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Research Article

**INVESTIGATE THE PHYSIOLOGICAL CHANGES OF THE
IRAN'S WOMEN NATIONAL FUTSAL TEAM AND COMPARE
THEM WITH WOMEN'S FOOTBALL TEAM BEFORE AND
AFTER TRAINING, 2015****Farideh Shojaee* and Parisa Samadi**Department of Physical Education, Tehran Medical Sciences Branch, Islamic Azad University,
Tehran, Iran**Abstract:**

Exercising is considered a healthy way to gain, maintain, and improve one's health that not only improves individuals' physical health but also positively affects their mental health and causes the majority of the society to be happy and lively. The purpose of this study is to investigate the physiological changes of the Iran's women national futsal team and compare them with women's football team before and after training in 2015. The present semi-experimental interventional study conducted, at the first stage, on 15 members of women's national football team and 10 members of women's national futsal team in 2015. The number of inhale and exhale, heart rate, systolic and diastolic blood pressure and body mass were recorded separately by treadmill during rest time. VO₂max was determined by the treadmill, and according to the program that was given to the treadmill, when the athlete was at 50% VO₂max, the treadmill stopped; then, the 5 parameters were measured at 0 and 30 minutes during the rest time. The data collected were analyzed by SPSS version 18 through using descriptive-analytical statistics and chi-squared statistical test (X² test). The mean age of women football players was 26.53±2.2 years and that of futsal players was 26.11±2.33. The results of this study showed that changes in the number of inhale and exhale, heart rate, systolic and diastolic blood pressure, and body mass are similar in women football and futsal players before and after training. It is suggested to conduct further studies to investigate the effects of other sports fields on physiological changes.

Keywords: *Physiological Changes, Women National, Futsal, Football, Training, Iran***Corresponding Author:****Farideh Shojaee,**

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INTRODUCTION:

The advances made by humans and the resulting machinery have caused an increasing incidence of chronic noncommunicable diseases such as hypertension, heart disease, obesity, cardiovascular diseases, and infection [1], all of which have incurred huge costs on the health systems of countries [2]. Exercising is considered a healthy way to gain, maintain, and improve one's health that not only improves individuals' physical health but also positively affects their mental health and causes the majority of the society to be happy and lively [3]. Exercising increases basal metabolic rate in the body, which is accompanied by increased oxygen consumption by cells, and increases effective metabolism and burns extra fat in the body [4]. However, the effect of exercise on human body varies depending on the type and intensity of exercise, and it is supposed to cause a wide variation of significant physical and metabolic changes [5, 6]. Additionally, the intensity, duration and type of exercise can affect physiological changes through varying the amount of oxygen consumed by the body [7]. Studies have shown that long-term physical activity has a more significant effect on lowering blood cholesterol levels in comparison to hard and short-term exercise activities [8]. In fact, if a person's blood fat is high, he should know that only using a low-fat diet can help him reduce his cholesterol levels, so that he or she can control his calorie intake. In other words, a diet can only lower the level of blood cholesterol if the caloric intake is reduced to normal [9]. Soccer is a team sport the members and players of which have individual differences and characteristics; depending on the nature of the sport and the environment in which the game is played, such as the size of the field, the playing environment, playing time, playing systems, and skills and encounters, several factors affect this sport [10]. Futsal players have, also, certain physical features due to the nature of the sport and the environment in which they play, and comparison of required characteristics in football and futsal players can be of great importance [11]. Therefore, it is expected that higher physical activity and running of futsal players and longer duration of football create different results on the body. It, also, must be noted that due to differences in the physiology of the male body, these changes should be considered separately in each of these groups [12]. The purpose of this study is to investigate the physiological changes of the Iran's women's national futsal team and compare them with women's football team before and after training in 2015.

MATERIALS AND METHODS:

The present semi-experimental interventional study conducted, at the first stage, on 15 members of women's national football team and 10 members of women's national futsal team in 2015; being female, membership of the national team, and at least 5 years of sports activity, either in football or futsal, were the main inclusion criteria. Age, weight, height, daily exercise, history of exercise, and factors effective in the study, such as nutrition and fluid intake during exercise were equalized and collected using a researcher-made questionnaire. Additionally, the number of inhale and exhale, heart rate, systolic and diastolic blood pressure and body mass were recorded separately by treadmill during rest time. VO_{2max} was determined by the treadmill, and according to the program that was given to the treadmill, when the athlete was at 50% VO_{2max} , the treadmill stopped; then, the 5 parameters were measured at 0 and 30 minutes during the rest time; systolic and diastolic blood pressure changes, heart rate, respiration, and the temperature of the body of the subjects compared in both football and futsal players before and after the intervention. The data collected were analyzed by SPSS version 18 through using descriptive-analytical statistics and chi-squared statistical test (X^2 test)[13, 14]. Moreover, $p < 0.05$ was considered as the significance level.

