SPORT - Science & Practice, Vol. 15, №1, 2025, pp. 29-39.

Original scientific paper

PHYSICAL ACTIVITY AS DETERMINANT OF SATISFACTION WITH LIFE AMONG CADET FOOTBALL PLAYERS [1]

UDC: 796.03:613.955
159.922.8:796.332
DOI: 10.5937/snp15-1-62753

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Abstract: The aim of this transversal research was to examine the possibility of predicting the variables of physical activities, and quality of life in interaction with health, physical self-concept, and physical functioning in the context of explaining the criteria of satisfaction with life in cadet football players. The pertinent sample consisted of 160 participants (M_{age} = 15.74; SD = 1.49). The Satisfaction with Life Scale – SWLS, the International Physical Activity Questionnaire – IPAQ-S, the Physical Self-Description Questionnaire – PSDQ, and the Short Form-36 Health Survey (SF-36) were used to collect data. The findings of the hierarchical regression analysis showed that significant predictors – body mass index, physical exercise, as a segment of body image, and physical functioning predict 20% of the variance of satisfaction with life ($p \leq .05$). This suggests that the perception of satisfaction with life in adolescents is more relevant for engaging in physical activities than the level of their physical activities. Also, the variables such as body mass index, physical exercise, along with self-concept of physical appearance and physical functioning are important mediators in explaining the construct of satisfaction with life, so they can be guidelines for identifying the perceived level of this dependent variable in the adolescent sport population in the Republic of Serbia. Theoretical contributions and practical implications are interpreted in accordance with the correlational and multiple linear regression findings of previous empirical studies.

Keywords: *adolescence, football players, physical self-concept, health status*

INTRODUCTION

Aerobic and anaerobic *physical activity*, e.g. walking, swimming, cycling, motor games, hiking, housework and physical exercise means moving the body using the skeletal musculature and the skeleton, with energy consumption greater than that during the resting phase, for proper growth and physical development, positive impact on physical and mental health and improvement or maintenance of functional, morphological, cognitive and conative characteristics and motor skills (Ivanović & Ivanović, 2019). The aforementioned authors believe that physical activities have many benefits for people, and they should be exercised regularly and gradually in a rhythm that suits the body, in order to encourage the strengthening of the body and the realization of the desired goal. In addition, physical activity reduces symptoms of depression, anxiety, stress and the risk of premature mortality, increases

[1] Paper received: 13th November 2025; accepted for publication: 14th December 2025.
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self-esteem and intellectual functions in everyday tasks (Przybylska et al., 2024). The World Health Organization recommends that children under the age of 17 do at least three activities a week: running, skipping rope, gymnastics and team sports, e.g. football, volleyball and basketball, because this is the age when it is important to strengthen and properly develop bones and skeletal muscles (World Health Organization, 2022). Unfortunately, only about 20% of children and young people in the world achieve these advised standards. The intensity of exercise is divided into absolute or relative. Absolute intensity is expressed through metabolic equivalent (MET), oxygen consumption and calorie consumption, and indicates the amount of energy spent during the activity. Low intensity refers to the activity of up to 2.9 METs, moderate activities are in the range of 3.0 – 5.9 METs, while high activities imply energy consumption of over 6.0 METs. For example, walking at a speed of 5 km/h requires consumption of 4 METs, while running at a speed of 12 km/h has a consumption of 12 METs (Croatian Institute of Public Health, 2022). Relative intensity implies the effort necessary to carry out a physical activity and is described by physiological parameters such as the percentage of maximum heart rate or the percentage of maximum oxygen consumption.

The multidimensional construct - *satisfaction with life* represents the subjective level at which an individual positively perceives the physical, mental and social quality of their own life (Parsakia et al., 2024). A number of factors contribute to a person's satisfaction with life. For example: supportive and moderating relationships, hobbies, creative workplace, positive emotional experiences, etc. On the other hand, stress, poor health, financial difficulties and negative emotions reduce the level of satisfaction with life. One study (Zhai et al., 2024) showed that satisfaction with life among adolescents, who spend more time engaging in physical activity, positively affects their satisfaction with school. That is why it is important that adolescents enjoy classes and that they perceive their participation in solving tasks as a positive and satisfactory thing.

An important concept in psychological analyses of adolescents is *body image*, i.e. the *self-concept* of one's physical appearance, *body satisfaction*. The experience of understanding one's physical appearance (self-concept) presupposes a set of representations, fantasies, emotions, attitudes and meanings related to the body and certain parts of a person (Rojas-Padilla et al., 2024). Body image can also be understood as a mental self-description of one's own body, the attitude towards physical appearance, the state of health, whereby the attitudes of value arise in the context of faith, culture and tradition (Berengüí et al., 2023). The experience of body image affects the perceptual, cognitive, emotional and behavioural functions of an individual during their growth and physical development. It is not static but dynamic and depends on external (social and cultural) and internal (biological and psychological) factors, which change, are maintained and developed. Body image/self-concept of one's physical appearance includes the totality of perception that an individual has about themselves and their identity, the way they see themselves in different dimensions of life, and in relation to their own environment. It, as the central phenomenon of this model, implies attitudes and schemes based on physical appearance, which are influenced by cultural socialization factors, interpersonal experiences, physical characteristics and personality dimensions (Burgon et al., 2023). The aforementioned authors believe that adolescents who physiologically mature earlier are usually more popular, occupy leading social positions, and are often sports stars, which generates greater self-satisfaction and a more positive body image.

