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CONTRIBUTIONS TO THE PSYCHOLOGICAL AND BIOMOTRIC PROFILE OF THE RUGBY PLAYER IN THE PUBERTY PERIOD

THESIS SUMMARY

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INTRODUCTION

Studies on rugby in our country are limited, especially in the case of junior players during puberty. The specialized data on the selection and training of players are focused on the category of seniors, argued by the fact that this is representing in fact the sporting performance. We consider that this stage is a significant one in the selection and training of future performance athletes and, for this reason, we will pay special attention to it.

The doctoral thesis entitled *Contributions to the psychological and biomotric profile of the rugby player in the puberty period,* includes two main approaches to the proposed topic. In the first research report called, *Psychomotor and physiological peculiarities of rugby players during puberty,* the results obtained in scientific research by sports specialists were analyzed, where we noticed that in our country, up to the age of 16, studies on the biomotric profile of rugby players are insufficient.

In the second research report, entitled, *Analysis of some characteristics of the rugby player's personality during puberty,* it was pursued outlining a personality profile of the rugby player during puberty, from different teams in the area of Moldova. The results of this study generate new directions of research in the field of sports psychology, but especially in the context of the game of rugby, a sport insufficiently addressed in the literature.

The second direction proposed in the doctoral thesis is found in the third research report, entitled, *Investigating the biological potential of rugby players during puberty*, because we believe that these aspects of personality may be closely related to certain biological indices but also with certain psychomotor behaviors of individuals. This research aims to continue the profile of the rugby player during puberty, in the area of Moldova, started in the second report. If in the first part of the research we aimed to build a model of the personality profile of the players, in the second part we focused on studying their biomotric potential.

The study of the literature in the field of sports, especially regarding the game of rugby, highlighted aspects related to both the psychological and biological peculiarities of players both during puberty and after.

In the integral training of young people, there is a gradual increase in the complexity of motor acts, but also a finesse of their mastery. Its purpose is to optimize functional capabilities and maintain them in accordance with the parameters of effort, to perform complex tasks, to adapt mentally and physically to specific stimuli, but also to achieve human performance.

The functionality of the organs is a criterion of the body's health and its ability to adapt to physical effort, being the factor that most often limits the achievement of sports performance. For this reason, we considered it necessary to study somato-functional and motor indices of athletes, selecting from the literature the most relevant tests used in the evaluation of athletes.

PART I- SYNTHESIS OF DATA FROM THE SPECIALTY LITERATURE

CHAPTER 1. ASPECTS REGARDING THE PERSONALITY OF RUGBY PLAYERS IN THE PUBERTY PERIOD

1.1. THE CHILD'S PERSONALITY IN THE PUBERTY PERIOD

During the personality formation period, an important role in the child's multilateral development is the knowledge of the evolution of psychic processes, because it offers the possibility to enter directly into the formation of the future adult, by noticing possible deviant phenomena and behaviors of the individual.

Puberty is characterized by growth processes, the development of secondary sexual characteristics and the maturation of psychosocial skills. The onset and progression of puberty varies among adolescents, with changes gradually occurring during this period. Factors that include individual differences in physical and psychosocial development, age-based developmental stage, and rate of pubertal development may contribute to the way adolescents experience sports activities. During adolescence, gender differences become increasingly apparent and can have a significant impact on participation in sports activities (Brown et al., 2017).

Another decisive factor in the formation of the human personality is the environment, the main problem being the assurance of the educational character of the family, school, professional, sports situations and of the informal groups (Geambaşu, 2018).

During adolescence, in the field of sports, the coach becomes a true role model of the adolescent, and participation in a particular sport can be used to impress or to achieve a certain social status (Brown et al., 2017).

Adolescents at this stage of development are able to recognize and understand the requirements of a particular sport and may decide whether they are willing to engage in the behaviors necessary to meet those requirements (Brown et al., 2017). Activation in a school sports club can contribute to the positive development of personality and, at the same time, to the stabilization of emotional empathy among adolescents (Kwon, 2018).

Involvement in a sports activity is determined by many factors such as the processes of growth and physical development, cognitive development, psychosocial development, financial possibilities, social resources and motivation or interest of the athlete (Brown et al., 2017).

Participation in sports activities can generate physical, psychological and social effects of individuals, but at the same time, it can also lead to improved personality and empathic capacity, which is effective for understanding, maintaining and improving interpersonal relationships in the sports context (Overway et al., 2009).

1.2. PARTICULARITIES OF THE ATHLETES' PERSONALITY

Sports performance is conditioned by the biological value and personality of the athlete, his intellectual source, but also time. Thus, in sports activities, knowledge of mental characteristics, character traits or the level of individual sensory and cognitive processes, have become decisive factors of sports performance (Cojocariu, 2010), various studies emphasizing the importance of personality characteristics in sports performance (Martinaș and Cojocariu, 2021).

In recent decades, the subject of personality has received considerable attention in the literature of sports psychology (Brinkman et al., 2016), demonstrating that the sports performance of professional players is influenced by personality and psychological traits of individuals (Yunusa et al., 2016). The interaction of genetic and environmental influences is a promising avenue for research that can improve understanding of the effects of personality on physical activity and sport, as well as sports success (Allen et al., 2013).

Regarding the sports environment, it can be determined by the ability of an athlete to cope with the pressure and his willingness to perform constant physical exertion in various conditions (Allen et al., 2013).

Research on personality in sports psychology concludes that athletic success and participation in physical activity may well be predicted by personality traits. Thus, personality traits contribute to the long-term athletic success, interpersonal relationships, and psychological states of athletes before, during, and after competitions (Allen and Laborde, 2014).

The literature states that athletic identity is shaped mainly by two personality factors, extraversion and the competitive level of the individual (Cabrita et al., 2014), and other authors believe that it is determined by an increased level of extraversion, conscientiousness, stability emotional and openness, and a low level of agreeableness (Khan et al., 2016).

Participation in sports activities by children and adolescents is associated with improving the psychological and social health of individuals, especially when it comes to team sports (Eime et al., 2013).

In team sports, personality traits can be used in the selection of players and it is recommended to use specific tools for the evaluation of athletes by specialists in the field (Allen and Laborde, 2014).

It is important to note that the personality of the team members is associated with various aspects of its functioning and effectiveness, such as behavior in tasks, processes and roles within the team, performance, influences, collective personality and interaction of traits (LePine et al., 2011).

1.3. ASPECTS REGARDING THE PERSONALITY OF RUGBY PLAYER

The game of rugby is a sport that is becoming more and more popular all over the world, which requires specific somatic-functional and mental characteristics. From a psychological point of view, the following characteristics are highlighted, self-control, collaboration, combativeness, decision-making ability, fair play, courage, discipline, emotional balance, maturity in thinking and initiative, necessary in shaping future performance athletes (Archibold et al., 2017; Leung et al., 2017; Chiwaridzo et al., 2016; Read et al., 2017; Read et al., 2018; Burger et al., 2016).

The profile of the rugby player is characterized by a very good physical condition in correlation with the mental conditions (Petrache, 2009). Regardless of the position played, the psychological model defines the rugby player by treating all aspects of personality, emotional, volitional and intellectual-cognitive (Badea, 2012).

In the game of rugby, aggression is allowed by regulation, being educated the ability of the athlete to play and fight to the end, without using violent acts to achieve the desired performance (Chihaia and Pop, 2014). The game of rugby involves a direct physical confrontation, which requires good control of emotions and prohibits any form of violence (Sarthou, 2010).

Rugby players use their aggressive energy only within the limits of the rules, without reaching a level of intensity capable of destroying the integrity of the opponent. Although rugby is a sport based on aggression and fighting spirit, the relationship between players and referees is always based on respect (Chihaia and Pop, 2014).

Some authors consider that psychological training represents success in sports performance (Van Rooyen, 2015), psychological factors being considered decisive in sports careers (MacNamara et al., 2010). Thus, the psychological skills of athletes will determine athletic success (Hendricks, 2012) and competitiveness, commitment and self-confidence will contribute to achieving high performance (MacNamara et al., 2010; Kruyt and Grobbelaar, 2019).

Therefore, according to Table 1, rugby players are characterized by good self-control, collaboration, combativeness, fair play, courage, discipline, maturity in thinking and initiative, and in terms of personality factors, an increased level of

extraversion, agreeableness and conscientiousness and low values of neurosis and openness.

Table 1. The personality traits of rugby players in the literature

AIMED ASPECTS	CONCLUSIONS	AUTHORS
Rugby players	Self-control, collaboration, combativeness, decision-making ability, fair play, courage, discipline, emotional balance, maturity in thinking and initiative.	Archibold et al., 2017; Leung et al., 2017; Chiwaridzo et al., 2015; Read et al., 2017; Read et al., 2018; Burger et al., 2015.
Rugby players compared to football players	High levels of emotional intensity, anxiety, frustration, stress, vulnerability to suffering.	Rabelo et al., 2014
	Higher level of neurosis, confidence and openness to experience.	
	No significant differences in the case of extraversion and its facets.	
Professional rugby players compared to semi-professional ones	Statistically significant differences in neurosis.	Kruger et al., 2019
	No differences between the level of conscientiousness, agreeableness and openness.	
	Increased level of mental endurance	Sheard și Golby, 2010
Selected athletes compared to those not selected in the National Professional Rugby League	High level of confidence, challenge, commitment, emotional control and mental resilience.	Tredrea et al., 2017
Rugby players 7	High level of extraversion, agreeableness and conscientiousness and normal values, slightly lower, in case of neurosis and openness.	Martinaș și Lepciuc, 2020

1.4. PARTIAL CONCLUSIONS

In the literature there are studies that analyze the personality of athletes practicing different sports, both female and male, by different age groups and using alternative assessment tools. At the same time, we can say that the subject of personality has not been fully addressed by specialists, in terms of the game of

rugby, and that the topic of personality of athletes specific to puberty is insufficiently discussed in the literature.

