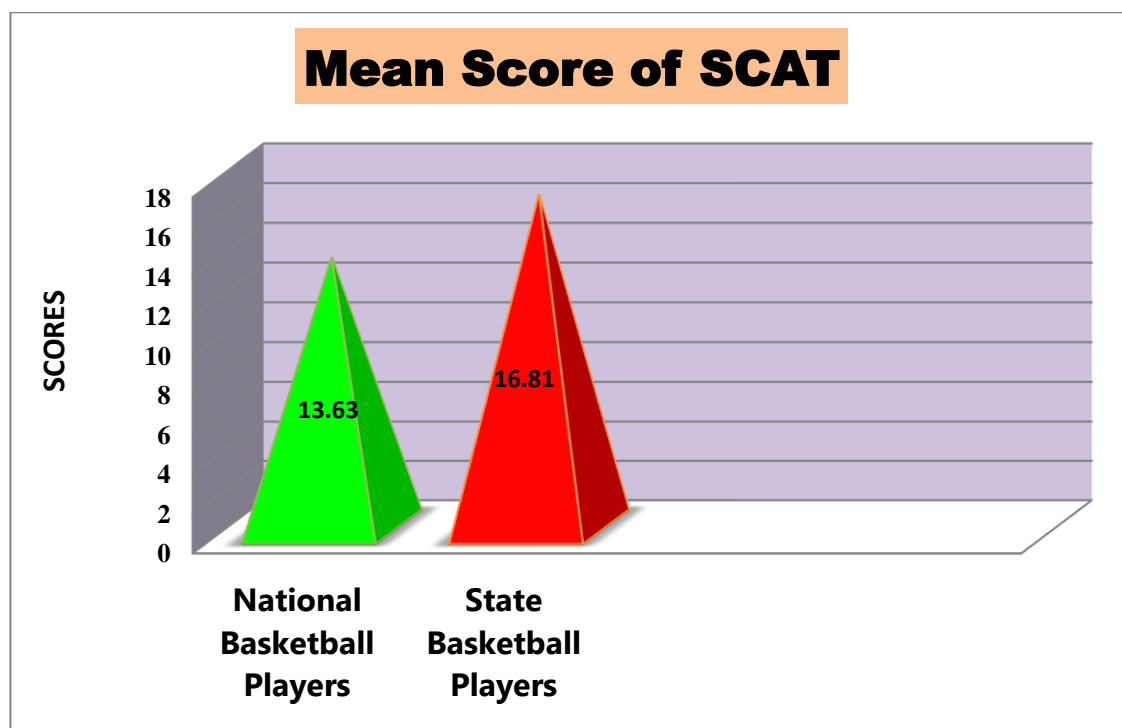
@Insignificant at 0.05 level of confidence, where, $t_{(0.05)(20)} = 2.086$

Tabulated value of ‘t’ value at 0.05 level of significance with 20 df = 2.086

Tabulation $t_{0.05}$ for S.D df = 2.086

From the finding of the above table, National level men basketball players mean is 13.63 and state level men basketball players mean is 16.81 and standard deviation is 3.32 and 16.07 respectively. After analysis of data ‘t’ ratio is not = 0.51 at 0.05 level of significance. Here there is no significant exists between national and state level men basketball players of Manipur.

The graphical representation of means comparison is shown at figure.



Discussion of Finding

The finding of the study reveals that there is no significant difference in anxiety level among national and state level men basketball players of Manipur.

The significant difference was not found on this study because the age of all the players of national and state level men basketball players of Manipur for this study was range in between 18-25 ages. At these ages most of the people have thinking abilities and manage his/her situation.

Testing of Hypothesis:

From the above finding of the study reveal that statistically there was no significant difference in competition anxiety level between national and state level men basketball players of Manipur. Hence hypothesis stated earlier is rejected and null hypothesis is accepted.

Conclusion:

The results of the study indicated that there was insignificant in the competition anxiety level of national and state level men basketball players of Manipur.

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LACK OF AWARENESS OF SPORTS FATIGUE

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*⁷ Pravesh Mandawara *⁸ Jayendra Kenekar**

Abstract:

Sports Science refers to the study of science in relation to sporting activities. Sports Science aims to maximise the performance of the athlete and reduce the risk of injury. With the current advancement in Sports Science and technology, the success is subject to various parameters. Coaches are a key aspect of this equation, athletes rely on coaches for proper direction regarding training and injury prevention, but lack of knowledge puts the athletes at risk. Athletes tend to overtrain leading to fatigue and increasing the probability of an injury. In the Indian sporting context, there is an urgent need to negate and generate awareness about Sports Fatigue.

Introduction:

Players follow a dedicated training regime to raise their performance levels. Sometimes athletes push themselves leading to sports fatigue. It is critical to address this as an athlete's performance levels revolve around fatigue levels. Training schedules and intensity should be

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decided by the coach and a sport scientist, as they understand the needs and requirements of the athlete. Along with physical fatigue, mental fatigue affects the performance of the athlete. This research paper focuses on the awareness pattern of fatigue and the current techniques used by sports scientists and coaches to address it.

Background:

To combat Sports Fatigue, it is essential for the athlete and the coach to understand the intricacies of training, exercise, physical and mental fitness. All athletes have different physical standards, so it is essential to create a dedicated program for each of them. Coaches need to be educated about the correlation of mind and body in athletes.

It is necessary to carefully monitor to prevent overtraining, this should be backed by thorough training regime that is tailored to the athlete's requirement (Budgett,1998).

Former Indian Women's Cricket team physio Anuja Dalvi in an interview said the following:

“There is a huge difference in the training intensity in Women's Cricket to that of Men's Cricket as hormones play a major part in women's cricket and not only those women cricketers have to do household chores along with training as they need to manage the family as well.”

This difference in training intensity means that there is a huge difference in the fatigue levels of female athletes and male athletes.

Sports science has a positive impact on the athletes, as it helps in preventing injury and recommends precautionary measures. Technology has enabled coaches to understand the injury and prescribe a detailed treatment for the athlete.

A recovery plan comprises of many aspects and while combating fatigue, psychological aspect becomes critical as it affects the performance of the athlete.

Varadyini Gorhe, one of the leading sports psychologists' states:

“Lack of continuity in proper training leads to injury in athletes and this breakage in routine is harmful for mental health of athletes. Psychologists help the athletes to set a new routine taking into consideration the injury related problems an athlete faces”.

The current pandemic has highlighted the aspect of mental toughness, bio-bubbles constituted by sporting leagues have taken their toll on athletes, on this situation Varadyini Gorhe stated the following:

“Lack of interaction during the time of sporting events in bio bubble leads to mental fatigue in athletes. The athletes have to face high level of anxiety which takes toll on their mental health leading to mental fatigue”.

It is necessary to careful monitor to prevent overtraining, this should be backed by thorough training regime that is tailored to the athlete’s requirement (Budgett,1998).

Method:

Key aspect of the research is to understand the level of awareness about sports fatigue in the Indian ecosystem. 196 responses were collected through a Google form and tabulated in excel for proper data representation.

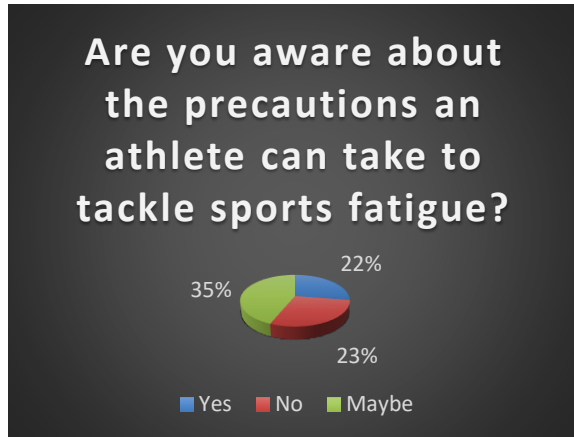
To supplement our research, interviews with Industry experts were conducted to gain additional insights.

Sr.No	Name	Designation
1	Anuja Dalvi	Physiotherapist
2	Nikhil Latey	Sports Scientist
3	Varadyini Gorhe	Sports Psychologist

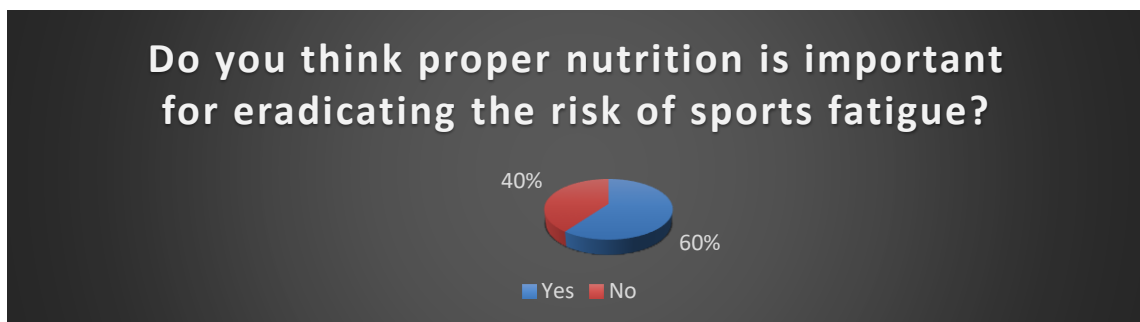
Data Analysis:

The following data presented in this paper has been obtained from questionnaire set by IISM in order to attain maximum data related to sports fatigue. The questionnaire set clearly showed that the topic of sports fatigue is an underlying topic in sports industry. When asked sports athletes/management students we were able to understand that while a majority of them

were aware of the importance of sports science, most of them were not aware about the field of sports fatigue. In the research conducted we observed that while 84% of Sports athletes/management students were aware about sports science, 35% of them were not really sure about the impact of sports fatigue on performance of the athlete.



Lack of awareness was clearly observed in the data. We observed that 60% of people were not aware of the importance of proper nutrition in order to reduce the impact of sports fatigue.



The athletes from the questionnaire were also asked as to how they would prevent sports fatigue playing an important role in performance of the athletes. The athletes seemed quite clear that proper warm up and cool down after intensive training is essential for preventing sports fatigue related negative impacts.

Discussion:

In a competitive world it becomes of utmost importance that every athlete gives his/her best performance to be on top. In order to give the best performance, the athletes need to be aware of all the intricacies of the sporting industry. In current scenario having skills is not just the requirement but understanding and performing on the lines of the intricacies of sport becomes important. The athletes will get aware about these intricacies only if their coaches and guides help them in understanding them. It will be possible for them if the proper knowledge about that is taught from start.

EFFECT OF DETRAINING OF TRATAKA ON PSYCHOLOGICAL VARIABLES OF SPORTS PERSON

***1 Rajat Sukladas**

***2 Sandipraj S. Autade**

Abstract:

The main purpose of the study was to find out the effect of detraining of trataka on psychological variables of sports person. For this purpose thirty samples were selected randomly (both male and female) from Bharati Vidyapeeth, College of Physical Education. For the purpose of establishing reliability of data the two variables i.e. reaction time and memory were being tested. The standard equipment was used for this study. The reaction timer and memory drum were used and average was recorded, as a final data. Average performance of reaction time were pre test (0.554) and post test were (0.525). The average performance of memory pre test were (3.65) and post test (3.75). Mean, S.D. and ANOVA were implemented for analysis of data. The result of this study revealed that there is no significant effect of detraining of trataka on psychological variables of sports person.

Keyword: Trataka, Memory, Reaction time and Detraining.

Introduction:

Trataka (in Sanskrit trataka to look or to gaze) is the practice of starting of some external object. It is used in yoga as a way of developing concentration, strengthening the eyes. Trataka is defined as focusing your attention with concentration on a point or on the

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flame of a lamp continuously without blinking. There are three types of trataka. i.e. Inner trataka, Madhya trataka and Bahya trataka. Inner trataka is closing the eyes and focusing your attention on the middle of your forehead. Where lord Shiva's third eye is located. In the beginning you may feel some pain or heat in your head but do not worry. As it will normalize gradually. Try to keep your entire attention on this point.

An athlete or sports person or sports woman is a person who is good at a sports and competes in one or more sports that involve in physical strength, speed or endurance. The terms application to those who participate in other activities, such as horse riding or driving, is somewhat controversial. Athlete may be professionals or amateurs. Most professional athletes have particularly well developed physiques obtained by extensive physical training and strict exercise accompanied by a strict dietary regimen. A person who is active in sports: as one who engages in the sports of the field and especially in hunting or fishing, athletes involved in isotonic exercises have an increased mean left ventricular and diastolic volume and are less likely to be depressed.

Methodology:

This was an experimental research which was conducted to find out the detraining of trataka on psychological variables of sports person. This study was confined to the yoga student of Bharati Vidyapeeth, College of Physical Education. The purposive with random sampling procedure were adopted to make the sample. The 30 yoga students had taken with age ranging from 18-25 years were selected for the sample of the study. For the analysis of data ANOVA was used as statistical tool. The level of significant was 0.05. The data was analyzed by using descriptive statistics.

Method of Measurement of Variable:

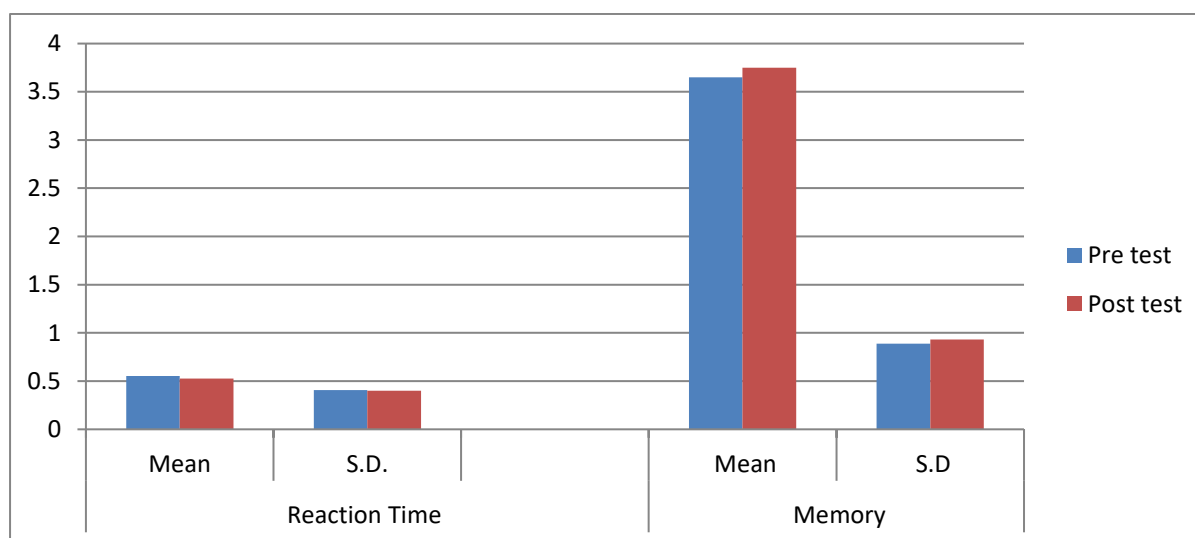
Reaction time and memory were the variable for this study. The field test was used to measure the selected variable.