RESULTS:

The mean age of women football players was 26.53 ± 2.2 years and that of futsal players was 26.11 ± 2.33 . The average BMI of footballers turned out to be 22.60 ± 1.29 kg/m^2 and that of women in futsal group was 24.00 ± 1.82 kg/m^2 . The two groups turned out to be similar in regard with sport history, 5.2 for footballers and 6.2 for women futsal players. The frequency distribution of daily exercise time in the football group was 4.67 ± 1.04 and that of the futsal group was 5.10 ± 1.97 hours per day. Heart rate changes during the 30 minutes of recovery experienced 1.8% decrease in the footballers and 1% for women futsal players ($P > 0.05$)(Table 1). The mean temperature change at zero time of recovery was 3.7% for footballers and 3.50% for futsal players; this rate increased by 1.7 and 1.2 for footballers and futsal players after 30 minutes of recovery ($P > 0.05$). Mean changes in systolic blood pressure at zero time of recovery was 27.27% for footballers and 25.89% for futsal players; this rate experienced 0.1% in both groups after 30 minutes recovery ($P > 0.05$).

Table 1: Mean of heart rate changes in two groups

Field	Mean of Heart Rate Changes	
	Time Zero Minutes	Time Thirty Minutes (Recovery)
Football	+ 112 %	- 1.8 %
Futsal	+ 113 %	+ 1 %

Table 2: Mean of breathing changes in two groups

Field	Mean of Breathing Changes	
	Time Zero Minutes	Time Thirty Minutes (Recovery)
Football	+ 115 %	0 %
Futsal	+ 100 %	- 8 %

Table 3: Mean of Changes in systolic and diastolic blood pressure in two groups

Field	Mean of Changes in Systolic Blood Pressure	
	Time Zero Minutes	Time Thirty Minutes (Recovery)
Football	+ 27.27 %	- 4.55 %
Futsal	+ 25.89 %	- 6.25 %
Field	Mean of Changes in Diastolic Blood Pressure	
	Time Zero Minutes	Time Thirty Minutes (Recovery)
Football	+ 0.1%	0%
Futsal	+ 0.1%	0%

DISCUSSION:

Physical activity is the best preventive measure against many diseases. Nowadays, the importance of physical education and sports for all segments of society, especially young people, who are the future makers of the community, and are continually involved in intellectual activities, is very clear. The results of various studies have shown that one of the general needs of all sports is the physical fitness and football is an ideal sport for physical fitness. Recreational and competitive football is a healthy physical activity, provided that players have the necessary physical fitness [15]. Futsal is an energetic and exciting sport which has, recently, become quite popular among the youth. Futsal players have certain physical characteristics due to the nature of the sport and the environment in which the game is played [16]. The purpose of this study is to investigate the physiological changes of the Iran's women's national futsal team and compare them with women's football team before and after training in 2015. The results of this study showed that there was no statistically

significant difference between the two groups in regard with changes in blood pressure, heart rate, respiration and body mass immediately after training and 30 minutes later ($P > 0.05$). Additionally, although systolic blood pressure increases significantly immediately after training, it decreases even down to lower than baseline levels 30 minutes after exercise in 50% VO_{2max} ; but, diastolic blood pressure is not significantly altered immediately after treatment and during recovery. Based on the results of Dantas et al study (2008), which was conducted in Brazil in order to investigate the impact of physical activity on the blood pressure and heart rate of patients, showed that increase in the intensity of physical activity increases systolic blood pressure significantly, but there is no change in diastolic blood pressure; varying the intensity of the exercises causes the alteration of blood pressure, so that after 30 minutes of activity with a 75-50% vo_{2max} , the MAP is lower than basal [17]. Based on the findings of the present study, diastolic pressure does not change significantly and the systolic blood pressure is lower than baseline

during recovery. Based on the results of Benvenuti et al study (2010), which was conducted in Italy, although there is no difference in scheduled performance between women football and futsal players, there is a significant difference in their reaction performance [18]; despite doing different exercises, women football and futsal players of the present study turned out to be similar in regard with physiological changes. So et al study (2010) indicated that exercising more than 2 times per week in university students reduced their systolic and diastolic blood pressure in comparison to the time when they did exercise less than 2 times per week, which is independent of the effect of exercise on BMI and heart rate [19]; however, the results of the present study showed changes in the blood pressure. Also, the oral temperature decreases sharply, causing a decrease in the oral temperature by 8.1 c° during 3 minutes; but then, the decrease in temperature will continue to slow down and at 30 minutes after training although the temperature has increased in comparison with the recovery time, it has decreased in comparison with the zero time. Although the present study didn't examine the process of temperature change, it was observed that temperature decreased significantly 30 minutes after training in comparison with zero recovery time. The results of Iwane et al study (2000) showed that exercising more than 1,000 steps per day reduces blood pressure and heart rate, but does not have a significant effect on BMI [20]; these changes were similar between the two groups of soccer and futsal players in the present study.

CONCLUSION:

The results of this study showed that changes in the number of inhale and exhale, heart rate, systolic and diastolic blood pressure, and body mass are similar in women football and futsal players before and after training. Therefore, it can be deduced that more physical involvement and running compensates shorter duration of the game, which is considered a positive point in football. It is suggested to conduct further studies to investigate the effects of other sports fields on physiological changes.

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