THE INFLUENCE OF PHYSICAL ACTIVITY ON THE HEALTH OF FOOTBALL PLAYERS

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Abstract: *This study sought to ascertain if leading an active lifestyle had an impact on retired football players' health. According to their post-retirement physical activity patterns, sixty former professional football players who finished their athletic careers at least 10 years ago were divided into two groups for the research. Through the use of a questionnaire, health and lifestyle variables, such as levels of recreational physical activity, illnesses, family medical histories, smoking, alcohol use, and dietary patterns, were gathered. Additionally, blood parameters, cardiovascular health, and lung functions were assessed. Our findings demonstrated that retired football players who led sedentary lifestyles compared to those who were physically active had considerably greater body weight and body fat percentage. The active group had larger forced expiratory volume in one-second absolute and projected values. It was discovered that 12 retired sportsmen have intraventricular conduction delays. The results indicate that compared to former football players who lead less active lives, those who engage in greater levels of physical activity had improved body composition, respiratory functioning, and blood lipids. Former professional athletes are advised to continue living physically active lives to preserve their health and lower their chances of illness and impairment in later years of life.*

Introduction

The most widely practiced sport in the world; football is a physically demanding game that calls for peak performance. Players nowadays must be more adaptable and versatile in order to possess the skills needed on the performance and game fields. Athletes must thus practice intensely and very hard to enhance key physical characteristics if they want to play professional football at a high level [1]. Football players go through a number of physical and physiological adjustments as a result of this training method. These adaptations are reliant on intense training and have an impact on an athlete's health metrics [1-3]. Moderate physical activity is known to improve health in a number of ways, including by lowering the risk of disorders that affect the cardiovascular system, musculoskeletal issues, and type 2 diabetes. The consequences of excessive physical activity on top athletes, however, are not well studied. Furthermore, it is challenging to rule out lifestyle choices and inherited health risks like smoking, dieting, and levels of recreational physical activity as confounding variables, making it challenging to interpret the findings of studies evaluating the effects of high-intensity exercise and associated long-term disease risks.

Strong evidence supports the idea that engaging in regular physical activity may help prevent depression, several types of cancer, hypertension, stroke, metabolic syndrome, type 2 diabetes, and some cardiovascular illnesses [4-6]. Extreme exercise may injure the heart and lead to cardiac fibrosis and ventricular arrhythmia, according to several studies [7-9]. Additionally, there is some evidence that ongoing, intense exercise lowers mortality risk and improves functional abilities [7,10,11]. According to several research [12,13], engaging in sports activities that demand standing for long periods of time may contribute to the onset of osteoarthritis. For instance, according to several musculoskeletal research [14,15], former elite football players are 3-5 times more likely to develop gonarthrosis than inactive people are, and taking part in intense football training enhances these risks. In addition, it is well known that participation in sports improves bone mineral density, and this adaptation is thought to be permanent [16, 17]. Former football players are said to have higher bone mineral density and a lower fracture risk than sedentary people [16–18], but a study by Karlsson et al. [19] found that this advantage disappears for those who are over 60 and 35 years after retirement, and as a result, their fracture risks are comparable to those of sedentary people.

Elite athletes retire from competition for a variety of reasons. A more challenging transition may be felt if the athlete retires as a result of an injury, age, being deselected from a team, or performance loss [20, 21]. Additionally, it has been shown that sports-related injuries are often the cause of retirement [22]. Negative psychosocial impacts may occur when a person must stop participating in sports for medical reasons, such as injuries. According to Gouttebarge et al. [20], anxiety and depression were present in 104 former professional football players at rates ranging from 16% to 39%. Some of their lifestyle choices that they make even after they have retired from competitive sports have health repercussions in addition to psychological ones. Researchers found that former athletes with reduced coronary risk lipid profiles were physically inactive after their sporting careers. Additionally, Pihl and Jürimae [1] found a link between former athletes' weight increase following retirement and a greater incidence of risk factors for cardiovascular disease. Additionally, it was shown that former athletes who were physically active had a considerably lower biological age compared to those who were sedentary [2]. According to findings from a different research [10] on retired athletes, the frequency and intensity of daily physical activity had greater health-protective benefits than past competition. Despite the fact that professional athletes now have a lower chance of dying young from conditions like diabetes, hypertension, ischemic heart disease, and others, it has been suggested that maintaining an active lifestyle is more vital for health. [10,23,24].

