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The Effect of 12-Week Psychological Skills Training on Coping Skills and Performance Strategies in High School Volleyball Players

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ABSTRACT

This study aims to analyze the effect of Psychological Skills Training (PST), which includes goal setting, imagery, relaxation, and self-talk, on high school volleyball team players in terms of athletes' ability to cope with sportive problems and selected performance strategies. The study groups for this research were determined in two steps. In the first step, high schools in Mersin's central districts and those carrying out educational activities with the same curriculum were reviewed so that the study groups would have similar characteristics. With the purposeful sampling method, nine Anatolian High schools located in non-vocational Anatolian type-high schools and preparing for competitions in volleyball, a young female category was determined, and two of these high schools were suitable for the study. In the second step, two high school teams were assigned as experimental groups (*n = 14) and control groups* (*n = 14*) by drawing lots. The mean ages of the participants were 14.93 (*SD* = .730) and 15.14 (*SD* = .770) for the experimental and control groups, respectively. The Personal Information Form, Coping Scale with Sports Problems (ACSI-28), and Performance Strategies Test (TOPS) were used as data collection tools. In the data analysis, a two-factor ANOVA test was used for mixed measurements. As a result, it was found that PST carried out in the school environment has no effect on athletes' ability to cope with sports problems or performance strategies other than imagery in training.

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INTRODUCTION

Problems such as muscle strain, lack of concentration, and self-confidence under pressure caused by high levels of anxiety and hyper-stress during sports activities are defined as sportive problems (Smith et al., 1995). Since sporting problems create adversities for athletes and teams, athletes need to know how to make decisions and cope with the stressful situations they experience when under pressure (Woodman & Hardy, 2001). It is emphasized that in today's professional or semi-professional sports matches, the difference in physical performance between winning and losing has decreased, resulting in increased pressure on athletes. Therefore, Psychological Skills Training (PST) has become essential for athletes in recent years (Birrer & Morgan, 2010; Weinberg & Gould, 2019).

PST is an applied discipline in which human psychology and behavior in sports and exercise activities are studied scientifically. When we look at its recent history, it can be seen that it drew attention in North America in the 1980s and became a widely researched topic (Foster et al., 2016; Gill et al., 20170; Martens, 1987; Vealey, 1988, 2007; Weinberg & Gould, 2019). In general, PST is defined as a process that includes developing psychological skills with appropriate techniques, scheduled practices, activities, and exercises to increase performance, where the psychological preparations concretize. (Konter, 1998; Martens, 1987; Vealey, 2007; Weinberg & Gould, 2019). PST aims to provide athletes with the necessary psychological skills to solve problems that may occur before or during the matches (e.g., high anxiety, low motivation) and to achieve the perfection of the movement. It is also considered important for young athletes since they are still budding (Martens, 1987; Weiss, 2011). It is thought that young athletes must gain the ability to cope with sporting problems to maintain their motivation and not decrease their performance levels (Foster et al., 2016; Horn et al., 2011; Weinberg & Gould, 2019; Weiss, 2011). Folkman and Lazarus (1985) defined the ability to cope with difficulties necessary for resolving sporting problems as behavioral and emotional reactions that are put forward to control environmental and internal desires and conflicts and minimize life tension. Weinberg and Gould (2019) also state that for success in sports, stress management, coping with difficulties, and the solution to sporting problems caused by anxiety during injury or pressure can be provided by PST. Each psychological skill gained through PST is determined as a performance strategy (Thomas et al., 1999; Vealey, 2007). Goal setting, imagery, relaxation, and self-talk are the foremost common strategies of the studies conducted with young people (Gould et al., 1991; Klien, 2017; McCarthy et al., 2010; Vealey, 1988, 2007; Weinberg & Gould, 2019). Goal setting is defined as a technical strategy that creates positive

changes in critical psychological situations like anxiety, lack of trust, or motivation that affect the performance of athletes of various ages and skill levels (Locke & Latham, 2002). Imagery is a sensual (seeing, feeling, hearing) strategic experience without external stimuli. Through imagery, anxiety, despair, or joy during a game can be imagined and experienced before the game, contributing to the development of psychological skills (Martens, 1987). Relaxation reduces muscle strain, de-escalates the overactivity of the sympathetic nervous system (related to adrenalin and heart rate), and calms the mind through productive strategic activities (e.g., imagery; Burton & Raedeke, 2008). Self-talk is defined as a dialog that enables athletes to interpret their emotions and perceptions, organize their assessments and beliefs, give instructions, and reinforce themselves (Hackfort & Schwenkmezger, 1993). This study assumed that coping skills with sporting problems are a variable that increases in parallel with the acquisition of performance strategies.

