



STUDIA UNIVERSITATIS  
BABEŞ-BOLYAI



# EDUCATIO ARTIS GYMNASTICAE

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# **S T U D I A**

## **UNIVERSITATIS BABEȘ-BOLYAI**

### **EDUCATIO ARTIS GYMNASTICAE**

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## STRUCTURE OF COORDINATION CAPACITIES AND PREDICTION OF COORDINATION PERFORMANCE IN SPORT GAMES

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**ABSTRACT.** In ontogenesis, sport games lay specific requirements on the level of coordination capacities. Development of coordination capacities differs from the one of conditional capacities, while individual peculiarities of sportsmen should not be omitted. An important role is played by the hierarchy of coordination prerequisites in the structure of sport performance. This is the reason why we intended to mention several remarks concerning the issues of the structure of coordination capacities and possibilities of prediction of coordination performance in selected sports in 11-19-year-old girls and boys. Thus we can contribute to the issues of sport talents identification as well as to the reduction of specific tests of coordination capacities.

**Keywords:** football, basketball, volleyball, handball, ice-hockey, coordination, structure, performance, prediction, girls, boys.

### INTRODUCTION

Increasing both performance in sport games and competitiveness in sport competitions presses sport coaches to pay attention to the selection of young talented sportsmen into the sport classes. The issues of sport preparation and selection of talented sportsmen are well elaborated in the literature. In spite of that, selection of talents is carried out mainly on the basis of experience of coaches and their intuition. Majority of authors agree that there is a lack of complexity in the selection of talents, which should take account of variety of aspects, such as motor, physiological, morphological, psychological and pedagogical ones.

Searching for a sport talent is a problem of diagnostics of prerequisites for the given sport activity. Specification of procedures and criteria is inevitable for unveiling the inborn prerequisites of a potential talent. In talent search it is necessary to comprehensively take into account data on health state, functional and motor prerequisites, psychic immunity, personal characteristics and other factors. Talent selection can be divided into two mutually affecting and consequential

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phases: revealing sport talents and prediction of their sport performance (Hofmann – Schneider, 1985). For these purposes model load tests are frequently used and prerequisites are evaluated according to actual motor performance of individuals in tests (Blahuš, 2004). Speed and strength capacities along with movement acceleration could be considered as two decisive conditional capacities. Technical prerequisites, as another decisive group of dispositions of an individual, are difficult to assess and they are mostly assessed using professional assessment. Tactical prerequisites are almost inapprehensible using quantitative methods and that is why they are evaluated using qualitative methods, such as assessment scales. Coordination prerequisites are missing. Test batteries, which are used for talents selection for sport preparation in the age of 10-11, detect the level of conditional motor capacities, but almost completely neglect coordination capacities of children.

Attempts to specify hierarchy and changing share of individual capacities in various sports were recorded, while some more specific capacities in relation to different kinds of sports were picked. In spite of complexity of coordination capacities, they seem to be relatively independent prerequisites of performance control of motor activity, while the dominant role is played by heredity (Bouchard a kol. 1997). In children and youth the following relatively independent coordination capacities were derived: reaction speed, balance, spatial orientation, kinesthetic-differentiation, rhythmic capacities, and others.

The practice shows us that the level of sport performance is limited by a series of factors, of which the most important are somatic, functional and motor prerequisites (conditional and coordination), trainability of a sportsman, tempo of growth of technical and tactical forwardness, motivation and psychic stability (Lednický - Doležalová, 2002). It is necessary to remind that the „weight“ of prerequisites, which determine sport talent, is not constant, it varies significantly as to age and level of obtained trainability (Ljach, 1985). In the course of ontogenesis individual sports lay specific demands on the level of coordination capacities. Development of coordination capacities differs from the one of conditional capacities, while individual peculiarities of sportsmen should be taken into account. An important role is played by the hierarchy of coordination prerequisites in the structure of sport performance (Moravec, 2007).

Reversible - entropic - reduction processes of factors of the structure of sport performance in sport games are in mutual relationship with the ontogenesis of development and actual sport performance of players. Structure of coordination capacities in sport games draws from the knowledge of the sport performance itself. The most dramatic period, from the point of view of determining the hierarchy of individual capacities, is the period of puberty, in consequence of which we predict differences in the structure of coordination capacities depending on age, sex and sport specialization.

## OBJECTIVE

The aim of the contribution is to present issues of the structure of coordination capacities and outline possibilities of prediction of overall coordination performance in football, basketball, volleyball, handball and ice-hockey in 11-19-year-old boys and girls.

## METHODS

A randomly selected group of boys and girls attending sport classes in the Slovak Republic specializing in football, basketball, volleyball, handball and ice-hockey served as experimental groups of sportsmen (table 1).

