RESEARCH REVIEW JOURNALS
Volume-04
Issue-03
March -2019

ISSN: 2455-3085 (Online)
RESEARCH REVIEW International Journal of Multidisciplinary
www.rrjournals.com [UGC Listed Journal]

Influence of Concurrent Training on Self-Efficacy amongst Physical Health and Performance of Contact Game and Non-Contact Game Players

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ARTICLE DETAILS

Article History
Published Online: 15 March 2019

Keywords
self-efficacy, contact game, non-contact game, concurrent training, endurance-strength training, strength-endurance training, physical fitness, performance

ABSTRACT

The purpose of the study was to a compare the self-efficacy of contact game and non-contact game players. The study of narrative review was to evaluate the current literature and to provide further insight into the role of concurrent training on various components of physical health or performance. Literature was obtained by electronic searches of databases using specific keywords. Combined effect of training sessions proved to be as beneficial as drug interactions. Results from cross-sectional, longitudinal, and intervention studies are reviewed and discussed with main focus on physical parameters, such as body composition, physiological parameters, molecular adaptation, athlete's perspective, order of execution, interference phenomena and recovery. In conclusion, concurrent resistance and endurance training is an effective method for enhancing overall fitness as well as improving quality of life. For these total 80 players (40 subjects contact game players, 40 subjects of non-contact game players) who had participated at national club level and aged between 17 to 22 yrs. were selected using purposive sampling technique. The collected data was analyzed using Independent sample's' test. The results of the study showed that there was a no significant difference in self-efficacy Contact Game and Non-Contact Game Players at 0.05 level of confidence. It was concluded that Non-Contact Game players showed significantly more self-efficacy than the Contact Game Players.

1. Introduction

Psychology is a science in which, we study about human behavior and Sports Psychology is primarily concerned with the analysis of behavior of sports persons. Sports psychology involves the study of how psychological factors affect performance and how participation in sports and exercises affect psychological and physical factors. Concentration, confidence, control, and commitment are generally considered the main psychological qualities that are important for successful performance in sports. Nowadays sports not only require physical skills, but a strong mental game as well. Self - efficacy and Locus of Control are complex components of mind. Self - efficacy is the most important single attribute and the key to understanding the behavior of an individual. The self - efficacy is how we think about and evaluate ourselves. To be aware of oneself is to have a concept of oneself. The term self - efficacy concept is a general term used to refer to how someone thinks about or perceives them. Self - efficacy is a multi - dimensional construct that refers to an individual's perception of "self" in relation to any number of characteristics. A locus of control orientation is a belief about whether the outcomes of our actions are contingent on what we do (internal control orientation) or on events outside our personal control (external control orientation). In the present scenario, sports have become highly competitive. All individuals are varying from each other. No two individuals are exactly alike. Personality traits are very important in sports. There are many situations which may require first aid, and Sports psychology in many ways is a fortunate scientific field of inquiry as it provides an arena for the study of human performance and emotions spanning the "thrill of victory to the agony of defeat" as well as group dynamics, organizational behavior and individual personality characteristics. Overall the literature supports, the idea that the mental preparation strategies have a positive effect on the performance as it is assumed that physical ability of an individual are related to his psychological structure because the environment in which the physical abilities are displayed constitute an ideal setting for the development of psychological characteristics as well.The rationale of this research work circles around the factors like self-efficacy which is the axis of human traits and to a large extent affects the outcome of the specific behavior. Self-efficacy is people's belief in their capabilities to perform in ways that give them control over events that affect their lives. Bandura (1977) used self-efficacy to denote a situational specific variable which influences performance and determines how much efforts individual will expand and how long they will persist in the face of obstacles and difficult experiences. Therefore, higher the self-efficacy more will be the intensive effort while lower the self-efficacy less will be the effort and difficult tasks will be viewed as threats.

