

Fatigue, Wellness and Recovery of Young Athletes in Long Term Training Center Programs

Ranu Baskora Aji Putra^{1*}, Tandiyo Rahayu¹, Hadi¹, Sobihin¹, Bayu Rahardian²

¹ Universitas Negeri Semarang

² Ministry of Youth and Sports of Republic of Indonesia

Corresponding author: ranu_baskora@mail.unnes.ac.id

Abstract: Programmatic long-term training centers will have a significant impact if the implementation is in accordance with the portion of training and pays attention to the environment and condition of athletes. The purpose of this study was to analyze the factors of fatigue, wellness and recovery levels and the impact that arises on long-term exercise concentration. The method used in this study is the Systematic mapping study. This paper is approached inductive and deductive using articles and books that are relevant to the topic of study that have been mapped before. Five databases were sought for empirical research published between 2002 and 2021. The study map was drawn from various reviews on the part of the connection with a review of research results and articles on topics around the SL movement as many as 42 articles.

Keywords: Fatigue, Wellness and Recovery

INTRODUCTION

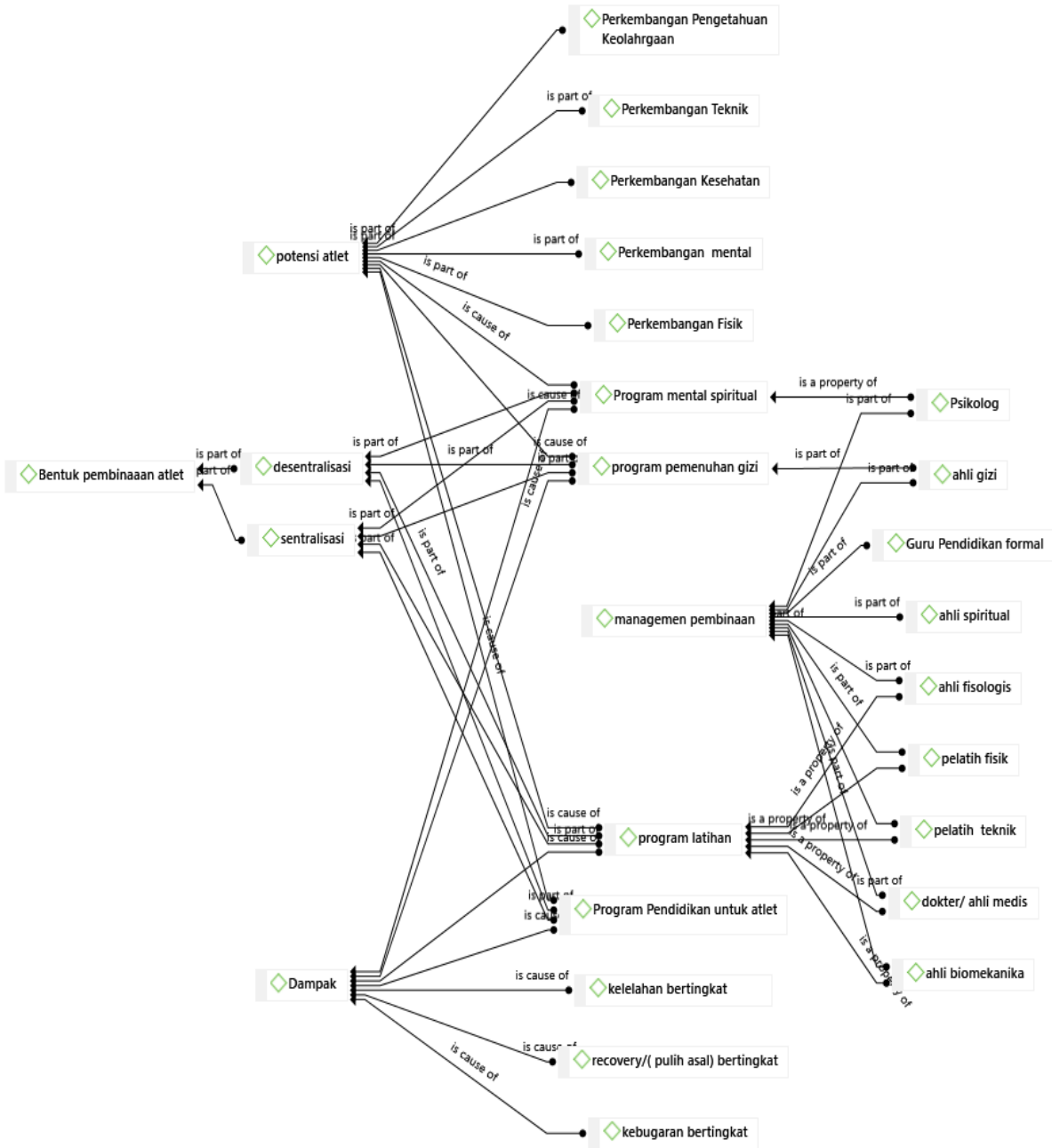
The Indonesian Sports System is one of the efforts to build a solid foundation and building for athlete coaching. The Government of Indonesia regulates in the Law of the Republic of Indonesia number 11 of 2022 article 20 stated that development and development in a planned, systematic, integrated manner, tiered, and sustainable with the support of Sports science and technology in achieving sports achievements. In the form of the implementation of the law, the government compiled a national sports design in several sports centers that combine academics and sports practitioners to support the development of athletes starting from students and will later be tiered to professional athletes. As a first step in the National Sports Design, the Ministry of Youth and Sports in 2022 formed 4 (four) young sportsman centers with a homebase of science-based universities sports. The center or center is a form of coaching from upstream to downstream to form an optimal performance. The coaching system can be in the form of centralization and decentralization has a synergistic impact on the development of sports achievements (Soegiyanto, 2011). The decentralized system divides coaching into organization systems or clubs that can be a lot of recruiting athletes and finding talents and interests from stages Massing of each sport. (Lesmana et al., 2020), (M. Nugraha et al., 2021). One indication of the success of decentralized