Specialists in the field have highlighted many aspects related to the correlation between personality traits and the practice of a physical or sports activity. The athletic performance of professional players is influenced by personality traits, underlined by a high level of extraversion, competitive level, conscientiousness, emotional stability and openness, and a low level of pleasantness.

As for adult rugby players, the studies show a high level of extraversion, agreeableness and conscientiousness and normal, slightly lower values in the case of neurosis and openness.

Therefore, personality and its factors influence sports performance, and for this reason, it is necessary to analyze the personality from the pubertal period of individuals, to determine the dominant characteristics of athletes.

As a result of studying the literature, we can say that the subject of our research is insufficiently addressed. For this reason, no defining characteristics of puberty rugby players have been identified in terms of their personality.

CHAPTER 2. ASPECTS REGARDING THE BIOLOGICAL POTENTIAL OF THE RUGBY PLAYER IN THE PUBERTY PERIOD

2.1. BIOLOGICAL CHARACTERISTICS OF RUGBY PLAYERS

The game of rugby is considered a sport of individual duties and abilities, due to the requirements of each position, but the unity of the team is essential in achieving the objectives (Oprean, 2012). Due to the nature of its complexity, this sport intensely demands the energy resources of athletes, their optimization being a conditioning factor of sports performance (Oprean et al., 2017).

The characteristic moments of rugby are the phases of the game in which the players try to advance with the ball through the resistance of the direct opponent, as well as the phases of acceleration at maximum intensity. The energy required for this type of effort is provided by anaerobic sources, while for the entire effort made during the game, the energy provided by the aerobic pathways is required. In the game of rugby, the development of aerobic capacity is extremely important both for providing the necessary energy throughout the game and for restoring phosphocreatine reserves (Cîrjoescu and Tache, 2016).

Rugby players must have physiological characteristics that allow them to cope with the effort during the match (Lombard et al., 2015; Johnston et al., 2014; Bradley et al., 2015).

The functional peculiarities of the respiratory system in professional rugby players differ from one position to another, due to a specific training on the positions, the increased intensity of the game and the superior physical requirements. These differences between positions at the level of a junior team are without statistical significance, a phenomenon that also occurs in amateur rugby players (Oprean, 2012).

Thus, in the specific physical training of the rugby game, the aim is to optimize the vital capacity, the cardiac output and the hormonal, metabolic and neurological functions of the athletes (Oprean and Cojocariu, 2014).

Rugby players need a wide range of motor skills, and their assessment should provide us with objective data on how to adapt players to the requirements of the game and how the body adapts to training programs, as well as data to provide information on monitoring the development of athletes predicts talent identification and player selection.

The choice of the most appropriate tests and measurements that can be used both in the selection and in checking the level of rugby players is a topical issue, and is increasingly debated in the literature. Research in this area highlights

the batteries of tests and measurements used both for junior players and for senior, amateur, semi-professional or professional players.

2.2. BIOLOGICAL CHARACTERISTICS OF RUGBY PLAYERS IN THE PUBERTY PERIOD

In the rugby game specific to the U10-U14 categories, the emphasis is on the general physical training and not on the specific one, thus allowing the players to have a multilateral training, which will facilitate in the future the specialization on their positions. In this context, we can speak of an improvement of the great functions of the body, which will allow the adaptation to effort and, at the same time, the optimization of the effort capacity of the athletes.

Therefore, we are talking about a long-term development of the athlete, a training that will allow players to learn and strengthen the technical-tactical elements in parallel with the evolution of the parameters of strength, speed, endurance and skill specific to the game of rugby.

The transition from childhood to adolescence brings to the body a series of somatic-functional, motor and cognitive transformations. In this regard, it has been shown that during adolescence, activation in a sports club, helps to improve motor skills and contributes to the formation of an active and healthy lifestyle (Drenowatz et al., 2019).

In the game of rugby, the relationship between physical and motor development of athletes is considered a decisive factor in sports performance (Smart et al., 2014).

2.3. PARTIAL CONCLUSIONS

Regarding the human biological potential, the literature has provided us with some benchmarks regarding its characteristics during puberty, on the basis of which we can direct and individualize sports training.

Puberty is considered the favorable period for the improvement of motor skills, for the consolidation of basic and utility-applied motor skills, but also for the learning and consolidation of specific motor skills. Thus, this period represents the favorable moment of integration and initiation in a sports game, a fact due to the evolution of the fundamental nervous processes.

The growth and development processes of this period are disproportionate, the puberty having an unequal, indefinite aspect, but, precisely for this reason, it is important to intervene on them through physical and sports activities.

In terms of physical effort, it must be adapted to individual characteristics and age characteristics, but also aimed at achieving high performance.

Various studies conducted in this context have confirmed that participation in physical activity and sports is beneficial for this period, where the emphasis is on the harmonious physical development of the body, on optimizing the general human motor capacity, but also on maintaining optimal health. and creating an active lifestyle by forming a taste for systematic independent exercise.

The study of the literature in the field of rugby has highlighted many aspects related to both the mental and biological peculiarities of the players during puberty and after.

The evolution of anthropometric parameters is considered relevant in the future selection of athletes, and their improvement and mental and physical abilities will contribute to increasing performance in future sports careers.

Due to the current dynamism of the game, practitioners must have a vast, structured and staged motor baggage in the training program, so that the body can cope with the physical demands of the game.

In the training process of athletes, it is necessary the constant presence of tests and evaluations from a medical, motor, psychological and technical-tactical point of view, specific to each stage of age. These permanent checks are a starting point and form the premises for guiding the coach in organizing the training process.

We can therefore observe an interest of specialists in the relationship between the anthropometric and physiological characteristics and the effort capacity of athletes. At the same time, the evolution of these parameters is monitored from the beginning of the career, by applying different tests and measurements in the training process.

Another aspect highlighted by specialists is that of the degree of maturity of athletes and the effects of relative age on the human body, phenomena that will influence the future careers of individuals.

As a result of studying the literature, we can say that rugby players during puberty should achieve certain performance in the tests of speed, upper and lower limb strength, agility or aerobic power, these characteristics being considered essential in the selection of athletes. At the same time, the existing associations between these indicators can offer new research directions, these being considered landmarks in obtaining high performances.

Therefore, we can conclude that the results of specialized studies focus on the training and modelling of athletes from an early age and state that they will influence future sports performance.

PARTEA II- APPLIED PART

CHAPTER 3. IDENTIFYING THE PERSONALITY PROFILE OF THE RUGBY PLAYER IN THE PUBERTY PERIOD

3.1. RESEARCH PREMISES

After studying the literature on the topic of research, I found that this topic of the personality of the rugby player during puberty, is very little addressed by specialists in the field. I believe that the personality of individuals can make their mark on the player's performance and can have various influences on the communication and relationships established within the team. At the same time, the few opinions of specialists related to this aspect suggest that there are proven associations between certain factors and facets of the personality and the achievement of high sports performance.

3.2. THE PURPOSE, OBJECTIVES, TASKS AND HYPOTHESES OF THE RESEARCH

The purpose of this research is to analyze the personality of rugby players during puberty in the area of Moldova and to outline a personality profile of them.

In this regard, the objectives and tasks that helped to achieve them were set.

1. Identification and selection of research subjects among children playing rugby during puberty, in the area of Moldova, until October 2020.
   - identification of rugby clubs in the area of Moldova consisting of athletes in the age category U15;
   - communication with the coaches of the sports clubs and establishing the development protocol;
2. Identification and application of the personality analysis tool, validated on the Romanian population until November 2020.
   - study of the literature on the assessment of children's personality during puberty;
   - communication with a psychologist to identify the most appropriate tool for analyzing children's personality during puberty;
   - applying the physical questionnaire among the players from Iași, with the help of the coach;

- application of the online questionnaire among the players from the other teams, due to the pandemic context, under the guidance of the coaches, through the Google Forms platform;

3. Collection, analysis and interpretation of the results obtained by January 2021.

- collecting data obtained both physically and online;
- entering the data obtained in the PsihoProfile platform and generating individual reports;
- building the database based on the values obtained from the individual reports;
- application of the statistical method with the help of the IBM SPSS Statistics 20 program;
- interpreting the results obtained and drawing conclusions.

The hypotheses from which we started in conducting this research are the following:

HYPOTHESIS 1: We assume that depending on the type of athlete, the personality traits of rugby players during puberty in the area of Moldova are similar.

HYPOTHESIS 2: We consider that rugby players at puberty have varying levels of personality factors.

HYPOTHESIS 3: We assume that there are similar attributes between the rugby teams included in the study in terms of the personality of the athletes.

3.3. MATERIAL AND METHOD

Research methods such as the bibliographic study method, the survey method and the statistical method have been used in this research.

