

A NARRATIVE REVIEW ON THE MOTIVATIONAL FACTORS AND BENEFITS OF USING *CROSSFIT* ELEMENTS IN THE TRAINING OF COMBAT SPORTS (JUDO AND SAMBO)

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Abstract: *The scientific research on using CrossFit in combat sports like judo and sambo lacks evidence, prompting further investigation. This paper aims to analyze existing literature on CrossFit and combat sports. We conducted searches in Web of Science and Scopus databases using keywords like CrossFit, benefits, motivation, training, and workout, focusing on judo and sambo. We found 101 relevant results and conducted a systematic review following the PRISMA model. Integrating CrossFit into training improves physical fitness, enhances sports performance, aids injury management, and impacts athletes' psychological well-being, including satisfaction, self-esteem, and community belonging.*

Key words: *CrossFit, training, workout, benefits, motivation, judo, sambo*

1. Introduction

CrossFit training improves physical skills: cardiovascular/respiratory endurance, stamina, strength, flexibility, power, range of motion, speed, coordination, flexibility, agility, balance, and accuracy [12], [21], [29].

CrossFit is among the most dynamic forms of training in the world, it is based on the alternation of basic movements from different sports, it combines high-intensity exercises with functional

movements, performed at high speed. CrossFit training is a motivational alternative to traditional resistance training models [11].

CrossFit is all about evidence-based fitness. To analyze and evaluate a CrossFit training program, measurable, observable, and repeatable data are used to determine the safety, effectiveness, and efficiency of the program. The effectiveness of the training program refers to the increase in modal work capacity over long periods of time.

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Efficiency refers to the time required to achieve a training goal, and safety to the safety of the athletes [15].

Periodization of training resulted in beneficial changes in body composition and improvement in athletes' physical fitness [28].

The aim of the paper is to do a systematic literature review to identify the motivation of using CrossFit elements in sports exercises and training and their benefits, with emphasis in judo and sambo.

2. Using CrossFit Elements in Judo

Judo is a sport where athletic performance depends on speed, strength, and functional fitness [22], it requires complex technical and tactical skills and imposes high physiological and neuromuscular demands. It has been declared an Olympic sport since 1972 for men and since 1992 for women, which as in all combat sports and in judo, the physical condition of the athletes is the most important and involves intermittent efforts of high intensity, based on a large muscle strength and power demands for all trunk segments. To be able to cope with these high physical and technical demands, specialized strength training and conditioning programs are needed for athletes.

In classical training systems, endurance and resistance exercises are often separated. Currently, the combination of both types of exercises is increasingly used in sports training. One type of training that combines the two elements is CrossFit training. CrossFit workout routines involve exercises that use large muscle groups, high repetitions, fast

execution speed and short recovery periods.

The prolonged effort and long-term psycho-emotional tension cause changes in the physiological indicators of judoka, which has the effect of reducing immunity. Increasingly, the need to optimize training techniques leading to the improvement of athletes' resistance and combating the decrease in immunity is shown.

The Russian school of judo shows that the best indicator of the effectiveness of training is the general level of endurance of the athletes, which is embodied in the ability to withstand future exhaustion [22]. To increase the level of special endurance of athletes, it is recommended to use interval training, intensive cardio training techniques and strength training.

Studies conducted among young judokas have demonstrated the effectiveness of using CrossFit training to improve motor skills. Thus, general, and judo-specific physical condition improved, as well as fighting activity in competitive matches. The age period of 10-12 years is ideal for the creation and improvement of motor skills in athletes, but the literature does not present sufficient scientific evidence in this regard. A study carried out on this age group shows that using CrossFit training for 15-20 minutes twice a week after the technical phase of regular training (3 training sessions of 90 minutes per week) leads to improvement in muscle strength, stamina, speed, as well as O Soto Gari and O Goshi throws. The pulse of the athletes was determined before, during and at the end of training. CrossFit-based workouts included a.) Tabata, "as many rounds/reps as possible" and b.) time trials with a 21-15-9 rep scheme performed at 60-70% intensity [1].

Osipov et al. conducted an 8-week experiment that included CrossFit-type training in judoka with an average age of 17 years. The results obtained show that the use of strength training or that which includes Crossfit elements depends on the challenges of each judoka during the competition season [25]. As such, short-term off-season and pre-season training programs are required in judo.

Research into different strength training protocols is needed to determine the best combination needed to improve the performance of elite judoka. Different strength training interventions have a multidirectional effect on athletes' strength performance in specific strength tests. The use of strength exercises in classical training or CrossFit-type elements in judoka does not significantly change the physiological responses and the success of technical actions performed during competitive matches.

The same author demonstrated that 12 weeks of different protocols of strength training, resistance training and mixed training (CrossFit + resistance), are more effective to increase some strength and sports performance of junior male judokas [24].

Effective judo training strategies should focus primarily on achieving high levels of isometric arm and hand strength as well as maximal strength [2]. It is essential that during the warm-up phase of the pre-competitive training, it determines the achievement of a maximum potentiation of the strength of the arms.

In the physical training of combat sports athletes, it is necessary to develop "manual skills" on which the efficiency of technical-tactical actions depends. Hence the importance of the so-called "hand techniques" because athletes perform

numerous catches and/or throws. Numerous authors have shown that the results obtained in the hand strength measurement test depend on the age of the athletes, their body weight. At the same time, they do not depend on the specifics of the strength training intervention, but on the duration of the strength training period.

2.1. The main tests used in determining the influence of the type of training on the strength of judo athletes.

The literature presents tests such as: the isometric handgrip resistance test, the one-repetition maximum bench press test, the back squat tests, the pull test and competitive performance assessment, the Ditrich rod grip reaction force test, dynamometric measurement of hand strength [2], [9], [25], Special judo fitness test (SJFT), measuring the level of lactic acid in the blood after performing SJFT, electrocardiogram [22].

