


Article

# Accelerometry-Measured Physical Activity in Amateur Footballers. Is It Enough to Obtain Health Benefits?

Javier Fernandez-Rio <sup>1,\*</sup>, Sixto González-Víllora <sup>2</sup>, Alfonso Valero-Valenzuela <sup>3</sup>,  
Alejandro Anton-Candanedo <sup>1</sup>, Juan Andrés Merino-Barrero <sup>4</sup>,  
Juan Vicente Sierra de los Ríos <sup>2</sup> and Miguel Angel López Gajardo <sup>5</sup>

<sup>1</sup> Faculty of Teacher Training and Education, University of Oviedo, C/Aniceto Sela, s/n, Despacho 222, 33005 Oviedo, Spain; candanedo91@gmail.com

<sup>2</sup> Faculty of Education (Cuenca), University of Castilla-La Mancha, 16071 Cuenca, Spain; sixto.gonzalez@uclm.es (S.G.-V.); juanvisr@gmail.com (J.V.S.d.l.R.)

<sup>3</sup> Faculty of Sports Science, University of Murcia, 30720 Murcia, Spain; avalero@um.es

<sup>4</sup> Faculty of Education, International University of La Rioja, 26006 Logroño, Spain; jandres.merino@unir.net

<sup>5</sup> Faculty of Sports Science, University of Extremadura, 06006 Badajoz, Spain; mianlopezg@gmail.com

\* Correspondence: javier.rio@uniovi.es

Received: 14 May 2020; Accepted: 29 May 2020; Published: 1 June 2020



**Abstract:** Amateur football is played by millions of individuals worldwide, but it has been scarcely researched (almost no studies have targeted this sport). There seems to be a need to fill this gap, because it has an impact in these individuals' health status. The aim of our research was to uncover amateur football players' physical and psychological traits to understand the impact of this sport in their health (physical, mental, and social well-being). Two-hundred footballers (17–40 years) from four regions in Spain (north, central, southwest, southeast), enrolled in 16 different football teams participated. They completed a questionnaire to assess their motives for sport participation, their intention to continue playing football, and their exercise addiction. To objectively measure their physical activity levels, accelerometers were used during practice sessions. Ratings of perceived exertion (RPE) were obtained from coaches prior to and after every practice session and players at the end of every practice. Results showed a mean 140.1 moderate-to-vigorous physical activity (MVPA)/minutes/week. Players' RPE scores were similar in the "fairly light" range (6–20 scale) at pre ( $11.38 \pm 1.64$ ) and post training ( $11.83 \pm 1.39$ ), and it was not different between players and coaches ( $11.50 \pm 1.52$ ). Enjoyment was the highest-ranked motive to practice amateur football ( $6.34 \pm 0.67$ ; 1–7 range), followed by fitness ( $5.68 \pm 0.97$ ; 1–7 range), social ( $4.80 \pm 0.85$ ; 1–7 range), and appearance ( $4.04 \pm 1.21$ ; 1–7 range). Players had some symptoms of exercise addiction ( $21.09 \pm 4.53$ ; 1–30 range) and their intentions to continue playing were very high ( $4.31 \pm 1.08$ ; 1–5 range). Moreover, enjoyment was the strongest predictor of these intentions ( $R^2 = 0.260$ ). In conclusion, a weekly amateur football practice almost allows players to meet international MVPA recommendations for health benefits. Enjoyment was their strongest motive to practice, and the players showed some symptoms of exercise addiction. These two variables were the strongest predictors of the participants' intention to continue playing amateur football. This sport could be considered adequate to help adults maintain an active, healthy lifestyle.

**Keywords:** accelerometers; motives; health; addiction; football

## 1. Introduction

According to the World Health Organization (2020) [1], “health is a state of complete physical, mental and social well-being”. Therefore, to understand the health status of an individual, researchers must look into physical, mental, and social factors. Health promotion “is the process of enabling people to increase control over, and to improve their health” [2]. Currently, individuals of all ages try to maintain their health through physical activity practice, for example, by doing sports like football.