**Table 1.**

**Count of girls and boys in sports games**

			Age/count of sportsmen								
	Sex	Count	11	12	13	14	15	16	17	18	19
Football	Male	(n=559)	70	96	54	65	64	46	68	59	37
Basketball	Female	(n=252)	50	51	50	50	51				
	Male	(n=253)	50	52	51	50	50				
Volleyball	Female	(n=256)	50	50	53	53	50				
Handball	Female	(n=253)	51	51	50	50	51				
Ice-hockey	Male	(n=283)	63	57	56	57	50				

Coordination performance was observed using 7 motor criteria by Hirtz (1985): T1 – Bench walking with 3 turns (dynamic balance), T2 – Stopping a rolling ball (complex motor reaction capacity), T3 – Maintaining motor rhythm (rhythmic capacity), T4 – Shuttle run (spatial orientation), T5 – Precision standing broad jump (kinesthetic-differentiation of legs), T6 – Precision throw (kinesthetic-differentiation of arms), T7 – Time estimation - 5s (temporal parameters estimation).

Individual performances in coordination tests were transformed into points based on the 5-grade coordination standard for football according to Šimonek a kol. (2008) and figured up in one test value, which presents an overall level of coordination performance (predictant „Y“).

Dependence and share of individual coordination criteria to the overall coordination performance were disclosed using the technique of multiple correlation and regression analysis. Selection of three most valid coordination (predictors „ $X_{(T1-T7)}$ “) criteria into prediction equations of coordination performance were realized using forward stepwise regression.

The structure of coordination performance for individual age categories is presented by means of a percentage pie chart. Prediction equations include calculated

coefficients of partial regression ( $b_{0.3}$ ), standard error of regression (SEy) and determinant of multiple correlation ( $R^2$ ). When interpreting the results of measurements and forming conclusions logical methods were used. Numeral processing of data was evaluated by statistic programmes Microsoft Excel and SPSS 13.0.

The problem was solved within the framework of the research project KEGA 3/3022/05: Standards of coordination capacities for talented sportsmen under the coordination of professor Jaromír Šimonek.

## RESULTS AND DISCUSSION


### Structure of coordination capacities

We set up the structure of coordination capacities in individual sport games based on seven coordination criteria using multiple correlation and regression analysis (table 2). The share of individual coordination capacities on the coordination performance in sport specializations appears differentially from the point of view of individual age categories as well as sex. In collective sports among the three most valid capacities were most frequently found rhythmic capacity, spatial orientation and temporal parameters estimation.

Table 2.

Share of coordination abilities in 11- to 19-year-old girls and boys  
in selected sports games [%]

		Age									
		KS	11	12	13	14	15	16	17	18	19
Soccer boys	T1	10,89	20,26 <sup>1</sup>	16,29	17,94 <sup>1</sup>	10,03	21,39 <sup>2</sup>	14,32	10,97	31,24 <sup>1</sup>	
	T2	2,12	5,32	11,27	16,31	10,67 <sup>3</sup>	11,24	12,36	7,51	14,15 <sup>2</sup>	
	T3	18,15 <sup>2</sup>	13,22 <sup>3</sup>	10,10	11,16	17,36	15,48 <sup>3</sup>	9,49	30,71 <sup>1</sup>	10,27	
	T4	17,95 <sup>1</sup>	19,56	16,59 <sup>2</sup>	11,92	18,59 <sup>2</sup>	14,21	21,29 <sup>1</sup>	13,64 <sup>3</sup>	2,54	
	T5	13,83	13,51	14,32	3,45	17,43 <sup>1</sup>	20,21 <sup>1</sup>	6,51	13,18	6,34	
	T6	18,54	14,04 <sup>2</sup>	17,78 <sup>1</sup>	18,94 <sup>2</sup>	14,03	11,07	17,61 <sup>3</sup>	9,65	18,81	
	T7	18,52 <sup>3</sup>	14,09	13,64 <sup>3</sup>	20,29 <sup>3</sup>	11,89	6,40	18,42 <sup>2</sup>	14,34 <sup>2</sup>	16,65 <sup>3</sup>	
Basketball girls	T1	22,29 <sup>1</sup>	12,86	10,89	4,94 <sup>3</sup>	19,57	<b>Legend:</b> <b>KS</b> – coordination capacities, <b>T1</b> – dynamic balance, <b>T2</b> - motor reaction speed, <b>T3</b> – rhythmic capacity, <b>T4</b> – spatial orientation, <b>T5</b> - kinesthetic-differentiation capacity of legs, <b>T6</b> - kinesthetic-differentiation capacity of arms, <b>T7</b> – temporal parameters estimation				
	T2	12,95	16,93	18,35	7,71	11,37 <sup>3</sup>					
	T3	16,16 <sup>2</sup>	12,09	12,53 <sup>2</sup>	0,48	1,25					
	T4	9,35	18,29 <sup>2</sup>	24,75 <sup>1</sup>	18,88 <sup>2</sup>	12,39					
	T5	6,54 <sup>3</sup>	11,81 <sup>3</sup>	16,37	22,85	8,27					
	T6	10,94	7,77	6,03	10,22	17,71 <sup>2</sup>					
	T7	21,77	20,24 <sup>1</sup>	11,08 <sup>3</sup>	34,92 <sup>1</sup>	29,45 <sup>1</sup>					
Basketball boys	T1	7,43	29,06 <sup>1</sup>	20,10	7,42	11,98					
	T2	13,98	19,89	13,54	14,10	20,76 <sup>1</sup>					
	T3	16,62 <sup>3</sup>	6,28	10,93	20,18 <sup>2</sup>	15,49					
	T4	11,85	15,18 <sup>2</sup>	19,99 <sup>1</sup>	17,48 <sup>3</sup>	14,69 <sup>2</sup>					
	T5	19,02 <sup>2</sup>	5,20	21,28 <sup>2</sup>	27,83 <sup>1</sup>	13,68 <sup>3</sup>					
	T6	13,77	10,96 <sup>3</sup>	6,64	10,13	5,33					

