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## Discriminating Mental Skills among Adolescent Elite and Competitive Soccer and Volleyball Players

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### ABSTRACT

**Background.** Mental skills are defined as a set of trainable mental abilities and methods that are held to underpin successful learning and performance. **Objectives.** The aim of the present research was to study and compare the mental skills of adolescent elite and competitive volleyball and soccer players. **Methods.** The sample consisted of 100 players (54 elite soccer, 13 elite volleyball, 18 competitive soccer and 15 competitive volleyball) selected via a purposive sampling method. Data were collected using the Ottawa Mental Skills Assessment Tool-2 (OMSAT-2). **Results.** Elite and competitive volleyball players had higher scores for stress reactions than elite soccer players. In addition, elite soccer players had more self-confidence than competitive soccer and volleyball players. Also, competitive volleyball players had higher levels of fear than elite soccer players. There were no other significant differences in mental skills between soccer and volleyball players. **Conclusion.** It seems that adolescent volleyball players stand in more immediate need of learning strategies for coping with stress, fear and self-confidence management than soccer players. Results are discussed in terms of an athlete's levels, the nature and characteristics of the sport and choking during performance.

**KEY WORDS:** Soccer, Volleyball, Psychology, Self-Confidence, Fear, Coping with Stress.

### INTRODUCTION

In order to achieve peak performance athletes need a package including physical, psychological, technical and tactical skills (1). As we know, regular physical practice has always been a very important component in athletes' lives. Training in psychological skills, on the other hand, has not always been considered an inherently important element by either athletes or coaches. However, research in sport psychology, which has grown

continually over recent decades, has consistently supported the conclusion that psychological factors do play an important role in athletic performance. Interest in applied sport psychology and mental training began to strengthen in the late 1970's (2, 3).

Although athletes, coaches and sport scientists may sometimes fail to recognize the important role of psychological skills in athletic

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performance, studies point strongly to just such a relationship (4). In recent years, a new approach has emerged with an emphasis on identifying mental skills related to particular sports (5). Sports psychologists have proposed three relevant categories of mental skills. The first covers basic skills including goal setting, confidence and commitment. The second category involves psychosomatic skills such as response to stress, fear, relaxation and refreshment, skills that are associated with an athlete's physiological characteristics. The third category encompasses cognitive skills including visualization, mental rehearsal, focusing, refocusing and competition planning; all these involve interaction with cognitive processes, such as learning, perception, memory and thinking (5, 6).

Among the mental skills common to high performing athletes are goal setting, imagery, self-confidence and the ability to focus on performance (7-10). Martens (1987), and Weinberg and Gould (1995) have indicated that the basic psychological skills that athletes need to practice and develop are mental imaging, control of mental power, stress control, attention, concentration and goal setting. Some studies have concluded that more experienced athletes identify themselves as more confident, make more use of goal setting processes and are more concentrated in their purpose (11, 12). Some time ago Mahoney and Avenier (1977) had already argued that more successful athletes make more use of psychological skills than less successful athletes (13).

In 1987, Mahoney, Gabriel and Perkins identified skills that differentiated elite athletes from their less exceptional peers. Their study showed that, compared to non-elite athletes, elite athletes reported that they experienced fewer problems with anxiety, were more successful at deploying their concentration, were more self-confident, relied more on internally referenced and kinesthetic mental preparations, were more focused on their own performance than that of their team, and were more highly motivated to do well in their sport (14).

In this regard some research has revealed age differences in the use made of psychological skills. Bebetos and Antoniou (2003) reported that older athletes (25 years and older) tended to cope better with adversity than younger athletes

(13-18 years), while no differences were detected between the intermediate age group (19-24 years) and the two other groups. Their results are supported by Géczi, Tóth, Sipos, Fügedi, Dancs, and Bognár (2009), and by Munroe-Chandler, Hall, Fishburne, Murphy, and Hall (2012) (15, 16). The results of a study by Bois, Sarrazin, Southon, and Boiché (2009)(17) showed that, given the specific nature of some sports, e.g., golf, the use of psychological skills such as controlling emotions, concentration, imagery, and self-talk is an integral part of training programs for athletes. So, it seems that the nature of the sport may determine which psychological skills are most relevant. Although the nature and mission of most sports is similar, from psychological, cognitive, and perceptual perspectives they have different requirements.