Football is probably the most dominant sport: 500 million people practice it worldwide [3]. Three football organizations were acknowledged by the authors of [4]: (a) Professional: football is considered a job ruled by professional organizations (National and Regional Federations included in International Federations like Union des Associations Europeenes de Football (UEFA) and Federation Internationale de Football Association (FIFA)), (b) Leisure: football is a hobby ruled by non-profit organizations, and (c) Exercise: football is a means to achieve/maintain health ruled by non-profit organizations. The last type has also been called football fitness and it is becoming more popular in countries like Denmark [5]. The second type has also been called recreational and it is also widespread [6]. There is also an emerging type of football called street soccer that is played outside on a 4 vs. 4 basis in reduced areas [7]. Different studies have shown that all football options can produce physical [8], cardiovascular [9], psychological, and social benefits [10], helping in the prevention and treatment of diseases [11–13]. There is yet another type of football organization: Amateur Football. It has the ingredients of professional football (i.e., professional organizations rule the sport, official divisions, long-lasting leagues, demanding training schedules), but players do not earn any money. Yet, it cannot be considered leisure/recreational or exercise/fitness football, because the outcomes of the games are important, regular practice is compulsory to get ready for weekend matches, and it is not considered a hobby. Therefore, amateur football could be defined as a type of football ruled by professional organizations, organized in official divisions that include long-lasting leagues and training schedules, where the games’ outcome is important, but players do not earn any money. Almost in every country with a professional league (England, France, Germany, Poland, etc.), there exist multiple amateur regional leagues with hundreds of teams and thousands of individuals. However, the effects of this type of physical activity practice on the players’ health or the motives that lead thousands of individuals to play this sport have not been investigated, probably because it lacks the popularity of professional football, the social image of leisure/recreational football, and the drive/marketing of new proposals like exercise/fitness/street football/soccer. Most of the research has been conducted on professional, youth, recreational, or fitness football, but millions of amateur footballers have been ignored [14]. Why do individuals who competed in earlier stages of their football career continue in amateur football with all the demands of professional football (i.e., pressure to win, injuries, time away from the family), but not the benefits (i.e., money, fame)?

The impact of football training on individuals’ health has been found to be as positive as that generated by other types of physical activity (i.e., running, swimming, cycling). However, the adherence to these other activities, based on aerobic efforts and repetitive activity, is low, and a high percentage of participants quit after a few months, mostly because of boredom or tiredness [15,16]. For many, these activities can be too monotonous and/or demanding. Many seek more enjoyable physical activity programs like ball games, where practice is more pleasing, which can help with engagement. Amateur sport participants have acknowledged that their most important motive for sport involvement was health, but also social/enjoyment and skill development [17]. Young adults have declared that their motives to be physically active were mastery (become skilled performing the activity) and fitness [18]. Fitness football seemed to interest women originally for health reasons, but enjoyment and friendship were also important [6]. Many individuals, who do not have the skills (physical, technical, tactical, psychological) to reach the professional football level, continue playing in amateur leagues during their twenties, thirties, or even forties; why? Their love for the game, the comradeship that the sport builds, or the possibility to maintain active lifestyles? If the last one is the case, is amateur football training enough to obtain health benefits?

International organizations linked to health warned that adults should meet at least one of these four conditions to achieve health benefits [19]: (a) 150 min/week of moderate-to-vigorous physical activity (MVPA), (b) 30 min/5 days/week of moderate-intensity physical activity, (c) 20 min/3 days/week of vigorous-intensity physical activity, or (d) 600 metabolic equivalent (METs)/week. Regrettably, 60% of adults do not meet any of the conditions [11]. Promisingly, recent studies found an increase in adults' leisure time physical activity, including sport participation [20]. Can amateur football practice help players meet the criteria to be considered physically active individuals? Wearable devices like accelerometers have become very popular to quantitatively assess physical activity because they can provide unbiased data of the intensity, frequency, and duration of any physical activity program without disturbing individuals [21]. To our knowledge, there are no published studies that have used accelerometers to assess the impact of football practice on the players' physical demands. Moreover, no comparisons have been made between objective measures and subjective perceptions of the same program (ratings of perceived exertion) to fully understand football training from the physical, mental and social perspective of health and well-being.

Regrettably, an activity that begins as a healthy habit may turn into a problem when it is practiced at intensity levels that lead to distress, causing physical and/or psychological harm. Exercise dependence is estimated to exist in 3% of the general population, showing a significant increase among individuals who practice sport [22]. Exercise addiction is a behavioural disorder produced by both physiological and psychological factors [23]. It has been mostly studied in power, fitness, and endurance disciplines [24]. To our knowledge, only one study was conducted in soccer players, and the number of participants was limited [25]. Since amateur football players practice for many years without any monetary compensation, and endure bad weather conditions at times, could they be considered addicted to exercise?

The main goal of the study was to uncover amateur football players' physical and psychological traits to understand the impact of this sport on their health (physical, mental, and social well-being). The first hypothesis was that this group of athletes will meet the requirement of 150 min/week of MVPA. The second hypothesis was that the strongest motive to play football of these amateur footballers will be health. Finally, the third hypothesis was that this group of individuals will show low levels of exercise addiction.