In this paper, 132 male and female rugby players (68 = male and 64 = female) were investigated during puberty, age category U15, from several teams (CSS Gura Humorului, CSS Bârlad, CSS Union of Iași and CSM Pașcani) from different cities in the area of Moldova (N = 132, Gura Humorului = 22 boys, Bârlad = 23 boys, Iași M = 23 boys, Iași F = 35 girls, Pașcani = 29 girls).

For the personality assessment, the Big Five © plus_short Questionnaire was applied, built and validated on the Romanian population in accordance with the Big Five model. The questionnaire was applied online using the Google Forms form and physically for the players from Iași, in November 2020. The individual results were generated and interpreted by the PsihoProfile platform, and the values of the five main factors and their facets were entered in the database. data and analyzed using the IBM SPSS Statistics 20 program, the values of the five main

personality factors being coded on a scale from 1 to 10, and those of the facets, on a scale from 1 to 4.

To test the hypotheses of the paper, analytical tools such as descriptive statistics, the Independent Samples T Test, the Paired Samples T Test, and the Anova Statistical Test were used.

The statistical tests were applied according to the investigated variables, thus delimiting the independent variables represented by the team that includes the athletes and the gender of the players, and the dependent variables represented by the main factors and facets of personality, according to Table 2.

Table 2. Research variables

INDEPENDENT VARIABLES				
The kind of athletes				
The team that includes the athletes				
DEPENDENT VARIABLES				
Extraversion	**Agreeableness**	**Neurosis**	**Conscientiousness**	**Opening**
Activity	Altruism	Anxiety	Ambition	Emotionality
Emotionality	Compassion	Depression	Debt	Imagination
Assertiveness	Cooperation	Exaggeration	Personal efficiency	Intellect
Excitability	Trust	Anger	Order	Artistic interest
Sociability	Modesty	Shyness	Perseverance	Liberalism
Cheerfulness	Moral	Vulnerability	Caution	Adventurous spirit

3.4. RESULTS AND DISCUSSIONS

HYPOTHESIS TESTING 1

To test Hypothesis 1, the Independent Samples T Test was used to determine the differences between girls and boys in their personality traits.

Thus, regarding the extraversion and facets of this main factor, statistically significant differences between girls and boys are highlighted in the case of activity ($p = 0.000$), excitability ($p = 0.042$) and sociability ($p = 0.011$).

There are significant differences between girls and boys only in terms of morality ($p = 0.043$), the facet of the main factor of agreeableness. In the case of the other facets, the values obtained by the athletes are close.

Regarding the neurosis and the facets of this factor, between girls and boys there are significant differences only in the case of the facet depression ($p = 0.044$), where the boys obtained higher values.

There are statistically significant differences between girls and boys only in the case of debt ($p = 0.001$) and caution ($p = 0.021$), where girls scored higher than male players.

The boys obtained higher values of the liberalism facet (p = 0.000) and lower values of the adventurous facet facet (p = 0.042) than the girls, the differences of the other values obtained being insignificant.

HYPOTHESIS TESTING 2

To test hypothesis 2 and determine the variability of the main personality factors, we applied the Paired Samples T Test. Thus, significant differences were identified between personality attributes, where p = 0.000, highlighting close levels only in terms of extraversion and conscientiousness (p = 0.637) and neurosis and openness (p = 0.370). This indicates that rugby players have varying levels of personality.

Regarding the main personality factors, the rugby players during the puberty period in the area of Moldova are characterized by high values of extraversion, agreeableness and conscientiousness, and average values of neurosis and openness.

HYPOTHESIS TESTING 3

To test hypothesis 3 and identify similar personality attributes among the rugby teams included in the study, the Anova test was applied.

Thus, with regard to the teams consisting of male rugby players, differences were identified only in the case of the moral side (p = 0.006) and in the case of the anger side (p = 0.039). This highlights the fact that in terms of male rugby players, the attributes of the personality are similar, reinforced by the fact that in the case of the other facets and main personality factors no statistically significant differences were identified.

Comparing the two teams with female rugby players, we found that there are no statistically significant differences in the main factors and facets of personality, except for the cooperation facet (p = 0.042) and the liberalism facet (p = 0.000).

These results for both male and female players highlight the fact that these personality attributes can be considered features of rugby players, except for the four facets, where we will interpret the results with more caution.

3.5. THE PERSONALITY PROFILE OF THE RUGBY PLAYER IN THE PUBERTY PERIOD

We can therefore summarize that the results of the present study are similar to other research in the field of sports psychology, rugby players being characterized by high values of the main factors, extraversion, agreeableness and conscientiousness and average values of neurosis and openness.

Because there are statistically significant differences between girls and boys on certain facets of personality, we will make a model for each category.

The results of our study are materialized in the realization of a personality profile of the rugby player, during puberty, in the area of Moldova, its component features being found in Figure 1 for girls, and in Figure 2 for boys.

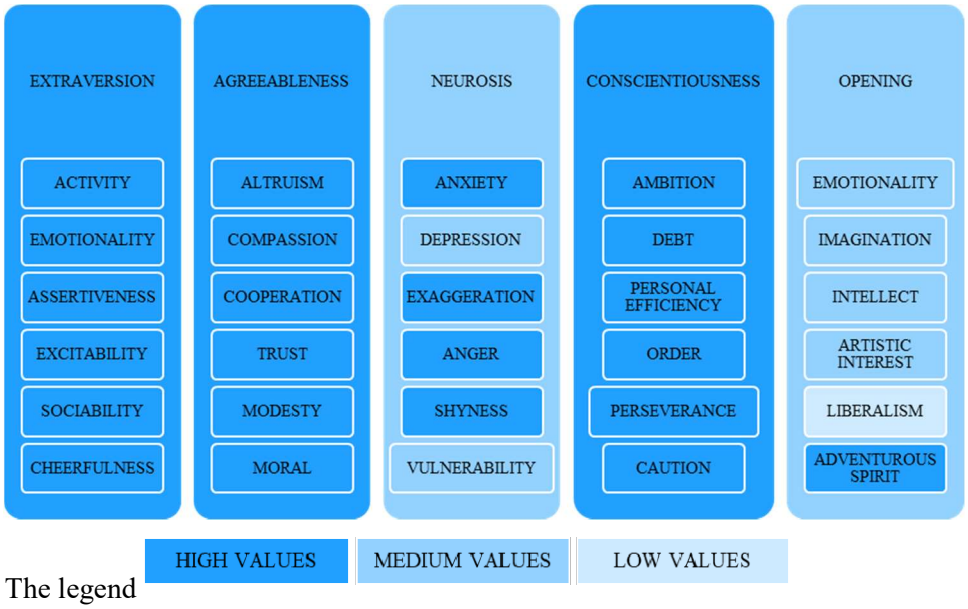

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Figure 1. The personality profile of the rugby player during puberty, in the area of Moldova - factors and facets with reference values obtained as a result of the research – girls

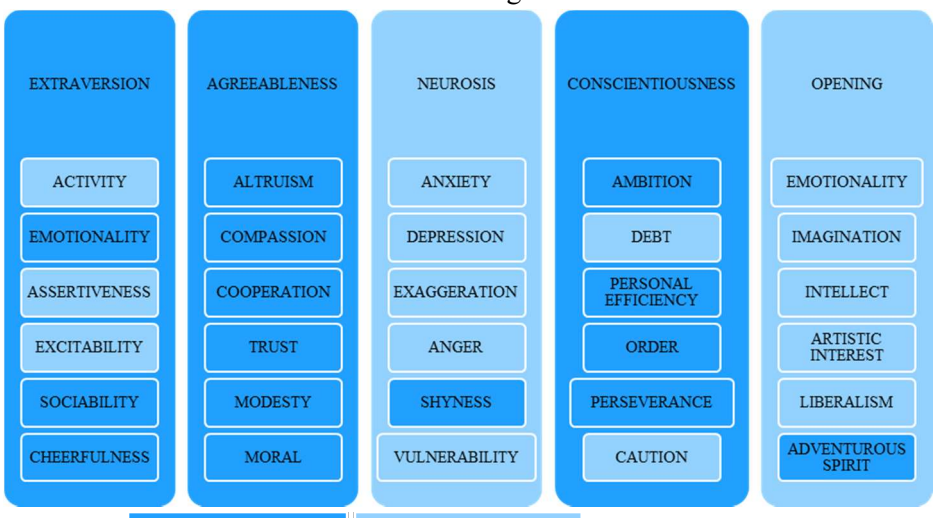

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Figure 2. The personality profile of the rugby player during puberty, in the area of Moldova - factors and facets with reference values obtained as a result of the research – boys

Comparing the groups of boys, we found that there are no significant differences between male players in terms of these personality attributes, except for the facets of morality and anger, where we will interpret the results more carefully. Regarding the two groups of girls, the results obtained indicate that differences between female players are highlighted only in the case of cooperation and liberalism. These results strengthen our claims, emphasizing that no statistically significant differences are identified between personality attributes, thus outlining the personality profile of male and female rugby players during puberty in Moldova.

3.6. PARTIAL CONCLUSIONS

Following the results obtained in testing hypothesis 1, we can say that there are similarities between girls and boys in terms of the main personality factors but also in the case of some facets of them, of rugby players in puberty in Moldova. At the same time, we note that there are differences between girls and boys only in the case of activity, excitability and sociability, facets of extraversion, morality, facet of the main factor of agreeableness, depression, facet of neurosis, duty and prudence, facets of conscientiousness, liberalism and the adventurous spirit, facets of openness.