Even though players engage in intense physical exercise during their sporting careers, they may not continue this once they stop competing. In this research, former football players' body composition, blood indicators, and cardiopulmonary functions will be compared in relation to their degree of leisure physical activity. We speculate that former football players' body composition, serum lipid profiles, blood counts, respiratory functions, and electrocardiographic outcomes are all improved by leading an active lifestyle.

Materials and Methods

Participants

Participants in the research were 40–50-year-old football players who retired from the sport at least ten years before and were willing volunteers. Based on their results on the International Physical Activity Scale, former football players were divided into two groups (IPAQ). The physically active group (AG, n: 30) consisted of people who are extremely active and scored at least 3000 metabolic equivalent of task (MET)-minutes per week, whereas the sedentary group (SG, n: 30) consisted of people who scored below 3000 MET-minutes per week [25]. They matched together former football players with similar ages who participated in comparable training and tournaments.

Through the use of a questionnaire, health and lifestyle variables were gathered in order to learn more about illnesses, family medical history, smoking, alcohol use, and food patterns. [26].

Family history and early mortality from any diseases were seen as important factors. A systolic blood pressure of more than 140 mmHg or a diastolic blood pressure greater than 90 mmHg was required for hypertension [27]. Several tests were conducted on the participants to evaluate their health, including lung function tests, urine tests, blood tests, and electrocardiograms.

Before the research began, each participant received information about the procedures and completed an informed consent form in writing. The Akdeniz University Clinical Research Ethical Board gave its approval to the research, which was carried out in line with the Declaration of Helsinki (70904504/197; 09/09/2015).

Physical Activity Questionnaire (IPAQ)

The International Physical Activity Questionnaire (IPAQ) short form was utilized to assess the volunteers' level of physical activity [25,28]. It is advised to administer this questionnaire to adults between the ages of 18 and 69. In order to assess how many days in the last week and how long (a) intense physical activities, (b) moderate intensity physical activities, and (c) walking were conducted, the questionnaire asks about minimum 10-minute physical activities completed during the previous seven days. The final question aims to gauge how much time a person spends sitting each day. The amount of time spent engaging in vigorous and moderate physical activity as well as walking is converted into the basic metabolic unit (MET), which is used to determine the overall physical activity score (MET-min/week).

Body Mass Index (BMI)

Body mass index (BMI) was computed as weight in kg over height in meter squared using a portable stadiometer (Harpenden Portable Stadiometer, Holtain, Crymych UK) to measure height without shoes. According to WHO guidelines [29], obesity was defined as a BMI greater than 30.0 kg/m2, while overweight was defined as a BMI between 25 and 29.9 kg/m2.

Bioelectric Impedance Measurements

Tanita Body Composition Analyzer Type SC-330 was used to collect bioelectric impedance measurements (BIA) of the subjects' body weight and body fat percentage (Tanita, Tokyo, Japan). Participants were measured while standing still with both feet balanced on the scale. Prior to the test, participants were instructed to refrain from heavy activity, consume no alcohol, consume no caffeine for at least four hours, and consume no food for two hours. [30].

Respiratory Tests

Spirometry was used to measure the participants' respiratory volumes and capabilities in order to assess their state of respiratory health (Pony FX, COSMED, Italy). Peak expiratory flow (PEF), forced expiratory flow at 25-75% (FEF), maximum voluntary ventilation (MVV) in 12 seconds, forced vital capacity (FVC), forced expiratory volume in the first second (FEV1), and spirometry measures were made. All spirometry tests were carried out in accordance with the American Thoracic Society's (ATS) guidelines for spirometry standardization. The percentage of anticipated values of FVC

(FVCp) and FEV1 were calculated using the reference values (ERS 93) for spirometry parameters from the European Respiratory Society [31].