In the past 10 years, empirical research has emphasized the relevance of *health status*, which includes full functioning or the efficiency of body and mind, and social adaptation (Ivanović & Ivanović, 2018). In accordance with this definition, it is possible to assess the extent to which a person's well-being is impaired in the field of physical, mental and social health. The author's research (Chapa et al., 2022) draws attention to the harmful effects of technology and the increasing number of obese adolescents among the school population, as well as the increase in the abuse of alcohol and drugs among high school students. The authors claim that physical exercise during adolescence is an important moderating factor for the health of young people, and that the predictors such as physical inactivity, excess body weight and restrictions due to physical limitations represent significant negative determinants of health status during puberty. On the other hand, more physically active adolescents with normal body mass enjoy better health (Faroughi et al., 2024).

Since the applicability of the measuring instruments used in this paper has not yet been tested on a Serbian sample, and while the other studies do not offer consistent results, the *aim* of this quantitative research is to examine the relationship between physical activities, health-related quality of life, physical self-concept, physical functioning and satisfaction with life of cadet football players. Considering the results of previous research, it is assumed that the positive interaction between physical activity and satisfaction with life will be confirmed in the sample of adolescent soccer players (H_1). It is also expected that statistically significant predictors of satisfaction with life among young players from 14 to 16 years of age will be body mass index, level of intensity of physical activity, self-assessment of physical activity and quality of life related to their health (H_2).

METHOD

Participants and research procedure

The research was carried out in the Kolubara district on a pertinent sample of 160 cadet football players from three clubs from Valjevo: FC "Budućnost" (Serbian League West), FC "Radnički" (Kolubara-Mačva Zone) and FC "ZSK" (Kolubara district League). The average age of the participants was (M = 15.74 $_{years}$, SD = 1.19). All participants had undergone at least two years of systematic and organized training, at least three times a week. Data collection was carried out during October 2025.

The application of the measuring instruments was carried out in groups, at the club premises, as part of the regular training sessions of football players, where each subject was tested individually using the pen-and-paper method. Before testing, the objective of the research was explained to the participants and they were guaranteed anonymity, along with instructions on filling in the questionnaire and scale. The estimated time of the testing, in the presence of the examiner, was approximately 20 minutes, where each subject could withdraw from testing at any time, without giving reasons and without any consequences. Three subjects with significant Mahalanobis distances at the $p \leq .01$ level were excluded as multivariate outliers (Tabachnik & Fidell, 2013). The research was approved by the football players' parents and coaches, as well as the Scientific Council of the Serbian Academy of Innovation Sciences from Belgrade, based on the Declaration of Helsinki.

Measuring instruments

Body Mass Index (BMI)

The International Biological Program was used for measuring anthropometric parameters of body mass and body height (Weiner & Lourie, 1969). The participants' body mass was measured with a medical scale, with a measurement precision of 0.1 kg, and body height with a height meter in a standing position, with a measurement precision of 0.1 cm, while the subjects were in light clothes without shoes. The degree of nutrition of the participants is expressed through the body mass index (BMI), which represents the ratio of body mass in kilograms to the square of body height in meters. BMI is calculated by dividing the participant's body mass in kilograms by the square of body height in meters according to the standard formula: BMI (kg/m²) = body mass (kg)/{height² (m)}. According to the recommendation of the World Health Organization - WHO, nutrition is classified into categories based on the following obtained BMI values: a) malnutrition - values less than 18.5 kg/m², b) normal body mass - values from 18.6 to 24.9 kg/m², c) excess body mass (overweight) - values of 25 to 29.9 kg/m² and d) obesity - values of 30 and more kg/m² (World Health Organization, 2021). The threshold value for overweight and obesity was BMI ≥ 25 kg/m².

Table 1 shows the categories of body mass index, i.e. the self-assessment of the participants' nutrition.

Table 1. *Body mass index categories – BMI (N = 160)*

BMI	f	%
Insufficient body mass (malnutrition)	1	.7
Normal body mass	95	59.37
Excess body mass (overweight)	59	36.9
Obesity	5	3.1

Annotation: BMI = body mass index; f = frequency; % = percentage

By looking into the the data matrix, it can be seen that the most participants have a normal body mass (from 18.6 - 24.9 kg/m²) and an excessive body mass (from 25 - 29.9 kg/m²), while there is only one adolescent who is malnourished, and five of them are obese, i.e. with over 30 kg/m²).