coaching is determined by the number of athletes who are netted able to focus their training on increasing personal and team potential. The centralized system of coaching is also one way of developing performance coaching. In a centralized system, it is formed in a special coaching management in the goals or achievement of certain targets. The management of the centralized system formed special divisions to support the implementation of coaching, including the coaching division, sports science division, education division, nutrition division, health division. Each division works in accordance with expertise to support the implementation of a centralized system according to its main tasks and functions. The success of the centralization system will be realized if cooperation between sub-divisions supports the implementation of training programs to achieve specified achievement targets (Indrayana & Setiawan, 2019), (Lubis et al., 2020). In the implementation of long-term training programs achieve certain goals in accordance with the development and condition of athletes. Training principles that pay attention to the individual needs of athletes are part of a multi-level coaching process (Love et al., 2020). Conditions that often occur in a long-term centralized training system include the implementation of training programs not according to plan, irregular provision The intensity and dose of training to athletes that result in increased fatigue levels, decreased performance in training and matches. Fatigue causes physical quality to decrease and has an impact on not achieving technical performance in sports (Giriwijoyo & Sidik, 2013).

The purpose of this article is to describe and learn about the relationship between fatigue, fitness, health and recovery in the implementation of long-term exercise programs from reviews based on a literature review of articles and books.

METHOD

This paper contains a discussion of the relationship between the impact of exercise in the form of fatigue, health and recovery, origin recovery with conditions and the implementation of long-term training in order to increased achievement. Tracing this study with the Systematic mapping study method. This paper is approached inductively and deductively using articles and books that are relevant to the topic of study that have been mapped before. Articles found and peer reviewed were identified by the search engines PubMed, Crossref, Google Scholar articles, Scopus and publications by local universities from 2013 to 2023. Here is a concept map of this study approach



Picture 1. Inter Connection Concept Map Field of study in bahasa Indonesia

RESULTS AND DISCUSSION

Athlete Development Potential

Human potential, especially athletes, is a gift that is given to be developed as optimally as possible, among others, the potential of intelligence allows athletes to develop the process of thinking, strategizing develop reason to overcome problems in achieving achievements (Nugroho, 2017). Development of intelligence potential through formal and non-formal education with the aim

of developing and sharpening reasoning. Physical potential is the capital to be able to improve biomotor, namely strength, speed, accuracy and endurance in an effort to reach a limit of achievement required in a match. Physical ability requires adaptation to programmed exercises continuously improving physical quality (Putra & Imam Solikin, 2020). Mental development in athletes is obtained from exercises that aim to allow athletes to overcome stress, maintain concentration, avoid and try suppress negative feelings that attack during competition and cultivate self-confidence and other positive feelings. According to Wibowo & Rahayu, (2016); Ifandi & Verawati, (2022) there are many exercises to improve athletes' mentality, namely imagery exercises and meditation exercises to increase self-confidence, focus and concentration when performing in exercise. Technique performance potential in sports also affects performance when doing sports specifically. Techniques are developed by technical coaches who always keep an eye on the truth the quality of motion in accordance with the laws of physics and biomechanics). His technique is enhanced by practicing drills and gaining experience in the sport he pursues (Hidayat et al., 2022). The next potential is Health. Health can develop rapidly with growth and development as well as the level of understanding of the importance of personal hygiene, personal responsibility, self-care awareness and knowledge of behavior and healthy living habits (Characters et al., 2016).