Regarding hypothesis 2, we can say that this is confirmed, because the main personality factors have varying levels among rugby players during puberty. Regarding the results obtained in testing hypothesis 3, we can say that there are similar attributes between rugby teams in terms of the personality of athletes.

The results of this study generate new directions of research in the field of sports psychology, but especially in the context of the game of rugby, a sports discipline insufficiently addressed in the literature in our country.

CHAPTER 4. IDENTIFYING THE BIOLOGICAL PROFILE OF THE RUGBY PLAYER IN THE PUBERTY PERIOD

4.1. RESEARCH PREMISES

Studies in the field of rugby show that the improvement of the biological potential, the technical-tactical parameters and the psychological ones during puberty, will influence the sports performance of the future adult. Thus, we consider this statement as the premise of our future field of research.

Following the results obtained in the literature and the study of various opinions of specialists, this paper aims to analyze the biological potential of rugby players from different teams in Moldova, in order to outline a biomotric profile of the rugby player, during puberty.

According to the results from the literature, it is obvious that there are clear differences between the two age categories of athletes, girls and boys, due to the processes of growth and development that they go through at this stage of puberty. However, due to the fact that at this stage the game of rugby is played in a mixed format, and sometimes, due to the small number of practitioners, younger athletes are forced to play in a higher age category, we consider necessary an investigation. of the biological potential of the athletes who find themselves in these situations, which can be, of course, in accordance with the literature, but it would be interesting if we identified in the case of some parameters these differences.

At puberty, the main purpose of rugby training is the multilateral development of the athlete, creating a favorable environment for the correct and harmonious growth and development of the body from a somatic-functional point of view, the development of large apparatus and body systems, strengthening motor skills and abilities. specific to the game of rugby, but also their adaptation to various situations, close to the real conditions of the game. Thus, the training in which the players participate should multilaterally influence the athletes, and determine the optimization of the specific motor capacity, by creating and developing a complex motor baggage, necessary in the game of rugby.

After studying the specialized literature and the documents present on the FRR website, on the selection models and the evaluation of the biological potential of the rugby players in the pubertal stage, we consider necessary the investigation of other parameters that could complete the biomotric profile of the rugby player. from this period of puberty. At the same time, the application of a battery of tests that investigates other indicators than those existing in the official documents, could bring additional information on the sports selection and the orientation of the training process. Thus, the creation of a common database with the results

obtained within several teams from the area of Moldova, can help to outline a current profile of the rugby player, during puberty.

4.2. THE PURPOSE, OBJECTIVES, TASKS AND HYPOTHESES OF THE RESEARCH

The aim of this research was to outline the biomotric profile of rugby players during puberty in the area of Moldova, and also to identify the most appropriate methods for assessing their motor and somatic-functional parameters.

In this regard, the following objectives and tasks have been established, which will help to achieve the purpose of the research.

1. Identification and selection of research subjects among children playing rugby during puberty, in the area of Moldova, until September 2021.
   - identification of rugby clubs in the area of Moldova that consist of athletes in the age categories U13 and U15;
   - communication with the coaches of the sports clubs and establishing the protocol for conducting the research;
2. Identify and apply the most appropriate analysis tools to identify the biomotric profile of rugby players during puberty, in the area of Moldova, until 30.10.2021.
   - the study of the specialized literature regarding the testing of the motor and somatic-functional parameters of the rugby players in the pubertal period;
   - establishing the battery of tests used in the research and the equipment needed to apply them;
   - formation of the protocol for conducting the tests used;
   - testing the subjects from the 4 teams from the area of Moldova;
3. Collection, analysis and interpretation of the results obtained by January 2022.
   - building the database by entering the values obtained by the athletes in all the tests applied in the IBM SPSS Statistics 20 program;
   - application of the statistical method with the help of the IBM SPSS Statistics 20 program;
   - interpreting the results obtained and drawing conclusions.

The hypotheses from which we started in conducting this research were the following:

MAIN HYPOTHESIS 1: We consider that there are differences regarding certain somatic, physiological and motor parameters of the rugby players in the area of Moldova, in the two age categories, U13 and U15, girls and boys.

SECONDARY HYPOTHESIS 1.1: We assume that we will highlight differences on morpho-functional and motor indices of the body, among female athletes in the age categories U13 and U15.

SECONDARY HYPOTHESIS 1.2: We consider that male rugby players in the two age categories, U13 and U15, will have different values of somatic, physiological and motor parameters.

SECONDARY HYPOTHESIS 1.3: We consider that the values of somatic, physiological and motor indices of rugby players are similar, in terms of the gender of the athletes.

MAIN HYPOTHESIS 2: We consider that there is a good level of association at the level of somatic-functional and physical parameters evaluated, both in terms of the two genders and the two age categories of athletes.

SECONDARY HYPOTHESIS 2.1: We assume that in terms of the somatic, physiological and motor parameters of rugby players, some good and very good connections are established, in both age categories, U13 and U15.

SECONDARY HYPOTHESIS 2.2: We assume that among male rugby players in the two age categories, U13 and U15, there are good and very good associations between certain physical, somatic and functional indices of the body.

MAIN HYPOTHESIS 3: We assume that there are differences between the teams in the study in terms of the physical and motor development of athletes.

4.3. MATERIAL AND METHOD

The following research methods were used in this research: the bibliographic study method, the testing method and the statistical method.

In this paper, 113 male (N = 91) and female (N = 22) rugby players were investigated during puberty, from several teams from different cities in the area of Moldova (CSS Gura Humorului, CSS Bârlad, CSS Unirea Iași and CSM Pașcani).

The groups were made according to the age category and gender of the athletes and presented as follows, U13 girls (N = 9), U15 girls (N = 13), U13 boys (N = 45) and U15 boys (N = 46).

The results obtained were analyzed using the following statistical tools, described below. Descriptive statistics and graphical representations provided us with information about the mean values and standard deviations of the subjects, the degree of significance of the differences between them being rendered by applying statistical tests Independent Samples T Test between the two age categories formed.

Next, we considered it necessary to apply the Pearson correlation coefficient, in order to establish the existing causal relationships between the

values obtained, in order to reach new conclusions that will generate other future research directions.

Finally, in order to outline the biological profile of the rugby player during puberty and to determine the normal distribution of the data obtained, the Shapiro-Wilk test was applied among the two age groups, depending on the gender of the athletes. Thus, 3 beaches were created where the obtained results were framed, delimiting 3 criteria for evaluating the results, low, medium and high.

At the same time, we considered it necessary to investigate the physical and motor development of the rugby players in the 6 teams, from where, with the help of the Anova test and multiple comparisons, we highlighted the differences between the players.

The statistical tests were applied according to the investigated variables, thus delimiting the independent variables represented by the team of the athletes, their gender and age category, and the dependent variables represented by the physical and somato-functional parameters of the athletes, according to the table 3.

Table 3. Research variables

INDEPENDENT VARIABLES		
The kind of athletes		
The age of athletes		
The team that includes the athletes		
DEPENDENT VARIABLES		
SOMATIC INDEXES	PHYSIOLOGICAL INDICES	MOTOR INDICATORS
height (cm)	lung elasticity (cm)	spine mobility (cm)
body weight (kg)	FVC- forced vital capacity	hand flexor strength (kg)
fat mass (kg)	FEV1- forced expiratory volume in the first second	explosive force of lower limbs (cm)
fat-free meal (kg)	PEF- maximum expiratory flow	ground limb reactivity
BMI (kg / m2)	maximum aerobic speed (km / h)	upper and lower limb complex reaction rate (ms)
RMB (Kcal)	maximum oxygen consumption VO2max (ml / kg / min)	speed (s)
muscle mass (kg)		agility (s)
skeletal muscle mass (kg)		
bone mass (kg)		
water mass (kg)		

The evaluation of the athletes took place during the competition period, 14.10.2021-30.10.2021, being made up of anthropometric measurements, body

analysis and a battery of tests to determine the motor capacity and the effort capacity of the athletes.

The choice of this battery of tests was based on the information from the literature, selecting from the articles studied in this field the tests considered most relevant, to which were added other tests, not applied to rugby players in this category so far, which can be considered a novelty in this field.

The test battery and research infrastructure are summarized below in Table 4.