Table 1: Data Analysis of Reaction Time and Memory

	Reaction Time				Memory			
Group	Subjects	Mean	S.D.	ANOVA	Subjects	Mean	S.D.	ANOVA
Pre test	30	0.554	0.407	0.231	30	3.65	0.887	2.75
Post test		0.525	0.401			3.75	0.933	

*level of significant: 0.05

Graph 1: Data Analysis of Reaction Time and Memory



Discussion and Conclusion:

The result of Descriptive Statistics revealed that the pre test mean of reaction time was (0.554) post test (0.525), and standard deviation were 0.407 and 0.401 respectively. On the application of ANOVA it was found that the calculated value is 0.231. The pre test and post test mean of memory were 3.65 and 3.75 respectively and standard deviation were 0.887 and 0.933. That has been confined that by applying ANOVA and found that the calculated value is 2.75.

Hence from the analysis, it is known that there is no significant effect of detraining of trataka on psychological variables of sports person.

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EFFECT OF UP AND DOWN HILL RUNNING TRAINING PROGRAMME ON THE PERFORMANCE OF 100M RUN FOR BOYS AGED 12 TO 14 YEARS

***Mr. Rizwan Bashir Shah**

Abstract:

The Objective of the study was to collect information about Effect of Up and Down Hill Running Training Programme on the Performance of 100m Run For Boys Aged 12 to 14 Years from South Mumbai. It was an experimental design study consisted of Controlled Group and Experimental Group. All the subjects were randomly selected from The New Era School, Mumbai Aged 12 to 14 Years Boys. Six weeks Up and Down Hill Running Training Programme was conducted for the Experimental Group. As per the design of the study, Pre and Post Data was collected from both the groups respectively. The collected data was analysed by t- test method of Statistical procedure. The t-value of the comparison mean between Pre and Post test of 100m Run was 0.54 which was significant at 0.05 level. It was concluded that Six weeks Up and Down Hill Running Training Programme was useful for improving 100m Run performance for Boys Aged 12 to 14 Years.

Keywords: Up and Down Hill Running, 100m Run, Adolescence, Training Programme, Experimental Design

Introduction:

Sports represent the human culture. Sports are generally classified as a part of our culture in different ways in several areas. E.g. Sports performance, physical education, rehabilitation sports, fitness and leisure sports, adventure sports, etc., each area of sports caters to the requirements and demands of particular sections of his society and importance then the area. The principal aim of performance sports is to prepare sports person for giving high sports

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performances.

Coaches and physical educationist today are continuously confronted with the task of improving the performance of the players with the help of specialized training in athletics, games and sports. For achieving high level of performance at national and international levels, the systematic training and conditioning of players play a vital role.

The status in athletics reveals an upward trend in the performance, which clearly indicates that physical educationist, and coaches have been working hard in the field of research to find new methods of training so as to maintain players on top for a long period of time by achieving peak performance.

The present study aims to find whether athletic performance can be developed with the help of up hill and down hill running training programme.

The investigator is of the opinion that the quality of traditional training has to be radically altered to enable or to attain consistency of peak performance for long period. various training methods had been used for the improvement of the performance, they are interval, weight training , fartlek, etc. however, regarding the efficiency of up hill and down hill running training may have better significance for enhancing top performance of an athlete. This assumption has difference of opinion and infact it has no real experimental evidence especially for the Indian athletes. Therefore, the research problem, “**A Study Of Effect Of Up And Down Hill Running Training Programme On The Performance Of Selected Athletic Events For Boys Aged 12 To 14 Years**” has been studied with the following **objectives** to conduct.

Objectives of the study:

- The objective of the study was to find out whether 100m run performance can be improved with the help of up and down hill running.

Hypothesis:

- Up & down hill running would not contribute to the 100m run performance

Limitations:

- While conducting the experiment, the research scholar could not control the food habits, health & the daily living style of the subjects involved in the study of both control as well as experimental group, as they were day scholars & had varied background.

Delimitations:

- Since the study has large scope for different age groups.
- It is therefore, decided to delimit the study to 6 weeks only for the boys aged 12 to 14 years of The New Era School, Kempes Corner, Mumbai-400007 for the 100m run performance.

Significance of the study:

- The study will help the players, coaches and Research scholars to see the usefulness, effectiveness as well as utility of uphill & downhill running to improve speed & performance of the 100m athletic event.
- This study may give an opportunity and encouragement to the interested researchers to conduct further studies on hill running in relation with performance, fitness of the athletes and for the players participating in other games.

Methodology:

Research Design:

The researcher had chosen a parallel group design for conducting experiment.. This study consisted of one controlled group and the other experimental group. The experimental group received up and down hill running training, whereas controlled group organized before and after an experimental period of six weeks.

Selection of subjects:

Subjects were pulled by using technique of Fisher's table random sampling, from the New Era School, Mumbai. The students represented the school in inter school athletics were selected. They were divided into groups consisting 20 subjects in each, viz. experimental and control group.

Training Schedule:

The period of training was of six weeks. The subjects will be made to run up hill and downhill as per the training schedule i.e., mentioned in training period

Training Schedule had been imparted as below

15 minutes	warm up
25 minutes	training period
10 minutes	event practice
10 minutes	cool down

Criterion measures:

VARIABLE	TEST	UNIT	TOOL
100 METER RUN	100 METER RUN	seconds	Stop watch

Statistical analysis:

The data was recorded by using standard procedures. The data was analyzed by using 't' test as suggested by M.C Guigan for significance of difference. The analysis was done by SPSS 11.5 (software statistical package).

Result of the selected variables on the control group. (within group):

Table 1: Result of selected exercises on 100m run of Control group

Test	Score Unit	Pre-Test Mean+_SD	Post-Test Mean+_SD	Mean Difference	SE	't'	Remark
100 m	Sec.	15.71 (1.084)	16.19 (0.99)	0.11	0.21	0.54	P<0.05

It is seen from Table no.1 that in the case of 100m the mean score of pre test and post test of the controlled group are 15.71 (1.08) and 16.19 (0.99) respectively, whereas the mean difference is -0.48 and 't' value of the same which is significant at 0.05 level.(P<0.05)

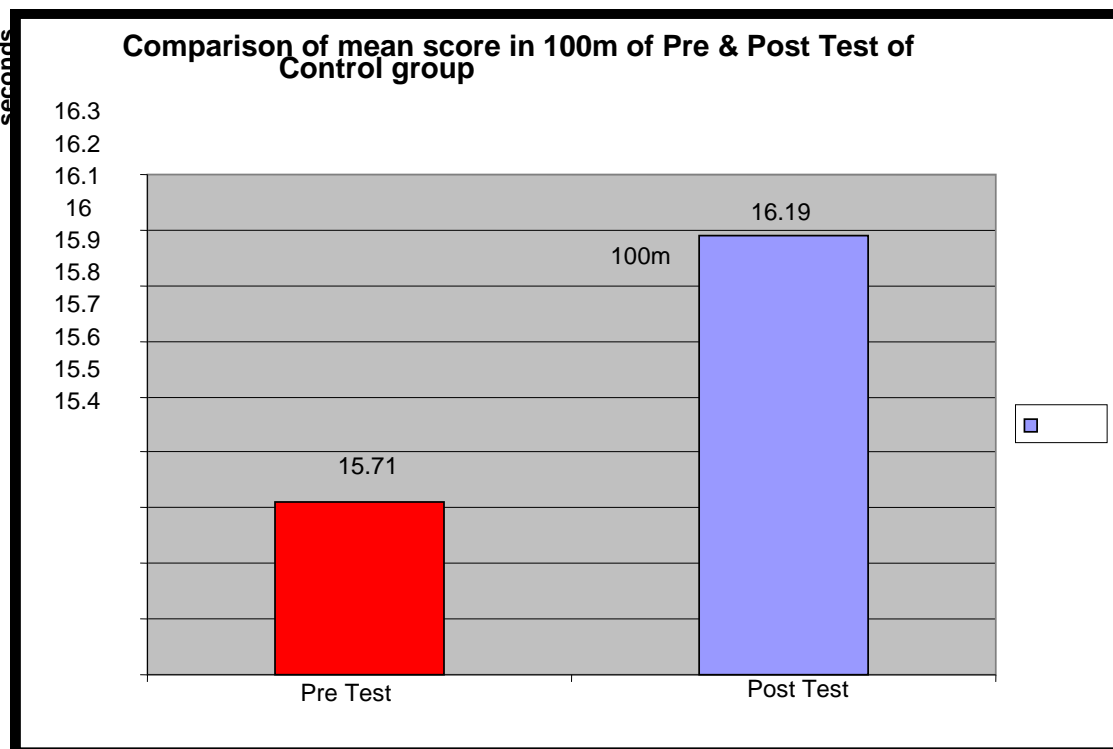


Fig. 1: Result of selected exercises on 100m run of Control group

Result of Selected Variables on the Experimental Group. (Within Group)

Table 2: Result of Selected Variables on the Experimental Group. (Within Group)

Test	Score Unit	Pre-Test Mean+_SD	Post-Test Mean+_SD	Mean Difference	SE	't'	Remark
100 m	Sec.	14.8705 (0.97)	14.1955 (1.01)	0.19	0.14	1.29	P<0.05

Influence of selected exercise on 100m run:

It is seen from Table no.1 that in the case of 100m the mean score of pre test and post test of the experimental group are 14.87 (0.97) and 14.19 (1.01) respectively, whereas the mean difference is 0.19 and 't' value of the same which is significant at 0.05 level.(P<0.05)

The above results have been also represented graphically

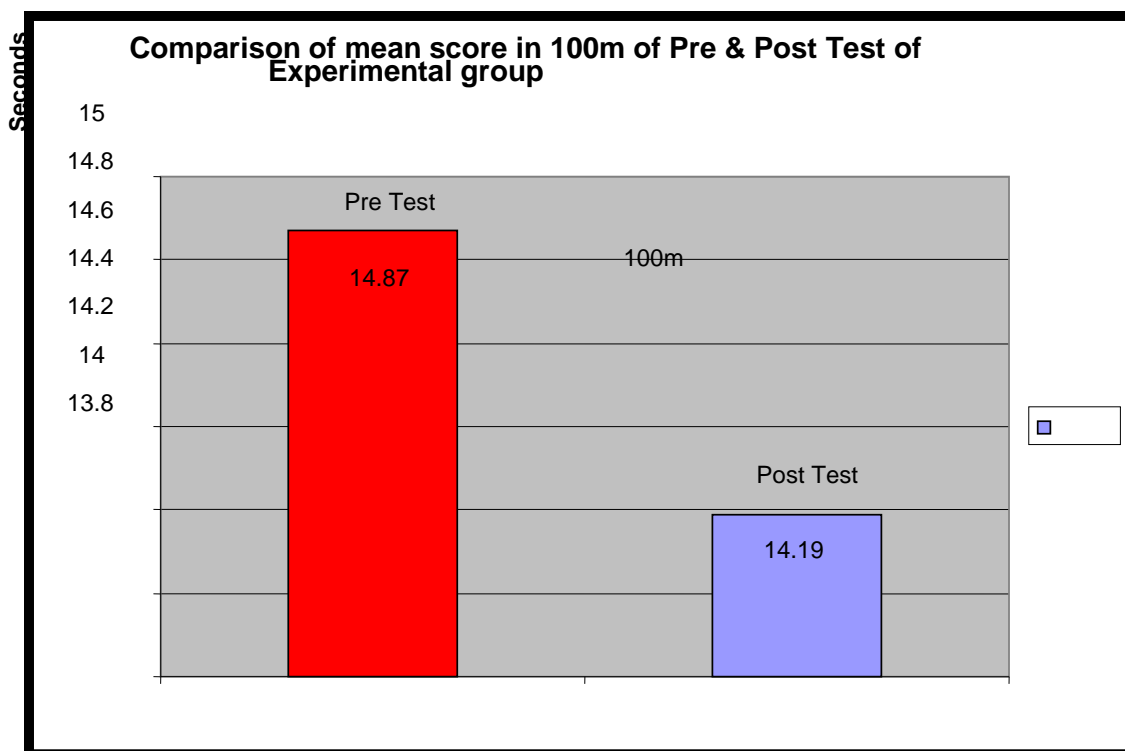


Fig. 2: Influence of selected exercise on 100m run

Comparison of results of selected variables between the control and experimental group. (between group)

Table-3: Comparison of results of selected variables between the control and experimental group. (between group)

Variables	Group Compared	Mean Gain	Mean Difference	Standard Error Mean Gain	't'	remark
100m	Control Vs Experimental	0.1150 0.1835	0.685	0.25433	0.269	P>0.05

It is seen that from the table 3 that in case of 100m that the mean gain of the control group and experimental group is 0.1150 and 0.1835 respectively, whereas the difference in mean gain of both group is 0.0685 which is not in favor of control group, whereas the 't' values of the same is 0.269 which is not significant at 0.05 level.

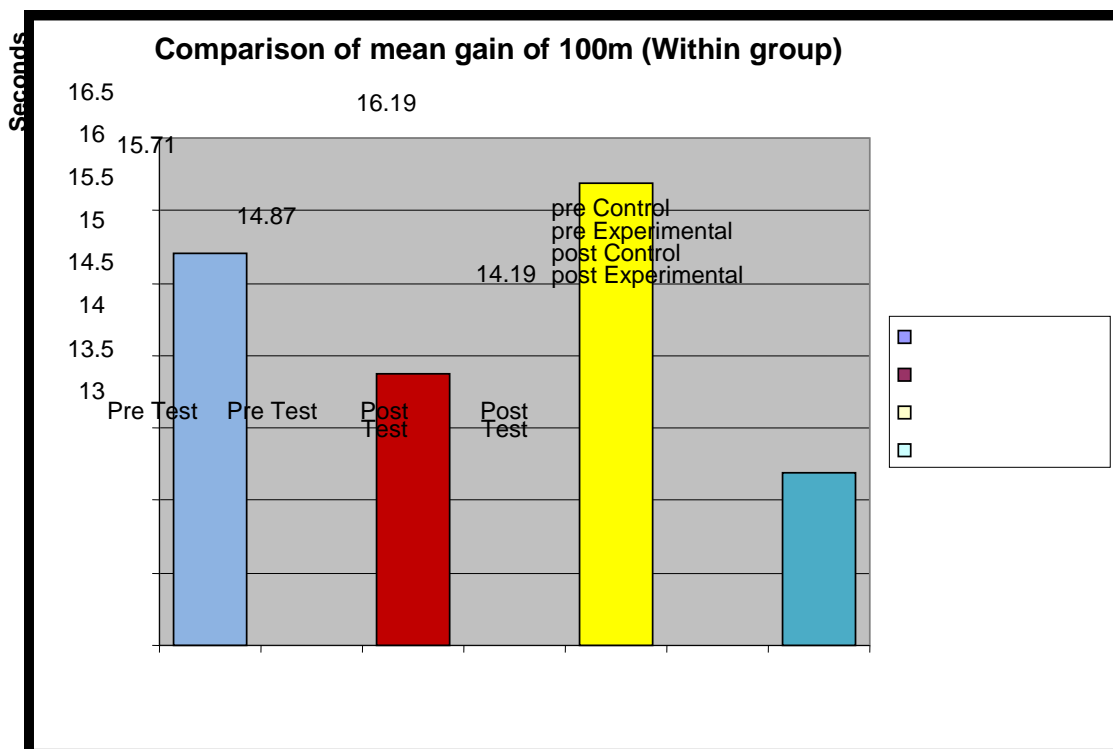


Fig. 3

Discussion on results:

The analysis of data reveals that the Experimental group has improved in 100m, within group significantly. Also the comparison between the Experimental and the controlled group shows that the Experimental group improved significantly in 100m. The probable reason behind this was the up hill and down hill running training program was proper for the improvement in the above Performance test. The selected exercise might lead to the improvement in 100m of the Experimental group who had undergone of training programme. The training intervention composed of up hill and down hill running training might have helped to improve the selected performance variable of the Experimental group. Regarding the 100m improvement is statistically significant though there is little improvement in the variable in Control group i.e. 100m run, but not statistically significant.

