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Investigation of self-awareness levels of female students participating in international youth camp by different variables

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Abstract

The aim of the study was to examine the self-awareness levels of female students participating in international youth camp according to country, age and education variables. The study group of the study was composed of a total of 92 female students who participated in the international youth camp organized by the Ministry of Youth and Sports from Turkey and from various countries. The data of the study were collected by Self-Awareness scale. Descriptive statistical techniques were used in the analysis of the data. Besides this, Mann Whitney-U and Kruskall Wallis-H tests were used for comparison of intergroup data. The results were interpreted at $p < 0.05$ significance level. As a result of the study, it has been observed that the overall self-awareness level of female students participating in the international youth camp is high and regarding the sub-dimensions, cognitive skills of female students, then their social intelligence and lastly their emotional intelligence better establish their self-awareness levels. It was determined that there was no statistically significant difference in self-awareness levels of female students by the age variable in terms of demographic variables, but it varied significantly by the country and education variables.

Keywords: Ministry of Youth and Sports, international youth camp, female students, self-awareness

INTRODUCTION

No matter how much work and responsibilities the individuals undertake today, they will allocate a certain time period to leisure activities according to their personal desires if they use their time effectively and efficiently. Leisure time defined as the free time frame staying out of the time allocated by the individual to professional responsibilities, self and family and being above the obligations (Karaküçük, 2008) results in personal and social development if used positively and causes such problems as inefficiency and sadness if used negatively (Balcı and İlhan, 2006).

Participation in leisure time activities has recently become a way of life and it is now seen as an obligation to introduce different programs and projects for the enhancement and expansion of the activities. For this reason, leisure time activities have benefited the individual physically, socially and psychologically through the presentation of individual's own style. At the same time, the activities in which the individual has performed passively or actively have included the efforts affecting the way of life within the field of activity by enabling them to take place within the community and to glorify living together (Kelly, 1990; Yerlisu et al. 2010).

Participation in leisure time activities may vary from one individual to another. It constantly changes according to the requirements, needs and demands of the individual. Individuals voluntarily participate in recreational programs that include leisure time activities. Because recreational programs are a discipline approach aiming to make a positive contribution to the quality of life and personal development in line with the needs and demands of individuals. Various leisure time activities are held by the Ministry of Youth and Sports [MYS] in Turkey. The youth camps – one of these activities – are prepared to enable individuals to spend their free time with various social, cultural and sports activities. Within the scope of "International Youth Camp" held in two different facilities of MYS in 2015, Samsun 19 Mayıs Youth Camp was held on 31st July – 7th August for female participants and Trabzon Düzköy Youth Camp was held on 9th – 16th August for male participants. Many people participated in these camps not only from Turkey but also from Albania, Bosnia and Herzegovina, Macedonia, Afghanistan, Bahrain, China, Georgia, Indonesia, Mongolia, Morocco, Somalia, Sudan and Togo (Youth Camps, 2015).

As part of the international youth camp program where female students participate as leisure activities, participants have benefited from both academic and cultural activities along with camping activities and have been in thematic sessions. These themes are such topics as volunteering, contribution to society and common values and participants have found the opportunity to exchange ideas on these issues. During the international youth camp, female students coming from different provinces and countries have enjoyed and effectively spent their free time in addition to gaining personal and social values. It was considered important for the students to get personal contributions as much as the social values during the camp. Especially during this time, female participants were also expected to recognize their unknown aspects and to increase their awareness. One of these benefits is to increase self-awareness levels of female participants in the camp.

Self-awareness is the self-knowledge and evaluation phase where the individual applies self-focus according to internal and environmental factors. Self-awareness is defined in different ways in literature. Kernis (2003) defines self-awareness as the process in which one's own feelings, thoughts, and wishes are handled in a realistic way and they know the strengths and weaknesses of their character traits. According to Frisina (2014), self-awareness is defined as an honest understanding of individuals' self-recognition, their own values, desires, thought patterns, motivations, goals and

ambitions, emotional responses, strengths and weaknesses and influence on others. According to another definition, self-awareness means that the individual has a more objective and positive awareness of emotional states such as happiness and sadness (Anderson, et al., 1996; Chang, 1998). At the same time, self-awareness is a condition related to the self-knowledge and capacity of a person (Duval and Wicklund, 1972).

According to Manning (1986), the motives necessary for participation in outdoor recreational activities arise from the desire for success, loyalty, control, escape and self-awareness. Since the individual's self-awareness, self-discovery, success and self-realization elements constitute the center of the individual's value system (Cater 2006; Trauer 2006). It is thought that positive contributions have been made to the self-awareness, self-discovery, success motive, self-realization desires and self-awareness levels of female students through the activities in the program of international youth camp. Since the female students shape their positive-negative behaviors during the camp and express themselves to other individuals they don't know at all.

The purpose of this study is to analyze the self-awareness levels of female students participating in international youth camp by various demographic variables. For this purpose, answers have been sought for the questions below;

1) What is the self-awareness level of female students participating in international youth camp?
2) Do the self-awareness levels of female students participating in international youth camp significantly differ by domestic and abroad countries, age and education?

METHOD

This study, which aims to examine the self-awareness levels of female students participating in the international youth camp according to various demographic variables, is characterized as a descriptive screening model. The study group of the research is composed of a total of 92 female students as 64 females from domestic participants in international youth camp organized by MYS and 28 female abroad participants from Bosnia and Herzegovina, Macedonia, Afghanistan, Bahrain, China, Georgia, Indonesia, Mongolia, Morocco, Somalia, Sudan and Togo. The distribution of female students by their country is indicated in Table 1.

Table 1: The distribution of female students participating in international youth camp by country

Country	n	%	Country	n	%
1-Turkey	64	69.57	8-Indonesia	3	3.26
2-Bosnia and Herzegovina	3	3.26	9-Mongolia	1	1.09
3-Macedonia	3	3.26	10-Morocco	3	3.26
4-Afghanistan	1	1.09	11-Somalia	3	3.26
5-Bahrain	5	5.43	12-Sudan	1	1.09
6-China	2	2.17	13-Togo	1	1.09
7-Georgia	2	2.17	**Total**	**92**	**100**

Data of the research were obtained with "Self Awareness" scale developed by Condon (2011). The scale is composed of two parts. In the first part, there are 3 questions related to country, age and education, 58 questions related to "Self Awareness" and 16 questions stating the current "Mood" of the participants in the second part. Self-awareness levels are determined with the items of 1-21 in the scale directed to cognitive skills of participants, the items of 22-42 directed to social intelligence and the items of 43-58 directed to emotional intelligence.

The scale items are 7-point Likert scaled in the way "1:Describes me extremely poorly……. 7:Describes me extremely well" and the negative items are reversely graded.
The questions ascertaining to the current mood of the participants are 4-point Likert type and the positive items (1, 2, 5, 6, 11, 13, 14, 16) are "1:Definitely do not feel, 2:Do not feel, 3:Slightly feel and 4:Definitely feel" and the negative items (3, 4, 7, 8, 9, 10, 12, 15) are reversely graded.

While the high grades obtained from cognitive skills, social and emotional intelligence sub-dimensions of self-awareness scale indicate that the participants have high level of self-awareness in these fields, the high grades obtained from the questions for mood point out that the participants are in a good mood (psychological well-being). Condon (2011) found the Cronbach's α internal consistency coefficients of the scale as between .62 and .87. In the current study, Cronbach alpha internal consistency coefficients were calculated as .95 for Cognitive skills, .84 for Social Intelligence and .84 for Emotional Intelligence. According to these results, it can be stated that the scale is highly reliable (>.70) (Nunnally, 1978).

The demographic data obtained from the research were arranged and interpreted as frequency and percentage tables. With the purpose of determining the difference between the self-awareness levels of students by the independent variables coming from demographic data, normal distribution of sub-dimensions were analyzed and data were distributed normally according to Skewness and Kurtosis values; however, non-parametric tests such as Mann Whitney-U and Kruskall Wallis-H tests were preferred in analyses due to the fact that some group numbers were low (n<10). The findings obtained were interpreted at p<.05 significance level.

RESULTS

The distribution of female students participating in international youth camp by country, age and education are given in Table 2.

Table 2. Demographic distributions of female students participating in international youth camp

Country	**N**	**%**
Domestic	64	69.57
Abroad	28	30.43
Age		
15-20	47	51.09
21-25	41	44.57
26-30	4	4.35
Education		
College	5	5.43
Undergraduate	78	84.78
Postgraduate	9	9.78
Total	**92**	**100.00**

Concerning Table 2, 64 female students participated in international youth camp from Turkey (69.57%) and 28 female participants from different countries (30.43%). 47 of these participants are aged between 15-20 (51.09%), 41 of them are aged between 21-25 (44.57%) and 4 of them are aged between 26-30 (4.35%). Regarding the education status, 5 of the participants are college graduate (5.43%), 78 of them have a bachelor's degree (84.78%) and 9 of them have a postgraduate degree (9.78%).

Table 3. Descriptive statistical results of self-awareness levels of female students participating in international youth camp

Self-Awareness	**N**	**Aver.**	**SS**	**Min.**	**Max.**	**Skewness**	**Kurtosis**
Cognitive Skills	92	5.39	0.94	1.57	7.00	-0.12	1.33
Social Intelligence	92	4.49	0.82	2.67	7.00	0.68	0.28

Emotional Intelligence	92	5.53	0.72	3.94	7.00	-0.14	-0.65
Mood	92	2.79	0.39	1.81	4.00	0.50	0.67

When Table 3 is analyzed, it is observed that skewness values of data obtained from the sub-dimensions of self-awareness scale are between +1 and -1; Kurtosis values change between -2 and +2 and data distribute normally. However, non-parametric tests were used in analysis of data due to the fact that the number of some groups was low according to the demographic variables (Table 4, 5, 6).

According to Table 3, the averages of self-awareness levels of female students participating in international youth camp in sub-dimensions are as follows; 5.39±0.94 in the sub-dimension of "cognitive skills", 4.49±0.82 in the sub-dimension of "social intelligence" and 5.53±0.72 in the sub-dimension of "emotional intelligence" and the self-awareness levels of female students were found to be higher in emotional intelligence sub-dimension in comparison to other dimensions. In other words, emotional intelligence of female students first, then their cognitive skills and lastly their social intelligence determine their self-awareness levels better. According to these results, self-awareness levels of female students participating in international youth camp are generally high. Concerning the general "mood" averages of the participants (2.79±0.39), it has been observed that they feel themselves in a sort of bad mood.

Table 4. Mann Whitney-U test results on sub-dimension self-awareness levels of female students participating in international youth camp from Turkey and other countries

Dimension	**Country**	**N**	**M.R.**	**S.T.**	**U**	**p**
Cognitive Skills	Domestic	64	43.52	2785.00		
	Abroad	28	53.32	1493.00	705.000	0.10
Total		92				
Social Intelligence	Domestic	64	42.62	2727.50		
	Abroad	28	55.38	1550.50	647.500	0.03*
Total		92				
Emotional Intelligence	Domestic	64	42.05	2691.50		
	Abroad	28	56.66	1586.50	611.500	0.01*
Total		92				

*p<0.05

When Table 4 is analyzed, it is seen that the mean rank of the scores obtained in the sub-dimension of self-awareness scale from the female students participating in international youth camp from other countries is higher than the students participating in the camp from Turkey. However, self-awareness levels of the female students participating in international youth camp significantly differ only in the sub-dimensions of social intelligence ($U_{(92)}$=647.500; p<0.05) and emotional intelligence ($U_{(92)}$=611.500; p<0.05) in favor of the female students participating from other countries.

Table 5. Kruskall Wallis-H test results on self-awareness levels of female students participating in international youth camp by the age variable

Dimension	**Age Group**	**N**	**M.R.**	**Chi-square**	**p**
Cognitive Skills	15-20	47	45.07		
	21-25	41	48.72	0.620	0.73
	26-30	4	40.50		
Total		92			
Social Intelligence	15-20	47	45.40		
	21-25	41	47.74	0.168	0.91
	26-30	4	46.63		
Total		92			
Emotional Intelligence	15-20	47	43.31	1.376	0.50

	21-25	41	49.79
	26-30	4	50.25
Total		92	

Concerning Table 5, self-awareness levels of female students participating in international youth camp don't differ significantly in all sub-dimensions by the age variable according to the Kruskall Wallis-H test result (p>0.05).

Table 6. Kruskall Wallis-h test results on self-awareness levels of female students participating in international youth camp by the education variable

Dimension	Education	N	M.R.	Sd	χ^2	p	Advanced Test (MWU)
Cognitive Skills	College	5	65.40	2	6.122	0.05	
	Undergraduate	78	43.60				
	Postgraduate	9	61.11				
Total		92					
Social Intelligence	College	5	68.50	2	4.906	0.08	
	Undergraduate	78	44.12				
	Postgraduate	9	54.89				
Total		92					
Emotional Intelligence	College	5	68.40	2	7.982	*0.01	1-2
	Undergraduate	78	43.20				2-3
	Postgraduate	9	62.94				
Total		92					

*p<0.05

When we look at the Table 6, self-awareness levels of female students participating in international youth camp by the education variable significantly differ in the sub-dimension of emotional intelligence ($KWH_{(2-92)}$=7,982; p<0.05) while they significantly differ in other sub-dimensions (p>0.05). According to result of Mann Whitney U test applied in order to determine from which group the difference arises in the sub-dimension of emotional intelligence (Table 7), it has been determined that the difference exists between college students and undergraduate students ($U_{(83)}$=88.000; p<0.05) and between undergraduate students and postgraduate students ($U_{(87)}$=200.500; p<0.05). Concerning the mean rank of groups, it has been observed that mean rank of college students and postgraduate students is higher than the undergraduate students.

