



The Role of Conditioning Training in Preventing Injuries

Kondisyon Antrenmanlarının Sakatlıkları Önlemedeki Rolü

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Abstract: Sports hold an important place in human life with their positive contributions. Sports become an integral part of life in societies that prioritize physical and mental development. Sporting activities require structured training programs. The sustainability of these activities or training can be associated with fitness. Fitness involves planned and continuous loads to increase sports performance, enhance the athlete's capacity for work, and develop motor skills (Uluç, 2023). Sporting activities and training sessions also come with the risk of sports accidents and injuries. The negative consequences of these situations on individuals have been discussed. Looking at the literature, sports injuries in different disciplines have been linked to a lack of fitness, emphasizing the importance of fitness training.

Keywords: Conditioning Training, Sports Injuries, Conditioning

Özet: Spor insan hayatına olan olumlu katkılarıyla önemli bir yere sahiptir. Fiziksel ve ruhsal gelişimini önemseyen toplumlarda spor hayatın bir parçasıdır. Sporsal faaliyetler, programlı antrenmanlar gerektirir. Yapılan bu faaliyet veya antrenmanların sürdürülebilirliği kondisyonla ilişkilendirilebilir. Kondisyon, sporsal verimliliği artırmak, sporunun iş yapabilme kapasitesini artırabilmek ve motorik özellikleri geliştirmek için yapılan planlı ve sürekli yüklenmelerdir (Uluç, 2023). Sporsal faaliyetler ve antrenmanlar spor kazalarını ve spor sakatlanmalarını beraberinde getirir. Oluşan bu durumların bireye olan olumsuz geri dönüşlerinden bahsedilmiştir. Literatüre bakıldığında farklı branşlarda yaşanan spor sakatlıkları kondisyon eksikliğiyle ilişkilendirilmiş, kondisyon antrenmanlarının önemi vurgulanmıştır.

Anahtar Kelimeler: Kondisyon Antrenmanı, Spor Sakatlıkları, Kondisyon.

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Introduction

Sport is defined as physical activities conducted according to specific rules, with or without equipment, individually or in teams, that promote socialization, benefit the mind and body, involve competition and cooperation, and are performed during leisure or as a full-time activity (Sunay, 2020). Sports hold an important place in human life due to their positive contributions. While sporting activities keep individuals physically fit and healthy, they also contribute to their socio-cultural development (Gönen et al., 2022). In societies prioritizing physical and mental development, sport is an integral part of life.

Sporting activities require structured training programs. Sevim (2001) defines the concept of training as "an educational process aimed at improving and maximizing physical and moral strength, technical and tactical skills through organic and psychological loads." Any damage occurring during sporting activities is referred to as a sports injury, and there are numerous causes for these injuries in athletes during activities (Kılıç et al., 2014). The increasing number of competitions and training sessions in many disciplines leads to a higher frequency of sports injuries (Uğur et al., 2010). Conditioning is necessary to sustain healthier and longer training sessions. Conditioning involves planned and timed loads to enhance sports efficiency, increase an athlete's work capacity, and develop motor skills (Uluç, 2023). Motor skills include strength, agility, endurance, speed, flexibility, and coordination. These parameters should form the foundation of every discipline.

Balancing ability is crucial for success in many sports, especially gymnastics, and must include static and dynamic components (Yel et al., 2023a). Balance exercises should be considered a fundamental aspect of training and competitions.

Engaging in sporting activities and training inevitably leads to sports accidents and injuries. Athletes may suffer injuries during training or competition. Especially in combat sports and disciplines with high physical contact, adverse situations such as injuries and accidents are common. It can be said that sports activities generally have a higher risk of injuries, illnesses, and accidents compared to other fields (Çakır & Erbaş, 2021; Yel et al., 2023b). This subsequently becomes a factor that hinders training or competition.

Bavlı and Kozanoğlu (2008) categorize the causes of sports injuries into personal and environmental factors. Personal factors include age and gender, physical structure and suitability for the sport, psychomotor development, psychosocial reasons, past injuries, inadequate rehabilitation, insufficient sports techniques, and inadequate warm-up. These factors are directly related to the individual's biological and psychological characteristics and can increase the risk of injury. Environmental factors include the type of sport, the physical structure of the sports area, sports equipment, coach and training planning, climatic and environmental conditions, the duration of sporting activities, the role of opponents and teammates, and referee and game rules. These factors are related to the environment and organization of the sport, and if appropriate measures are not taken, they can increase the

risk of injury. Considering personal and environmental factors, adopting a multidisciplinary approach to prevent sports injuries is necessary.

The literature has examined sports injuries in specific disciplines (Çakır & Kısa, 2021; Shephard, 2003). The areas where injuries occur and their causes have been investigated. These situations have been associated with a lack of conditioning. The importance and necessity of conditioning training have been emphasized.

The objective of the Study

This Study presents a contemporary approach regarding "The Role of Conditioning Training in Preventing Injuries."