Volleyball girls	T7	17,32 <sup>1</sup>	13,42	7,52 <sup>3</sup>	2,87	18,07	 <p>Three coordination capacities with the highest partial share in the structure of coordination abilities.</p> <p>x<sup>(1-3)</sup> - Three coordination capacities selected into the prediction equation with the specification of ranking.</p>
	T1	13,01	16,44 <sup>3</sup>	15,38	10,30	17,51 <sup>3</sup>	
	T2	13,74	14,10	7,16	8,63	8,79	
	T3	15,69 <sup>3</sup>	18,82 <sup>1</sup>	16,36 <sup>3</sup>	17,53 <sup>2</sup>	18,12 <sup>2</sup>	
	T4	21,41 <sup>1</sup>	17,79 <sup>2</sup>	17,19 <sup>2</sup>	22,51 <sup>1</sup>	10,85	
	T5	19,63 <sup>2</sup>	14,75	7,84	10,65	10,82	
	T6	10,98	2,30	9,92	16,18 <sup>3</sup>	13,04	
Handball girls	T7	5,54	15,80	26,15 <sup>1</sup>	14,20	20,87 <sup>1</sup>	
	T1	7,58	4,52	15,40 <sup>2</sup>	5,96	8,49	
	T2	14,76 <sup>3</sup>	18,02	16,27 <sup>1</sup>	7,88 <sup>2</sup>	8,87	
	T3	17,75 <sup>2</sup>	18,49 <sup>3</sup>	13,05 <sup>3</sup>	20,16	17,44 <sup>1</sup>	
	T4	6,24	4,04	13,17	11,39	18,63 <sup>2</sup>	
	T5	15,21	7,17 <sup>2</sup>	13,41	17,60 <sup>3</sup>	14,43	
	T6	26,39 <sup>1</sup>	17,42	16,78	11,20	12,42	
Ice-hockey boys	T7	12,07	30,34 <sup>1</sup>	11,91	25,80 <sup>1</sup>	19,72 <sup>3</sup>	
	T1	9,27 <sup>2</sup>	12,75	13,52	16,80 <sup>2</sup>	17,70 <sup>2</sup>	
	T2	11,10	8,21 <sup>3</sup>	22,59 <sup>2</sup>	4,62	15,78	
	T3	20,26 <sup>3</sup>	20,84	29,63 <sup>1</sup>	18,83	19,12 <sup>3</sup>	
	T4	15,42	21,93 <sup>2</sup>	6,49	23,38 <sup>1</sup>	18,09 <sup>1</sup>	
	T5	9,93	7,62	7,45	15,97	17,75	
	T6	9,79	4,48	2,36	7,39 <sup>3</sup>	4,41	
	T7	24,23 <sup>1</sup>	24,16 <sup>1</sup>	17,96 <sup>3</sup>	13,02	7,16	

- **In soccer players** of this age range the most significant coordination capacities are temporal parameters estimation, dynamic balance, spatial orientation and kinesthetic-differentiation capacity.
- **In female basketball players** the most significant are temporal parameters estimation and spatial orientation capacity.
- **In male basketball players** the following coordination capacities are the most important: spatial orientation and kinesthetic-differentiation capacity.
- **In female volleyball players** the most important coordination capacities seem to be maintenance of motor rhythm and spatial orientation capacity.
- **In female handball players** the most significant are rhythmic capacity and temporal parameters estimation.
- **In male hockey players** in the ontogenesis the following coordination capacities are the most significant: rhythmic capacity, spatial orientation and temporal parameters estimation.

### Prediction of coordination performance

Using forward stepwise regression we succeeded in determining the order of importance of individual predictors on the coordination performance and also specifying the most valid variables into regression equation for the prediction of coordination performance (table 3). After implementing the tests and calculating points based on the standards by Šimonek a kol. (2008) we can institute point values into regression equations for  $X_{(T1-T7)}$  and we thus obtain intraindividual



predicted overall coordination performance expressed in points. However, we have to take into account that prediction equation is the one for the prediction of performance, but not any guide for obtaining a good performance.