## 2. Materials and Methods

### 2.1. Subjects

Two-hundred football players ( $23.15 \pm 4.05$  years; age range 17–40) from four different regions in Spain (north = 52; central = 52; southwest = 56; southeast = 40), enrolled in 16 different football teams, and their 16 coaches agreed to participate. All players were amateurs, i.e., individuals who played football on an unpaid basis. Based on the previously described characteristics of amateur football (i.e., professional organizations rule the sport, official divisions, long-lasting leagues, demanding training schedules), teams' eligibility criteria were: (a) compete in the Spanish 5th division (organized by Regional Football Federations under the supervision of the Spanish National Football Federation), and (b) regular practice (three times a week, one hour and 30 min each). These criteria allowed only amateur football teams to enter the study. Similarly, based on the previously mentioned characteristics of amateur football players (i.e., they do not earn any money from playing football, games' outcome is important, regular practice is compulsory to get ready for weekend matches, it is not considered a hobby), players' inclusion criteria were: (a) willingness to be monitored, (b) not being paid any money for playing football, (c) regular attendance to practices and matches (>90% for both), and (d) >4 years of football experience. These criteria helped involve only amateur players in the study. Prior to study enrolment, all participants underwent a medical examination to validate their health status. Participants' body mass ( $76.87 \pm 46.19$  kg) and the sum of seven skinfolds ( $79.81 \pm 28.74$ ) were determined. Finally, participants' basic demographic characteristics were obtained: (a) average football experience:  $15.21 \pm 4.90$  years (range 4–30), (b) employment: 36.7% workers, 11.3%

unemployed, 52.0% students; and (c) Education: 59.3% secondary education, 35.3% university degree, 5.4% primary education. The study followed a prospective research design with only one group of participants [26]. This design is also considered transversal and correlational. In our case, a simple design was used because a key group of individuals that possessed one trait (being amateur football players) was targeted.

## 2.2. Procedure

First, permission to conduct the study was obtained from the University of Oviedo Ethics Committee. Second, the research project was presented to each football team's manager, coach, and players, and written permission was obtained from all of them or their legal tutors.

Third, participants followed a similar weekly football training program: three sessions per week (90 min each) over four weeks for a total of 12 sessions. All included conditioning, and technical and tactical skills were globally performed. Practices involved individual, pairs, and/or group drills with/without defence, always with a ball. There was not a specific training protocol/workload for the teams. The goal was to assess intact training contexts. Fourth, players completed a questionnaire at the beginning of the study, and they were monitored during all practices. The project respected the ethical values required in research conducted in human beings: informed consent, right to information, protection of personal data, guarantees of confidentiality, non-discrimination, gratuity, and possibility to leave the study at any time.

## 2.3. Measurements

*Accelerometers.* One ActiGraph GT3Xw (ActiGraphTM, LLC, Fort Walton Beach, FL, USA) per player was used. Data was collected through a triaxial function every 10 s. The cut-off points were adjusted for adults [27] to categorize physical activity intensity as sedentary (0–99 counts/minute), light (100–1951 counts/minute), moderate (1952–5724 counts/minute), vigorous (5725–9498 counts/minute), and very vigorous (9499 counts/minute and above). MVPA, METs, Kcal, and steps were also obtained. Before the beginning of each practice session, researchers placed the accelerometers just above the players' right hip, under the clothes, and collected each one at the end.

*Motives for practice.* The Spanish validated version of the Perceived Motives for Physical Activity Measure–Revised was used [28]. It consists of five subscales, but only four were used: *Enjoyment*, *Appearance*, *Social*, and *Fitness/Health*. Participants responded to the stem: "I play football ... " in a seven-point Likert-type scale. Cronbach's alphas were: 0.831, 0.871, 0.653, and 0.886.

*Addiction.* The Spanish validated version of the Exercise Addiction Inventory was used [29]. Participants responded to the stem: "To what degree do you agree with the following statements?" in a five-point Likert-type scale. Twenty-four points or more classify individuals as being at risk of addiction, 13–23 as having symptoms, and 0–12 as asymptomatic. Cronbach's alpha was 0.771.

*Intention to continue playing football.* Since there were no validated questionnaires to assess players' intention, the following question was included: "I intend to continue playing football for a long time". Participants answered in a five-point Likert-type scale.

*Ratings of Perceived Exertion (RPE).* Borg and Kaiser [30] found a linear relationship between perceptual factors and physiological or physical parameters in a 6–20 scale. Participants were asked to rate their perceived exertion at the end of each practice session. Before and after each session, coaches were asked too. The goal was to compare the expected with the produced RPE.

## 3. Statistical Analyses

Actilife 6.7.1. software (ActiGraphTM, LLC, Fort Walton Beach, FL, USA) was used to handle all data obtained through the accelerometers, which was later exported and analysed using the Statistical Package for Social Science 24.0 (SPSS; IBM, Chicago, IL, USA). Descriptive, inferential, and correlational analyses were conducted. Several one-way analyses of variance (ANOVA) were also conducted to assess differences among groups of participants in all the variables under study (MVPA, RPE, motives,

depressive symptoms, addiction, and intention to continue playing) based on a number of grouping variables (i.e., playing position, age, years of experience, etc.). The F-test is still a valid statistical procedure under non-normality conditions when skewness and kurtosis range between  $-1$  and  $1$ . Therefore, the Games–Howell post-hoc test was used to compare groups, since it does not assume equal variances and sample sizes. Pearson’s bivariate correlations were also calculated among all the previously mentioned variables under study to assess the relationships between them. Finally, the variables that correlated stronger with intention to continue playing football (enjoyment, addiction) were entered into a hierarchical multiple regression analysis to determine the predicting power of these variables on the dependent variable (intention to continue playing football).

