Department of Sport Science and Yoga

Ramakrishna Mission Vivekananda Educational and Research Institute

(Deemed University)

Belur Math, Dist. Howrah 711202, West Bengal

(Rated A++ BY NAAC)

Educational Excursion to

LAKSHMIBAI NATIONAL INSTITUTE OF PHYSICAL EDUCATION (LNIPE), GWALIOR

6th-11th January, 2020

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Overview of the Department of Sports Science & Yoga

The Ramakrishna Mission Vivekananda Educational & Research Institute (RKMVERI) (Deemed University), Belur Math, was established in 2005, under Section 3 of University Grants Commission (UGC) Act, 1956, in order to promote education and research in selected “thrust” areas – of which adapted sports and yoga were one of the important areas. In the year 2012, the University established a full-fledged academic Department of Sports Science and Yoga to promote scientific study and research related to sports, including adapted sports, and yoga. The Department is housed in a newly built state-of-the-art Atma vikas building. Academic programs run by the department include MSc. in Sports Science. Sincere efforts by highly qualified full time faculty members led to the stage where several programmes on sports science and yoga could be introduced within a few years of the genesis of the department. Recognizing the services of Ramakrishna Mission to mankind, UNESCO instituted the prestigious UNESCO Chair in the field of “Inclusive Adapted Physical Education and Yoga” at the University in the year 2012.

About Lakshmibai National Institute of Physical Education

After the initial warm and comfortable stay at Gwalior Ramakrishna mission ashrama for two consecutive days and visiting the local historical places, the six students of MSc Sports Science along with their professor started their lab visits at LNIPE, Gwalior. Their stay was arranged by RKMVERI at the Mahatma Gandhi International Guesthouse inside LNIPE Campus. From Monday 6th January till Friday 10th January, the students visited all the laboratories, met the faculty members, attended classes and gathered important information about the Lab equipment. They had hands-on exposure to most of the Lab equipment and procedures. They were introduced to a large number of sports facilities and games inside the campus. The Faculties of LNIPE were extremely encouraging and helpful throughout the visit.



Day-1

SPORTS PSYCHOLOGY LAB VISIT-

Sports Psychology is an interdisciplinary science, uses psychological knowledge and skills to address optimal performance, well being and development of a sportsperson.We visited the lab on 06.01.2020.

Instruments and techniques demonstrated:

1.Biofeedback and Neurofeedback equipment

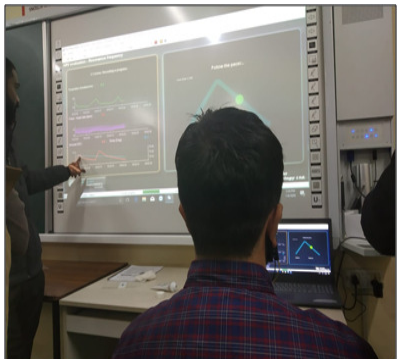
2.Mirror Tracer

3.Hand Steadiness Tester: Hole Type

4.Photoelectric Rotary Pursuit

5.Bassin Anticipation Timer
6. Vienna Test System

1. BIOFEEDBACK AND NEUROFEEDBACK EQUIPMENT



•To analyse and detect Breathing Rate, Heart Rate, Galvanic Skin Response, Blood Pressure, Muscle Tension, Brain Waves and Skin Temperature.

•To understand psychological problems and improve performance using self training techniques.

•Subject was asked to back count ,recollect a strong-emotional memory and follow a visual signal to inspire and expire accordingly.

•Electrodes, Non-Contact Monitor Tools, Telemetric Systems and Computer Programs were used to analyse.

2. MIRROR TRACER

•Involves reversal ability, hand-eye coordination and learning.

•Subject is required to race the star pattern while watching only it's mirror image using reverse visual cues.

•This equipment has a shield to hide the subject's hand from view while tracing.

3. HAND STEADINESS TESTER

•The subject's task is to hold a metal-tipped stylus in 9 progressively smaller hole sizes without touching the sides.The effects on steadiness of Right Vs. Left, exercise, smoking and alcohol ingestion can be observed

4. PHOTOELECTRIC ROTARY PURSUIT

•To assess general perceptual motor parameters : Handedness, transfer of training, distribution of practice and Hand-Eye coordination.

•Subject's task is to follow a rotating light with a photocell tipped wand .