Soccer is undoubtedly one of the most popular sports in the world, engaging people worldwide, whether as players, spectators or TV viewers (18). A survey by the *Fédération Internationale de Football Association* (FIFA) in 2006 reported that 265 million people regularly play soccer, giving soccer one of the highest participation rates for sports in the world. In addition, large soccer events have in recent years attracted more TV viewers than most other sporting events (19). This global access to soccer requires and invites optimal performance on the part of all of its practitioners, particularly the players. In order to boost soccer players' performance, researchers in the different sports sciences, including sport psychology, have actively studied its practitioners (20, 21). Over the last five decades, the role of applied psychology in soccer has experienced some growth in Western countries. In other countries, awareness of the important role of mental attributes has grown at a slower pace (22).

Most research projects conducted in eastern countries have traditionally been limited to theoretical psychological concepts or have been conducted in the field by physical educators or interested graduate students. When examining such sports-related psychological research, we observed that the majority of the topics published have been restricted to "personality" (23), "anxiety" (22), "causal attribution" (24), the "cause of success" (23), "motivation"(23), or competitive behavior (23, 24).

On the basis of the number of spectators at sports event, we can say that football is the most popular sport in Iran. On the other hand, the other sport that is growing in popularity among Iranian adolescents is volleyball. Due to its high sensitivity to winning points and the touch-and-go nature of volleyball, an athlete's mental skills are expected to be of paramount importance in winning or losing the game. Mohammadzadeh and Sami (2014) showed that elite volleyball players with better concentration, higher self-confidence, and more mental efficiency are less affected by emotions, which leads to more successful performance (25).

Considering the great importance of these subjects, and drawing on the literature reviewed here, the following hypothesis was tested in the present study. We anticipated that the nature of the sport and the level at which it is performed would affect the type of psychological skills displayed by players. If this is the case, the question that needs to be asked is what exactly these skills are.

## MATERIALS AND METHODS

**Participants.** A total of 100 talented young male athletes, 54 elite soccer players (mean age 14.4), 13 elite volleyball players (mean age 15.3), 18 competitive soccer players (mean age 15.2) and 15 competitive volleyball players (mean age 14.7), were selected (overall mean age 14.9 years,  $sd = 0.9$ ). Elite players were member of Iranian national teams between 2011 and 2015, who had participated in international competitions; competitive players were members of selective teams in East Azerbaijan province (Iran) who had no international experience.

**Procedure.** All athletes gave their informed consent prior to participation and individually completed the questionnaires in a group setting. To minimize unwanted pressure on the respondents in giving answers, athletes were told that the results would be used solely for research purposes.

**Instrument.** The Ottawa Mental Skills Assessment Tool-2 (OMSAT-2) was employed to assess the mental skill level of teenage athletes in resting mode. The 71 items of this instrument measure 12 mental skills: goal setting, self-confidence, commitment, stress reactions, fear, activation, relaxation,

imagery, mental practice, focusing, refocusing and competition planning. Items are rated on 6-point Likert scales running from "strongly disagree" to "strongly agree" (26). This inventory has acceptable psychometric properties, with internal consistency values ranging from  $\alpha=.78$  to  $\alpha=.87$ ; the internal consistency of total inventory was  $\alpha=.83$ , and test-retest reliability based on Pearson's correlation coefficients varied from  $r=.67$  to  $r=.90$ , with an average of  $.78$  (27). The Farsi version was validated in terms of construct validity and reliability (28).

**Data analysis.** Shapiro-Wilk's test was used to check the normalization of the scores distribution. Descriptive statistics (Means and SDs) were determined for the data. Pearson and Spearman correlation coefficients were computed and multivariate analysis of variance (MANOVA) and Kruskal-Wallis tests were run to investigate differences between the four groups. All the analyses were performed using IBM SPSS Statistics V23.0 (IBM Corporation, Armonk NY, USA).

## RESULTS

The purpose of this study was to investigate the psychological skills of elite and competitive soccer and volleyball players. The means and SDs of the variables assessed are shown in table 1 separately for each of the groups. Equal variances and normal distributions were confirmed for stress reactions, focusing and refocusing. Additionally, there were significant relationships among these variables (ranging from .205 to .501,  $p \leq .05$ ). Thus, we used Multivariate Analysis of Variance (MANOVA) to compare groups (as fixed factors) with respect to these dependent variables (Table 1).

