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An Examination of Concentration and Mental Toughness in Professional Basketball Players

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Abstract

This study was carried out to investigate the concentration and mental toughness of professional basketball players. A total of 290 professional basketball players aged 16–26 years who played in the Turkish Basketball First and Second Leagues participated in the study. The "Sport Mental Toughness Questionnaire (SMTQ-14)" developed by Sheard et al. (2009) was used to determine mental toughness levels of the basketball players participating in the study, and the "Letter Cancellation Task" scale developed by Kumar and Telles (2009) was used to determine their concentration levels. Data were analyzed by using the Kolmogorov-Smirnov test, an independent samples t-test, and one-way analyses of variance (ANOVA).

Results show that the concentration ability of the basketball players did not significantly differ in terms of gender, age and sports age. There were statistically significant differences in overall mental toughness, confidence and control. The players' mental toughness and confidence scores differed significantly based on sports age. It is interesting to find that overall mental toughness was higher in the basketball players with a sports age of 1–5 years. According to their positions in the play, the players' concentration ability was found to be significantly different between guards and pivots in favor of the guards. The concentration ability of the players playing at the guard position was higher than that of the players playing at other positions. Overall mental toughness and its sub-dimensions had no significant differences according to the positions. However, it is striking that overall mental toughness scores and its sub-dimension scores were high in guards and pivots.

Keywords: basketball players, concentration, mental toughness

1. Introduction

Basketball is a common sport fondly followed by the vast majority of the world, finding its participants in almost every society and age group. The majority of the game takes place in an anaerobic (oxygen-free metabolism) environment, because the game is played at a high speed and occurs with continuous and sudden changes between movement patterns such as leaping, sudden runs and sudden switches of direction (Hoffman and Maresh, 2000; Crisafulli et al., 2002). It is crucial that the player has a good anaerobic toughness, rapidity, and a high level of agility in order to keep his or her ability at top level for 40 minutes while he or she carries out movements that require rapid acceleration and deceleration, direction changes, sideways shifts, leaps (rebounds, blocks and shoots), quick runs (sprints) either with or without the ball in an area which is 28 m long and 15 m wide (Delextrat and Cohen, 2009). The player needs to be ready and active in receiving and throwing passes, in shooting, dribbling, and rebounding at any time due to the fact that the ability to move and decide in basketball is momentary (Muratlı, Toraman and Çetin, 2000). Research shows that elite basketball players have different structural and biomotor abilities when assessed according to their positions in the play. Studies have found similar results on structural differences of players. Pivot players have been shown to be taller and heavier than forward and guard players (Ostojic, Mazic and Dikic, 2006; Latin, Berk and Baechle, 1994). Krane and Williams (2010) proposed an 11-item template of psychological abilities that should be found in elite athletes who are getting ready for the Olympics. Based on this work, Cox (2012) has determined the psychological characteristics of elite athletes. Although they may vary depending on the sports branch, they can be listed as follows: suitable personality characteristics; having a controllable inner focus for success and failure; a high level of self-confidence and belief in the ultimate achievement; intrinsic motivation; a strong goal-oriented dominance for athletic success; a full concentration on an existing task; an ability to control emotion and excitement; strong coping skills to cope with difficulties faced; setting challenging goals and having the ability to formulate plans to achieve them; the ability to use self-talk, imagination, self-control and other psychological methods to gain confidence and motivation; and mental toughness

