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Comparison of Selected Mental Skills Between Elite and Non-Elite Male and Female Taekwondo Athletes

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Abstract: The purpose of this study was to compare selected mental skills in elite and non-elite taekwondo athletes. 88 male and 54 female taekwondo athletes (elite=60, non-elite=82) answered Ottawa Mental Skills Assessment Tools (version 3). This questionnaire assessed three categories of mental skills: foundation skills, psycho-somatic skills and cognitive skills. The results of 2×2 MANOVA revealed a significant difference between male and female athletes only in activation factor. Also, elite athletes significantly used game planning, goal setting, activation, relaxation, self-confidence and commitment more than non-elite athletes. However, non-elite athletes were better than elite athletes in refocusing and stress reaction. According to the results of this study, it is recommended that taekwondo coaches improved game planning, goal setting, activation, self-confidence and commitment factors in non-elite taekwondo athletes. Elite taekwondo athletes also should develop their refocusing and stress reaction to maintain their skill level.

Key words: OMSAT-3 % Mental Skills % Elite Taekwondo Athlete % Non-Elite Taekwondo Athlete

INTRODUCTION

The domain of sport competition is developing every day so the athletes nearly have the same physical abilities and have different mental skills. Therefore, it is not possible to ignore the role of mental skills to achieve maximum performance [1]. This subject indicates the necessity of engaging in psychological aspects of sport. As it was observed in recent Olympic Games, some athletes who were considered to win medals failed in the competitions and stated the lack of mental preparedness as one of the important reasons for their failure. Studies conducted in the field of sport psychology have made it evident that mental skills play an important role in achieving excellence in sport [2-6]. Cox and Yoo (1995) indicated that success in professional sport not only depends on the physique of players and technical aspects but also on psychological skill [7].

Also, Le Roux and Pienaar (2001) illustrated that sport psychology plays an important role in competitive sports [8]. The importance of sport psychology is more emphasized when it can be stated that by studying an athlete's behavior within a sporting environment, we can explain, predict and change behavior [9]. Moreover, some researchers revealed that mental training is the most effective way to improve sport performance [10-12]. However, Weinberg and Williams (2007) supposed that it is required to study the affective variables such as gender, skill level and age groups more [13]. Therefore, recognition and development of mental skills consequently makes competitors, coaches, officials and researchers interested in sport psychology.

Mahoney and Gabriel (1987) noticed that skills such as stress management, concentration, arousal, mental preparation and self-confidence are important components of mental skills which make the psychology profile of elite athletes [4]. O'sullivan, Zuckerman *et al*. showed (1998) that positive self-confidence is a privilege in sports and on the other hand excessive sensitivity to criticism can lessen a player's performance during the match [14]. The relationship between stress, anxiety, self-confidence and performing motor skills has been mentioned in many researches [15, 16]. Some theories and experiences have strongly supported this positive relationship [17, 18].

Sport psychologists have proposed the following classification for mental skills:

Foundation Skills: Consists of goal setting, self-confidence and commitment [19, 20].

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Psycho-Somatic Skills: Consists of stress reaction, fear control, relaxation and activation which have a relationship with physiological traits [21].

Cognitive Skills: Consist of imagery, mental training, focusing, refocusing and competition planning. These skills are related with cognitive processes such as learning, perception, memory and thinking [22, 23].

Goal setting is one of the most important factors in performance enhancement which is being mentioned by many researchers [2, 24].

Commitment is one of the requirements for achieving perfection to the extent that it becomes the main focus of one's life to achieve the goal [25]. According to Harris and Harris (1984), the athlete's level of commitment increases with sacrifice, when his time and effort is honored and he is supported and also when this commitment is made public [2]. Athletes need high commitment in order to achieve excellent performance [26, 27].

Self-confidence is another necessary element to achieve enhanced performance [26, 28, 29]. It is also observed that athletes benefit from goal setting to increase self-confidence.

Martens (1977) defined stress as a process that involves the perception of substantial imbalance between environmental demands and response capability [17]. Durand-Bush (1995) and Rotella and Lerner (1993) revealed that stressor situation is very useful for most successful athletes, because they have a positive approach to anxiety and worry [30, 31].

Corbin (1972) defined mental practice as the repetition of a task, without observable movement, for the specific intention of learning [32]. Suinn (1983) related mental practices to different methods such as thinking about an action without imagining or feeling it, talking to oneself and reviewing the steps of an action and imagining oneself or another individual executing an action while visualizing the way of performing that action. In his definition, Suinn specified that mental practice does not mean imagery [33].

Relaxation is a technique which is often applied by people to decrease arousal. Relaxation and activation help reach or control the level of arousal and decrease fluctuation in performance [34].

