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EFFECT OF MENTAL FATIGUE ON SELECTED PERCEPTUAL ABILITY AMONG TAEKWONDO PLAYERS: A SYSTEMATIC REVIEW

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Abstract

The purpose of this review is to present proofs of how mental fatigue can alter a player's perceptual abilities. In the present study 15 research articles are included. Different perceptual-cognitive capabilities, including complex cognitive abilities and fundamental cognitive processes, were discussed on the behalf of previous studies done and reviewed in the current study. By the methodology, instead, examined a crucial element for subsequent research: effect of mental fatigue on selected perceptual ability among taekwondo players. One of the key elements that affects an player's performance level is fatigue. When mental or physical exertion is extended, or both, it can lead to mental exhaustion, which is usually remedied by rest. Research and theoretical publications demonstrate the term's usage to be somewhat ambiguous. The term "fatigue" can refer to a variety of conditions, including a biological state of weariness or decreased energy after mental or physical activity, the emotions of fatigue and lassitude that are experienced in such conditions, or to the drop in performance efficiency that occurs over the course of an extended work session. To fully comprehend the findings of the study, though, a thorough analysis is required. The review also hopes to stimulate potential future study on the subject.

***Index Terms*:** Mental fatigue, Perceptual ability, Taekwondo

1. INTRODUCTION

Taekwondo is a Korean martial art. It combines combat and self-defense techniques with sport. A martial art from Korea is taekwondo. It blends sports and training with combat and self-defense techniques. Several Korean masters combined elements of taekyeon Okinawan karate and other traditions to create taekwondo in the 1940s.

The world taekwondo federation claims that shikhar is the originator and developer of taekwondo and is the one who came up with the name "taekwondo." Taekwondo development, according to the World Taekwondo Federation, was a team effort. Taekwondo has two main branches, albeit they are not exclusive of one another. On April 11, 1955, the name "taekwondo" was officially adopted. It was suggested by either Choi Hong Hi of the Oh Do Kwan or Duk Sung Son of the Chung Do Kwan.

Tradition taekwondo primarily refers to the martial art as it was practised in the South Korean military in the 1950s and 1960s, as well as in a number of other civil organisations, such as schools and universities. Particularly, traditional patterns frequently reference aspects of Korean history, culture, and religious thought in their names and symbolism. International Tae-Kwon-Do Federation may be referred to as traditional tae-kwon-Do. The Korean flag reflects symbolism.

Sport taekwondo has changed from the 1950s, possibly with a somewhat different emphasis now that it is more focused on speed and competition "as in Olympic sparring." Additionally, there are two main forms of sport taekwondo. Most international Tae kwon-Do practitioners adhere to a single style that Choi Hong Hi created in 1955. The sihap gyeorugi sparring technique was developed from kukkiwon, which is where the other style has its roots. The World Taekwondo Federation (WTF), which regulates this sport, has added this form as an event to the summer Olympics. Dr. Kim Un Yong founded the Kukkiwon, the first headquarters of the World Taekwondo Federation, in 1973. The atr emphasises kicks and punches delivered from a mobile stance, despite there being doctrinal and technical distinctions between sparring in the two primary styles and among the many organisations. In addition to a variety of takedowns or sweeps, throws, and joint locks, a system of blocks, kicks, punches, and open-handed blows are typically taught in taekwondo instruction. Jiapsul, or pressure points, are employed alongside self-defense techniques taken from various martial arts such Japanese judo, Korean hapkido, Korean wrestling, or ssireum. Tae and Kwon in Korean both mean "to strike or break with the foot," "to strike or break with the fist," and "to way, method, or path," respectively. Taekwondo, which roughly translates to "the way of the foot and mind," can includeThe overwhelming body of scientific research from several studies has shown that a sportsperson's ability to perform at a high level is influenced by his psychological makeup in addition to somatic and physiological factors, skills, and strategies. Top performance in track and field athletics depends on a variety of psychic skills. The ability to think rationally is crucial to success in international sporting competitions. As a result, "Superb psychological fitness" and personal training are crucial elements that aid in reaching outstanding performance.