Table 4. Test battery and research infrastructure used in the paper

TEST NAME	EVALUATE (UM)	EQUIPMENT REQUIRED	VALIDARE
HEIGHT	-height (cm)	Bosch GLM80 rangefinder	Cheng et al. (2014)
LUNG ELASTICITY	-pulmonary elasticity in forced and exhaled breath (cm)	-metallic square	
SIT AND REACH TEST	-mobility of the spine (cm)	-centimeter	Wells et al. (1952) Vaz et al. (2021)
BODY ANALYSIS	-body weight (kg)	Sit & Reach flexometer	Long et al. (2021) Walsh et al. (2011) Geeson-Brown et al. (2020)
STRENGTH OF PALM FLEXORS	-fat weight (kg)	Bosch GLM80 rangefinder	Wikholm et al. (1991) Díaz Muñoz, et al. (2019) Ashall et al. (2021)
SQUAT JUMP	-fat without fat (kg)	-TANITA MC-580	Trofin & Honceriu (2017) Dobbin et al. (2017)
COUNTERMOVEMENT JUMP	-IMC (kg / m2)	-2 handheld dynamometers	
FREE JUMP	-RMB (Kcal)	-Just Jump system	Cojocariu (2011)
4 JUMPS	-skeletal muscle mass (kg)	-Just Jump system	Scott et al. (2003) West, C.R. et al. (2010)
VITEZĂ 10M, 20M, 40M, 60M	-viteza de deplasare (s)	-laptop, adapted keyboards, TreactionCo software, FootSwitch software	Green et al. (2011) Gabbett et al. (2008)
505 AGILITY TEST	-agilitatea (s)		
VAMEVAL	- maximum aerobic speed (km/h) -VO2max (ml/kg/min)	-meter measuring wheel Topmaster,	Trofin et al. (2013)

TEST NAME	EVALUATE (UM)	EQUIPMENT REQUIRED	VALIDARE
		knobs, Hama Star 75 tripods, 2 tablets, portable audio system, iPad mini 2 (ME277HC / A), Polar Team system with 20 H7 sensors	Trofin & Honceriu (2019) Baker & Heaney (2015)

4.4. RESULTS AND DISCUSSIONS

TESTING THE MAIN HYPOTHESIS 1

To test the main hypothesis 1, we used the Independent Samples T Test, which gave us information about the differences between the averages of rugby players between the two categories, U13 and U15.

SECONDARY HYPOTHESIS TESTING 1.1

Thus, to test the secondary hypothesis 1.1, the Independent Samples T Test was applied, which determined the differences between the averages obtained by rugby players in the two age categories, U13 girls and U15 girls, in terms of motor assessment. and their somatic-functional, according to table 5.

Table 5. Statistical analysis of somatic, functional and motor parameters of rugby players in the two age categories, U13 and U15

	GIRLS						
	U13 (N=9)			U15 (N=13)			P
	MA		AS	MA		AS	
HEIGHT (cm)	150,78	±	10,86	159,15	±	5,44	0,026
WEIGHT (kg)	49,70	±	14,14	56,05	±	6,21	0,164
FAT WEIGHT (kg)	7,96	±	10,82	14,12	±	5,37	0,091
MM SKELETAL (kg)	22,88	±	2,10	23,17	±	2,18	0,819
BMI (kg / m2)	21,42	±	3,99	22,03	±	1,87	0,635
MOBILITY CV (cm)	-5,02	±	9,82	6,78	±	8,34	0,007
LUNG ELASTICITY (cm)	5,74	±	2,12	6,95	±	2,57	0,259
FFP NON-DOMINANT MEMBER (kg)	17,01	±	5,18	24,96	±	4,15	0,001
FFP DOMINANT MEMBER (kg)	16,46	±	6,07	25,07	±	3,84	0,001
SJ (cm)	32,49	±	5,82	27,84	±	5,91	0,083
CMJ (cm)	33,43	±	5,00	28,42	±	5,53	0,042
FJ (cm)	39,33	±	5,23	32,95	±	6,07	0,019
J4_1	0,38	±	0,09	0,28	±	0,03	0,001

J4_2	1,47	±	0,34	1,66	±	0,22	0,131
J4_3 (inch)	14,21	±	2,81	10,69	±	2,27	0,004
SPEED 10M (s)	2,34	±	0,22	2,15	±	0,09	0,012
SPEED 20M (s)	4,25	±	0,44	3,85	±	0,21	0,009
SPEED 40M (s)	8,01	±	1,06	6,72	±	0,55	0,001
SPEED 60M (s)	11,71	±	1,54	10,10	±	0,85	0,005
AGILITY 505 (s)	3,07	±	0,29	2,84	±	0,19	0,031
VAMEVAL_FC_MAX (%)	96,88	±	2,57	96,61	±	3,59	0,847
MAXIMUM AEROBIC SPEED (km / h)	11,65	±	1,57	13,79	±	1,65	0,006
VO2MAX (ml / kg / min)	40,77	±	5,48	48,28	±	5,77	0,006
FVC (l)	2,35	±	0,43	3,13	±	0,41	0,000
FEV1 (l)	1,85	±	0,60	2,43	±	0,55	0,028
PEF (l)	3,21	±	1,64	3,34	±	1,05	0,825
V_RACTION NON-DOMINANT HAND (MS)	537,78	±	153,39	402,19	±	28,77	0,005
V_DOMINANT HAND REACTION (MS)	538,31	±	106,99	415,79	±	37,95	0,001
V_REACTION FOOT NON-DOMINANT (MS)	549,70	±	112,63	455,70	±	83,57	0,036
V_DOMINANT FOOT REACTION (MS)	528,33	±	86,61	443,91	±	82,54	0,032

SECONDARY HYPOTHESIS TESTING 1.2

To test the secondary hypothesis 1.2, the Independent Samples T Test was applied, according to Table 6, which determined the differences between the averages obtained by rugby players in the tests of assessment of motor skills and exercise capacity, but also physical development. of these, within the two age categories, U13 boys and U15 boys.

Table 6. Statistical analysis of somatic, functional and motor parameters of rugby players in the two age categories, U13 and U15

	BOYS						
	U13 (N=45)			U15 (N=46)			P
	MA		AS	MA		AS	
HEIGHT (cm)	154,35	±	12,70	171,82	±	7,18	0,000
WEIGHT (kg)	52,65	±	15,85	71,25	±	15,42	0,000
FAT WEIGHT (kg)	12,16	±	10,28	11,67	±	9,08	0,812
MM SKELETAL (kg)	22,41	±	5,34	31,62	±	4,46	0,000
BMI (kg / m2)	21,82	±	4,81	23,99	±	4,28	0,025
MOBILITY CV (cm)	-4,95	±	8,55	-1,04	±	9,68	0,044
LUNG ELASTICITY (cm)	6,41	±	1,72	7,83	±	2,82	0,005
FFP NON-DOMINANT MEMBER (kg)	20,05	±	6,40	34,23	±	8,16	0,000
FFP DOMINANT MEMBER (kg)	21,22	±	7,12	36,27	±	7,85	0,000

	BOYS						
	U13 (N=45)			U15 (N=46)			P
	MA		AS	MA		AS	
SJ (cm)	28,08	±	6,25	34,37	±	6,14	0,000
CMJ (cm)	27,31	±	7,09	34,57	±	6,00	0,000
FJ (cm)	32,77	±	7,49	40,34	±	6,70	0,000
J4_1	0,43	±	0,17	0,42	±	0,12	0,764
J4_2	1,28	±	0,41	1,38	±	0,38	0,206
J4_3 (inch)	13,62	±	12,77	14,36	±	2,60	0,702
SPEED 10M (s)	2,30	±	0,31	2,02	±	0,26	0,000
SPEED 20M (s)	4,07	±	0,68	3,53	±	0,49	0,000
SPEED 40M (s)	7,57	±	1,17	6,35	±	0,80	0,000
SPEED 60M (s)	11,14	±	1,75	9,33	±	1,26	0,000
AGILITY 505 (s)	3,01	±	0,33	2,76	±	0,29	0,000
VAMEVAL_FC_MAX (%)	95,82	±	4,33	97,02	±	4,11	0,179
MAXIMUM AEROBIC SPEED (km / h)	12,36	±	2,26	13,99	±	1,85	0,000
VO2MAX (ml / kg / min)	43,25	±	7,90	48,97	±	6,48	0,000
FVC (l)	2,67	±	0,81	3,97	±	0,84	0,000
FEV1 (l)	2,02	±	0,75	3,31	±	0,92	0,000
PEF (l)	3,23	±	1,67	5,51	±	1,96	0,000
V_REACTION NON-DOMINANT HAND (MS)	464,43	±	99,01	401,36	±	42,67	0,000
V_ DOMINANT HAND REACTION (MS)	466,16	±	87,32	407,50	±	40,40	0,000
V_REACTION FOOT NON-DOMINANT (MS)	518,32	±	225,43	439,05	±	50,01	0,022
V_DOMINANT FOOT REACTION (MS)	557,42	±	453,17	432,11	±	56,39	0,066

SECONDARY HYPOTHESIS TESTING 1.3

Next, to test the secondary hypothesis 1.3, and to determine the differences in motor, somatic and functional, existing between athletes, depending on their gender and age category, we applied the statistical tests Independent Samples T Test.

Thus, in the first part, in order to determine the differences between female and male athletes, we divided the subjects into two groups, regardless of their age category.

From a somatic point of view, we notice that male rugby players are better developed, as they have a higher height, weight, fat mass, skeletal muscle mass and body mass index than female athletes. The differences between them are significant ($p < 0.005$), except for the results obtained in the fat mass.

Regarding the physiological indices of the body, the values obtained at the lung elasticity and at the Vameval test are similar between girls and boys, the differences between them being without statistical significance. Significant differences are found between girls and boys in the case of forced vital capacity, forced expiratory volume in the first second and maximum expiratory flow ($p < 0.005$).

From the point of view of motor skills, between girls and boys, statistically significant differences are highlighted in the test for assessing the mobility of the spine ($p = 0.032$) and in the test for assessing the strength of the palmar flexors ($p = 0.017 / 0.003$). In terms of explosive strength of the lower limbs, speed of movement, agility and speed of reaction, the results obtained by the two groups are similar.