Table 7. Mann Whitney-U test results on self-awareness levels of female students participating in international youth camp in the sub-dimension of emotional intelligence by the education variable according to binary groups

Education	N	M.R.	S.T.	U	p
College	5	63.40	317.00	88.000	0.04*
Undergraduate	78	40.63	3169.00		
Total	83				
Undergraduate	78	42.07	3281.50	200.500	0.03*
Postgraduate	9	60.72	546.50		
Total	87				

*p<0.05

CONCLUSION and SUGGESTION

In this study analyzing the self-awareness levels of female students participating from Turkey and other countries in international youth camp organized by MYS by the variables of country-based participation, age and education, it has been observed that self-awareness levels of female students are generally high, they have a positive mood and regarding the sub-dimensions, first emotional

intelligence of female students, then their cognitive skills and lastly their social intelligence determine their self-awareness levels better.

Looking at literature, it has been determined in some researches that (Rothlind et al., 2017; Locke, 2005) low level of self-awareness is in directly proportionate to cognitive skills and cognitive intelligences of individuals play an effective role in determining their self-awareness while it has been stated in some other researches that (Stogdill, 1963; Blake and Mouton, 1978) emotional and social intelligence of individuals are effective in establishing their self-awareness. It has been asserted in another study (Condon, 2011) that both cognitive skills and emotional intelligence are important characteristics for self-awareness levels of individuals.

According to Goleman (2000), self-consciousness is the ability of an individual to recognize and monitor any emotion when recognized and to use it in making decisions. Since self-awareness is the ability of self-reflection at a wide range of consciousness levels, it is thought that it causes self-awareness levels of female students to be higher in the sub-dimensions of emotional intelligence and cognitive skills.

In the study of Hançer and Tanrısevdi (2003), it has been ascertained that the feature of being able to understand the feelings and emotions of others – which is one of the most important factors of social intelligence – is among the most important characteristics required in a good and effective leader. In the study of Graves (1999) which evaluates the relation between emotional intelligence and cognitive skills with the purpose of foreseeing the performance, it has been determined that emotional intelligence and cognitive skills play the same important role in interpreting the differences regarding the skills of individuals to demonstrate their (a) effect and (b) interpersonal competences. It is also thought that the positive interaction of female students participating in international youth camp with each other positively affects their self-awareness levels in the dimension of emotional intelligence and cognitive skills.

Another finding of the study is that self-awareness levels of female students participating in international youth camp don't differ significantly by the age variable while self-awareness levels significantly differ in some dub-dimensions by the variables of country-based participation and education. Self-awareness levels of female students participating in international youth camp from other countries have been observed to be higher than the students participating in the camp from Turkey. While self-awareness levels of female students participating in the camp from Turkey and other countries significantly differ in the sub-dimensions of social and emotional intelligence, they don't differ significantly in the sub-dimension of cognitive skills. According to this result, it can be stated that the self-awareness levels of female students participating in the international youth camp from other countries are at a more positive level with social and emotional intelligence dimension.

It is stated in the previous researches (Akbolat and Işık, 2012; Moon and Hur, 2011) that the individuals with high level of emotional intelligence are more successful in their professional life and human relations, they become good leaders and they are more skillful in motivating themselves and others. In the study of Scheer et al. (2012), it has been stated that emotional intelligence is affected from the individual's success, daily social relations and their competitive characters. According to Goleman (1995), emotional intelligence provides employees with the competition power and helps them be more successful in their jobs. It is assumed that although international camp environment doesn't create a sharp competition environment among the participants, the demonstration of

competitive characters of female students participating in the camp from other countries causes this result.

Self-awareness levels of female participant students significantly differ only in the sub-dimension of emotional intelligence by the education variable while they don't significantly differ in the sub-dimensions of cognitive skills and social intelligence statistically. It has been observed that self-awareness levels of college students and postgraduate students are higher than the undergraduate students for the sub-dimension of emotional intelligence. In the research of Gürbüz and Yüksel (2008) conducted on employees, they have stated that the higher the education level is, the higher the total emotional intelligence attitude scores become. The researches conducted and the practices indicate that emotional intelligence can be learnt (Goleman, 2000).

Intelligence and ability come first in the cognitive features. Intelligence and ability points out to the learning potential of the individual while success denotes the learnt potential (Walsh and Betz, 1995). Therefore, the reason for higher self-awareness levels of female students having college and undergraduate degree is thought to be the fact that their capacity to perceive, internalize and respond the information is newer and their emotional and social intelligences come before their cognitive skills. As a matter of fact, Lord et al. (1986) have uttered that intelligence is considerably related to leadership perceptions in order to use the cognitive skills.

As a result, self-awareness concerns individuals' self-knowledge, being aware of the fact that they are self. It is all related to knowing one's own values, beliefs, personal preferences and tendencies. In this regard, it can be stated that the individuals with high level of self-awareness can be more effective and successful in their interpersonal relations due to the fact that they are aware of both their own feelings and the feelings of others, they can empathize with others, they can control themselves and their social and cognitive abilities are high.

Youth Camps provide an environment providing the participants at national and international level with different experiences, new friendships and lasting memories that cannot be forgotten. The fact that especially female students coming from world countries benefit from such practices incorporating the slogan of 'learning by doing and living' within the camp programs emphasizes the importance of this research. In this study analyzing the self-awareness levels of female students participating in international youth camp – organized by MYS – from various countries, analyzing the self-awareness levels of the participants in the camps with male participants, keeping the study samples larger and conducting a new study with the individuals participating from Turkey in similar camps of other countries have been brought as suggestions of the research.

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Main goalkeeper versus his substitute: Which criteria limits the selection of the potential

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Abstract

Goalkeeper (GK) is an expert in soccer and goalkeeping is a completely professional job. In fact, achieving success seems impossible without a reliable GK. Face to this credence, our goals were intended to test the limits of naked-eye coach's appreciation, in selecting the potential goalkeepers via the Algerian championship. Considered by our scientists in their subjectivity to take into account the effect of anthropometric characteristics on quantification of training loads and their relationships with physical performance. Pointed by FIFA in the conviction of the overweight goalkeeper, who should work harder under this dead weight. For this proposal, 28 goalkeepers from eight Oran league teams, second division at Algerian championships. Their homogeneity was assessed giving their qualifications in their teams (14-MG v's 14-SG), as well as their performance in the penalty test. Tested by the flowing trials; Penalty Kicks (PK), drill rule drop (TR), 'T' Drill Test and anthropometric characteristics; body height (BH) & weight (BW) and waist circumference (WC), during the season 2015-2016. As a protocol to predict the differences between selected players and their weaknesses in the penalty test. Based on applied statistics; our results expose the defects of traditional method in the predict of anthropometric characteristics and their influence on training loads to maintain optimal fitness body. Record in the insignificantly of independent t-test in all comparisons practised between MG V'S SG. Advised by the relation BMI to WC size, as higher factors predicting the success of the sample in the penalty test. Supported by similar studies in the quantification of bound training loads, relative with the excess of body fat and its consequences on the physical performance, associated with anthropometric dimensions (shape or type).

Keywords: Goalkeeper, selection, soccer, Algerian.

INTRODUCTION

Describes the role of the goalkeeper (GK) in the game of soccer, the statistics revalued that 80% of team responsible ranking (Simon Smith, 2008) success (Zoran Kacic, 2015), returns to its performance (Joaquin Dosil, 2006) as a particular player (Mat Buckland, 2005), which have de privilege to use different skills separate class than field players (Rafi Srebro, Vladimir Petcov, 2002). Offer him or her the opportunity to be a strategist (Timothy Mulqueen , 2010) during a match (Michael Hurley , 2011).

Especially with the arrival of laws FIFA (John MacKay, 2015), which nominated him to participate as the eleventh player. A task that need from him an additional physical condition, depends on several factors as genetic traits, health, diet, environment, training schedule, moods and body composition control (Domingo J R-C, et al., 2014).

Exposed by (ZORAN M, et al 2011) as reserve physiological, indicators of its physical performance levels (KRUSTRUP P,et al, 2005), associated with it body fat. While it's less increase body physical fitness. Agreed in similar as an ultimate factor troubling the physiological and morphological characteristics of the athletic performance. Support by (Thomas L.et al, 2012) in the organisms' body vitality of player relative to physical load's realisation. Challenging from the coaches an accurate, potential information about the post-game specialness demands, to develop a training program based on those requests (Gray AJ, Jenkins DG, 2010).

Evidence illustrating the complications of the methods for selecting the goalkeepers (Zoran Kacic, 2007). Revealed by our scientists, that the national football never reached its cruising speed, as much as the traditional method is used in the sections of the Algerian footballers. Revoked by FIFA, via overweight goalkeepers (Eddison C,Jeff G. K, 2006) to working (Jerry Kindall, John Winkin, 2000) harder under these conditions (Alex Welsh, 2014). Identify by similar studies in the impact of anthropometric specifications on the physical performance. As well as the limitations of traditional methods, which put our coaches at risk for injuries in selecting the typical goalkeeper training loads and their relation to the level of growth of physical and morphological characteristics. Reported in various Eastern European countries to its weakness, which needs to be validated by scientific theories and evidence. View its judgement based on the naked eye and the experiences of coaches (Elaine Wolstencroft, 2002). Dismissed by (Athanasios G. et al, 2014) in several problems, when the coach centred his decisions based on this method to identify the talents of non-talents.

Backings on these guidelines, this study attempted to examine the strength and weakness of the observation method in the selection of the potential goalkeeper. Recognised by (Mohammad Bazmara, et al, 2012) that this procedure is carried out by coaches using their experiences and observations to choose their GK. While the scientific literature spots the utility of analysis quantitatively or quantified based on the qualifications of the footballer. When quantitative uses give a general trend, still qualitative values propose specific training positions. Reference in similar studies as guidelines for establishing the individualised training and assessment program in the players' profession plan (Hakim Hamzaoui, et al, 2016). Suggested by (Ziv G and Lidor R., 2011) that coaches must bring a cautious approach when they planned their tests protocols and devices for assessing physiological and physical characteristics among the recruitment of GK. From the proofs, the present study, challenge to inspect the gaps of the observation method for selecting the potential goalkeeper. Based on the light of their qualification Main goalkeeper (MG) or substitute (SG), and their ratio performance in penalty testing (PPT %), as protocol chosen for this modest study.

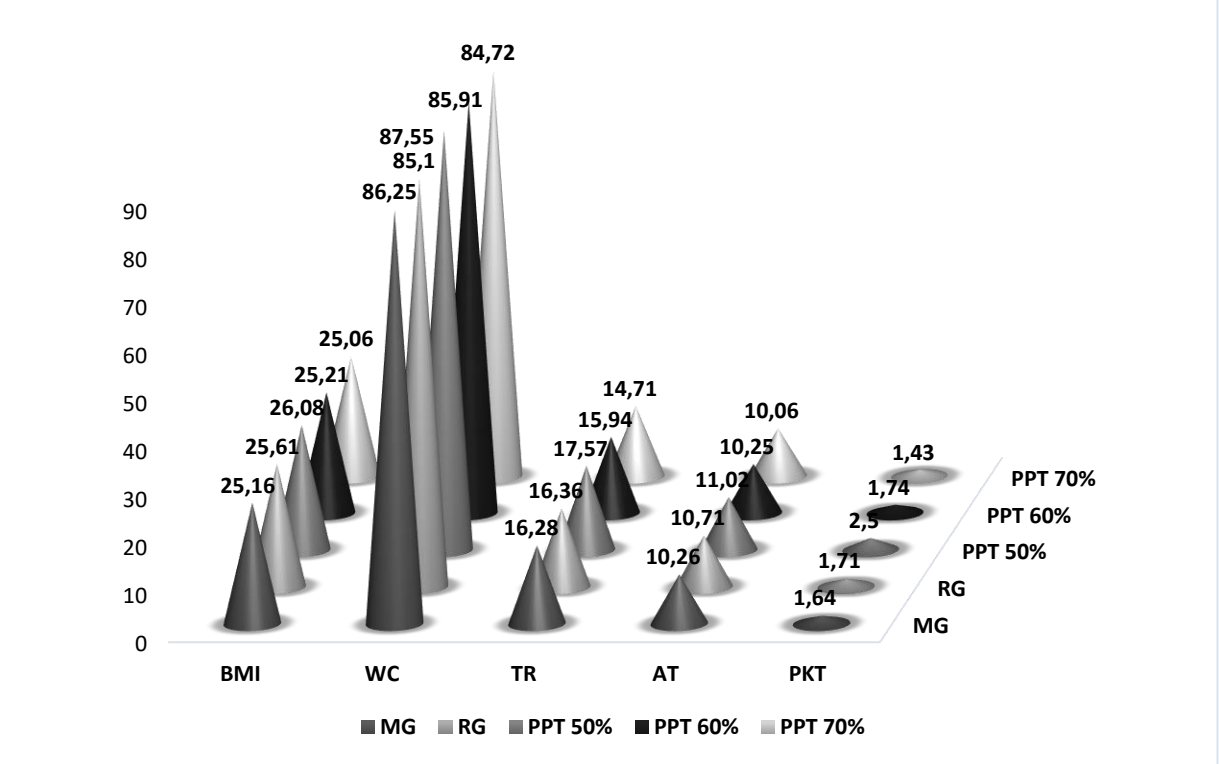
METHOD

Search approach:

The researchers centred on the descriptive approach with two groups of goalkeepers classified into the following groupings: Total GK=28, main MG=14 and substitutes RG=14. As well as their ratio in penalty testing performance (PPT %). Such as a protocol to check the impact of training program between the two groups as well as the predictions of the factors that weaken their performances in goalkeepers skills. Support for proposals that football coaches employed with GK need to know that professional adult GKs usually have a body mass under 5% (kg/m^2) its ideal weight related to its height; mixed agility, strength, power and speed; cover approximately 5.5 km during a game, mostly by walking and jogging. Account by similar studies in the extra body fat as a negative effect of the body loss management relative to the realised training programme (Sporis G, et al, 2009).