Satisfaction with Life Scale (SWLS)

SWLS (Satisfaction with Life Scale; Lukaski & Raymond-Pope, 2021) examines the global overall assessment of satisfaction with life and consists of five items. Participants' task is to evaluate the statements on a 7-point

Likert-type scale (from 1 = *I do not agree at all* to 7 = *I completely agree*). For example: "*My living conditions are excellent*", "*I am satisfied with my life*". The total score is calculated by adding up the results of all items, with a higher score indicating greater satisfaction with life. The reliability of the internal consistency type is measured by Cronbach's alpha coefficient and in this research amounts to (α = .85).

The Physical Self-Description Questionnaire-Short Form (PSDQ-S)

PSDQ-S (The Physical Self-Description Questionnaire-Short Form; Marsh et al., 2010) includes nine specific and two general subscales. For the purposes of this research, a subscale was used that examines the physical self-description of the participants' own physical appearance, who then provide self-assessments on a 5-point Likert-type scale, from 1 (*incorrect*) to 6 (*correct*). In this research, the coefficient of the internal consistency of reliability (*Cronbach's*) for the used questionnaire is (α = .78).

The Short Form-36 Health Survey (SF-36)

SF-36 (the Short Form-36 Health Survey; Ware et al., 2010) includes two scales: physical functioning and restrictions due to physical limitations, which are used to assess the quality of life and physical and mental health of the participants. The questionnaire contains 36 items covering eight health domains: physical functioning (10 items), restrictions due to physical limitations (4 items), physical pain (2 items), vitality (4 items), general perception of health (5 items), social functioning (2 items), limitations due to emotional difficulties (3 items) and mental health (5 items). The theoretical range goes from 0 to 100 points, where 0 points represent the maximum health limitation, while 100 points represents a very positive response and suggests no health limitations. The reliability coefficients (Cronbach's alpha) in this sample are (α = .87) for the subscale of physical functioning and (α = .83) for the subscale of restrictions due to physical limitations.

The International Physical Activity Questionnaire (IPAQ-S)

The IPAQ-S (The International Physical Activity Questionnaire, Craig et al., 2003) examines the intensity of physical activity that is carried out daily. The questionnaire includes 27 items: the frequency and duration of physical activities spent walking, activities of moderate and high intensity and time spent in a sitting or lying position, during the past seven days. Moderate activities include activities in which breathing is faster than usual, while high-intensity activities refer to those in which breathing is faster than moderate. The participant is tasked with selecting the number of days per week (from 1 to 7) that they spent performing particularly demanding physical activities, and below that to write how much time they spent doing physical activities related to the frequency, duration and intensity of physical activity in four domains of life: work, transport, household and free time. The result is presented as continuous variables expressed in METs or categorical variables in three categories (low intensity physical activity, moderate and high intensity physical activity). By summing up the values of the level of physical activity in the four mentioned domains, the total level of physical activity is calculated. Based on the parameters of intensity, frequency and duration of physical activity, which are part of the IPAQ questionnaire, energy consumption correlated with physical activity, expressed in metabolic units (MET), is estimated. Since participants' answers are mostly expressed in minutes spent doing a particular physical activity, the physical activity score is expressed in MET minutes and is obtained by multiplying MET minutes spent doing a particular physical activity and the MET scores. The value of MET-minute is equal to the value of consumed kilocalories. The obtained Cronbach's alpha coefficients for the variables of physical activity by domain, as well as the variables of total physical activity in this research range from α = .73 to α =.79.

Statistical data processing

Using basic descriptive statistics and measures of skewness and kurtosis coefficients, the values of the variables for checking the normality of the distributions were calculated. Reliability analysis (Cronbach's α-coefficient) was used to define the psychometric characteristics of the instruments. The Pearson correlation coefficients were also calculated, in order to define the relationship between the examined variables, while multiple hierarchical regression analysis was conducted in order to define the partial relative contributions of the predictors in explaining the variance of satisfaction with life. The value of ($p \leq .05$ or $p \leq .01$) was used as the level of significance. Statistical data processing was carried out in the software program Statistical Package IBM-SPSS, version 26.0.

RESULTS

Table 2 shows basic descriptive parameters of the measured variables: body mass index, physical activity of high and moderate intensity, walking, total physical activity, sitting, physical activities, satisfaction with life and physical functioning as an indicator of quality of life and health.

