

Multifactorial introspective analysis of the individual impact at the end of an athlete's performance sports career

Analiza introspectivă multifactorială a impactului individual la încheierea carierei sportive de performanță

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Abstract

Background. Retirement from sport is a difficult stage in the life of each athlete, representing the renunciation of a major self-defining activity. The need to adapt to a new lifestyle and the implementation of a gradual disengagement program is well known, having a major influence on both the psyche and the body. However, in many cases, sports clubs do not provide moral support to athletes at the end of their career.

Aims. The aim of this study is a multifactorial analysis of the individual impact at the end of a sports performance career. The main hypothesis from which we started in this research is to verify and validate statistically whether career termination adversely affects the former high performance athlete from a triple perspective: morphological, physiological, and psychobehavioral.

Methods. The research was conducted over a five-week period (9 July - 13 August 2018) on a total of 30 former high performance athletes. In the research we used a questionnaire that looked not only at aspects regarding current health status and morphofunctional changes, but also opinions about the impact of high performance sports activity on several aspects of one's personal life (lifestyle, diet, smoking, alcohol consumption, psychobehavioral balance, etc.).

Results. From the comparative analysis of the statistical significance of the differences between the means of positive and negative effects on the subjects and the calculation of the "t" test, it results that at a probability threshold of $P < 0.05$, the difference of the means of the two data strings is insignificant statistically, the calculated value of "t" being $t = 1.227$ and $R^2 = 0.05471$.

Conclusions. The overall conclusion, after analyzing and interpreting the data, invalidates our hypothesis that the end of a high performance sports career has a multifactorial negative impact on former athletes. Although we have seen a number of adverse effects following withdrawal from competitive sport, they are not influences with individual disturbing effects. On a number of issues, we found that sports performance has positive effects even after retirement.

Key words: sudden disengagement, progressive disengagement, sports performance, retirement from sport

Rezumat

Premize. Retragerea este o etapă dificilă în viața fiecărui sportiv, aceasta reprezentând renunțarea la o activitate majoră auto-definitorie. Necesitatea adaptării la noul stil de viață și implementarea unui program de dezantrenare treptată este bine cunoscută, având influență majoră atât asupra psihicului, cât și asupra fizicului. Cu toate acestea, deseori, cluburile sportive nu acordă suport moral sportivilor în momentul încheierii carierei de performanță.

Obiective. Acest studiu urmărește analiza multifactorială a impactului individual la încheierea carierei sportive de performanță. Ipoteza principală de la care am plecat în realizarea acestei cercetări este aceea potrivit căreia să verificăm și să validăm statistic dacă încheierea carierei afectează negativ fostul sportiv de performanță, din triplă perspectivă: morfologică, fiziologică și psiho-comportamentală.

Metode. Cercetarea a fost realizată pe o perioadă de cinci săptămâni (9 iulie - 13 august 2018), pe un lot total de 30 de foști sportivi de performanță. În cercetare am utilizat un chestionar care a vizat aspecte privind situația actuală a sănătății și a modificărilor morfo-funcționale survenite, dar și opinii privind impactul activității sportive de performanță asupra unor multiple aspecte ale vieții personale (stil de viață, alimentație, fumat, consum de alcool, echilibrul psiho-comportamental ș.a.).

Rezultate. Din analiza comparativă a semnificației statistice a diferențelor înregistrate între mediile efectelor pozitive și ale

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celor negative asupra subiecților și calcularea testului „t” rezultă că la un prag de probabilitate de $P < 0.05$, diferența mediilor celor două șiruri de date este nesemnificativă din punct de vedere statistic, valoarea calculată a lui „t” fiind de $t = 1,227$ și a lui R^2 de 0,05471.

Concluzii. Concluzia generală, după analiza și interpretarea datelor, infirmă ipoteza emisă de noi, conform căreia încheierea activității sportive de performanță are un impact multifactorial negativ asupra foștilor sportivi. Deși am constatat o serie de efecte negative consecutive retragerii, ele nu sunt de natura unor influențe cu efecte perturbatorii individuale. La o serie de aspecte, am constatat că activitatea sportivă de performanță a avut efecte pozitive sustenabile și după retragere.