Sports, a psycho-social activity that emphasises competition and teamwork, can cause psychological stress and strain, particularly when an athlete must accept an anticipated loss. The athlete has a variety of emotional issues both before and during competitions. Many of the players' psycho-somatic issues are essentially brought on by stress, an accumulation of excessive concern, emotional tension, and their employment.

One of the key elements that affects an athlete's performance level is fatigue. When mental or physical exertion is extended, or both, it can lead to mental exhaustion, which is usually remedied by rest. Research and theoretical publications demonstrate the term's usage to be somewhat ambiguous. The term "fatigue" can refer to a variety of conditions, including a biological state of weariness or decreased energy after mental or physical activity, the emotions of fatigue and lassitude that are experienced in such conditions, or to the drop in performance efficiency that occurs over the course of an extended work session. Because your body and mind are working nearly nonstop, your nerves are constantly under strain and your muscles are frequently constricted. In the end, this causes both physical and mental exhaustion.

2. SIGNIFICANCE OF THE STUDY

The finding of this study will help significantly to understand mental fatigue related factors and management of it for better performance. Further it will also help in following ways-:

1] It may add new knowledge in the field of sport, especially in taekwondo.

2] It may also help the coaches in training those variables of psychomotor, which is affected most by fatigue.

3] The result of the study may be formulated based on developing scientific training.

4] Furthermore, this may lead to better means to reduce mental fatigue. Out of perceptual activities.

3. REVIEW OF LITERATURE

A careful review and explanation of the literature related to the present study is essential to have insight into the research already carried out in the field. To provide the background materials for this study, the scholar tried to go through the related literature, a brief review of which is presented in this chapter.

Wari [1963] conducted a study on the effect of fatigue on balance, kinesthetic positioning and steadiness and used a work bout of 15 squat thrusts in one minute to induce mile fatigue. The differences between pretest and post-test indicated a tendency to improve static balance, but no effect on kinesthetic positioning of the shoulder joint and an increase in hand tremor. Mild fatigue appeared detrimental to performance in which hand steadiness was important.

Divoll [1960] studied the interrelationship of fatigue, hand dexterity, strength, and kinesthetic sensitivity. For these subjects were given three repetitions of the test battery as learning trails prior to fatigue and post fatigue records. Kinesthetic was not significantly related to either strength or dexterity. Three of the seven kinesthetic tests showed significant improvement following fatigue, three others showed significant, non-showed significant less.

Bates and Ostering [1977] studied the effect of fatigue on 12 female subjects who are filmed at two stages of maximal efforts, gross physical performances task [running]. A comparison was then made between selected temporal and kinematics. Parameters describing the activity. The result appears to support the concept that fatigue does not simply produce a uniform reduction in the component of a movement pattern but changes their relationship completed.

Gunner & Hans [1981] studied the variation of hand steadiness with physical stress. For this purpose, the performances of 12 subjects in a hand steadiness expressed in a form of value of hand steadiness was found not to increases linearly with work intensity.

Brar [1984] investigated the psych-physiological performance variation of high and low fitness groups resulting from induced mental and physical fatigue, he concluded that-

1] Physical fatigue improved the reaction time whereas mental fatigue prolonged the reaction time, but fitness level and reaction time will be independent.

2] Mental fatigue decreased the speed of reaction whereas, physical fatigue did not affect it. Fitness and speed of movement will be not related.

3] Mental fatigue and physical impaired the hand steadiness of the subjects.

4] Fitness will be found to be an underlying factor of depth perception. Mental fatigue impaired the depth perception.