Table 2. *Descriptive parameters of analysed variables (N = 160)*

Variable	Min	Max	*M*	*SD*	SE	*Sk*	*Ku*
Body mass index (BMI) – kg/m^2	13.96	29.63	19.46	2,47	.18	.15	.48
IPAQ-S High-intensity PA (MET-min/weekly)	.00	100	29.05	2.06	.44	.68	.40
Moderate-intensity PA (MET-min/weekly)	.00	500	20.01	1.12	.35	.79	-.07
Walking (MET-min/weekly)	.00	39	15.35	1.03	.29	.77	-.52
Total PA (MET-min/weekly)	.00	166	70.02	2.14	.16	.19	.53
Sitting – hours	.46	23	4.76	2.17	.52	.83	.90
PSDQ-S							
Physical activity	2.41	7.05	5.01	.87	.36	.49	.53
SWLS Satisfaction with life scale	1.36	6.52	4.88	1.36	.49	-.57	-.09
SF-36 Physical functioning	.00	100	68.23	2.74	.64	.87	.82
Restrictions due to physical limitations	.00	100	77.26	1.56	.70	-.92	.87

Legend: Min = Minimum result, **Max** = Maximum result, **M** = Arithmetic mean, **SD** = Standard deviation, **SG** = Standard error of the arithmetic mean, **Sk** = Skewness, **Ku** = Kurtosis

The normality of the distributions of the used variables on the statistical set of participants was tested by the coefficients of Skewness and Kurtosis at the level of inference error ($p \leq .05$). The calculated values of Sk and Ku are in the range of ± 1.96, which indicates a normal – Gaussian probability distribution of data and further application of parametric methods in statistical data analysis (Haqiqatkhah et al., 2023).

In order to verify the connection between physical activity, satisfaction with life and quality of life in cohesion with adolescent health, a correlation analysis was conducted (Table 3).

Table 3. *Intercorrelations (Pearson coefficient r) between examined variables in research (N = 160)*

Variable	1	2	3	4	5	6	7	8
1. BMI	–	-05	-.15	-.12	-.09	-.30**	-.07	-.11
2. High-intensity PA		–	.67*	.01	-. 32*	.26**	.32**	.05
3. Moderate-intensity PA			–	.55**	.03	-.07	.09	-.01
4. Walking				–	.06	.02	-.10	-.04
5. Sitting					–	-.05	-.08	
6. PA (PSDAQ-S)						–		.22**
7. Restrictions due to physical limitations (SF-36)							–	.15*
Satisfaction with life								–

*Annotation: *p ≤ .05; **p ≤ .01*

A review of the matrix of correlations of the used measuring instruments shows a statistically significant low negative interdependence between body mass index and physical functioning as one of the indicators of the quality of life related to health. This suggests that participants who have lower body mass index perceive their physical functioning as better. At the same time, a positive correlation was found between high-intensity physical activity and moderate-intensity physical activity, and a negative correlation between high-intensity physical activity and sitting. Also, a moderate degree of positive interaction between physical activity of moderate intensity and walking is observed. In addition, in relation to different intensities of physical activity, the only significant intercorrelation with high-intensity physical activity was manifested as a segment of the body image of the subject. This shows that adolescents who are involved in high-intensity physical activities perceive their body image in a relevantly more positive way. In addition, high-intensity physical activity is also in a significantly low positive relationship with the variable that implies quality of life in interaction with health – restrictions due to physical limitations, which indicates that participants who perform high-intensity physical activity perceive that they have significantly fewer restrictions due to physical limitations. A significant mutually positive influence was obtained between the variables of satisfaction with life and physical activity as a segment of the self-assessment of physical appearance. On the other hand, no correlation was established between the variables: levels of physical activity (high, moderate-intensity, walking, sitting) and satisfaction with life. This research definitely indicates that aspects of quality of life are statistically significantly positively related to satisfaction with life. Therefore, in accordance with the assumed moderating effects of prediction error – residuals (Kennedy et al., 2022), the obtained correlation results in this research confirmed the firstly tested working hypothesis (H1), i.e. positive interaction of physical activity and satisfaction with life.

In conclusion, it should be noted that the correlation between the variables: physical activities of high and moderate intensity, walking, sitting, self-concept and body mass index, was not significant, and that in the hierarchical regression analysis the height-weight indicator of nutrition stood out as a statistically significant predictor of satisfaction with life, which indicates that there was a suppression effect (Tabachnick & Fidell, 2013) on a sample of young football players at the age of mental and physical development between puberty and maturity.

In order to check the contribution of the predictor variables: the intensity of physical activity, the perception of physical activity, as a segment of adolescent self-concept, and the aspect of physical functioning, as a moderator, in explaining the criterion variable – satisfaction with life, a hierarchical regression analysis was conducted in three models of the regression equation (Table 4).