#### 4. Results

Regarding the first hypothesis, participating amateur football players’ physical health parameters (physical activity levels and energy expenditure) are included in Table 1. The most important result was that this groups of football players spent an average  $46.70 \pm 13.71$  min of MVPA in every practice session. Since they practiced three times every week, they averaged 140.1 min of MVPA per week. On the other hand, RPE scores showed that football practice was considered “fairly light” pre ( $11.38 \pm 1.64$ ) and post training ( $11.83 \pm 1.39$ ), and it was not different between players and coaches ( $11.50 \pm 1.52$ ).

**Table 1.** Physical activity levels per practice session.

	M $\pm$ SD	Range	Kurtosis	Skewness
Sedentary Physical Activity	21.01 $\pm$ 10.36 *	52.71	−0.023	0.599
Light Physical Activity	21.07 $\pm$ 6.72 *	29.32	−0.625	0.045
Moderate Physical Activity	27.18 $\pm$ 8.97 *	46.53	0.807	0.838
Vigorous Physical Activity	16.28 $\pm$ 7.10 *	29.84	−0.467	0.534
Very Vigorous Physical Activity	3.19 $\pm$ 3.95 *	36.42	25.852	4.014
Moderate-to-Vigorous Physical Activity	46.70 $\pm$ 13.41 *	53.42	−0.703	0.188
Energy Expenditure (METs)	3.63 $\pm$ 1.61	20.584	86.036	7.565
Energy Expenditure (Kcal)	355.98 $\pm$ 85.78	764.398	11.878	2.144
Distance (Steps)	5581.70 $\pm$ 1081.24	6736.833	0.716	0.236
Players’ RPE post-training	11.38 $\pm$ 1.64 **	9.00	0.630	−0.153
Coaches’ RPE pre-training	11.50 $\pm$ 1.52 **	8.00	0.882	−0.221
Coaches’ RPE post-training	11.83 $\pm$ 1.39 **	7.00	0.961	0.319

Note: M = Mean; SD = Standard Deviation; \* minutes; \*\* 6–20 scale.

Regarding the second and third hypotheses, Table 2 shows the results obtained through the questionnaire. Regarding the motives to play football, enjoyment was the highest-ranked ( $6.34 \pm 0.67$ ; 1–7 range), followed by health/fitness ( $5.68 \pm 0.97$ ; 1–7 range), social ( $4.80 \pm 0.85$ ; 1–7 range), and appearance ( $4.04 \pm 1.21$ ; 1–7 range). Regarding the participants’ addiction to playing football, results defined these individuals as having some symptoms ( $21.09 \pm 4.53$ ; 1–30 range). Finally, when asked about their intentions to continue playing football, the players’ scores were very high ( $4.31 \pm 1.08$ ; 1–5 range), very close to the maximum.

**Table 2.** Motives to practice football, addiction, and intention to continue playing.

	M $\pm$ SD	Range	Kurtosis	Skewness
Enjoyment	6.34 $\pm$ 0.67 *	6.43	0.112	−0.516
Fitness	5.68 $\pm$ 0.97 *	5.83	0.878	−0.806
Social	4.80 $\pm$ 0.85 *	5.00	0.935	−0.427
Appearance	4.04 $\pm$ 1.21 *	6.00	0.030	−0.638
Addiction	21.09 $\pm$ 4.53 **	24.00	0.200	−0.720
Intention to continue playing football	4.31 $\pm$ 1.08 ***	4.00	2.037	0.342

Note: M = Mean; SD = Standard Deviation. \* 1–7 scale; \*\* 1–30 scale; \*\*\* 1–5 scale.



Results from the first one-way ANOVA showed that there was a significant difference among the playing positions only on enjoyment:  $F(3, 196) = 2.94, p < 0.034$ . Post hoc testing revealed that the difference was between goalkeepers ( $6.73 \pm 0.24$ ) and the other playing positions. No significant differences were observed on MVPA or any of the other variables assessed.