Studies involving PST in which more than one technique is applied are regarded as multimodal, and it is stated that the performance strategies (e.g., imagery, relaxation) developed to ensure the use of psychological skills in these multimodal studies are interrelated and it is more beneficial to use them together (Martens, 1987). Therefore, when we examine the research on the subject, we can see that it is effective to use performance strategies together. For example, Horn et al. (2011) performed PST research on college softball and baseball players which including goal setting, imagery, relaxation, and self-talk techniques. As a result, they found that players started to use their psychological skills, and their performance improved. Fulgham (1999) carried out a PST study that included imagery and goal-setting techniques to improve the psychological skills of high school female volleyball players, and it was concluded that these techniques improved the performance strategies of the players.

When we look at the research on psychological skills training in Turkey, we can give examples of the research conducted by Miçooğulları and Kirazcı (2016) and Urfa and Aşçı (2018) because they work with young athletes. Miçooğulları and Kirazcı (2016) conducted a six-week PST program that included team cohesion, goal setting, imagery, relaxation, and self-talk techniques to develop psychological skills in young basketball players. The results showed that PST positively affected team cohesion and self-confidence in athletes. Urfa and Aşçı (2018) conducted ten weeks of PST with the participation of young soccer players, which included goal setting, imagery, self-talk, a pre-performance routine, concentration, and self-monitoring techniques and strategies. They observed that young soccer players' self-esteem and attention levels improved.

According to the literature, athletes over the age of 13 strive to improve and exhibit their sportive skills, and young athletes must improve their psychological skills in terms of their performance and careers; however, present studies about the psychological preparation process of young athletes are not sufficient (Coté & Hay, 2002; Foster et al., 2016; Horn et al., 2011; Miçooğulları & Kirazcı, 2016; Weinberg & Gould, 2019; Weiss, 1991). Regarding this insufficiency, Vealey (1988, 2007) stated that since the physical skills of elite athletes are developed and psychological factors are thought to have a considerable and essential role in their performance, most PST studies are focused on elite athletes. However, it is also crucial for non-elite athletes to improve their psychological skills. He claimed that studies with athletes from high school and college, as well as athletes who retired because of disability, will make a significant difference. Gilbert et al. (2007) stated that the use of sports psychology in high schools is low, and PST should be supported for student-athletes. Foster et al. (2016) presented that despite Vealey's call (2007) to increase PST research on young participants, there has not been sufficient research in England in this area, and they stated that PST with young people will benefit their psychological development and physical performance. Likewise, Danish et al. (2005) emphasized that schools are one of the most critical places where young people's development is contributed, and PST programs will help them gain psychological skills. Several authors claimed that schools are appropriate for PST because routine education programs provide many psychological skills for athletes to gain (Coté & Hay, 2002; Foster et al., 2016; Gilbert et al., 2007; Weismann, 2005). Besides, Martin (2005) indicated that the experiences gained at a young age by PST have a positive effect on expectations and attitudes towards the practices of receiving psychological support in the following years. Considering that the nonformal PST programs are expensive and trainers do not spare enough time for this work (Martens, 1987; Weinberg & Gould, 2019; Weismann, 2005), we can say that having young athletes in the selected sample is essential. This study aims to investigate the effect of PST, which comprises goal setting, imagery, relaxation, and self-talk, on high school volleyball team players in terms of athletes' ability to cope with sportive problems and selected performance strategies. This study, performed in a school environment, will contribute to PST research and provide up-to-date data for the related training programs.

METHODS

Research Model

This study is designed as a quasi-experimental model, including pretest-posttest comparison groups. Quasi-experimental models are defined as models in which cause-and-effect relationships cannot be established, and where manipulation or control of the model cannot be made or is partially made due to natural or practical reasons (Erkuş, 2005). Apart from the pretest and post-test, which are necessary for repeated measurement, a third (follow-up) test was performed to monitor the persistency. Hence, the design of this study can be named a 2 x 3 factorial design.

Participant

The study groups were determined in two steps. In the first step, high schools in Mersin's central districts with the same curriculum were reviewed so that the study groups would have similar characteristics. Using the purposive sampling method, nine Anatolian high schools located in non-vocational Anatolian high schools prepared for volleyball competitions. A young female category was determined, and two high schools were suitable for the study. The acceptability criteria for the schools determined by the criterion sampling method (Büyüköztürk et al., 2008), which is one of the types of purposive sampling methods, are as follows: i) Similar academic success levels of both schools (determined according to the data of the Provincial Directorate of National Education); ii) regular preparations and participation in provincial level volleyball team competitions in the last two years; iii) preparation for the provincial competitions in the young female's volleyball category and having at least 14 student-athletes actively participating in the volleyball team; iv) a minimum of 1 year of experience in volleyball competitions (playing at school or in a club) for athletes; v) volleyball team trainers being physical education teachers; vi) carrying out volleyball practices in similar physical conditions. Sporting experience was not inquired about, but the inclusion criterion was having played volleyball for at least one year.

In the second step, two high school teams were assigned as the experimental group (n= 14) and the control group (n= 14) by lot. The mean ages of the participants were 14.93 (SD= .730) and 15.14 (SD= .770) for the experimental and control groups, respectively.

