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## Ergogenic aids in relation with Olympic weightlifting sport

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### Abstract

The aim of the present study was to examine and analyze the role of ergogenic aid in Olympic weightlifting. The paper focuses on finding out how different kinds of ergogenic aid affect Olympic weightlifting performance. For the classification and analysis of ergogenic aid, the Nutritional, Physiological, Psychological, Pharmacological and Biomechanical aids have been selected for the study. The Olympic Weightlifting sport has two fundamental skills Snatch and Clean and Jerk. This skill requires Nutritional, Physiological, Psychological, Pharmacological and Biomechanical support for optimum performance during the training and Competition. The skills of Olympic Weightlifting require instant energy for the lift of maximum weight with the use of absolute and dynamic strength motion. Nutritional, Psychological and Pharmacological support improves performance and increases chances for winning the competitions. A review of the literature reveals that Ergogenic aid affects Olympic weightlifting performance. Therefore, the use of Ergogenic aid in Nutritional, Physiological, Psychological, Pharmacological and Biomechanical improve competition & training performance and improve recovery seem to be justified.

**Keywords:** Nutritional, physiological, psychological, pharmacological and biomechanical, Olympic weightlifting, ergogenic aid

### Introduction

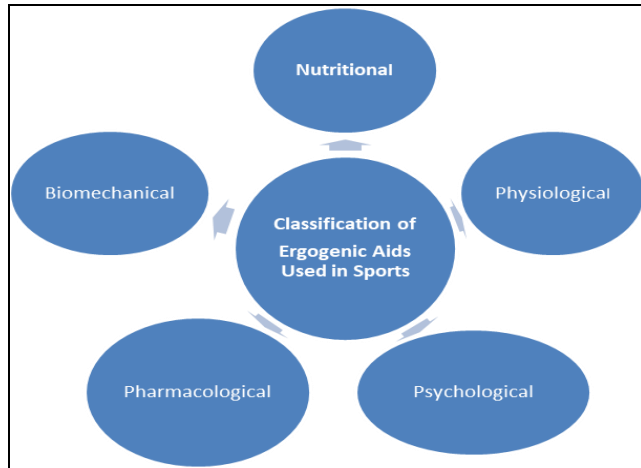
Achievement in sports continues to improve for a variety of reasons. Technological improvements in equipment design provide mechanical, biomechanical and new coaching methods to improve the Physiological fitness, Nutrition, Psychological and skill state. (Melvin, H, 1989) <sup>[12]</sup>. The overall development to the top level in the Olympic Weightlifting sport in recent years have seen a change in the approach of the training system, Nutritional, Psychological, Physiological and technical support to achieve excellence in weightlifting skills Snatch and Clean & jerk. There are three types of variables for optimal performance in weightlifting that would somewhat Control. Physiological, Psychological and Nutritional preparation help the weightlifters pre, during and post-the performance. All three Variables are interrelated to each other. The nutritional variable ability works as a source of energy, the Physiological variable ability works to supply energy (ADP-ATP) and the Psychology variable ability works to control the energy.

Ergogenic word is derived from the Greek words Ergon (work) and Gennan (to Produce). It is understood as work producing or work enhancing. The means of Ergogenic aids in sports help to improve athletic performance beyond that which may occur through natural ability and training (Melvin, H 1989) <sup>[12]</sup>. The athletes use ergogenic aids to improve and enhance performance through energy utilization, including energy production, control and efficiency. In the Aerobic and Anaerobic nature of sports, athletes use ergogenic aid as the best legal supplement to maximize strength, endurance and lean body mass. (Reimers, E, 2020) <sup>[9]</sup>

In sports competitions and training, athletes have been using different types of special aids in an attempt to improve performance. In ancient times much of the concentration was on nutritional aspects as specific organs of animals. They believed that consuming the lion's heart in the diet affects athletes' willpower during the competitions. Over the 50 years, athletes of both Aerobic and Anaerobic nature of sports are trying to experiment the improved performance through enhanced use of drugs such as opium, alcohol, Bicarbonate soda,

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Ammonia inhalants, Caffeine and more for developed athletic abilities before, during and after the competitions. In the field of Sports and Exercise Sciences athletes and sports scientists work on a variety of ways to classify ergogenic aid to Olympic weightlifting sports performance, but for the purpose of this paper, five ergogenic aid were used: Nutritional, Physiological, Psychological, Pharmacological and Biomechanical for the study.



**Fig 1:** The graphic 1 shows the classification of ergogenic aids

### Nutritional Aids

There are six types of nutrients which is used in the daily diet by the athletes are Carbohydrates, Proteins, Vitamins, Fats, Minerals and Water. These nutrients supply energy when and where required, Pre and post-training or competitions. Nutritional aids as supplements consist of Amino Acids; Creatine is widely used as supplements in powder form in the Power and strength sports. These aids are aimed primarily at enhancing performance by affecting energy metabolism or by effects on the central nervous systems. This aids also increase lean body mass or muscle mass by stimulation of protein synthesis and reducing body fat content. (Maughan, R.J, 1999)<sup>[5]</sup>.