Following the results obtained, we can say that from the point of view of somatic-functional development, there are differences between girls and boys, but from the point of view of motor skills, there are not very big differences between them, the values between them being close.

In the following, we divided the subjects into two age groups, U13 and U15, girls and boys, and applied the Independent Samples T test to determine the differences between girls and boys in the same age group, in terms of concerns their motor and somatic-functional development.

U13 athletes, girls and boys, are at the same level of physical and motor development, the results obtained by them being close, but significant differences were also noticed between them in terms of explosive strength of the lower limbs assessed by Countermovement Jump tests ($p = 0.017$) and Free Jump ($p = 0.016$) and in terms of reaction time obtained in the dominant upper limb ($p = 0.034$).

Following the above, we can say that in the case of athletes in the age category U13, girls and boys are at the same level of physical and motor development.

In terms of the older age category, the differences between boys and girls are more numerous, which is explained by the growth and development processes that athletes go through during this period.

U15 athletes obtained close values of somatic indices such as fat mass and body mass index, but in the case of height ($p = 0.000$), weight ($p = 0.001$) and muscle mass ($p = 0.000$), are highlighted statistically significant differences between girls and boys.

The analysis of physiological indices reveals significant differences between boys and girls in terms of forced vital capacity ($p = 0.001$), forced expiratory volume in the first second ($p = 0.002$) and maximum expiratory flow ($p = 0.000$). We also note that there are no statistically significant differences in lung

elasticity, maximum heart rate, maximum oxygen consumption and maximum aerobic speed of athletes, girls and boys.

From the point of view of motor skills, there are statistically significant differences between girls and boys, in terms of the strength of the palmar flexors ($p = 0.000$), the explosive force of the lower limbs evaluated through the 3 samples ($p = 0.001$) and the speed of movement on distances 20m ($p = 0.027$) and 60m ($p = 0.042$).

Following the results presented above, we can say that athletes in the age category U15, girls and boys, are at a different level of motor and morpho-functional development.

TESTING THE MAIN HYPOTHESIS 2

To test the main hypothesis 2, Pearson correlations were applied to establish the causal relationships between the values of motor, somatic and functional parameters.

SECONDARY HYPOTHESIS TESTING 2.1

In the following, in order to test the secondary hypothesis 2.1, the correlations that show statistical significance ($p < 0.05$) in terms of somatic-functional and motor indices of rugby players in category U13 will be analyzed, according to table 7.

Table 7. Correlations of relevant somato-functional and motor parameters existing in the category U13 girls

	GOOD CORRELATION	r/p	STRONG CORRELATION	r/p
FFP_DOM			FFP_NED	,948/,000
SJ	4J_3	,721/,028	CMJ	,913/,001
			FJ	,929/,000
CMJ	4J_3	,734/,024	FJ	,919/,000
FJ			4J_3	,777/,014
V_10M			V_20M	,977/,000
			V_40M	,937/,000
			V_60M	,945/,000
			505	,827/,006
V_20M			V_40M	,979/,000
			V_60M	,975/,000
			505	,902/,001
V_40M			V_60M	,975/,000
			505	,937/,000
V_60M			505	,919/,000
			MG	,990/,010
VR_M_NEDOM	VR_P_NEDOM	,706/,033	INALTIME	-,758/,018
			VR_M_DOM	,882/,002
			VR_P_DOM	,889/,001
VR_M_DOM	VR_P_NEDOM	,711/,032	VR_P_DOM	,765/,016
VR_P_NEDOM	INALTIME	-,704/,034		
	VR_P_DOM	,715/,030		
VR_P_DOM			INALTIME	-,868/,002
			MG_PD	-,777/,014

Table 8 shows the correlations that show statistical significance ($p < 0.05$) in terms of motor and somatic-functional indices in athletes in the U15 category.

Table 8. Correlations of relevant somatic-functional and motor parameters existing in the category U15 girls

	GOOD CORRELATION	r/p	STRONG CORRELATION	r/p
FFP_DOM	FFP_NEDOM	,620/,024		
FFP_NEDOM			MMS	,977/,009
SJ	MG	-,692/,009	CMJ	,943/,000
	4J_3	,594/,032	FJ	,872/,000
	V_10M	-,683/,010		
	V_20M	-,679/,011		
	V_60M	-,619/,024		
CMJ	MG	-,709/,007	FJ	,825/,001
	4J_3	,630/,021		
	V_10M	-,675/,011		
	V_20M	-,634/,020		
	V_60M	-,556/,048		
FJ	V_20M	-,689/,009	V_10M	-,764/,002
	V_60M	-,650/,016		
	505	-,664/,013		
	MG	-,740/,004		
4J_1	VR_P_NEDOM	,705/,007		
	VR_P_DOM	,723/,005		
V_10M	505	,640/,019	V_20M	,888/,000
			V_40M	,767/,002
			V_60M	,816/,001
			MMS	,897/,042
V_20M	505	,690/,009	V_40M	,891/,000
			V_60M	,896/,000
V_40M			V_60M	,980/,000
V_60M	505	,568/,043	MMS	,968/,013
VR_M_NEDOM	VR_P_NEDOM	,705/,007		
	VR_P_DOM	,646/,017		
VR_P_NEDOM	INALTIME	,655/,015	VR_P_DOM	,835/,000
VR_P_DOM	INALTIME	,676/,011		

SECONDARY HYPOTHESIS TESTING 2.2

In the following, to test the secondary hypothesis 2.2, we will analyze the correlations that are statistically significant ($p < 0.05$) for rugby players in the U13 category, in terms of motor and morpho-functional parameters, according to Table 9.

Table 9. Correlations of relevant somato-functional and motor parameters existing in category U13 boys

	MODERATE CORRELATION	r/p	GOOD CORRELATION	r/p	STRONG CORRELATION	r/p
FFP_NEDOM			INALTIME	,667/,000	FFP_DOM	,907/,000
			GREUTATE	,593/,000		

	MODERATE CORRELATION	r/p	GOOD CORRELATION	r/p	STRONG CORRELATION	r/p
			MM_BS	,723/,000		
			MMS	,736/,000		
FFP_DOM	VR_M_DOM	-,348/,019	INALTIME	,725/,000	MM_BD	,794/,000
			GREUTATE	,642/,000	MMS	,821/,000
SJ	INALTIME	,306/,041	V_10M	-,640/,000	CMJ	,844/,000
	4J_2	,443/,002	V_20M	-,525/,000	FJ	,873/,000
	MG	-,432/,003	V_40M	-,640/,000		
			V_60M	-,646/,000		
			505	-,572/,000		
CMJ	INALTIME	,418/,004	V_10M	-,577/,000	FJ	,868/,000
	V_20M	-,467/,001	V_40M	-,572/,000		
	505	-,489/,001	V_60M	-,586/,000		
	MG	-,449/,002				
FJ	INALTIME	,377/,011	V_10M	-,645/,000		
	4J_2	,298/,047	V_20M	-,565/,000		
	MG	-,478/,001	V_40M	-,710/,000		
			V_60M	-,713/,000		
			505	-,594/,000		
4J_1	INALTIME	,331/,026	MMS	,523/,001		
	GREUTATE	,349/,019				
	MM_PD_PS	,480/,003				
4J_2	GREUTATE	-,440/,003				
	MG_PD	-,339/,023				
	MM_PD	-,409/,015				
	MG_PS	-,491/,003				
	MM_PS	-,424/,011				
	V_10M	-,359/,016				
	V_40M	-,341/,022				
	V_60M	-,363/,014				
	505	-,340/,022				
	MG	-,319/,033				
	MMS	-,395/,019				
V_10M	INALTIME	-,432/,003			V_20M	,903/,000
					V_40M	,909/,000
					V_60M	,912/,000
					505	,757/,000
V_20M	INALTIME	-,425/,004			V_40M	,924/,000
					V_60M	,908/,000
					505	,767/,000
V_40M	INALTIME	-,418/,004			V_60M	,977/,000
					505	,812/,000
V_60M	INALTIME	-,401/,006			505	,824/,000
505	INALTIME	-,318/,033				
FC_MAX	V_10M	-,375/,011				
	V_40M	-,364/,014				
	V_60M	-,325/,029				
	VMA	,340/,022				
	V02MAX	,340/,022				
VR_M_NEDOM	INALTIME	-,306/,041	VR_M_DOM	,511/,000	VR_P_NED.	,760/,000
	MMS	-,438/,008	VR_P_DOM	,717/,000		
	MM_BS	-,422/,012				
VR_M_DOM	INALTIME	-,498/,000				
	VR_P_NEDOM	,314/,036				
	MMS	-,448/,007				
	MM_BD	-,396/,019				
VR_P_NEDOM	MMS	-,354/,037			VR_P_DOM	,969/,000
	MM_PS	-,357/,035				

Next, the correlations that are statistically significant (p <0.05) for rugby players in the U15 category will be analyzed, in terms of motor and somatic-functional parameters, according to table 10.