Procedure

This study obtained research permissions from the Mersin Governorship and Mersin Provincial Directorate for National Education, and Ethics Committee Approval from Mersin University Ethics Committee (31.12.2018/017). The students in the research groups and their

parents were informed about the aim and characteristics of the study, and students signed an informed consent form. After ACSI-28 and TOPS were applied as a pre-test to the participants, the athletes in the experimental group to be applied PST were trained about PST, and it was ensured that the athletes gained the necessary knowledge. In this process, the control group did not intervene. The PST program, determined after the trainer's opinions, athlete interviews, and necessary observations, was applied for 12 weeks. At the end of the 12th week, a posttest was conducted with the same scales (Figure 1). Because of the constraints of the research schools, the follow-up test was performed to eight weeks later, and then the analyses were started. Eight weeks is an appropriate time range for the follow-up test in the literature (Davis & Moore, 1935; Haynie, 1997). The PST program delivered as part of the research is presented in Table 1 and Table 2 shows a sample of the 3-day PST used in the 12-week program described above.

Figure 1
Research Process Flow Chart

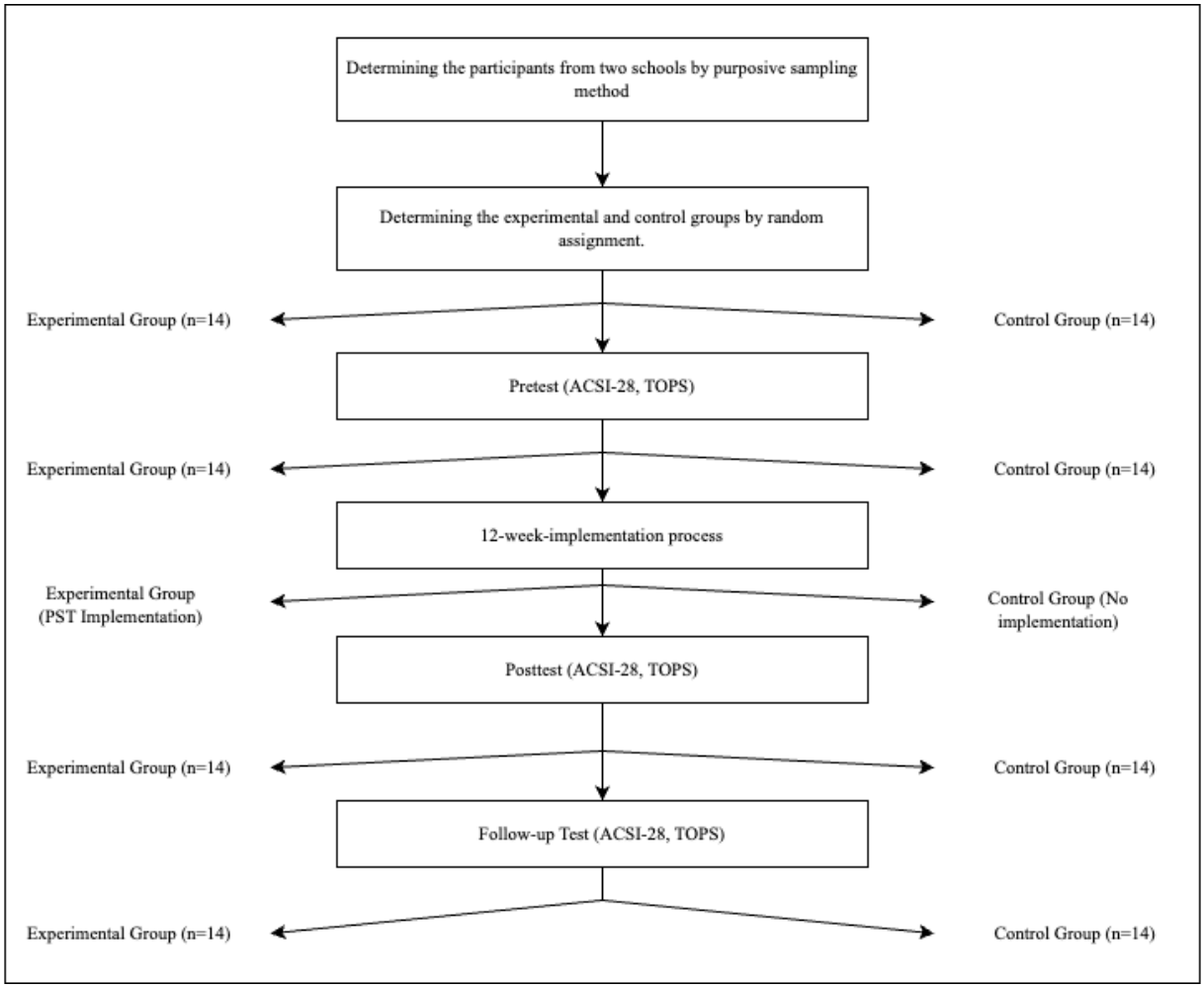

Table 1
12-Week PST Program

Day (Duration)	1st Week	2nd Week	3rd Week	4th Week	5th Week	6th Week
Monday (20-30 min)	First meeting and orientation with athletes	Explanation of the definition, principles, and importance of goal-setting	Explanation of the definition, principles, and importance of imagery	Explanation of the definition, principles, and importance of relaxation	Explanation of the definition, principles, and importance of self-talk	Goal-setting application
Tuesday (20-30 min)	Explaining the volleyball game relationship with and importance of PST	Goal-setting practice	Imagery practice	Relaxation practice	Self-talk practice	Imagery practice Relaxation practice
Thursday (20-30 min)	Explaining the volleyball game relationship with and importance of PST	Goal-setting practice	Imagery practice	Relaxation practice	Self-talk practice	Self-talk practice
Day (Duration)	7st Week	8th Week	9rd Week	10th Week	11th Week	12th Week
Monday (20-30 min)	Goal-setting practice Self-talk practice	Goal-setting practice Self-talk practice	Goal-setting practice Self-talk practice	Goal-setting practice Self-talk practice	Goal-setting practice Self-talk practice	Goal-setting practice Self-talk practice
Tuesday (20-30 min)	Imagery practice Relaxation practice	Imagery practice Relaxation practice	Imagery practice Relaxation practice	Imagery practice Relaxation practice	Imagery practice Relaxation practice	Imagery practice Relaxation practice
Thursday (20-30 min)	The use of psychological skills in the game	The use of psychological skills in the game	The use of psychological skills in the game	The use of psychological skills in the game	The use of psychological skills in the game	The use of psychological skills in the game

Table 2
Examples of the Use of PST in the Study

1st Day	**Subject: First meeting and orientation with athletes** Duration: 30 min Activity Performed: Ice Breaking Activity and learn about sports psychology by telling athletes' stories. Implementation: Before the training session, the athletes are taken to the volleyball court by their PE teachers. Out by the athletes. This is aimed at getting the athletes to develop the best slogan for the team. This will help to communicate with the athletes and help to develop the ability to work together. General explanations about sports psychology are given to the athletes after the icebreaker activity. This is mainly based on defining and explaining the principles involved. Afterwards, examples of psychological processes experienced by experienced athletes are provided (Hasırcı et al., 2018; Weinberg & Gould, 2019).