Similarly, another one-way ANOVA was conducted to assess differences between groups of participants (north, central, southwest, and southeast). Results showed that there was a significant difference among the four regions on MVPA:  $F(3, 196) = 6.52, p < 0.001$ , intention to continue playing football:  $F(3, 196) = 13.963, p < 0.001$ , enjoyment:  $F(3, 196) = 14.41, p < 0.001$ , appearance:  $F(3, 196) = 8.82, p < 0.001$ , health/fitness:  $F(3, 196) = 6.81, p < 0.001$ , and exercise addiction:  $F(3, 196) = 20.44, p < 0.001$ . Post hoc testing revealed those differences in MVPA were between central:  $52.51 \pm 8.58$ , southwest:  $46.84 \pm 6.97$ , and southeast:  $40.82 \pm 9.71$ ; intention to continue playing football was between southeast:  $5.00 \pm 0.01$ , southwest:  $4.57 \pm 0.73$ , north:  $4.00 \pm 1.15$ , and central:  $3.81 \pm 1.35$ ; enjoyment was between southeast:  $6.85 \pm 0.01$ , southwest:  $6.40 \pm 0.54$ , north:  $6.17 \pm 0.79$ , and central:  $6.05 \pm 0.71$ ; appearance was between southeast:  $4.83 \pm 0.01$ , and the others: central:  $4.01 \pm 1.49$ , southwest:  $3.88 \pm 1.28$ , and north:  $3.64 \pm 1.02$ ; fitness was between southeast:  $6.16 \pm 0.01$  and the others: southwest:  $5.78 \pm 1.06$ , central:  $5.51 \pm 1.08$ , and north:  $5.37 \pm 0.99$ ; and exercise addiction was between southeast:  $25.00 \pm 0.01$  and the others, and between southwest ( $21.66 \pm 3.52$ ) and central:  $19.52 \pm 5.58$  with north:  $19.03 \pm 4.04$ .

Finally, to understand the connections between all the variables under study and their impact on amateur football players' health (physical, mental, and social well-being) bivariate correlations were assessed between all the variables, and the results are presented in Table 3. Regarding the participants' intention to continue playing football, the highest correlated variables were exercise addiction and enjoyment. Regarding MVPA, it was enjoyment (negatively).

**Table 3.** Bivariate correlations among variables.

	1	2	3	4	5	6	7
1. Intention to continue playing football	1	-0.129	0.510 **	0.111	0.175 *	0.115	0.568 **
2. Moderate-to-vigorous physical activity	-0.129	1	-0.154 *	-0.031	-0.004	0.007	-0.049
3. Enjoyment	0.510 **	-0.154 *	1	0.251 **	0.519 **	0.443 **	0.581 **
4. Appearance	0.111	-0.031	0.251 **	1	0.493 **	0.662 **	0.337 **
5. Social	0.175 *	-0.004	0.519 **	0.493 **	1	0.501 **	0.369 **
6. Fitness	0.115	0.007	0.443 **	0.662 **	0.501 **	1	0.356 **
7. Addiction	0.568 **	-0.049	0.581 **	0.337 **	0.369 **	0.356 **	1

Note: \*\*  $p < 0.01$ , \*  $p < 0.05$ .

These strong correlations were used to continue the analyses of the data obtained, and regression analyses were conducted. First, the assumptions for regression analyses were tested and satisfied. Analyses also showed that multicollinearity was not a concern: tolerance = 0.662, variance inflation factor = 1.510 (both under 10; traditionally used as cut-off point). The data also met the assumption of independent errors: Durbin–Watson = 1.699 (scores between 1 and 3 are accepted). The order of entering the independent variables in the hierarchical multiple regression analysis was, in block one, enjoyment accounted for 25.6% of the variance in the participants' intention to continue playing football:  $R^2 = 0.260$ , adjusted  $R^2 = 0.256$ ,  $F(1, 60.43) = 69.428, p < 0.001$ ; in block two, exercise addiction accounted for an additional 11.2% of the variance in the participants' intentions to continue playing football (36.8% total):  $R^2_{\text{change}} = 0.112$ ,  $F_{\text{change}}(1, 43.22) = 35.025, p < 0.001$  (Table 4).

**Table 4.** Partial regression coefficients for each predictor on each block/step in the regression analyses.

Block/Step	Predictor	B (95% CI)	Std. Error B	$\beta$	$Sr^2$
1	Enjoyment	0.813 (-2.071–0.382)	0.098	0.510	0.26
2	Enjoyment	0.432 (-1.637–0.642)	0.111	0.271	0.07
	Addiction	0.098 (0.065–0.131)	0.017	0.411	0.15

Note. CI = Confidence Intervals; Std. Error = Standard Errors;  $Sr^2$  = Squared Semi-partial Correlations.

## 5. Discussion

The main aim of the study was to uncover amateur football players' physical and psychological traits to understand the impact of this sport on their health (physical, mental, and social well-being). Results showed that they did not meet the international requirements of 150 min of MVPA per week, their strongest motive to play football was enjoyment, followed by health/fitness and social, and they had some symptoms of exercise addiction.

The first hypothesis was that this group of amateur football players will meet the requirement of 150 min/week of MVPA, and the results did not confirm this. They averaged 46.70 min of MVPA per practice. Since they had three practices every week, they reached 140.1 MVPA minutes per week. This is just below one of the four conditions described by international organizations to achieve health benefits by performing physical activity [19], which is 150 min/week of MVPA. Nevertheless, these players belonged to teams enrolled in an official league ruled by a professional organization with matches every weekend from September to May (main features of amateur football). Therefore, it could be assumed that those individuals who play the weekend game (most players, because the teams have limited rosters) could reach the minimum required to obtain health benefits. This is extremely speculative at this time, and more research is needed.