**Regression equation:**  $Y = b_0 + b_1 * X_{(T)} + b_2 * X_{(T)} + b_3 * X_{(T)}; SEy; R^2$ ;

**Legend for the equation and table 3:** **Y** = predicted coordination performance (points); **b<sub>0</sub>; b<sub>1</sub>; b<sub>2</sub>; b<sub>3</sub>** = regression coefficients according to table 2; **X<sub>(T1-T7)</sub>** = performance in selected coordination tests (points); **SEy** = regression equation error (points); **R<sup>2</sup>** = reliability of the regression equation (%);

**KV** = overall coordination performance (points)

**Table 3.**

**Regression equations for the prediction of coordination performance in 11- to 19-year-old girls and boys in selected sports games**

	Age	Forecast equation	CP
Soccer boys	11	$Y = 8,193 + 1,897 * X_{(T4)} + 1,063 * X_{(T3)} + 1,078 * X_{(T7)}; SEy: 2,078; R^2: 73,31$	20,33
	12	$Y = 7,992 + 1,937 * X_{(T1)} + 1,359 * X_{(T6)} + 0,938 * X_{(T3)}; SEy: 2,312; R^2: 70,73$	21,11
	13	$Y = 7,265 + 1,411 * X_{(T6)} + 1,922 * X_{(T4)} + 1,241 * X_{(T7)}; SEy: 2,329; R^2: 73,89$	20,72
	14	$Y = 9,882 + 1,527 * X_{(T1)} + 1,083 * X_{(T6)} + 1,110 * X_{(T7)}; SEy: 2,149; R^2: 70,44$	20,38
	15	$Y = 6,752 + 1,954 * X_{(T5)} + 1,471 * X_{(T4)} + 1,215 * X_{(T2)}; SEy: 2,194; R^2: 74,35$	19,94
	16	$Y = 10,687 + 1,366 * X_{(T5)} + 1,368 * X_{(T1)} + 0,858 * X_{(T3)}; SEy: 2,145; R^2: 70,14$	20,39
	17	$Y = 9,692 + 1,465 * X_{(T4)} + 1,128 * X_{(T7)} + 1,143 * X_{(T6)}; SEy: 2,024; R^2: 72,09$	20,06
	18	$Y = 11,973 + 1,21 * X_{(T3)} + 0,920 * X_{(T7)} + 0,775 * X_{(T4)}; SEy: 1,967; R^2: 60,93$	20,47
	19	$Y = 10,473 + 1,295 * X_{(T1)} + 1,219 * X_{(T2)} + 0,826 * X_{(T7)}; SEy: 1,505; R^2: 71,47$	20,32
Basketball girls	11	$Y = 7,778 + 0,719 * X_{(T1)} + 0,552 * X_{(T3)} + 0,258 * X_{(T5)}; SEy: 1,746; R^2: 76,16$	20,90
	12	$Y = 7,114 + 0,523 * X_{(T7)} + 0,419 * X_{(T4)} + 0,419 * X_{(T5)}; SEy: 2,175; R^2: 71,50$	20,61
	13	$Y = 8,107 + 0,669 * X_{(T4)} + 0,560 * X_{(T3)} + 0,382 * X_{(T7)}; SEy: 2,024; R^2: 76,97$	20,62
	14	$Y = 9,049 + 0,646 * X_{(T7)} + 0,561 * X_{(T4)} + 0,276 * X_{(T1)}; SEy: 1,100; R^2: 77,78$	18,22
	15	$Y = 8,121 + 0,613 * X_{(T7)} + 0,455 * X_{(T6)} + 0,365 * X_{(T2)}; SEy: 1,355; R^2: 74,57$	17,82
Basketball boys	11	$Y = 8,792 + 1,274 * X_{(T7)} + 1,356 * X_{(T5)} + 1,434 * X_{(T3)}; SEy: 1,865; R^2: 71,68$	19,98
	12	$Y = 8,995 + 1,684 * X_{(T1)} + 1,666 * X_{(T4)} + 0,930 * X_{(T6)}; SEy: 1,689; R^2: 84,43$	21,48
	13	$Y = 6,968 + 2,320 * X_{(T4)} + 1,274 * X_{(T5)} + 1,030 * X_{(T7)}; SEy: 2,085; R^2: 81,26$	19,43
	14	$Y = 11,498 + 0,997 * X_{(T5)} + 1,322 * X_{(T3)} + 0,944 * X_{(T4)}; SEy: 1,629; R^2: 70,90$	20,74
	15	$Y = 8,295 + 1,470 * X_{(T2)} + 1,471 * X_{(T4)} + 1,347 * X_{(T5)}; SEy: 2,109; R^2: 70,55$	21,10
Volleyball girls	11	$Y = 10,513 + 1,338 * X_{(T4)} + 1,167 * X_{(T5)} + 0,926 * X_{(T3)}; SEy: 2,211; R^2: 66,08$	20,16
	12	$Y = 9,388 + 1,435 * X_{(T4)} + 1,318 * X_{(T1)} + 1,021 * X_{(T3)}; SEy: 2,138; R^2: 66,39$	21,08
	13	$Y = 9,920 + 1,099 * X_{(T7)} + 1,635 * X_{(T4)} + 0,878 * X_{(T3)}; SEy: 2,106; R^2: 71,18$	20,04