It is seen the significant improvement in 100m the positive result in turn rejected the null hypothesis HO1. Various research reports in the area of exercise and physical fitness revealed that training of up hill and down hill running has a good effect on the performance factors. A systematic training of training can improve 100m run performance.

Training contributes to take care of ones Performance, skill, co-ordination. The result of present study is also in agreement of with various findings related to up hill and down hill running training. Therefore it can be interpreted that the result obtained in the present study has real significances with special reference to performance.

Conclusion:

This study within limitations warrants the following conclusion Regular exposure of exercise involved in up and down hill running for the period of six weeks can significantly improve the overall performance.

Recommendations:

1. The study recommends that up and down hill running training can be used as a suitable means to improve the performance of athletes.
2. This type of study can be given to women and youth boys athlete.

3. This type of study can be given for long distance runners.
4. It is recommended that further studies be conducted to verify these results using perhaps a longer period of up and down hill running training with greater practice session per day. Thus, great need of additional studies is emphasized.
5. This type of study can be incorporated in the schedule of sports training for the better results.

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EFFECT OF NUTRITIONAL SUPPLEMENTATION, DIET PROGRAM, WEIGHT TRAINING AND CARDIO TRAINING AS REMEDIAL MEASURES FOR OVERWEIGHT AND OBESE ADULTS OF URBAN AREA

***Dr. Sachin B. Shinde**

Abstract:

*The purpose of this study to measure the effect of existing method and specific training as remedial measures for overweight and obese adults of urban areas. For the present study 60 male and female was selected from urban area with the help of survey on 1800 adults from health and fitness centre and parents from schools. One group pretest post test method Research Design was used for data collection. Pre-data was collected from male and female and suggested them 4 training program namely nutritional supplement, diet, weight training and cardio training. This training was conducted for for 10 weeks. After 10 weeks post data was collected from the same sample. Collected data was analyzed with the help of **2*4 Factorial Ancova**. The *F* value was 18.66 which is significant at 0.01 level. The treatment found more effective to male and females aged 35 to 45 years for keeping control on their BMI.*

Keywords- Nutritional Supplementation, Diet Program, Weight Training, Cardio Training, Overweight, Obese and Urban Areas

Introduction:

What supposed to be the reasons that cause Overweight and Obesity over the long period of time, much different kind of Researches have been conducted for Controlling the Overweight and Obesity amongst Human populations. The Researchers have come

*Director of Global Sports Academy

across many findings and reasons and Cause of getting Overweight and Obese. It is the food that we intake gives us energy. A lack of energy balance most often causes overweight and obesity. The Energy balance means that the energy IN equals the energy OUT. Energy IN is the amount of energy or calories that a person gets from food and drinks. Energy OUT is the amount of energy that body uses for things like breathing, digesting, and to stay physically active. To maintain a healthy weight, your energy IN and OUT don't have to balance exactly every day. It's the balance over time that helps the person to maintain a healthy body weight.

- Body weight Stays = The same amount of energy IN and energy OUT over time
- Body Weight Gain = More energy IN than energy OUT over time
- Body Weight Loss = More energy OUT than energy IN over time

Overweight and obesity thus happen over the period of time when we take in more calories than we use, it happens Due to Social Lifestyle and Work nature People who aren't very physically active. One of the major reason for this is that many people spend hours in front of TVs and computers doing work and leisure activities. In fact, more than 2 hours a day of regular TV viewing time has been linked to Overweight and Obesity.(Fitness for life, Charles Corbin.2004)

Objective of the Study:

- To study the effect of Treatment on BMI of Obese Urban Adults by taking Pre-BMI as Covariate

Hypothesis of the Study:

- There is no significance difference in the adjusted mean scores of BMI of Obese Urban Adults by taking Pre-BMI as Covariate

Delimitation of the Study:

This study was delimited to the Body Composition

- This study was delimited to the Morphological variable i.e. bodyweight measured by Weighing machine and Body height measure by Stadiometer
- This study was delimited to Males and Females belonging to Mumbai district only
- This study was delimited to Male and females who was going in health and fitness center & People who are only taking Diet consultation
- Thairoid problem was not be taken into consideration

Limitation:

While conducting this study, the researcher recorded the following shortcoming:

- The lifestyle of both the Groups were not controlled by the Researcher, Supplements, Diet & Training of Experimental Groups were not controlled for the Experimental group

Research Design:

The study was planned on the basis of the principles of Non Equivalent Group Design, thus this piece of research conducted one group Pre test- Post test design, and in this design a baseline is established prior to the treatment (x). The symbolic expression of this design is as under

- A survey research is conducted in various health & fitness centres and School parents with sample population of 1800 who are having Overweight and Obesity problem, Males and Females aged between 35 to 45 years, they were selected and constituted with 4 experimental group. Specific training programme was imparted for 10 weeks.
- Pre test data of the subjects was collected on the selected Morphological and Physiological basis, after the pre test is over the subjects of the experimental groups were trained with specific training program and the other three groups with prevalent training programmes, after the treatment all the 4 groups was undergone for post tested on same parameters.

Population and Sampling:

For the present study 240 Urban adults of 35years to 45years Age group was selected, the Sample was consisting of n=240, (120 Males & 120 Females) respectively,

- Out of 120 from each gender category 60 subjects were representing people who are taking Nutritional supplements, Diet programme along with weight training and Cardio training,

STATISTICAL PROCEDURE

The data of all the variables were primarily for descriptive statistics further they were analyzed by employing 2 X 4 Factorial ANCOVA.

RESULTS ON BODY MASS INDEX (BMI)

Effect of Treatment on BMI of Obese Urban Adults by taking Pre-BMI as Covariate

The objective was to study the effect of Treatment on BMI of Obese Urban Adults by taking Pre-BMI as Covariate There were four levels of Treatment Namely (A) Nutritional Supplements, Diet programme & Weight training and Cardio Training, (B) Diet programme & Weight training and Cardio Training, (C) Diet programme and (D) Diet programme & Specific Training programme. Male and Female were the level of Gender. Pre-BMI was the Covariate. Thus, the data were analysed with the help of 4X2 Factorial ANCOVA. The results are given in Table 1.

Table 1: Summary of 2X4 Factorial Design ANCOVA of Body Mass Index by taking Pre-BMI as Covariate

Source of Variance	df	SSy.x	MSSy.x	Fy.x
Treatment	3	8.79	2.93	18.66
Gender	1	0.002	0.002	0.02
Treatment*Gender	3	9.76	20.73	20.73
Error	231	36.26	0.16	
Total	239			

From Table.1 it can be seen that the adjusted F-value for treatment is 18.66 which is significant at 0.01 level with $df=3/231$ it means that adjusted mean score of BMI of the Four Groups differs significantly when the Pre-BMI was taken as Covariate. So there was a significant effect of Treatment on BMI of Overweight and Obese Adults when their Pre-BMI was taken as Covariate. Thus, the Null Hypothesis that there is no significant effect of treatment on BMI of Overweight and Obese Adults when Pre-BMI was taken as covariate is rejected.

The adjusted mean score of Nutritional Supplements was 30.17, Diet programme was 30.27 only Diet was 29.77 & Weight training and Cardio Training was 0.17 which is indicated that Diet was found significant difference at 0.01 level.

Effect of Treatment on BMI by taking Pre-BMI as Covariate

Improvement in Body Mass Index has been seen In Experimental Group 'A' who have been training with Pre Existing Training Method(A) Nutritional Supplements, Diet programme & Weight training and Cardio Training,

Finding:

Improvement in Body Mass Index has been seen In Experimental Group 'A' who have been training with Pre Existing Training Method (A) Nutritional Supplements, Diet programme & Weight training and Cardio Training,

Conclusion:

The Present Experimental study, within limitations, warrants the following conclusions:

□ The adjusted mean score of BMI of the Four Treatment Groups differs significantly when the Pre-BMI was taken as Covariate. So there was a significant effect of Treatment on BMI of Obese Adults when their Pre-BMI was taken as Covariate.

Recommendation:

After considering all pros and cons of the present study following recommendations regarding its implication and suggestions for further studies are made:

□ Obese and hypertensive people who have lifestyle related problems can take benefit of the training schedule as designed in this study.

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ASSESSMENT OF NUTRITIONAL KNOWLEDGE OF SENIOR LEVEL SOFTBALL PLAYERS: A KNOWLEDGE TEST

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Keywords: Nutrition, Sports Nutrition, Softball, Fitness, Knowledge, Awareness, Dietary Supplements, Micronutrients, Macronutrients, Calories.

Introduction:

Nutrition is an important component of any physical fitness or sports training program. The main dietary goal of an active individual is to obtain adequate nutrition to optimize their health and fitness or sports performance.

Nutrition affects a sportsman in many ways. At the basic level, it plays an important role in achieving and maintaining health. Optimal nutrition can reduce fatigue, allowing a sportsman to train and compete longer or recovery faster between training sessions.

There has been scarcity of research in India on sports like Softball which has a very good following at the world stage thus, it is high time that we as researchers can put Indian Softball at the global level by doing related researches in the various domains of sports sciences and the present study tries to highlight one such domain which is sports nutrition.

Methodology:

The present study is a very basic knowledge test about nutrition and specifically sports nutrition which is a basic need for any national level player. To collect the data, survey method was used in the form of in-person interview and group interview through a standardized questionnaire to realize the objectives of the study. Before participating in the survey, the full

consent of the participants and their voluntary participation was taken. The aim & objectives were thoroughly discussed with the participants. It was also assured that their identity was always kept confidential.

Participants:

A total sample size of 85 participants from various state teams participating in senior national softball championship were selected for the study using non probability convenience sampling as the study is related to a specified population. Senior male as well as female sportsperson aged between 18-28 who had participated at the national level or above had been selected from all over the country. To minimize the impact of delusions, a cleaning process was adopted in order to diminish ineligible and incomplete responses & the final size of the sample was 70 having male to female proportion of 1.5:1 i.e., 42 males and 28 females.

Questionnaire:

The questionnaire was constructed by Melissa M. Wallinga in 2012. The questionnaire consisted of 22 questions with options which can be opted more than once for a same question that assessed the nutritional knowledge with specific constructs like nutritional counselling, knowledge source, awareness, calories, supplements, sports drinks, diet plan, sources of macronutrients and micronutrients of the subjects.

Administration of Questionnaire:

As the survey population was large on the basis of demographic separation, the questionnaire was communicated through one-to-one personal interviews as well as group interviews and also considering the COVID-19 pandemic situation.

Statistical Analysis:

The type of statistical technique used was descriptive statistics to bring out conclusion for the collected data.

Results:

Question No.	Question	Yes/ Correct	No/ Incorrect	Don't Know
1	Do you have access to nutrition counselling?	31.43%	52.86%	15.71%
2	Do you actively seek out or read nutrition information?	58.57%	30%	11.43%
3	Do you read the nutrition facts label when selecting a food item to eat?	37.14%	51.43%	11.43%
4	Having a nutritious diet will improve my athletic performance.	78.58%	1.42%	20%
5	I am aware of how many calories I need to consume every day to promote my best athletic Performance.	35.71%	37.14%	27.14%
6	Having a Sports Nutritionist at my University is or would be helpful to me as an athlete.	67.14%	10%	22.86%
7	Carbohydrates and fats are the main sources of energy for the muscles.	57.14%	22.86%	20%
8	Protein is the primary source of energy for the muscles.	12.86%	71.43%	15.71%
9	Protein supplements are needed in addition to food for muscle growth and development.	7.14%	72.86%	20%
10	The vast majority of supplements sold to the general public have been tested for effectiveness or Safety.	15.71%	44.29%	40%
11	Consuming fruits and vegetables every day is important in order to get necessary vitamins and Minerals.	85.71%	4.29%	10%
12	High-fat foods should be reduced in my diet.	58.29%	25.71%	20%
13	Vitamin and mineral supplements provide energy to my body.	7.14%	75.72%	17.14%
14	My coaches have encouraged me to either lose or gain weight.	67.14%	30%	2.86%

15	It is recommended to consume sports drinks during practices and competitions lasting longer than 1 Hour.	50%	20%	30%
16	Sports drinks like Gatorade and PowerAde are better than drinking water and should be consumed all throughout the day.	30%	30%	40%
17	During 2-a-days or heavy practice days I should eat more calories.	65.71%	15.71%	18.58%
18	When I am inactive my calorie needs do not change.	38.43%	38.57%	30%
19	Eating within 45 minutes of a workout is important.	68.57%	12.86%	18.57%
20	Milk is a good source of Calcium and Vitamin D.	78.57%	2.86%	18.57%
21	Whole grain breads are a good source of fibre.	67.14%	12.86%	20%
22	A turkey breast is a good source of lean protein.	37.14%	8.57%	54.29%

- **Total Correct-** 47.46%
- **Total Incorrect-** 30.53%
- **Total Don't know-** 22.01%
- **Total False Answers-** $30.53 + 22.01 = 52.54\%$

Discussion:

As the results from the collected and analysed data clearly reveal the status of nutritional knowledge that the players have. There are a few points that the results of the study convey & communicate:

1. More than 60% of the players do not have any access to the nutritional counselling but at the same time more than 50% do actively & voluntarily seek out the information related to nutrition through their own means and methods. This means, they have the positive intent but don't have any reliable sources of information with regard to nutrition which can lead to misinformation.

2. More than 75% of the athletes know that a proper nutritious diet will be helpful to achieve their goals in relation to sports which is a positive but also more than 60% don't know what foods to choose and what to consider when they are looking at the nutrition facts label. Again, lack of knowledge is a setback.
3. More than 65% agree to the fact that having a sports nutrition expert at their facility will be helpful for them but also more than 60% don't know what is the required amount of RDA and calorie composition & consumption suitable for an athlete. Thus, no expert counselling is also a domain that is lacking.
4. More than 75% don't know the basic functions of the various macro and micro nutrients serve to our body.
5. Roughly, 60% on an average don't have adequate knowledge about the functions and benefits of sports drinks.
6. Overall, more than 50% answered incorrectly in the knowledge test which means that half of the Indian softball is unaware about nutrition which is a worry.

Conclusion:

The results of the study clearly concluded that the athletes at least do know the importance of nutrition and its impact on their performance but the most dissatisfying fact revealed was there is no expert counselling being provided to them and they are left on their own. Lack of proper knowledge, guidance, reliable sources of information can be a major factor behind the performances of Indian softball teams at the international stage.

India is currently ranked in the top 15 teams in the world men's and women's softball ranking which shows that there is a lot of potential in the Indian softball team & this potential can bring good results in the future if the players are better exposed to the nutritional knowledge and providing them with proper nutritional counselling & guidance.

DESCRIPTIVE SURVEY ON ONLINE TEACHING AND ITS LEGAL ISSUES IN POST PANDEMIC FACED BY PHYSICAL EDUCATORS

***Dr. Sumit Damodar Kamble**

Abstract:

The main objectives of the study was collecting information on impact of covid19 on online teaching management and its issues faced by Physical Education teachers and coaches. Students developed their physical and mental fitness during physical education periods. "Good health means whose body is free from illness and disease" said by M.K. Gandhi. Physical education teacher are always works for good fitness and optimum health among students and accordingly they conducted lectures. In the covid19, Online teaching was tentative solutions for managing all lectures including physical education too. Descriptive survey method was used for data collection. The questionnaire was responded by 97 physical education teachers. The 66 male and 31 female attempted the responses through Google form online. Form the collected information, The results form male and female physical education teachers for online teaching was not significant having Chi-Square value was 1.094 and for financial problem face by permanent and temporary was significant with having Chi-Square value was 8.995 at 0.05 levels. The impact of Pandemic on online teaching for male and female physical education teachers was constant in nature were as on financial problem face by permanent and temporary physical education teachers was differed due to salary deduction by school management.