Most sport psychology researchers, applied consultants, coaches, and athletes agree that confidence is an essential contributor to optimal sport performance. Research has identified confidence as a characteristic that clearly distinguishes between successful and unsuccessful athletes (Manzo, Mondi, Clark & Schneider, 2005). Self-efficacy as defined by Bandura (1977) is an individual‟s belief that she/he has the necessary skills to produce the desired outcome. Self-efficacy is considered as a situation-specific issue. Veale (1986) applied these ideas of Bandura to the sport domain and developed sport confidence. Sport confidence is developed sport confidence concept which means the athletes" certainty that they have the ability to be successful in their sport.Self-

efficacy is a self-judgment about the successful realization capacity of a performance (Bandura, 1984). Generally, it is an individual's" belief about what they are capable of doing. Self-efficacy belief is one of the important factors that affect an athlete's" performance (Hardy, Woodman & Carrington, 2004). Most of the studies that investigated the relationship between performance and self-efficacy. /indicated a positive relationship. For example; Beauchamp, Bray, and Albinos (2002) suggested stated that athletes who exhibit high performance have higher degrees of self-efficacy, whereas, athletes who exhibit poor performance have lower degrees of self-efficacy. Accordingto Bandura"s (1977, 1982) theory of self-efficacy, self-efficacy is required for a competent and satisfactory performance. In competitive situations, higher self-efficacy belief and optimal emotional arousal produce a superior performance (Bandura, 1982). Bandura"s model has been supported by researchers in the sport domain (Felts&Muggon, 1983; Gould & Weiss, 1981).

2. Self-Efficacy between Contact Game and Non-Contact Game

Sports are categorized in different categories i.e. contact, semi-contact and non-contact sports. Contact sports are those sports in which physical contact occurs among contestants during a competition. For Example: Judo, Kabaddi, wrestling and boxing. Semi-contact sports are those sports in which body contact occurs sometimes as per the demands of a situation. For example: Football, Hockey. Non-Contact sports are those sports in which no body contact occurs during a competition. For Example, Volleyball, Ball Badminton and Badminton. Contact sports are inherently violent because they involve deliberate and forceful impacts. This can either be with fellow players, in the case of boxing, hockey and football, or with the ground in sports like rodeo and ski jumping. Limited contact sports, like volleyball, basketball and fencing, have a high probability of occasional, inadvertent contact, mostly due to loss of balance or control. Noncontact sports are not guaranteed to be injury-free, but are relatively or completely contact-free. All sports demand an increasing level of fitness, and benefit from targeted cross training to build cardiovascular conditioning and strength. Non-contact sports offer the additional benefit of improved fitness with greater control over injury risks.