The research sample

Represent all goalkeepers under 17 years with the best ranking in Oran football league for the season 2015-2016. The second division holds in their posts, their homogeneousness was calculated based on age training and test penalty kicks skill, the time the reaction (Ruler Drop Test) and Agility-T- test, and anthropometric parameters (BH, BW, BMI, WC) at the end of the Go phase. As protocol, See



body mass index (BMI), Waist circumference (WC), Ruler Drop Test (TR), 'T' Drill Test (AT) and Test penalty kicks skill (PKT)

Figure 1. Characteristics of Main Goalkeeper (MG) versus his Substitute (MG) appointing based on the protocol.

Testing Protocol

All physical tests were conducted after warm-up, which was under the supervision of the goalkeepers coach.

Anthropometry, Body Composition, and waistline as indicator of obesity

Body height (cm) and body mass (kg) of each player were measured and the body mass index (BMI) was calculated (kg/m^2). Waist circumference was measured as a surrogate of body fat distribution as the complement of BMI measurements. To evaluate the results: we refer to the normative data of BMI or WC provided by the World Health Organization according to (Stanley P. B, Wayne C. M, Jane M. E, 2006), agreed by the Medical Science, according to (Neeraj Goswamy, MD, 2014).

Ruler Drop Test (TR)

The objective of this test is to monitor. The athlete's reaction time. To undertake this test, we will require Metre ruler – Assistant, to conduct the test:

- The assistance between the outstretched index finger and thumb of the athlete's dominant hand holds the ruler so that the top of the athlete's thumb is level with the zero centimetre line on the ruler.
- The assistant releases the ruler and the athlete catches the ruler between their index finger and thumb as quickly possible.
- The assistant record distance between the bottom of the ruler and the top of the athlete's thumb, where the ruler has been caught.
- The test is repeated 2 more times and the average value used in the assessment.

To evaluate the results: we refer to the normative data, adapted for 16 to 19-year (Bob Davis, 2000).

'T' Drill Test (AT)

The subjects start from the standing point at cone A, and they are asked to run in a straight line to come to B. Then, they slide to cone C, which is the left side. After touching cone C, they slide to the right and touch cone D. Finally, they run again to the left, touch Cone B, and run back to the start position. Every subject performed three trials with the best score recorded for analysis (Robert G. L. et al, 2014).

Test penalty kicks skill (PKT)

In the penalty kick scenario, the goalkeeper is the threatening primary source in the environment (Jay Martin, 2015). While in the case of this study, we recruited 5 senior players who framed their shots well. All kicks were in the legal position defined by FIFA's laws. Each goalkeeper must stop the 5 shots. All penalties go by the turn. The non-framed penalty it is not counted.

Statistical Analyses

All results were analysed using SPSS software (version 20.0; SPSS, Inc., Chicago, IL) in p value was set at $p<0.05$. As our protocol is carried out to assess the differences between MG and RG. We based on the independent sample t-test to get access to the difference between the two groups. While the multi-regression analyses were used to predict the factors, which explain the weakness of our GK in penalty test, giving to variables choose to study. Shapiro-Wilk and Levine were accompanied to analyse the normality and homogeneity of our total sample.

RESULTS

On the light of the qualification of our GK (MG Vs SG) and their performance ratios in penalty testing (PPT %), as protocol chosen in this study sees Figure 1. Composed to check the advantages and disadvantages of naked-eye appreciation in selecting the potential goalkeepers as a procedure practised by our coaches. Through Table 1. Built on descriptive statistics. Our results categorise our total sample in overweight category giving their BMI at high risk of abdominal obesity, agreeing with their WC more than 80cm. As well as the differences between the MG and SG are not statistically significances. Justified by the independent t-test in all comparisons practised. Recorded by researchers in weight for height relationship to predict the ideal BMI, and WC to BMI to predict the adjusted physical fitness body. Expected in by Multi-Regression analyses see Table 2. Through the BMI and WC as the only predictors of success in penalty testing at $P \leq 0.05$. Reinforced by significant of F and T at $P \leq 0.001$. A result, which guides us to confirm the need of desirable body weight building, aimed at the ideal composition body (Kathleen M L, Sylvia E-S, and Janice L. R, 2012) relative to the levels performance among our sample. Admitted by the search teams, as an inappropriate body mass index (BMI) expressing the excess of body gain (M Zerf, 2017). Whereas its measurements are limited when we used the naked eye as a means to select the potential goalkeeper. Interpret by (Edward T H & Dixie L T, 2017) as a negative effect of fat relates to the both mechanical and metabolically in most physical tasks depending on the translocation of body weight (William E. Garrett, Donald T. Kirkendall , 2000). Illustrated by (Walter F. B & Emile L. B, 2012) in its upper, affects the movements, to become fluid and more energetically efficiently reflected by highly trained athletes. Upholds in this study as defects of observation method, which bases its judgments on the behaviour of the naked eye. Recorded in body fat, as a factor, influencing the physical performed relative to anthropometric characteristics (Mohammed Zerf, 2016). Missing from players to achieve higher results, upper than the average, absolute to their bodily constitution relative to their training process for long-term (Marko G, Stevo P, Slavko M, Bojan M, and Mica R, 2017) with maximum efficiency. Estimated in this study, through the weight-for-height reference of the optional body connected to the select athletes at lower levels of fat. Relying on the quantification and comparison of anthropometric indexes, which should help coaches have a better understanding of the necessities of post-play specification (Zerf M, Houar A, Mime M and Bengoua A, 2016).

Table 1. Descriptive Statistics

		N	Mean±SD	Shapiro-Wilk	p≤0,05	Levene's	p≤0,05	T	p≤0,05
Weight (kg)	MG	14	67.41±6.05	0.949	0.538	0.353	0.558	-0.39	0.699
	SG	14	68.33±6,36	0.894	0.094				
	Total	28	67.87±6.11	0.944	0.472				
Height (cm)	MG	14	177.07±4,22	0.935	0.358	1.073	0.310	0.48	0.630
	SG	14	176.07±6.40	0.912	0.168				
	Total	28	176.57±5,34	0.908	0.148				
WC (cm)	MG	14	86.25±1,82	0.943	0.458	0.924	0.335	0.27	0.876
	SG	14	85.10±2,16	0.945	0.482				
	Total	28	15.16±1,96	0.889	0.078				
BMI (kg/m2)	MG	14	25.16±1.71	0.889	0.079	2.27	0.144	0.94	0.36
	SG	14	25.61±1.39	0.887	0.074				
	Total	28	25.89±1,56	0.952	0.587				
PK (n°)	MG	14	1.64±0.84	0.941	0.427	0.003	0.955	-0.44	0.67
	SG	14	1.78±0.89	0.944	0.467				
	Total	28	1.71±0.85	0.949	0.538				
TR (cm)	MG	14	16.28±2.84	0.894	0.094	0.52	0.477	-1.03	0.31
	SG	14	16.36±2.67	0.944	0.472				
	Total	28	16.31±2.76	0,935	0,358				
AT (secs)	MG	14	10.26±0.66	0.912	0.168	0.36	0.553	-1.87	0.07
	SG	14	10.71±0.59	0.908	0.148				
	Total	28	10.48±0.65	0.943	0.458				

waist circumference (WC)'17years': 73.66 to 78.74 (cm) via sportsmen, more are suggestive at high-risk body fat, Body Mass Index (BMI) overweight≥25, Ruler Drop Test Average (TR) 15.9 - 20.4cm, 'T' Drill Test Average (AT) 10.13 - 10.37 secs, penalty kicks (PK)skill Less goal, to calculate the success rate (PPT%).

Table 2. Multi-regression analyses relating performance in penalties (PPT %) with the other variables listed in the present study

Least squares multiple regression

Dependent Y	PPT%

Method	Stepwise
Enter variable if P<	0.05
Remove variable if P>	0.1

Sample size	28
Coefficient of determination R2	0.7460
R2-adjusted	0.7257
Multiple correlation coefficient	0.8637
Residual standard deviation	0.4587

Regression Equation

Independent variables	Coefficient	Std. Error	rpartial	t	P
(Constant)	24.4998				
BMI	-0.3873	0.1285	-0.5163	-3.015	0.0058
WC	-0.09120	0.02293	-0.6225	-3.977	0.0005

Variables not included in the model
TR
AT

Analysis of Variance

Source	DF	Sum of Squares	Mean Square

Regression	2	15.4538	7.7269
Residual	25	5.2605	0.2104

F-ratio	36.7217
Significance level	P<0.0001

DISCUSSION

Founded on the last few years, there is no other position on the soccer field that has seen so many deep-rooted changes as seen in goalkeeping. Our data collected or control data, indicated in insignificant of the independent t-test significant thought all comparisons practised between our two groups. Similarly, to BMI and WC as the simply factors capable of recognising the changes in success in the penalty performance.

Our results claim the defects of the observation method at the base of the naked eye. Founded on the affirmation accommodated by anthropometric studies, that certain physical factor, including body fat, body mass, muscle mass and body influence a lot on athletic performance (Cherif M, Mohamed S, Najlaoui O, & Gomri D, 2012). Documented in the case of this study in the levels of BMI related to WC. Where our selected goalkeepers (MG or SG) are classified as overweight at high-risk abdominal obesity, according to WHO standards. Inferred in previous as a factor influencing performance (Zerf M, Atouti N, & Ben F A, 2017). Account by FIFA as dead body weight gain, which needs additional work via overweight goalkeepers. Understood by the research team, in weight gain and weight stabilisation corresponds to adjust body weight associated with body lost and control program. Esteemed by previous researchers in the excessive body fat. As a phenomenon, at high-risk factors, injury related to the increase in body mass index (BMI). Leading the athlete to many risk factors that requested examinations of the association between excessive weight and sports damage (A Ezzat, A Schneeberg, M Koehoorn, 2014). Claims by (William J. K, Steven J. F, Michael R. D, 2012) in its consequences on physical performance. Indeed by (Stanley P. B, Wayne C. M, Jane M. E, 2006) in the relation between body composition and advantage athletic performance to keep up a high level of fitness associated with the ideal athletic body competition.
From the principle, that body composition analysis is part of the physical fitness assessment in estimating the impact of the body gain corresponds to level fat and lean muscle (Philipp Halfmann, 2012). As an expected goal target of weight loss program (Sandy Fritz, 2013), including the decrease of body fat (John C Griffin, 2015) to achieve desired body composition relative to best performance.

Our recommendations are addressed to our coaches, especially the goalkeeper trainers to check and record the changes in body composition compared to fat levels since its lower improve performance (William J. K, Steven J. F, Michael R. D, 2012). The case of our MG or SG categorised in overweight. Leading the researchers to approve that sports involvement cannot guarantee its influence on physiological and morphological body composition, requesting from coach/player to prescribe the exercise for weight loss (Pantelis T N, 2012). Exposed by Carlos Lago-Peñas et al, that training program mid football players need to be modified in consideration of its consequences on skills and athletics events (Carlos L-P, Ezequiel R, Luis C, and Maite G-L, 2014). Challenged by the agility, balance, coordination, power, reaction time and speed, as most physical and motor qualities missed among all footballers (Eleanor M & Linda D, 2015). Conjured in this study via the excess of body fat impairs the ability to execute agility movements at a high level (Brent A A, Katie S and Patricia A D, 2017). Agreed by (Roberta E. Rikli, C. Jessie Jones, 2013) in the excessive body fat, which powerless the human to

move with grace. Designate by (Jay D, Mark R, 2012) in agility and speed decreasing middle players with more percentage fat.

Since the main goal of any training process is to stimulate physiological, biomechanical and psychological demands (Bill Foran, 2000). We highlight our overweight goalkeepers to works harder to develop their agility, speed, and flexibility, as well as willingness and motivation as a psychological procedure (Don Z, Peter E, 2013).

Further, to select the foremost goalkeeper, we accentuate our coaches' to inspect the desirable physical qualities associated with ideal anthropometric characteristics (Alan Hargreaves, 1990) based on control tests (lab or field) to ensure the benefits of the required training program. A practice criticises by the Algerian studies, through goalkeepers training sessions (Hadjar Kh. M., et al, 2016). Record in them recommendations to integrate the goalkeepers in all training sessions. In order to maintain or improve their physical fitness (Lorenzo D I, Ferretto F, 2004) and basic skills (Horst Wein, 1973). Founded on the scientific method, as a fundamental and significant practice must use in the developed countries (Sanjay Kumar Prajapat, 2015). The opposite of Algerian practices indicate by our scientists, that national football never reached its cruising speed, as much as the traditional method is used to select our soccer. Admit by similar in their several problems when coach use the naked eye as a method (Zerf Mohammed et al., 2016). Confident by Algerians studies in its weakness to rate or to reckoning the amount of body fat and their effects on athletics fitness. Describe by (Zahner, L. e, 2012) in the selection based on the "gaze of coach" which is subjective and based on instinct.