3. The Use of CrossFit-type Elements in Sambo

Success in combat sports depends on the technical skills and tactical training of the athletes and especially on their physical condition. This in turn depends on training intensity, competitive tasks and work techniques used in functional training.

In the case of athletes who practice sambo, the average weekly training time is between 14-15 hours, of which approximately 45-50% is allocated to the athletes' physical training. The level of physical condition especially of sambo practitioners can be improved through competition simulation games – randori

practice. The use of randori in pre-competitive training is recommended to be approx. 40-60 minutes and 4 weekly sessions.

Most often in training for the special physical training of athletes in contact sports (judo, sambo, and combat sambo) exercises with weights, exercises on machines and exercises using one's own weight or that of the sparring partner are used. To improve special physical training, throwing exercises with varied amplitude, counter timer, using special combat dummies or sparring partners are used [22]. Strength exercises are increasingly performed as circuit exercises.

Through the selection of physical exercises performed during circuit training, all muscle groups are intervened, either as continuous or interval training, they can be used for an entire cycle of physical training [22].

Osipov et al (2020) showed that the use of CrossFit-type exercises in the special physical training of sambo practitioners improves the level of functional fitness [23].

4. The Motivation for using *CrossFit* Elements in Training

The concept of motivation refers to a force within an individual that causes him to do something to fulfill a biological or physiological need. In sport, motivation is an important aspect of exercise initiation, participation, and adherence [5].

The main motivation in CrossFit is to maximize athletic performance [17]. Practicing CrossFit has several positive physiological effects, such as: improving body composition, cardiovascular/respiratory fitness, strength flexibility, power, and balance. A long-term effect is

the improvement of maximal oxygen consumption after CrossFit programs [21].

Motivation is also closely related to the psychological needs of athletes. In the case of CrossFit training, athletes get to identify with the exercises, practice them with pleasure and perceive them as a challenge [3]. In general, CrossFit workouts are constantly varied, which leads to the inclusion of new exercises, strengthening motivational factors. They respond to basic psychological needs: autonomy, competence, and relatedness [10].

For CrossFit training to become routine, behavioral changes based on challenge motivation, feelings of competence, autonomy, interaction, recognition, and social belonging are needed [6], [7], [27]. Bycura et al pointed out that there are differences in the motivational factors for practicing CrossFit physical exercises according to the sex of the practitioners. Thus, women are more motivated to exercise for stress management, weight maintenance, and overall appearance. For men the important motivational factors are challenge, social recognition, competition, strength, endurance, and agility [7].

CrossFit coaches should consider how perceptions of motivational climate may vary based on demographic variables. Thus, the motivation of athletes, their encouragement and training depend on the motivational factors specific to each gender [26].

CrossFit causes behavioral changes over time and the adoption of a healthy lifestyle [12], [13]. Claudino et al. carried out a systematic review of the literature on CrossFit and showed that practicing this type of training is associated with

motivation, satisfaction, and sense of community of the practitioners [8].

A study by Box A. et al among over 700 high intensity exercisers looked at intrapersonal, interpersonal motivation related to physical and mental health, body image and general fitness. In general, motivation changes depending on participants' experience of high-intensity training, bringing several benefits to mental and physical health [4].

Table 1 shows the motivational factors identified in CrossFit.

Motivational factors in CrossFit Table 1

MOTIVATIONAL FACTORS IN CROSSFIT		
General motivational factors	Identification with the exercise	
	The pleasure of exercise	
	Interaction	
	Social belonging	
	Satisfaction	
	Physical and mental health	
	Improving general fitness	
Specific motivational factors	Female	Stress management
		Maintaining body weight
		Overall nice appearance
	Male	Resistance
		Agility
		Physical strength
		Challenge
		Social recognition
		Competition

CrossFit can be used as a means of improving social inclusion, promoting healthy habits, community involvement and exercise for a healthy lifestyle [19], which allows the prevention of illness [18]. A study published ten years ago recommends that CrossFit exercises be included in public health interventions [16].

Motivation can be extrinsic or intrinsic. Extrinsic motivation causes an individual to change their behavior, while intrinsic motivation depends on engaging in that behavior [5]. Extrinsic motivation is given by athletic and competitive performance, which allows the improvement of physical abilities, health, and well-being of CrossFit practitioners [11], [20]. Intrinsic motivation to exercise is influenced by the enjoyment and challenges experienced through exercise and belonging to the group, which responds to individuals' need for autonomy and satisfaction [14].

Some studies claim that practicing CrossFit also influences the athlete's mood. The athlete's mood thus depends on the intensity of the training, the participation in the competition or the periodization of the training [13].

Other studies highlight aspects related to anxiety and fear of competition, higher in individual sports, manifested in high heart rate, sweaty hands, and stomach pains, which without proper management can lead over time to the appearance of chronic stress. They are thus imposed, especially in individual sports and anti-stress training, which allow overcoming anxiety, pre-competitive fears and improving performance. In this context, there is a need for individual support and counseling of athletes before competitions, so that athletes can overcome their fears without affecting their performance [30].

5. Conclusions

The use of CrossFit elements in the training activities of athletes of various types of combat allows athletes to achieve a significant increase in the level of fitness, especially in specialized physical impacts.

The main benefits that the inclusion of CrossFit elements in training brings are: improving physical condition, achieving better sports performance, better injury management and involves the psychological variables of athletes, embodied in satisfaction, improving self-esteem and sense of purpose belonging to a community.

CrossFit aims to maximize athletic performance, is a means of improving social inclusion, promoting healthy habits, community involvement and exercise for a healthy lifestyle and disease prevention.

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