	Age	Forecast equation	CP
	14	$Y = 9,581 + 1,704 * X_{(T4)} + 1,118 * X_{(T5)} + 1,085 * X_{(T6)}$ ; SEy: 2,367; $R^2$ : 67,83	20,11
	15	$Y = 9,435 + 1,359 * X_{(T1)} + 1,340 * X_{(T7)} + 1,152 * X_{(T3)}$ ; SEy: 2,041; $R^2$ : 72,64	20,52
Handball girls	11	$Y = 9,709 + 1,271 * X_{(T6)} + 1,171 * X_{(T3)} + 1,361 * X_{(T2)}$ ; SEy: 1,739; $R^2$ : 74,43	20,35
	12	$Y = 11,429 + 1,379 * X_{(T7)} + 0,886 * X_{(T5)} + 0,711 * X_{(T3)}$ ; SEy: 1,706; $R^2$ : 61,34	20,86
	13	$Y = 8,047 + 1,704 * X_{(T2)} + 1,492 * X_{(T1)} + 1,170 * X_{(T3)}$ ; SEy: 2,284; $R^2$ : 65,96	21,16
	14	$Y = 8,866 + 1,306 * X_{(T7)} + 1,728 * X_{(T2)} + 0,834 * X_{(T5)}$ ; SEy: 1,874; $R^2$ : 61,99	20,94
	15	$Y = 11,138 + 0,934 * X_{(T3)} + 1,167 * X_{(T4)} + 1,025 * X_{(T7)}$ ; SEy: 2,024; $R^2$ : 58,25	20,34
Ice-hockey boys	11	$Y = 10,032 + 1,270 * X_{(T7)} + 1,250 * X_{(T1)} + 1,003 * X_{(T3)}$ ; SEy: 1,870; $R^2$ : 62,69	20,38
	12	$Y = 9,576 + 1,532 * X_{(T7)} + 1,026 * X_{(T4)} + 1,175 * X_{(T2)}$ ; SEy: 1,946; $R^2$ : 69,17	20,63
	13	$Y = 12,293 + 1,006 * X_{(T3)} + 1,154 * X_{(T2)} + 0,942 * X_{(T7)}$ ; SEy: 1,523; $R^2$ : 72,77	22,11
	14	$Y = 8,986 + 1,377 * X_{(T4)} + 1,279 * X_{(T1)} + 1,213 * X_{(T6)}$ ; SEy: 1,973; $R^2$ : 62,64	19,68
	15	$Y = 9,393 + 1,384 * X_{(T4)} + 1,287 * X_{(T1)} + 1,202 * X_{(T3)}$ ; SEy: 1,610; $R^2$ : 70,78	20,60

**Legend:** Y = predicted coordination performance (points);  $b_0$ ;  $b_1$ ;  $b_2$ ;  $b_3$  = regression coefficients;  $X_{(T1-T7)}$  = performance in the selected coordination tests (points); SEy = regression equation error (points);  $R^2$  = reliability of the regression equation (%); CP = overall coordination performance (points)

## CONCLUSIONS

- In the age category of 11-19 years, entropic processes of coordination capacities are manifested. At the beginning, these processes are characteristic by disordering and towards the end of the category by orderliness of the system, they are dynamically changing depending on age and growth of sport performance. Within this developmental process (genesis) not only their significance, but also arrangement of individual factors of the structure of coordination performance change.

- In collective sports among the three most valid coordination capacities are rhythmic capacity, spatial orientation capacity and temporal parameters estimation.

- Structure of coordination capacities in selected sport games seems to be in accord with the sport specialization and sensitive periods of development of coordination capacities.

- Prediction of coordination abilities by means of three selected test criteria in selected sports seems to be sufficient.

- The obtained results correspond to the current level of coordination capacities in the observed sports in individual age categories and different sport specializations.

- It is recommended to complement the sets of conditional tests of special motor capabilities in the selected sport games used for the selection of sport talents aged 9-10 into sport classes by the above mentioned coordination test criteria.

- When selecting coordination tests in further age categories we recommend to be governed by the height of shares of coordination criteria in the structure of coordination performance.

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## HUMAN MOTRICITY SCIENCES VERSUS PHYSICAL EDUCATION AND SPORTS

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**ABSTRACT.** The problems of physical exercise, with its many valences, are presently approached on a wide scale, due to the positive impact of physical activities upon the human biological side, a reality perceived and acknowledged by a greater and greater number of social factors involved in the life quality optimization processes. Thus, the human motricity field, also called *Physical education and sports*, enriches with new theses issued from its own sciences and from the applied ones, which allow thorough interdisciplinary and transdisciplinary investigations. In this article, we aim at arguing why it would be appropriate to replace the *Physical education and sports* syntagma with that of *Human motricity sciences*.