Kendrick [1968] assessed the performance in selected gross motor skills before and after fatiguing exercise. He tested each of the five groups of colleges men on one of the following gross skills. BB free throws, BB jumpshot, repeated vertical jumps, total body response, accuracy and 20-yard sprints. Subjects were then given a sub-maximal work bout consisting of bench stepping at 33 steps/min. until the established criteria for fatigue were reached. It was found that general body fatigue impaired performance, which called for strength, endurance and rapidly of response. Accuracy performance using light object, as in BB shooting, was not appreciably affected by general body fatigue. Five minutes of rest was not sufficient to recover from fatigue in tasks involving repeated jumps and repeated short sprints.

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Marshall {1969}7 divided 80 senior high school boys into two group to study the immediate effect of fatigue upon selected measures of kinethesia. the experimental group undertook 10 minutes sit up exercise just prior to performing on a stabliometer. Without a fatigue bout. There wer significant decrement in initial, final and overall performance of the experimental subject, which supported the hypothesis that preliminary unrelated fatiguing exercises would causes a detrimental effect on performance.

Schwartz {1970}8 placed thirty male college subjects in two group to discover if varying degree of muscular fatigue had any effect on depth perception. The experimental group pedaled a bicycle ergometer under condition of increasing work loads until a heard rate of 170 bpm was reached or until unable to pedal was required. The depth perception scores and heart rate were recorded simultaneously at preselected times during the experimental period. All subjects in the experimental period. All subjects in the experimental group were actively exercising during the time these data were collected. The data from the control group were collected following the same procedure except that they did not perform physical work. ANOVA indicated no significant difference between the depth perception and scores during the experimental period and so significant interaction effect. These finding were confirmed by thee paired ‘t’ test that indicated no significant differences between initial and final depth perception, scores of eight groups.

Schwartz [1970] placed 30 male college subjects in two groups to discover if varying degree of general muscular fatigue add any effect of the depth perception. The depth perception score and heart rate were recorded simultaneously at preselected time during the experimental period ANOVA indicated no significant differences between the depth perception score of the experimental period and no interaction effects. These finding were confirmed by the paired ‘t’ test that indicates no significant differences between initial and final depth perception score of either group.

Gullet [1985] conducted a study to know the effect of cycling induced fatigue. The present study focuses on the difficulty encountered when running after, completing an intense bicycle ride during a triathlon ten 40min force platform and cinematographically data were collected before the bike ride and at interval upto 25 min after dismounting the bike. The measurements provide and indication of the effects of cycling on gait, and the degree of normalization that look place over time. Five triathletes were randomly placed in a cool control group that utilized a constant cycling cadence and gear ratio. The experimental group consisted of 5 triathletes that used a constant condence, but down shifted to. A lower gear ratio during the least five minutes of the bike ride. A profile analysis was used to determine trends in data. Additionally, it appeared that downshifting to a lower gear ratio during the last five minutes of the cycling stages, reduced the negative effects of cycling upon many parameters of running mechanics.

Sarhid and Rahman [1987] investigated the effect of local fatigue on motor performance and the implication for physical education instruction. The purpose of this study was to compare the effect of three conditions of local fatigue on the performances of a fine motor task to relate the implications to physical education instructions.

Marshall [1969] divided 80 senior high school boys into two groups to study, the immediate effect of fatigue upon selected measure of kinesthesia. The equipment group undertook a 10minutes sit up exercises. Just prior to performing on a stable meter, while the control group performed on the stabled meter without a fatigue bout. These were significant decrement in initial, final and overall performances of the experimental subjects, which supported the hypothesis that preliminary unrelated fatiguing exercise would cause detrimental effect on performance.

Johnson [1980] examined the effect of various levels of fatigue on the speed and accuracy of visual recognition. Thirty six volunteer subjects participated in an investigation to examine the effect of various levels of fatigue on recognition memory. The subjects, who were required to learn certain items consisted of dot pattern of the garner element variety. These items were presented via techistosopic slide projectors. The items were five types: -

1] Target items of high goodness.
2] Target items of low goodness.
3] Alternate items of high are similar to target items of low goodness.
4] Alternate items of intense high similar to target items goodness.
5] Alternate items of low similarly to both types of target items.