Athletes usually face a lack of arousal before or during a competition. In this case, energizing techniques would be effective to increase their level of arousal and to have successful performance. Coaches and athletes have used many energizing techniques [35], although there is not enough research on their efficacy [13].

Most of the mental skills such as goal setting, relaxation, energizing, imagery and mental practice require excellent attention, control and concentration. Researchers have suggested that the ability to consistently focus on a relevant task and environmental stimuli, which is often referred to as concentration in the popular literature, is a vital aspect of athletic performance [25, 36].

Researchers have suggested that planning is an important step in the achievement of peak performance [37]. According to Willams and Krane (1998), pre-competition routines or plans not only helps athletes to establish a consistent method of performance, but also helps them control their arousal level [37]. Developing pre-competition and competition plans is a long process that requires constant evaluation and refinement [38].

Conducting a study, Orlick and Partington (1988) assessed mental readiness of 235 Canadian Olympic athletes through questionnaires and individual interviews. They found that among physical, technical and mental preparation, mental preparation was the only variable that significantly differentiated the Olympic athletes [5].

Stevenson (1999), in a study on male and female elite and non-elite athletes concluded that mental skills of Ottawa test did not have significant difference between males and females; on the other hand, he acclaimed a significant difference in developing provincial levels in mental skill of goal setting, commitment, planning, focusing and refocusing [23].

Durand-Bush *et al*., (2001) applied this questionnaire to compare elite and non-elite Canadian athletes. The results indicated that elite athletes are significantly better than non-elite athletes in stress reaction, focus, refocus, self-confidence and commitment [30].

However, Salmela *et al*., (2009) found different results in their research on delegations of Asian games in Doha. In this study, it was recognized that delegations of Asian games, compared to the individuals who were not selected, were more qualified to deal with stress and refocus [39].

Cr Cuin *et al*., (2009) validated the Romanian version of OMSAT-3. They compared the achieved results between elite and non-elite athletes and finally concluded that elite athletes are better than non-elite athletes in commitment, refocus, self-confidence, stress reaction and activation skills [40].

Kruger (2010) used OMSAT-3 questionnaire and Psychological Skill Inventory (PSI) to compare successful and unsuccessful players of college hockey and found that the successful group achieved better results in %67 of research variables which included four factors of

18 factors (i.e. achievement motivation, goal direction, goal setting and fear control). Moreover, there was a significant difference between athletes in six factors: achievement motivation, stress reactions, fear control, self-confidence, mental practice as well as imagery [24].

Taekwondo has entered Olympics as one of the two Asian games since Sydney Olympic Games. The taekwondo athletes fight in eight classes and a team can receive eight medals in these tournaments and this shows the importance of this field to collect medals. Today, 190 countries have the membership of World Taekwondo Federation. Also, there are limited studies on competing level and especially gender of players in different fields. Because of the lack of information about the effect of some factors such as gender and competing level on mental skills of athletes and thanks to the importance of taekwondo, the purpose of this study was to investigate some mental skills in selected elite and non-elite male and female taekwondo athletes.

MATERIALS AND METHODS

The current study was a descriptive, causal-comparative research. Statistical population of the study consisted of Iranian elite and non-elite taekwondo athletes. The statistical sample comprised of 142 taekwondo athletes (88 men and 54 women) who were selected randomly and voluntarily filled up Ottawa Mental Skills Assessment Tool (OMSAT-3).

Instrumentation: Personal information including sex, age and skill level was collected through a questioner. Also, OMSAT-3 was used to evaluate the extent of selected mental skill application. The questioner examined 12 mental skills in three categories: 1) Foundation skills including goal setting, commitment and self-confidence, 2) Psycho-somatic skills including fear control, relaxation, activation and stress reaction, 3) cognitive skills including focus, refocus, mental practice, imagery and game planning [41]. The questioner reliability and validity was measured in Iran and approved by researchers.

Statistical Method: In the present study, one-way ANOVA test was conducted first to specify elite and non-elite taekwondo players. Results from Tukey follow-up test demonstrated a small difference between national and international taekwondo athletes, so they were considered as elite athletes and those at club and province levels as non-elite ones. MANOVA 2×2 was used to compare the mean of the two groups in main effects and interactions of gender (male and female) and skill (elite and non-elite) on al1 OMSAT-3 scales. Also descriptive statistics (mean and standard deviation) was employed for describing the groups. Statistical analysis was conducted by SPSS 17 version (" =0.05).

RESULTS

Descriptive data can be observed in Table 1 for each sex and level. There were no significant difference between male and female (df=144, p=0.516 > 0.05) and elite and non- elite (df=144, p=0.595 > 0.05) athletes in age factor.