**Keywords:** motricity sciences, physical education, sport, science domain

**REZUMAT.** Științele motricității umane vs. Educație fizică și sport. Problematika Exercițiului fizic și a multiplelor sale valențe, cunoaște în momentul de față o amploare deosebită, generată de impactul pozitiv pe care activitățile motrice îl exercită asupra biologicului uman, realitate resimțită și recunoscută de tot mai mulți factori sociali cu implicații în procesele de optimizare a calității vieții. Astfel, domeniul motricității umane, cunoscut sub denumirea de *Educație fizică și sport*, se îmbogățește cu noi teze ale științelor proprii și ale celor aplicate, care permit abordări interdisciplinare și transdisciplinare de mare profunzime. În cele ce urmează, intenționăm să aducem argumentele necesare pentru a susține înlocuirea denumirii domeniului *Educație fizică și sport* cu sintagma *Științele motricității umane*.

**Cuvinte cheie:** științele motricității, educație fizică, sport, domeniu de știință

### 1. A short history of the topics

The physical exercise birth goes back to immemorial times, it accompanying the human being all his existence long. Organized under different forms, starting with the spontaneous play, exercises were subsequently included into educational actions that became more and more differentiated, according to their finalities and

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content. Theoretical and practical knowledge about physical exercises can be found in the historical documents issued in the society development first phases, they being mainly oriented to military, educative, medical and even performance goals.

The end of the 19<sup>th</sup> century and all the 20<sup>th</sup> century were stages within which man's motricity developed under the physical exercise influence, by reaching the complexity it has in our days. Physical exercises structured in time, they turning into social, cultural and educational activities called physical education, sports, physical therapy, leisure and corporal expression activities, all of them representing substructures meant to valorize the human movements, with educative, formative, recovery, creative and performance objectives. (A.Dragnea et.al., 2002)

With the issuing of physical education and particularly of sports schools and systems, as well as of the conceptual and notional apparatus substantiating them, the normative system and the organization structures started becoming more and more accurate and efficient, by transforming man's motricity, as a social awareness feature, into a strong tool able to influence one's own being.

Man's movement, under the generic title of motricity, is a cause and an effect, equally directed towards the individual, his body, his natural and social environments, concretized in different finalities related to health, personality and social integration. For these reasons, motricity became an interest field for the sciences of man, generically brought together under the name of "anthropology".

The biological, psychological, cultural and social approaches to motricity have led to the accumulation of an impressive volume of scientific knowledge usually interpreted from the standpoint of the science that studied the man's movement, in general, and especially its manifestation as motor activities.

This knowledge coagulation into a distinct scientific domain hasn't always been satisfactorily fulfilled, from the identity, the interpretative, axiological and taxonomic rigor points of view, it often generating confusions between the activity names and those of the sciences concerned with the problems specific to motricity, in its whole, or to different specializations. Thus, in the course of time, this science field was given numerous names: *Physical education*, *Physical culture*, *Physical culture and sports*, *Physical education and sports*, *Sports science*, *Physical education and sports science*, *Corporal activity science*, *Motor activity science*, *Physical and sports activity science*, *Kinesiology*, *Kinanthropology*, *Motor anthropology*. (P.Parlebas, 1990; A.Dragnea & A.Bota, 1999; M.Epuran, 2008)

The various names given to the motricity research field were related to conceptions usually focused on segments of the domain in its whole. Thus, sometimes, by ignorance, the global approaches were neglected or even rejected, fact that generated an identity crisis (which, until recently, also characterized other sciences of man), more and more emphasized by the motor activity expansion in our contemporary society.

It is well-known that a vaguely defined and an imprecisely named field renders difficult the interpretative order (scientific rigorousness), favors the superposition of the interest spheres of different sciences and creates confusion in the category classification on well-settled criteria. In this context, the interdisciplinary and transdisciplinary interpreting becomes an almost impossible to reach desideratum. (M.Epuran, 2005)

Presently, the name of “Physical education and sports”, both as a science fundamental field and as an academic (and, implicitly, as a specialization) field doesn’t meet at all the science requirements, in general, the practical reality and the rigors imposed by the academic education organizing, because of the following reasons that answer the question:

*Why the name of **Physical education and sports** specified in the List for the graduation/ specialization/ curricula fields, which are regionally and/ or generally regulated, according to the G.O. no. 635/ 2008, is not appropriate any more ?*

**a.** Modern science tries its universalization by emphasizing some constants related to human nature, to the description of cultures and societies, of behaviors and mentalities, as generalizing approaches to the mankind in its whole. Consequently, by mentioning only two activities, physical education and sports, we don’t meet at all this requirement.

Starting with the seventies, the specialists have drawn the attention on the fact that the “physical education” syntagma is partially inappropriate to identify the professional tasks within the educational system and totally inappropriate to identify the activities included into the academic curricula (C.Bouchard, 1976; C.Bouchard, S.Blair, W.Haskelm, 2007). The lack of an integrating paradigm or of a central unifying theory explains why physical education has been labeled not only as a study discipline, but also as a science field.