Cuvinte cheie: dezanrenare bruscă, dezanrenare treptată, performanță sportivă, retragere.

Introduction

High performance athletes train intensely for years, making huge personal sacrifices to fulfill their dreams. Regardless of the season or their mood, athletes attend practice, maintaining a lifestyle based on rigor and discipline. Given that high performance involves strong will and full commitment, this has the potential to form characters.

Retirement from sport is a difficult stage in the life of each athlete, representing the renunciation of a major self-defining activity (Lavalley & Robinson, 2007; Lotysz & Short, 2004; McGillivray et al., 2005). The reasons for choosing to end a sports career are multiple. A study conducted on 19 elite athletes in Finland evidences the aspects leading to sports career termination, mentioning that these are different depending on sex (Ronkainen et al., 2016). Thus, female athletes reported having various difficulties in the last year of their career, such as health problems, feeling lonely, social pressure and lack of support from the family, while a lower proportion of male athletes felt social pressure and even reported that friendship with the team members was a major reason to delay withdrawal from sport. Furthermore, Wylleman et al. (2004) showed that following retirement, athletes may experience depression, identity crises, alcohol or drug abuse, as well as a reduction of self-confidence and an increase in the amount of foods consumed. Although athletes make a living by practicing sport in various clubs for long time periods, the lack of financial satisfaction is a frequent reason for career termination. In Romania, life annuities have been introduced for the benefit of former champions, winners of medals in European and World Championships or in Olympic Games. However, a large proportion of athletes do not reach such performances and, in the absence of training in a particular field, end up as unqualified workers. Most frequently, education is neglected during high performance sports practice, from lack of awareness that any sports career will inevitably end (Cosh & Tully, 2014). A study conducted on 17 elite athletes evidences the need to implement career assistance programs encouraging athletes to focus their attention on personal success, in addition to sport glory (Ryan, 2015). Thus, the intervention of a psychologist is essential for guiding athletes towards a direction that best suits their abilities and wishes, as a starting point at the end of the sports career (Lopez de Subijana et al., 2015). Over time, four main areas have been identified in which former athletes most frequently work after ending their career: coaching, media, business, and community initiatives.

The individual impact of sports career termination is stronger when retirement is sudden. The need for adaptation to a new lifestyle and implementation of a

gradual disengagement program is well known, having a major influence on both the psyche and the body (Agnew, 2015). Research in this area evidences a significantly higher incidence of gonarthrosis and coxarthrosis in former athletes compared to the population who did not practice high performance sport (Turner et al., 2000; Drawer & Fuller, 2001; Conaghan, 2002). These diseases can be associated with a high body mass index (Arliani et al., 2014).

We consider that maintaining a stable body weight is indicative of a rational quality diet. While during the competition period, intense training requires adequate energy support and effective energy dosing, after sports career termination, these aspects are no longer given the same attention. Athletes' awareness of correct eating strategies and of the impact of physical activity is due to the intervention of a multidisciplinary team, including a nutritionist, a coach, a physical trainer and a psychologist. Thus, a series of factors favor weight gain at the end of a sports performance career (Neagu & Gliga, 2017). The most common factor is maintaining the same eating habits, despite a significant decrease in the intensity and frequency of training or even its absence.

A large proportion of former elite athletes declare performing no physical activity after having withdrawn from competitive sport. Accepting the fact that any sports career comes to an end is not an easy task; the transition to a “normal” life is often brutal and requires a long period of adaptation and support from the family, as well as from specialized persons (Roberts et al., 2015; Stronach et al., 2014). Giving up a sports performance career is both a challenge and a relief (Jones & Denison, 2017). This also represents a shift towards independent management of everyday life (Schwenk, 2007). The lifestyle changes and the loss of personal identity that accompany sports career termination pose a high risk of depression (Cosh et al., 2012; Weigand et al., 2013; Sanders & Stevinson, 2017).