Sports in which physical contact between players is possible or even inevitable -- such as soccer, rugby and boxing -- are thrilling for athletes and spectators alike. However, that thrill comes with a price. Physical Separation in some noncontact sports separate athletes entirely, or at least place them in discrete lanes or portions of a playing area, greatly reducing the risk of body contact or head impacts. Examples include track, swimming, tennis and table tennis; in each case, the racers participate in separate lanes or separate sides of the court and, at least theoretically, should never make contact. Allowing players to take the field in turns, as is the case for golf, further limits the possibility of body contact. In a few sports, such as rowing, bodybuilding, ice skating, archery and some types of horseback riding, the nature of the sport makes body contact between players all but impossible. A (full) contact sport is any sport for which significant physical impact force on players, either deliberate or incidental, is allowed for within the rules of the game. Contact actions include tackling, blocking and a whole range of other moves that can differ substantially in their rules and degree of application. Examples of contact sports are Roller derby, Lacrosse, Rugby, American football, water polo, wrestling, and team handball. Full-contact martial arts include boxing, mixed martial arts, Brazilian jiu-jitsu, May Thai, judo, various forms of full contact game karate, wrestling and some forms of Taekwondo. Limited Contact. Not all noncontact sports are, in fact, completely contact-free. In theory, sports such as volleyball, baseball, cycling and cricket allow little or no contact between players. However, body contact in these sports is, in spite of the rules, common to varying degrees. Some "noncontact" sports, such as whitewater kayaking, snowboarding and gymnastics, truly don"t involve any direct contact between players; however, the very nature of the sport can still expose athletes to a higher risk of injury than playing milder noncontact sports does. The recent focus on the dangers of collision and contact sports, to both professional and student athletes has highlighted some of the serious injuries sustained through body blows. But there are plenty of opportunities for improving fitness and enjoying an athletic challenge that don't involve the risks that come from smashing into other people, stationary objects or the ground. Non-contact sports can be as demanding as any football game or boxing match with far less risk for permanent injury. The recent focus on the dangers of collision and contact sports, to both professional and student athletes has highlighted some of the serious injuries sustained through body blows. But there are plenty of opportunities for improving fitness and enjoying an athletic challenge that don't involve the risks that come from smashing into other people, stationary objects or the ground. Non-contact sports can be as demanding as any football game or boxing match - - with far less risk for permanent injury. Comparative Risks and Benefits Contact sports are inherently violent because they involve deliberate and forceful impacts. This can either be with fellow players, in the case of boxing, hockey and football, or with the ground in sports like rodeo and ski jumping. Limited contact sports, like volleyball, basketball and fencing, have a high probability of occasional, inadvertent contact, mostly due to loss of balance or control. Non-contact sports are not guaranteed to be injury-free, but are relatively or completely contact-free. All sports demand an increasing level of fitness, and benefit from targeted cross-training to build cardiovascular conditioning and strength. Non-contact sports offer the additional benefit of improved fitness with greater control over injury risks. Contact sports are sports that emphasize or require physical contact between players. Some sports, such as mixed martial arts, are scored on impacting an opponent, while others, including rugby football, require tackling of players. These sports are often known as full-contact, as the sport cannot be undertaken without contact.

Other sports have contact, but such events are illegal under the rules of the game or are accidental and do not form part of the sport. The contact in contact sports can also include impact via a piece of sporting equipment, such as being struck by a hockey stick or football. Non-contact sports are those where participants should have no possible means of impact, such as sprinting, swimming, darts or snooker, where players use separate lanes or take turns of play. Consideration should also be given to other sports such as Moto-cross and Bicycle Moto-cross (BMX) and cycling which all involve riding/racing in packs of riders. This often results in brushing and bumping off

other riders. It can additionally result in crashing, and possible head injury. Even though these riders wear helmets, head injuries can be serious. Non-contact sports are sports where participants compete alternately in lanes or are physically separated such as to make nearly impossible for them to make contact during the course of a game without committing an out - of-bounds offense or, more likely, disqualification. Examples Include volleyball, baseball, softball, cricket, tennis, badminton, squash, golf, croquet, bowling, bowls, pool, snooker, darts, curling, bodybuilding, swimming, diving, running, sprinting, and gymnastics.

3. Athlete's Training Perspective

Role of strength training in endurance sports

In 2010, Aagaard and Andersen suggested that strength training can enhance both long-term (>30 min) and short-term (<15 min) endurance capacity in well-trained individuals, as well as in highly trained top-level endurance athletes, especially with the use of high volume, heavy résistance strength training protocols. The enhancement in training-induced endurance capacity appears to involvean increase in the proportion of type IIA muscle fibres as well as gains in maximal muscle strength (MVC), rapid force characteristics (rate of force development), and enhancements in neuromuscular function (Aagaard and Andersen, 2010).

In 2010, Ronnestad et al. investigated an endurance training regimen supplemented by heavy strength training. They showed an increase in peak power output, maximal aerobic power output, leg strength and thigh muscle cross-sectional area. They further suggested that it could be used in pre-preparatory and competitive period of sports, as in enhancing cycling performance determinants and performance (Christos et al., 2003). However, a recent study by Enright et al. (in press) on soccer players to understand the effect of CT on hormones indicated no significant difference in pre-post readings.

