



The Effects of a Psychological Skills Training Program on Mental Toughness of Skillful Female Volleyball Players

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ABSTRACT: The present study aims to investigate the effects of a Psychological Skills Training (PST) program on mental toughness of skillful female volleyball players. The statistical population used in the study consists of two league 1 female teams in Tehran province, Iran with total members of 22 individuals. From them, 11 individuals were selected randomly for each control group and experimental group. The data related to mental toughness were collected using Sport Mental Toughness Questionnaire of Sheard and Golby (2009). The subjects of the experimental group performed psychological practices for 8 weeks, 2 sessions a week or total of 15 sessions such that each session included 30 minutes of the program. No program for psychological skills was delivered to control group. After the 15th session, an after-test was taken through SMTQ from experimental group based on the pre-test. Statistical methods in two descriptive and inferential levels and Kolmogorov-Smirnov statistical tests and T-test were used for analyzing data. The obtained results indicated that volleyball players who participated in Psychological Skills Training program have earned meaningfully higher scores in all subscales compared to the control group. Finally, it can be concluded that a course on Psychological Skills training has a meaningful effect on mental toughness of female volleyball players.

KEYWORDS: Psychological Skills Training (PST), mental toughness, female skillful volleyball players

I. INTRODUCTION

Most athletes, coaches and even sport fans have experienced matches where the lack of psychological preparedness impeded the success of the athlete or the team, despite their physical and technical preparedness. Lack of motivation and concentration, low self-confidence, stress and anxiety may prevent the athlete from getting the desirable performance. Often, what prevents an athlete from getting success or what causes another athlete to get the peak of success has nothing to do with outside factors, rather it should be sought in the inner and mental world of athletes. Accordingly, performance and technical levels as well as success in many areas are obtainable for the athlete through Psychological Skills Training (Vaez Mousavi and Mosayyebi, 1386 Shamsi).

Recently, the concept of mental toughness has attracted the attention of many sport psychologists and they know how psychological factors perpetuate the success of an athlete in sport (Gucciardi and et al., 2008). Jones et al. has defined mental toughness as "having heritable and developed (acquirable) psychological abilities which cause the athlete to 1) generally confronts his/her opponents more effectively than them, even though he/she must meet some performance requirements, regardless of the performance of his/her opponents 2) especially enjoys better constancy and stability and is more determined, concentrated and self-confident to handle high stress situations compared to his/her opponents." People with mental toughness tend to be interested in social activities, since they are able to maintain their calmness and take risks, they are active in many situations and have less anxiety compared. They are not affected by the situation and the competition in which they are involved (Clough et al., 2002). Loehr (1985) conducted one of the earliest studies on mental toughness. The researcher emphasized that as coaches and athletes believe, at least 50 percent of success is due to psychological factors resulting from mental toughness. Sport psychologists have always stated mental toughness as one of the most important characteristics of coaches, athletes and professional sport (Nichols, 2008).

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Psychological Skills Training (PST) such as concentration, setting the excitement levels, increasing self-confidence and maintaining the motivation requires regular practicing of skills (Weinberg and Gould, 2010). According to the definition proposed by Weinberg and Gould (2007), Psychological Skills Training (PST) involves regular, continuous and stable practicing of psychological and mental skills to increase performance, increase pleasure or attain higher level of satisfaction or happiness. The methods and techniques which are considered as standard components of PST are mainly obtained from main psychological resources (Weinberg and Gould, 2010). Well-planned PST programs provide an opportunity for personal development of youth athletes in competitive sport and extend mental skills which are used by athletes, thereby facilitate their growth in other walks of their lives (Sheard and Golby, 2006).

A number of researchers have reviewed the studies that have been conducted to examine mental toughness through qualitative methods (Crust and Azadi, 2010). For example, Golby and Sheard (2009) applied psychological interventions as a means to evaluate mental toughness. Clough et al. (2002) has used the psychological theory as the basis of their work and has defined mental toughness as a trait quality (Crust and Azadi, 2010).