On its purpose, we suggested that the selection of players must focus on the laboratory or field tests to confirm the progress and gaps of selected players. The case of this study, which claimed the limitations of traditional methods in selecting the potential goalkeepers. Owing to the physiological demand assessment associated with body composition change (body fat, bone and muscle), requesting the employ of scientific basis to quantify loads of training programs to improve physical performance in accordance with anthropometric size. Advanced in the current study based on FIFA statistical via the overweight goalkeeper (Eddison C,Jeff G. K, 2006). Demanding it lasts to work harder under this body weight disorder to fulfil the specifics physiologic, morphologic and physical requests (Gerd T, Klaus R, 2000). Although, as a recommendation, we ask our trainers to apply the scientific method to test the development of teams/players with different aspects associated with their needs during the match connected to their levels of fitness coordinated to them body components (Donald T Kirkendall, 2007).

CONCLUSION

Since the overweight in our sample warrants further investigation to control the consequences of overweighting via goalkeepers. Needs from our coaches to develop an intervention that targets weight management. As a negative point in our coaches' selection practices. It is extremely important for our coaches to know; selecting a potential goalkeeper involves the application of multidisciplinary scientific and highly expert approach with available scientific findings and inferences, skilful knowledge, intuition and experience to decide about player choice and training (Slavko T, Vladan P, Viktorija T, and Damir V, 2008). Evidence guides us to criticise the naked eye as a method, which built their judgements on coaching experience. Record in the present study in its failure to predict the effects of body composition (Gerd T, Klaus R, 2000) or body fat on the levels goalkeepers performance, associated with specified post-game physical demands (Claire Mitchell-Taverner, 2005). Expressed by (Reilly T, Williams AM, Nevill A, Franks A, 2000), to predict the success of talent in adult elite competition, the anthropometric and physical characteristics are actually crucial to discriminate talented from non-talented soccer players

(Robertson S, Woods C, Gastin P, 2015). Although to select the potential goalkeeper, we recommended our coaches to approve their observations. Found on predisposing tests to enhance their decisions credibility and objectivity in selecting/detecting or evaluating the progress of their players in the long-term or short (Buchheit M, et al, 2012).

Conflict of interest

None.

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Conflict of interests: None

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Reviewing perceived exercise benefits and barriers among sports employees

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Abstract

The purpose of this study was to examine perceived exercise benefits and barriers in sports employees. The sample of the research consists of a total of 200 sportsmen consisting of Antalya youth services and trainer and sports specialist working in the sports center and physical education teachers working in the schools related to national education. The Exercise Benefits/Barriers Scale developed by Sechrist, Walker and Pender (1987), Turkish validation and reliability tests of which were performed by Ortabağ (2009), was employed to determine the exercise benefits and barrier levels of the participants. In the evaluation of the data, frequency analysis, t test and ANOVA test were used. As a result; it was found that there were significant differences between perceived exercise benefits and barriers and variables of marital status, adequate nutrition, exercising. It was identified that the single employees had higher level of perceived exercise benefits and barriers than the married employees. There was also a significant difference between perceived exercise benefits and adequate nutrition. On the other hand; there was not a significant difference between perceived exercise barriers and adequate nutrition. There was also a significant discrepancy between perceived exercise benefits and exercising. However; no significant difference was found between perceived exercise benefits and barriers and variables of age and gender. Also; average perceived exercise barriers were higher among female employees than male employees.

Keywords: Sports employees, perceived exercise benefit/barrier

INTRODUCTION

Exercise is the whole of scheduled physical activities performed for fitness, physical performance, and weight control or maintaining health (Thompson, Gordon and Pescatello, 2009). Regular physical activity has been reported to be useful for improving physiological and psychological health (Biddle, Gorely and Stensel, 2004). Exercise offer numerous advantages such as increasing strength, endurance and flexibility of muscles, reducing and maintaining weight, as well as decreasing risks for cardiovascular diseases and thrombosis, blood lipid and glucose levels, improving psychological status and sleep quality, bone mineral density, and preventing some cancers and reducing chronic pain (Lee et al. 2012). Exercise are reported to play a crucial role in preventing and treating diseases (Ardıç, 2014). An active life style enhances energy and vitality and strengthens one's energy and will to live (Mavric et al., 2014). Perceiving benefits of health promoting behaviors, internal and external factors, motivation of individuals, health status and perceiving benefits of behavior are effective upon health improving behaviors (Öz, 2004; Sabuncu et al., 1993). It is important for the individual to understand his or her illness and health. Based on this perception, health behaviors, awareness is strengthened and the individual controls his / her health (Baltaş et al., 2008). In order to gain health benefit, it is recommended that physical activities should be done moderately and regularly (Pender et al., 2006). Individuals may perceive various barriers to positive health behaviors on individual and social basis depending on different reasons like psychological, cultural, individual factors. Barriers are internal and external factors that prevent health promoting behaviors from being realized. Among barriers to positive health behaviors are physical and psychological characteristics, motivation and environmental factors (Maurer and Smith, 2000). Barriers to regular physical activities may include being too busy to do physical exercises in professional life, family and daily routines, having the idea that physical activities are not necessary because of the assumption that a normal body weight is maintained, fear of injuries, not playing sports before, not enjoying doing exercises alone, weather conditions, not feeling safe when doing exercises alone, health problems and lack of proper places for physical activities in residential areas (WHO, 2016.) As exercise benefit perception prevails over exercise barrier perception, possibility to perform positive health behaviors increases (Baltaş et al., 2008; Maurer and Smith, 2000; Tabak, 2000). It is pointed out that there is a positive correlation between perceived exercise benefits and doing exercises (Esposito and Fitzpatrick, 2011). It is thought that sports employees (coaches, sports specialists, physical education teachers) are important in terms of the formation of exercise benefits and obstacles perceptions, awareness of exercise benefits, elimination of exercise barriers, and liking sport to other people in society. In this sense, investigation of exercise benefit and barrier gains importance. It is argued that maximizing exercise benefits and minimizing exercise barriers are important for human health. In the current study; the aim was to review level of perceived exercise benefits and barriers among physical education teachers, trainers and sports experts who worked in sports field.

METHOD

The sample of the research consists of a total of 200 sportsmen consisting of Antalya youth services and trainer and sports specialist working in the sports center and physical education teachers working in the schools related to national education. The Exercise Benefits/Barriers Scale developed by Sechrist, Walker and Pender (1987), Turkish validity and reliability tests of which were performed by Ortabağ (2009), was employed to determine the exercise benefit/barrier levels of the participants.

The Exercise Benefits/Barriers Scale

"Exercise Benefit/Barrier Scale" was developed by Sechrist, Walker and Pender in 1987. Cronbach Alpha coefficient of the scale was 0.95. Cronbach Alpha coefficients of EBBS-subscales ranged

between 0.95 and 0.86 (Sechrist, Walker and Pender, 1987). Turkish validity and reliability tests of the scale were performed by Ortabağ (2009) in the study titled as Validity and Reliability of the Exercise Benefits/Barriers Scale for Female University Students in Turkey. In the study of Ortabağ, Cronbach Alpha coefficient of the scale was 0.92. In the current study, Cronbach Alpha coefficient of the scale was found to be 0.91. The scale is consisted of a total of 43 items. There are two subscales of the scale: Exercise Barrier Scale and Exercise Benefit Scale. Each subscale can independently be used. A score obtained from all the items provides score of the Exercise Benefit/Barrier Scale. The scale can be used and scored as a whole or two different scales. Items of the scale are marked in Likert format with the following codes: from Strongly Agree to Strongly Disagree. Items of the Barrier Scale are 4, 6, 9, 12, 14, 16, 19, 21, 24,28, 33, 37, 40 and 42 while items of the Benefit Scale are 1, 2, 3, 5, 7, 8, 10, 11, 13, 15, 17, 18, 20, 22, 23, 25, 26, 27, 29, 30, 31, 32, 34, 35, 36, 38, 39, 41 and 43. The lowest score is 43 while the highest score is 172. The higher a score is, the more one believes in exercise benefits. Total score of Benefit Scale ranges from 29 to 116 while total score of Barrier Scale ranges from 14 to 56. Therefore; the higher a score is, the higher one perceives of barriers to exercise.

Data Analysis

Frequency analysis, significance test (t test) of the difference between two averages and ANOVA test were used to assess the data. For the analyses of the data; frequency analysis, significance test (t test) of the difference between two averages and ANOVA test and Post-hoc TUKEY test were employed.

RESULTS

Table 1. Descriptive characteristics of sports employees

Variables		**N**	**%**
Age	19-23	59	29.5
	24-28	67	33.5
	29-33	33	16.5
	≥34	41	20.5
Sex	Female	96	48.0
	Male	104	52.0
Marital status	Single	150	75.0
	Married	50	25.0
Adequate nutrition	Yes	56	28.0
	No	144	72.0
Exercising	Yes	198	99.0
	No	2	1.0
Status of exercising	Never	24	12.0
	1-2 days a week	106	53.0
	≥3-4 days a week	70	35.0
	Total	200	100.0

As seen in Table 1; 33.5% of the participant sports employees belonged to 24-28 age group, 29.5% of them to 19-23 age group; %48 of them were female, 52% of them were male and 25% of them were married (n:50), 75% of them were single (n:150). 72% of the participants thought that they did not have an adequate nutrition (n:144), 99% of them told that they played sports (n:198) and 53% of the participants stated that they did exercise 1-2 days a week (n:106).

Table 2. Assessment of perceived exercise benefit/barrier in terms of age variable

Perceived exercise benefit/barrier	Age	N	$\bar{X}$	σ	F	p
Perceived exercise benefit	19-23	59	1.66	.34	1.537	.206
	24-28	67	1.60	.29		
	29-33	33	1.62	.21		
	≥34	41	1.53	.31		
Perceived exercise barrier	19-23	59	2.00	.48	1.727	.163
	24-28	67	1.89	.32		
	29-33	33	1.93	.27		
	≥34	41	1.82	.41		

As seen in Table 2, there was not a significant discrepancy between perceived exercise benefit/barrier and age variable ($p>0.05$). Average scores of perceived exercise benefit and perceived exercise barrier were higher among those sports employees aged 19-23 years than other age groups [respectively, (1.66±0.34) (2.00 ± 0.48)].

Table 3. Assessment of perceived exercise benefit/barrier in terms of gender variable

Perceived exercise benefit/barrier	Gender	N	$\bar{X}$	σ	t	p
Perceived exercise benefit	Female	96	1.61	.31	-.094	.925
	Male	104	1.61	.29		
Perceived exercise barrier	Female	96	1.92	.39	.075	.940
	Male	104	1.91	.39		

As seen in Table 3, there was not a significant difference between perceived exercise benefit/barrier and gender variable ($p>0.05$). It was found that average score of perceived exercise barrier was higher among female employees than male employees.

Table 4. Assessment of perceived exercise benefit/barrier in terms of marital status variable

Perceived exercise benefit/barrier	Marital status	N	$\bar{X}$	σ	t	p
Perceived exercise benefit	Single	150	1.64	.30	2.472	**.014***
	Married	50	1.52	.30		
Perceived exercise barrier	Single	150	1.96	.39	2.987	**.003***
	Married	50	1.77	.37		

As seen in Table 4, there was a significant difference between perceived exercise benefit/barrier and marital status variable ($p<0.05$). Average score of perceived exercise benefit was 1.64±.30 among the single sports employees while it was 1.52±.30 among married sports employees. On the other hand;

average score of perceived exercise barrier was 1.96±.39 among the single sports employees while it was 1.77±.37 among married sports employees. It was seen that perceived exercise benefit/barrier of the single sports employees was higher than married sports employees.

Table 5. Assessment of perceived exercise benefit/barrier in terms of adequate nutrition variable

Perceived exercise benefit/barrier	Adequate nutrition	N	$\bar{X}$	σ	t	p
Perceived exercise benefit	Yes	56	1.51	.37	-2.415	**.006***
	No	144	1.64	.26		
Perceived exercise barrier	Yes	56	1.85	.48	-1.306	.036
	No	144	1.94	.35		

As seen in Table 5, a significant difference was found between perceived exercise benefit and adequate nutrition variable ($p<0.05$) whereas there was not a significant difference between perceived exercise barrier and adequate nutrition variable ($p>0.05$). Average score of perceived exercise benefit was 1.51±0.37 among those sports employees who had an adequate nutrition while it was 1.64±0.26 among those sports employees who did not have an adequate nutrition. As for score of perceived exercise barrier; it was 1.85±0.48 among those who had an adequate nutrition while it was 1.94±0.35 among those who did not have an adequate nutrition.

Table 6. Assessment of perceived exercise benefit/barrier in terms of exercising variable

Perceived exercise benefit/barrier	Exercising	N	$\bar{X}$	σ	Post Hoc	F	P
Perceived exercise benefit	Never[1]	24	1.70	.38	1-2 2-3	3.320	**.038***
	1-2 days a week[2]	106	1.63	.22			
	≥3-4 days a week[3]	70	1.54	.36			
Perceived exercise barrier	Never	24	1.93	.42		.197	.821
	1-2 days a week	106	1.93	.29			
	≥3-4 days a week	70	1.89	.50			

As seen in Table 6, a significant discrepancy was found between perceived exercise benefit and exercising variable ($p<0.05$) while there was no significant discrepancy between perceived exercise barrier and exercising variable ($p>0.05$). Average score of perceived exercise benefit was 1.70±0.38 among those saying that "I never exercised in a week", 1.63±0.22 among those saying that "I exercised 1-2 days a week" and 1.54±0.36 among those saying that "I exercised ≥3-4 days a week". Average score of perceived exercise barrier was 1.93±0.38 among those saying that "I never exercised in a week", 1.93±0.22 among those saying that "I exercised 1-2 days a week" and 1.89±0.50 among those saying that "I exercised ≥3-4 days a week". It was noted that in terms of perceived exercise benefit, there was a significant difference between those sports employees stating that they never exercised in a week and those sports employees stating that they exercised 1-2 days a week and between those sports employees

stating that they exercised 1-2 days a week and those saying that they exercised ≥3-4 days a week. It was interesting that perceived exercise benefit was higher among those sports employees stating that they never exercised.