5. BASSIN ANTICIPATION TESTER

•This unit is to test the area of human visual acuity related to Hand- Eye coordination and anticipation.

•Subject is instructed to watch a light as it travels down the runway, anticipates the light reaching the target and press a push button to coincide with the possible arrival of the light at the target.

6. VIENNA TEST SYSTEM

Used to measure both ability factors and personality traits.

Utilizes a holistic approach to provide a rapid, precise and comprehensive analysis of the test results.

Measures motivation, frustration, toleration, stress management, impulsivity Vs. Reflectivity and aspiration level.

22 Tests, Full Fit Score=1000

Tests under Vienna System:

•Adaptive spatial ability Test •Sustained Attention • Determination Test

•Reaction Test•Visual Memory Test

•Time/Movement Anticipation

Not Language Dependent, Attractive and Interesting Tests, used for :

Talent Assessment Sports for Kids (TAKIDS),Talent Assessment Sports for Teens (TATEENS)

Day- 2

EXERCISE PHYSIOLOGY LAB VISIT-

Exercise physiology and rehabilitation has an important role in improving an athlete's performance especially after having a serious injury. We, the students of M.Sc sports science, RKMVERI visited the Exercise physiology lab of Lakshmibai National Institute Of Physical Education (LNIPE), on 7th January, 2020.There we came to know about different instruments and tests, their names and applications in sports field. The tests and the instruments are shortly described below:

1) SPIROMETRY- **Spirometry** (meaning *the measuring of breath*) is the most common of the pulmonary function tests (PFTs).It is helpful in assessing asthma, pulmonary fibrosis, cystic fibrosis, and Chronic Obstructive Pulmonary Disease (COPD). It is also helpful as part of a system of **health surveillance**, in which breathing patterns are measured over time. The study suggests that specific types of training used in basketball, water polo or rowing could have potential for improving pulmonary function and rehabilitation.

Fig- spirometer (measuring instrument of spirometry)

2) Blood lactate test- Blood lactate is a product of anaerobic glycolysis, and the measurement of lactate in the blood is used in physiological assessments of athletes.The test is done by using blood lactate analyzer.

Importance: Blood lactate levels indicate a combination of lactate production and release into the blood, and its removal from the blood. Blood lactate measurements are used to monitor changes in anaerobic power and responses to set workloads

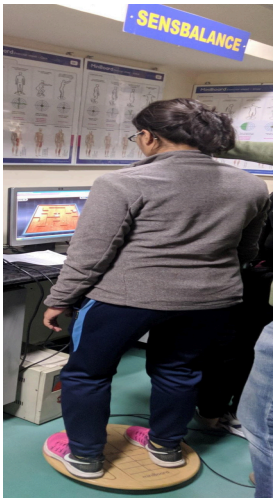
3) David leg flexion/extension and back stretch- A versatile device for the knee extension and back stretching. The unique resistance curve provides a smooth and pleasant training experience even for painful knee and back problems. Highly effective and safe.

IMPORTANCE: i) Increasing and maintaining knee extension that is equal to the opposite normal knee is an important component in the successful outcome for the patient after anterior cruciate ligament (ACL) reconstruction.

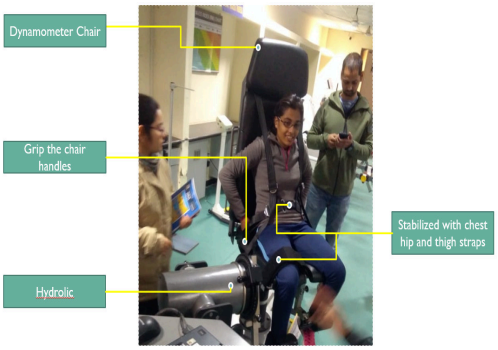
ii)) Lower back muscle injuries also can be cured by the proper application of this device.

Fig- David leg extension/flexion and back stretch machine

4) Sense Balance MiniBoard- This equipment is supplied by Sensamove. The Sensbalance MiniBoard combines the interactive training software and exercise games with the well-known benefits of a conventional wobble board. This results in an innovative and very effective new product in the range of interactive balance products of Sensamove. With easy exchangeable accessories the tilting angle and exercise difficulty can be customized. This makes the Miniboard a widely applicable training and therapy tool. It is used for the development of strengths of ankle, knee and core muscles. It is also used to develop core stability, balance, proprioception leading to improvement of agility.