2nd Day	Subject: Explaining the volleyball game relationship with and importance of PST Duration: 30 min Activity Performed: Athletes' experiences with volleyball. Implementation: The athletes are brought into the classroom by the physical education teacher. The athletes are asked to write down on a piece of paper what their best and worst moments in volleyball have been. What they have written down is then presented and linked to the PBA. The way in which the PBA will impact performance is explained by the expert coach with the help of examples (Hanin, 2000).
3rd Day	Subject: Goal Setting Duration: 30 min Activity Performed: Provide examples and explanations of goal setting. Implementation: The physical education teacher brings the athletes into the classroom. It is explained how goal-setting will take place in the PBA and a sample goal-setting exercise called Success Plan (Hasırcı et al., 2018) is performed with the athletes. The athletes are asked to close their eyes and breathe calmly during the exercise. While their eyes are still closed, the athletes are asked to think about the goal they want to achieve in their sporting life. The athletes are then asked to open their eyes and write on paper the goals they want to achieve in the next ten years, five years, two years, six months, one month, one week, three days, and one day.

Data Collection Tools

Personal Information Form

The Personal Information Form, which athletes determines which athletes will participate in the study, contains information about athletes age and volleyball experience.

Athletic Coping Skills Inventory (ACSI-28)

The Athletic Coping Skills Inventory (ACSI-28) is a personal evaluation form initially developed by Smith et al. (1995) to measure the coping skills of athletes. It was adjusted for Turkish culture by Özcan and Günay (2017). The inventory has 26 items and seven subscales and is scored on a four-point Likert scale. The participants were asked to answer how often (almost never = 0, sometimes = 1, often = 2, almost always = 3) they experienced the related

instances. The seven subscales were not considered, and the scale was evaluated according to the total score. The total scale score ranges between 0 and 78, indicating the ability to cope with sporting problems. The Cronbach Alpha value, the internal consistency coefficient of the scale adjusted by Özcan and Günay (2017), varies between .62 and .80 in subscales. Since this scale was adjusted for junior high school students, we did a confirmatory factor analysis (CFA) with high school students to confirm its reliability and validity. As a result, Cronbach Alpha values ranged between .59 and .74 for this study group. The goodness of fit of the ACSI-28 based on the confirmatory factor analysis was as follows: Goodness of Fit Index (GFI) = 0.90, Adjusted Goodness of Fit Index (AGFI) = 0.88, Root Mean Square Error of Approximation (RMSEA) = 0.055, Standardized Root Mean Square Residual (SRMR) = 0.065, and Comperative Fit Index (CFI) = 0.95. Considering the statistical compatibility calculated by CFA, it was concluded that the collected data is coherent with the scale's previously determined structure.