Descriptive data including mean and standard deviation of each mental skill in different groups can be observed in Table 2. Fig. 1 shows that the highest score is related to self-confidence existing in elite male athletes group (24.97 ± 2.13) and the lowest score is related to stress reaction existing in elite females (13.47 ± 4.15).

Comparing means of males and females demonstrated a significant difference only in activation skill. When comparing elite and non-elite taekwondo athletes, it was observed that the two groups were significantly different in the following skills: game planning, goal setting, refocusing, stress reaction, relaxation, activation, commitment and self-confidence (Table 3). Also, the results showed that the interactive effects of sex and skill levels were not significant.

Table 1: Descriptive results of taekwondo athletes

	Age		Elite		Non-elite	
Variables	M	SD	National	International	Club	Provincial
Male	21.60	4.40	21	22	21	24
Female	21.71	4.77	14	3	20	16

Table 2: Mean and standard deviation of mental skills in different groups

	Male				Female			
	Elite		Non-elite		Elite		Non-elite	
Variables	M	SD	M	SD	M	SD	M	SD
Fear control	13.94	3.58	14.34	3.67	13.64	3.18	14.33	4.07
Game planning	22.39	4.22	20.13	4.48	22.76	3.73	19.44	4.66
Goal setting	23.97	3.14	21.40	4.27	24.70	2.80	21.94	3.99
Stress Reaction	14.04	3.63	15.59	3.61	13.47	4.15	16.30	3.16
Refocus	13.95	4.18	15.50	4.61	13.58	5.37	15.41	4.99
Focus	14.32	3.95	15.20	3.18	14.76	2.72	15.55	3.54
Mental Practice	22.53	4.03	20.31	4.33	22.29	2.73	19.44	4.16
Imagery	18.18	2.50	17.36	3.81	18.41	2.15	17.19	3.91
Activation	21.69	3.50	20.31	3.86	20.35	3.27	18.77	4.23
Relaxation	21.27	2.77	18.40	5.01	19.64	3.96	17.47	4.48
Self-confidence	24.97	2.13	22.56	3.94	24.82	2.87	21.77	4.31
Commitment	23.67	4.51	21.25	5.00	24.05	3.86	22.27	4.74

Table 3: Results of 2×2 MANOVA

	Sex		Skill Level		Sex×Skill Level	
Variables	Sig	F	Sig	F	Sig	F
Fear control	0.661	0.194	0.144	2.159	0.653	0.204
Game planning	0.840	0.041	0.001*	12.293	0.506	0.445
Goal setting	0.353	0.870	0.000*	15.545	0.887	0.020
Stress reaction	0.915	0.011	0.001*	11.291	0.324	0.981
Re-focus	0.793	0.069	0.050*	3.910	0.869	0.027
Focus	0.535	0.388	0.191	1.731	0.945	0.005
Mental practice	0.450	0.575	0.001	11.878	0.667	0.185
Imagery	0.963	0.002	0.094	2.844	0.745	0.107
Activation	0.039*	4.364	0.034*	4.576	0.888	0.020
Relaxation	0.093	2.868	0.001*	11.061	0.647	0.210
Self-confidence	0.457	0.555	0.000*	18.557	0.616	0.253
Commitment	0.407	0.691	0.015*	6.129	0.705	0.143

*" =0.05

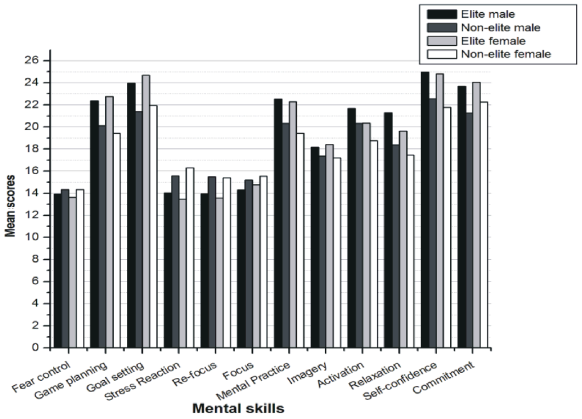

Fig. 1: Mean scores of selected mental skills between different groups

DISCUSSION

This study aimed to explore the effect of sex and competing level on selected mental skills in Iranian elite and non-elite male and female taekwondo athletes. The results of the study were predictable, except in two cases. Few studies are conducted on mental skills by OMSAT-3; therefore, the results of this study can be new and novel. As demonstrated by previous researches, elite athletes use mental skills more than non-elite athletes [41, 23, 30, 40, 24]. Below, we will discuss each variable.