Table 4. *Results of hierarchical regression analysis with life satisfaction as criterion variable (N = 160)*

Predictors	Model I		Model II		Model III	
	β	SE β	β	SE β	β	SE β
BMI	-.20**	.11	-.20** .43	.09	-.15	.34
High-intensity PA			-.01	.42	-.10	.25
Moderate-intensity PA			-.05	.37	-.02	.43
Walking			-.04	.25	-.03	.29
Sitting			-.01			
PA (PSDQ-S)			.23**	.56	.15*	.10
Physical functioning (SF-36)					.19*	
Restrictions due to physical limitations (SF-36)					.12	.58
ΔR^2	.05*		.04*		.09**	
R^2	.05		.09		.20	

Annotation: β = Standardized regression beta-coefficient; *SE* β = Standard error of beta-coefficient; R^2 = Coefficient of multiple determination; ΔR^2 = Corrected coefficient of multiple determination - total contribution of individual group of predictors to explained variance $^{**}p \leq .01$, $^{*}p \leq .05$

Before conducting the hierarchical regression analysis, the autocorrelations of the linear models, i.e. the independence of the residuals in the model, were checked using the Durbin-Watson test. Collinearity was tested with the values of the linear relationship (variance inflation factors; VIF) and the reciprocal value (Tolerance). The calculated values of the Durbin-Watson test, VIF and Tolerance are in accordance with the recommended values, and it is concluded that the residuals are not correlated, that is, there is no phenomenon of multicollinearity between the predictor variables in the model, and that the condition for the application of regression is met (Senaviratna & Cooray, 2019).

In the first block of variables of the hierarchical linear regression of the moderator effect, BMI was included as a predictor variable, in the second block of variables the level of intensity of physical activity and body image, and in the third block of variables aspects of physical functioning (as indicators of quality of life) were introduced. In this way, it was possible to identify partial relative contributions of individual predictors in explaining the overall variability of satisfaction with life.

The regression findings indicated that in the 1st initial set of independent variables, *body mass index* is a statistically significant negative predictor that explains 5% of the total variance of the criteria. A negative sign indicates that participants who have a lower body mass index are more satisfied with their life, and vice versa, a higher height-weight indicator of an individual's nutrition is the basis for expecting that their level of satisfaction with life will be lower. In the 2nd regression model, the predictive results of the measured independent variables (different intensities of physical activity) show that they did not have statistically significant interactions with the outcome of the criterion variable, that is, their moderating effects were not significant, which points to the conclusion that the correlations of different intensities of physical activity do not depend on the analysed determinants of satisfaction with life.

However, in this model, only the variable physical exercise as a segment of self-concept of physical appearance manifested a partial level of significance ($\beta = .23$, $p \leq .05$), which additionally partially contributes with 4% to the interpretation of the variability of satisfaction with life criteria. More precisely, this means that participants who have a more positive body self-concept are probably more satisfied with their lives. In the 3rd last regression model of the used measuring instruments, a positive predictor *physical functioning* is included, which statistically significantly increases the coefficient of multiple correlation, while additionally predicting 9% of the total variance of the criteria, which suggests that young people who perceive their physical functioning to be as good as possible are more satisfied with life. The regression equation in the last Model III definitely shows that with this set of statistically significant predictor variables (the intensity of physical activity, the perception of physical activity as a segment of body image and an aspect of physical functioning) it is possible to predict 20% of the total variability of the dependent variable of satisfaction with life. This suggests the conclusion that the application of the proposed multivariate regression model (Hair et al. 2024) is justified, i.e. that the working hypothesis (H_2) was confirmed on the sample of young football players, i.e. the expectation that statistically significant predictors of satisfaction with life among young players aged 14 to 16 will be body mass index, level of intensity of physical activity, self-assessment of physical activity and health-related quality of life.

DISCUSSION

The aim of this cross-sectional study was to examine the relationship between physical activities, quality of life in interaction with health status, physical self-concept, physical functioning and satisfaction with life in cadet football players.

Body composition implies the ratio of muscle mass (muscles, skeleton, organs) to fat in the body, and in anthropological and medical research it is estimated using body mass index, which was invented by mathematician Adophe Quetelet in the 19th century, with an aim to quickly and efficiently diagnose obesity (Korzonek-Szlacheta et al., 2024). A balanced body composition is correlated with improved overall health and reduced risk of chronic diseases (Moreno-Díaz et al., 2024). However, body mass index can give incorrect information at different ages, e.g. in infants and soldiers since it is not possible to accurately assess body composition, i.e. the percentage of body fat, which is the biggest problem in athletes with excess weight (Anam et al., 2024). The aforementioned suspicion partially coincides with the results of body mass index in this study, where BMI varied from 15.26 to 30.85 kg/m².

Therefore, it can be concluded that BMI can be justifiably used in the evaluation of the body composition of Serbian sports population, while one should be careful in the interpretation due to its shortcomings and limitations.

Defining the intensity of physical activity (PA) is very important in its implementation. In doing so, it is important to understand the intensity categories of physical activity (low, moderate and high-intensity PA) during physical exercise, and to adapt its intensity to each athlete's organism. Given that young football players participated in this research, the findings at the level of high-intensity physical activity are expected because most of the participants also engage in some additional sport in their free time, which implies a significantly higher frequency of heart rate, breathing and sweating. A simple method to define the category of high-intensity physical activity is done using the conversation test. If during physical activity a string of words can be spoken, and not a whole sentence, it shows that the participants are in the category of high-intensity physical activity (Subbarayalu et al., 2024). In the research (Boat et al., 2024), it is recommended that people should regularly perform high-intensity physical activities for 75-150 minutes, in order to reduce sedentary habits and improve health. In addition, adolescents who do high-intensity physical activities achieve better success in school.