Olympic weightlifting sport is in which the competitive performance is so short that all of the energy for the lift performance requires high energy phosphates, ATP and P Cr metabolism process. Weight Lifters need energy for dominating use of the pathway of ADP-ATP and PCr as a source of energy for the reaching at optimum level of Performance or assist efforts for very short periods of time in three attempts of lifts. In weightlifting sport the multivitamins and mineral supplements is popular among the coaches and athletes, other Ergogenic Aid in the form of powders such as a amino acid, caffeine and creation monohydrate are also used by weightlifters or strength training athletes. (Kence, 1994)<sup>[13]</sup>. The Nutritional values of food sources of Protein, Amino Acids, Creatine is the only supplement that has been reported to enhance skeletal muscle hypertrophy and functional capacity in the response to resistance training in the pre and post-workout. (Hespe 2007)<sup>[14]</sup>. It was evident that Nutritional Aids as a supplement play important role in training and performance. The Olympic weightlifting skills require a greater focus on training load, specific body weight, Timing and quantity of food supplements as a Nutritional Aids.

### Physiological Aids

Physiological aids are substances designed specifically to

improve physiological processes that enhance human energy production. (Melvin, H, 1989)<sup>[12]</sup>. In the Olympic weightlifting, athletes require legal supplementations (No drugs) Creatine, Alkaline Salt (Sodium bicarbonate) and Ammonia Salt. Studies with strong evidence suggest Sodium bicarbonate supplementation is very popular in the high intensity nature of Sports. Sodium bicarbonate has effective performance enhancers in the pre-training or competition. The inhaling or smelling salts of ammonia help weight lifts more weight by causing a reaction in the membranes of nose and lungs and the breath works faster and the heart rate increase, so this reaction releases Adrenaline and helps athletes to ignore the load pursuers or pain. (Lucas, K. 2021)<sup>[4]</sup> Creatine is a good option for heavy repetitions and recovers faster between the sets during the weightlifting and Powerlifting sports. Several studies evaluated that Physiological Aids response, the Creatine, Alkaline Salt and ammonia show the similar result in weightlifting.

### Psychological Aids

In the Olympic weightlifting sport, the body and mind depend on each other for optimal functioning, the mind affects the body and body affects the mind. Athlete body energy systems and support system activated in pre and post-weightlifting training is controlled by the brain and spinal cord contractions, known the Central Nervous System. The central Nervous system controls the energy system and produces good movement functions and fulfils the required demands of the training and Competition. The Central Nervous System works on the Physiological activity in the body, on the other hand, the brain or mind controls thoughts, emotional feelings, Perceptions, Anxiety experienced at the Pre, during and Post weightlifting training and Competitions situations. The Various Psychological Aids as Mental training improve the athletic performance such as Attention Control, Autogenic training, Concentration, Implosive Goal setting, Imagery, Deep Breathing, Meditation and Relaxation Imagery trainings. (Williams, M, 1989)<sup>[7]</sup>.

### Pharmacological Aids

Pharmacological aid includes the agents or drugs which is used by athletes, illegal and legal, for improving the sports Performance. From the legal point of view, the Creatine Monohydrate Supplementation has shown significant gain in the strength, Power, Mass and water retention in the weightlifting athletes. The Caffeine substance does not show improvement in the reaction time, strength, power in the high intensity sports. Studies with strong evidence suggest that Creatine Monohydrate have been improving the Physical and Psychological functional Capacity and recovery of Pre and Post training sessions. Research has shown that in Weightlifting athletes appear to be the most prolific users of Ashwagandha and Shilajit, an herbal supplement used to improve the strength, power and recovery of the muscles as physical demand during the pre and post-training. The shilajit use as a supplementation elicited favourable for muscle and connective tissue adaptation and a decline muscle fatigue (Keller LJ, 2019)<sup>[6]</sup>.

### Biomechanical Aids

Biomechanical aid helps to understand the scientific principle of Mechanical and Biomechanics area and to study for better performance at pre, during and post-training levels. In the weightlifting skills, the primary goal is to move Barbell with

weight through explosive movement with accuracy and fulfilling the required demand of the training and Competition. The various Characteristics, types and designs of equipments like barbells, platforms, Plates, Collars, shoes matter in performance and athletes require well-designed equipments to get optimum performance using less energy. In the Olympic weightlifting athletes, Coaches used the Biomechanical aids such as Sports Equipments, Body Position, Body Composition, way of trajectory of Barbell, Movement of barbell and laws of Physics were studied with the Use of Computers, Motion analyses camera for improving the techniques and predicting performance. The research in weightlifting sports biomechanics is constantly looking to improve athlete performance by modifying the ways that athletes apply in the pre, during and post-training and competitions.

### Conclusion

The aim of this study was to evaluate the relationship of Ergogenic Aids with Olympic Weightlifting Sport. In the view of related literature, number of researchers and articles stated that the legal Ergogenic Aids such as Nutritional, Physiological, Psychological, Pharmacological and Biomechanical found strong relation to Olympic Weightlifting Sport performance during the training and Competitions. There is evidence, to support the use of Ergogenic aid during periods of training, competition, injury & recovery, but further scientific evidence, practical aspects and legal framework is required before the use of these aid can be recommended.

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