Gender: Stevenson (1999) revealed no significant difference in selected mental skills between men and women [23] while the results of the current study demonstrated a significant difference between men and women in activation skill in a way that men used this mental skill more than women did. Activation is a process in which the individual increases his/her physiology and mental status in situations where higher energy, motivation and concentration are required [24]. One of the possible reasons of men's superiority over women in using this skill could be the fact that martial sport are more compatible with masculine specifications and totally men are more capable of activation or energizing and this is rooted in sexuality characteristics.

Skill Level: Significant differences were observed between elite and non-elite taekwondo athletes:

Game Planning: The results showed a significant difference between elite and non-elite taekwondo athletes in using game planning skill in a way that the elite taekwondo athletes used this ability more than non-elite taekwondo athletes. The results of this study are in line with Stevenson (1999), Orlick and Partington (1988) and Gould *et al*., (1992) [5, 23, 42]. The past studies showed that the elite athletes usually prepared clear and distinct designs for the matches. These players used planning in order to reach mental preparedness, decrease consternation and deal with unpredicted situations [19, 23].

Goal Setting: In goal setting, the elite taekwondo athletes were significantly better than non-elite taekwondo athletes. These results are conforming to the results of Stevenson (1999) and Cr Cuin *et al*., (2009) [23, 40]. The aims resulted in highest performance level are those which are specific and challenging [43]. Also, the effects of difficult objectives are more useful than simple objectives [44]. Mallett and Hanrahan (2004) believe that the elite athletes are motivated by personal objectives and success. The elite athletes believe in themselves a lot and this is the orientation of their life [44].

Stress Reaction: Comparing the elite and non-elite taekwondo athletes showed that the non-elite taekwondo athletes acted better than the elite ones in stress reaction. These results are in contrast with the previous studies [23, 24, 30]. Negative reaction to stress could be harmful to performance, while positive reactions could improve the performance. The factors that can create stress in players include selection for the team, confinement of financial supporters, attendance of high-ranking authorities in the matches, circumstantiality of the media and expectations from the individual to be the champion, experiences of previous injuries or fear of the previous defeats [13].

Refocus: Elite taekwondo athletes gained lower scores than non-elite taekwondo players. These results are in conformity with the results of previous studies [5, 23, 30, 40]. According to Orlick and Partington (1988) in spite of being an important skill, retrieval of concentration is exercised rarely by the player [5]. The elite taekwondo athletes are more exposed to stimuli such as orders of coach, shout and cheer of the fans, reporters and cameras and so on which all disturb their concentration.

Activation: The elite taekwondo athletes use activation significantly more than the non-elite taekwondo athletes. These results are in conformity with the results of Murphy *et al*., (1988) and Cr Ciun *et al*., (2009) [40, 45]. One of the possible reasons could be the role of the coach in regularizing mental preparedness programs and conducting the players to gain mental energy level.

Self-Confidence: The results revealed that elite taekwondo athletes were significantly better than the non-elite ones in self-confidence factor. These results are in conformity with the results of Bush and Salmela (2001), Cr Ciun *et al*., (2009) and Kruger (2010). Orlick (1992) stated that self-confidence and commitment are the most important variables of an elite athlete's performance [24, 30, 40]. Bota (1993) found that self-confidence, commitment and goal setting are the most essential measures for distinction between elite athletes and non-elite ones [20].

Commitment: One of the other skills in which the elite taekwondo athletes are better than the non-elites is commitment. These results are conforming with the results of Bush *et al*., (2001), Stevenson (1999) and Cr Ciun *et al*., (2009) [23, 30, 40]. These results demonstrated that the elite athletes are committed to their field of exercise in a way that this fact influences other wishes in their personal life [4, 26]. Ericsson *et al*., (1993) emphasized that expert performers regularize their life according to their exercise which explains their commitment [36].

Relaxation: According to the results of this study, the elite taekwondo athletes also use relaxation more than non-elite taekwondo athletes. While the elite taekwondo players could focus and plan efficiently, relaxation is a factor that has an important role in this matter [30].

CONCLUSION

According to the results of this study, it could be mentioned that gender variable is different in activation skill between males and females in a way that males use this skill more than females. So gender factor should be considered when presenting mental skills to the taekwondo athletes and different programs should be provided for them according to their gender. Also, the observed differences showed that skill level variable is more effective than gender. These results demonstrated that although the elite taekwondo athletes gained lower scores in refocus and stress reaction, other mental skills compensate for this shortage. It is also recommended to the coaches in this field to use game planning, goal setting, activation, self-confidence, commitment and relaxation for non-elite taekwondo players, nurture these skills in these players and try to make them proceed towards upper levels. It is recommended to the coaches and elite taekwondo athletes to improve skills of refocus and stress reaction in order to reach better performance and keep their competing level.

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