Boule and et al. (2005) conducted two qualitative studies on skillful athletes. The obtained results suggested that environmental factors including motivating situations, family influences, education and the amount an individual is affected by his/her environment play a vital role in developing mental toughness. The results obtained by Kenoten and et al. (2008) indicated that Psychological Skills Training (PST) plays an external role and this is especially a good subject to study skillful individuals with high level of mental toughness, who has shown qualities such as goal-setting, self-talk, visualization, coping strategies for competitive anxiety (Crust and Azadi, 2010). The study of Golby and Sheard (2006) has received support as Mental Skills Training proved to be influential on developing mental toughness. Mental skills are seen as influential on mental toughness, which is considered to be a very valuable quality (Weinberg and Williams, 2006). Middletown and et al. (2004) also suggested that acquaintance or experience may increase mental toughness. There are other evidences indicating that certain skills such as goal setting and self-talk plays an important role on developing psychological strength (Kenoten and et al., 2008). While the effect of environmental factors on developing psychological strength is evident and they have initially received supports, the role of sport psychology interventions including Psychological Skills Training (PST) is less obviously seen (Crust, 2007). A body of researches have been conducted in Iran to show psychological skills profile or compare these skills (Sanati Monfared, 1385 and Jafari, 1386), but there are only very few studies which implemented a Psychological Skills Training program during athletes preparation stage (Khanjari, 1389).

Athletes need to develop mental toughness to cope with challenging opportunities they face and overcome the hardships which impede their success (Kuehl, Kuehl and Tefertiller, 2005). Accordingly, the attention of researchers has been focused on how mental toughness is developed. This is important for sport psychologists working on athletes to increase their performance (Crust and Azadi, 2010).

A vast body of literature reported the benefits of the methods pursued in PST program. However, there are only few studies which have tried to measure mental toughness experimentally as an independent special variable. Since the performance and behavior of an athlete is directly affected by his/her own thoughts and psychological preparedness plays a very effective role in today international fields, it seems more researches are needed in this area.

If athletes enjoy a high level of mental toughness in their sport domain, is this mindset deliverable to other areas? Sheard and Golby (2006) examined how incremental enhancing effects of mental toughness can be transferred from one context to different contexts. They showed that high level of mental toughness in the domain of one activity doesn't necessarily mean high level of mental toughness in the domain of other activities (or other areas). Iranian sport section especially national teams need to undergo PST programs continuously to learn and internalize these skills and increasingly improve sport performance and develop psychological hardship, which has an undeniable role in the success of athletes.

During the last two decades, most researches have tried to conceptualize, define and describe the nature of mental toughness in athletes and sport environment (Jones and et al., 2002; Loehr, 1995) and only a few researches have examined how influential interventional factors including the Psychological Skills Training affect and improve mental toughness (Crust, 2007). Thus, the present study seeks to determine whether a Psychological Skills Training (PST) has any influence on mental toughness of elite female volleyball players?

II. METHODOLOGY

The present study is a semi-experimental pre-test & post-test method. The independent variables of the study includes psychological exercises and rehearsals (goal setting, relaxation, visualization and self-talk). Dependent variables of the study are the components of mental toughness including confidence, constancy and control. The statistical population of the study consists of 22 players from two league 1 female volleyball teams in Tehran province, Iran. The statistical sample was chosen and the subjects were selected in such a way that firstly a list of league 1 female teams was prepared. Then, I selected 2 teams through a random sampling

method. BankeRefah and Shahrdari were two teams selected from this region. Then, one of these teams was placed in the control group (including 11 individuals) and other team was placed in the experimental group (including 11 individuals).

Data collection tool

The data were collected using Sport Mental Toughness Questionnaire proposed by Golby and Sheard (2009). Based on SMTQ which is the only especial tool for evaluating toughness in sport to this date, 3 factors of confidence, constancy and control were considered the key factors of mental toughness. The validity and reliability of this questionnaire were verified completely by Golby and Sheard (2009). They reported Cronbach’ alpha coefficient of confidence, constancy and control subscales to be 0.80, 0.74 and 0.71, respectively. The validity of the questionnaire was also verified through confirmatory and exploratory factor analysis (Fournier and et al., 2005). Also, Kashani, Farrokhi and Motesharrei (1390) evaluated the reliability of persian language version of SMTQ questionnaire through examining temporal constancy (response stability) using test-retest method with a two weeks interval as well as through determining Intra-class Correlation Coefficient (ICC). They also evaluated the consistency (internal stability) of the questions through Cronbach’ alpha coefficient. The results obtained through this research indicated that intra-class correlation coefficient of subscales varied from 0.78 to 0.85 and Cronbach’ alpha coefficient varied from 0.73 to 0.83 indicating the acceptable reliability of the questionnaire. Also, these researchers used two methods to determine the content validity of the questioner. These methods are Content Validity Ratio (CVR) and Content Validity Index (CVI). They reported CVR of 0.83 and CVI of 0.85 with simplicity criterion, for specificity criterion of 0.87 and clarity criterion of 0.85, respectively. This implies the efficacy of content validity for SMTQ questionnaire to be used in internal researches (Kashani and et al., 1390).