DISCUSSION and CONCLUSION

Demographic information of sports employees participating in the survey; 29.5% of the participant sports employees belonged to 19-23 age group, 33.5% of them to 24-28 age group; %48 of them were female employees, 52% of them were male employees; 25% of them were married, 75% of them were single; 72% of the participants thought that they did not have an adequate nutrition; 99% of them told that they played sports and 53% of the participants stated that they did exercise 1-2 days a week (Table 1). There was not a significant discrepancy between perceived exercise benefit/barrier and age variable but average scores of perceived exercise benefit and perceived exercise barrier were higher among those sports employees aged 19-23 years than other age groups (Table 2). No significant difference was found between perceived exercise benefit/barrier and gender variable. It was identified that average score of perceived exercise barrier was higher among female employees than male employees; which may – according to us- have resulted from the fact that women in our society did not have time or had a limited time for exercising at home and professional life (Table 3). In a study of women with exercise benefit and disability perception, excessive workload, irregular working hours, lack of time and space for exercise, and physical difficulties were found to be factors that prevented women from exercising (Doğan and Ayaz, 2015). In another study in which perceived exercise benefits and barriers were examined among female university students, perceived barriers to exercise were reported as physical exertion, time expenditure, exercise milieu and family discouragement (Lovell, Ansari and Parker, 2010). In another study; younger and older non-exercising groups of women were compared in terms of barriers to do physical activities and total barrier perception was found considerably higher among the older age group (≥28-35 years) (Ansari and Lovell, 2009). There was a significant difference between perceived exercise benefit/barrier and marital status variable. Perceived exercise benefit/barrier was higher among the single sports employees than married sports employees. Life of an adult individual is different before and after marriage. We are of the opinion that the correlation between duties and responsibilities imposed by marriage and transition to a regular life is one reason for highly perceived exercise benefit (Table 4). Individuals' live styles influence both their quality of life and length of life (Karadeniz et al., 2008). It was explored that perceptions of health responsibilities of the married people are stronger than those single (Ayaz, Tezcan and Akıncı, 2005). Since marriage results in an orderly life style, it may be suggested that healthy life behaviors of the married people are higher (İlhan, Batmaz and Akhan, 2010). Findings of this study were similar to the findings of the current study. There was a significant discrepancy between perceived exercise benefit and adequate nutrition variable while no significant discrepancy was found between perceived exercise barrier and adequate nutrition variable. Perceived exercise benefit/barrier of those without adequate nutrition habits is higher. If individuals do not care about nutrition and do not have a regular and balanced nutrition, we think that they create a positive perception of exercise benefits (Table 5). It was found that, exercise score of those who told that they had adequate and balanced nutrition was also high (Yalçınkaya, Özer and Karamanoğlu, 2007). A significant discrepancy was found between perceived exercise benefit and exercising variable while there was no significant difference between perceived exercise barrier and exercising variable. It was interesting that perceived exercise benefit was higher among those sports employees stating that they never exercised in a week (Table 6). In a study on health care employees' perceived exercise benefit/barrier, it was identified that perceived exercise barrier was higher among those nurses who did not have any opportunity to exercise, had a disease that prevented them from exercising, did not exercise

regularly and exercised 1-2 days a week, took medication regularly, were overweight and obese (Doğan and Ayaz, 2015). According to Australian Queenslanders Health Survey reports (2008), it was noted that 53% of adult population were not aware of benefits of physical activities enough, nearly one of four adults (27.7%) were sedentary for 7 hours a day and spent 4.7 hours a day sedentarily. Ratio of diseases caused by lack of activity was 6.2% among men while it was 6.8% among women (Queensland Health, 2008). In the study of Gyurcsik (2006), barriers to physical activities among university students were examined and it was identified that these barriers were social activities (52%), work burden (74%), financial impossibilities (lack of money) (3%) and transportation (62%). In another study aimed at determining the perceived exercise benefit and disability of university students, physical difficulty, time allocation, exercise environment, lack of exercise in the family were determined as exercise-disabled (Lovell, Ansari and Parker, 2010). In a study of health employees' exercise benefit and disability perception, the perceived benefit scores were found significantly higher in sports and exercise practitioners (Bakır ve Hisar, 2016).

As a conclusion; it was found that there were significant differences between perceived exercise benefit/barrier and variables of marital status, adequate nutrition, exercising. It was identified that the single employees had higher level of perceived exercise benefit/barrier than the married employees. There was also a significant discrepancy between perceived exercise benefit and adequate nutrition but there was not a significant difference between perceived exercise barrier and adequate nutrition. There was also a significant difference between perceived exercise benefit and exercising. However; no significant difference was found between perceived exercise benefit/barrier and variables of age and sex. It was also identified that average score of perceived exercise barrier was higher among female employees than male employees. It is recommended that sports employees should be informed of healthy life and perceived exercise benefit/barrier and importance of exercises should be emphasized. It is recommended to increase the number of participants by using different variables. It is recommended that training programs for sport employees should be organized to encourage exercise.

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The effects of regular physical exercise on the values of the physical properties and body compositions of breast cancer patients in remission

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Abstract

The aim of this study is to determine the effect of regular physical exercises (step aerobics and resistance exercises) on physical properties and body compositions values of breast cancer patients in remission. In this study; sampling was formed three groups by 30 breast cancer female patients in remission that mean aged 53,13±6,45; step aerobics (n=11), resistance (n=10) and control (n=9); which completed anti-cancer cure in Akdeniz University Medical Faculty Hospital in the Medical Oncology Clinic. They were conducted as randomized controlled selection and homogeneous property. For patients in exercise groups, particular exercise programs (step aerobics and resistance) which take an hour in a day, three days in a week, 12 weeks were applied, but control group were not included in exercise program. Physical properties; height, weight and body mass index (BMI) and body compositions; body fat percentage (BF%), body fat mass (BFM), fat-free mass (FFM), skinfold measurements (SF triceps, SF suprailiac, SF thigh, SF body fat percentage) were conducted to all patient groups before and after this study. Statistical analysis of the difference between pre-post test measurements of physical characteristics and body composition values of patients; Wilcoxon Test was used for nonparametric tests ($p < 0.05$). Statistical significance was also assessed by MannWhitney U test ($p < 0.05$) by comparing Kruskal Wallis test with the percentage of difference between the physical characteristics and body composition of the whole group and the difference between the pre-end test values of the groups. The results of the study, positive results were appeared on regular physical exercise on patients' physical properties and body compositions values of breast cancer patients in remission. Our study was demonstrated similar results as actual literature. Positive results that decreases in BMI, % Fat, SF thigh in step aerobics exercise group, % Fat, SF thigh and SF % Fat values, increases in FFM values in resistance exercise group. However, negative results that increases in BMI, SF suprailiac values, decreases in FFM in control group.

Keywords: Body composition, breast cancer, physical properties, regular exercise

INTRODUCTION

Cancer, which is considered among the chronic diseases, is seen as one of the most important health problems of our time because of its high frequency, often lead to a high rate of death, and the increased environmental carcinogenic factors. Cancer makes the individual's lifespan, and quality of life be adversely affected by the physical, psychological, and socio-economic problems it creates (Aydın Bektas ve Akdemir, 2006). The duration of survival of patients with cancer has been increased with the drug therapies, radiation, and surgical procedures applied in cancer treatment. Typically, a decrease has been seen in physical and psychosocial well-being of patients after the operations. Sports and exercise play an important role as being one of the adjuvant therapies in solving or at least minimizing such problems.

Exercise prevents or reduces the general response of the side effects with regard to the treatment of cancer patients (ACSM's, 2000; Zhou, 2007). Benefits of physical activity to patients with cancer are decreasing the risk of cancer by reducing the fatigue, nausea, body fat ratio, anxiety and depression, developing muscle strength, lean body mass, aerobic capacity and immune system, and increasing the quality of life (Apozgen Zengin, 2013). While most researchers conducted their studies on pro-treatment period of cancer patients, a very small number of research was conducted during their treatment. Exercise programs with cancer patients have positive effects on the physical performance, fatigue, emotional status, and the quality of life. However, such an important topic couldn't get the desired importance in both clinical practice and the literature (Eyigör et al., 2010).

It has been reported that exercise may be beneficial to prevention and reduction of fatigue and the quality of life of the patients in the early phase of breast cancer (Mock et al., 1997). In addition, exercise is a method that provides positive developments in terms of the quality of life, cardiorespiratory fitness, physical function and fatigue for the patients with breast cancer (Fong et al., 2012; McNeely et al., 2006). Prospective studies have been made on women with breast cancer illustrates that regular exercise during the disease diagnosis, treatment and pro-treatment periods reduces the mortality by 50% (Irwin et al.,2008; Mutrie et al., 2007). Regular exercise is a factor that has positive effects on pain, movement restriction, and lymphedema. The women who were treated for breast cancer are in need of sport rehabilitation. It must include postoperative arm exercises and appropriate exercises to prevent lymphedema. According to the researches, it is possible to eliminate the detrimental effects when the exercise is done right and guided. In order to avoid the decrease in shoulder mobility, it is important to do active arm exercise (Galva'o and Newton, 2005; Giuliano, 2004). While there are some studies that illustrates the positive effect of physical activity on cancer patients, there are not a lot of studies that demonstrates the effects of strength and endurance exercise. It has been found in a few study that there are positive effects of resistance exercise on the physical capacity, fatigue, and the quality of life of cancer patients (Zopf et al.,2013; Wehrle et al., 2013). In the light of the literature review above, exercise has been found to be a key factor in the development of physical fitness parameters for breast cancer patients.

In our study; The effects of aerobic and resistance exercises on patients with remission breast cancer were similar to the literature and showed positive results in physical characteristics and body composition. In recent studies similar exercises have generally been applied. In our study, exercise groups were composed of aerobic and resistance exercise groups. Also, unlike other studies, the control group was included in the study.

The aim of the study is to determine the influence of different 12-week exercises programs (step aerobic and resistance exercises) applied to patients with breast cancer on their physical characteristics and body composition.

METHOD

Participants of the Study

The participants of the study are formed by 30 women patients with breast cancer (an average age of 53,13 ± 6.45 years) in remission in Medical Oncology Clinic of Akdeniz University Medical Faculty Hospital carrying the following features; not having physical disabilities at a level that prevents the person from doing exercise, acknowledging to work, not having problems related to communication and transport to the place of the exercise, not having the medical history of metastatic, cerebrovascular accident (CVA), cardiac, neurological and psychiatric disease. The participants are identified as the first group step aerobics (n=11), the second group resistance exercise (n=10), and the third group control (n=9) as a result of a randomized controlled trial. Exercise groups consists of female patients living in Antalya that volunteer for regular physical exercise application for a period of 12 weeks. The approval for the research was received by the Ethical Comittee for Clinical Trials of Akdeniz University Faculty of Medicine.

Materials and Procedures

Physical properties; height, weight, body mass index (BMI) and body composition; body fat percentage (BF%), body fat mass (BFM), fat-free mass (FFM), skinfold measurements (SF Triceps, SF Suprailiac, SF thigh, SF body fat percentage) were examined in all the patients participating in the study groups before and after 12 weeks of study. Pre-test and post-test of the participants were performed in a lab environment while different types of workouts were carried out in the gym and walking track. The exercise groups who participated in the study were scheduled for indoor and outdoor activities for an hour a day and three days a week for a period of 12-week exercise program. The control group were chosen from the patients who couldn't attend to the exercise programs for certain reasons and they didn't involve in the program. Considering the operations that the patients had, a variety of exercises that will allow the expansion of the movement areas were done against the physical challenges and difficulties in providing their self-care. With the program implemented, waiting for development in physical characteristics and body composition, it also had a rehabilitation feature that will support the immune system and reduce the side effects of the treatment received. Step aerobic exercises and resistance exercises were specified according to their level of patients by doctors' control and applied to patients as supported by the literature (Fong et al., 2012; Knols et al., 2005; Schneider et al., 2003).