Results of the MANOVA showed that there was a significant effect of level and type of sport on psychological skills (Wilk's lambda = 0.66,  $F = 4.72$ ,  $P < .001$  and Partial Eta squared = .129) (Table 2).

As Table 2 indicates there were significant differences between the four groups in terms of stress reactions. However, there were no significant differences between groups with respect to the other two variables (focusing and refocusing) (Table 3).

The results show that, compared to elite soccer players, the elite and competitive volleyball

players exhibited higher values for stress reactions. (Table 3).

**Table 1.** Mean and SD of psychological skills among players.

Variables	Soccer		Volleyball	
	Elite (M ± SD)	Competitive (M ± SD)	Elite (M ± SD)	Competitive (M ± SD)
Goal setting	4.05 ± .59	3.69 ± .45	4.03 ± .66	3.90 ± .55
Self-confidence	4.44 ± .61	3.87 ± .69	4.31 ± .46	3.79 ± .45
Commitment	4.37 ± .55	4.25 ± .32	4.26 ± .50	4.26 ± .47
Stress reactions	1.88 ± .55	2.13 ± .69	2.58 ± .64	2.54 ± .41
Fear	1.60 ± .80	2.06 ± .89	2.53 ± 1.59	2.60 ± .85
Relaxation	3.92 ± .88	3.35 ± 1.16	3.71 ± 1.23	3.75 ± 1.21
Activation	3.82 ± .77	3.48 ± .95	3.83 ± .85	3.81 ± .81
Imagery	3.86 ± .83	3.94 ± .67	4.04 ± .76	3.93 ± .76
Mental practice	3.76 ± .77	3.90 ± 1.49	4.04 ± .73	3.96 ± .72
Focusing	2.09 ± .76	2.27 ± .77	2.18 ± 1.03	2.12 ± .97
Refocusing	2.74 ± .87	2.81 ± .92	2.25 ± .88	2.23 ± .85
Competition planning	3.84 ± .93	3.55 ± .77	3.83 ± 1.16	3.92 ± 1.10

**Table 2.** Tests of Between group Effects.

Dependent Variable	Type III Sum of Squares	df	Mean Square	F	P	Partial Eta Squared
Stress reactions	8.593	3	2.864	8.562	.0001*	.211
Focusing	.488	3	.163	.231	.874	.007
Refocusing	5.587	3	1.862	2.377	.075	.069

\*:  $p < .01$

**Table 3.** Pairwise comparisons among groups in stress reactions.

(I) group	(J) group	Mean Difference (I-J)	Std. Error	P	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
ES	EV	-.704	.179	.001*	-1.186	-.223
	CS	-.250	.157	.692	-.674	.174
	CV	-.663	.169	.001*	-1.118	-.208
EV	CS	.454	.211	.201	-.113	1.021
	CV	.041	.219	.999	-.549	.632
CS	CV	-.413	.202	.264	-.957	.132

**ES:** Elite Soccer players, **EV:** Elite Volleyball players, **CS:** Competitive Soccer players, **CV:** Competitive Volleyball players. \*:  $p < .05$

The Kruskal-Wallis test was used for comparison of the variables that did not meet criteria of normality or equality of variances. There were significant differences among groups with respect to self-confidence ( $p < .001$ ) and fear ( $p = .018$ ). Pairwise comparisons by Bonferroni test revealed elite soccer players had more self-confidence than competitive soccer ( $p < .001$ ) and volleyball players ( $p < .001$ ). Also, competitive volleyball players scored higher for fear than elite soccer players ( $p = .002$ ). However, with respect to

the other sub-scales of the OMSAT, there were no significant group differences: goal setting ( $p = .064$ ); commitment ( $p = .296$ ); relaxation ( $p = .347$ ); activation ( $p = .646$ ); imagery ( $p = .945$ ); mental practice ( $p = .616$ ); competition planning ( $p = .317$ ).