Role of endurance training in strength sports

In 2007, Elliott et al. stated that distance running in power athletes resulted in improvement recovery between bouts of exercise and days of competition. Especially, long slow distance running can be used as a tool for better recovery after demanding contests or workouts (Elliott et al., 2007). CT was also found to increase VO2max and repeated sprint ability in rugby players (Robineau et al., 2016).

Effect of order of exercises

The exercises should be prescribed in a specific order in order to achieve a favourable outcome. Different studies have been carried out regarding the order of execution of exercises. In 2016, a study was done to analyse the interference of strength and aerobic training order over an 8-week period on explosive skills and maximal oxygen uptake in prepubescent children. The strength-endurance group produced better results than the endurance-strength group for muscle strength variables. However, results were opposite for aerobic capacity variables. Therefore, these training methods should be taken into consideration, when to optimise explosive strength and cardiorespiratory fitness training in sports (Alves et al., 2016). In 2011, Di Blasio et al. carried out a study in concurrent exercise in three different orders: endurance-resistance training (ERT), resistance-endurance training (RET) and alternating endurance resistance training (AERT). Data analysis revealed that AERT elicited a significantly greater increase of energy expenditure, VO2 and ventilatory equivalent, but there was no difference between ERT and RET. They further concluded that the proportion of oxygen in expired air (FeO2) was higher in ERT and lower in RET and AERT. Thus, AERT has a greater capacity to maintain a constant increased VO2 and ventilator demand to physiologically and energetically sustain the training compared to ERT and RET. Additionally, the rate of perceived exertion is less when endurance exercises are performed first in a concurrent endurance resistance training program (Di Blasio et al., 2012). Researchers have concluded that endurance training should be performed before strength training for better gains as it helps to increase maximum aerobic power, anaerobic power and maximum strength (Zafari, 2012). Similarly, high intensity endurance followed by circuit resistance training also improved aerobic capacity and endurance performance (Chtara et al., 2005), but this sequence did not influence the adaptive response of maximal muscular strength, explosive strength, and power (Chtara et al., 2008). On contrary, Alves et al. (2012) concluded that the training sequence of endurance and resistance exercise in a concurrent exercise session had no effects on relative VO2, heart rate and respiratory exchange ratio during exercise. However, post-exercise VO2 was found significantly greater when endurance exercise was performed before resistance exercise (Alves et al., 2012). Post-exercise hypotensive response after concurrent exercise also showed an order effect with endurance resistance exercise producing a more significant effect (Delavar and Faraji, 2011; Santiago et al., 2013). When resistance exercise is performed following endurance exercise, the expression of genes responsible in the cascade reaction of mitochondrial biogenesis are enhanced and activation of proteins involved in regulation of protein synthesis is also increased (Wang et al., 2011).

Interference effect in combined training

Apro et al. (2013) observed that both aerobic and resistance exercises interfere in their responses when performed together. They found that muscle growth was not inhibited by subsequent endurance exercise. Similarly, it has been found that the rate of strength development is similar for the CT group and strength training group for the first 7 weeks of training (Hickson, 1980). A positive interference effect was seen with CT, i.e. gain in lower body muscle strength was higher than for the strength training group alone (Cadore et al., 2010). Secondly, a combination of resistance training with high-intensity endurance training led to increases in strength and explosive strength and power, but not to the same extent (Chtara et al., 2008). It has been evaluated that when volume and/or frequency of exercises are high in CT, it may adversely affect the gains observed during strength and power training, thus favouring positive interference phenomena (Kraemer et al., 2004). Further, CT did not blunt muscle strength and hypertrophy increments when compared with strength training. Several studies have supported that a low volume of CT produced similar muscle strength and hypertrophy increments when compared to low-volume strength training alone and does not support an interference effect (Davis et al., 2008; Glowacki et al., 2004; Libardi et al., 2012; Silva et al., 2012).

