

Tapering in the Sport of Karate: Narrative Review

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Abstract. Karate is a sport that involves physical contact and has been very popular all over the world, one of which aims to achieve achievements. Participation in martial arts is considered to be a sport that attaches great importance to physical exercise, psychology and physiology that must be well fostered by the coach. Therefore, a correct training program must be prepared and understand the decrease in training weights for the few weeks before the game. Tapering strategy in karate martial arts is an effort to improve the performance of the competition. Tapering is a decrease in the weight of exercise carried out about 8-14 days aimed at maximizing psychological, physiological and physical adaptations resulting from the loading of previous exercises. The results of research and empirical evidence have proven that tapering can improve athletes' performance and are widely practiced in the world of sports achievements that take place two weeks before the competition. After the preparation of this paper, coaches and athletes, especially in the karate martial arts branch, can understand and apply tapering methods so that the highest achievements can be achieved.

Keywords: Sport Performance, Tapering Strategy, Karate Martial Arts

1 Introduction

Karate is a martial art that is very popular all over the world not only among adults but among teenagers and children already practicing karate martial arts [24]. Karate comes from Japan which combines physical movement with aerobic and anerobic energy systems [11][8][12]. Participation in martial arts is seen as a sport that attaches great importance to physical exercise, psychology, physiology that must be well fostered [12]. It is reinforced by some experts that the most important goal of a coach and athlete in sports achievement is to improve technical, psychic, physiological and physical abilities as much as possible and be able to control the exercise program so that exercise does not cause overtraining [18]. It is reinforced by other literature that during high volume exercise with limited recovery can lead to accumulated fatigue that can interfere with physical and physiological adaptation [17].

The strategy of reducing training weights in the world of sports achievement is often applied before the eve of the main game for several weeks or periods called tapering [27]. Sports coaches and scientists often reduce the training load before entering the main match to manage fitness so that the highest performance is achieved [29]. The purpose of tapering is to maximize psychological adaptation, physiology and while eliminating fatigue resulting from the loading of more exercise [17]. Based on other literature that tapering aims to reduce psychological fatigue, and physiology and optimize exercise performance [27][29][14][6].

This is in line with previous research that tapering is proven to improve athlete performance and has been widely demonstrated in the world of sports achievements that take place two weeks before the competition [6]. Exercise load in sports achievement can be described as a combination and combination of the volume, intensity and frequency of exercise [17]. Therefore trainers are required to determine the extent to which the exercise load is reduced and able to maintain or improve psychological, physiological and physical adaptations [17][14]. Reduction in exercise load can stimulate exercise programs such as reducing exercise frequency, reducing exercise volume or shortening the duration of training sessions [19].

The sport of achievement, especially karate, is very important to understand tapering strategies to optimize match performance, but the peroblematics faced is that there is still a little discussion about tapering strategies or reducing training weights in martial arts. This is in accordance with the opinion of scientists that the lack of knowledge and evidence of tapering strategies in martial arts[7], reinforced by the opinion of other experts that the information used to be a guide for coaches in strategizing tapering is still relatively little [6] [10].

1.1 Objectives

The purpose of this study is to provide a brief review and recommendations to be a practical guide for karate coaches and be information for academics who pursue the sport of karate and physical trainers.

2 Literature Review

Speaking of exercise programs, of course, you must understand about tapering strategies. Tapering is a strategy to reduce the volume of practice before the main game [26]. Scientific evidence states that setting tapering before carrying out matches is very important. But please note that the tapering strategy needs to be considered. The effect of improper tapering can eliminate some performance such as biomechanical aspects and athlete physiology, besides that when not applying tapering will cause overtraining in athletes [28]. Studies in cycling sports have implemented tapering gradually which is carried out for 2 weeks able to increase anaerobic resistance [28]. Another study stated that applying tapering exponentially is able to significantly increase maximum strength and jump in the sport of rugby [26]. Interesting research from Lovell, Bousson & McLellan (2013) states that, in addition to maximizing performance in tapering strategies by increasing and maintaining exercise intensity and lowering exercise weights gradually proven to reduce body fat by 8.5% [18]. Based on the literatur study, it is stated that the management of the training program, especially in the competition preparation period, needs to be considered carefully by implementing a tapering strategy.