In this study, MVPA was significantly different among different groups of participants (it was higher in the players of the central group). This indicated that amateur football training intensities can be very different depending on the coach. Surprisingly, there were no differences on MVPA based on the participants' playing position (goalkeeper, defender, midfielder, and attacker). This seems to indicate that practices involved all players equally through global tasks and exercises, not like professional football where training is highly specialized depending on the players' position [31]. This could be one of the reasons for the success of amateur football: all players feel equally involved in practice. Again, this is highly speculative, and more research should be conducted. Finally, previous studies [6,20] have shown that vigorous physical activity can produce more health benefits than moderate physical activity (i.e., walking). Results from the present study showed that amateur football training can produce considerable amounts of vigorous and very vigorous intensity, which makes this physical activity beneficial for the individuals' health. Unfortunately, to our knowledge, there are no published studies on football that have used accelerometers to assess athletes' physical activity levels with which to compare.

Previous research has shown that despite high heart rates during training, fitness and recreational football had lower scores of perceived exertion compared to other physical activities such as jogging, interval running, or fitness training [32]. In this study, RPE scores rated amateur football practice as "fairly light". Moreover, the coaches' RPE pre-training showed that they believed that they had prepared a light training program, and when asked again after practice the RPE post-training score was almost the same. Furthermore, a similar player RPE score was also obtained after practice. Therefore, all actors involved had a very similar perception: practice was fairly light. Amateur players went to practice after a full working and/or study day. They were tired and probably not prepared for physically demanding exercises. Previous studies showed similar medium-to-low RPE levels in recreational football [33] and street soccer [7], but much higher in professional football due to more demanding training protocols [31,34]. This is probably a key element of amateur football: low intensity levels to make participants enjoy the sport, but high enough to produce close-to-adequate MVPA levels. This could help with adherence for many years despite hard training conditions (rain, cold, wind). Fitness football has high recruitment, especially among women, but also many dropouts [8].

The second hypothesis was that the strongest motive to play football of these amateur footballers will be health/fitness, and results did not confirm this. The highest-ranked motive was enjoyment, followed by health/fitness. Unfortunately, there are no previous studies on amateur football, but others conducted in recreational/leisure football players showed that their strongest motive was health, followed by mastery and enjoyment [10]. An important difference between recreational and amateur football is that the former is considered a hobby, while the latter is ruled by professional organizations

(Regional and national Federations included in International Federations like UEFA and FIFA) and organized in regional leagues (Spanish 5th division) where the outcome of every weekend game is important for the standings. This competitive system probably made players feel connected to the sport and explains why they felt that enjoyment was the most important motive to play amateur football. Despite wins/losses being very important, does amateur football still have “the youthful joy of playing your game? The pure fun?” [3]. Results seemed to indicate that it did, since enjoyment was the highest-ranked motive. Of course, more research is needed to clarify this issue. Results also showed that amateur football is not like fitness football. The latter focuses on fitness, but also on the social benefits of playing the sport [4,5], which is not the focus of the other, where the social motives scored in third place, probably because there is an official competition and winning/losing matters. Moreover, enjoyment was the strongest predictor of this amateur football players’ intention to continue playing, followed by exercise addiction. Therefore, the ingredients of amateur football described in this study (official competition, regular practice, weekend games, win/loss important, no money for playing) probably make participants enjoy the sport and make them willing to continue playing in the future (adherence). This is very important, because these individuals are likely meeting the international recommendations on MVPA to obtain health benefits (if the impact of weekend games is included).

Finally, the third hypothesis was that these amateur football players will show low levels of exercise addiction, and the results did not fully supported this, because they did show some symptoms. Moreover, southeast participants’ scores showed that they could be classified as being at risk of addiction [29]. To our knowledge, there are no published studies on exercise addiction in football. Di Lodovico et al. [24] indicated that endurance sports produced the highest prevalence of exercise addiction rates, and ball games were considered to have low rates. This group of amateur football players had an extended football experience (over 15 years), but they still practiced and competed without any monetary compensation and endured the bad weather conditions (cold, rain, wind). Moreover, they rated their intentions to continue playing football as very high, and exercise addiction was the second predictor of these intentions. Results seemed to indicate that only individuals with some symptoms of exercise addiction can endure these conditions and still be willing to continue. Of course, this is highly speculative, and more research is needed to confirm or refuse this finding.

This study has some limitations. First, it was conducted only on male football players. Future research should focus on women and younger players. Second, all participants belonged to a Spanish amateur league. Similar studies should be conducted in other countries to compare different populations. Third, the study followed a single, transversal, correlational research design, and data cannot be used to infer causality. Future studies should use other research designs (i.e., experimental) to compare groups of amateur football players.