(Cox, 2012). Concentration is defined as the mental effort that one is willing to put on the most important thing in any situation (Moran, 2004). Concentration is the ability to focus on relevant environmental cues (Weinberg and Gould, 2015). A highly concentrated athlete tries to do his job in the best possible way, speeds up the process of learning new skills, improves his self-confidence, controls stress and anxiety by using his experience and focuses on the factors that are in control. Internal factors that influence concentration are negative thoughts, fears, sadness, and worries. External factors include umpire decisions, spectators, competitor athletes, weather conditions and media (www.scribd.com, 2018). Mental toughness is defined by concepts such as coping with pressure and difficulties effectively, recovery after failures, challenge, being insistent and not giving up, competition with himself and with others, being unaffected or flexible in adverse situations, having a firm belief in taking control of his future, showing improvement under pressure and having superior mental skills (Clough, Earle and Sewell, 2002; Middleton et al., 2004; Jones, Hanton and Connaughton, 2002; Bull et al., 2005; Golby, Sheard and Lavallee, 2003; Thelwell, Weston and Greenlees, 2005; Luthans, 2002). Control, as one of the sub-dimensions of mental toughness, is the ability to maintain performance without being brought under control by another external factor while trying to manage multiple situations. The confidence sub-dimension is the ability to sustain self-belief despite failures and not to quail before opponents. The stability sub-dimension is dedicating oneself to pursue goals and striving to reach the goals despite difficulties. It is closely related with the effort and purpose of achieving predetermined goals despite difficulties. The struggle sub-dimension is the ability to see potential threats as a personal development opportunity and to comprehend the ever-evolving environmental change (Clough, Earle and Sewell, 2002). Mentally-tough athletes have the tendency to be individuals who are highly competitive; determined; self-motivated; able to maintain concentration in situations that cause pressure and can cope effectively with such situations; resist increasing difficulties; and can maintain a high level of self-belief even after failures (Crust and Clough, 2011). Concentration and mental toughness abilities are known to be important components of athlete performance. In light of this information, the aim of this study was to investigate mental toughness and concentration abilities in professional basketball players.

2. Material and Method

In order to investigate concentration and mental toughness abilities in professional basketball players, a total of 290 players aged 16–26 years — 148 females and 142 males — who were playing in the Turkish Basketball First and Second Leagues were included in the study. The "Sport Mental Toughness Questionnaire (SMTQ-14)" developed by Sheard et al. (2009) was used to determine the mental toughness levels of the basketball players participating in the study, and the "Letter Cancellation Task" scale developed by Kumar and Telles (2009) was used to determine the concentration level.

The Concentration Scale: The Letter Cancellation Task as used by Kumar and Telles (2009) was used to measure the concentration levels of the participants. The task consisted of a block of randomly placed letters in 14 columns and 22 rows with six assigned letters listed at the top of the page. The participants were required to cancel the letters within the block in 90 seconds. A score of concentration on the Letter Cancellation Task was calculated for each participant by counting the number of correctly canceled letters within the grid. This score represented the speed and accuracy of the participant's completion and therefore his or her concentration level (Kumar and Telles, 2009).

The Sports Mental Toughness Questionnaire (SMTQ): In order to determine the level of mental toughness in the sports environment, "Sports Mental Toughness Questionnaire (SMTQ-14)" was used. The questionnaire was developed by Sheard et al. (2009) and consisted of 14 items. In addition to general mental stability, the scale included three sub-dimensions (Confidence, Continuity, and Control) with 4-point Likert type questions (1 = False, 4 = Fully True). The Cronbach Alpha values for the sub-dimensions of the original scale were .81 for confidence; .74 for continuity; and .71 for control. The three sub-dimensions of SMTQ are defined as follows. Confidence: It is believing in one's own talents to reach a goal in challenging situations and thinking better than competitors (Items 1, 5, 6, 11, 13, and 14). Control: It is being cool, controlled and comfortable under pressure or in unexpected situations (Items 2, 4, 7, and 9). Continuity: It is taking responsibility, concentration and struggling to achieve objectives (Items 3, 8, 10, and 12) (Sheard, Golby and Van Wersch, 2009; Sheard, 2013).

Statistical Analysis of Data

Data obtained from the basketball players were analyzed in the SPSS 22.0 package program. The normality of the data was tested using the Kolmogorov-Smirnov test. Since the data were found to be normally distributed, independent samples t-tests were used in cases where two independent variables were compared and one-way analyses of variance (ANOVA) were used to calculate the differences between three and more independent variables. Moreover, the frequency distributions of the basketball players who participated in the study were calculated according to their positions by gender.