III. EXECUTION METHOD

We took measures to ensure that the subject of the study was fully understood by related federation and get their cooperation for our research. Also, the technical team and the coaches of the league 1 team (skillful players) were informed about the importance of using psychological practices. Then, two teams were selected randomly, of which one team was considered as the experimental group and other team was considered as the control group for the study. Firstly, the mental toughness of the athletes was evaluated using Sport Mental Toughness Questionnaire (SMTQ). In the next step, the researcher taught PST psychological practices to the athletes in experimental group. The first phase of the study involved teaching the PST practices which was conducted for all the members of the group. The second phase of the teaching was designed for acquiring the skills and the third phase of teaching was devoted to practicing the skills. Unlike the first phase, the second and third phases were conducted individually where the subjects of experimental group underwent psychological practices for 8 weeks (Sheard and et al., 2006), 2 sessions a week for a total of 15 sessions. Each session took 30 minutes and consisted of psychological practices including practice package of goal setting, relaxation, visualization and self-talk (Khanjari, 1389). These sessions were designated for Psychological Skills Training (PST) as psychological intervention. Once these 15 sessions were completed, both the experimental group and the control group which hadn’t received any PST program, underwent another SMTQ post-test based on the pre-test.

The data analysis was performed through statistical methods in two descriptive and inferential levels as well as statistical tests based on the data scale and SPSS statistical software. Firstly, central tendency and standard deviation were used as descriptive indexes to examine descriptive and structural condition of the subjects. In the next step, we used Kolmogorov–Smirnov test to examine the normality of data distribution for using appropriate parametric and non-parametric statistical test. Also, an independent T-test was used to determine the effect of a Psychological Skills Training program on mental toughness and its subscales (confidence, constancy, control) among skillful female volleyball players (in two experimental and control group). For all hypotheses, a meaningful level of alpha (0.05) was considered.

IV. RESULTS

The average value, standard deviation and the number of individuals are reported in table 1 with respect to the subjects and in table 2 and table 3 with respect to the groups.

Table 1. Demographic characteristics of the subjects

Index / Subjects	Number	Age (year)	Height (cm)	Weight (kg)	History of activity in volleyball
Experiment group	11 individuals	21/89 ±2/14	176/ 20 ± 5/86	63/34 ± 3/65	1/68±9/27
Control group	11 individuals	22/03 ±2/23	175/ 78 ± 4/47	64/19 ± 3/82	1/33±8/87

Table 2. Descriptive statistical parameters for study variables of experimental group (Volleyball players of Shahr-dari team)

Statistical parameter Variable	steps	mean	s.d	Mean.pre – Mean.post
Confidence	Pre-test	3/2576	0/288	0/4545
	Post-test	3/7121	0/184	
Constancy	Pre-test	3/3409	0/257	0/4545
	Post-test	3/7955	0/151	
Control	Pre-test	2/7045	0/445	0/75
	Post-test	3/4545	0/35	
Mental toughness	Pre-test	3/1234	0/241	0/539
	Post-test	3/6623	0/181	

Table 3. Descriptive statistical parameters for study variables of control group (Volleyball players of BankeRefah team)

Statistical parameter Variable	steps	mean	s.d	Mean.post – Mean.pre
Confidence	Pre-test	3/0455	0/259	0/0152
	Post-test	3/0606	0/201	
Constancy	Pre-test	3/2955	0/313	0/0227
	Post-test	3/3182	0/226	
Control	Pre-test	2/5682	0/549	0/1818
	Post-test	2/75	0/622	
Mental toughness	Pre-test	2/9805	0/263	0/0649
	Post-test	3/0455	0/262	

Table 4. The results of Kolmogorov–Smirnovtest that show the normality of the data.

Table 4-4. The results of Kolmogorov–Smirnov (K-S) Test

Statistical parameter Variable	Pre-test		Post-test	
	sig	z	sig	z
Confidence	0/304	0/969	0/495	0/831
Constancy	0/185	1/091	0/77	1/101
Control	0/88	0/588	0/36	0/924
Mental toughness	0/79	0/652	0/801	0/644

P≤0/05

Table 5 shows the results of independent T-test. These data are used for examining the effect of a Psychological Skills Training program on mental toughness and its subscales (confidence, constancy and control) among skillful female volleyball players (in two experimental and control group).