Exercise program

Both groups (step aerobics and resistance) participating in the study were given specific exercise programs (indoor and outdoor activities) for one week, three days a week for 12 weeks. The control group was selected from patients who could not participate in exercise programs due to certain reasons and was not included in the exercise program. The exercise program consists of static and dynamic exercises to reduce movement restriction and weakness, especially in the shoulder and arm region. Improvement of physical fitness with physical training program, improvement of muscle fatigue, improvement of muscular endurance, development of aerobic endurance, improvement of flexibility and balance parameters have been promoted to increase the body resistance and to support the immune system and reduce the side effects of the treatment. Step aerobic and resistance exercises were determined by the physician according to the patient's level and status. Aerobic exercises include simple

mattress movements, upper and lower extremity exercises, and a stepper with aerobics on music accompaniment. The exercises included low-intensity activities directed at music accompanied by large muscle groups. The intensity of the exercise did not exceed 50% of the heart rate of the patients and increased by 5% every two weeks, but never exceeded 70% of the intensity. Individual programs were applied within the group exercises considering the loss of the average age of the patients participating in the grub and the losses in the shoulder functions caused by the disease. The resistance exercise group was initially assessed and the key elements of the supine, prone, lateral-lying and standing postures were taught before the exercise program. These key elements are: respiration (diaphragmatic), focus (neutral position), chest wall placement, shoulder placement, head-neck placement (neutral position). The intensity of the exercise did not exceed 50% of the heart rate of the patients and increased by 5% every two weeks, but never exceeded 70% of the intensity. In this program, upper and lower extremity exercises were performed for strength development with elastic bands (thera-band), elastic tubes (thera-tube) and balance balls (pilates ball). Starting with the simple level, the exercise levels were increased to moderate according to the patients' development. During the first weeks, active hand and elbow exercises were performed. It was followed by isometric hand and forearm exercises. Subsequently, pain in the shoulder joint (flexion, abduction, internal and external rotation) was done. Stretching exercises, pendulum exercises, strengthening of the chest and back muscles and posture exercises were added to the resistance exercise program in the following days. Within this program, static, dynamic exercises and pilates movements were made to restrict movement and weakness in the shoulder and arm region. Thus, strengthening of the trunk muscles is aimed at joint mobility, balance and coordination.

Data collection protocol

"Voluntary informed consent form" and "there's no harm in doing sports" document has been requested by the participants. From the physical properties and body composition parameters, height was measured with Stadiometre (Holtain), weight and body composition were measured with TANITA, and skin fold thickness was measured with skinfold callipers.

Statistical Analyzes

In the evaluation of data; by producing the descriptive statistics of physical properties and body composition parameters, the average (X) and standard deviation (Sd), the pre-post test measurements differences between non-parametric Wilcoxon tests, and the level of significance among those was tested. In addition, the level of significance was tested in all groups with Kruskal-Wallis Test by comparing the physical properties and body composition values of the groups in between the percentage of pre-post test and by Mann-Whitney U test to find which group is the source of the gap between the groups.

RESULTS

Descriptive statistics and the pre-post test comparisons Participant's physical characteristics and body composition values are shown in Table 1. There had been positive results in the values of BMI, BF %, and SF thigh in the step aerobics group, in BF%, FFM, SF thigh and SF body fat mass percent age in the resistance group. In the control group, there had been a significant difference between the values of BMI and SF supra; however, this has occurred results in a negative way ($p<0,05$).

Table 1. Descriptive statistics and the pre-post test comparisons of participant's physical characteristics and body composition values

	Step Aerobics (n=11)		**Resistance (n=10)**		**Control (n=9)**	
	Pre test X±Sd	**Post test X±Sd**	**Pre test X±Sd**	**Post test X±Sd**	**Pre test X±Sd**	**Post test X±Sd**
Weight (kg)	75,3±8,0	74,9±6,2	68,7±10,3	69,5±10,6	77,7±10,6	79,5±10,6
	z=-1,511	p=0,131	z=-,296	p=0,767	z=-,593	p=0,553
BMI (kg/m^2)	31,8±3,0	30,4±3,1	27,1±3,6	27,1±3,7	29,9±4,2	31,4±4,3
	z=-2,847	**p=0,004***	z=,280	p=0,779	**z=-1,958**	**p=0,050***
BF (%)	40,6±2,9	38,9±3,1	37,1±6,1	35,6±5,4	39,6±4,1	40,7±4,7
	z= -2,581	**p=0,010***	**z=-2,243**	**p=0,025***	z=-1,126	p=0,260
BFM(kg)	31,2±4,6	29,1±4,6	26,3±7,4	25,3±6,8	31,6±6,5	32,5±7,2
	z=-2,803	p=0,005*	z=-1,584	p=0,113	z=-1,051	p=0,293
FFM (kg)	45,3±2,5	45,4±2,9	42,6±3,1	43,7±3,7	46,9±3,5	44,8±2,5
	z=-,356	p=0,722	**z=-2,397**	**p=0,017***	**z=-2,028**	**p=0,043***
SF Triceps (mm)	33,2±7,1	30,0±6,7	28,0±4,5	26,0±5,7	31,1±3,5	31,4±3,2
	z=-,889	p=0,374	z=1,479	p=0,139	z=-,479	p=0,632
SF Supra(mm)	29,1±4,5	26,8±9,3	25,5±6,5	24,1±7,5	31,5±6,4	36,6±6,4
	z=-,979	p=0,328	z=-,612	p=0,541	**z=-2,018**	**p=0,044***
SF thigh (mm)	36,7±12,8	32,7±12,5	39,2±3,4	29,8±8,8	38,5±3,5	39,4±4,4
	z=-2,240	**p=0,025***	**z=-2,547**	**p=0,011***	z=-,987	p=0,323
SF body fat mass (%)	37,9±2,7	35,2±5,3	35,4±3,0	31,6±5,1	37,3±2,5	38,8±3,0
	z=-1,778	p=0,075	**z=-2,191**	**p=0,028***	z=1,836	p=0,066

***p<0,05**

The results of the comparison of differences among the physical properties (weight, BMI) and body composition (BF%, BFM, FFM, SF triceps, SF suprailiac, SF thigh, SF body fat mass) measurements of step aerobics, resistance and control groups before and after the exercises are shown in percentages (%) in Table-2. Significant differences in statistical values among BMI, BF%, BFM, FFM, SF thigh and SF body fat mass as a result of the comparison of the difference in pre-post test of the physical characteristics and body composition analysis of the patients among the groups (p<0,05). The difference in the BMI parameter was derived from step aerobics-resistance and step aerobics-control groups. This difference stems from the fact that the BMI values of step aerobic exercises are significantly and positively changed compared to the other two groups. The difference in the BF% parameter was derived from the resistance-control and step aerobic-control groups. This difference is due to the significant and

positive change of the BF% values of the step aerobic and resistance exercisers according to the control group. The difference in the BFM parameter was derived from step aerobic-control groups. This difference is due to the significant and positive change in the BFM scores of the step aerobic exercise group compared to the control group. The difference in the FFM parameter was derived from the resistance-control and step aerobic-control groups. This difference stems from the fact that the FFM of the resistance exercise changed significantly and positively against the control group. The difference in the SF thigh parameter was due to the resistance-control and step aerobic-control groups. This difference is due to the significant and positive change of the SF Thigh values of those who exercise step aerobics and resistance compared to the control group. The difference in the SF BFM parameters is due to the resistance-control and step aerobic-control groups. This difference is due to the significant and positive change of SF BFM values according to the control group in those who exercise step aerobics and resistance. In addition, a statistically significant difference between step aerobic-control groups in terms of SF Suprailiac although there is no difference when that parameter is compared in general ($p < 0,05$).

Table 2. The pre-post test comparison of physical characteristics and physical composition of the patients in percentage (%) difference between groups

Variables	**Step Aero – Resistance (n=11)**		**Resistance – Control (n=11)**		**Step Aero-Control (n=11)**		**General (n=30)**	
Differences in pre-post test	**U**	**p**	**U**	**p**	**U**	**p**	**x^2**	**p**
Weight (kg)	29,00	0,07	41,00	0,74	25,00	0,06	4,78	0,09
BMI (kg)	**27,50**	**0,05***	26,00	0,12	**11,00**	**0,00***	**9,95**	**0,01***
BF (%)	55,00	1,00	**12,00**	**0,01***	**14,00**	**0,01***	**9,62**	**0,01***
BFM(kg)	46,00	0,53	22,00	0,06	**15,50**	**0,01***	**7,08**	**0,03***
FFM (kg)	31,00	0,09	**8,00**	**0,00***	**21,00**	**0,03***	**10,98**	**0,00***
SF Triceps (mm)	54,00	0,94	32,00	0,29	34,00	0,24	1,67	0,43
SF Suprailiac (mm)	53,00	0,89	27,00	0,14	**23,00**	**0,04***	4,12	0,13
SF thigh (mm)	37,00	0,20	**9,50**	**0,00***	**16,00**	**0,01***	**10,83**	**0,00***
SF body fat mass (%)	48,00	0,62	**9,00**	**0,00***	**23,00**	**0,04***	**8,43**	**0,01***

***p<0,05**

DISCUSSION and CONCLUSION

The process which starts by learning the disease cancer continues with the process of treatment and post treatment of the disease. Along with this process, some problems such as physical, social, emotional and psychological problems occur in cancer patients. The problems occurred by cancer can be minimalized by supporting it during and post treatment with adjuvant therapies and a multidisciplinary structure. By the end of the treatment process, the role of doctors and hospital ends, and the patients are alone with the problems that occur with the disease. Sports and exercise plays an important role in solving or minimizing the problems as being an adjuvant therapy. Implemented for the patients in the program, while applying the aerobic exercises to aerobic stepper group, the resistance group is mainly engaged in static, dynamic exercises and pilates movements to avoid restricted mobility and weakness in the shoulders and arms. The movements in the exercise program, are intended to be a guide to apply what

type of exercise program to the cancer patients in accordance with their changes, will help reducing fat with mass movements, improving the physical properties and body composition, strengthening and stretching the muscles, increasing the resistance of the body to support the immune system and carrying the feature of reducing the side effects of the cancer treatment.

There are published systematic reviews and meta-analysis available with regard to exercise (aerobic, strengthening, etc.) in cancer patients, as in many other chronic diseases, both decreases the risk of developing the disease and decreases the physical, physiological, psychological and emotional symptoms occur among diagnosed patients as well as increasing the power of the individual to deal with the disease itself and being at peace with the environment in addition to its positive results within a more powerful communications infrastructure (ACSM's, 2005; Becker et al.,2013, Fong et al., 2012; Knols et al., 2005; McCaughan and Arzola, 2007; McNeely et al., 2006; Mutrie et al., 2007). Over the past 20 years, exercise started to play an important role in cancer prevention and its control. Courneya and Friedenrich said that physical activity and exercise is important in controlling cancer in all the periods defined as prevention in pre-diagnosis, preparation for the treatment after diagnosis, post-treatment preparation/rehabilitation, improving disease prevention/health and survival of the patient (Courneya and Friedenrich, 1999). It has been concluded that the physical activity that is done after treatment by breast cancer patients have positive effects on their body composition, physical function, physiological output, and the quality of life (Fong et al., 2012). There is no enough evidence that shows which type of exercise is more effective for breast cancer patients in postoperative period (McCaughan and Arzola, 2007). The most commonly used exercises are aerobic exercises, empowerment and resistance exercises, joint range of motion exercises and stretching exercises (Harris et al., 2012; McNeely et al., 2006). Exercise programs in patients with breast cancer in the literature are applied in the form of 6, 8, 10 or 12 weeks (Fong et al., 2012; McKenzie and Kalda, 2003; Schmitz and Speck, 2010).

In the light of the literature, it can be said that the exercise program should be included because there is a decrease in muscle mass and increase in the fat mass when the values of the body composition values of the cancer patients after treatment are analysed. Segal and his friends have made a research on the effects of 24-week aerobic and resistance exercise on the physical fitness, body composition, some hormone and blood values of the patients undergoing radiotherapy. As a result, it has been found that resistance exercise prevents the increase of body fat and aerobic exercise develops physical suitability (Segal et al., 2009). 242 breast cancer patient has participated to the study of Courneya and his friends, the patients have worked in aerobic and resistance exercise groups for 18 weeks, no significant difference quality of life has been observed as a result of the exercises while some significant improvements have been found in their self-esteem, physical fitness and body composition (Courneya et al., 2007). In a study done in the USA, aerobic exercise has been applied to 60 breast cancer patients and their body composition has been compared with the control groups; it has been found out that there is a significant decrease in BMI, FFM and SF values (Drouin, 2002). As a result of the meta analyses with regard to the participation of breast cancer patients to the physical activity and its comparison with the control group, a decrease in some body composition parameters as BMI and body weight has occurred (Fong et al., 2012).

In our study, the physical properties and body composition values of 12-week step aerobic and resistance groups gave positive and meaningful results by showing similarity with the literature. In the light of these results, we believe that as step aerobic exercise and resistance exercise will contribute to the body composition of breast cancer patients, in particular, a reduction in body fat percentage will occur, the decrease of the weight gained after the treatment is important for the physical and psychological health as well as it they will reduce the risk of the catching the disease and will make positive impact on breast

cancer patients in remission getting back in shape. It has been clearly found out that there are beneficial effects of exercise when the two groups in which the participants do exercise and don't exercise are compared.

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A comparison of Fenerbahçe and Galatasaray football club fans: The factors of affecting stadium participations

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Abstract

Aim: The aim of this study is to investigate the factors affecting the stadium attendance of the supporters of Turkish professional football clubs that have stadiums fulfilling the UEFA criteria. Material and Method: The study population includes the supporters of Fenerbahçe and Galatasaray Football Club participating in Turkish Spor Toto Super League in 2013-2014 seasons and having stadiums that fulfill the UEFA criteria. The sample consists of randomly selected (n=832) supporters. As well as demographic data of the supporters, reasons affecting the Stadium Attendance Scale developed by Soygüden, 2014 which consists of 30 questions were used to collect the data. Statistical analysis of the data was done using SPSS 16.0 packet program and descriptive statistics, independent t-test and one-way ANOVA test were applied. Results: Among the variables affecting the participation of Galatasaray Football Club supporters participating in the stadium; "Recreation Activity Opportunity", "Stadium Atmosphere" and "Personal Relaxation Opportunity" variables were found high. Among the variables affecting the reasons for not participating in stadiums of Fenerbahçe Football Club fans; the levels of "Negative Ergonomic Environment" and "Unethical Situations" were found to be high. Conclusion: As a result, Galatasaray FC supporters' participation to the stadium most effective factor was found "Recreation Activity Opportunity" than the Fenerbahçe FK supporters. In this case, it is recommended to increase the number and quality of recreational activities in the stadium. Our research showed that Fenerbahçe FC supporter's non participation to the stadium most effective factor was found "Negative Ergonomic Environment" than the Galatasaray FC supporters. With this result, it is proposed to improve the negative ergonomic environmental conditions in order to allow more fans to participate in the stadium.