3. Results

Table 1. Distribution of the Basketball Players by Position and Gender

Position	Gender			
	Female		Male	
	N	*%*	*N*	*%*
Guard	40	27.0	28	19.7
Point guard	21	14.2	26	18.3
Forward	39	26.4	39	27.5
Power forward	22	14.9	26	18.3
Pivot	26	17.6	23	16.2
Total	**148**	**100**	**142**	**100**

Table 1 shows the frequency distributions of the basketball players participating in the study according to their positions and gender.

Table 2. Comparison of the Mental Toughness of the Basketball Players by Gender

Variables	Gender	*N*	M	SD ±	SE	t test	
						t	p
Concentration	Female	148	37.56	13.44	1.10	.866	.387
	Male	142	36.32	10.65	.89		
Overall mental toughness	Female	148	34.76	6.82	.56	1.396	.164
	Male	142	33.82	4.26	.35		
Confidence	Female	148	13.97	2.37	.19	.348	.728
	Male	142	13.86	3.13	.26		
Control	Female	148	12.23	5.94	.48	1.880	.061
	Male	142	11.26	1.59	.13		
Continuity	Female	148	8.84	2.05	.16	.631	.529
	Male	142	8.70	1.70	.14		

As seen in Table 2, there was no statistically significant difference between the female and male basketball players in terms of concentration, overall mental toughness and mental toughness sub-dimensions ($p<.05$). However, female players had higher mean scores on concentration and overall mental toughness than male players.

Table 3. Comparison of the Mental Toughness of the Basketball Players by Age

Variables		Age group	*N*	X	SD ±	F	p	Difference
Concentration	**1**	16–20 years old	114	37.60	12.82	.938	.392	
	2	21–25 years old	97	35.58	11.96			
	3	26 years and older	79	37.72	11.37			
	4	Total	290	36.96	12.15			
Overall mental toughness	**1**	16–20 years old	114	35.51	7.58	4.426	.013**	1–2
	2	21–25 years old	97	33.36	4.10			
	3	26 years and older	79	33.68	3.63			
	4	Total	290	34.29	5.71			
Confidence	**1**	16–20 years old	114	14.51	3.77	4.453	.012*	1–2 1–3
	2	21–25 years old	97	13.60	1.78			
	3	26 years and older	79	13.46	1.77			
	4	Total	290	13.92	2.77			
Control	**1**	16–20 years old	114	12.61	6.59	3.673	.027*	1–2
	2	21–25 years old	97	11.11	1.82			
	3	26 years and older	79	11.30	1.76			
	4	Total	290	11.76	4.40			
Continuity	**1**	16–20 years old	114	8.78	2.02	.457	.633	
	2	21–25 years old	97	8.65	1.80			
	3	26 years and older	79	8.92	1.81			
	4	Total	290	8.78	1.89			

**Significance at .05 level*

As seen in Table 3, there was no significant difference in the concentration ability according to age groups ($p<.05$). Overall mental toughness, confidence and control scores of the players differed significantly depending on age groups ($p<.05$). The mean overall mental toughness score of the 16–20-year-old basketball players was 35.51 ±7.58, while that of the 21–25-year-old basketball players was 33.36 ±4.10. It is interesting that the 16–20-year-old basketball players had higher overall mental toughness scores.

The mean confidence score was found to be 14.51 ±3.77 in the 16–20-year-old basketball players, 13.60 ±1.78 in the 21–25-year-old basketball players, and 13.46 ±2.77 in the basketball players who were 26 years old or older. We can say that the ability to sustain self-belief despite failures and not to quail before opponents was higher in the 16–20-year-old basketball players.

The mean control score of the 16–20-year-old basketball players was 12.61 ±6.59, while that of the 21–25-year-old basketball players was 11.11 ±1.82. We can say that the ability to maintain performance without being brought under control by another external factor while trying to manage multiple situations was higher in the 16–20-year-old basketball players.