Test of Performance Strategies (TOPS)

Test of Performance Strategies (TOPS) was developed by Thomas et al. (1999). It is a five-point Likert scale comprising 64 items originally designed to measure psychological skills and techniques used by athletes during both practice and competitions in a comprehensive field and their strategic uses. The points are determined as follows: 1 = never, 2 = rarely, 3 = sometimes, 4 = often, and 5 = always. TOPS was adjusted for Turkish culture by Özder (2017). TOPS comprises 52 items in seven subdimensions of competition and practice subscales. The subdimensions of the competition subscale are Goal-setting (4 items), Emotional Control (4 items), Imagery (4 items), Activation (4 items), Self-talking (4 items), Negative Thinking (4 items), Relaxation (3 items). The subdimensions of the practice subscale are Emotional Control (4 items), Imagery (4 items), Relaxation (4 items), Distractibility (4 items), Goal-setting (3 items), Activation (3 items), Self-talking (3 items). The Cronbach Alpha values of the competition and practice subscales were calculated as .78 and .86, respectively (Özder, 2017). The high scores indicate that psychological skill techniques/strategies are preferred more. This study evaluated eight sub-dimensions, namely, Goal-setting, Imagery, Relaxation, and Self-talking, which are only included in the competition and practice sub-dimensions.

Since the adjustment process of this test was carried out with adult athletes, we performed a confirmatory factor analysis (CFA) with high school students to confirm its reliability – and validity. As a result of CFA, it was found that the Cronbach Alpha values for the Goal-setting, Imagery, Relaxation, and Self-talking sub-dimensions ranged between .55 and .74. The TOPS scale was subjected to confirmatory factor analysis. The goodness of fit

indicators was as follows: Goodness of Fit Index (GFI) = 0.84, Adjusted Goodness of Fit Index (AGFI) = 0.81, Root Mean Square Error of Approximation (RMSEA) = 0.047, Standardized Root Mean Square Residual (SRMR) = 0.060, and Comparative Fit Index (CFI) = 0.95. Considering the statistical coherency calculated by CFA, it was concluded that the collected data was compatible with the scale's previously determined structure.

Data Analysis

To evaluate the data's normality, Z skewness and Z kurtosis values (ranging from -1.96 to +1.96) were examined with the Shapiro-Wilks test. After confirming that Coping Skills with Sportive Problems and Performance Strategies Preference values were normally distributed, a two-factor ANOVA test for mixed-up measurements was conducted to compare the mean scores of the experimental group (with PST) and the control group (without PST). The data were analyzed on SPSS 23.

RESULTS

To investigate the effects of PST on athletes' ability to cope with sportive problems and their preferred performance strategies; descriptive statistics and ANOVA results related to ACSI-28 scores, descriptive statistics and ANOVA results related to TOPS Competition subscale subdimensions, and descriptive statistics and ANOVA results related to TOPS Training subscale subdimensions are presented respectively.

Athletic Coping Skills Inventory (ACSI) Results

2 x 3 factorial ANOVA results indicated that there is no Group x Test interaction effect [$F_{(2,52)} = 1.17$, $p > .05$], Group main effect [$F_{(1,26)} = .054$, $p > .05$], and Test main effect [$F_{(2,52)} = 2.584$, $p > .05$] on ACSI-28 scores of the athletes. The mean scores of the ACSI-28 pretest, posttest, and follow-up tests are given in Table 3.

Findings of TOPS Competition Subscale

The results of 2 x 3 factorial ANOVA for mixed measurements indicated no Group x Test interaction effect [$F_{(2,52)} = .891$, $p > .05$], Group main effect [$F_{(1,26)} = .026$, $p > .05$], and Test main effect [$F_{(2,52)} = 1.962$, $p > .05$] on TOPS Competition Goal Setting scores (Table 3). The results of 2 x 3 factorial ANOVA for mixed measurements showed that the Group x Test interaction effect [$F_{(2,52)} = .242$, $p > .05$], Group main effect [$F_{(1,26)} = 1.491$, $p > .05$] and Test main effect [$F_{(2,52)} = 1.498$, $p > .05$] on TOPS Competition Imagery scores (Table 3). The results of 2 x 3 factorial ANOVA for mixed measurements showed that there is a Group x Test interaction

effect [$F_{(2,52)}$ = 4.014, p< .05], there is no Group main effect [$F_{(1,26)}$ = 3.002, p> .05]. There is a Test main effect [$F_{(2,52)}$ = 11.724, p< .05] on TOPS Competition Relaxation scores (Table 3). According to the results of the analysis, the pretest scores of athletes in Competition Relaxation ($\bar{X}$ = 2.44) were lower than the posttest ($\bar{X}$ = 2.88) and follow-up test scores ($\bar{X}$ = 3.12) (Table 3). The results of 2 x 3 factorial ANOVA for mixed measurements indicated that there is no Group X Test interaction effect [$F_{(2,52)}$ = 1.309, p> .05], Group main effect [$F_{(1,26)}$ = .112, p> .05] and Test main effect [$F_{(2,52)}$ = .222, p> .05] on TOPS Competition Self-Talk scores (Table 3).