## 6. Conclusions

The main aim of the study was to uncover amateur football players’ physical and psychological traits to understand the impact of this sport in their health (physical, mental, and social well-being). Results showed that amateur football practice (3 times/week) almost met the international recommendations on MVPA to obtain health benefits (some groups did meet them), and practice was considered “fairly light”. Enjoyment was the highest-ranked motive to play amateur football, followed by health/fitness, social, and appearance. This group of amateur football players could be classified as having some symptoms of exercise addiction, and enjoyment and exercise addiction were the best predictors of their intentions to continue playing. Amateur football’s successful formula seems to be low enough intensity levels of exercise in practice to make participants enjoy the sport, but high enough to produce adequate MVPA levels. This helps with adherence for many years despite hard training conditions (rain, cold, wind). Amateur football could be considered an adequate sport to help adults maintain an active, healthy lifestyle. Coaches and clubs should be aware of these results to attract and retain amateur football players to their teams.



**Author Contributions:** J.F.-R.: conceptualization, analysis; review and editing. S.G.-V.: investigation, visualization; review. A.V.-V.: investigation, visualization, review. A.A.-C.: investigation, resources. J.A.M.-B.: investigation, resources. J.V.S.d.l.R.: investigation, resources. M.A.L.G.: investigation, resources. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Conflicts of Interest:** The authors declare no conflicts of interest.

## References

- World Health Organization (WHO). What Is the WHO Definition of Health. Available online: <https://www.who.int/about/who-we-are/frequently-asked-questions> (accessed on 28 October 2019).
- World Health Organization (WHO). What Is Health Promotion. Available online: [https://www.who.int/health-topics/health-promotion#tab=tab\\_1](https://www.who.int/health-topics/health-promotion#tab=tab_1) (accessed on 10 November 2019).
- Castagna, C.; de Sousa, M.; Krstrup, P.; Kirkendall, D.T. Recreational team sports: The motivational medicine. *J. Sport Health Sci.* **2018**, *72*, 129–131. [[CrossRef](#)] [[PubMed](#)]
- Bennike, S.; Wikman, J.M.; Ottesen, L.S. Football Fitness—A new version of football? A concept for adult players in Danish football clubs. *Scand. J. Med. Sci. Sports* **2014**, *241*, 138–146. [[CrossRef](#)] [[PubMed](#)]
- Thing, L.F.; Hybholt, M.G.; Jensen, A.L.; Ottesen, L.S. Football Fitness-for the sake of one's health? The perspectives of female players. *Qual. Res. Sport Exerc. Health* **2019**. [[CrossRef](#)]
- Knuth, A.G.; Hallal, P.C. Temporal trends in physical activity: A systematic review. *J. Phys. Act. Health* **2009**, *65*, 548–556. [[CrossRef](#)] [[PubMed](#)]
- Randers, M.B.; Marschall, J.; Nielsen, T.T.; Møller, A.; Zebis, M.K.; Krstrup, P. Heart rate and movement pattern in street soccer for homeless women. *Ger. J. Exerc. Sport Res.* **2018**, *48*, 211–217. [[CrossRef](#)]
- Ottesen, L.S.; Krstrup, P.; Mohr, M. Evaluating a nationwide recreational football intervention—recruitment, attendance, adherence, exercise intensity and health effects. *Biomed. Res. Int.* **2016**. [[CrossRef](#)]
- Krstrup, P.; Bangsbo, J. Recreational football is effective in the treatment of non-communicable diseases. *Brit. J. Sport Med.* **2015**, *49*, 1426–1427. [[CrossRef](#)] [[PubMed](#)]
- Čović, N.; Alić, H.; Manić, G. Effects of recreational soccer on health status improvement. *Sport Sci.* **2015**, *8*, 18–24.
- Lee, I.M.; Shiroma, E.J.; Lobelo, F.; Puska, P.; Blair, S.N.; Katzmarzyk, P.T.; Lancet Physical Activity Series Working Group. Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy. *Lancet* **2012**, *380*, 219–229. [[CrossRef](#)]
- Bangsbo, J.; Hansen, P.R.; Dvorak, J.; Krstrup, P. Recreational football for disease prevention and treatment in untrained men: A narrative review examining cardiovascular health, lipid profile, body composition, muscle strength and functional capacity. *Brit. J. Sport Med.* **2015**, *499*, 568–576. [[CrossRef](#)]
- Parnell, D.; Cope, E.; Bailey, R.; Krstrup, P.; Curran, K. Football and physical health: What do we know? *Sport Soc.* **2018**. [[CrossRef](#)]
- Esposito, F.; Impellizzeri, F.M.; Margonato, V.; Vanni, R.; Pizzini, G.; Veicsteinas, A. Validity of heart rate as an indicator of aerobic demand during soccer activities in amateur soccer players. *Eur. J. Appl. Physiol.* **2004**, *93*, 167–172. [[CrossRef](#)]
- Hammami, A.; Chamari, K.; Slimani, M.; Shephard, R.J.; Yousfi, N.; Tabka, Z.; Bouhleb, E. Effects of recreational soccer on physical fitness and health indices in sedentary healthy and unhealthy subjects. *Biol. Sport* **2016**, *332*, 127–137. [[CrossRef](#)] [[PubMed](#)]
- Krstrup, P.; Aagaard, P.; Nybo, L.; Petersen, J.; Mohr, M.; Bangsbo, J. Recreational football as a health promoting activity: A topical review. *Scand. J. Med. Sci. Sports* **2010**, *20*, 1–13. [[CrossRef](#)] [[PubMed](#)]
- Caglar, E.; Canlan, Y.; Demir, M. Recreational exercise motives of adolescents and young adults. *J. Hum. Kinet.* **2009**, *22*, 83–89. [[CrossRef](#)]
- Aaltonen, S.; Rottensteiner, M.; Kaprio, J.; Kujala, U.M. Aaltonen S, Rottensteiner M, Kaprio J et al. Motives for physical activity among active and inactive persons in their mid-30s. *Scand. J. Med. Sci. Sports* **2014**, *244*, 727–735. [[CrossRef](#)]
- American College of Sports Medicine; Position Stand. Quantity and Quality of Exercise for Developing and Maintaining Cardiorespiratory, Musculoskeletal, and Neuromotor Fitness in Apparently Healthy Adults: Guidance for Prescribing Exercise. *Med. Sci. Sports Exerc.* **2011**, *437*, 1334–1359.