Table 4. Comparison of the Mental Toughness of the Basketball Players by Spots Age

Variables		Sports age	*N*	X	SD±	F	p	Difference
Concentration	**1**	1–5 years	31	34.03	15.1	1.613	.187	
	2	6–10 years	106	38.52	11.3			
	3	11–15 years	91	35.65	11.8			
	4	16 years or older	62	37.66	11.9			
	5	Total	290	36.96	12.1			
Overall mental toughness	**1**	1–5 years	31	38.00	9.45	6.769	.000*	1–2 1–3 1–4
	2	6–10 years	106	34.69	6.20			
	3	11–15 years	91	32.96	3.88			
	4	16 years or older	62	33.73	3.45			
	5	Total	290	34.29	5.71			
Confidence	**1**	1–5 years	31	15.26	2.55	4.849	.003*	1–3 1–4
	2	6–10 years	106	14.26	3.71			
	3	11–15 years	91	13.46	1.96			
	4	16 years or older	62	13.34	1.45			
	5	Total	290	13.92	2.77			
Control	**1**	1–5 years	31	13.32	7.33	2.364	.071	
	2	6–10 years	106	12.06	5.70			
	3	11–15 years	91	11.04	1.65			
	4	16 years or older	62	11.50	1.82			
	5	Total	290	11.76	4.40			
Continuity	**1**	1–5 years	31	9.42	1.85	2.197	.089	
	2	6–10 years	106	8.80	2.10			
	3	11–15 years	91	8.45	1.65			
	4	16 years or older	62	8.89	1.79			
	5	Total	290	8.78	1.89			

As seen in Table 4, there was no significant difference in the concentration ability according to sports age ($p<.05$). Overall mental toughness and control scores of the players differed significantly based on sports age ($p<.05$). The mean overall mental toughness of the players whose sports age was 1–5 years was 38.00±15.1 while that of the players whose sports age was 11–15 years was 32.96±3.88. It is attention-grabbing that overall mental toughness was higher in the players with a smaller sports age than in the players with a greater sports age. The mean confidence score of the players whose sports age was 1–5 years was 15.26±2.55 while that of the players whose sports age was 11–15 years was 13.46±1.96. We can say that the ability to sustain self-belief despite failures and not to quail before opponents was higher in the basketball players whose sports age was 1–5 years.

Table 5. Comparison of the Mental Toughness of the Basketball Players by Their Positions in the Play

Variables		Position	*N*	X	SD±	F	p	Difference
Concentration	**1**	Guard	68	40.21	12.9	2.575	.038	
	2	Point guard	47	37.70	11.5			
	3	Forward	78	36.76	11.6			1–5
	4	Power forward	48	35.71	12.4			
	5	Pivot	49	33.27	11.3			
	6	Total	290	36.96	12.1			
Overall mental toughness	**1**	Guard	68	34.76	7.59	1.338	.256	
	2	Point guard	47	33.27	3.86			
	3	Forward	78	33.83	5.00			
	4	Power forward	48	34.02	3.84			
	5	Pivot	49	35.65	6.61			
	6	Total	290	34.30	5.72			
Confidence	**1**	Guard	68	14.04	2.67	.185	.946	
	2	Point guard	47	13.62	2.04			
	3	Forward	78	13.91	4.01			
	4	Power forward	48	13.96	1.86			
	5	Pivot	49	14.00	1.76			
	6	Total	290	13.92	2.77			
Control	**1**	Guard	68	11.91	5.22	.396	.811	
	2	Point guard	47	11.21	1.75			
	3	Forward	78	11.86	4.98			
	4	Power forward	48	11.44	1.79			
	5	Pivot	49	12.20	5.67			
	6	Total	290	11.76	4.40			
Continuity	**1**	Guard	68	8.81	1.86	2.162	.073	
	2	Point guard	47	8.45	1.77			
	3	Forward	78	8.62	1.81			
	4	Power forward	48	8.63	1.73			
	5	Pivot	49	9.45	2.19			
	6	Total	290	8.78	1.89			

As seen in Table 5, according to player positions, guards and pivots had significantly different concentration scores, in favor of the guards ($p<.05$). Overall mental toughness scores and its sub-dimension scores did not significantly differ

according to player positions (p>.05).