A study conducted on 62 former elite athletes, regarding quality of life at the end of their sports careers, reveals the fact that athletes who voluntarily retired from sport believe that their life changed for the better (Martin et al., 2014; Alfermann et al., 2004; Taylor & Ogilvie, 2001). Also, experience (positive or negative) during high performance sports practice is essential to explain transition following retirement and adaptation to the post-sport career (Tshube & Feltz, 2015).

Most often, sports clubs do not provide moral support to athletes at the end of their career (Surujlal & Zyl, 2014). We consider that implementing psychological counseling programs and increasing awareness about the positive effects of progressive disengagement programs might play an extremely important role (Padrao dos Santos, 2016; Surujlal, 2016). Also, sports clubs might assist

former athletes by organizing various physical activities, workshops or competitions for sports veterans.

Despite evidence of adaptation difficulties experienced by former athletes, the multiple factors that have a major impact are studied to a limited extent (Giannone et al., 2017; Knights et al., 2016).

Certainly, not all former athletes are facing these difficulties (Lagimodiere & Strachan, 2015). In this regard, we wish to emphasize the following aspect: "Sport can help us to become wiser, to learn how to lose or win, and especially, to always find the strength to start over again" (Cara, 2015).

Hypothesis

The aim of this study is a multifactorial analysis of the individual impact at the end of a sports performance career. The main hypothesis from which we started in this research is that career termination adversely affects former high performance athletes. The transition towards a "normal" life is often brutal, and requires a long period of adaptation and support from both the family and specialized persons.

This research aims to draw attention to the psychological impact of this major change in the life of former high performance athletes and to the importance of implementing a well-designed awareness program.

Material and methods

Research protocol

a) Period and place of the research

This study was conducted over a five-week period (9 July - 13 August 2018), using an online questionnaire applied to a total number of 30 former high performance athletes.

b) Subjects and groups

Regarding the dependent variable, we mention that all the 30 subjects included in the study were informed about the aim of the research and gave their consent for the use of their personal data, while remaining anonymous. Data related to age, gender, the sport practiced, and membership of representative Romanian teams were recorded (Table I). Also, the best results obtained in different National, Balkan, European, World Cups and Championships and in the Olympic Games are presented in Table II.

In addition, the reason for sports career termination and the length of the sports career were also taken into consideration (Table III).

c) Tests applied

Data regarding the individual impact at the end of the high performance sports career were recorded using an online questionnaire entitled "Life after sport", which was developed and structured in two parts. The first part includes 21 items related to current health status, continuation of maintenance exercise and morphofunctional changes, while the second part comprises individual opinions based on 14 items related to the impact of high performance sports activity on multiple aspects of personal life (lifestyle, diet, smoking, alcohol consumption, psychobehavioral balance,

Table I

Distribution of subjects depending on age, sex, the sport practiced, and membership of representative Romanian teams

Subjects				Distribution by sport						Members of representative Romanian teams			
Age (years)		Sex		Basketball	Volleyball	Rowing	Football	Handball	Swimming	Body building	Olympic team	National team	Extended National team
Intervals	n	Women	Men										
20-29	5	0	5	0	5	0	0	0	0	0	0	4	1
30-39	8	0	8	2	4	0	1	0	1	0	1	3	4
40-49	8	5	3	0	1	5	0	0	1	1	0	7	1
50-59	9	7	2	0	1	7	0	1	0	0	1	8	0
Total	30	12	18	2	11	12	1	1	2	1	2	22	6
%	100%	40%	60%	6.67%	36.67%	40.00%	3.33%	3.33%	6.67%	3.33%	6.67%	73.33%	20.00%

Table II

Distribution of subjects depending on the best personal results obtained in various competitions