Table 3
Test for Performance Strategy Preference of the Groups – Mean Scores and Standard Deviation Values of Competition and Practice Subscales

	Experimental						Control					
	Pretest		*Posttest*		*Follow-up*		*Pretest*		*Posttest*		*Follow-up*	
	$\bar{X}$	*SD*	$\bar{X}$	*SD*	$\bar{X}$	*SD*	$\bar{X}$	*SD*	$\bar{X}$	*SD*	$\bar{X}$	*SD*
ACSI-28	36.79	7.15	43.50	9.54	43.50	9.71	39.64	11.35	40.71	12.12	41.21	11.10
TOPS Competition												
Goal Setting	2.89	.745	3.11	.691	3.36	.705	3.05	.816	3.05	.779	3.14	.586
Imagery	3.09	.949	3.25	1.09	3.48	.958	2.79	.930	2.91	1.05	2.96	.887
Relaxation [a, b]	2.40	.694	3.24	.646	3.36	.722	2.48	.637	2.52	1.02	2.88	.464
Self-Talk	3.05	.941	3.38	.864	3.41	.907	3.29	.790	3.14	.949	3.14	.813
TOPSPractice												
Goal Setting	2.71	.794	2.98	.647	2.95	.597	2.81	.894	2.93	.997	2.95	.738
Imagery [c]	3.10	.778	3.48	.811	3.55	.748	2.83	.958	2.64	.940	2.91	.818
Relaxation [a,c]	1.93	.485	3.13	.457	2.91	.744	2.21	.479	2.52	.917	2.71	.619
Self-Talk	3.31	.647	3.31	1.01	3.43	.831	3.33	.716	3.24	.852	3.31	.480

Note. [a] Group X Test interaction effect; [b] Test main effect; [c] Group main effect

Findings of TOPS Practice Subscale

The results of 2 x 3 factorial ANOVA for mixed measurements indicated that there is no Group x Test interaction effect [$F_{(2,52)}$ = .128, p> .05], Group main effect [$F_{(1,26)}$ = .004, p> .05], and Test main effect [$F_{(2,52)}$ = 1.166, p> .05] on TOPS Practice Goal Setting scores. The pretest, posttest, and follow-up test mean scores and standard deviation values for TOPS Practice Goal Setting are shown in Table 3. The results of 2 x 3 factorial ANOVA for mixed measurements showed that there is no Group X Test interaction effect [$F_{(2,52)}$ = 2.153, p> .05], there is a Group main effect [$F_{(1,26)}$ = 4.474, p< .05] and there is no Test main effect [$F_{(2,52)}$ = 1.835, p> .05] on TOPS Practice Imagery scores. According to the analysis results, the mean score of athletes in the

experimental group in Practice Imagery ($\bar{X}$= 3.38) was higher than the mean score of athletes in the control group ($\bar{X}$ = 2.80). The pretest, posttest, and follow-up test mean scores and standard deviation values for TOPS Practice Imagery are shown in Table 3. The results of 2 x 3 factorial ANOVA for mixed measurements showed that there is a Group X Test interaction effect [$F_{(2,52)}$ = 4.642, p< .05], there is no Group main effect[$F_{(1,26)}$ = 1.004, p> .05]. There is a Test main effect [$F_{(2,52)}$ = 17.227, p< .05] on TOPS Practice Imagery scores. on TOPS Practice Imagery scores According to the results of the analysis, the pretest scores of athletes ($\bar{X}$ = 2.07) were higher than the posttest scores ($\bar{X}$= 2.82) and follow-up scores ($\bar{X}$= 2.81) in Practice Relaxation. The pretest, posttest, and follow-up test mean scores and standard deviation values for TOPS Practice Relaxation are shown in Table 3. The results of 2 x 3 factorial ANOVA for mixed measurements indicated that there is no effect of interaction between Group X Test variables [$F_{(2,52)}$ = 0.95, p> .05], group variable [$F_{(1,26)}$ = .064, p> .05] effect, and Test variable effect also are not mentionable on TOPS Practice Self-Talk scores [$F_{(2,52)}$ = .162, p> .05]. The pretest, posttest, and follow-up test mean scores and standard deviation values for TOPS Practice Self-Talk are shown in Table 3.