Significance and Justification of the Study

Sports injuries can decrease athletes' performance, restrict their athletic careers, and even cause permanent damage, potentially leading to early retirement. This situation can have severe consequences for both individual athletes and sports organizations. Therefore, preventing sports injuries is vital for athletes to maintain a healthy and sustainable career. Research is essential to understand the causes of injuries, risk factors, and protective measures. Developing strategies to prevent sports injuries is crucial. The association of injuries with a lack of or weakness in conditioning underscores the importance of incorporating this preventive measure into new programs. The Study by Akhmedov et al. (2016) addresses the negative impacts of sports injuries on athletes' health. Investigating sports injuries is a crucial step towards enhancing athletes' performance, ensuring the safety of sports activities, and maximizing the overall health benefits of sports.

1.2. Severity of Injuries

To fully understand the issue of sports injuries, it is necessary to have a good definition of the type and incidence of sports injuries and efficiently and practically grade the severity of the injuries. Sports injuries can be categorized into three levels of severity:

- **Mild - 1st degree:** Unable to participate in activities for 1-7 days,
- **Moderate - 2nd degree:** Unable to participate in activities for 7-21 days,
- **Severe - 3rd degree:** Unable to participate in activities for more than 21 days, resulting in permanent injury.

1.2.1. Factors Considered Important After Injury:

- The nature of the sports injury,

- The form and duration of treatment,
- The period of absence from the sport,
- Lost workdays,
- Permanent damage,
- Cost.

1.3. Internal and External Factors Affecting Sports Injuries

When adequate precautions are not taken, the high level of physical performance required by sports can lead to various sports injuries due to internal and external factors (Kanbir, 2005).

1.3.1. Internal Factors

1.3.1.1. Level of Physical Fitness: The strength, flexibility, endurance, and overall physical condition of athletes directly affect the risk of injury. Insufficient conditioning can lead to muscle and joint injuries (Radwan et al., 2014).

1.3.1.2. Biomechanical Factors: Body structure and biomechanical properties can influence injury risk. For example, biomechanical issues such as flat feet or leg length discrepancies can increase the likelihood of injuries.

1.3.1.3. Previous Injuries: Past injuries can increase the risk of new injuries in athletes. Returning to sports without fully recovering from a previous injury can lead to recurrent injuries.

1.3.1.4. Age and Gender: Age and gender are significant factors that affect injury risk. For instance, growth plates in young athletes are more susceptible to injury, while hormonal differences in female athletes may make them more prone to certain types of injuries.

1.3.1.5. Psychological State: For an individual to live a healthy life, physiological and psychological elements must coexist (Gönen & Ceyhan, 2022). Psychological factors such as stress, anxiety, and motivation can also affect injury risk. High-stress levels can lead to a lack of concentration and injuries associated with carelessness.

1.3.2. External Factors

1.3.2.1. Training and Playing Conditions: The intensity, duration, and frequency of training sessions significantly affect the risk of injury. Overtraining or insufficient rest can lead to overuse injuries (Leppanen et al., 2014). Proper training and education reduce these risks (Wilson, 2015).

1.3.2.2. Equipment and Clothing: Inappropriate or poor-quality sports equipment and clothing can increase the risk of

injury. Factors such as the correct choice of shoes and the use of appropriate protective gear are essential.

1.3.2.3. Playing Surface and Environmental Conditions:

The condition of the playing surface (e.g., slippery or rugged surfaces) and environmental conditions (e.g., weather) can affect the risk of injury. Wet or uneven surfaces can increase the risk of slipping and falling. The hardness of the field and grass is believed to contribute to a higher risk of injury (Orchard, 2002).

1.3.2.4. Coaches and Medical Staff: The knowledge and experience of coaches and medical staff play a crucial role in reducing the injury risk of athletes. Incorrect technique instruction or inadequate first aid intervention can increase the risk of injury. According to scientific data, external factors are significant but modifiable risk factors that can cause sports injuries (Dobbinson et al., 2016; Donaldson et al., 2013).

1.3.2.5. Rules and Regulations: Sport-specific rules and regulations aim to ensure the safety of athletes. In contact sports, enforcing and monitoring rules related to protective gear, helmets, gloves, etc., play a critical role in reducing the risk of injury.

Each of these factors can affect the risk of injury for athletes. Therefore, it is essential to consider these factors to protect the health of athletes

SPORTS INJURIES IN DIFFERENT DISCIPLINES

The body parts affected by sports injuries vary depending on the characteristics of the sports discipline (Atay et al., 2017).

The structural characteristics of adolescent basketball players and the types of injuries they encounter based on their positions are shown in Table 1 (Bavlı & Kozanoğlu, 2008).

In the study conducted by Yünceviz et al. (1997), it was found that the most commonly injured body regions in wrestlers were the knee (26%) and the shoulder (20%). The least injured regions were the head and neck, with a rate of 4%.

As with any sport, wrestling injuries can be influenced by environmental and individual factors. If an athlete lacks sufficient strength, they may be unable to resist their opponent effectively, resulting in injury. Similarly, a lack of coordination may lead to an inability to perform movements at the required speed, increasing the risk of injury. Injuries during competitions may be related to the athlete's lack of conditioning. It is recommended that strength training and other relevant programs be implemented for the injured regions.