Current age (years)	Ranking													
	National Championships		Balkan Championships		European Championships		World Championships		Olympic Games		Romanian Cup		European Cups	
	I-III	IV-VIII	I-III	IV-VIII	I-III	IV-VIII	I-III	IV-VIII	I-III	IV-VIII	I-III	IV-VIII	I-III	IV-VIII
20-29	5	0	2	0	0	0	0	0	0	0	0	0	0	0
30-39	4	0	1	0	1	1	1	0	0	1	2	0	1	0
40-49	6	0	2	0	0	1	2	0	0	0	1	0	0	0
50-59	5	0	0	0	0	0	5	0	1	0	2	0	0	0
Total	20	0	5	0	1	2	8	0	1	1	5	0	1	0
%	66.67%	0.00%	16.67%	0.00%	3.33%	6.67%	26.67%	0.00%	3.33%	3.33%	16.67%	0.00%	3.33%	0.00%

Table III

Distribution of subjects depending on the reason of retirement from high performance sports activity

Current age (years)	Mean length of the sports career (years)	Reason of withdrawal						Sports age limit	Professional career
		Injury	Club conflict	Financial	Starting a family	Disease			
20-29	13.40	1	0	2	0	0	0	2	
30-39	18.63	2	0	2	0	1	1	2	
40-49	12.25	2	2	0	0	3	0	1	
50-59	11.56	1	2	0	3	1	2	0	
Total	13.96	6	4	4	3	5	3	5	
%		20.00%	13.33%	13.33%	10.00%	16.67%	10.00%	16.67%	

family life), the subjects' responses being grouped into two categories: disagreement and agreement. After collection of the questionnaires, each item was assigned a positive or negative effect on quality of life; thus, the subjects' responses were treated taking into consideration this aspect.

d) Statistical processing

Data were processed using the *GraphPad Prism 7* software, analyzing values such as the "t" test, differences between the means, R², 95% confidence intervals, etc. The graphic method was also used.

Results

The concept of progressive disengagement is known by 66.67% of the subjects included in this study (Fig. 2). However, 63.33% declare that they interrupted sports activity suddenly, while only 36.67% went through gradual disengagement (Fig. 1). Maintenance exercise is continued with a frequency of 2-3 days per week by 46.67% of the subjects, while 36.67% of these report performing no physical activity after having ended their high performance sports career. Also, the frequency of these maintenance physical activities decreases with age; 66.67% of subjects aged 50-59 years perform no physical exercise (Fig. 3).

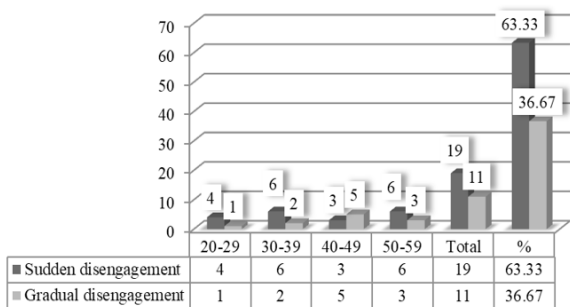


Fig. 1 – Gradation of disengagement

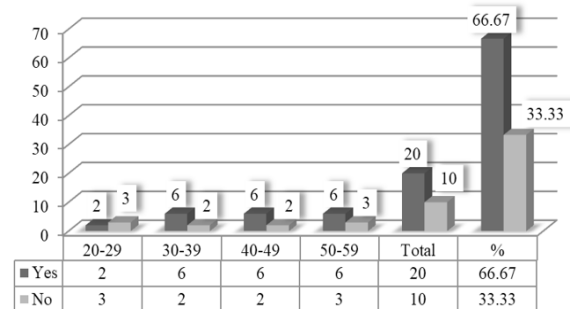


Fig. 2 – Knowledge of the concept of gradual disengagement

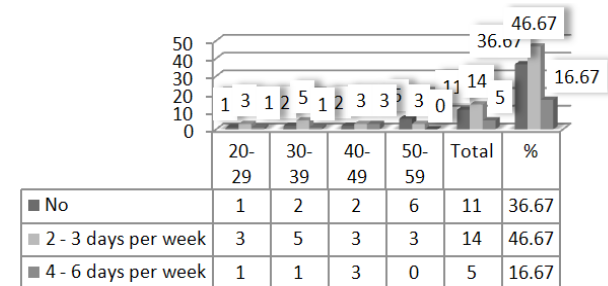


Fig. 3 – Continuing physical activity after retirement

Eighty percent of the subjects included in this study believe that sport had a positive influence on their health, while 13.33% consider that it had a negative influence (Fig. 4). Among the medical conditions found in 23.33% of former high performance athletes after their withdrawal from sport, we mention hypothyroidism, peripheral circulatory insufficiency, fibromyalgia, gonarthrosis, coxarthrosis, uric arthritis and ankylosing spondylitis (Fig. 5).