Human movement, in general, due to its specific activities, requires the integration of some analysis perspectives, such as the philosophic, social, cultural, psychological, physical ones, by including the human behavior manifestation forms and, obviously, the motor behavior. This approach expresses the multidisciplinary interest in the study of the motricity forms used in the knowledge and the human becoming processes. (S.Hoffman, 2005)

**b.** Physical education and sports are two applicative activities of the same field, circumscribing specific theoretical and practical references, but marginalizing many other socially constituted and acknowledged motor activities. These motricity new forms, issued and developed in order to fulfill objectives differentiated from those settled for physical education and sports, correspond to the various directions in which the physical exercise is multi-functionally valorized.

**c.** Physical education and sports refer to corporal, to physical phenomena, by ignoring the very essence of these activities, namely the human movement, which is determined by many factors. But motricity includes, besides the body

segments, their functions, the fact of being aware of them (the whole psychical zone), the activity designing and managing etc.

**d.** Motor acts and actions integrated into differentiated activities have distinct roles: health, education - personality forming, motor excellence reaching, recreation, recovery and communication through motor gesture language; physical education and sports are partially involved, together with other motricity forms, in the fulfillment of the above-mentioned roles.

**e.** By simultaneously approaching physical education and sports as a *fundamental field* and, non-differentiatedly, as a *specialization*, represents a deviation from the scientific rigors that define, on the one hand, the scientific field the respective academic education is included in, and, on the other hand, the academic study subbranches or specializations.

The integrative analysis of knowledge in the motricity sphere must aim at meeting the society pressing requirements. Nowadays, the social needs require the study disciplines to prefigure some profitable educational systems, a consistent health program, a positive sporting climate and a collective mentality able to equally valorize the individual's physical and psychical sides.

Thus, it is possible to identify, in the corporal movement study area, some formative aimed challenges imposing the science field reformulation, which means:

- **to renew, to rethink the educational process** (S.Șerbănoiu, 2002; M.Stănescu, V.Tudor, 2003) Educational policies aim at improving the future teachers' forming and their school teaching experience, having in view that the physical education lesson has got new meanings, due to the introduction of fitness, of the leisure time skills, of the adventure activities etc. With this school curricula "expansion", our student - the future teacher will combine his teaching abilities with the decision making and the permanent reflection;

- **to promote health and recovery through movement.** (A.Bota, 2007) Motricity, as a field, is also assigned to another important zone of the health policies, which refers to the prophylaxis of various disorders, the recovery in different pathologies, the maintaining of an increased efficiency in the professional environments, within a healthy-balanced natural environment;

- **to redefine sports.** (A.Dragnea. S. Teodorescu, 2002) It is obvious that the modern sports features must be promoted in the field science content. These ones refer to equality and humanism, advanced technologies, ethics aspects, minority population recruiting, opportunities for the disabled etc. Students will be thus trained to work in this context, even as leaders, in professions which develop with the sports phenomenon expansion;

- **to increase the expression and communication capacities.** (F.Levieux & J.P.Levieux, 1997). The body movement symbolic function starts becoming important, together with the sanogenetic one, for the excellence reaching or for the body recovery. The motricity expressive characteristics, significant in this

communication era, have lately been added to the functional aspects. The unique experience of some activities such as dance, eurythmics or art-sports, the deep alterations they induce in the physical sphere, but also at the personality level, start being accepted and, consequently, introduced into the formal education system in many advanced countries. At the same time, the regenerating (recovery) power of these creative practicing forms recommends them as successful therapies in many psycho-emotional disorders, and not only.

## **2. Arguments for the legitimacy of giving the fundamental field the name of *Human motricity sciences***

### **I. The concept of “motricity”**

From the biological point of view, the muscular reactions involved in the movement performing by the body or by some of its segments are generically called *motricity*. It consists in the movement organizing and reorganizing through the muscle contraction and relaxation, which lead to positions and travels on different directions, through acts and actions coordinated by the nervous system in relation with the environmental conditions. (A.Dragnea & A.Bota, 1999)

An interdisciplinary definition of motricity refers to the totality of the conscious movements acquired through learning and of the unconscious reflex ones, the latter representing the basis of motor skill forming.

Consequently, motricity has many fundamental **attributes**:

- Motricity illustrates man’s awareness through motor acts, actions and activities, which essentially contribute to the articulation of some conducts and behaviors mainly oriented towards the individual’s self-development and adaptation to the natural and social environments. Therefore, motricity is the human being’s defining characteristic and, at the same time, a stimulus for the development of his socio-culturally integrated personality.
- Motricity is the result of man’s bio-psychical synergic activity, as a response to the stresses of the natural and social environments.
- Conscious motricity relies on the human psychism, less determined by instincts and greatly determined by intellectual, motor, artistic aptitudes that, under the education impact, may take different forms.
- Motricity is responsible for the human metamorphosis through the use of one’s own movements in an evolving sense. This process develops by means of some motor structures, of some spatial-temporal configurations affectively and expressively imprinted, within some conducts and behaviors that leave their mark on phenomena and on the social life in its whole.