DISCUSSION

According to the findings of this study, there was no difference between experimental and control groups in terms of coping skills, practice and competition goal setting, relaxation, self-talk, and competition imagery, while there was in practice imagery. The results of this study showed similarity with a part of the literature results; however, they were not similar to another part of it. Crocker et al. (1988) conducted a PST study with 16 – 18-year-old young volleyball players, including relaxation and self-talk techniques, and obtained a similar finding of coping skills with sportive problems. However, PST was ineffective in coping with anxiety. Walter et al. (2019) ran a PST study with young athletes who compete in areas such as swimming, calisthenics, handball, and volleyball and found that PST affected athletes positively in terms of coping with physical anxiety, self-confidence, and self-sufficiency; however, it was not as much effective on cognitive anxiety and the ability to act on their own will. Klien (2012) performed a PST study with college baseball and softball players, including self-talk techniques, and deduced that PST did not affect coping skills and self-sufficiency levels. Skvarla and Clement (2019) did a PST study with young college dancers, including imagery, relaxation, and self-talk. They found no difference between the PST group and the non-PST group in coping skills. One effective in coping with sporting problems may be the insufficient time spent with athletes in this study. Crocker et al. (1988) emphasized that the

programs for relieving anxiety, one of the coping skills, require a longer time to get an achievement. According to the study, before and during the competition, one could sometimes experience unexpected situations; thus, it is difficult to heal that mood in a limited time mentally. Another reason PST is inadequate in coping skills with sportive problems may be that young and semi-experienced athletes could be focusing too much on the biomechanics of the move. Hayslip et al. (2010) claimed that amateur golfers pay more attention to the biomechanics of the game due to their physical skill level compared to upper-level golfers; thus, they have difficulty using their psychological skills effectively. We had high school students with one year of experience in this study. None of the participants were upper-level athletes; they can have difficulty in using the sportive coping skills because one of the most effective most influential factors for psychological skills used is physical skills (Martens, 1987; Vealey, 1988, 2007; Weinberg & Gould, 2019).

There are also studies in the literature that with do not match our findings on coping skills with sportive problems. One of these studies was performed with young tennis players by Hatzigeorgiadis et al. (2008). They saw self-sufficiency and performance increased in young tennis players with PST, including self-talk. Elliott (2003), another incompatible study, observed that after PST with high school softball players, including goal setting, imagery, relaxation, and self-talk, participants' self-confidence increased, and cognitive anxiety decreased. Beauchamp et al. (1996) performed a PST study with amateur college golfers. They found, including stress management, relaxation, and concentration techniques, and that golfers' coping skills with sporting problems increased after PST. Mamassis and Doganis (2014) conducted a PST study with 14-year-old tennis players, including goal setting, imagery, relaxation, and concentration techniques, and they revealed that the players' anxiety levels related to competition decreased. Finally, Curry and Maniar (2003) studied young college players, including goal setting, imagery, problem-solving strategies, and techniques. They found that the PST group used performance strategies effectively and improved their coping skills with performance problems when they were under pressure. The different sample groups and differences in PST composition may cause the unsimilarity between our study and these studies. For example, Curry and Maniar (2003) used decision-making, time management, developing relationships, effective communication, and irregular nutrition unlike us.

We did not find any difference between the experimental and control groups in the TOPS competition and practice subscales except practice imagery scale in our study. There are few PST studies with high school players aiming to increase the use of psychological skills in

literature with similar TOPS findings. Leffingwell (2000) performed two PST studies with college sports players on different types of sports, and they came up with similar results: players' usage level of the performance strategies such as goal setting, relaxation, imagery, and self-talk did not change with PST. Wild (2001) ran a PST study with a high school male hockey team, including goal setting, imagery, and attention control, and did not find any difference after PST. This indifference may be due to the requirement for more training about PST's foundations and its effects on performance. The same comment was emphasized by Weinberg and Gould (2019) in the explanations made on the PST calendar, that a more extended preparation period may be needed for PST to be more effective on athletes. In the literature, research results that are not similar to the study's TOPS training and competition subscale findings are more common. These studies generally emphasize that athletes use their psychological skills and performance strategies effectively after PST. However, seeing the PST effect in all dimensions in these dissimilar studies is hard. Some of the studies show that PST is partly effective. First, taking studies conducted in Turkey as an example due to cultural proximity, a study conducted by Miçooğulları and Kirazcı (2016) involving young basketball players reported that a six-week PST program did not affect anxiety levels, but it did positively affect team cohesion and self-confidence in players. In another study conducted in Turkey, Urfa and Aşçı (2018) conducted a 10-week PST program with the participation of young football players. The results showed that young football players' self-confidence and attention levels increased, and there was no change in physical anxiety, anxiety, motivation, and shot accuracy scores. In another study conducted in Turkey, Urfa and Aşçı (2018) conducted a 10-week PST program involving young footballers. The results showed that young footballers' self-esteem and attention levels increased and there was no change in somatic anxiety, worry, motivation, and shooting accuracy scores.