Table 10. Correlations of relevant somatic-functional and motor parameters existing in category U15 boys

	MODERATE CORRELATION	r/p	GOOD CORRELATION	r/p	STRONG CORRELATION	r/p
FFP_DOM	INALTIME	,429/,003	MMS	,610/,000	FFP_NEDOM	,895/,000
	GREUTATE	,292/,049	MM_BD	,656/,000		
FFP_NEDOM	INALTIME	,374/,011	MM_BS	,687/,000		
			MMS	,638/,000		
SJ	GREUTATE	-,329/,025	4J_3	,719/,000	CMJ	,866/,000
			V_10M	-,656/,000	FJ	,837/,000
			V_20M	-,656/,000		
			V_40M	-,736/,000		
			V_60M	-,724/,000		
			505	-,673/,000		
			MG	-,519/,001		
CMJ	MG	-,497/,002	4J_3	,600/,000	FJ	,829/,000
			V_10M	-,579/,000		
			V_20M	-,630/,000		
			V_40M	-,745/,000		
			V_60M	-,743/,000		
			505	-,597/,000		
FJ	GREUTATE	-,354/,016	4J_3	,654/,000		
	MG	-,473/,004	V_10M	-,622/,000		
			V_20M	-,656/,000		
			V_40M	-,696/,000		
			V_60M	-,686/,000		
			505	-,603/,000		
4J_1	V_40M	,311/,035				
	V_60M	,299/,044				
4J_2	V_40M	-,301/,042				
	V_60M	-,296/,045				
4J_3	GREUTATE	-,361/,014	V_10M	-,519/,000		
	MG	-,444/,007	V_20M	-,538/,000		
			V_40M	-,515/,000		
			V_60M	-,525/,000		
			505	-,593/,000		
V_10M			GREUTATE	,542/,000	V_20M	,964/,000
			505	,740/,000	V_40M	,898/,000
			MG	,569/,000	V_60M	,872/,000
V_20M	GREUTATE	,496/,000	MG	,606/,000	V_40M	,933/,000
					V_60M	,934/,000
					505	,812/,000
V_40M			GREUTATE	,542/,000	V_60M	,984/,000
			MG	,637/,000	505	,802/,000
V_60M	GREUTATE	,463/,001	MG	,566/,000	505	,827/,000
505	GREUTATE	,441/,002				
	MG	,348/,018				
FC_MAX	FEV1	,321/,030				
	V_10M	-,403/,005				
	V_20M	-,413/,004				
	V_40M	-,458/,001				

	MODERATE CORRELATION	r/p	GOOD CORRELATION	r/p	STRONG CORRELATION	r/p
	V_60M	-,420/,004				
EP	FVC	,297/,045				
VR_M_ NEDOM	VR_P_DOM	,299/,044	VR_M_DOM	,539/,000		
VR_P_ NEDOM	VR_P_DOM	,473/,001				
	MM_PS	-,346/,039				

In order to summarize the results obtained above, we can state that in terms of morphological, physiological and motor indices, some correlations may have an important significance, which may provide details about the entire training process of athletes, but there are correlations that may be accidental, which are not necessarily relevant in practice. Referring to the level of correlations, we found both high correlations, where r is between 0.75 and 1, but also good correlations, where r has values between 0.5 and 0.75, and moderate, where r is between 0.25 and 0.5, which, from a statistical point of view, this staggering can give us details about the degree of importance of the relationship established between the two parameters.

At the same time, we notice that depending on the gender of athletes but also the category they belong to, the relationships established between indices may be different or may have different degrees of significance, precisely due to independent variables that influence the level of physical and motor development of athletes.

From the above, we can highlight the most relevant relationships established in terms of somatic, physiological and motor parameters, in the two age categories, depending on the type of athletes.

Thus, the level of development of the isometric force at the level of the upper limbs, determined by the assessment of the strength of the palmar flexors, has close values on both sides, the established correlations being high in all categories except U15 girls, where the correlation is good. This can be explained by the fact that in the game of rugby, the athletes use their upper limbs equally, it is not necessary to use the predominant one of the members in the game. Regarding the playing technique, the catching and passing of the ball is done with two hands, the plywood is made with both arms, the throw from the edge is done with both hands, or even in the formation of the pile and mole, the forces applied during which they are evenly distributed, both upper limbs being used equally.

Regarding the explosive force of the lower limbs, the results obtained in the 3 tests establish high correlations in all categories. However, we notice that between the explosive force of the lower limbs and the speed of movement, but also the agility of the athletes, there are good and very good correlations in all categories, except the U13 girls category. I believe that in speed running, the

explosive force has an essential role both in the impulse of the running step and in the change of direction, so we can deduce from this that the training programs to which athletes are subjected have an influence on both muscle strength, as well as on the speed and agility of the athletes. In rugby these qualities are highlighted in most phases of the game, especially in the attacking phases, in acceleration, in kicking or in transformations, or even in lifting from the edge. At the same time, the strength of the lower limbs plays a key role in maintaining the stability of the body in motion.

Regarding the correlation of the speed tests with the results of the agility test, it is obvious that the latter involves the speed of movement, and this can be highlighted in the game of rugby in the changes of direction.

According to the results obtained, rugby players have a relatively similar reaction speed of the upper limbs to that of the lower limbs, a quality required throughout the game.

At the same time, there are some moderate correlations between certain physiological parameters, which can give us information about the effort capacity of athletes and the proper functioning of the body's apparatus and systems, essential aspects in the game of rugby to support this type of mixed effort. with variations in intensity.

Finally, we address the existing correlations between somatic and motor indices, and we notice that the established relationships are moderate, good and very good. In some cases, taller athletes may perform better in tests of reaction speed, lower limb explosive force, running speed, speed and agility. In relation to the results obtained, we can assume that athletes who have a higher height can get better results in terms of speed and speed in dexterity, which can be explained by the fact that athletes with longer segments perform steps of Running with a higher amplitude, and at the same time, have a stronger impulse in the legs, according to the above. These motor parameters were also interpreted according to other somatic indices, such as skeletal muscle mass, fat mass or weight, but we did not identify significant influences of these last 3 somatic parameters.

TESTING THE MAIN HYPOTHESIS 3

In order to test the main hypothesis 3 and to highlight the differences between the averages between the 6 teams, regarding the somatic, physiological and motor indices of the athletes, the statistical test Anova was applied. Following the results obtained, we can say that there are differences between the teams in the study in terms of physical and motor development of players.

4.5. CONTRIBUTIONS ON THE RUGBY PLAYER'S BIOMOTRIC PROFILE IN THE PUBERTY PERIOD

The final product of this research is determined by the creation of a biomotric profile of the rugby player during puberty, in the area of Moldova. In this regard, the Shapiro-Wilk test was applied in the two age groups, depending on the gender of the athletes, to determine the normal distribution of the values obtained by the athletes. Note that where $p < 0.005$, in order to obtain a normal distribution of values, the minimum and maximum values were removed from the calculation, and the Shapiro-Wilk test was applied again.

Following the obtained results, the aim was to build a model, delimited in 3 ranges, which represent the evaluation criteria of the obtained results, determined by the calculation of the standard deviation. Thus, a standard deviation plus and minus one from the arithmetic mean represent the mean values, and the high and low values are those above and below this range of mean values.

Please note that the values obtained for the two groups of girls are indicative, which is caused by the low number of subjects we tested, but these may be the basis for future research.

The final product of this research is determined by the creation of a biomotric profile of the rugby player during puberty, in the area of Moldova. Below are the values obtained by rugby players during puberty in the area of Moldova, depending on the age category and gender of athletes, delimited into 3 categories, poor, medium and high results (Tables 11-14).

Table 11. Classification of the results obtained - U13 girls

	U13 GIRLS		
	SLAB	MEDIU	RIDICAT
MOBILITY C.V. (CM)	< -14,84	-14,84 — 4,8	4,8 >
LUNG ELASTICITY (CM)	< 3,62	3,62 — 7,86	7,86 >
FVC (L)	< 1,92	1,92 — 2,78	2,78 >
FORCE PALM FLEXORS-NON-DOMINANT HAND (KG)	< 11,83	11,83 — 22,19	22,19 >
FORCE PALM FLEXORS-DOMINANT HAND (KG)	< 10,39	10,39 — 22,53	22,53 >
SQUAT JUMP (CM)	< 26,67	26,67 — 38,31	38,31 >
COUNTERMOVEMENT JUMP (CM)	< 28,43	28,43 — 38,43	38,43 >
FREE JUMP (CM)	< 34,1	34,1 — 44,56	44,56 >
SPEED 10M (S)	< 2,56	2,56 — 2,12	2,12 >
SPEED 20M (S)	< 4,69	4,69 — 3,81	3,81 >
SPEED 40M (S)	< 9,07	9,07 — 6,95	6,95 >

SPEED 60M (S)	< 10,63	10,63 — 10,33	10,33 >
AGILITY 505 (S)	< 3,36	3,36 — 2,78	2,78 >
REACTION SPEED NON-DOMINANT HAND (MS)	< 567,78	567,78 — 416,96	416,96 >
REACTION SPEED DOMINANT HAND (MS)	< 645,3	645,3 — 431,32	431,32 >
REACTION SPEED NON-DOMINANT LOWER MEMBER (MS)	< 662,33	662,33 — 437,07	437,07 >
REACTION SPEED DOMINANT LOWER MEMBER (MS)	< 614,94	614,94 — 441,72	441,72 >