Coaching management

Efforts made to support athletes' achievements are good training management. Management is a process to organize, organize, manage human resources so that all move to achieve goals. The management of sports center coaching includes experts who move together with their respective expertise to work to advance the formation of athletes from various disciplines. According to Prasetyo et al., (2018); Mulyo et al., (2014) mentioned that government policies both regional and central as well as the private sector determine the direction, objectives, planning and implementation as well as supervision of the management of sports achievement coaching well. The policy determines various elements in the achievement coaching center, according to Latifa & Niswah, (2017); Jopang, (2018) said that in addition to organizational managers, education and dormitory, equipment and infrastructure facilities also needed expert resource expertise, namely technical trainers, physical trainers, biomechanics experts, doctors and medical teams, nutritionists, psychologists, formal teachers and teachers.

Technical and physical trainers synergize with each other in shaping performance during exercise. (Hermahayu & Rumini, 2021) argue that the role of the coach is vital for physical development, technique for athletes. In line with the training program to perfect the technique and physique, the trainer adjusts to the development and maturity of his athletes. Cooperation between expertise in other fields such as biomechanics to evaluate movement in techniques developed by athletes, doctors and medical teams handling health complaints (Penggali et al., 2021); (Samodra et al., 2022) and The program is supported by nutritionists who are in charge of regulating athletes' nutrition according to physical growth, exercise and appropriate intake needs (Penggali et al., 2021). Another form of support for the development of long-term training centers is psychologists who deal with psychological problems of athletes which include mental development, emotional improvement of athletes' psychological conditions (Padillah, 2018); (Kurniawan, 2017) and spiritual teacher to strengthen the faith and personality of athletes.

Principles of a long-term Exercise Program

Each supporter has a program or set of plans to reach the developmental stages of athlete training. The training program is prepared by taking into account the conditions, characteristics of athletes and supported by theoretical studies of each activity (Gustian et al., 2020). Training planned through the program will be affective if it meets the principles of exercise, which are as follows: The principle of **specificity**, there are two things that need to be considered in the principle of specificity, namely: doing special exercises according to the characteristics of the sport, doing exercises to develop special biomotor abilities in sports. Exercise should be aimed specifically at the energy system or muscle fibers used, also associated with an increase in specific motor skills. The training program carried out must be special, tailored to the goals to be achieved in sports (Jopang, 2018). **The overload principles**, the overload principle is the principle of training with weights that are above the excitatory threshold. If the training load is too light (below the excitatory threshold). To get a good exercise effect, the body's organs must be given a load exceeding the load of daily activities. The load given is close to maximum to maximum, (Darojat et al., 2019). The use of overloaded weights will stimulate physiological adjustments in the body, so continuous improvement in performance can only be achieved with an increase in exercise load (Bompa & Carrera, 2015). **The Principle of Individuality**. In practice, each individual is also different in ability. Training will have more impact on the training program planned and implemented based on the characteristics and conditions of individual athletes. Factors such as: age, gender, body shape,

maturity, educational background, length of practice, level of physical fitness, psychological characteristics, all of these should be considered in developing an exercise program. **The Principle of Reversibility.** A person's activeness in doing exercise or physical activity can increase physical ability, otherwise inactivity or without exercise will cause a deterioration of physical ability. Every training result if not maintained will return to its original state. Regular and continuous exercise of physical exercise should be regular and continuous. So that the body's adaptation to the exercise situation has an impact on the body's ability to increase according to the stimuli given (Bompa & Carrera, 2015).

Impact of Exercise

A training program that is carried out appropriately and purposefully through conditions that are in accordance with the theory of motion and training principles will have a positive and significant impact on the body and mental and psychological athletes. The impact of training can be negative which means that it has a bad influence on athletes if the implementation of the training program does not pay attention to the effects of training carefully. The effects of training arising from rigorous and long-duration training sessions lead to athlete fatigue, decreased health fitness (Safitri et al., 2020); (Rini, Susilo & Hanum N.A, 2016).