20. Hallal, P.C.; Andersen, L.B.; Bull, F.C.; Guthold, R.; Haskell, W.; Ekelund, U.; Lancet Physical Activity Series Working Group. Global physical activity levels: Surveillance progress, pitfalls, and prospects. *Lancet* **2012**, *380*, 247–257. [[CrossRef](#)]
21. Sanders, T.; Cliff, D.P.; Lonsdale, C. Measuring adolescent boys' physical activity: Bout length and the influence of accelerometer epoch length. *PLoS ONE* **2014**, *93*, e92040. [[CrossRef](#)]
22. Sussman, S.; Lisha, N.; Griffiths, M. Prevalence of the addictions: A problem of the majority or the minority? *Eval. Health Prof.* **2011**, *341*, 3–56. [[CrossRef](#)]
23. Costa, S.; Hausenblas, H.A.; Oliva, P.; Cuzzocrea, F.; Larcán, R. The role of age, gender, mood states and Exercise frequency on exercise dependence. *J. Behav. Addict.* **2012**, *24*, 216–223. [[CrossRef](#)]
24. Di Lodovico, L.; Poulmais, S.; Gorwood, P. Which sports are more at risk of physical exercise addiction: A systematic review. *Addict. Behav.* **2018**. [[CrossRef](#)]
25. Maselli, M.; Gobbi, E.; Probst, M.; Carraro, A. Prevalence of primary and secondary exercise dependence and its correlation with drive for thinness in practitioners of different sports and physical activities. *Int. J. Ment. Health Addict.* **2019**, *17*, 89–101. [[CrossRef](#)]
26. Montero, I.; León, O.G. A guide for naming research studies in psychology. *Int. J. Clin. Health Psychol.* **2007**, *7*, 847–862.
27. Freedson, P.S.; Melanson, E.; Sirard, J. Calibration of the Computer Science and Applications, Inc. accelerometer. *Med. Sci. Sports Exerc.* **1998**, *305*, 777–781. [[CrossRef](#)] [[PubMed](#)]
28. Richard, M.; Christina, M.F.; Deborah, L.S.; Rubio, N.; Kennon, M.S. Intrinsic motivation and exercise adherence. *Int. J. Sport Psychol.* **1997**, *28*, 335–354.
29. Terry, A.; Szabo, A.; Griffiths, M. The exercise addiction inventory: A new brief screening tool. *Addict. Res. Theory* **2004**, *12*, 489–499. [[CrossRef](#)]
30. Borg, E.; Kaijser, L. A comparison between three rating scales for perceived exertion and two different work tests. *Scand. J. Med. Sci. Sports* **2006**, *16*, 57–69. [[CrossRef](#)]
31. Clemente, F.M.; Mendes, B.; Nikolaidis, P.T.; Calvete, F.; Carriço, S.; Owen, A.L. Internal training load and its longitudinal relationship with seasonal player wellness in elite professional soccer. *Physiol. Behav.* **2017**, *1791*, 262–267. [[CrossRef](#)]
32. Dunlop, D.D.; Song, J.; Arntson, E.K.; Semanik, P.A.; Lee, J.; Chang, R.W.; Hootman, J.M. Sedentary time in US older adults associated with disability in activities of daily living independent of physical activity. *J. Phys. Act. Health* **2015**, *121*, 93–101. [[CrossRef](#)]
33. Hill-Haas, S.V.; Dawson, B.; Impellizzeri, F.M.; Coutts, A.J. Physiology of small-sided games training in football. A systematic review. *Sports Med.* **2011**, *413*, 199–220. [[CrossRef](#)] [[PubMed](#)]
34. Jatene, P.; Pereira, G.B.; Chaperuto, É.C.; Fukushima, A.R.; Doro, M. Training sessions' RPE in professional football is influenced by playing position. *J. Phys. Educ. Sport* **2019**, *19*, 1398–1406.



© 2020 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).