Keywords-Teaching, Pandemic, Problems and issues, Economical Conditions, Management, Health, Fitness, physical

Introduction:

Covide19 pandemic really disturbs the life of human being. There was health problems

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increased and issue occurs in the day to Day activities of the human being. The business and management faced many crises in the entire field including education too. Teachers were teaching online till today. Online teaching and school teaching both were totally different. The six to eight hours regular school teaching before pandemic was systemic, easy and maintaining student's relationship with teachers through various curriculum and non curriculum which help directly the growth and development of children as well as teachers. During pandemic it was challenge for teachers to teach and work for their growth through online teaching. Online teaching was new to all teachers at the time of starting the academic year 2020-2021. But "practice makes a man perfect", now there were few errors in online teaching and quality of presentation was improved a lot. Teachers were backbones of every country. They teach all the personalities whether actors, sportspersons, lawyers, doctors and business man too. A teacher was always works for students and guides them for achieving success or reach to their goals in life.

The present research was conducted to know the any problems face by physical education teachers in online teaching and personal financial management in post covid19. Physical education is also important part of education in schools and colleges. The economical monthly budget status of physical education teachers also disturbed during pandemic. With help of this online collected information study was justify the objective as well as hypotheses. The information like present working, nature of appointment, salary related problem, teaching related problems and money related problems were collected through Google Form sheet from education teachers.

Physical Educationist:

- **Measurement Expert** (K.Kansal, 2012)
- **coach** (K.Kansal, 2012)
- **Educationist** (K.Kansal, 2012)
- **Trainer** (K.Kansal, 2012)
- **Recreation expert** (K.Kansal, 2012)
- **Wellness expert** (K.Kansal, 2012)
- **A good counselor** (K.Kansal, 2012)
- **A good visionary** (K.Kansal, 2012)

The need of physical educator in school and colleges was compulsory due to above some needed characteristics of Physical Education Teachers. They are also good planners for sports events, good leaders, good citizen and multidisciplinary person who inculcate interest in students for sports and physical education. Physical education teachers works as pillar of the educational institute.

Online School Teaching:

Pandemic situation schools and colleges were not working. Physical teaching was not allowed due to safety parameters of covid19. For all subjects' teachers, online teaching option was available with online apps like Zoom Meeting and Google meet. Online teaching is effective and appropriate idea for teaching students with avoided physical contacts from each others. For effective online teaching following things were required are as follows;

- Electronic gadget was required like Computer, Android Mobiles, Laptop and tablets which teachers to teach students smoothly. Same gadgets were also available with students too.
- Required good quality network for no disturbance for explanations of lectures and having control on students during online schools.
- Having knowledge of various software, like Microsoft word, Microsoft Power Point,
- Good command on various internal options of Zoom App and Google Meet App which help teachers for controlling class as well as sharing screen of presentations for students.
- Required good battery backup plan if there will be no electricity whenever.

All the much needed things are required for smooth and effective online schools for students to teach all subjects. Teachers may face some problems in starting of pandemic for online teaching but now they used the apps very effectively and adopted the conditions around.

Personal financial Management:

Finance may be defined According to **Khan and Jain** as “the Art and Science of Managing Money”. It is also referred as the provision of money at the time when it is needed.

According to **Oxford dictionary**, the word 'finance' connotes 'management of money' (Paramasivan, p. 1)

The personal financial management was much more needed for all. The money is nothing but earnings in terms of currency. We can purchase things as per our needs. Every person do financial management for own which was always useful him to pay all the bills, investment of save money, future planning, medical emergency and many more unexpected problems in future. In the personal Financial Management individual has to understand the financial needs in day to day life and accordingly plan for better future. Personal financial management was directly and indirectly stands for planning future activities in present.

Objectives of the Study:

The present study has following Objectives been as follows;

- To study the association between Gender and reaction towards online teaching of physical education teachers.
- To study the association between Nature of Appointment and reaction towards financial problem of physical education teachers.

Hypothesis of the study:

The present study has following Hypothesis been as follows;

- There is no significance association between Gender and reaction towards online teaching of physical education teachers.
- There is no significance association between Nature of Appointment and reaction towards financial problem of physical education teachers.

Delimitation of the study:

The Delimitations were as follows;

- The data was collected from Mumbai region physical education teachers only.
- Study was delimited for online teaching and problem in financial settlement of physical education teachers only.

- The data was collected with help of online questionnaire made through Google Form format only.
- The data was Analyses with help of Chi- Square Method Only.

Design of the study:

In the present study **Descriptive Survey** method was used for collection of data. The data was collected from physical education teachers who work in school and colleges. The Google Form questionnaire was prepared and sends to various what apps group. Total **Ninety Seven (97)** physical education teachers replied the responses and data was collected accordingly for present status in online teaching as well as financial problems faces by physical education teachers. Further it was analyses with help of statistically.

Subject of the study:

The sample was collected from online survey through related questionnaire. The total 66 male and 31 females Physical Education teachers were responded for present study randomly. As per the responses 51 Physical Education Teachers were Permanent and 46 Physical Education Teachers were Temporary in working in their respected schools

Procedure of the Data Collection:

The data was collected through online questionnaires from physical education teachers randomly. The set of questions were asked for knowing the problems in online teaching and financial problem faced by Physical Education teachers in post covid19 pandemic. The responses had been converted in to quantitative data for interpretation with help of statistical analyses. Following information were collected through online questionnaire.

- Information about Gender and working status of physical education.
- Information related to online teaching as well as effect of pandemic on it.
- Information related financial conditions during post pandemic.

Statistical Procedure:

The collected data were analyzed with help of Chi – Square Method. The results were interpreted as per the findings and justify the objectives and hypotheses accordingly. (Sansanwal, 2020)

The Results and Interpretation of the Study:

The result of association between Gender and reaction towards online teaching of physical education teachers.

The Objective was to study the association between Gender and reaction towards online teaching of physical education teachers. The gender of two type namely Male and Female. Reaction is recorded in three categories namely Yes, No and May Be. The data were analyses with help of Chi-Square Method can be shown in the table 1;

Table 1: Gender wise reaction toward online teaching of physical education teachers

Gender	Yes	No	May be	Total	Chi Square Value	Remarks
Male	33	27	6	66	1.094	p>0.05
Female	19	10	2	31		

From the table 1, it can be seen that the Chi-Square value of association between Gender and reaction towards online teaching of physical education teachers is **1.094** which is not significant. It is indicates that there is no significant difference in the association between Gender and reaction towards online teaching of physical education teachers. Thus the null hypothesis that, there is no significant association between Gender and reaction towards online teaching of physical education teachers is not rejected. It may therefore, be said that reaction toward online teaching of male and female physical education teachers were found equal to each other.

The result of association between Nature of Appointment and reaction towards financial problem of physical education teachers

The Objective was to study the association between Nature of Appointment and reaction towards financial problem of physical education teachers. The Nature of Appointment

was of two types namely Permanent and Temporary. Reaction is recorded in two categories namely Yes and No. The data were analysed with help of Chi-Square Method can be shown in the table 2;

Table 2: Nature of Appointment wise reaction towards financial problem of physical education teachers

Nature of Appointment	Yes	No	May be	Total	Chi-Square Value	Remarks
Permanent	29	22	0	51	8.995	p<0.05
Temporary	39	07	0	46		

From the table 2, it can be seen that the Chi-Square value of association between Nature of Appointment and reaction towards financial problem of physical education teachers is **8.995** which is significant at **0.05** level with **df =1**. It indicates that there is significant difference in the association between Nature of Appointment and reaction towards financial problem of physical education teachers. Thus the null hypothesis that, there is no significant association between Nature of Appointment and reaction towards financial problem of physical education teachers is rejected. It may therefore, be said that the permanent and temporary physical education teacher's reaction toward financial problem was favorable.

Findings:

The findings were as follows;

- Reaction toward online teaching of male and female physical education teachers were found equal to each other.
- The permanent and temporary physical education teacher's reaction toward financial problem was favorable.

Responses Related to Online Teaching:

The following are some valuable responses related to online teaching by physical education teachers gathered from collected information.

- The network issues faced by teachers during online teaching. Due to that not possible to teach effectively and satisfactory during online teaching for students
- Students Interaction is very less and not possible to judge all the students at one time during online teaching.
- It is time consuming during Evaluation of students.
- Free version of Zoom App was used for online teaching but due that it has less functions and time validity 40 minutes only.
- Explanation of sports event through YouTube facing loading problem as well as could not correct students during skills physically.
- Teaching in very limited place is not possible which affected the fitness exercises during online teaching.
- Less interest from students for online physical education lectures.
- Could not conduct the sports competitions online due network issues.
- Could not teach skills and practice of skills due to time limitation.
- The mistakes could not be rectifying during online teaching.
- Work load is more than normal school time.
- Required to find online teaching methods in certain problems in future.
- Poor family could not have smart gadgets like smart phone, laptops and tablets to attend the online lectures.
- School environment surrounding is missing in online teaching process.
- Due to number of lectures and battery backup of phones is one of the measure problem in online teaching process.
- Vision problems is occurs due to online teaching to students as well as to teachers.
- Very less importance to physical education compare to other academic subjects like math, science.

Response Related to Financial Problems:

The following are some valuable responses related to financial problem of physical education teachers gathered together from collected information.

- School management started salary deduction from 10% to more than 30% during covid19; it can cause the financial unbalanced situations faced by physical education teachers.

- Due to covid19, coaching centre were closed it leads to financial problem to coaches.
- Installment of EMI is bounce due to covid19 pandemic.
- Not able to pay the electrical bills, hospital charges, groceries bills building maintenances charges, paid extra charges for solution of Internet connectivity, its all leads to personal financial problems and increased the worries for survival with family.
- Minimize the needs and trying to complete only basic needs like food to eat only.
- Daily expenses of family could not manage in covid19 due to no work or jobless situations.
- Regular budget of family collapsed its results in to anxiety and stress level increased in managing family and their problems related to health.

Conclusions:

The present short descriptive study on covid19 pandemic was conducted on physical education teachers working in Mumbai region. Online teaching has no positive responses by male and female physical education teachers but as per their justification physical education cannot teach online effectively. Permanent and temporary physical education teachers has positive responses toward financial problem occurs in post pandemic due to deductions in salary by school management. This survey was really helpful to understand the status of online teaching for physical education subject as well financial problems face by physical education teachers due to pandemic in country.

Recommendations:

The present study was descriptive survey. All the information was collected through questionnaire. As per the results and finding from the study following were important recommendations suggested by researcher. They were as follows,

- It is recommended that along with all subject understand the need and importance of physical education to the students and make positive attitude for physical education subject accordingly.
- Developed curriculum for physical education subject for state board students from standard 1st to 12th.

- During pandemic school management deducted salary of physical education teachers or any other subject teachers due not recovery of fees from students, after recovery of full fees as per fees structures from parents, repayments all together deducted salary to teachers.
- Online physical education teaching is not much effective for physical fitness, allowed sports coaching as well as fitness classes for students in the schools and colleges.
- Physical literacy is important to all and to fulfill the gap of the physical literacy, appoints Physical Education Teachers in primary schools in state board schools as well as Sports Directors in Degree Colleges of Mumbai University as per the UGC norms. It will help to lead employment also.

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SEX TESTING: AN ELIGIBILITY REQUIREMENT FOR FEMALE ATHLETES

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Abstract:

The purpose of the study is to highlight the major issue related to the women's eligibility criteria and the gender testing and (DSD) Disorder of sexual development. The term hyperandrogenism is categorized for the women athletes the endogenous testosterone level greater than 10 nmol/l (nanomole per litre) are ineligible. They are entirely different from doping and other cases. Sports competitions are conducted in different age groups in both Men and Women category globally. Every Association is bound to abide by the regulations of the International Olympic Committee, and the International governing body of the concerned game. Then only the rules and regulations will be evenly obeyed and the participants can participate equally. International Sports Associations are conducting competitions with the spirit of equal participation to all competitors. And they also restrict the players who are not eligible according to their rules and regulations. Sex testing is a major part of the eligibility criteria is determined by the level of testosterone in the body. Eligibility is the first criteria to compete in a competition and is decided on the eligibility criteria prescribed by the International Sports Associations.

Keywords: Hyperandrogenism, Endogenous, Testosterone, Doping.

Introduction:

Sex testing started in the Winter Olympic Games in 1936. Competition of sports is very necessary because every human being is directly or indirectly related to sports in his

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lifetime and the personals that opted sports as a carrier is fully concerned about that. The career of a sportsman is not developing in a day. It takes several years of hard work, dedication, and most important is the time which they devote to sports training.

Sports competitions are conducted in different age groups in both Men and Women category globally. Every Association is bound to abide by the regulations of the International Olympic Committee, the International governing body of the concerned game. Then only the rules and regulations will be evenly obeyed and the participants can participate equally. International Sports Associations are conducting competitions with the spirit of equal participation to all competitors. And they also restrict the players who are not eligible according to their rules and regulations. Eligibility is the first criteria to compete in a competition and is decided based on the eligibility criteria prescribed by the International Sports Association. The theme behind all rules and regulations is common for all and equal opportunity to all and fair play.

This is to ensure fair and meaningful competition in the sport of athletics, competition has to be organized within categories that create a level playing field and ensure that success is determined by talent, dedication, hard work, and the other values and characteristics that the sport embodies and celebrates.

Anatomically there are several significant advantages in size, strength and power enjoyed (on average) by men over women from puberty onwards, due in large part to men's much higher levels of circulating testosterone, and the impact that such advantages can have on sporting performance, it is generally accepted that competition between male and female athletes would not be fair and meaningful, and would risk discouraging women from participation in the sport. Therefore, in addition to separate competition categories based on age, World Athletics has also created separate competition categories for male and female athletes.¹⁷ These tests have affected many athletes such as Dutee Chand, Santhi Soundarajan Indian professional sprinter who got disqualified over being higher testosterone levels. Jose Maria Martinez Pantio a Spanish hurdler was also banned. Caster Semenya is an 800 mtr

¹⁷ <https://www.worldathletics.org/about-iaaf/documents/book-of-rules> retrieved on 12.02.2022

Athlete from South Africa. These are some examples of sex testing and they are disqualified due to the higher testosterone hormone levels in the body.

Hormone testing and disorder of sexual development (DSD):

A hormone is a chemical substance secreted from the glands of the endocrine system. These secreted substances control various organs of the body. Also the metabolic functions, Chemical reactions of various cells and the specific hormone is liable for the organ or cell groups. Testosterone is a hormone with a high impact on the physiology of males and females. Hormone effect through aromatization to oestradiol. Some studies also found that testosterone has favorable effects on the lungs and cardiac output as well as through its long-term positive anabolic actions. Testosterone also impacts the psychology of athletes in training as well as in the highest competition levels. It directly affects the behavior and attitude of female athletes too. If it is produced in excess naturally then it will lead to a special medical case which is called (DSD) Disorder of sexual development.