Blood Tests

After an overnight fast, blood samples were taken the next morning. In the same standardized lab, all samples underwent analysis. Participants' antecubital veins were used to collect blood samples for the assessments of their thyroid function, serum lipids, and complete blood count. The values of the full blood count parameters for hemoglobin (Hb), hematocrit (Hct), red blood cell count (RBC), and white blood cell count (WBC) were assessed. Serum lipids were assessed as triglyceride (Tg), low-density lipoprotein cholesterol (LDLc), high-density lipoprotein cholesterol (HDLc), and total cholesterol (Tc). Thyroid stimulating hormone (TSH), free thyroxine (FT4), and free triiodothyronine blood concentrations were measured as part of the evaluation of thyroid function (FT3).

Electrocardiography (ECG):-

After 5 minutes of resting, the participants' ECGs were recorded in the supine position at 25 mm/s with a 1 L frequency. Using descriptive categories from Pelliccia et al. [32], a skilled cardiologist evaluated the ECG results in detail, analyzing the rhythm, heartbeat rate, QRS and T axes, QRS-T angle, PR, QRS, QT periods, the amplitude and period of P wave, QRS amplitude, R/S rate, the presence of pathological Q wave, ST segment, and T wave. A heartbeat that is at rest is one that is less than 60 beats per minute for sinus bradycardia.

Analysis of the Data

Every value is shown as the mean standard deviation (SD). Shapiro-Wilk and Levene's tests were used to confirm that all data met the assumptions of normality and homogeneity of variance. The findings of the Shapiro-Wilk, Levene, and values of skewness-kurtosis tests were used to examine the assumptions of the normality and homogeneity of the data in the study. For groups with a normal distribution, parametric tests were used, and for data that didn't fit these criteria, non-parametric tests were used. The Independent Sample T-Test (parametric) and Mann-Whitney U Test (non-parametric) were used to assess the differences between the groups. Utilizing IBM SPSS Statistics for Macintosh, version 23.0, statistical analyses were carried out (IBM Corp., Armonk, NY, USA). The University of Kiel's G-power program, version 3.1, was used to analyze the effect sizes (ES). Effect sizes are stated as Cohen's d, where a small effect size is defined as $d = 0.2$, a medium effect size as $d = 0.5$, and a high effect size as $d = 0.8$. P 0.05 was used as the statistical significance threshold. [33].

Results

There were no statistically significant differences between the groups in terms of alcohol intake, food habits, or smoking frequency. Former football players who had sedentary lifestyles as opposed to active lifestyles were shown to have considerably greater levels of physical characteristics, such as body weight, body mass index, and body fat percentage (p 0.001). The mean BMI values for both groups were within the overweight levels as determined by WHO standards. However, SG's BMI statistics are noticeably better than AG's. Table 1 displays the participants' physical characteristics.

Table 1. Physical Variables.

Variables	AG (n = 30)	SG (n = 30)	p	ES

Age (year)	43.4 ±4.1 (41.1; 45.2)	43.0 ± 4.4 (40.8; 45.4)	0.715	0.09
Height (cm)	177.7 ± 5.5 (175.6; 179.8)	176.3± 4.6 (174.6; 178.0)	0.301	0.28
Weight (kg)	79.5 ± 9.3 (76.0; 83.0)	88.5 ± 11.6 (84.2; 92.8)	0.002	0.85
BF% (%)	19.3±3.3 (18.1; 20.6)	24.5 ± 4.6 (22.8; 26.2)	0.000	1.30
BMI (kg/m2)	25.0 ±2.3 (24.3; 26.0)	28.4 ±3.0 (27.3; 34.90)	0.000	1.27

Values are means SD (95% Confidence Interval); AG = physically active group; SG = sedentary group; BF% = body fat percentage; BMI = body mass index; ES = effect size.
The values of FEV1 and FEV1p were shown to be considerably greater in AG than SG (p 0.05). Other spirometry parameters showed no statistically significant differences ($p > 0.05$). Furthermore, it was discovered that SG was below the averages of the predicted reference values for FEV1 and FVC. Table 2 displays the spirometry variables.