A study evaluating volleyball injuries and their causes found that the most significant injuries in volleyball were ankle sprains and shoulder and knee problems. The injury distribution was 50% ankle, 20% thumb and fingers, and 5% knee. Sprains accounted for 55% of all injuries, while fractures made up 3%. The most common injuries in volleyball occurred during blocking, stepping on an opponent's foot, and ball handling (Küçük, 2012).

In a study by Alp and colleagues on the injury regions of archers, it was found that the most common injuries were in the shoulder (27.5%, n=60), neck (18.3%, n=40), and back (16.1%, n=35) (Alp & Özdiç, 2020).

In other studies, it has been found that the most common injury sites in handball are the ankle and knee (Pirly et al., 2011). The incidence of injuries occurring during competitions in handball is higher (Olsen et al., 2006, pp. 426-432).

More than half (55-60%) of injuries in adolescents are sports-related injuries. The most significant portion of these injuries is overuse-related musculoskeletal injuries. When looking at the injury rates in adolescents, the most commonly affected body regions are, in order: ankle and knee, hand, wrist, elbow, front and back of the calf, head, neck and clavicle, shoulder, foot, back, hip, and hamstring muscles (Nazan et al., 2006; Emin, 2004).

Scientific research demonstrates the effectiveness of various preventive programs in reducing sports injuries. Comprehensive programs that enhance athletes' muscle strength, flexibility, and balance are recommended to decrease overall sports injuries. These programs aim to prevent trauma and strains during sports activities. To preventTo prevent ankle sprains, orthotics and balance and coordination exercises that stimulate proprioception has been noted to increase ankle stability and reduce injury risk. Research on anterior cruciate ligament (ACL) and knee injuries indicates the effectiveness of neuromuscular training and plyometric exercises, which improve muscle agility and strength to ensure knee stability. Eccentric training, which focuses on lengthening the muscle and enhancing its contraction, is preferred to prevent hamstring injuries. These exercises improve control over muscle lengthening and contraction, playing a protective role in sports prone to hamstring injuries. In conclusion, the methods highlighted in these scientific studies constitute a significant resource for reducing sports injuries and contribute to athletes maintaining their performance over the long term (Koz & Ersöz, 2004).

Injury concerns adversely affect athletes' morale, motivation, and financial stability. Athletes may experience sports

injuries due to unfortunate events, negatively impacting their careers. Despite precautions, injuries requiring prolonged treatment and mandatory breaks from sports are common (Öztemur, 2017). Many athletes have been forced to retire from professional sports due to injuries (Thatcher et al., 2011), underscoring the need to prevent sports injuries (Akhmedov et al., 2016). Strengthening muscle and explosive power can reduce injury risks, particularly in preventing lower extremity injuries (Meylan & Malatesta, 2009). In contact sports, injuries are more frequent. In competitive sports, injuries are observed more frequently than in recreational activities. Participation in sports without coach supervision carries higher risks.

Sports significantly positively affect physical health, cognitive function, and quality of life. However, improper training habits, nutritional deficiencies, and psychological factors pose severe risks for young athletes concerning sports injuries (Karabörklü et al., 2018). Statistics show a higher incidence of injuries in the lower extremities, particularly in the knee, ankle, and hip regions, commonly involving muscle strains, tears, tendon or ligament ruptures, and fractures (Kocaman et al., 2018). These injuries can lead to negative consequences such as prolonged absence from sports and social life.

Internal factors like muscle strength, endurance, flexibility, core stability, balance, and proprioception are crucial in assessing injury risks. Conditioning exercises that enhance muscle strength contribute to overall body resilience, supporting joints and bones and reducing injury risks. Coaches should design balanced training programs that target all muscle groups equally, minimizing muscle imbalances and injury risks (Laursen & Jenkins, 2002). Balance and coordination exercises enable athletes to perform sports-specific techniques more controlled and accurately, thus lowering the risks of falls and collisions. Conditioning training enhances aerobic and anaerobic endurance across different sports, reducing the likelihood of technical errors and injuries.

Pre-exercise and post-exercise dynamic warm-ups and cool-downs prepare muscles and reduce injury risks. Flexibility is crucial in reducing the risk of injuries among athletes (Young et al., 2002). Conditioning exercises improve muscle and joint flexibility, preventing injuries from sudden movements or overstretching. Adequate muscle strength, flexibility, and endurance specific to the type of sport are fundamental factors in preventing injuries and ensuring successful athletic performance (Karabörklü et al., 2018).

Controlled strengthening and stretching exercises during rehabilitation contribute to recovery and prevent future injuries. Coaches must ensure athletes have sufficient rest and recovery periods, as excessive training and inadequate rest significantly increase injury risks (Halsen, 2014).

In conclusion, studies confirm the effectiveness of conditioning training in preventing injuries. Addressing external factors contributing to injuries and improving preventive measures are recommended. Additionally, the importance and impact of sports massage in preventing athlete injuries and facilitating their return to sports cannot be overlooked (Aydoğan, 2014). Conditioning training enhances athletes' physical and mental resilience, minimizing injury risks.

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