Fulgham (1999) performed a PST study with high school female volleyball players, including imagery and goal-setting techniques, and presented that PST improved performance strategies about these two techniques. Horn et al. (2011) conducted a PST study with college softball players whose average age was 18, including goal setting, imagery, relaxation, and self-talk. At the end of the program, they found that players started using these performance strategies during competitions and daily life, and their competition performance was affected positively. Gilbert et al. (2007) did a PST study called UNIFORM (Goal setting, no mistake, imagery, entirely focusing, ultra-positivity, relaxation, stress control, routine preparations) with high school athletes from different sports, including playing games and watching movies. They found that athletes acquired the habit of using psychological skills

through PST. Papacharisis et al. (2005) conducted a PST study with 12-year-old female volleyball and male football players, including goal setting, problem-solving, and positive thinking. They observed that players improved their self-belief skills by using performance strategies effectively with the taught techniques. Megs and Chen (2019) ran a PST study with young swimmers, including goal setting and self-talk. As a result, they revealed that the swimmers used the performance strategies of both techniques effectively.

Another study finding is the difference between groups regarding the TOPS practice imagery dimension. There are studies in the literature that support this result. Di Corrado et al. (2020) revealed that athlete students used imagery skills effectively after PST. Simonsmeier and Buecker (2016) stated that imagery positively affects physical skills development and competition performance for young athletes. The increase in imagery after PST may be related to the fact that amateur athletes pay attention to physical performance rather than psychological performance, as claimed by Goyen and Anshel (1998) and Hayslip et al. (2010). Because, as Martens (1987) and Weinberg and Gould (2019) stated, athletes can use imagery to improve their psychological performance and physical performance. Looking at the studies that do not agree with the findings of this research regarding imagery, the study conducted by Elçi et al. (2013) in Turkey with the participation of swimmers in the 9-13 age group can be cited as an example. Elçi et al. (2013) concluded in their study that imagery practice had no effect on skill development and emphasized that students under the age of 12 were particularly lacking in imagery practice, which had an impact on the results of the study.

CONCLUSION

In sum, this PST study was performed with high school volleyball team players to analyze the effect of PST on athletes' coping skills with sportive problems and their performance strategy preference. At the end of the 12-week PST program, we found that PST did not have any effect on teenage female volleyball players' coping skills with sportive problems and their performance strategies (goal setting, competition imagery, relaxation, and self-talk) except imagery. Considering the limited number of PST studies, some studies are showing the effect of PST on coping skills with sportive problems, while there are other studies indicating that PST is partly effective or not effective at all (Klien, 2012; Skvarla & Clement, 2019; Walter et al., 2019). The differences among these studies are thought to be caused by insufficient duration of PST, age-related characteristics of participants, and the difference between athletes' performance levels. Many PST studies revealed that PST increases the use of performance strategies by young athletes (Horn et al., 2011; Vealey, 2007; Weinberg &

Gould, 2019). However, Foster et al. (2016) showed that even though Vealey (2007) called to increase PST studies with young participants, the progress in recent years has not been enough. For that reason, it is essential to conduct a study that is designed as quasi-experimental research, including pretest, posttest, comparison groups, and follow-up test, and the results presented up-to-date information for sports psychology.

In other words, we can say that what researchers did in these studies was to take a snapshot (ignoring biopsychological features) without considering the qualitative developing differences and characteristics (i.e., Maturity level, personality, cognitive/social skills) of young participants, and this may affect the result (Foster et al., 2016; Visek et al., 2013). Considering the studies showing that less talented and more talented players can be affected by PST differently, and since there may be players from all levels in a school team, PST studies should be backed by individual programs. We see that the number of PST studies in Turkey is relatively low, so few were conducted with young people. Therefore, running PST studies, especially in schools, will help in the formation of programs that will contribute to young athletes' physical and psychological development. Since this study is quasi-experimental, the results cannot be generalized for the entire population.

PRACTICAL IMPLICATIONS

Based on the experience we had in this study, the possible suggestions for researchers those plan to do PST studies are as follows: i) PST content can be diversified according to age groups, ii) PST program can be prepared considering the team environment where there are both gifted and less gifted players together, iii) PST can be performed consistent with the cooperation of parents, trainer, and consultant, iv) if PST may last at least for the season, v) PST can be individualized according to the features of athletes, vi) PST studies should be done in several kinds of schools and sports**.**

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Authors' contribution

Both authors contributed conception and design of the study. Both authors contributed to drafting the manuscript, critical revisions, and review of the results.

Declaration of conflict interest

The authors declare that they have no conflict of interest.

Ethics Statement

In this study, research permissions were obtained from Mersin Governorship and Mersin Provincial Directorate of National Education, and Ethics Committee Approval was obtained from Mersin University Social and Human Sciences Ethics Committee (31.12.2018/017).

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