Table 2. Spirometry Parameters.

Variables	**AG (n = 30)**	**SG (n = 30)**	P	ES
FVC (L)	4.97 ± 0.67 (4.72; 5.22)	4.74± 0.49 (4.56; 4.93)	0.132	0.39
FVCp (%)	103.50 ± 11.35 (99.26; 107.74)	98.77 ±10.27 (94.93; 102.60)	0.096	0.44
FEV1 (L)	4.08 ± 0.51 (3.89; 4.27)	3.78 ±0.49 (3.60; 3.96)	0.025	0.60
FEV1p (%)	103.70 ±9.24 (100.25; 103.74)	96.60 ±12.19 (92.05; 101.15)	0.014	0.66
FEV1/FVC (%)	82.21 ± 4.78 (80.43; 84.44)	79.98 ±8.69 (76.73; 83.22)	0.408	0.32
PEF (L/s)	8.96 ± 1.80 (8.29; 9.64)	8.44 ± 2.17 (7.63; 9.25)	0.310	0.26
FEF 25–75 % (L/s)	4.26 ± 1.01 (3.88; 4.63)	3.92 ± 1.17 (4.48; 4.35)	0.234	0.31
MVV (L/min)	140.79±18.81 (133.76; 147.81)	137.60 ± 23.36 (128.22;146.32)	0.563	0.15

Values are means SD (95% Confidence Interval); AG = physically active group; SG = sedentary group;
FVC = forced vital capacity; FEV1 = forced expiratory volume in the first; MVV = maximal voluntary ventilation;
PEF = peak expiratory flow; FEF = forced expiratory flow at 25–75%; and ES = effect size.

Values are expressed as means standard deviations (95% confidence interval); AG stands for physically active group; SG for sedentary group; FVC stands for forced vital capacity; FEV1 stands for forced expiratory volume in the first; MVV stands for maximal voluntary ventilation; PEF stands for peak expiratory flow; FEF stands for forced expiratory flow at 25-75%; and ES stands for effect size.

Table 3. Blood Parameters.

Blood Parameters	**Variables**	**AG (n = 30)**	**SG (n = 30)**	**RR**	P	ES
Serum	Tg (mg/dL)	153.18 _ 91.81	191.54 _ 126.14	0–150	0.162	0.35

Lipids		(118.9; 187.5)	(144.4; 238.7)			
	Tc (mg/dL)	205.63 _ 38.15 (191.4; 219.9)	223.03 _ 35.71 (209.7; 236.4)	0-200	0.073	0.47
	LDLc (mg/dL)	118.11 _ 28.23 (107.6; 128.7)	130.91 _ 30.41 (119.6; 142.3)	0-100	0.046	0.44
	HDLc (mg/dL)	45.08 _ 10.73 (41.1; 49.1)	43.43 _ 9.41 (39.9; 46.9)	40-60	0.668	0.16
Blood Counts	RBC (_106/_L)	5.04 _ 0.26 (4.9; 5.1)	5.24 _ 0.57 (5.0; 5.5)	4-6	0.075	0.45
	WBC (_103/_L)	7.01 _ 1.86	6.67 _ 1.38 (6.15; 7.18)	4.8–10	0.615	0.21
	Hct (%)	43.79 _ 2.49 (42.9; 44.7)	43.69 _ 2.59 (42.7; 44.7)	35-52	0.340.	0.04
	Hb (g/dL)	14.92 _ 1.08 (14.5; 15.3)	14.77 _ 1.07 (14.4; 15.2)	12-16	225	0.14
Thyroid Functions	TSH	1.80 _ 0.80 (1.5; 2.1)	0.86 _ 0.88 (1.5; 2.2)	0.5–4.7	0.988	1.12
	FT3	3.27 _ 0.37 (3.1; 3.4)	3.44 _ 0.25 (3.4; 3.5)	2.3–4.2	0.040	0.54
	FT4	1.27 _ 0.15 (1.2; 1.3)	1.28 _ 0.15 (1.2; 1.3)	0.9–2.0	0.694	0.07