Post-exercise hypotensive response also shows a positive interference effect (Teixeira et al., 2011). As reported by Alves and colleagues in 2011, the use of concurrent endurance and resistance exercise may also serve to improve space and time management practices in fitness facilities; it also provides an additional way to reduce the monotony of training. Reduction in volume of work performed was noted in a strength training session when it was performed after aerobic training; this limitation could probable be due to two reasons: (1) inadequate recovery period between the two different exercises; or (2) local muscular fatigue was involved in the exercise sessions. Alves et al. (2012) stated that when 24 h of recovery is provided there will be no loss in training volume. Sporer and Wenger (2003) have observed impaired strength performance for up to 8 h following 40 min of aerobic exercise; especially the local muscle group involved in aerobic exercise was compromised. AERT in a circuit design can be a useful tool to optimise the recovery period due to the higher increase from baseline of fat-powered energy consumption compared to other exercise protocols (Di Blasio et al., 2012). In 2012, the primary objective of the study by Wilson et al. was to identify which components of endurance training (e.g. modality, duration, frequency) are detrimental to resistance training outcomes. A meta-analysis of 21 studies was performed; hypertrophy and strength were significantly more enhanced with strength and CT, than with endurance training alone. Power development was reduced with CT. Results indicate that interference effects of endurance training are a factor of the modality, frequency, and duration of the endurance training selected (Wilson et al., 2012).

4. Data Analysis and Interpretation

The data collected was analyzed using statistical technique such as t-test independent. In this chapter the data will be interpreted under two heads viz.

- Analysis and interpretation of self-efficacy score of contact game.
- Analysis and interpretation of self-efficacy score of noncontact game.
- Comparative analysis of the score of contact game and non-contact game. All the statistical calculations were done using the 11.5 spas software.

Analysis and Interpretation:

After data collection and scoring the next step is to analyze the data and verify the research hypothesis followed by interpretation. The details of data analysis and interpretation of results have been presented systematically in this study.

5. Analysis of self efficacy

Descriptive Statistic

Table 1: Descriptive Statistic of Self Efficacy between Contact Game and Non-Contact Game Players

	Game Type	N	Mean	Std. Deviation	Std. Error Mean
Self-efficacy	Contact game	40	156.2500	21.09168	3.33489
	Noncontact game	40	166.7750	22.07968	3.49110

The above table 1 shows the mean and standard deviation for self-efficacy of contact game as 156.25 and 21.09 respectively and the mean and standard deviation of self-efficacy of non-contact game 166.77 and 22.07 respectively.

Table 2: Self Efficacy between Contact Game and Non-Contact Game Players

		F	Sig.	T	dd	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Self-efficacy	Equal variances assumed	.225	.636	-2.180	78	.032	-10.52500	4.82797
	Equal variances not assumed			-2.180	77.837	.032	-10.52500	4.82797

Table 2 shows the statistical analysis for self-efficacy using independent sample t test. Since the significant value is greater than 0.05 equal variance is assumed. The calculated t value (-2.180) for dd 78 shows that there is a no significant difference in Self Efficacy between Contact Game and Non-Contact Game players at 0.05 significance level (p=.032). Hence the research hypothesis was rejected and null hypothesis was accepted.

6. Conclusions

Researcher analyzes the collected data as per objective set for the research study. After implementing the appropriate statistical tools to analyze the data, it was shown that is on significance difference between the self-efficacy of contact game and non-contact game. Hence research hypothesis is accepted. From the findings it was observed that there is no significant difference in the self-efficacy of contact game players and non-Contact Game players. This finding may be due to their past successful experience and may be due to the exposure of the players to various level of competition which improves their confidence and in turn their self-efficacy. Bandura (1997) suggested that past sports experiences and repeated successes increase and build self-efficacy. Trait sport confidence was a strong robust belief in personal efficacy, while predictor of state sport confidence in super repeated failures. As Bandura suggested that the Experience is very important for the players to have higher self-efficacy an in the present study the subject selected in both the groups had similar level of experience. This could be the reason that there was no significant difference found in the self-efficacy of contact game players and non-contact Game players.

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