Table 5. The results of a Psychological Skills Training program designated for skillful female volleyball players

Statistical index Variable	Group	Mean (post –pre)	S.D (post –pre)	Test levenes		- testt		
				F	Sig	t	d.f	Sig
Confidence	Experimental	0/4545	0/184	0/13	0/722	4/668	20	0/001
	Control	0/0152	0/252					
Constancy	Experimental	0/4545	0/151	0/074	0/788	6/197	20	0/001
	Control	0/0227	0/175					
Control	Experimental	0/75	0/296	0/145	0/707	3/858	20	0/001
	Control	0/1818	0/389					
Mental toughness	Experimental	0/539	0/137	0/013	0/909	8/003	20	0/001
	Control	0/0649	0/141					

The obtained results indicated that volleyball players who participated in Psychological Skills Training program earned meaningfully higher scores in mental toughness variable as well as all subscales. Also, there was not any statistically significant difference at the beginning of the research between these two groups and this meaningful difference was observed in the Post-test. So, it can be concluded that a Psychological Skills Training program has a meaningful effect on mental toughness of skillful female volleyball players.

V. DISCUSSION AND CONCLUSION

The results of the study shows that the confidence level of the subjects of the experimental group has meaningfully increased after teaching PST practices compared to that of the control group subjects. The results obtained through this study is in agreement with the study conducted by Sheard and et al. (2006), Gucciardi and et al., Crust and Azadi (2010), Crust and Clog (2011), Weinberg and et al. (2009), Caddick and Rali (2012), Driska (2012) and Chank and et al. (2012). The result of this study is also inconsistent with the results obtained by Clough and et al. (2002), who defined mental toughness as a trait quality. Thus, it can be concluded that mental toughness is not attributable to any heritable factor, rather its changeability aspect can be utilized by taking environmental conditions into consideration to increase the performance of athletes.

The results obtained in the study indicated that the constancy level among the subjects of experimental group has meaningfully increased after teaching PST practices compared to control group. These results is consistent with the results obtained by Sheard and Golby (2006) and Crust and Azadi (2010), Crust and Clog (2011), Weinberg and et al. (2009), Caddick and Rali (2012), Driska (2012) and Chank and et al. (2012), while it is inconsistent with the researches conducted by Clough and et al. (2002).

The result of the study indicated that the control level among the subjects of the control group has meaningfully increased after teaching PST practices. Consistent and inconsistent researches are similar to those of the first and second hypotheses. In other words, it is consistent with the results obtained by Sheard and Golby (2006) and Crust and Azadi (2010), Crust and Clog (2011), Weinberg and et al. (2009), Caddick and Rali (2012), Driska (2012) and Chank and et al. (2012), while it is inconsistent with what Clough and et al. (2002) has proposed as the results of their studies.

The results of the study indicated that the overall mental toughness among the subjects of the control group has meaningfully increased after teaching PST practices. These results are consistent with the results obtained by Sheard and Golby (2006) and Crust and Azadi (2010), Crust and Clog (2011), Wineberg and et al. (2009), Kadik and Rali (2012), Dirska (2012) and Chank and et al. (2012) and are inconsistent with the results of the study conducted by Clough and et al. (2002).

Based on the results, it can be concluded that the present study supports the definition proposed by Jones (2002), which is commonly referred to in most mental toughness literature. According to the definition proposed by Jones, mental toughness is a heritable or developed characteristic which enhance the performance of athlete compared to that of his/her opponent. So, in the second part of this definition, mental toughness is considered as a quality which can be developed. Hence, the results of the present study indicate that the mental toughness of individuals can be developed and improved. The results obtained through this study are inconsistent with those obtained by Clough and et al. (2002), because they have considered mental toughness as a trait quality which can not be developed and improved. Whereas, the present study shows that mental toughness will be enhanced, if athletes use and practice mental skills package.

Mental toughness is affected by many factors. Thus, this study has significantly mitigated the debate of whether mental toughness is heritable or acquirable? Accordingly, it can be proposed that heritable factors may have higher contribution in the mental toughness among some individuals compared to other individuals. But, athletes can somewhat develop this important psychological skill by making presence in competitive environments, hard exercises as well as using mental skills techniques such as psychological practices.

Only the hypotheses made about the main factors were meaningful. However, based on what have been proposed, it can be concluded that there is a meaningful difference between the mental toughness of the control group and the experimental group. Also, the subjects of the experimental group have shown meaningful increase in mental toughness and overall mental toughness subscales after Psychological Training Skills (PST). It should be noted that the way the Psychological Skills Training (PST) program is implemented considerably influences the results of the research. Also, various factors such as the time chosen for implementing these practices and the length of each session, age, the way coach or sport psychologist behave with the subjects, the activity level and the nature of the sport are all influential factors in this kind of research. In summary, mental toughness is affected by various variables and more researches are needed in this area to discover basic mechanisms for developing mental toughness. As a result, mental toughness is affected by various psychological factors including PST. The results obtained in this research can be used by individuals, sport couches and sport psychologists to increase mental toughness. Also, athletes can use the results to develop their psychological skills just as they do with their physical skills.

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