Values are means _ SD (95% Confidence Interval); AG = physically active group; SG = sedentary group;
RR = reference range; Tg = triglyceride;
Tc = total cholesterol;
LDLc = low density lipoprotein cholesterol;
HDLc = high density lipoprotein cholesterol; RBC = red blood cell count;
WBC = white blood cell count;
Hct = hematocrit;
Hb = hemoglobin;
TSH = thyroid stimulating hormone;
FT3 = free triiodothyronine;
FT4 = free thyroxine; and ES = effect size.

A similar number of sinus bradycardia cases were diagnosed in the ECG of participants from both groups (8 and 10 for AG and SG, respectively). The resting heartbeat is similar in both groups (62.87 ± 9.16 and 66.43 ± 11.58 for AG and SG, respectively; $p = 0.653$). However, nine people in SG and three people in AG were seen to have intraventricular conduction delay and one person in both groups was found to have left anterior fascicular block.

Discussion

It is well known that engaging in regular physical activity improves health and length of life [34]. As the degree of sports involvement improves, the risk of mortality is said to reduce by 20–35% [34–36]. Additionally, according to some studies, being fit or active may cut one's chance of dying, particularly from cardiovascular illnesses, by as much as 50% [5].

But according to certain research [37,38], exceptional athletes who lead sedentary lifestyles after retiring from athletics run a much higher risk of developing chronic diseases.

Athletes have a range of metabolic, functional, and morphological adaptations as a result of consistent exercise. In order to satisfy the demands of this complex game, football players must acquire traits like strength, agility, endurance, and speed. Football players get adaptable modifications to their neuromuscular, respiratory, and cardiovascular systems as a consequence of their integrated training [39]. For instance, according to Anderson et al. [40], football players had greater muscular fibers than inactive people do. Additionally, high-intensity exercise is linked to improved bone geometric features as well as increased bone mineral density and composition [41]. According to several research, athletes' hearts acquire evolved morphological, functional, and electrical features as a result of continuous accumulation of exercise stress [42,43]. Athletes' varied physiological systems undergo distinct adaptations depending on the sort of activity they conduct. It was suggested that athletes should keep up their exercise regimen in order to preserve the molecular, cellular, and biochemical alterations they acquire over their active sporting careers. [34,38,44].

Many former athletes continue to lead physically active lifestyles in late age, per certain research [45-48]. However, a significant portion of players (about 25%) reduce their level of physical activity or lead sedentary lives after leaving competitive sports [49,50]. Even though they would prefer to continue participating in high level athletic activities, athletes are unable to engage in physical activities due to prior discomfort or injuries, according to several research [44,51]. Former athletes may not want to engage in physical activity without a competitive edge [44]. Former athletes may also face additional psychological obstacles that keep them from engaging in physical activity. Having a strong athletic identity may deter former athletes from exercising, according to Tracey and Elcombe's research [21]. They also mentioned that both acute and chronic injuries may lead to inactivity, and that the psychological effects of injuries may discourage people from engaging in physical exercise. Former athletes may also find it embarrassing to exercise because of their struggles to stay in shape or retain their athletic performance [21,51]. Additionally, engagement in physical activities may be impacted by socioeconomic or cultural disparities [52,53]. The biological aging process of former football players involving both body composition and cardiorespiratory functions may be adversely affected as a consequence of reduced physical activity.