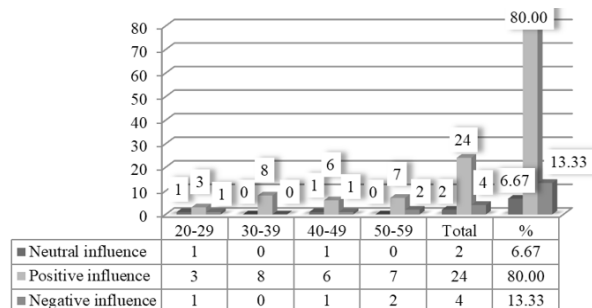


Fig. 4 – The influence of sport on health after retirement

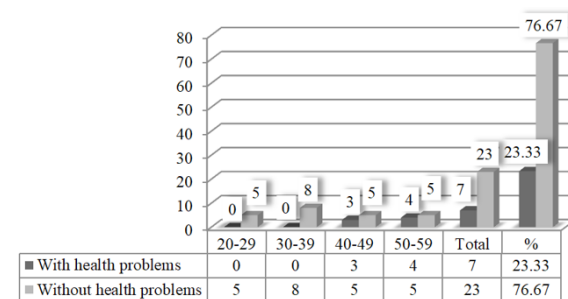


Fig. 5 – Emergence of health problems after retirement

Data related to height, current weight and weight during high performance sports practice were recorded and converted to body mass index. Without exception, for all age categories, the body mass index during high performance sports practice ranged within the *minimum health risk* category (BMI = 18.5-24.9), while the current body mass index ranged within the *moderate health risk* category (BMI = 25-29.9) (Fig. 6).

Regarding the difference between BMI values during the sports performance career and current BMI values, the smallest difference was found in subjects aged 20-29 years ($\Delta_{BMI} = 1.55$), while the greatest difference was found, somewhat unexpectedly, in the 40-49 age group ($\Delta_{BMI} = 6.27$). It would have been expected to find the greatest difference in the 50-59 age group. The mean difference for the entire group of subjects was $\Delta_{BMI} = 3.29$.

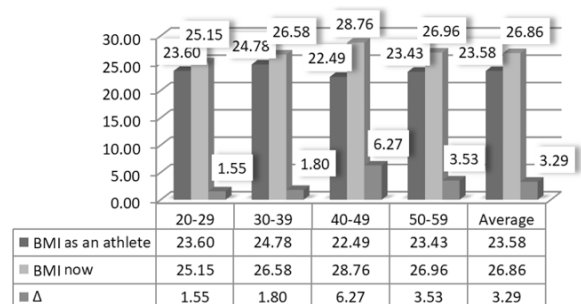


Fig. 6 – The variation of BMI after retirement from sport

Concerning the influence of sport on the quality of professional life, 76.67% of the subjects included in this study consider that their current professional career was positively influenced by their sports career; 3.33% report a negative influence, and 20.00% believe that sports practice had no influence on their current professional life (Fig. 7). In addition, the current profession has nothing to do with sports activity in 56.57% of cases, including subjects with occupations such as cook, carpenter, nurse, lawyer, art restorer, policeman, etc. On the other hand, 43.33% of the subjects work as coaches, referees, physical education and sport teachers, kinesiotherapists, and fitness and body building trainers (Fig. 8).