The subject responded to each item by depressing a telegraphy key, which stopped the response time counter. All subjects complete the task while under the influences of fatigue induced by pedaling cycle ergometer. Fatigue levels were 80% of PWC170 for six minutes, and 100% of PWC170 for six minutes.

Philips [1963] examined the influence of fatiguing warm up exercises on speed of movement and reaction latency. He concluded that related warm-up exercise of moderate intensity failed to improve arm speed in a large muscle's criterion movement, while heavy but non- related warm-ups exercise did improve speed by 26 percent. Three groups, each consisting of 25 male colleges students, were measured under both tests and control conditions. Neither of the warmup exercises influenced reduction latency. The correlation between RT and MT scored was non- significant [r = .17] for the heavy exercise [stool stepping], highly reliable individual differences were observed in stepping rate drop off before fatigue [r = .93] and after 37 percent fatigue [r = .98], but the two types of drop off scores were not significant co-related [r = .24]. In the arm action warm up exercise, the correlation between initial rate of movement and rate at 24 percent fatigue was non- significant [r = .08].

Latter [1959] investigated into the effects of fatigue and warmup on speed of arm movements also compared the results of his study with others. Others studies have shown that a three components exponential fatigue curve can be used to compute speed as a function of elapsed time in running. The present investigation showed that this types of curve describes accurately the initial build up in rate of arm shoulder movements and subsequent drop off from fatigue in a four minutes test and retest of twenty colleges men. Warm-up preceding one of the tests is found to have an influence. One test period causes a practice effects of 2.7 percent, chiefly in the first third curve. Test retest reliability was low [r = .51] for the first five seconds of the performances. For each third of the total test it was fairly high ranging from .82 to .87.

Kamen [1981] investigated fractionated reaction time in power trained and endurance trained athletes under conditions of fatiguing isometric exercise. For this purpose he assessed fractionated knee extensor and planter flexor RT components in a group of eight weight lifters and eight long distance runners, following a four day period of baseline stabilization of each muscles group, a 50 percent maximal voluntary contraction [MVC] holding time exercise was administered. Result showed that the runner had longer premotor time [PMT] shan

the weight lifters in thew knee extensors, but had much PMT than the lifters in the planter flexor condition. Compared to previously reported investigations using non-athletes, the date for the present sample of the athletes indicated faster total RT in both the knee extensors and the planter flexors. A resistance of 15 percent MVC applied during the RT task resulted in lengthened of the motor time [MT] component in both groups prior to exercise. However, while knee extensor resisted motor time was lengthened by the exercise task, no such lengthening occurred in planter flexor resisted RT. It was concluded that power trained and endurance trained athletes exhibit differences in response to fractioned RT task, under both baseline and fatiguing exercise conditions.

4. DISCUSSION AND CONCLUSION

The physical performance decline brought on by mental exhaustion appears to be significantly influenced by the length and difficulty of the physical task. A higher perceived exertion is the main cause of the detrimental effects of mental exhaustion on endurance performance.
The current study shows that active male endurance athletes' cognitive and whole-body endurance performance is hampered by mental weariness. Additionally, following mental tiredness, perception of effort and subjective ratings of mental weariness reduced. To maximise endurance performance, coaches should take their athletes' mental tiredness state into account. Prior to competition, they should stay away from any activities that call for prolonged concentration or mental exhaustion. Additionally, to lessen the mental tiredness brought on by the high cognitive demands during competition, sport scientists and coaches should adopt an appropriate plan, such as pre-competition cognitive strategy or caffeine administration. A training paradigm is then required in order to reproduce and extend our findings in fully-powered research with both male and female athletes due to the aforementioned inadequacies.

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