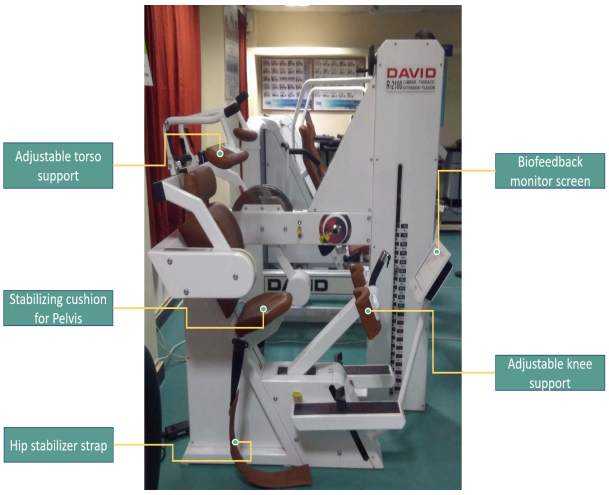


5) Isokinetic Testing System (Humac norm)-This equipment is supplied by Humac norm. This is used for isometric, isotonic and isokinetic training of shoulder, elbow,wrist, knee and ankle. It is also used to assess muscle function, monitor rehabilitation progress, and maximize force production. This system is also used to improve mobility, stability, control and strength.



6) Lumbar / Thoracic Flexion (David R2100)-

This equipment is supplied by David. This machine mobilizes the lumbar/thoracic spine in the sagittal plane activating the flexor muscles. Some notable features of this machine are as follows:



- Automatic foot plate and seat adjustments (electronic version)
- Range of Motion adjustment to accommodate various users
- Unique hip fixation eliminates the activation of the strong hip flexors helping targeting abdominal area

- Highly mobilizing segmental vertebrae level movement
- EVE integration with strength and mobility tests
- Weight stack: 2,5/100 kg, 5.5/220 lbs.

This machine is used for musculoskeletal rehabilitation and strengthening. It is also used for neuromuscular training.

Conclusion-

We have learnt about different tests and instruments which are used to check the current physiological status of an athlete. The isokinetic machine and the David machines are specifically used for sports rehabilitation purposes. How the tests are performed and the machines work were described thoroughly by some of the phd scholars of the department.

DAY- 3

BIOMECHANICS LAB VISIT-

Biomechanics is one of the major areas of sports science and it can contribute a lot for the improvements of sports performance and training.So students of M.Sc sports science, RKMVERI visited the Biomechanics lab of Lakshmibai National Institute of physical education (LNIPE) on 8th january 2020.This visit gives them a fresh idea about Biomechanics. They saw a lot of new as well as traditional instruments which are often used in biomechanics. They are described below-

1)Baropodometric Pressure Platform- This sophisticated instrument helps to measure and analyze the foot plantar pressure during movement condition or in standing state.In this device only standing foot pressure can be measured.By using this instrument we can also measure the postural sway . To improve overall performance this instrument plays a major role. They have got some hands on experience on this instrument. So here you can see that Tanugatri majumder, a student of our department was standing on this instrument and one fellow was analysing various parameters using specific software.

Fig- Baropodometric Pressure Platform

Fig- During analysis period

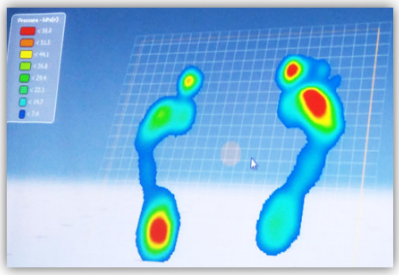


Fig- Foot pressure distribution

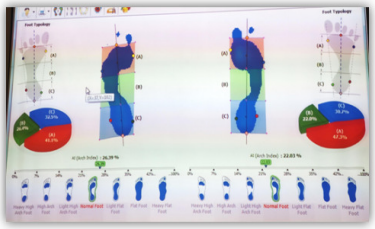


Fig- Foot deformities analyzer

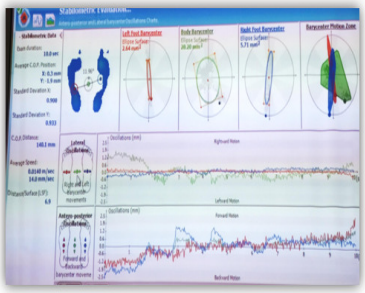


Fig- postural sway analyzer

2)*BTS P600D (force plates)-* The force plates are defined to evaluate gait analysis and kinetic variables of force movements and also for clinical purposes.It plays a major role to identify and analyze problems in walking postures.