The aim set in this research also referred to the examination of the interactions of physical activity, satisfaction with life and health-related quality of life in football players during adolescence. It has been shown that football players who are more satisfied with life think significantly more that they engage in physical activity if it is measured as a segment of their body image self-concept. At the same time, satisfaction with life is not in cohesion with the level of physical activity. Some findings indicate that individuals who engage in physical activities of high and moderate intensity are more satisfied with life and happier than those who engage in physical activities of low intensity (Ahsan & Ali, 2023). However, the existing findings are not logically connected in the relations between different intensities of physical activity and subjective well-being. For example, in a study (Liu et al., 2023) it was determined that a moderate to high-level physical activity correlates with a greater quality of life, and that the highest subjective self-concept of physical appearance is among participants who engage in low-intensity physical activities. Also, empirical findings in another study (Parsakia et al., 2024) confirm that satisfaction with life increases if an individual engages in physical activities daily. Adolescents who are more satisfied with life emphasize greater importance of a better quality of life, i.e. of their physical functioning segment with fewer restrictions due to physical limitations. The mutual effect between physical activity and quality of life was also proven in a study (Yang et al., 2024), where it was stated that high-intensity physical activities contribute to the quality of life correlated with health, which generally increases satisfaction with life in adolescence.

By examining the mutual influence of physical activity, physical functioning and satisfaction with life, relevant determinants were obtained that predict the satisfaction with life construct. Empirical findings on the examined sample, with about ⅕ variability, suggest that cadet football players with a lower body mass index, a higher level of physical activity as a segment of self-concept, and those who perceive their physical functioning as better are more satisfied with life. However, although the tested predictor variables successfully explained a significant percentage of satisfaction with life, a significant part of the variance (about 80%) remained unexplained, which indicates that it is a complex concept explained by numerous other untested factors. Also, another author's research (Parsakia et al., 2024) indicates that male athletes are more satisfied with life compared to female athletes of the same age. At the same time, a higher body mass index in athletes negatively affects the quality of life associated with their health status (Faroughi et al., 2024). In addition, the physical activity of athletes is in a significant interaction with satisfaction with life during adolescence (Ault et al., 2024; Predoiu et al., 2024).

When interpreting the results of this cross-sectional study, it is important to take into account its methodological limitations. The first limitation refers to the pertinent sample that was available for research at that time. It would be better if the number of participants was greater and if football players from a larger number of clubs from the entire territory of Serbia participated. The limitations of this research may be in giving socially desirable answers, which are probably the result of filling out the instruments in groups due to the fear that their answers would be visible i.e. available to other participants in the group. Also, the method of collecting data through *self-assessments*, due to the tendency to give socially desirable answers, calls into question the sincerity of such answers. This can be solved by using some other measure, e.g. peer and coach assessments to get more honest answers. The last limitation concerns the attrition of subjects. Considering the anthropometric measurements (body weight and body height) and the large number of given items, there is a possibility that the subjects were tired and their motivation decreased, which may have affected the results of the research. Also, considering the correlational design of the research and the obtained low connection between the variables, caution is necessary in the interpretation

because it is not possible to conclude about causal relationships. Therefore, in the future representative sample of all competitive categories of football players, of both sexes, some variables such as lifestyle, social environment, values and attitudes, and the influence of peers and coaches should be included in order to confirm our conclusions about the direction of interactions between satisfaction with life and physical activity as a segment of body image, high-intensity physical activities and quality of life associated with the health of active athletes.

Despite the aforementioned limitations, the findings of this research contribute to a better understanding of the latent factors that predict satisfaction with life among Serbian cadet football players. However, future research (of experimental and longitudinal design) on a representative sample of all competitive categories of football players, of both sexes, should be directed at examining guidelines for improving football players' satisfaction with life. All predictive factors cannot be removed, but it is important to take preventative measures in order to reduce those that can be reduced. Through education, knowledge and skills such as communication with peers and coaches, organizing free time, physical activity, cadet football players can enable the achievement of greater satisfaction with life in the football adolescent population.