3 Material and Methods

This study is a narrative review study, which provides scientific evidence from previous research by examining it more deeply[4]. Databases to search for scientific articles from google scholar, ScienceDirect, and Scopus are then supported by ebooks and books that are relevant on the subject of tapering strategies in sports achievement.

4 Results and Discussion

4.1 Intensity

In the tapering phase, the intensity of the exercise is maintained to maintain the athlete's skills and physical condition[15]. In line with the research of experts that maintaining the intensity of exercise in the tapering phase is the most effective method of optimizing performance for most athletes[6]. Exercise intensity is key in maintaining exercise performance during the tapering phase[24]. Based on the literature when the intensity of 70% exercise will produce and maintain strength, then the intensity of 90% in the tapering phase will improve performance better[5]. This is similar to Mujika's research (2010). That with intensive exercise with high intensity or often called anaerobic threshold can encourage increased performance Vo_{2max} , then reinforced by some literature that the intensity is maintained or may be raised slightly higher but the duration of rest must be long enough to provide a chance of recovery properly[7]. Based on the description above, it can be explained that the intensity of exercise in the tapering phase is maintained to maintain physical and technical aspects.

4.2 Volume and Frequency

Reporting from some literature that the volume of exercise in the tapering phase can be markedly reduced because it can inhibit and make performance declines in terms of physical, physiological, or psychological [18]. Research shows that lowering the volume of exercise can result in better performance and physiology of athletes [6]. This is to other literature that athlete performance will be better if it reduces the volume of exercise by 42%-60% by reducing the duration of training rather than reducing the frequency of exercise [18]. Then found empirical evidence of a decrease in exercise load on the aspect of aerobic sustenance, the results showed that there had been an improvement in sustained performance by reducing exercise load for 2 weeks by applying an exponential volume reduction by 41%-60 without reducing exercise intensity and exercise frequency [5]. It is to other literature that in the first and second micro cycles the volume of exercise decreases in the range of 40%-50% [1].

This is reinforced by some experts that the tapering method by lowering the volume of exercise will result in greater profits than maintaining the volume of exercise or increasing the volume of exercise[5][18][1]. Tapering by lowering the volume lower is better than tapering done moderately [16]. Recently also found evidence that tapering periods carried out over two weeks by reducing exercise volume by 50% while maintaining intensity were shown to increase strength significantly (Could 2019). In line with the description above found research evidence on taekwondo martial arts with the purpose of research is to analyze the influence of tapering periods on the improvement of anaerobic power on taekwondo kick performance, it has been concluded that by applying 2 weeks of tapering with the linear type (progressive) can optimize anaerobic power in male taekwondo athletes [2]. Based on the above description, it can be concluded that reducing the volume of exercise by 42%-60% for 2 weeks can optimize athlete performance.

Bompa & Buzzichelli (2019) explained that reducing exercise frequency is a classic method often used by trainers during the tapering phase [5]. Heiko & Boris (2018) explained that the application of exercise by lowering the frequency between the number of training sessions per week has not been significant evidence of improving exercise performance [14]. But based on other literature found that lowering the frequency of exercise is very closely related to the

volume and intensity of exercise that which makes it difficult to see the effect of reducing exercise frequency [18]. Previous research stated that a 50% reduction in the number of exercises in the tapering phase was able to improve athletes' performance by reducing the amount of exercise for 2 to 4 weeks with results to maintain psychics in training and competition in athletics [3]. This opinion is reinforced by Bompa & Buzzichelli (2019) that a 50% reduction in the frequency of exercise can improve athletes' performance [5]. The frequency of exercise in trained athletes is recommended to be maintained at 80% or more who have the goal of maintaining technical ability [21]. Based on the description above, it can be concluded that the frequency of exercise during the tapering phase must be adjusted to the sport and the situation of the athlete's condition