This is the important factor where the international sports organizations and governing bodies challenge the qualification of female athletes. For much better clarity in this issue, the female classifications with specification brought by the International Athletics Association Federation. The criteria in the hyperandrogenism categorized for the women athletes the endogenous testosterone level greater than 10 nmol/l are ineligible.¹⁸

Purpose of Hormone Testing:

The very purpose of the test is to categorize the ineligible female participants in the national and international competitions. Also to serve the cause behind the sports competitions this is in the service of human beings and peaceful society with the preservation of human dignity.¹⁹ To provide a fair and equal playing opportunity among all athletes. To protect human rights and any unfair act or discrimination among the athletes. According to the United Nations, women's rights has to be secure and they must give equal opportunity in education and health

¹⁸ <https://www.worldathletics.org/news/press-release/eligibility-regulations-for-female-classification>

¹⁹ <https://stillmed.olympics.com/media/Document%20Library/OlympicOrg/General/EN-Olympic-Charter.pdf>

as well as in all social affairs.²⁰ The role of Testosterone in the behavior of sportspersons is also defined as a controller of competition aggression.²¹ A study discussed the competition behaviour on the response of Testosterone is found that it only helps to develop internal motivation to win the competition with positive body response.²²

Discussion and Conclusion:

It can be sum-up with these points This study provides a balanced discussion of the female athlete and Testosterone affects in the competitions whether there is a close connection with positive impact or not Herein, we discuss sex-based differences in muscle morphology and fatigability, respiratory-neuromechanical function, substrate effect of utilization, oxygen utilization, gastrointestinal structure and function, and hormonal control.

1. Sex testing shouldn't be treated as an eligibility requirement it can be a part of doping testing only where the tests are conducted to identify any unnatural development.
2. Test report must be circulated only with the prior consent of the Athlete himself.
3. A strong regulation must be framed for the violation of doping regulations and specifications for testosterone doping.
4. A fair and transparent code of conduct must be followed for and doping test and the same should be briefed to the concerned athlete before the said test.

With the entire discussions and recommendations, one thing which is very clear about the female athlete's eligibility to participate in an International event is only a doping test that can have a test of blood testosterone levels.

²⁰ <https://www.un.org/en/about-us/universal-declaration-of-human-rights>

²¹ Salvadora A, Suay F, Martínez-Sanchis S, Simon VM, Brain PF. Correlating testosterone and fighting in male participants in judo contests. *Physiol Behav.* 1999 Dec 1-15;68(1-2):205-9. doi: 10.1016/s0031-9384(99)00168-7. PMID: 10627082

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A REVIEW OF FLUCTUATION IN THE HEMATOLOGICAL VARIABLE DURING DIFFERENT PHASES OF MENSTRUAL CYCLE

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Abstract:

The study's goal was to examine the changes in hematological parameters during the several phases of the menstrual cycle, including Menstrual, Follicular, Ovulation, and Luteal Phase. Various research databases were examined for published publications for this purpose, and findings were drawn. The study's findings revealed fluctuations in hematological markers during the menstrual cycle. RBC and haemoglobin levels grew dramatically during the follicular phase but remained stable during ovulation and the luteal phase. WBC levels rose throughout the follicular phase, remained almost constant during the ovulation phase, and fell somewhat during the luteal phase. The platelet count followed the same pattern as the WBC. The number of platelets rose during the follicular phase but dropped during the luteal phase. Menstruation is characterized by bleeding, which causes blood loss and lower levels of hematological markers. The follicular phase is regarded as a compensating phase, during which hematological variables considerably rise. The drop in WBC and platelet count during the luteal phase is due to a fall in oestrogen levels. The study revealed that fluctuations in hematological markers are evident throughout the menstrual cycle.

Keywords: menstrual, follicular, ovulation, luteal, hematological

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Introduction:

Menstruation is the cyclical and rhythmic transition that happens in the reproductive cycle of a sexually mature female[1]. When fertilisation fails, the endometrium that has been methodically prepared for the development of a fertilised ovum is deconstructed and lost. Menstrual bleeding, commonly known as the ovarian cycle, is the regular outflow of blood from the vaginal canal caused by the removal of the uterine lining. In a mature female, the endometrial lining is lost monthly if fertilization does not occur. On average, the cycle lasts 28 days[2]. This can take up to 45 days in typical women. Estrogen, which promotes the luteal phase, and progesterone, which enhances the follicular phase, are both engaged in this process, which operates on the uterus to prepare it for the implantation of the fertilised ovum. When fertilization fails, these hormones fall and the uterine lining becomes inflamed. Menstrual flow occurs as the lining sloughs away[3]. The cycle is calculated from the starting day of one menstrual period to the first day of the next [4]. The menstrual cycle is defined by cyclical fluctuations in FSH, LH, oestrogen, and progesterone levels. [5] Data on RBC, WBC, and HGB levels in male and female cynomolgus macaques, capuchin macaques, and humans demonstrate that females have considerably lower amounts of RBC, HCT, and HGB than males, which is assumed to be owing to menstruation-related blood loss[8]. Prolonged and significant bleeding causes substantial blood loss (>80 ml), which can lead to anaemia, necessitating the measurement of red blood cells (RBC), haemoglobin, and erythrocyte sedimentation rate (ESR) [9]. Blood loss during menstruation has been postulated as one of the causes of iron deficiency anaemia in nonhuman primates and women. Menstruation has been shown in preclinical studies to impact red blood cell mass characteristics as well as serum total protein, albumin, and globulins [10,33].

There hasn't been much research done in the field of menstrual cycle focused on the athletic population, and those that have been done haven't taken into account all hematological factors. Furthermore, multiple studies have been undertaken to explore the changes in various types of blood cell counts and hormone profiles during the menstrual cycle, but the results have been inconsistent and contradictory. Researchers also found that studies have not explicitly focused on athletes who compete in sports dominated by speed endurance. So, the present study's goal is to look at the researches that have been done related hematological parameters

during the menstrual cycle's follicular, ovulation, luteal, and menstruation phases, with a focus on athletes who compete in speed endurance sports.

Method:

We conducted a literature review of Hematological changes occur during all four phases of Mensuration using the following databases: (1) Pubmed/Medline, (2) Embase, (3) Web of Science, (4) Scopus and (5) Google Scholar. We developed an analytic framework using a combination of these broad categories: menstruation, Red blood cell, White blood cell, Platelets, Hemoglobin and female athletes (namely focused on the Speed endurance athletes). We operationalized each of these categories as specific terms that we used to search the literature.

To operationalize menstruation, we used 5 terms; menstrual phases, follicular phase, ovulation phase, luteal phase and menstrual phase. To operationalize hematological changes, we used 4 terms: Red blood cell (RBC), White blood cell (WBC), Platelets and Hemoglobin. Lastly, to operationalize athletes, we used 3 terms: speed endurance athletes, elite athletes, sports performance. We used the “and” identifier to connect each menstruation term to each hematological term and to each athlete term. The search resulted in 144 separate searches. The search found a total of 270,599 articles, of which 270,207 were duplicates and irrelevant to our topic of interest. Thereafter, 382 abstracts and/or articles were perused of which 158 were excluded because they were based difference hematological variables and 196 were excluded again because they were not based on athletes. Eleven articles were obtained through snowballing. Altogether, twenty-eight articles were included in this literature review.

Result:

Our search yielded Thirty-two papers (Table 1) that discussed either different phases of mensuration (n=15), white blood cell (n=6), red blood cell (n=8) and platelets (n=6) in the following phases: 1) Menstrual phase 2) Follicular phase 3) Ovulation phases ; and 4) Luteal phase.

Red blood cell

The studies in previous years have revealed that when comparing red blood cells in all four stages among the various phases, the findings revealed that there is significant difference in the RBC level between Menstrual and Follicular Phase; while no significant difference exist between any other phases on the cycle. RBC count significantly increased in the follicular phase. But there was no further increase in RBC levels during other three phases. Similar results were found in case of Hemoglobin and similar of hemoglobin variation was observed during the whole menstrual cycle. The menstrual phase is characterized by huge amount of bleeding which leads to decrease in the RBC and hemoglobin levels. This period of hemorrhage is followed by follicular phase in which the body attempts to compensate the loss during the menstrual phase. As a result of this, there is increase in the RBC and hemoglobin levels which is seen in follicular phase, which almost remains unchanged during the ovulation phase but slightly decreases during the end the menstrual cycle^[26].

White Blood Cell:

When white blood cells were compared throughout menstrual cycles, it was discovered there is significant difference in the WBC level between Menstrual and other three Phases; likewise Significant difference was found in Ovulation and Luteal phase; while no significant difference exist between Follicular and Ovulation, Similarly no significance was found in Follicular and Luteal. WBC levels increased during the follicular phase and remains almost unchanged in the later phases of menstrual cycle. The reason for this increase is attributed to the increase in estrogen levels during the follicular phase. Estrogen stimulated the increased production of granulocytes and release of neutrophils^[27]. These findings are consistent with the results of previously conducted studies^[28].

Platelets:

Platelet counts throughout all stages. The result revealed that the platelet count was On the basis of a statistical comparison of platelet counts throughout all stages. The result revealed there is significant difference in the Platelets level between Menstrual and Luteal Phases; while no significant difference exist between any other phases on the cycle. Platelet count increased in the follicular phase and remains unchanged during the ovulation phase^[16]. The Luteal phase

is marked with decrease in the platelet count. The cause for increase in platelet count in follicular phase is due to increased megakaryocytes boosting by estrogen to promote platelet formation. Since level of estrogen is found increased during the follicular phase which in turn stimulate platelet production. But at the end of the menstrual cycle, when the ovum did not get fertilized, the estrogen levels again decrease which leads to decrease in platelet count.

Conclusion:

The goal of this study was to see how different hematological variables, such as red blood cells (RBC), white blood cells (WBC), and platelets, affected distinct phases of the menstrual cycle, such as menstrual, follicular, ovulation, and luteal phase. The study's prior findings demonstrated that in the follicular phase, all hematological indicators increase significantly. During the menstrual cycle, blood loss occurs, resulting in a drop in hematological variables. RBC and Hb levels rise throughout the follicular phase and then level off in the latter stages of the menstrual cycle. WBC and platelet count rise in the follicular phase, stay steady during the ovulation phase, and fall towards the conclusion of the luteal phase. As a result, the researcher suggests analyzing these hematological factors to track the performance of female athletes at various stages.

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THE LANDSCAPE OF TALENT IDENTIFICATION FORMULA IN INDIA: WITH SPECIAL REFERENCE OF VARIOUS GOVT. SCHEMES, AND POSSIBLE INTERVENTIONS USING ARTIFICIAL INTELLIGENCE

***¹ Utsav Chaware**

***² Dr. Anindita Das**

Abstract:

Talent identification (TI) is an intrigued but convoluted area in research. Many conventional practices are evolved to expand TI into coordinates of Talent detection, selection, and Talent transfer. In India, talent identification is widely practiced via various governmental schemes like- National Sports Talent Search Scheme (NSTSS), National Physical Fitness Drive (NPFDD), National Sports Talent Search (NSTS), and the most recent Khelo India scheme, to produce elite performers. This article induces in-depth literature and policy review and critical analysis of the formula used. The investigation reveals the implication mechanism used in these schemes is never accessed and no major policy turnouts have been taken. Most of the schemes encourage average athletic ability (adding scores of all physical and motor ability tests) instead of recognizing extraordinary potential, also Talent detection instead of identification could be a remedy as the majority of the population is not occupied with rich sports infrastructure and aids. Artificial intelligence (AI) with wide applicability in sports can be transcendental for talent detection and identification which could draw exceptional patterns with physical components and motor abilities which is impossible to resolve manually for coaches and policymakers. This article underscores an exigency to analyze and recalibrate the formula applied and selection criteria used, it also conceives an idea of solving the same using AI and machine learning technology.

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Introduction:

Sports Talent Identification (TI) is now an accustomed term in the sports fraternity, with significant research proliferated/fortifying the concept over the past decade, and researchers around the globe working on TI, it has evolved tremendously. Talent Identification and Development System [TIDS] is locating potential athletes at a young age and empowering them with more skills to bring laurels at the world-class podium (Rongen et al., 2018). The concept of Talent identification has evolved since the early 2000s, Reilly et al., (2000) extends TIDS in various coordinates, (i) Talent Detection, locating potential performers who are not currently involved in sports; (ii) Talent Identification, identifying performers pursuing sports at a young age and can excel further; (iii) Talent development, stage of skill refinement and learning; (iv) Talent selection, picking-up the potential performers to undergo high performance and planned training for longterm to gain world-class performance, and the final step; (v) Talent transfer, where athletes shifts from one sport to other for better prospects in the event (MacNamara & Collins, 2015; Rea & Lavallee, 2018). Many other models and methods of talent identification have evolved with research, most of them focusing on Physical and Anthropometric variables with skills, many inducting psychological and cognitive tests for elite performance (Rusdiana, 2021), developed nations and clubs display dominance in sports and competition invest huge amounts of funds in policymaking, Talent identification, and grooming potential talents (Till & Baker, 2020a). India with a dense and diverse population has very little inclination towards sports. To facilitate sports in the country Government of India has been introducing/commencing various schemes and policies such as the National Sports Policy in 2001 with a bi-modal focus (i) broad base of sports participation in the country and (ii) to locate potential talents to nurture for world-class performance. Various other TI schemes by Union and state authorities are been run to pick sports talent in the country, but there exists no such mechanism to access the efficacy and productivity of a talent identification procedure, policy, and methods applied (Till & Baker, 2020a; Vaeyens et al., 2008). In India, since 2000-2001 many such policies are been inaugurated on the ground to enrich the nation with talented sports personnel but none of the policies was accessed for the results and no major policy turnouts have been taken. Review literature for the following schemes and investigations regarding the schemes are still in deficit. This article induces in-depth literature and policy review and critical analysis of the formula used in the talent identification procedure.

With technology taking over the precision and efficiency way beyond human capacity in every domain and yielding unmatched results, it's time for major turnover in sports talent identification and talent grooming. Artificial Intelligence (AI) could help elevate the process of talent location and can generate revolutionary results which aren't possible with human judgments. This article conceives the idea of integrating the issue of talent identification with the modern-day technology of AI. Since, talent identification has always been an intrigued and debatable topic among coaches, sports authorities, and researchers. This study attempts to connect talent identification with AI mechanisms for talent location and development.

This study emphasizes on the talent identification formula and criteria used by various govt schemes in India for talent identification and screening, impact of those methods on talent identification approaches and possible improvement's with aid of technology can bring to the talent identification mechanism.

Material and Methods:

This paper involves a thorough review and critical analysis of various recent Government Sports Policies and schemes in India namely NSTSS, NPF, NSTS, etc. Literature regarding policy formation and implementation accounted for the Sports Authority of India, an apex sports body of India under the Ministry of Youth Affairs and Sports. To get a broader and more empirical record of the talent identification practices on-ground visit and observation of the State Talent search scheme was done by the researcher where District sports officers (N=9) involved in the administrative and operational functioning of talent identification were interviewed, Physical education teachers (N=8) involved in the measurement and execution process were interviewed personally regarding the implementational values of the various schemes in the present and past time, the policy execution, framework of Talent identification policy in India, Results, and efficacy of the scheme. Questions regarding the efficacy of formula opted to select athletes were also asked.