The concentration levels of the players were 40.21±12.9 at the guard position, 37.70±11.5 at the point guard position, 36.76±11.6 at the forward position, 35.71±12.4 at the power forward position, and 33.27±11.3 at the pivot position. The concentration ability of the players playing at the guard position was found to be higher than that of the basketball players playing at other positions. It is attention-grabbing that although there was no significant difference in overall mental toughness and its sub-dimensions according to positions, the guard and pivot players had higher scores.

4. Discussion and Conclusion

This research study was carried out in order to investigate the concentration and mental toughness of professional basketball players.

There was no statistically significant difference between the female and male basketball players in terms of concentration, overall mental toughness and sub-dimensions of mental toughness. However, the mean concentration and overall mental toughness scores of the female players were higher than those of the male players (Table 2). In a study titled "Mental toughness and emotional intelligence of professional basketball players in terms of different variables," it was found that mental toughness did not differ according to gender; nevertheless, mental toughness was higher in females than in males (Yazıcı, 2016). There was no significant difference in the concentration ability according to age groups. However, there were statistically significant differences in overall mental toughness, confidence and control according to age groups. The fact that overall mental toughness was higher in the 16–20-year-old basketball players than in the other age groups is an attention-grabbing finding. In the confidence sub-dimension of mental toughness, it was found that the ability to sustain self-belief despite failures and not to quail before opponents was higher in the 16–20-year-old basketball players. In the control sub-dimension of mental toughness, it was found that the ability to maintain performance without being brought under control by another external factor while trying to manage multiple situations was higher in the 16–20-year-old basketball players. The reason for older players to have lower mental toughness mean scores is thought to be due to fatigue (Table 3). Fatigue has been found to cause a decreased mental toughness level in a study to determine the acute effect of fatigue resulting from anaerobic exercise on athletes' mental toughness levels (Güleroğlu, 2017). There was no significant difference in the concentration ability according to sports age. Overall mental toughness and control scores of the players were significantly different depending on sports age. The mean overall mental toughness score of the players with a sports age of 1–5 years was the highest (38.00±15.1). It is worthy to note that the basketball players with a sports age of 1–5 years had a higher overall mental toughness score. The mean confidence score of the players whose sports age was 1–5 years was the highest (15.26±2.55). It was found that the ability to sustain self-belief despite failures and not to quail before opponents was higher in the basketball players whose sports age was 1–5 years (Table 4). According to player positions, concentration scores of the guards were significantly different than those of the pivots, favoring the guards. Overall mental toughness and its sub-dimensions did not significantly differ according to player positions. The concentration level was the highest (40.21±12.9) in the players playing at the guard position. The concentration ability of the players playing at the guard position was higher than that of the basketball players playing at other positions. It is worthy to note that although there was no significant difference between the groups in terms of overall mental toughness and its sub-dimensions, the guard and pivot players had higher scores (Table 5). Research shows that mental toughness can vary from branch to branch and can be influenced by different dynamics (Gucciardi and Gordon, 2009; Bull et al., 2005). According to a study investigating the level of mental toughness of tennis and basketball players, the mental toughness of tennis players was found to be better than that of basketball players (Bülbül, 2015). A positive relationship has been found between emotional intelligence and mental toughness in a study conducted in order to determine the relationship between mental toughness and emotional intelligence in professional basketball players playing in Turkish leagues (Yazıcı, 2016). These research findings support our study.

Results show that the concentration ability of the basketball players did not significantly differ based on gender, age and sports age, but their overall mental toughness, confidence and control scores differed significantly. Overall mental toughness and confidence differed significantly depending on sports age. It is worthy to note that the basketball players with a sports age of 1–5 years had higher overall mental toughness scores. When the basketball players were examined according to their positions in the play, the concentration ability was found to be significantly different between guards and pivots in favor of the guards. The concentration ability of the players playing at the guard position was higher than that of the basketball players playing at other positions. Overall mental toughness and its sub-dimension scores did not differ significantly according to the positions played by the basketball players. However, it is striking that the guard and pivot players scored higher in overall mental toughness and its sub-dimensions.

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