This research aimed to examine some health-related indicators, such as serum lipids, body composition, cardiorespiratory functions, blood counts, and thyroid functions, of former football players in accordance with their post-retirement physical activity habits. According to the findings of our research, sedentary former football players had greater body weight, LDLc, BF%, and BMI values than non-sedentary individuals. Body composition, blood lipid concentrations, and body fat percentages are recognized as significant anthropometric predictors of metabolic abnormalities, type 2 diabetes, and coronary heart disease [54–56]. High body mass index, low-density lipoprotein cholesterol, and a high body fat percentage were linked to a greater metabolic risk profile, according to earlier research [56–58]. Overweight and obesity have been listed as one of the major causes of death [56]. Adiposity may also contribute to some malignancies, including endometrial, colon, breast, and kidney cancers, according to Bianchini et al. [59].

The two main contributors to obesity are hyperphagia and inactivity [60]. Therefore, reducing caloric consumption while increasing physical activity may help you lose weight. Furthermore, thyroid problems and other endocrine disorders have sometimes been associated to obesity. Weight gain and metabolism are linked to thyroid disorders [61]. It is well known that the thyroid hormones FT3 and FT4 influence metabolism and weight gain [62]. In our investigation, both groups' thyroid functioning were confirmed to be normal. However, we have discovered that inactive former football players had much greater body weights and body fat percentages (by around 10 kg) than physically active former football players. The results of many research [63,64] revealed that trained athletes had good body and serum lipid profiles. The BMI, body weight, and body fat percentage of former athletes who drastically curtailed their physical activity, according to certain research [65,66], however, showed a striking rise. After stopping their regular training and leading a less active lifestyle, former football players acquired additional weight, had an elevated body mass index, and a higher body fat percentage, according to Arliani et al[67] analysis of the health of former Brazilian professional football players. Marti et al. discovered a rise in body weight and inner fattening among former runners who reduced their degree of physical activity in a research on top runners [65]. Physical activity is a strong predictor of weight control, according to a research by Pihl et al. [66] that contrasts sedentary former football players with those who are physically active.

When people who were active athletes ceased competing, their level of physical activity decreased, which resulted in a rise in body weight and some unfavorable alterations to their blood lipids [68,69]. According to several research, weight growth has a detrimental impact on serum lipids, which raises the risk of cardiovascular illnesses [70,71]. Despite the fact that our investigation did not reveal any statistical differences, Tg, Tc, and LDL levels were shown to be greater in SG than AG. Our findings on the connection between serum lipids and cardiovascular diseases are in line with those of other studies [72–74], and former football players who lead physically active lifestyles have a lower indirect risk of developing cardiovascular diseases. Similar to this, Zaccagni et al. [69] revealed that former top athletes' frequent physical activity habits had a favorable impact on various biological aging processes, including body composition and cardiorespiratory functioning. According to Lynch et al. [75], former athletes who lead physically active lives have better body compositions and lower chances of cardiovascular disease than those who have sedentary lifestyles. According to Vingard et al. [76], older athletes who walk for at least 30 minutes three times a week are healthier than those who don't frequently exercise.

The left atrial diameter of former endurance athletes is bigger than that of the general population, according to Sanchis Gomar et al[77] .'s study on the consequences of high-intensity endurance training. Although it is well known that an increase in left atrial volume and width is associated with a higher chance of developing atrial fibrillation, none of the older athletes who participated in the study had the condition. Additionally, they said that additional study is required to shed light on the clinical outcomes related to morphological alterations in veteran athletes. [77].