## DISCUSSION

This study aimed to investigate psychological skills in elite and competitive soccer and volleyball players. The clearest findings to emerge from this study were significant

differences in the self-confidence, fear and stress reactions between elite and competitive volleyball and soccer players. We found that elite soccer players possessed a greater self-confidence than competitive soccer or volleyball players and expressed more fear and stress than competitive volleyball players but less stress than elite volleyball players. However, there were no significant difference between the groups for the other mental skills assessed. The present results are therefore consistent with previous findings in showing that athletes competing at the highest levels possess more refined mental skills than do less elite athletes (4, 25, 27). These results are consistent with theory; as express low beliefs associated with negative psychological momentum (such as feelings of fear and stress) which can in turn lead to choking, a condition that reduces the typical level of an athlete's performance (29).

It seems that, by its nature, volleyball has some key time-dependent features that need to be considered here. As mentioned earlier, a volleyball match between two competitive teams can produce significant mental stress for the players. In such situations, successful teams often rely on learned psychological concepts and strategies to optimize their collective psychophysical will to succeed.

As indicated above, reaching the final point of each set in a game of volleyball, as well as the final score of a game, is more critical and more demanding than soccer. In soccer, there is no limit on the number of mistakes a player may make, and these mistakes do not necessarily result in losing the match. In contrast, volleyball needs continuous fast reactions and quick decisions. Any mistake in receiving the ball, passing, or attacking could lead to losing a critical score, or granting an opportunity to the opposing team to win points, especially as it is much harder in volleyball, due to its serve-and-opposing-team-attack sequence, to compensate for mistakes and missed scoring opportunities once the team falls behind.

Thus, it seems that volleyball players are under pressure and forced to learn how they can minimize these mistakes in competition. It is by recognizing the real nature of professional volleyball that we can begin to explain why levels of stress and fear are higher among volleyball players than soccer players.

Performance tempo can often accelerate with anxiety but may also become excessively deliberate and slow. Changes in orientation towards other persons (or teammates) may become noticeable. A naturally aggressive, confident athlete may suddenly become passive and insecure, looking around for help from the coach or their teammates. The athlete may experience a shift away from task-oriented thinking (focusing on the immediate task at hand, visualizing a successful outcome) to task-irrelevant thinking (losing concentration, questioning strategy, thinking too far ahead). Clearly such extraneous thoughts will not help athletes find a solution to the problem confronting them, and often prove fatal to focused, task-specific thinking. As a result, performance can suffer and, in turn, stress may lead to a loss in confidence and further reducing the athlete's capabilities. A stressful experience often triggers negative emotions such as anger, fear, helplessness, frustration, and depression. The outward behavior of the individual may appear unusual or disjointed and, cognitively, the individual may have difficulty concentrating or focusing (30).

Although in this research there was no significant difference between volleyball and soccer players in terms of stress reactions, it was clear (based on mean scores) that volleyball players have high stress reactions than soccer players. This is consistent with other research (31). Also, none of our athletes had received any formal education in mental skills, so their responses reflected their natural mental abilities while engaging in professional sports.

Despite the new findings, several limitations warn against an overgeneralization of the results. First, the study design was cross-sectional which, strictly speaking, precludes conclusions about the causes of the differences observed. Second, even though our sample included elite national players, their small numbers could affect data analysis and results and, by extension, the conclusions that could be drawn. Furthermore, the sample consisted only of males aged 14-16 yrs. Old.

## CONCLUSION

Based on the present findings, we believe that elite soccer players may be at an advantage in terms of stress reactions, fear and self-confidence.

Results from the questionnaire (OMSAT) indicated that both elite and competitive volleyball players have much more stressful reactions to being evaluated by others, and are more likely to experience performance problems because of their anxiety levels, muscle tightness in competition, lower levels of performance in competition than in practice, and are worried and nervous because of the large crowds, the presence of parents and the behavior of competitors. As regards self-confidence, elite soccer players had a clear advantage over volleyball players and nonelite soccer players. Finally, fear was high among competitive volleyball players. Sources of fear may include perception of dangerous things in volleyball, the identity of volleyball, inability to gain control in volleyball, fear of failure and unknown fears.

### APPLICABLE REMARKS

- It is suggested that sport psychologists consider the mental needs of adolescent volleyball players, especially in terms of fear, stress reactions and their self-confidence. Options include use cognitive restructuring, visualization and guided relaxation.
- Additionally, goal setting, positive self-talk and personal affirmation may be used to build and manage self-confidence and player self-confidence.

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