Also, a Case study was reported to reflect a unique case of athletes with extraordinary performance and highlight important issues of concern. The case study provided better insight and helped in assessing the impact of TI schemes and highlighting the process of the Programme

Present Scheme and Mechanism:

Indian TI policies and schemes focus primarily on individuals who are presently involved in sports i.e. talent identification, various schemes such as National Sports Talent Search Scheme (NSTSS), and National Physical Fitness Drive (NPFDP), National Sports Talent Search (NSTS) by Sports Authority of India and various other schemes emphasize on athletes presently involved in sports and performing at state and national levels, but for the rural and tribal population which encompasses the majority of the country's population, such schemes remain impertinent. According to a report 'Evaluation / Impact assessment of Rural Sports Program' submitted to the Planning commission of India. *"The rural population of India, comprising about 70 percent of the country's total population with a higher level of physical fitness, physiological and morphological status concerning the others, seem to be a pillar of strength in the Country's sports arena"*.

Talent is defined as *'the presence or absence of particular skills or qualities identified at earlier time points that correlate to or predict expert future performance'* (Cobley et al., 2013). But the metric used and protocols defined in the aforementioned schemes which directly press over TI are misaligned towards the approach to identify athletes with extraordinary and outlying ability, but it encourages the average athletic ability to surpass real talent. Also, it does not weigh physical variables and tests based on their sports and discipline which prompts a 'one size fits all' approach in the screening phase of TI.

National physical fitness Program for school children (2012):

A flagship program launched by the Ministry of Youth Affairs and Sports, Govt. of India, for school children. National Physical Fitness Program (NPFDP) steadfastly for school children with the primary motive to integrate and elevate the physical fitness of school-going students and invigorate sports, physical fitness, and physical education via schools. Acknowledging physical education as a collective part of education program. Accompanying physical fitness, NPFDP also serves to spot meritorious sporting talent and nurture them for future performance.

Talent spotting was done in 2 phases, (i) Anthropometric measurements and BMI (ii) 7 item test battery encompassing, a.30m flying start, b. standing broad jump, c. Ball throw, d. 6x10 shuttle run, e. Balancing ability, f. Vertical Jump, and e. 800m run. Age-adjusted norms for 8 to 14 years of children were used for evaluation and assessment. Grades according to the accumulated scores were allotted from ‘A’ to ‘E’ where A is considered with Champ proficiency. Along with Height and weight, BMI was also considered as the basis for Talent Identification in the program. Sports-specific tests after physical competency were conducted for selected children.

National Sports Talent Search Scheme (2016):

‘Catch them young and teach them right’, Under the aegis of the Ministry of Youth Affairs and sports, the NSTSS program was launched in 2016 with an objective of ‘broad basing of sports’ and ‘promoting excellence’. Scheme sight to detect talented or rather gifted children under 8-12 years of age by Physical Efficiency and Sports Aptitude Tests (PESAT) in form of 6 battery test includes- 30m run (a), standing broad jump (b), forward bend and reach (c), 6x10 shuttle run (d), medicine ball put (e) and 600 m run (f), assigning scores as per norms. In the structured scheme commencing from school/block level to district and state level talents were ought to be identified. In **annexure5** (enclosed) of the scheme evaluation of test scores is displayed. How the performance will be evaluated.

Annexure 5

Proforma for Score Sheet

Testing level (School/Block/district)																		
Name of School/Block/district/State																		
Date of Testing																		
S. No.	Name of Candidate	Age	Height	Weight	30 Mts flying start (a)		Standing Broad Jump (b)			Medicine ball throw (c)			6x10 m shuttle runs (d)		Forward bend & reach (e)	800 m run (f)	Total (a+b+c+d+e+f)	
			In Cms.	In Kgs.	Atte mpt 1	At te m pt 2	Atte mpt 1	Att em pt 2	Atte mpt 3	Atte mpt 1	Att em pt 2	Att em pt 3	Att em pt 1	At te m pt 2				
1.																		
2.																		
3.																		
4.																		
5.																		
6.																		
7.																		
8.																		
9.																		
10																		
Signature of Evaluating Coach																		
Signature of Senior Coach																		
Signature of Zone Convener																		

Figure 1 Annexure 5 from NSTSS scheme for talent identification consolidated scoresheet

The evaluation used in the aforementioned scheme, selection of athlete is done by adding all the score of the tests i.e. $a+b+c+d+e+f$ and children with maximum scores are selected. This formula of selection and evaluation prompts the selection of an athlete who performed equally well or near average in all the abilities and not to those who stand extraordinary in one or other ability. Which derogates the very foundation and purpose of TI.

Case Study:

Rakesh Sahu a lean, tall and skinny 11year boy, from the rural outskirts of Madhya Pradesh, India, performed exceptionally in 600m run/walk test in 2 mins and 44 secs, scoring a maximum score in endurance against the criteria of 2.50mins for maximum. In medicine ball put and standing broad jump Rakesh's performance was ordinary and undistinguished, in evaluative procedure with scores averaged he didn't make it to the next level. Rakesh could have been an ace marathon runner, but due to the average evaluation, he was been cornered. Many such tribal and rural athletes with inborn ability couldn't furnish other components and end up facing rejection, falsifying the core of Talent Identification.

Many such schemes and programs rolled on to access and locate talents in children were discontinued as they were based on '*inappropriate and inaccurate assessment of physical fitness norms*' (John O'sullivan, 2013). (Vaeyens et al., 2008).

Talent Identification using Artificial Intelligence:

Artificial Intelligence (AI) is the modern technology that mimics human decisions, imitating human intelligence making a judgment with patterns and data which isn't possible for humans to encode manually(W Boers et al., 2009). Many of the modern researches are coming with the concept, application of AI to predict sports performance, sports injury, energy expenditure, fatigue and allied problems which could be dealt with using AI(Ellis et al., 2014; Oytun et al., 2020; Robertson, 2014). Musa et al., (2019) investigated the use of predicting high potential and talented archers by physical fitness indicators using weighted k-NN model variations and the results were valuable to discriminate between high-performers and low-performers. Siener et al., (2021) in a recent study tested the validity of prediction methods using discriminant analysis and a neural network in tennis players based on physical and motor

component tests, all the four methods tested showed medium-to-high validity which secures an efficient spot and future for talent identification using AI. Literature indicates AI could be effective as well as impactful in talent identification and advanced decision making and certainly can be used using present data for more meaningful outcomes.

Finding and Conclusion:

Most developed and equipped countries spend a lot of amounts on talent identification using biological and genetic indicators (Till & Baker, 2020a). In India where sports are not much considered and constrained, using technological gears for mass testing is not at all viable, and in the initial stage of screening research has proven the best and most accessible way to measure and evaluate talent is by physical abilities, later on, the selected athletes could be tested using advanced equipment. But the formula and mechanisms used presently needs to be aligned as they promote ‘average athletic ability’ and corner any extraordinary ability. Turner et al., (2019) in line with the study suggests. instead of using average values of all the athletic abilities, conversion of scores into z values and then comparing it in relation to other values may work better for identification process.

Although a new concept of ‘the total score of athleticisms’ is into play in recent studies which averages all the physical abilities to measure athletes’ performance and improve the are lacking, but this surely should not be a measure in talent identification where athlete with an extraordinary physical trait will be averaged with other abilities influencing the chances of selection (Turner et al., 2019). That’s a relative concept used for athletes’ improvement and should not me a measure to evaluate talent in TID.

Anthropometric variables and the game in which athlete is interested in should also be a major consideration in talent identification procedure, since every event demands its own specific set of motor components and ability, selection process and score should be adjusted based on the anthropometric ability, sports, and also to the position (team games) one is suitable to play in. All this considerations and data outcomes could not be analyzed, observed and evaluated by coaches and selectors, it requires a more precise and in-depth mechanism for the same. Artificial Intelligence can aid and assist coaches and physical education teachers to access students on basis of their physical, physiological, anthropometrical and motor variables

and scores adjusted as per demands, this with experience and calibration of human interpretation will help in more efficient selection process. Many researchers go with the motion of the same reaping more accurate selections when aided with data and AI (Till & Baker, 2020b). Its an emergent need to integrate AI and technological interventions with Talent identification methodology on India to elevate the sporting performance of the nation (Varenyes et al., 2008).

Importance of anthropometry and heigh, weight adjustments, and a key factor of age in years instead it should be more precise and age-specific adjusted values should be entailed. Since a fitness-based evaluation is should be criteria-based and not normative, as various athletes from various disciplines differ in motor abilities and when equal weightage is given to every motor component there are chances to miss an individual with outlying or extraordinary ability, hence affecting the probability of selection.

All the shortcomings of talent detection, identification, and selection could be done efficiently by AI algorithms in which custom patterns of an individual can be drawn, with anthropometric variables, motor components, and physical abilities. K-NN is one such algorithm in which athletic ability and non-athletic ability could be identified, the discriminant analysis or classifier could be used for locating talent using all the variables. Once classifying as athletic and non-athletic ability, further skill tests could be taken to measure the excellence in a sport. Even if the schemes focus skill-based evaluation and selection, some provisions should be made to admit and analyze the outliers and athletes who performed exceptionally in some or maybe one test in physical ability test, and drawing this pattern manually is not viable for humans, but with the use of advanced mechanics and machine algorithms various personalized patterns could be drawn to draw individuals' athletes. This can improve the selection methodology of talent extraction and development.

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LOCUS OF CONTROL IN INDIAN PARA-THROWER: AN ANALYTICAL STUDY

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*² Mahendra Kumar Singh

Abstract:

To understand locus of control, take an example of sports first, many sports person gives credit of their success to their family friends and coaching staff whereas many more gives credit to their handwork, discipline and perseverance. Here in this example sports person who believing it because of their family, friends and coaching staff have a higher external locus of control and on the other hand who believe only their hard work all paid off have a higher internal locus of control. In sports athletes who are highly internal motivated and believe they are responsible for results because of their own actions are considered as more likely to achieve greater achievement compared to external motivated athletes. Purpose behind the research was to know the current status of locus of control of Para-athletes. For this study, elite Indian para- throwers who participated and represented India at Various International platforms (Tokyo Paralympics, Para-World Championships) selected as the subjects of the study. Terry Pettijohn's Locus of Control Scale was administered to the participants. After analysis the data it was found that para-throwers were motivated by Internal factors and dominant the Internal Locus of Control in their Sports Performance.

Keywords- Locus of Control (LOC), Personality, Success, Sports, Para-throwers.

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Introduction:

Locus of Control (LOC) is regarded as an important feature of personality in psychology. Julian Rotter first proposed the concept in the 1950s (Rotter, 1966). A locus of control orientation is a view that the outcomes of our actions are determined by what we do (internal control orientation) or by events beyond our control (external control orientation) (Zimbardo, 1985). In general, it appears to be psychologically beneficial to believe that one has control over the things that one can influence (Neill, 1997). Locus of control, according to Rotter (1966), is an individual's sense of the underlying principal causes of events in his or her life. It is a crucial aspect of one's personality. He distinguished two types of locus of control: internal locus of control and external locus of control. Individuals with an internal locus of control accept as true that events happen as a result of their own actions, whereas those with an external locus of control feel that events happen as a result of luck, chance, or the actions of others. Athletes who have an external locus of control seem to be more prone to blame their failure on something outside of themselves. They do this when they have a bad performance. They may blame the manager, the referee, the opposing team, and the playing environment if they have a terrible performance. An athlete with an internal locus of control, on the other hand, is more likely to accept responsibilities about his or her performance and to turn inward to see what they could have done differently to improve their performance.

Researchers have been studying the link between sport and locus of control, mental toughness, aggression, stress, and other psychological traits for decades. There are various research on sports locus of control in the literature (Roshini, 2019; Filipiak, 2019; Rutkowska, 2014; Scoffier, 2010; Holden, 2019; Fard, 2015). There has been minimal investigation into the psychological factors that cause Elite Indian Para-Throwers' performance. Previously, only normal players or youth and senior level para-athletes were studied. The goal of the study was to examine locus of control patterns among elite para-throwers competing at an international level. As a result, the investigator sought to learn more about the current state of psychological parameter locus of control in India's finest para-throwers.

The study's research objectives were developed after a review of relevant literature on locus of control in youth persons involved in individual and team sports. First, to determine the current state of locus of control in elite para-throwers, and second, to provide actionable advice to athletes and coaches following the study's conclusion.

Methodology:

Subjects Selection of Study

12 para-athletes who represented India at the Paralympics, Para-world championships and Para-Asian Championships were selected as participants for this study. This study enlisted the help of 7 standing throwers and 5 seated throwers. The participants ranged in age from 20 to 40 years old. Data collection of the athletes took place in end of November 2021. To collect socio-demographic information a Personal Information form developed by the investigator with the help of supervisor and experts and (Table 1).

Table. 1: Socio-demographic information of the Para-athletes

FACTORS		TOTAL POPULATION (%)	MALE (%)	FEMALE (%)
Subject		12 (100%)	8 (66.66%)	4(33.33%)
Age				
	20-25	2 (16.66%)	1 (8.33%)	
	26-30	2 (16.66%)	3 (25%)	
	31-35	3 (25.00%)	1 (8.33%)	2 (16.66%)
	36-40	5 (41.66%)	3 (30%)	2 (16.66%)
Participation				
Level	Paralympics	5 (41.66%)	4 (40.00%)	1 (8.33%)
	Para-World	4 (33.33%)	2 (16.66%)	2(16.66%)
	Para-Asian	3 (25.00%)	2 (16.66%)	1(8.33%)

Assessment Criterion:

The scores obtained from Terry Pettijohn's developed variation to Rotter's original Locus of Control questionnaire as the criteria measure to measure the results.

Terry Pettijohn's Locus of Control Scale:

Julian Rotter (1966) developed a locus of control personality testing to determine whether a person believes in internal or external reinforcement. Focusing on Rotter's original model, Terry Pettijohn created the following test. Choose if each assertion is T (right) or F (wrong) for you. There are no correct or incorrect replies. This poll will present a general ideal about where you fit on the personality component of locus of control. Once you've finished all of the questions, add 5 points to your score if you scored statement #1 true, and none if you marked it wrong. The results are scored along the following scale:

Score Degree of control personality

0 - 15 Very strong external locus of control

20 - 35 External locus of control

40 - 60 Both external and internal locus of control

65 - 80 Internal locus of control

85 - 100 Very strong internal locus of control

Procedure:

The researcher met with the individuals in person and explained the goal of the investigation to assure their honesty and participation. The researcher gave explanation of how to respond to the LOC questions. Following the collection of responses from respondents, the scoring was carried out using the scoring key. The test took 5-10 minutes to complete because of data collection.

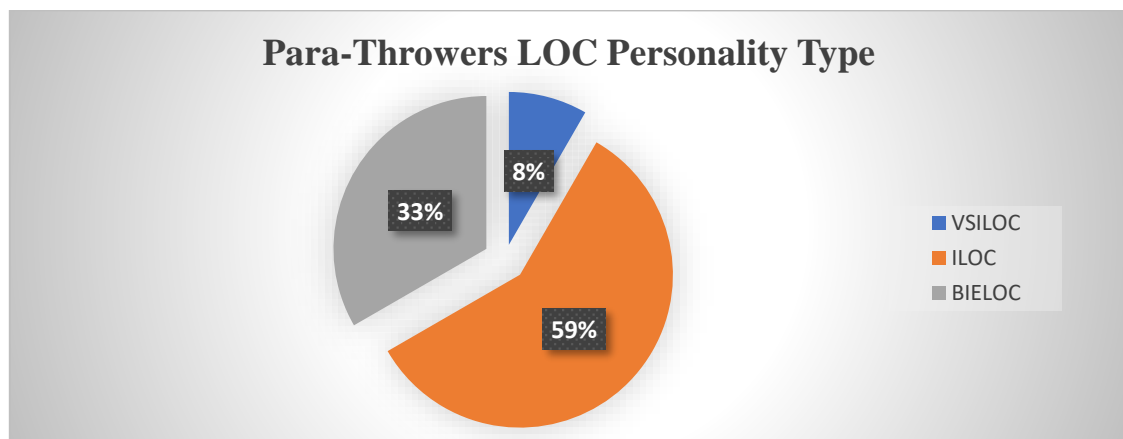
Statistical Tools:

The percentile method was used to do the analysis of the data by representing it in the Pie and Bar chart diagram.