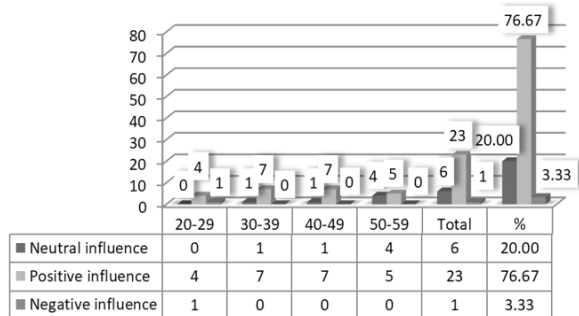


Fig. 7 – Influence on professional life

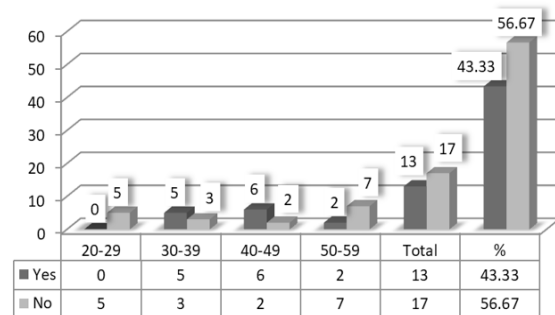


Fig. 8 – Professional activity is due to sports careers

The answers given by the interviewed subjects to the 14 questions related to the impact of high performance sports activity on multiple aspects of their personal life (lifestyle, diet, smoking, alcohol consumption, psychobehavioral balance, family life) were grouped into two categories: disagreement and agreement. Also, depending on the influence exerted on the subjects, their responses were grouped into positive and negative effects.

The distribution of answers to the questions assessing the positive and negative effects on quality of life after withdrawal from sports activity is shown in Table IV.

The comparative analysis, statistically processed using the *GraphPad Prism 7* software, of the statistical significance of differences between the means of *positive and negative effects* on the subjects, for the 14 questions-statements evaluating the effects of withdrawal from competitive sport on quality of life, and the calculation of the “t” test show that at a probability threshold of $P < 0.05$, the difference of the means of the two data strings is statistically *insignificant*, the calculated value of “t” being $t = 1.227$ and $R^2 = 0.05471$, with a 95% confidence interval ranging between -9.174 and 2.316 (Table V).

Table V

Statistical indicators of the significance of the difference between the means of positive effects compared to negative effects.

Statistical indicators	Values
P value	0.2309
Significantly different?	No
t, df	$t=1.227$ $df=26$
Mean ± SEM of column A	16.71 ± 1.976 , $n=14$
Mean ± SEM of column B	13.29 ± 1.976 , $n=14$
Difference between means	-3.429 ± 2.795
95% confidence interval	-9.174 to 2.316
R squared	0.05471

The central trendline and the graphic representation of the distribution of answers given by the subjects to the 14 items related to the effects of retirement from sport on quality of life are as follows (Fig. 9).

Table IV

Distribution of answers given by the subjects (n=30) and effects of retirement from sport on quality of life

n	Statements	Categories of answers		Effects		Δ ($E_+ - E_-$)		
		Disagreement n	Agreement n	Positive (+) n %	Negative (-) n %			
1	My life changed for the better	8	22	22	73.33	8	26.67	14
2	I cut down the amount of foods consumed	17	13	13	43.33	17	56.67	-4
3	I was supported by my family and friends	8	22	22	73.33	8	26.67	14
4	I received psychological counseling	27	3	3	10.00	27	90.00	-24
5	I received nutritional counseling	23	7	7	23.33	23	76.67	-16
6	I was explained the importance of continuing maintenance exercise	16	14	14	46.67	16	53.33	-2
7	The technical staff followed up my mental and physical state	25	5	5	16.67	25	83.33	-20
8	I tried to follow weight loss diets	14	16	16	53.33	14	46.67	2
9	I had difficulties in adapting to the new lifestyle	19	11	19	63.33	11	36.67	8
10	I experienced depression and sadness	24	6	6	20.00	24	80.00	18
11	I maintained the same eating habits (qualitatively)	12	18	18	60.00	12	40.00	6
12	I sometimes ate because I was upset	23	7	7	23.33	23	76.67	16
13	I started smoking	22	8	8	26.67	22	73.33	14
14	I started drinking alcohol	26	4	4	13.33	26	86.67	22
	Total	264	156	234	55.71	186	44.29	-
	Mean	18.85	11.15	16.71	-	13.29	-	-