Fatigue in Athletes

Fatigue is a decrease in muscle performance and a feeling of fatigue arises. Fatigue is a complex issue. The physiological cause is that there are problems in the provision of ATP + PC Anaerobic glycolysis, lactic acid accumulation, muscle mechanical failure and nervous system changes (Parwata, 2015). Viewed from the psychological side that feelings of anxiety, fear and depression and fatigue will affect a person's physical condition. B. A. Nugraha & Ramdhanie, (2018) argue that fatigue is physical and psychological helplessness. According to Parwata, (2015) feeling tired is a sign of physical limitations which is a protection to prevent further physical damage and tension. One sign of the level of fatigue is pain in the muscles called *Delayed onset muscle soreness* is a pain or pain in the muscles that is felt 24-48 hours after physical activity or exercise (Sari, 2016). Typical symptoms during DOMS (*delayed onset muscle soreness*) are pain, swelling, stiffness and loss of muscle strength. Inflammatory reactions are the underlying mechanism for the onset of these painful symptoms.

Recovery

Original recovery is a time of pause to provide opportunities for physiological functions and physical conditions to recover as before, not only reducing muscle activity, but also relieving the tension of the mind, and calming the soul. Recovering from the origin will have an impact on decreasing fatigue levels and restoring a fit appearance and ready to move again (Doherty et al., 2021). In its implementation, recovery is essentially divided into **temporary recovery**, namely a break during the training session between sets and reps, **recovery from training** is a rest break carried out after exercise which aims to remove metabolic waste, rebuild tissue damaged by exercise and rebalance the respiratory system and resist the energy system. Long-term recovery is given when the athlete has completed a long competition. The purpose of recovering this origin is given so that the athlete maintains a state of supercompensation after a long competition. After recovering from origin, it is expected that the athlete's body is psychologically and physiologically ready to compete in this compete.

Rest can be fulfilled in various ways, for example: Listen to the radio, watch television, chat with friends, lie down, watch competitions, read reading books / magazines, sleep and so on. Sleep is one of the best ways to rest, quality sleep and sufficient duration will have an impact on freshness for the body. According to Yuli, Nurhalisa, (2022) sleep time according to age-dependent needs: School-age children aged 6–13 years: 9–11 hours per day; Adolescents 14–17 years of age: 8–10 hours per day ; Young adults 18–25 years of age: 7–9 hours per day; Adults 26–64 years of age: 7–9 hours per day; Seniors over 65 years of age: 7–8 hours per day. As a result of lack of rest: fatigue, difficulty sleeping, easily affected by disease, eating less lust, difficulty defecating, sore muscles, and impaired work of the glands of the body.

Fitness and Health Level

Fitness and health are things that must be maintained every day. Fitness is a condition where a person can do activities without feeling tired (Adi, 2019), while health is a good condition on the physical, mental, psychological, and social sides. Physical health is the body's ability to use body tools within physiological limits to efficient activity without excessive fatigue. Physical health can be improved if exercise activities are sufficient according to portions for physical needs. (Supriani et al., 2021).

Mentally and psychological health is a condition in which a person realizes his or her potential and has the ability to cope with life's stresses in various situations and adapt emotionally, contributing to the environment. Mentoring, counseling and recitation in an atmosphere that is

devout to the creator will improve mental and psychological health (Soebiantoro, 2017); (Lestarina, 2021). Personal health effort is the effort of one by one to maintain and enhance the degree of his own health. These efforts include the following: Maintaining cleanliness of the body , clothing and environment; eat healthy food according to the needs of the body; A regular healthy lifestyle, sleep, work and rest regularly and recreation (Matondang & Agustina, 2022); Increase endurance and physique; Avoid the occurrence of disease, think positively, avoid unhealthy associations (Marga, 2020); Improve emotional and spiritual intelligence by obeying religious teachings (Matondang & Agustina, 2022), enough spiritual food, increasing knowledge, learning from life experiences (Soebiantoro, 2017); Equipping the environment with healthy facilities such as water, trash cans, health equipment (Matondang & Agustina, 2022) and routinely controlling health thresholds.

From the description above, the author assumes that there is a relationship between long-term exercise coaching with the management of fatigue levels, recovery and health fitness.

CONCLUSION

Training concentration programs wisely manage athletes to grow and develop physically, sports techniques, mental, spiritual, social in accordance with theory and knowledge applied by experts, coaches and sports observers. Training organizers should entrust the training program to a group of experts in their fields who work together solidly to achieve the targets set. Management of adequate and designed recovery fatigue levels will improve health fitness which has a positive impact on the growth and development of athletes to perform optimally

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