Results:

After implementing Percentile method on aggression level scores of para-throwers. Pie Chart And Bar chart diagram showing the LOC of para-throwers in Figure 1 and Figure 2 Respectively.

Figure 1: Pie Chart of LOC Personality Type of Para-throwers



Note-

*VSILOC- Very Strong Internal Locus of Control

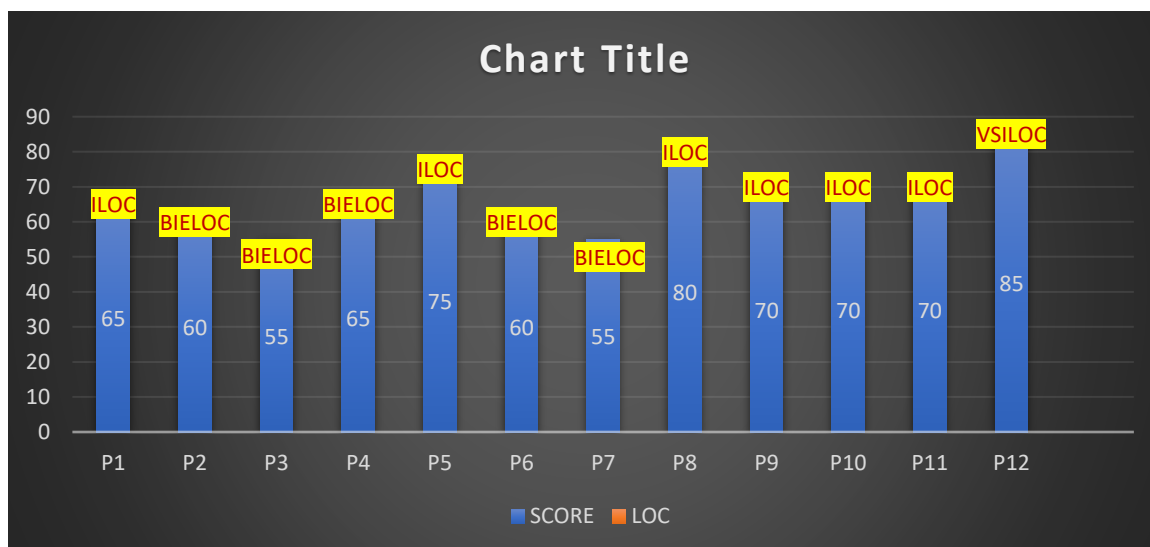
*ILOC- Internal Locus of Control

*BIELOC- Both Internal and External Locus of Control

This pie diagram shows the results of the survey in which the para-throwers responded to LOC Questionnaire. The participants had to honestly give answer to questions.

From the pie chart it is clearly shown that the majority of the para-thrower (59%) falls in Internal Locus of Control (ILOC), whereas 33% of para-thrower are Both Internal and External Locus of Control (BIELOC) and only 8% are Very Strong Internal Locus of Control (VSILOC).

Figure 2: Bar Chart of LOC Personality Type Scores of Para-athletes



Note-

*VSILOC- Very Strong Internal Locus of Control

*ILOC- Internal Locus of Control

*BIELOC- Both Internal and External Locus of Control

The bar chart showing the current status of LOC in Para-throwers. According to the chart, it shows that mostly the Para-thrower are ILOC (7-athletes) followed by BIELOC (4-athletes) and only one Para-thrower is VSILOC which means highly strongly internally motivated.

Discussion:

The aim of this study was to analyse the present state of locus of control in elite para-thrower who participated at international level. This study was carried out facing the need for sport psychology knowledge, and also provide actionable advice to athletes and coaches. After analysis the data researcher found that mostly the Para-thrower are ILOC (7-athletes) followed by BIELOC (4-athletes) and only one Para-thrower is VSILOC which means highly strongly internally motivated. The majority of the para-thrower (59%) falls in Internal Locus of Control (ILOC), whereas 33% of para-thrower are Both Internal and External Locus of Control (BIELOC) and only 8% are Very Strong Internal Locus of Control (VSILOC).

People with a higher internal locus of control appear to be happier, according to psychological study; for example, they are more goal-oriented (Neill, 1997), Certel and Kozak (2017) investigated university athletes throughout Europe in a separate study. Academic procrastination, self-efficacy, race, and teamwork were among the findings. Academic procrastination is linked to a higher external locus of control, according to this study. Increased self-efficacy is associated with a larger internal locus of control (Certel & Kozak, 2017). Intrinsic motivation has a favourable association with individual performance, according to a study by Mccorison (2020). These findings support the current study's findings, demonstrating that the majority of para-athletes with strong internal LOC and moderate internal LOC are motivated by internal factors such as their hard work and passion for the game, and are less influenced by external factors, which is a positive sign for their sports performance.

However, there are several limitations to this research. One of these is the very small number of people who were polled. The current study has a restriction, just like most research investigations. The study relied on self-reported information. Para-athletes may be impacted by recent experiences or unsure of how they feel at the moment they report their own feelings. As a result, it's possible that their responses to the surveys will be affected.

Other psychological traits such as coping methods, aggression, motivation, mental toughness, and so on will need to be researched in the future to determine if they meet the needs of more population groups such as para-jumpers, para-swimmers, para-runners, or para-badminton players.

Conclusion:

As a result, the researcher can conclude that majority of para-athlete having internal LOC are motivated from internal factors. A person with a higher internal locus of control will assist you in moving forward on your path, becoming goal-oriented because then you will work hard to get where you want to go, willing and able to work hard to achieve your goals because you believe that you are the only one who can push yourself to keep moving forward and will not wait for external factors to help you. Indian elite para-throwers have a stronger internal locus of control, whereas other athletes at the junior level and their coaches can work with them

to identify their LOC personality type, which will help them stay more focused on the job at hand rather than the outcome.

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A SURVEY OF THE ATTITUDE OF DEAF AND DUMB STUDENTS AND ORDINARY STUDENTS TOWARDS PHYSICAL EDUCATION OF PUNE CITY

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Abstract:

The main objective of this study was to find out the attitude of deaf and dumb students and ordinary students towards physical education in the age group of 12 to 16 years of Pune city. For data collection, the researcher randomly selected a sample of 200 deaf and dumb students and 200 ordinary students in the age group of 12 to 16 years from different schools of Pune city. Statistical tools mean, standard deviation, were used for analysis. The findings show that the general students in the age group of 12 to 16 years have a more positive attitude towards physical education than the deaf and dumb students.

Keywords: Attitude, Deaf and Dumb, Ordinary, Physical Education

Introduction:

Since human existence Physical education has been linked to human relationship. The life of humans prospered as they started discovering things. Research created inventions and machines which molded the lives of humans. The easy going lifestyle brought in limitations and exercise became the need for humans. There was change in the concept, aims and objectives of physical education due to the change in Geographical, Political and Social

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conditions. The goal of physical education is to develop the all round personality of the child. Good looks not only makes the personality effective but the child also needs to be physically, mentally, socially, emotionally and morally developed. With this the attitudes and instinctive self-confidence also gets developed. Variety of sports and physical education activities help in the growth and nourishes the feelings of students.

In the present research, the researcher has chosen this topic for the purpose of creating programs and facilities for the deaf and dumb students by recognizing and being aware of the many limitations as there is a difference in the learning process between deaf and dumb students and ordinary students. The attitude of secondary school students towards physical education is not as positive as it should be. Emphasis on physical education at secondary level can create an ideal generation in the field of sports. The role of physical education and students at the secondary school can be very important if the image of the country in the field of sports is to be maintained globally in the 21st century.

Ordinary children learn to talk by listening to people close to them. They can communicate successfully by talking to family members but deaf children are deaf so language cannot be heard. As a result both speech and hearing defects are complete. Deaf children, along with ordinary children, need to be physically strong to cope up with this stressful situation. Physical education plays an important role in keeping a person physically fit.

Research Methodology:

In the present research, the researcher has conducted a subjective survey to study and find out the attitude of deaf and dumb students and ordinary students towards physical education in the age group of 12 to 16 years of Pune city.

Population and Sampling:

For this research, all the students in the age group of 12 to 16 years in the school of deaf and dumb students coming under Pune Municipal Corporation were selected. In this, 200 students from deaf and dumb 4 schools and 200 students from ordinary 4 schools under Pune Municipal Corporation were selected and random selection method was used. Information was

collected using self made questionnaires to study the student's perspectives. During the data collection, researcher took the help of the teacher of deaf and dumb students to explain the purpose of study and questionnaire, after that questionnaire was filled by the students.

Analysis of Data:

Table 1: statistical analysis of attitude of deaf and dumb students and ordinary students towards physical education in the age group of 12 to 16 years

Category	Mean	SD	Total respondents
Deaf and Dumb	66.49	2.470	200
Ordinary	75.50	10.310	200

Findings and Conclusion:

The following conclusions were drawn from the research presented:

» The attitude of deaf and dumb students is poor towards physical education as they cannot participate as much as the Ordinary students can in games and sports as well as they don't have enough facilities in sports. Also, due to their physical deformities they lack in self-confidence which brings in an obstruction to adjust with ordinary students. Thus, the ordinary students between the age group of 12 to 16 years have more positive attitude towards physical education than deaf and dumb students.

It was also suggested that The researcher has recommended the same study for deaf and dumb And ordinary students which can be done in other districts, states and countries.

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SPORTS LAW: DEVELOPMENT & CHALLENGES IN INDIA

***Yashodhan K. Kharade**

Introduction:

Former head of FIFA, has described India as a "sleeping giant" because of the billions of people it possesses, and the sports sector as a career has been rapidly growing. The growth of the sports business as one of India's most important professions has necessitated the establishment of a comprehensive overall legislation that coordinates the entire structure of sports and establishes severe rules and punishments that can be developed and executed across the country. Earlier, the main interest of the Indian sports sector was cricket. Most of the sport business's appeal, both as a job and as a form of entertainment, has been focused on the sport of cricket, which has received the majority of governmental funding as well as other resources available to the sports sector. With the recent competitions linked to football, kabaddi, hockey, and other sporting activities, the Indian government's and general public's attitudes about cricket have evolved. The Indian government has also contemplated spending the same amount of money on other sports as it has on cricket.

Furthermore, the success of Indian athletes at the Olympics and in Asian sporting events, as well as at the national level and in other international sporting tournaments, has highlighted the need for a change in attention away from cricket and toward other sports.

With all of these advancements in India's sporting activities, it has begun to be regarded as a key source of entertainment in the country, creating a high number of professionals that work in the sports industry, either directly or indirectly. As the people involved in the sector has grown, strict norms and regulations, as well as bodies to coordinate them, have been

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established to regulate sporting activities. The growth of this industry necessitates the government's involvement and creation of distinct commissions or divisions tasked with resolving all issues and problems that arise from athletic activities. However, as the sporting sector has progressed, so have the regulations governing sports, which have evolved to the point that they now have the status of legislation. The Indian government is considering establishing a major agency to coordinate the country's athletic activities. The significance of sports law was demonstrated in the case of Mohammed Salah, who demonstrated the level to which sport law development is essential. This case revolved around Mohammed Salah's loan stint at Fiorentina from Chelsea. There has been a breach of Chelsea's agreement with Fiorentina, which has been disregarded by FIFA and the CAS. As a result, a lawsuit has been filed against Chelsea for the security violation. However, it is clear that if such issues had arisen in India, the scenario would have been even more perplexing, as there is no strong law or policy in place to coordinate such a agreement, which has resulted in the situation. This has highlighted the need for India to formulate and execute rigorous laws and regulations in the form of legislative power in the sporting industries. In addition, the athletic sector has been apprehensive with commercial operations in regard to investments made as well as dealings involving sporting actions.

The term "sports law" refers to a legal framework that must be implemented and formulated in order to regulate both professional and amateur sporting activity. Sports law cannot be reduced to a single piece of legislation due to the wide range of legal challenges that the sports industry has to deal with. Advocates working in the sports legal structure must be familiar with all aspects of the legal system that the sports industry is likely to encounter. Tort law, constitutional law, criminal law, intellectual property law, competition law, contract law, labour law, and other similar legal fields may be used while dealing with legal difficulties in the athletic arena. Although it is impractical to establish a single legal authority to govern the wide range of legal disputes that may arise in the field of sports, the growing complexity of sports structures and other scandalous misappropriation have been pointing towards the establishment of a more strict legal authority to regulate the sporting activities operating in India. Given the vast amount of resources involved as well as human contact, sports law should be given its own legal structure, both in terms of laws and the structure of judiciary, to provide a more compelling structure when dealing with conflicts.

This study will attempt to analyze the evolution of sports law and trace the major difficulties and concerns that have arisen as a result of it. It will explore the need for such a change in the legal structure in the sports field.

Problem caused by International Sports Federation and National Sports Organization in nonexistence of Sports Legislation:

The International Sports Federations (IFs) are in charge of ensuring the integrity of sports activities that have international coverage. It represents non-governmental international organisations that have obtained recognition from the International Olympic Committee (IOC) for the purpose of administering multiple sports or at least one sport at the global level of competition. All national federations that have been in charge of sports administration and are affiliated with the International Sports Federation. The International Sports Federations have a legal compulsion to ensure that its statutes, operations, and practices comply with the Olympic Charter in order to preserve the autonomy and independence of the sports they administer. These federations are in charge of managing and overseeing the routine operations of the numerous sports disciplines that operate around the world. It has been entrusted with the responsibility of organising and hosting the Olympic Games. The federation has also been given permission to prolong its view on the bid for hosting the Olympic Games.

Furthermore, the massive amount of money that has recently been made in sporting activities has raised the likelihood of misappropriation and other issues taking their natural course. The international organisations involved in sporting activities, on the other hand, have a broader scope than simply organising tournaments and regulating sporting events. International organisations in the realm of sports also have a separate part that deals with the legal structure for international sports. The International Association of Sports Law (IASL), the International Sports Dispute Resolution Forum (CAS), and the World Anti-Doping Agency are examples of these organisations (WADA). The issues that arise from sports law are not limited to a certain field of law. The activity of sports has been used to cover a variety of legal issues. It might range from doping tests to competition and team selection methods and qualifications, as well as monetary misappropriation and other legal issues.

The legislation governing sports is said to be influenced by a variety of circumstances involving diverse sporting activity. It is regarded as a type of applied law in this subject, with a number of other laws governing it. The law's main goal is to give fundamental principles in order to protect the benefit of individuals who participate in sports. There are a few difficulties related to this sector and the legislation that will be covered further down. The challenges that occur in this field jeopardize the industry's reputation, thus preserving the regulations, as well as the industry's integrity, is critical.

Issue of Contract:

The question of contract is the first such area of law that is a popular topic in sports law. The use of contracts by the sports organization has increased, not only for business considerations, but also for encoding and employment purposes. It could be a agreement with the coach or trainer, a contract with a player, or even a contract with another party engaged in the whole thing. When it comes to contractual concerns, the law of contract will be used to mitigate the situation. The case of "ASBL v Jean-Marc Bosman (1995)" illustrates this point. This ruling makes it unlawful for clubs to demand money from players who are looking for a way out of their contract. However, in order to avoid paying costs outside of the contract, movement must be limited to European Union teams only. This has prompted clubs to recruit players from outside the country to play for them and gain exposure.