Even though it is well known that elite athletes have better health and longer lifespans than the general population [10, 69, and 78], research is still ongoing on some of the long-term adaptations to high-intensity training and its effects on health. Regular exercise is supposed to strengthen the cardiovascular system. The heart and vascular structure enlarge as a chronic side effect of exercise, notably in endurance athletes [79]. Athletes' arteries have thinner walls and a larger lumen diameter, according to Green et al. [80]. Additionally, Sanchis Gomar et al. [77] looked at the long-term effects of high-intensity endurance training on left atrial volume in former athletes and found that these individuals had bigger left atrial dimensions than their younger counterparts. In a research on elite athletes, Pellicia et al. [81] discovered no cardiovascular issues, no decline in overall LV systolic function, no alterations in LV systolic function, and no anomalies in wall motion over 17 years after the athletes stopped training. However, they noted that while the left atrial size and left ventricular cavity of these ex-athletes have increased, there are no adverse effects on their health. Additionally, as the athletes age, no inferences are made regarding the clinical implications of the left atrium's expansion over an extended period of time [81].
Our study's ECG analyses revealed that 12 former players who had participated in high-level football training had intraventricular conduction delay, expansion of the QRS complex, and anterior fascicular block. A slower pulse, more parasympathetic responses for structural cardiac adaptations and non-homogenic repolarization of the ventricles have all been linked to great athletes. Chronic adaptations such as those previously stated may lead to rhythm and conduction discrepancies, morphological abnormalities in the QRS complex, and repolarization anomalies [82,83]. Furthermore, Macchi et al. [84] observed that these training-related cardiac adaptations do not fully revert to normal once training is stopped. Although ECG abnormalities are often considered to be normal in athletes, Pellicia et alresearch .'s [85] examined 12,550 athletes' ECG alterations over a period of 1–17 years and found that aberrant ECG findings in young, healthy-appearing athletes may be the first sign of underlying cardiomyopathies. As a result, it's critical to clinically monitor athletes who exhibit these ECG abnormalities. Nine of the 12 intraventricular conduction delays found in our research were in the sedentary group and three were in the group that participated in physical activity. The fact that the sedentary group exhibits a threefold increase in intraventricular conduction delay implies that continued physical activity after giving up a sport may affect ECG patterns. However, more study on this subject is required.
The respiratory system was examined as another health indicator in our research. After age 25 [86, 87], it is well known that the respiration volume and capability diminish. FVC and oxygen uptake specifically decline with age due to changes in the flexibility of the lungs, weakening of the breathing muscles, and problems with gas shifts [87-89]. Athletes' respiratory systems are more developed than those of sedentary people because of training, yet as they age, athletes' lungs also lose volume and capability. According to McClaran et al. [90], FEV1 and MVV values drop by around 12% over the course of six years, even in adults over 60 who exercise aerobically and have nearly twice as much maximum oxygen uptake as one would anticipate given their age. The respiratory system may be impacted by the way of living after giving up athletics. As an example, Eker et alstudy [91] found that the

anticipated FEV1 values of former football players who do not frequently exercise were statistically substantially lower (p 0.05) than those of a group of footballers who were age-matched. In our research, compared to sedentary former football players, former athletes who were more physically active had substantially higher FEV1 values, both as an absolute value and as anticipated values in accordance with the age-matched standards of the European Respiratory Society.

Football players may struggle greatly when it comes to retiring from their sporting careers. According to a study, ex-athletes may suffer from psychological and physical issues such severe depression, identity disorientation, drug and alcohol misuse, and eating disorders. Studies on health issues among retired football players are, however, limited.

The study's shortcomings include a small sample size, a lack of blinding, and a lack of gender comparison. Another drawback is that nutrition, which may have a significant role in determining weight growth and blood cholesterol levels, was not studied. Randomized longitudinal trials would be significantly more effective in elucidating the complex interactions between dietary, lifestyle, and health factors. Despite these drawbacks, we think that our findings will be helpful in promoting physical activity following football retirement.

Conclusions

In conclusion, both groups' results are observed to be within the normal ranges when the parameters of blood counts and thyroid functions are assessed using reference ranges. According to ECG findings, neither group was thought to have pathology. However, it was shown that 12 former sportsmen had an intraventricular conduction delay. In comparison to former football players who lead relatively inactive lives, former players who maintain healthy body weights and blood cholesterol levels had a lower risk of cardiovascular disease. According to the findings of this research, retired professional athletes should continue physically active lives in line with suggestions made by the American College of Sports Medicine [92] to preserve their health and lower their risk of illness and impairment in later life.

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