It also detects muscle failure.They have some high speed motion capture cameras which are basically used to evaluate the analysis.In modern day use of Force plates is very much required to improve a certain level of performance.

3)*16 channel EMG analyzer (BTS)-* EMG is an electrodiagnostic technique for evaluating and recording the electrical activity produced by skeletal muscle

Here the device is wireless and it can cover the range of 40 meter.As EMG device gives us a proper idea about muscle functioning so it plays a great role to find physiological problems in the muscle.This is a portable device.

Electromyography (EMG) measures muscle response or electrical activity in response to a nerve's stimulation of the muscle. So by using this device we can easily measure muscular problems and try to rectify the problem.

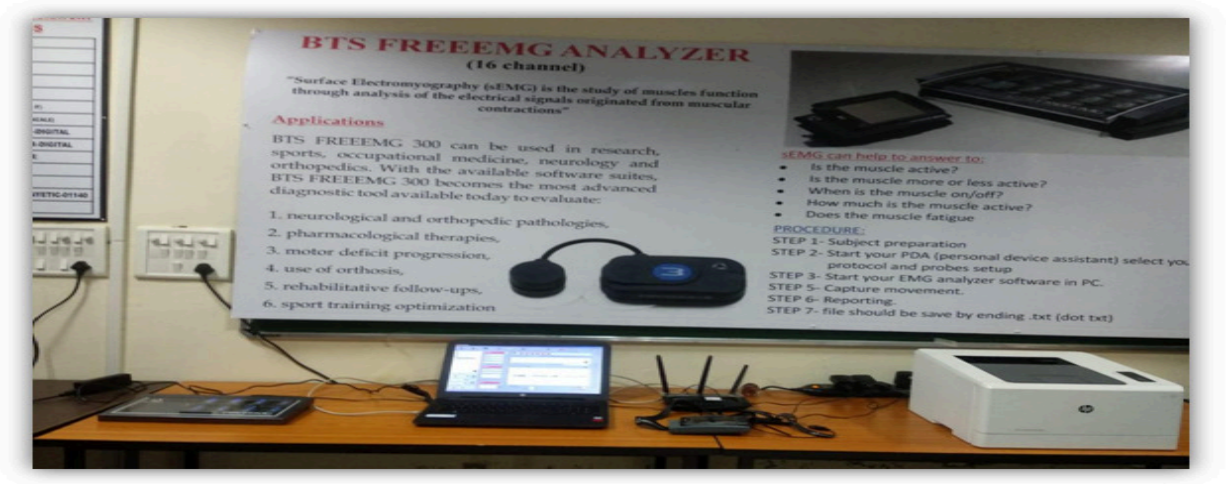


Fig- Bts EMG analyzer

4)Motion analysis system (2D & 3D)- *Biokin 2D motion analysis system can stick photos from set position to first step in a sprint. By this system various quantitative evaluations like linear displacements, linear & angular velocities & accelerations, trajectory can be done.*

3D motion analysis system by maxpro innovision is operated by maxpro software. It captures 3D motion by non proprietary cameras (up to 15 high resolution cameras).

Fig- Motion analysis system

This system gives us a proper idea about motion analysis. This system has a major role in the sports arena. It is also used to rectify the movement pattern and help to eliminate the unnecessary movement during the game.

5)*Treadmill (780 clubpro)-* Landice treadmill is a high quality fitness tool generally used for biomechanical analysis and fitness & rehabilitation purpose.Speed, grade, program time and various parameters can be adjusted in this equipment.