Issue of Copyright & Trademark:

The copyright law has for all time been an important part of intellectual property law in the sports world. The case of "National Basketball Association (NBA) v Motorola and STATS (New York) Second Circuit Court of Appeals" is one such example. In the field of sports, the issue of trademarks has also been a significant legal concern. A trademark is any name, symbol, word, blend, or device that is used to distinguish one manufacturer's products from those of other manufacturers. The main goal here is to figure out where the product came from in the first place. The case of "National Football League v. Coors Brewing Co." is an example of a trademark dispute. In this case, there was a dilution allegation of trademark violation brought by NFL, and the court upheld the claim as genuine, thereby interfering with the value of the company's distinctive identification. This area of law also includes licencing,

marketing, and sponsorship, as well as a variety of other intellectual property-related issues.

Issues in Sports Law:

The law's main goal is to give fundamental principles in order to protect the interests of individuals who participate in sports. There are a few difficulties related to this sector and the legislation that will be covered further down. The challenges that occur in this field jeopardise the industry's reputation, thus preserving the regulations, as well as the industry's integrity, is critical.

Corruption:

Sports corruption is a worldwide problem that makes it difficult for those in charge of organizing events, tournaments, and athletes in the sector. Individuals incur consequences as a result of issues linked to dishonesty in the form of bribery or any profit, online gambling and betting, or any fraudulent behavior. To avoid such difficulties from occurring, many bodies, including intergovernmental agencies and multiple sports governing bodies, have assembled to debate the challenges and suggest several strategies that can be used and implemented to reduce corruption-related issues. The bodies established aim to comprehend the issues surrounding corruption in order to tackle these issues and maintain the honor of sports.

Match Fixing:

Match fixing is a serious problem in the sports sector, and authorities have adopted a variety of ways to detect and manage it because it is a public eye issue. A game is deemed enjoyable because of its unpredictable nature, which appeals to observers or audience. Match fixing endangers the spirit of the game and makes it unpleasant to the public since it does not provide a fair treatment to both contestants and viewers. For example, as evidenced by the cricket incident "Worcestershire v Somerset, 1979", which was widely criticized by cricket administrators and the media because the plan was to affect the tie-breaking rule. Somerset was kicked out of the tournament the following year as a result of such actions. As a result, it can be seen that steps are being done to avoid it, but enforcement needs to be stricter and it should be made a criminal offense.

Individuals who work in the industry face difficulties and challenges as a result of these issues. As a result, various provisions must be followed in order to make sure and uphold the rights of individuals or participants in the sports industry. Some of the laws and regulations that European states follow can be used and implemented in the Indian framework to benefit the country and, as a result, reduce crimes and offences involving controversial matters in the industry. As evidenced by examples involving match fixing and other forms of corruption implemented by players or other sports participants. Such measures must be monitored and prevented, as they will result in fair play and provide participants with equal possibilities to carry out in a way that will assist them improve their skill.

Condition of Sports Law in India:

In India, sports law is still considered to be evolving, as the officially authorized system needs to evolve and acknowledge sports law as a distinct profession with its own set of rules and regulations. The Indian sports law is still evolving, and it is attempting to combine new ideas and strategies from other legislations into the Indian legal framework governing sports. There are several recommendations to strengthen the framework of Indian sports law, including educational possibilities for various sports-related activities, which would then distribute information about unique sports legislation in India. Individuals that are active in sports, such as athletes, teams, and organisations, require a good forum or platform to come forward and speak their ideas. To instil a sense of ethics and a code of conduct among those who work in the area. A code of ethics should be created for an individual's or a sportsperson's behaviour and conduct. There must be a high standard of investigation and research into the topic of law and how it relates to sports. After the research is completed, it is necessary to consider where the result of the research will be available. There may be the establishment of a consultation group that would provide sports-related advice, thereby assisting in the creation of knowledge about the different opportunities that can be pursued and which would create excellent employment opportunities for the younger generation.

Conclusion:

This paper examines the several types of sports law and how they connect to case law. It discusses the issues facing the field of sports and what can be done to improve the field's standard. It also examines numerous problems or scandals that have happened as a result of a lack of proper legislation, as evidenced by case studies. As a result, it aids in the understanding of the notion of sports law through the use of instances, and it links to issues and provides recommendations that may be utilised to advance the law's composition. Because sports have become such an important part of people's lives, they require their own regulatory structure, which includes unique rules and regulations. By being linked to sports law, such a restriction and limitation would be imposed. As a result, the existing regulatory framework's measures would not be applied, which would help or assist in eliminating or eradicating the challenges that exist as a result of the lack of a regulatory system.

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CHANGES AND CHALLENGES AND INFRASTRUCTURAL FACILITIES TO THE SPORTSPERSONS OF HARYANA: HARYANA SPORTS POLICY, 2015

***¹ Sushma**

***²Dr. Kultaj**

Abstract:

The present paper is an attempt to study the increase in cash award in New Haryana Sports Policy, 2015; to study the infrastructural facilities to the sportspersons of Haryana. Secondary data has been used from government gazettes, articles, journals, internet sources, magazines etc. It is noted that Haryana Govt. is playing a role to develop and promote of sports in Haryana by award, facilities. Most of medalists of National and International level are please with this. Haryana government tends to his best to develop sports. A lot of scheme of are here for sports person and coaches. People's increased expectations for sports were not met by prior rules, which generated discussion regarding the good impact sports may have on society. An entirely new approach to government was thus required, one that was motivated by the sports community's unwavering commitment, desire, and passion for its restoration. Discussions with stakeholders on how to increase the sports sector's ability to train athletes and offer sports have resulted in this mature and exciting new policy. Sports and physical fitness play an important part in Haryana's culture and society, hence the new vision and objectives are more ambitious than the previous one. It aims to improve the sports system's infrastructure, networks, and resources. "Broadening of sports" and "reaching excellence in sports" are the twin focuses of the policy. Commitment is essential to drive policy execution in order to achieve its objectives. Achieving the policy's aim will be easier in Haryana thanks to the concerted efforts of government and non-government organisations working together at local, district, and state levels. Haryana's government wants to encourage sports and physical

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wellness via this programme. To put this policy into action, specific plans, rules, and processes will need to be developed in the future.

Keywords: Sports, policy, infrastructure, awards

Introduction:

Haryana is one of India's wealthiest states. Sports success may be attributed statistically to five different variables: population, per capita income, previous performance, climate, and the host effect. Haryana has benefits on several aspects. In addition, the State has steadily maintained its position as one of the country's top achievers in terms of development metrics. In addition, the state of Haryana is quite young. As to 2001 census, 48 percent population is lying in the age band of 10-35 years. There is an increased focus on energising, educating, and mobilising the population's younger members. We can't imagine life without sports and games, and they're crucial for our future human resource development. They are also a great technique to channelize the energy of adolescents in useful and meaningful goals. The State Government has consequently allocated a high priority to offer incentives throughout the State. Haryana's sports infrastructure has to be universalized throughout the state in order to unearth and develop the newest sports potential among the state's youth. This would help Haryana become a lively state at the cutting edge of sports. In 2001, a sports policy was drafted, which was then updated in 2009.

The policy was evaluated and amended in the year 2012, and now in April, 2013, to boost the monetary rewards and incentives. A variety of updated rules affect sports from time to time, including the doubling of financial prizes for the 2016 Summer Olympics and Paralympics, as well as the sanctioning of honoraria for Dronacharya, Arjuna, and Dhyan Chand recipients. Haryana increased financial incentives, more assertion of a certain future; and yet higher push to achieve more and better.

Review of Literature:

Malik (1993) examined the root reasons of Indians' underwhelming international results and low standards. He found that the inadequate national sports strategy, poor functioning of

IOA, lack of scientific coaching and training are the culprits for this underlying sickness. According to Anand (1986), a great physical education and sports institution is essential if it is to turn forth sports coaches and physical education teachers who are well-trained and well-qualified. Educators with this level of expertise in physical education may execute policies and plans to promote physical activity and sports in rural and tribal sports. Sharma and Gupta (2005) stated that the government should take the major efforts with the co-operation of volunteer groups to give broad-base the physical education and sports in the nation. They found that a gradual and methodical reawakening of national building efforts was necessary. In order to instil a national sports ethos, the media must do its part to raise public awareness of and enthusiasm for sports among the general population. In India's sports policy, the use of scientific evidence has been well received. The policy may provide direction for positive results, but it may also need sincere efforts at the required level. The genuine effort and mentality will almost certainly produce unexpected results on a global scale, establishing India as a key player in the sports world. The policy aspects that distinguish Haryana as the country's sports capital are clear, but Jharkhand's inadequate planning, late updating, and wrong execution of sports policy may provide a development barrier for the state's athletes. As shown by the state's frequent updates in 2018 and 2019, Haryana has a stronger sports policy implementation plan than the other two states. Financial assistance and scholarships, both of which will be accessible in Haryana in 2015, are a key part of Punjab's new sports strategy. Fresh talent is discovered at an early stage in Haryana as a consequence of this grading system.

Objectives:

1. To study the new changes and challenges in Haryana sports policy, 2015.
2. To study the increase in cash award in New Haryana Sports Policy, 2015.
3. To study the infrastructural facilities to the sportspersons of Haryana.

Data Collection:

Secondary data has been used from government gazettes, articles, journals, internet sources, magazines etc.

Outcomes of the Haryana Sports Policy, 2015:

New sports policies in Haryana aim to help the state's most outstanding athletes and provide them with more employment possibilities. Sporting champions like Vijender Singh and Yogeshwar Dutt, from Haryana, have given respect to the state by winning gold and silver medals overseas. Think about the fact that Haryana, as part of its new sports strategy, has promised an increase in award money for national and international athletic contests champions. The programme, which started with a right to work and an insurance plan for sports players, has now added a pension plan and an annuity to its list of perks for sports. Additionally, the state government has devised awards for coaches and sports clubs all throughout the state, in addition to new trophies for players. On the occasion of Swami Vivekananda's 150th birth anniversary, Chief Minister Manohar Lal launched the "Haryana Physical Activities and Sports Policy-2015" at Rohtak on that day.

The erstwhile Congress administration of Bhupinder Singh Hooda in Haryana pioneered the tradition of paying medal winners with cash and government jobs. When the current BJP government came to power, they felt that the strategy had weaknesses and chose to develop a new one for the state of Haryana. As the Chief Minister noted, "In addition to the incentives supplied by the government of India, honorarium and pension will be given to Arjun Awardees, Dyanchand Awardees, and Rajiv Gandhi Khel Ratan Awardees from the State."

Every year, schools would perform a mass exercise to test the physical condition of all pupils, with the tagline "catch them young, catch them correctly." For the first time ever, there will be a significant rise in sports scholarships available in Haryana." He said, according to Manohar Lal "In each district, a senior secondary would be turned into a sports school.

The State Physical Fitness Program, mass exercise, and a redesigned version of the former Sports and Physical Aptitude Test will all be used to assess the physical fitness of all students (SPAT). There will be state-run agencies for sports development in Haryana, as announced by the state government. Adventure sports like climbing and cycling will be a focus of the state's promotion efforts as well. In addition, the PPP model would allow the state to access additional resources for the building of sports facilities.

Increase in the Award Money to Outstanding Sportspersons:

Rs 6 crore, up from Rs 5 crore before, was added as a bonus for Olympic and Paralympic gold medal winners under the new policy. For the silver and bronze winners, Rs.4 crore and Rs.2.5 crore have been declared. There has been a significant increase in the prize money awarded to Asian/Para Asian Games medal winners, with gold medalists now receiving Rs 3 crore instead of the previous Rs 2 crore. The winners of the silver and bronze medals will get a total of Rs1.5 crore and Rs75 lakh respectively. Commonwealth and Para Commonwealth medal winners are awarded Rs. 1.5 crore, Rs. 75 lakh & Rs. 50 lakh correspondingly for gold, silver and bronze. The cash prizes are only open to Haryana-based athletes who have represented the state in any sport and who now live or have a permanent place of residence in Haryana.

New Awards Announced:

There will be five winners each year of the Eklavya Award, which comes with a monetary prize of Rs 1 lakh and other prizes including a memento, certificate, jacket and necktie. In addition to a cheque for Rs 2 lakh, the Maharana Pratap Award for lifelong achievement to men's sports includes a memento, scroll, jacket, and a tie or scarf. The Rani laxmi Bai award for lifelong service in sports for women would include a monetary value of Rs 2 lakh, a memento, scroll, blazer, and a tie or scarf. Rs 2 lakh will be granted to the coach of the year as part of the Guru Vashisht Award For the referee, umpire or judge, the Vikrmaditaya award will consist of Rs 2 lakh, a commemorative scroll, blazer and scarf. A yearly cash prize of Rs 5 lakh will be offered to the top performing sports organisation.

Yoga Made Compulsory in Educational Institutions:

In all schools in Haryana, yoga has been declared mandatory, and each district sports stadium will be outfitted with ayoga facility. Every school's sports training programme will include a half- hour of yoga practice at zero hour. Other self - defense sports and activities, such as karate, will be permoted at all women's educational institutions.

'Akhada Competition' To Be Organised:

Akhada competitions will be held on a regular basis in order to raise awareness of the state's many 'Akhadas'. Sportspersons who placed first in the Akhara Kushti Competition at the state level tournaments now get Rs 5100 instead of the previous reward of Rs 500 . Other state-level tournaments have seen large increases in cash prize as well.

6,500 Village-Level Stadiums (Vyamshallas):

More than 6,500 village stadiums (Vyamshallas) will be built in Haryana, and Rs. 1 crore Sports Science lab will be built at MDU in Rohtak to help youngsters become healthy and identify and develop emerging sports potential.

Conclusion:

It should be highlighted that Haryana's government is actively supporting the growth and development of sports in the state by providing funding and infrastructure. It's good news for the vast majority of medal winners at the national and international levels. Haryana government tends to his best to promote sports. There are a slew of plans available for sports and coaches alike. Prior regulations failed to meet the rising public expectations for sports, resulting in debate about the positive influence sports may have on society. An altogether new approach to governance was therefore necessary, one that was inspired by the sports community's persistent devotion, desire, and enthusiasm for its restoration. This well-thought-out and exciting new strategy is the outcome of discussions with stakeholders on how to improve the sports sector's capacity to train athletes and provide sports. Haryana's culture and society place a high value on sports and physical health, hence the new vision and goals are more ambitious. It strives to strengthen the sports system's infrastructure, networks, and resources. "Broadening of sports" and "achieving excellence in sports" are the twin foci of the policy. For policy implementation to succeed, a person's level of dedication is critical. Achieving the policy's objective would be simpler in Haryana owing to the joint efforts of government and non-government groups working together at local, district, and state levels. With this initiative, the state of Haryana hopes to promote healthy lifestyles by promoting

sports and physical activity. To put this policy into effect, specific plans, procedures, and processes will need to be implemented in the future.

Suggestions:

It is suggested framing a self-sustained and broad – based National Sports Policy, State Sports Policy and its implementation by Ministry of Sports. The policy must ensure:

- Increase in the level of participation of sports in the student community.
- Organizing compulsory annual sports meet in all educational institutions
- Proper scouting of talent.
- Selection of team in advance for international competitions.
- Adequate coaching by the best coaches of India or abroad.
- Accountability of the concerned sports body for poor performance.
- Increase in the amount of cash awards to the medalist participated in national and international level championships.
- Guarantee of job by the government to the medalist sportspersons.

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