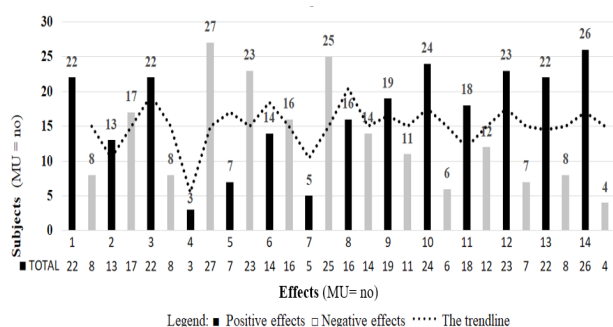


Fig. 9 – Positive and negative effects of retirement from sport on the subjects

Discussions

By interpreting the results obtained, it can be observed that some important aspects of the transition towards a different lifestyle from that of the high-performance sports practice period, such as knowledge of the progressive disengagement concept, its application and the continuation of maintenance exercise, are neglected. Also, aspects such as experiencing various health problems, the influence of the sports career on the current professional career and the impact of withdrawal from competitive sport on the body mass index were interpreted as follows:

- The absence of progressive disengagement programs developed for former athletes is confirmed by 63.33% of the subjects who recognize that they went through sudden disengagement, even if 66.67% of the subjects are familiar with the concept and the advantages of progressive disengagement;

- The frequency of maintenance physical activities decreases with age; 66.67% of subjects aged between 50 and 59 years and 20% of subjects aged between 20 and 29 years are completely sedentary;

- The influence of high performance sport on health, following retirement from sport, is perceived as positive by 80% of the inquired subjects and as negative by 13.33% of these;

- After withdrawal from high performance sports activity, 23.33% of the subjects developed various medical conditions, while 76.67% of the subjects report not suffering from any disease;

- Without exception, the body mass index during high performance sports practice ranges within the *minimum health risk* category (BMI = 18.5-24.9), while the current body mass index ranges within the *moderate health risk* category (BMI = 25-29.9);

- Regarding the influence of sport on the quality of professional life, 76.67% of the subjects included in this study consider that their current professional career was positively influenced by their sports career, 43.33% of the subjects working as coaches, referees, physical education and sport teachers, etc.

The comparative analysis of the differences between the means of *positive and negative effects* on the subjects, for the 14 items evaluating the effects of retirement from sport on quality of life shows that at a probability threshold of $P < 0.05$, a statistically *insignificant* difference can be observed, the calculated value of “*t*” being $t = 1.227$ and

$R^2 = 0.05471$, with a 95% confidence interval ranging between -9.174 and 2.316 .

Although the difference is statistically insignificant, an increased distribution of subjects who experienced negative effects on quality of life can be seen:

- Even though the psychological impact of sports career termination is a major one, 90% of the subjects received no counseling in this regard;

- Also, 76.67% of the subjects did not benefit from nutritional counseling;

- The members of the technical staff followed up the mental and physical state of former athletes in only 16.67% of the cases.

Good results were obtained for the positive effects on quality of life:

- A proportion of 73.33% of the subjects consider that after they ended their sports career, their life changed for the better;

- Regarding alcohol consumption, 86.67% of the subjects did not start drinking alcohol, while 73.33% of the subjects did not start smoking at the end of their sports career;

- Also, eating when feeling sad is found in a small proportion, only 23.33% of the subjects.

Conclusions

1. Sports career termination has a multifactorial negative impact on former athletes. This conclusion was validated by statistical analysis.

2. Although a number of negative effects of retirement from sport were observed, these were not influences with individual disturbing effects.

3. High performance sports activity had sustainable positive effects even after retirement, the majority of the subjects considering that after ending their sports career, their life changed for the better.

4. No morphofunctional alterations affecting the health index of former athletes were found.

5. None of the investigated subjects had any psychobehavioral disorders from both an affective-emotional and socio-professional perspective.

Conflicts of interest

No conflict to declare.

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