CONCLUSION

The results of this research indicate the correlation of satisfaction with life and physical activity as a part of the self-concept of one's physical appearance, as well as the interaction of high-intensity physical activity and the quality of life associated with the health of cadet football players, i.e. the views of difficulties due to their physical limitations. Therefore, the level of physical activity is not relevant for the construct satisfaction with life, but rather the general perception of young athletes when engaging in physical activities. Football players between the ages of 14 and 16 who have a lower body mass index, a higher level of physical activity as a segment of body image, self-concept and those who rate their physical functioning as better are more satisfied with life. Given the obtained regression research findings, i.e. the coefficient of indeterminacy, which show the influence of other untested predictor variables on the variance of satisfaction with life criteria, further empirical studies are necessary for a more complete understanding of the cohesion of physical activity and other aspects of satisfaction with life. The findings of this research offer practical implications for the introduction of additional predictor variables when testing satisfaction with life criteria. The results of this study can be an incentive for more detailed research on the relationship between physical activity and satisfaction with life, especially due to the current tendency of a sedentary lifestyle and its unfavourable consequences for the quality of life and health in a sample of athletes in adolescence.

REFERENCES

1. Ahsan, M., & Ali, A. (2023). Assessing the Emotional Intelligence and Sleep-Wake Pattern among Varsity Male Soccer Athletes Vs Male Non-Athletes Varsity Students. *Journal of Development and Social Sciences*, *4*(3), 594–608. https://doi.org/10.47205/jdss.2023(4-III)56
2. Anam, K., Setiowati, A., Indardi, N, Irawan, F. A., Pavlović, R., Susanto, N., Aditia, E. A., Muhibbi., M, & Setyawan, H. (2024). Functional movement screen score to predict injury risk of sports students: a review of foot shape and body mass index. *Pedagogy of Physical Culture and Sports*, *28*(2),124–31. https://doi.org/10.15561/26649837.2024.0206
3. Ault, K. J., Blanton, J. E., & Pierce, S. (2024). Student-athletes' perceptions of relationship quality and life skills development. *Journal of Applied Sport Psychology, 36*(1), 139–160. https://doi.org/10.1080/10413200.2023.2197970
4. Berengüí, R., Angosto, S., Hernández-Ruiz, A., Rueda-Flores, M., & Castejón, M. A. (2023). Body image and eating disorders in aesthetic sports: a systematic review of assessment and risk. *Science & Sports, 39,* 241–249. https://doi.org/10.1016/j.scispo.2023.03.006
5. Boat, R., Williams, R. A., Dring, K. J., Morris, J. G., Sunderland, C., Mary E. Nevill, M. E. (2024). Associations of Self-Control with Physical Activity, Physical Fitness, and Adiposity in Adolescents. *Behavioral Medicine, 50*(1), 82–90. https://doi.org/10.1080/08964289.2022.2114416