Keywords: Fenerbahçe and Galatasaray Football Club, fans, stadium attendance

INTRODUCTION

Fenerbahçe FC and Galatasaray FC are very important football clubs in Turkish football history. Fenerbahçe FC was established in 1907 and Galatasaray FC was established in 1905. Both teams have a long history and strong loyalty fans in Turkey. There are great competitions between the two teams. Many sport historian mention that both two teams has ever since competition and eternal friendship.

Football is very important sport in European countries and brings millions of fans to the stadium (Vallerand et al., 2008). As well as the same situation we can see in Turkey. Some researcher mentions that Fenerbahçe FC and Galatasaray FC hold total of estimated close to 50 million fans.

Especially in team sport, the sport consumer or loyalty fans plays an important role in the creation of the football game. Morrow (1999), mention that football always looking for strong supporters because supporters joint product of the game. Some of the football coach says that a strong supporter becomes 12 players of the game. Also, many researchers showed that strong relationship between the game success and supporter participation (DeSchriver and Jensen, 2002; Greenstein and Marcum, 1981).

Team performances affect such as game ticket, team store revenue, TV broadcasting and more different factors. Pinnuck and Potter (2006), in their study they were examined of the 1993-2002 periods in the Austrian football league the factors affecting the financial performance during the football season. In their study showed that findings were obtained about the existence of a meaningful relationship between sporting success and marketing revenues. Also, team performances have the important role and lead of fan behavior (Cialdini et al., 1976; Grove et al., 1991).

In most cases, multiple factors were considered to be important determinants of stadium participation. These determinants are; the size of the market, ticket prices, host and guest performance, match day and time, matches played in different leagues (such as the UEFA League) were affected to participation (Deschriver et al., 2013).

Along with that fan behavior will affect the coaches and players performance and team success will increase highly. In fact, coaches and the player's motivation have strong relationships with the fans behaviors. In addition, sports marketer will look for the fan behavior and sports marketers trying to attract more fans to the game, game attendance always increase the different factors of the sports markets (Hunt et al., 1999). The analysis of emotions during consumption experiences has been one of the key issues in the sports marketing (Neeley and Schumann, 2000).

The club brand image and sustainability key factor of the football clubs (Richelieu and Pons, 2009) sports service of the stadium increase the service quality at the stadium, sports consumer satisfaction come from the consumer expectations. This quality service bring new costumer to the stadiums. In Turkish Super football league very rare teams becomes a brand images. Turkish well known football clubs around the world are Galatasaray FC, Fenerbahçe FC, Beşiktaş FC and Trabzonspor FC; these teams have brand images and earning income to many different angles.

Consumer's satisfaction level always affects the next purchase behaviors. Many sport organizations are achieving customer satisfaction, this is a strategic goal for sport marketers and every sport marketers agree with satisfied customer more likely repeat same purchase behaviors (Leeweun et al., 2002). Fans satisfaction levels not only increase with the team performance also stadium environment and service strong relationships with that. Cronin and Taylor (1992) mention that consumer experience lately turn

to service encounters satisfaction and Oliver (1997) mention that satisfaction requires experience-dependency and involves emotional feelings. Also, satisfaction is suggested to be different from consumption emotions, in that emotions are evaluated by consumers and represent a first of satisfaction (Mano and Oliver, 1993).

Thus, the purpose of this study was to make comparison between the Fenerbahçe FC and Galatasaray FC spectators' effect of the participation to the stadiums.

METHOD

The universe of the research; the professional football team consists of supporters coming to the stadium to watch a professional football game. Research made in the 2013 -14 seasons in Turkey Spor Toto Super League teams and scale has been applied Galatasaray FC supporter at the Türk Telekom Arena stadium, Fenerbahçe FC supporter at the Sükrü Saraçoğlu Stadium.

In the first part of the scale developed by Soygüden et al., 2015, 12-item variables were used to determine the demographic, social and economic status of supporters. In the second part, there are 15 factors affecting the fans' participation in the stadium, while in the third part there are 15 factors influencing their participation in the stadium.

In the second part, the factors affecting participation in the stadium were collected under 3 groups and these 3 groups were gathered under the name of Recreation Activity Opportunity (4 items), Stadium Atmosphere (4 items) and Personal Relief Opportunity (3 items). In the third part, factors affecting non-participation in stadiums are grouped under 2 groups, which are grouped under the name of Negative Ergonomic Environment (8 items) and Non-Ethical Situations (3 items).Each variable in the generated scale was assessed using a 5-point Likert Scale (5 = "Strongly agree", 4 = "Agree", 3 = "Undecided", 2 = "I do not agree", 1 = "I never agree").

The study population includes the supporters of Fenerbahçe and Galatasaray Football Club participating in Spor Toto Super League in 2013-2014 seasons and having stadiums that fulfill the UEFA criteria. The sample consists of randomly selected (n=832) supporters. As well as demographic data of the supporters, reasons affecting the Stadium Attendance Scale developed by Soygüden et al., 2014 which consists of 30 questions were used to collect the data. Statistical analysis of the data was done using SPSS 16.0 packet program and descriptive statistics, factor analysis, independent t-test and one way ANOVA test were applied.The last column of the tables shows the difference between the groups. Averages in the last column indicate that the stars on the difference are significant compared to 0.05. The homogeneity of the ANOVA distributions made to the identified factors was examined. Levene Statistic homogeneity test; Post Hoc Tukey test was used for values above 0.05, Post Hoc Dunnett's T3 test was used for values less than 0.05. Then the difference between the groups was investigated.

RESULTS

The data obtained in this part of the study; the demographic and socio-economic characteristics of the participants, the relationship between the reasons for participation and non-participation in the stadium, and the relationships and differences between the variables affecting participation and non-participation in the stadium in the upcoming seasons.

Table 1. Distribution of participants according to their football clubs

Football Club	n	%
Galatasaray	390	46.87
Fenerbahçe	442	53.12
Total	832	100

Table 2. Distribution of participation gender status according to football clubs

		Gender		
Football Club		**Female**	**Male**	**Total**
Galatasaray	N	36	354	390
	%	9	91	47
Fenerbahçe	N	52	390	442
	%	12	88	53
Total	N	88	744	832
	%	11	89	100

Table 3. Distribution of participation age status according to football clubs

		Age								
Football Club		**Under 15**	**15-20**	**21-25**	**26-30**	**31-35**	**36-40**	**41-45**	**Over 45**	**Total**
Galatasaray	N	5	135	145	59	26	9	7	4	390
	%	1.2	35	37	15	7	2.3	2	1	47
Fenerbahçe	N	2	99	163	76	40	34	15	13	442
	%	0.5	22	37	17	9	8	3.3	2.3	53
Total	N	7	234	308	135	66	43	22	17	832
	%	1	28	37	16	8	5.1	3	2	100

In table 3, it constitutes 81% of the supporters in the age range of 15-30 years old.

Table 4. Distribution of participant's education status according to their clubs

		Education							
Team		**Primary School Graduated**	**Middle School Graduated**	**High School Student**	**High School Graduated**	**University Student**	**Bachelor Degree**	**Graduate Degree**	**Total**
Galatasaray	N	6	24	58	48	159	80	15	390
	%	1.5	6.2	14.9	12.3	40.8	20.5	3.8	46.8
Fenerbahçe	N	3	17	24	44	222	102	30	442
	%	0.7	3.8	5,4	10	50,2	23,1	6,8	53.1
Total	N	9	41	82	92	381	182	45	832
	%	0.7	4.9	9.8	11	45.8	21.8	5.4	100

X^2=682.481*

In Table 4, Fenerbahçe FC supporters (50%) are university student's status more than Galatasaray FC (40%) supporters.

Table 5. Distribution of participant's job position according to their clubs

Team		Full Time Work	Part Time Work	Housewife	Student	Retired	Unemployed	Self-Employment	Total
Galatasaray	N	142	21	1	196	3 0	8	19	390
	%	36.4	5.4	0.3	50.3	0.8	2.1	4.9	46.8
Fenerbahçe	N	172	23	1	211	4	7	24	442
	%	38.9	5.2	0.2	47.7	0.9	1.6	5.4	53.1
Total	N	314	44	2	407	34	15	43	832
	%	37.7	5.2	0.2	48.9	4	1.8	5.1	100

X^2=49.095*

Table 6. Distribution of participant's marriage status according to their clubs

		Marriage Status				
Team		**Married**	**Single**	**Divorce**	**Separate**	**Total**
Galatasaray	N	52	330	5	3	390
	%	13,3	84,6	1,3	0,8	46.8
Fenerbahçe	N	87	347	5	3	442
	%	19,7	78,5	1,1	0,7	53.1
Total	N	139	677	10	6	832
	%	16.7	81.3	1.2	0.7	100

X^2=4.982*

In Table 6, Fenerbahçe FC supporters (19%) are married status more than Galatasaray FC (13%) supporters.

Table 7. Distribution of participant watches the game at the stadium according to club.

		On average yearly, how many times do you watch the game at the stadium?						
Team		**1-4**	**5-8**	**9-12**	**13-16**	**17-20**	**21 or more**	**Total**
Galatasaray	N	134	71	43	32	18	92	390
	%	34,3	18,2	11	8,2	4,6	23,6	46.8
Fenerbahçe	N	173	67	40	31	38	93	442
	%	39,1	15,2	9	7	8,6	21	53.1
Total	N	307	138	83	63	56	185	832
	%	36.8	16.5	9.9	7.5	6.7	22.2	100

X^2=82.220*

In Table 7, Fenerbahçe FC supporters (39%) watch 1-4 games status more than Galatasaray FC (34%) supporters.

Table 8. Distribution of differentiation of the reasons for participation and non-participation in the stadium according to the team status variable of the scale lower dimensions

	Grup	N	Mean	SD	F	P	Mean Difference
Recreation Activity Opportunity	Galatasaray (1)	390	**4,5654**	,70155	**18,449**	**,000****	1>2*
	Fenerbahçe (2)	442	4,3241	,73580			
Stadium Atmosphere	Galatasaray (1)	390	**4,2346**	,81760	**15,896**	**,000****	1>2*
	Fenerbahçe (2)	442	4,0339	,73152			
Personal Relaxation Opportunity	Galatasaray (1)	390	**3,9983**	1,12615	**6,916**	**,001**	1>2*
	Fenerbahçe (2)	442	3,7315	1,01628			
Negative Ergonomic Environment	Galatasaray (1)	390	2,8715	1,26420	**5,733**	**,003**	1<2*
	Fenerbahçe (2)	442	2,9106	1,03811			
Unethical Situations	Galatasaray (1)	390	2,8060	1,39355	**5,574**	**,004**	1<2*
	Fenerbahçe (2)	442	2,9857	1,28916			

****P<0.01**

According to the team variables of the participating supporters; as a result of the Anova test (P <0.05), which showed a significant difference in the average of recreational activity opportunity, stadium atmosphere, personal relaxation opportunity, negative ergonomic environment and unethical situations.

In table 8, these results show that Galatasaray FC supporters' recreation activity opportunity level, stadium atmosphere level and personal relaxation level variable are higher than the compared to Fenerbahçe supporters. In addition, Fenerbahçe FC supporters show that the level of negative ergonomic environment variables and the unethical conditions are higher than those of Galatasaray FC supporters.

DISCUSSION and CONCLUSION

In the study; participants of the team was 89% male and 11% female supporters (Table 2). The difference between female supporters and male supporters in both teams is similar. Sport five (2002) found that football in Germany is predominantly a sport favored by male fans. As a result of the study; estimates show that 27% of all stadium participants were women.

In Table 3, stadiums participants in the study; 81% of them are in the between age group of 15-30 years old. Gençer and Aycan (2008) found that in their study 66.7% of those who participated in professional football games were 27 years old or less participant. Our study showed that Turkish football participant we able to say very young age of participant. In the study showed that 45% of the supporters were university students (Table 3). In the study; 41% of the Galatasaray FC supporters and 50% of the Fenerbahçe FC supporters were university students. Salman et al. (2010) stated that the Fenerbahçe FC supporter's level of education that was the most recent graduate of 52.2% was high school graduate participant. These results are similar with our study results.

Participants in the study; 81% consists of single non-married supporters (Table 6). Gençer and Aycan (2008) found that in their study 69% were single non-married and 31% were married supporters. Salman

et al., (2010) stated that 81% of Fenerbahçe FC fans were single non-married supporters. According to these determinations; it can be concluded that the number of single non-married fans is more than the number of married fans.

The "Recreational Activity Opportunity" component was found to be the most effective factor among the variables affecting the participation of professional soccer fans in the stadium. This suggests that the fans are more often caused by the need to spend more time pleasantly. Funk and James (2001) reported in their research that they showed a sense of social interaction among the reasons for participation as a spectator to sports activities.