6) Stadiometer- Stadiometer is an anthropometric equipment which is used to measure the standing height of an individual.It also minimizes the errors while measuring the standing height

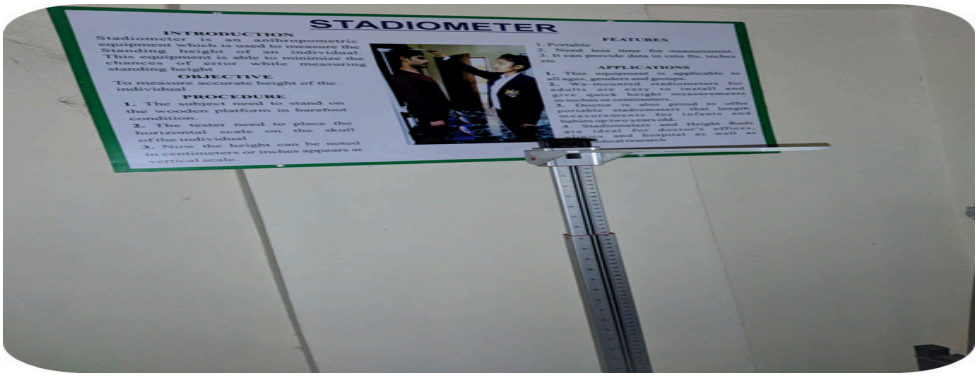


Fig- Stadiometer

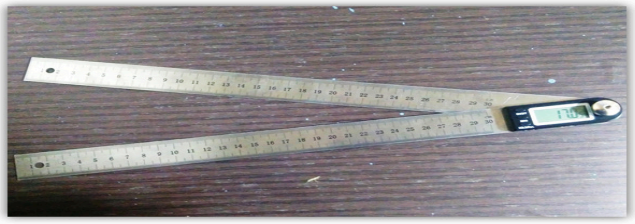
7)Grip strength dynamometer-digital (TAKEL 5401)- The dynamometer is used to perform the hand grip test.

The main purpose of this specific test is to measure the maximum strength of the hand and forearm muscles.

It is used for testing athletes' strength as well as strength of hands which affects catching & throwing.

8) Goniometer(digital)-

A goniometer is an instrument that either measures an angle or allows an object to rotate to a precise angular position. This instrument plays a major role in measurement of range of motion.



Conclusion

So, visiting LNIPE was a learning experience for us in the field of applied sports science. Experiencing the top level sports facility and attaining practical and theoretical classes helped us to understand about the advanced biomechanics and its practical implications in the sports arena. We also acquired knowledge about the static and dynamic balance of the body during various sports events. And relations between various body parts and muscle groups under various exercises and regular daily movements. .

DAY-4

YOGA AND FITNESS CENTER LAB VISIT-

Yoga plays an important role in the sports arena. Any athlete could benefit hugely by adding yoga to his or her training regimen. Yoga improves their concentration. It helps in developing physical fitness and it is also good for relaxation, good for rehabilitation after injury. M.sc sports science students visited the Yoga and Fitness Center lab of Laxmibai National Institute of Physical Education (LNIPE) on 9th january 2020. This visit helps them to gather some knowledge about the importance of Yoga in the sports arena. They visualized several types of instruments which are often used in yoga therapy. Several types of instruAnalysis the function of ment were-

1. BIOPULSER:

Biopulser is one of the most advanced technologies that comes with an instrument which measures whole body electrical activity from the palm and generate an aura with a software. Analysis of the function of 49 body organs & seven chakras.

2. STEAM ROOM:

Steam room is a powerful treatment to eliminate morbid matter from the surface of the skin. It helps in treating cases of arthritis (osteo and rheumatoid). It helps to relieve stiff joints.

3. SPINAL SPRAY BATH:

Spinal bath provides a shooting effect to the spinal column and thereby influences the central nervous system. Spinal baths can be given in old, neural & hot temperatures. Hot spinal bath is helpful in stimulating the nerves, especially when they are in a depressed state. Cold spinal bath relieves irritation of nerves, fatigue etc.

4. MASSAGE THERAPY:

Massage therapy is the scientific manipulation of the soft tissues of the body. Helps relieve stress and aids relaxation. Helps relieve muscle tension and stiffness. Promotes deeper and easier breathing.

5. FOOTBATH:

It is an alternative medicine option for people who suffer chronic lymphatic and bone pain. Foot Bath is relaxing and can relieve stress. Foot Bath helps with aching feet and sore leg muscles.

6. HIP BATH:

Hip baths open up all the pores of the skin and make the body light and fresh. Hip bath absorbs heat and the body feels relaxed. Hot hip bath is used in cases of delayed menstruation, painful urination etc.

CONCLUSION:

We have made certain learning experiences about the importance of yoga therapy in the sports arena by visiting LNIPE. We have known better attending practical class besides theory classes. We also gathered knowledge about the relation between Yoga therapy and Sports activity.