6. Burgon, R. H., Beard, J., & Waller, G. (2023). Body image concerns across different sports and sporting levels: a systematic review and meta-analysis. *Body Image, 46,* 9–31. doi: 10.1016/j.bodyim.2023.04.007
7. Chapa, D. A. N., Johnson, S. N., Richson, B. N., Bjorlie, K., Won, Y. Q., & Nelson, S. V. (2022). Eating-disorder psychopathology in female athletes and non-athletes: a meta-analysis. *International Journal* of *Eating Disorders*, *55*, 861–885. https://doi.org/10.1002/eat.23748
8. Craig, C. L., Marshall, A. L., Sjöström, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., Pratt, M., Ekelund, U., Yngve, A., Sallis, J. F. & Pekka, O. (2003). International physical activity questionnaire: 12-country reliability and validity. *Medicine and Science in Sports and Exercise, 35*(8), 1381–1395. https://doi.org/10.1249/01.MSS.0000078924.61453.FB
9. Diener, E. D., Emmons, R. A., Larsen, R. J. & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*(1), 71–75. https://doi.org/10.1207/s15327752jpa4901_13
10. Faroughi, P., Vijuyeh, M. C., Farshbafi, V. N., & Saadatnejad, S. H. (2024). Comparison of Life Satisfaction, Happiness and Self-Esteem of Female Athletes and Non-Athletes. *Journal of Humanistic approach to sport and exercise studies (HASES), 2*(4), 385–393.
11. Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*, *26*(2), 106–121. https://doi.org/10.1108/EBR-10-2013-0128
12. Haqiqatkhah, M. M., Ryan, O., & Hamaker, E. (2023). Skewness and staging: Does the floor effect induce bias in multilevel AR(1) models? *Multivariate Behavioral Research, 59*(2), 289–319. https://doi.org/10.1080/00273171.2023.2254769
13. *Hrvatski zdravstveno-statistički ljetopis* (2022). Zagreb: Hrvatski zavod za javno zdravstvo.
14. Ivanović, M., & Ivanović, U. (2018). *Gimnastika za zdravo dete od rođenja do 3. godine, nedonoščad i decu sa teškoćama u razvoju*. Valjevo: Valjevo-print.
15. Ivanović, M., & Ivanović, U. (2019). *Trudnoća i beba.* Beograd: AGM knjiga.
16. Kennedy C., Mercer, A., & Lau A. (2022). "Exploring the Assumption That Online Nonprobability Survey Respondents Are Answering in Good Faith," *Survey Methodology*, accepted for publication. Available at https://washstat.org/hansen/2022Kennedy.pdf
17. Korzonek-Szlacheta, I., Hudzik, B., Zubelewicz-Szkodzińska, B., Czuba, Z. P., Szlacheta, P.,Tomasik, A. (2024). The Association between Circulating Cytokines and Body Composition in Frail Patients with Cardiovascular Disease. *Nutrients*, *16*(8), 1227–1235. https://doi.org/10.3390/nu16081227
18. Larsen, R. J., Diener, E., Emmons, R. A. (1985). An evaluation of Subjective wellbeing measures*, Social Indicators Research, 17 (1)*, 1–17.
19. Liu, Y., Ke, Y., Liang, Y., Zhu, Z., Cao, Z., & Zhuang, J. (2023). Results from the China 2022 report card on physical activity for children and adolescents. *Journal of exercise science and fitness, 21*(1),1–5. https://doi.org/10.1016/j.jesf.2022.10.004
20. Marsh, H. W., Martin, A. J., & Jackson, S. (2010). Introducing a short version of the physical self description questionnaire: new strategies, short-form evaluative criteria, and applications of factor analyses. *Journal of Sport and Exercise Psychology, 32*(4), 438–482. https://doi.org/10.1123/jsep.32.4.438
21. Moreno-Díaz, M. I., Vaquero-Solís, M., Tapia-Serrano, M. A., & Sánchez-Miguel, P. A. (2024). Physical Activity, Body Composition, Physical Fitness, and Body Dissatisfaction in Physical Education of Extremadura Adolescents: An Exploratory Study. *Children, 11*(1), 83–92. https://doi.org/10.3390/children11010083
22. Parsakia, K., Knechtle, B., & Irandoust, K. (2024). Strength-Based Therapy: Empowering Athletes' Self-Efficacy and Life Satisfaction. *Health Nexus*, *2*(2), 1–7. https://doi.org/10.61838/kman.hn.2.2.1
23. Predoiu, A., Stănescu, I.,Matei, C. B., Mincu, C. L., Cosma, G., ... & Predoiu, R. (2024). Quality of life in young romanian athletes. *Physical Education, Sport and Kinetotherapy Journal, 63*(1), 27–43.
24. Przybylska, D. B., Futuch, M., & Kowalewska, A. (2024). Why Should Diabetic Women Be Active?—The Role of Personality, Self-Esteem, Body-Esteem, and Imagery. *Healthcare* 2024, *12*(8), 857; https://doi.org/10.3390/healthcare12080857
25. Rojas-Padilla, I. C., Portela-Pino, L., Martínez-Patiño, M. J. (2024). The Risk of Eating Disorders in Adolescent Athletes: How We Might Address This Phenomenon? *Sports*, *12*(3), 66–77. https://doi.org/10.3390/sports12030077

26. Senaviratna, N. A. M. R., & Cooray, T. M. J. A. (2019). Diagnosing multicollinearity of logistic regression model. *Asian Journal of Probability and Statistics, 5*(2), 1–9. https://doi.org/10.9734/ajpas/2019/v5i230132
27. Subbarayalu, A. V., Chinnusamy, S., Purushothaman, V. K., Chittode Krishnasamy, K., Krishnan Vasanthi, R., Karuppaiyan, R. K., Mani, P., Prabaharan, S., Ameer, A. M., & Udhaya Kumar, A. A. (2024). Lactate threshold training to improve long-distance running performance: A narrative review. *Montenegrin Journal of Sports Science and Medicine, 20*(1), 19–29. https://doi.org/10.26773/mjssm.240303
28. Tabachnick, B. G. & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Pearson.
29. Ware, J. E., Kosinski, M., & Gandek, B. (2000). SF-36Ò *Health Survey: Manual and Interpretation Guide.* Lincoln, RI: QualityMetric Incorporatd
30. Weiner, J. & Lourie, J. (1969). Human Biology, A Guide to Field Methods. *International Biological Program* , Oxfordand Edinburgh: Blackwell Scienti fic Publications.
31. World Health Organisation –WHO. (2021). *Call for Experts: WHO Guideline Development Group on Treatment of Children and Adolescents with Obesity.* Geneva, Switzerland: World Health Organisation.
32. Yang, M., Wu, J., Yigang Wu, Y., & Xinxing Li, H. (2024). How Does Physical Activity Enhance the Subjective Well-Being of University Students? A Chain Mediation of Cognitive Reappraisal and Resilience. *Behav. Sci.*, *14*(3), 164–173. https://doi.org/10.3390/bs14030164
33. Zhai, F., & Qiulin Wang, Q. (2024). The Impact of Coping Styles on the Mental Health of Outstanding Physical Education Students in Shanghai During the Normalization Epidemic: The Chain Mediation Role of Meaning in Life and Prosocial Behavior. *Psychology Research and Behavior Management, 17,* 1935–1945.