In this research, the "Stadium Atmosphere" component was found to be the second most important factor affecting the participation of professional soccer fans in the stadium. This research brings that fans' experience of stadium environment is characterized by high levels of good feelings and pleasure (Uhrich and Berkenstein, 2010). Experiencing the special atmosphere of a sports event is regarded in sports marketing worlds as one of the very important value-creating factor of live sport consumption (Uhrich and Koenigstorfer, 2009). The atmosphere at a sports event makes a different contribution to emotionalizing stadium visitors and satisfies their good consumption needs (Hirschman and Holbrook, 1982).

The third most important factor influencing the participation of professional soccer fans in the stadium is the "Personal Relaxation Opportunity" component. Wann (1997) lists the most commonly used motivations, pleasant tension, self-worth, escape, entertainment, show, economic, forget about the problem, become social, family needs in his research.

The most important factor that influences not participating in the stadium in our survey was determined as "Negative Ergonomic Environment" component. Environmental psychology is an interdisciplinary field (Gifford, 1997; Holahan, 1986; Russell and Ward, 1982) that provides insights into the theories of interiors and the dependence between human perceptions, cognitive emotions and behavioral reactions. For this reason, there is a close relationship between the quality of the place to be found or desired and the environmental psychology structure (Darden and Babin 1994; Russell and Pratt 1980).

The second factor influencing the non-participation of professional soccer fans in the stadium is the "Non-Ethical Situations" factor. Especially of the profanity effect many participant motivations to attend to the stadium.

As a result, Galatasaray FC supporters' participation to the stadium most effective factor was found "Recreation Activity Opportunity" than the Fenerbahçe FC supporters. In this case, it is recommended to increase the number and quality of recreational activities in the stadium. Our research showed that Fenerbahçe FC supporter's non participation to the stadium most effective factor was found "Negative Ergonomic Environment" than the Galatasaray FC supporters. With this result, it is proposed to improve the negative ergonomic environmental conditions in order to allow more fans to participate in the stadium.

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Angiontensin converting enzyme insertion/ deletion polymorphism of Turkish professional hip-hop and latin dancers

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Abstract

Angiotensin converting enzyme is one of the key components of cardiovascular system, effecting athletic performance. In this study, we aimed to analyze the angiotensin converting enzyme insertion/ deletion (ACE I/D) gene polymorphism in Turkish Hip-hop and Latin dancers. 25 professional dancers were recruited. Genotyping procedure was carried out by conventional PCR methodology. 8 (32%) of the dancers had DD, 13 (52%) had ID and 4 (16%) had II genotypes. Number and the percentages of D and I alleles were 29 (58%) and 21 (42%), respectively. Respective numbers and percentages of male dancers for DD, ID and II genotypes were 5 (33%), 7 (47%), 3 (20%). For females, 3 (30%) had DD, 6 (60%) had ID and 1 (10%) had II genotypes. D allele was found as 17 (57%) in males, and 12 (60%) for females. 13 (43%) male and 8 (40%) female dancers had I allele. This first study analyzing the distribution of ACE I/D alleles in professional dancers suggest that ID genotype and D allele may have a genetic advantage for the physical predisposition for dancers. But to fulfill the role of the ACE on dancing, further studies with extended numbers of subjects should be carried out.

Keywords: Dance, ACE, athletic performance, renin, human physiology

INTRODUCTION

Dance is a specific expression of human motor behaviors, as well as series of movements in which the person moves in space and time according to the rhythm of music, at least in the terms physical performance (Hugel et al., 1999). During the movements, help of a number of unique physical characteristics maintains the coordination. Therefore, dancers are considered to demonstrate better proprioception, have significantly faster long-latency neuromuscular responses, display consistent muscle activation and stronger interlimb coupling when compared to non-dancers (Jola et al., 2011; Simons, 2005; Sofianidis et al., 2012). Besides, the deep and wide movement of arms and legs, and excessive range of motion of the body by advanced movements are some of dancers characteristic movement types. All of these unique movements are controlled by the neuromuscular system, in which genetic factors play important roles.

Athletic performance is the term used for all the necessary mental and physical characteristics of an individual to compete for a given task in a certain exercise. These characteristics are mostly under the control of our genes, and sports genomics covers all the genetic studies related with athletic performance. One of the most studied genetic marker for human physical performance is angiotensin-converting enzyme gene (*ACE*) insertion (I)/ deletion (D) polymorphism (*ACE ID*). Gene product, angiotensin-converting enzyme (ACE), converts angiotensin I to angiotensin II, which causes blood vessels to constrict, and as a result blood pressure in increases. The most studied polymorphism in the gene (rs4646994) is determined by the presence or absence of a 287 bp *Alu* repeat element in intron 16 (Guney et al., 2013). Recent studies reported the higher activity of ACE enzyme in DD homozygotes, when compared to II homozygotes. I allele has been associated with improved endurance performance and the D allele with higher ACE activity and enhanced strength and sprint performance (Ulucan and Gole, 2014).

The ratio between environmental factors and genetic factors to determine the athletic performance or which have more effect on sports exercise metabolism has not been fully identified and is still a point of research. When we consider the fact that genes play crucial roles on athletic performance, many studies including successful athletes and genes should be carried out. Before, in certain populations, effect of ACE gene on athletic performance was evaluated, but to date, there is no study including Latin and Hip-Hop dancers and *ACE*. In this study, we aimed to analyze the distribution of *ACE ID* gene alleles in Latin and Hip-Hop dancers.

METHOD

Participsnts

A total of 25 professional dancers, all with Turkish ancestry were recruited for the study. They perform exercise activity nearly 9 hours/week. The study handled in accordance with ethical protocol. Written informed consent obtained from each dancer indicating that each participant understood and accepted the aim and study protocol of the study.

Materials and procedures

Genomic DNAs were isolated from 2 ml peripheral blood using the High Pure PCR Template Preparation kit (Roche, Mannheim, Germany) following the instructions of the manufacturer. Primers were as follows: sense 5'-CTGGAGACCACTCCCATCCTTTCT-3' and antisense 5'-GATGTGGCCATCACATTCGTCAGT-3'. Genotyping process was maintained by single polymerase chain reaction (PCR), in a total volume of 50 ul PCR mixture, containing 80-100 ng of genomic DNA,

1.25 mM of each primer, 25 mM KCl, 1 mM dNTP mixture, 1.5 mM MgCl2, 10 mM Tris-HCl, and 1U Taq DNA polymerase. Conditions for PCR was as 94°C for 5 min, annealing at 58°C for 1 min, and extension at 72°C for 2 min, a total of 30 cycles. Ending extension was 72°C for 7 min.

Analysis

After amplification, amplicons were separated by 1.8% agarose gel electrophoresis (with ethidium bromide), and genotyped under ultraviolet light. D allele gave rise to 190 bp fragments, I allele 490, and heterozygous genotypes displayed both DNA fragments (Figure 1).

RESULTS

We analyzed 25 Turkish professional dancers, 15 (60%) of them were males and 10 (%40) were females. 8 (32%) had DD genotype, 13 (52%) had ID and the rest had II genotypes. When we count the allele numbers, number and the percentages of D and I alleles were 29 (58%) and 21 (42%), respectively. For male dancers, respective numbers and percentages for DD, ID and II genotypes were 5 (33%), 7 (47%), and 3 (20%). For female dancers, 3 (30%) had DD, 6 (60%) had ID and only one (10%) had II genotypes. When we consider the alleles, D was found as 17 (57%) in males, and 12 (60%) for female dancers. The respective numbers and percentages for I allele were 13 (43%) and 8 (40%) for male and female dancers. These results were summarized in Table 1. In our cohort, *ACE* ID genotype and D allele was higher in number and percentage when compared to other genotypes and I allele.

Table 1: Numbers and the percentages of the *ACE* genotypes and alleles in dancer cohort

Dancers	ACE Genotypes and Percentages			Alleles	
	DD	ID	II	D	I
Male (n=15)	5 (33%)	7 (47%)	3 (20%)	17 (57%)	13 (43%)
Female (n=10)	3 (30%)	6 (60%)	1 (10%)	12 (60%)	8 (40%)
Total (n=25)	8 (32%)	13 (65%)	4 (16%)	29 (58%)	21 (42%)

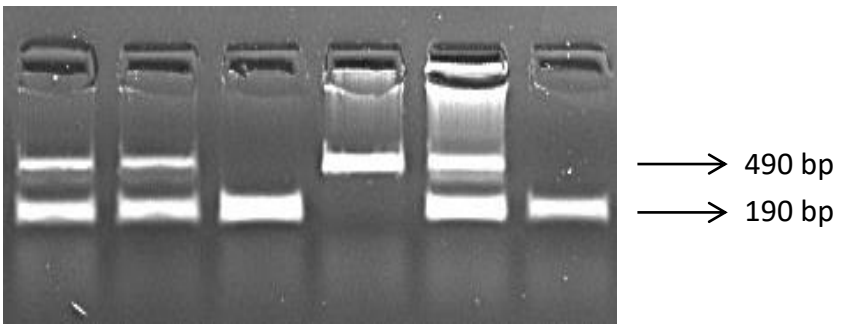

Figure 1. Agarose gel electrophoresis of *ACE* amplicons, black arrows indicate the length, and also the genotypes of the *ACE*. 490 bp indicates the I allele, 190 indicates D allele. Lanes 1,2 and 5 are the heterozygous, ID genotypes, lane 3 and 6 are DD, whereas lane 4 has II genotype.

DISCUSSION

Recent studies have shown that several genes are involved in determining the athletic performance, both physiologically and psychologically (Ulucan et al., 2014). Having information about the athletes, or dancers like in our case, genetic endowment will guide trainers to set up the optimal training modules. In this regard, genetic parameters will help trainers, and therefore, creation of genomic databases will be very useful for sport scientists.

Dancing activity can extend from several minutes to hours, depending on the style, and this activity is known to have an aerobic nature. A dancer's aerobic capacity is commonly considered to be related with the style of dance that they involve, gender and the level of technical ability. Although physical requirements of a dancer in dance classes (essentially designed for the development of technical skills) and during dance performance differs, choreography of dance needs high-intensity movement like quick moving, jump, rotation and leap (Wanke et al., 2012). All these physical parameters are under the control of environmental and genetic factors, and also related with cardiorespiratory status of the dancers (De Moor et al., 2007). In this study we analyzed *ACE* ID genotype, one of the most important regulatory gene in cardiovascular and muscle metabolic processes (Thompson et al., 2006), for the first time in Latin and Hip-hop dancers.

In our cohort, 65% of the dancers had ID genotype, and the percentage of the D allele was found to be as 58%. D allele, and DD genotype, is known to be responsible for high ACE concentration and is considered to be associated with success in speed-strength disciplines (Ulucan et al., 2014). But ID genotype is considered to be associated with sports like football, or basketball, which have mixed aerobic and anaerobic nature (Sercan et al., 2016). There are not enough studies, including dancers, with which we can compare our results. In a study with 97 Korean ballerinas and 203 non-dancers, like our findings, ID genotype was reported to be higher, but unlike our findings, I allele was higher in their cohort (Kim et al., 2014). Results of our and the latter study may help us to debate about the effect of genotype is much more important on phenotype, rather than the effects of alleles.

Ulucan et al. (2016) analyzed another important gene, alpha- actinin- 3 (ACTN3), R577X polymorphism in the same dancer cohort, and reported that RX genotype and X allele is dominant in dancers. RX genotype, like ACE ID genotype, is an intermediate genotype and is mostly related with aerobic and anaerobic sports, together. This study is metabolically in agreement with our study. But unlike our findings, they reported that X allele, which is related with endurance capacity, is higher in dancers.

There are also another studies associating the different kinds of sports and *ACE*. Gineviciene et al. (2016) indicated that ID genotype was the highest genotype with 43.9% and the percentage of the players having at least one D allele was 46.3% on 161 Russian athletes. In another study including Lithuanian football players, ID genotype was found to be the highest genotype with 46.7%, and the percentage of the players having at least one D allele was 76.3% (Gineviciene et al., 2014). Like the previous study, in Turkish football players, ID genotype was higher, and unlike our study, D allele was higher in Turkish football players (Ulucan, 2015). Magi et al. (2016) reported the significantly higher prevalence of the *ACE* ID in Estonian young male skiers in comparison with controls (Magi et al., 2016), stating the important effect of the related genotype in sport predisposition. For instance, there are some studies which cannot find any significantly difference sport and *ACE* gene. Grealy et al. (2016) compared Ironman Championships Triathletes and controls; whereas Heffernan et al. (2016) compared Elite Rugby Union Players and controls, and could not find any significant association between the *ACE* genotypes in the given sports and controls.

To understand the relationship between genes and dancing activity, we need more results including the different kinds of genes and their effect on dance metabolism. By the help of further studies, sports genomics will encourage coaches in developing strategies to improve physical fitness of dancers, and optimizing their artistic and technical skills. In addition, by the help of the genetic data, we will have a chance to understand the cardiorespiratory and neuromuscular systems of dancers, and we can enhance results in movement efficiency, fatigue delaying, and reduced susceptibility to injuries. Therefore, more studies with extended numbers of individuals are needed to understand the effect of genes on dancing activity.

The main limitation of this study is the numbers of the dancers and the style of the dance; only 25 Hip-hop and Latin dancers were examined in the terms of *ACE* genotype. But we hope that this preliminary study that we have conducted for the first time dancers will guide scientist to set up more studies.

CONCLUSION

According to our results that we have from our cohort, *ACE* ID genotype and D allele is more prevalent in Turkish professional Hip-hop and Latin dancers. These polymorphisms, alone or in combination with the additional genetic polymorphisms, should be taken into account when deciding a genomic score profile for success in dance.

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