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## Role of biomechanics in physical education and sports

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### Abstract

Physical educators teach a wide variety of human movements, and biomechanics provides a rationale critical for evaluating technique and prescribing intervention to help young people improve. Biomechanics also allows physical educators to identify exercises and physical activities that contribute to the physical development of various muscle groups and fitness components. In sports and exercise, biomechanics refers to the study of human movements, including the interaction between the athlete, sport equipment and the exercise environment Physical Education with Biomechanics and its implementation. People especially the students, players need help in improving their physical endurance but they often have problems like how the human body moves, what type of techniques can be used to develop motor skills Etc. Physical Education teaches various examples of Physical Exercise whereas Biomechanics is the study of the structure and function of biological systems by means of the methods of mechanics, the branch of physics involving analysis of the actions of forces Biomechanics provides proper and important techniques to make physical development of several muscle group and fitness components and skills. Biomechanics is the application of mechanics in the human movements. In Order to improve student's physical movement safely and effectively biomechanical techniques are necessary.

**Keywords:** biomechanics, physical education and sports

### Introduction

Bios = life. Mechanics = study the effect of forces on bodies during static and dynamic situations. Mechanics = It is the branch of physics which deals with the interrelations between force, matter and motion. Biomechanics is the application of mechanical principles to living structures either animals or human being at rest and during movement. To make quality sports player, every Coach should adopt Biomechanical principles that are mainly required to develop physical and mental development of Sportsmen. Countries that have quality Athletes like U.S.A, England, China, and Russia and so on apply the use of innovative biomechanical Techniques and equipments to make quality sportsmen which enrich nation's glory in the world. Using Sports Biomechanics the Performance of player can be increased at their best level by applying qualitative analysis exercise. The present study is an attempt to provide brief information about Biomechanics and its application in Physical Education and Sports to enable reader, practitioner and Students to have systematic guidance of better biomechanical technologies to develop Physical Endurance in sports.

### Define Biomechanics?

Biomechanics is the study of the movement of living things using the science of mechanics. (Hate, 1974) Biomechanics is the branch of Kinesiology which deals with the precise information of human Movements with scientific method. It is the application of mechanical principles in the study of living organism so as to prevent from injuries and train physical movements. There are two methods in Physical Education through which biomechanical principles can be applied to the several activities which are Qualitative analysis and Quantitative analysis. With the help of qualitative analysis, student's overall Physical practice can be performed by maintaining correctness in inadequacy under direct guidance and training. Biomechanical principles can be used in the Physical Education exercise with four qualitative Biomechanical analyses which are important for treating poor students to quality student in which at the Beginning there is a physical and mental preparation of various techniques, sports

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players, after that there is the direct observation then followed by intervention there is applying diagnosis as follows

### **Role of Biomechanics in Physical Education and Sports.**

Helps in improving Techniques Utilizing the various innovative techniques of Biomechanical Principles in practice and Sports helps To improve various error detections, improves skills, develop and strengthen qualitative and quantitative analysis with proper and selected tools and equipments. Design new equipment as biomechanics is the main part in the students' overall sports performance; it also helps to develop and design structure of equipments, Shoes and sports clothes design, sports tools facilities like single plate Photography, Automatic Tracking System, Electrogoniometry, Accelerometer, Pressure Measurement, Ground structure, surface structure and lab activities etc in proper way. According to sports type and place, sports equipments also are used as per the principles of biomechanics in physical Education and Sports. Increase in sports performance utilizing various new techniques of biomechanical principles in the Physical Education can help to enhance performance of students in the several sports. With several models of scientific quantitative analysis like force-motion, force-time, inertia, motion, coordination, continuum, segmental interaction and balance performance of player in terms of speed, time, and accuracy in sports can be improved. Under the proper Guidance of biomechanical techniques students who have such training show better result in comparison to those who don't have proper guidance. Prevention of Injuries Applying the innovative principles of it, player's injury risk can be reduced by maintaining proper care about cause, diagnosis, cure and rehabilitate them. In the qualitative type of analysis techniques to prevent and recover injuries also provided accordingly. Muscles improvement by following the biomechanical principles, various muscle groups and tissue structure can be improved in well condition. Actions such as kicking football by legs, throwing and Catching Ball, Jumping Long, lifting weight etc helps to maintain the elasticity in the muscles and build Biceps and Triceps, building joints that leads to strengthen the physical endurance. Improve internal organ system with the help of several structured approach and techniques of biomechanics in sports assist to keep internal body organ system properly because in the qualitative analysis there are various moves useful related to health of several internal organ systems. Working of all joints, function properly if the physical exercise is done accordingly.

### **Importance of biomechanics in sports**

1. Improves performance in sports.
2. Development of improved sports performance.
3. Helps in understand human body.
4. Create confidence in sportsperson.
5. Prevents sports injuries.
6. Helps in research work.
7. Improves in training techniques.
8. Increases the popularity of sports.

### **Conclusion**

This study concludes that role of biomechanics in physical education and sports play a crucial role in this field. Physical educators teach a wide variety of human movements, and biomechanics provides a rationale critical for evaluating technique and prescribing intervention to help young people improve. In sports and exercise, biomechanics refers to the study of human movements, including the interaction between

the athlete, sport equipment and the exercise environment. Athletes are always trying to find ways to get faster, higher and stronger with minimal injuries Biomechanics has a unique place in the field of Health Education, Physical Education and Sports. It helps to Trainers and coaches to improve the Physical performance of students with the various biomechanical techniques of different games. Its application in the life of person especially to Students, Sportsmen and Practitioners is noteworthy for Physical, Mental and Social Development. To put it simply, applying Biomechanical Principles in the Physical Exercise and Sports plays an important role in improving physical performance, Injury Mechanism, Equipment development, developing internal organ system well, etc stated above. Hope present study may provide detailed information of Biomechanical Application in Physical Education and Sports.

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