4.3 Duration

The duration or length of this tapering phase is difficult to determine because each sport has a different characteristic tapering duration, some are several days before the game and some are done 1 to 2 weeks before the match [7]. Literature studies state that it takes a tapering duration of 8 to 14 days to minimize and eliminate psychological, psychic, and physical fatigue properly [16]. It is reported that physical and psychic fatigue will return to its original state when tapering is performed for 15 days [13]. Recently Ramirez et al (2021) conducted research on plyometrics training squads by implementing tapering strategies, in conclusion, it was explained that the intervention of plyometrics exercises with the application of decreased volume and duration of exercise per session led to a significant improvement in jumping performance in athletes [25]. Based on the description above in general the duration of tapering in sports achievement is carried out 8 to 14 days.

4.4 Tapering Model

The literature states that the tapering model is divided into two, namely tapering progressively and non-progressively [16]. Progressive tapering is characterized by a gradual decrease in exercise weights, while non-progressive decrease in exercise weights using strict exercise standardization. Progressive tapering is still divided into 3 types, namely linearly, exponential decline slowly and exponential decline rapidly [21]. Linear tapering is characterized by a higher exercise load than tapering slowly and quickly, then non-progressive tapering is characterized by a sudden decrease in load that leads to possible loss of physical and physiological performance [21]. The effectiveness of exponential tapering quickly seems to be better and gives more significant results than tapering linearly and exponentially slowly [21]. Mujika & Padilla (2003) in his research explained that linear progressive exercise weight gain resulted in an increase of 1.2% to 1.5% then tapering exponentially resulted in an increase of 4.0% to 5.0% [21]. Based on the description above, it can be concluded that the use of tapering progressively linear is very dependent on factors such as training loads before entering the tapering phase, then tapering can be exponentially used to achieve the highest performance in a competition [22]. The following can be seen in the tapering curve image:

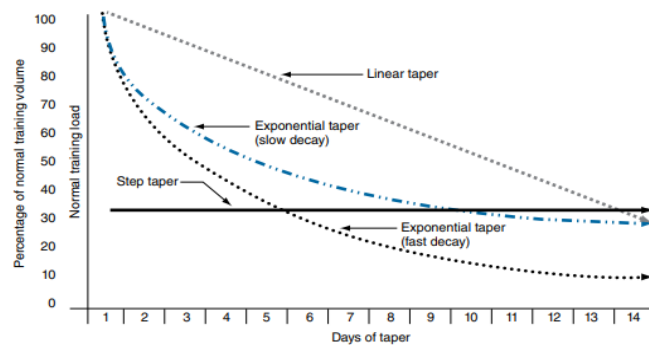


Fig. 1. Types of Tapering Source : Bompa & Buzzichelli (2019:214)

5 Conclusion

Based on the description above, the author can conclude that the importance of coaches and athletes, especially in karate martial arts, must understand the strategies and stages of tapering to achieve the highest performance. In theory tapering in sports achievement is the same, it's just that the coach must understand and adjust the age of the athlete, the level of athletes, and the situation of conditions in their respective sports. It should be emphasized that karate martial arts are a martial arts that is physical contact and one of the most important factors to achieving victory is the physical aspect because the regulation of the volume and intensity of training here becomes an important part of achieving the highest achievements. 14 days or 7 days before the game the coach must reduce the training volume by approximately 41% to 60% so as not to cause overtraining and excessive fatigue, then the coach can maintain intensity or increase the intensity of the exercise gradually with an extended recovery record.

Scientific evidence has been proven that tapering strategies can improve the appearance of athletes for the better.

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