Table 12. Classification of the results obtained - U15 girls

	U15 GIRLS		
	SLAB	**MEDIU**	**RIDICAT**
MOBILITY C.V. (CM)	< -1,56	-1,56 — 15,12	15,12 >
LUNG ELASTICITY (CM)	< 4,38	4,38 — 9,52	9,52 >
FVC (L)	< 2,72	2,72 — 3,54	3,54 >
FORCE PALM FLEXORS- NON-DOMINANT HAND (KG)	< 20,81	20,81 — 29,11	29,11 >
FORCE PALM FLEXORS- DOMINANT HAND (KG)	< 21,23	21,23 — 28,91	28,91 >
SQUAT JUMP (CM)	< 23,31	23,31 — 29,53	29,53 >
COUNTERMOVEMENT JUMP (CM)	< 28,57	28,57 — 40,57	40,57 >
FREE JUMP (CM)	< 33,65	33,65 — 47,03	47,03 >
SPEED 10M (S)	< 2,24	2,24 — 2,06	2,06 >
SPEED 20M (S)	< 4,06	4,06 — 3,64	3,64 >
SPEED 40M (S)	< 7,27	7,27 — 6,17	6,17 >
SPEED 60M (S)	< 10,95	10,95 — 9,25	9,25 >
AGILITY 505 (S)	< 3,03	3,03 — 2,65	2,65 >
REACTION SPEED NON-DOMINANT HAND (MS)	< 430,96	430,96 — 373,42	373,42 >
REACTION SPEED DOMINANT HAND (MS)	< 453,74	453,74 — 377,84	377,84 >
REACTION SPEED NON-DOMINANT LOWER MEMBER (MS)	< 539,27	539,27 — 372,13	372,13 >
REACTION SPEED DOMINANT LOWER MEMBER (MS)	< 488,49	488,49 — 375,71	375,71 >

Table 13. Classification of the results obtained - U13 boys

	U13 BĂIEȚI		
	SLAB	**MEDIU**	**RIDICAT**
MOBILITY C.V. (CM)	< -13,5	-13,5 — 3,6	3,6 >
LUNG ELASTICITY (CM)	< 4,69	4,69 — 8,13	8,13 >
FVC (L)	< 1,86	1,86 — 3,48	3,48 >

	U13 BĂIEȚI		
	SLAB	MEDIU	RIDICAT
FORCE PALM FLEXORS- NON-DOMINANT HAND (KG)	< 14,42	14,42 — 25,06	25,06 >
FORCE PALM FLEXORS- DOMINANT HAND (KG)	< 14,1	14,1 — 28,34	28,34 >
SQUAT JUMP (CM)	< 21,83	21,83 — 34,33	34,33 >
COUNTERMOVEMENT JUMP (CM)	< 20,22	20,22 — 34,4	34,4 >
FREE JUMP (CM)	< 25,28	25,28 — 40,26	40,26 >
SPEED 10M (S)	< 2,54	2,54 — 2	2 >
SPEED 20M (S)	< 4,55	4,55 — 3,41	3,41 >
SPEED 40M (S)	< 8,14	8,14 — 6,46	6,46 >
SPEED 60M (S)	< 12,18	12,18 — 9,48	9,48 >
AGILITY 505 (S)	< 3,26	3,26 — 2,7	2,7 >
REACTION SPEED NON-DOMINANT HAND (MS)	< 483,88	483,88 — 388,34	388,34 >
REACTION SPEED DOMINANT HAND (MS)	< 455,57	455,57 — 372,57	372,57 >
REACTION SPEED NON-DOMINANT LOWER MEMBER (MS)	< 526,99	526,99 — 414,69	414,69 >
REACTION SPEED DOMINANT LOWER MEMBER (MS)	< 572,82	572,82 — 409,06	409,06 >

Table 14. Classification of the results obtained - U15 boys

	U15 BĂIEȚI		
	SLAB	MEDIU	RIDICAT
MOBILITY C.V. (CM)	< -10,72	-10,72 — 8,64	8,64 >
LUNG ELASTICITY (CM)	< 5,52	5,52 — 9,76	9,76 >
FVC (L)	< 3,44	3,44 — 4,7	4,7 >
FORCE PALM FLEXORS- NON-DOMINANT HAND (KG)	< 26,07	26,07 — 42,39	42,39 >
FORCE PALM FLEXORS- DOMINANT HAND (KG)	< 28,42	28,42 — 44,12	44,12 >
SQUAT JUMP (CM)	< 28,23	28,23 — 40,51	40,51 >
COUNTERMOVEMENT JUMP (CM)	< 28,57	28,57 — 40,57	40,57 >
FREE JUMP (CM)	< 33,64	33,64 — 47,04	47,04 >
SPEED 10M (S)	< 2,11	2,11 — 1,81	1,81 >
SPEED 20M (S)	< 3,69	3,69 — 3,15	3,15 >
SPEED 40M (S)	< 6,7	6,7 — 5,74	5,74 >
SPEED 60M (S)	< 9,85	9,85 — 8,37	8,37 >
AGILITY 505 (S)	< 2,91	2,91 — 2,51	2,51 >
REACTION SPEED NON-DOMINANT HAND (MS)	< 444,03	444,03 — 358,69	358,69 >

REACTION SPEED DOMINANT HAND (MS)	<	447,9	447,9	—	367,1	367,1	>
REACTION SPEED NON-DOMINANT LOWER MEMBER (MS)	<	478,45	478,45	—	391,99	391,99	>
REACTION SPEED DOMINANT LOWER MEMBER (MS)	<	488,5	488,5	—	375,72	375,72	>

4.6. PARTIAL CONCLUSIONS

Following the results obtained in testing the main hypothesis 1, we can say that in terms of somato-functional development, there are differences between girls and boys, but in terms of motor skills, there are not very big differences between them, the values between them being close. At the same time, in the case of athletes in the U13 age category, girls and boys are at the same level of physical and motor development, but in terms of the older age category, the differences between boys and girls are more numerous, explained by the processes of growth and development that athletes go through during this period.

Following the results obtained in testing the main hypothesis 2, we can say that among the morphological, physiological and motor indices, a good level of association is established, both in terms of the two genders and the two age categories of athletes. We believe that some correlations may have an important significance, which may provide details about the entire training process of athletes, but there are also correlations that may be accidental, which are not necessarily relevant in practice. At the same time, we notice that, depending on the gender of athletes but also the category they belong to, the relationships established between indices may be different or may have different degrees of significance, precisely due to independent variables that influence the level of physical and motor development of athletes.

If we refer to the results obtained in testing the main hypothesis 3, we can say that there are differences between the teams in the study in terms of physical and motor development of players, this statement can be considered a future direction of research.

FINAL CONCLUSIONS

Following the results obtained, a multitude of aspects that can be researched in the future were highlighted. The specialized literature offers several directions in this respect, but I consider that they are insufficient, especially in our country. Reporting the results obtained in the literature highlights some similarities and differences, but this would be more relevant if it existed in our country, in order to further investigate the differences in the profile of the rugby player existing depending on the area of origin of the players, age or gender, things that could add to the future selection of athletes but also the orientation and planning of sports training.

The existing correlations regarding the components of motor skills and somatic-functional characteristics highlight other future research directions, which can be studied by researchers in the field, research that can help improve the development strategies of Romanian rugby.

The results of the two researches aim to update the existing data on rugby players during puberty, in the area of Moldova, both mentally and from a motor and somatic-functional point of view.

Another aspect that I consider essential is the development and proposal of an updated battery of tests, which will highlight other characteristics of the athletes in addition to those currently targeted, and which will be implemented at the level of all rugby teams in the country, in order to be able to have a current reference model and to highlight the similarities and differences between them and, at the same time, to try to solve the existing problems within them.

Of course, determining the personality profile of the rugby player during puberty brings more information about how players play on the field, and the ability to understand these traits can be used in the development of game strategies by coaches.

At the same time, I believe that the existence of an updated reference model of the rugby player, both mentally and biomotric, can help specialists in training orientation and planning, which could significantly increase the performance of athletes.

I believe that rugby players during puberty are the basis for the selection of future performance athletes, the growth and development processes they go through, leaving their mark on their performance, which could be achieved only by orienting and individualizing sports training.

RESEARCH LIMITS AND FUTURE RESEARCH DIRECTIONS

Following the completion of this paper, some limitations of the research were highlighted, as well as some future directions of research, presented below.

The research aimed at investigating the biomotric profile of the rugby player during puberty, was conducted only on rugby teams in the area of Northern Moldova, this topic of interest can be studied in other parts of the country or even nationally in the future.

At the same time, due to the pandemic situation, the number of athletes in the teams was low and the access inside the sports clubs was limited, conditioned by the restrictions imposed at the moment.

Regarding the assessment of the rugby player's personality, we had difficulty in identifying the most appropriate analysis tool used in the investigation of athletes during puberty.

At the same time, due to the pandemic context, the number of subjects was limited and the application of the questionnaire could not be done face to face.

As for the future directions of research, we intend to extend the research to other areas of the country, in order to achieve a national mental and biomotric profile of the rugby player during puberty.

At the same time, we intend to study other aspects related to the mental profile of the rugby player during puberty, addressing various topics such as aggression, anxiety or stress levels.

Of course, I would like to take a closer look at the associations highlighted in the paper on motor and somatic-functional cues of rugby players during puberty.

As the number of female subjects was low, we aim to analyze the biological potential of rugby players among other female teams.

Finally, we aim to analyze other aspects of the biological potential of rugby players, using different evaluation methods than those used in this research.

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