Synthetically, we can assert that the physical exercise practicing field possesses an obvious specificity and that the involved subject doesn’t identify either with the simple mechanical devices, with the energetic ones or with the



“body-machine”, but with all these “hypostases” together, covered by the generic term of *motricity*.

## **II. The “Human motricity sciences”**

Differentiated motor activities (physical education, sports, physical therapy, leisure motor activities, corporal expression activities) are presently studied by their own sciences and theories (scientific and academic constructs), which include defining norms and conceptual delimitations at all the levels the applied epistemology describes from the observational, experimental, theoretical and practical points of view. There are thus drawn up the activity desirable patterns, according to the scientific requirements and to the field practical realities.

The sciences that study human motricity issued and developed relying on the acknowledged sciences, they turning nowadays into interdisciplinary syntheses which emphasize the particular features of this field. In this context, we mainly refer to the human being's development through his movement capacity improvement, his effort capacity increase, through psychomotor education and social integration.

The already acknowledged scientific theories of motricity have many functions (S.Estes, 1996; M.Epuran, 2005):

- they synthesize and present, in a specific language, a rich informative material resulted from the known motor activities;
- they use their own semiotic language made up of signs, body positions, motor acts, gestures, symbols etc., thematically classified into structures, groups and subgroups facilitating the informational content transmitting;
- they systematize on taxonomic criteria and organize their own categories and phenomena, by formulating postulates, principles (the studied subfield set of norms), theorems, laws and hypotheses;
- they explain the causal relationships among different kinds of processes (such as the biological and psychological ones) involved by the specific effort;
- they interpret the data provided by the activity different organization forms and make proposals for their efficiency increase;
- they make predictions about the short, middle and long term field evolution, relying on interdisciplinary analyses and interpretations; the predictive systems are concretized into educational patterns specific to the different motor activities;
- the substantiation sciences, due to the motricity sphere approach, and the sciences specific to human motricity are in a multi-factorially determined symbiosis generating original scientific approaches that shape a field with a distinct identity.

To support the previously mentioned, we specify the most popular situations the “Human motricity sciences” syntagma is used in, at the European and World levels. (table no.1, table no.2, table no.3, table no.4)

**Table 1.****Name of the science field in different countries**

<b><i>COUNTRY</i></b>	<b><i>SCIENCE FIELD</i></b>
BELGIUM	Motricity sciences
FRANCE	Motricity sciences
ITALY	Motor sciences
NORWAY	Human movement and sport science
AUSTRALIA	Human movement science
USA	Human movement science

**Table 2.****Name of the universities, faculties, colleges, departments**

<b><i>COUNTRY - UNIVERSITY</i></b>	<b><i>FACULTY</i></b>
Free University of Brussels (BELGIUM)	Institute of Motor Sciences
University of Liege (BELGIUM)	Department of Motor Sciences
University of Cassino; University of Naples (ITALY)	Faculty of Motor Sciences
University of Movement Sciences (Rome, ITALY)	University Institute of Motor Sciences
University of Verona (ITALY)	Faculty of Motor Sciences
University of Bologna (ITALY)	Faculty of Motor Sciences
Vrije University, Amsterdam (HOLLAND)	Institute of Sciences for the Fundamental and Clinical Human Movement Sciences
AUSTRALIA	College of Human Movement Science
Grand Valley State University (USA)	Department of Movement Science
Northwestern University (USA)	University of Physical Therapy and Human Movement Sciences

**Table 3.****Name of the degree and doctoral programs**

<b><i>COUNTRY - UNIVERSITY</i></b>	<b><i>PROGRAMS - DEGREES</i></b>
Free University of Brussels (BELGIUM)	Bachelor's degree in Motor Sciences
University of Movement Sciences (Rome, ITALY)	Bachelor's degree in Motor Sciences
University of Trondheim (NORWAY)	Bachelor's degree in Sports and Human Movement Science
University of Delaware, Stockholm (SWEDEN)	Master's degree in Human Movement Science
College of Human Movement Science (AUSTRALIA)	Bachelor's degree in Human Movement Science

<i><b>COUNTRY - UNIVERSITY</b></i>	<i><b>PROGRAMS - DEGREES</b></i>
CQ University (AUSTRALIA)	Bachelor's degree in Human Movement Science
RMIT University (MELBOURNE - AUSTRALIA)	Bachelor's degree in Human Movement Science
University of North Carolina, Department of Movement Science (Grand Valley University, USA)	Doctoral program in Human Movement Science
Teachers College - Columbia University (USA)	Movement and Education Science
Northwestern University (USA)	Physical Therapy and Human Movement Sciences

Table 4.

Name of some specialty magazines

<i><b>Journal</b></i>	<i><b>ISSN</b></i>
Human Movement Science - A Journal Devoted to Pure and Applied Research on Human Movement	ISSN 0167 - 9457
Human Movement	University School of Physical Education, Wrocław, Poland; University School of Physical Education, Poznań, Poland; ISSN 1732-3991 (print version), ISSN 1899-1955 (electronic version)

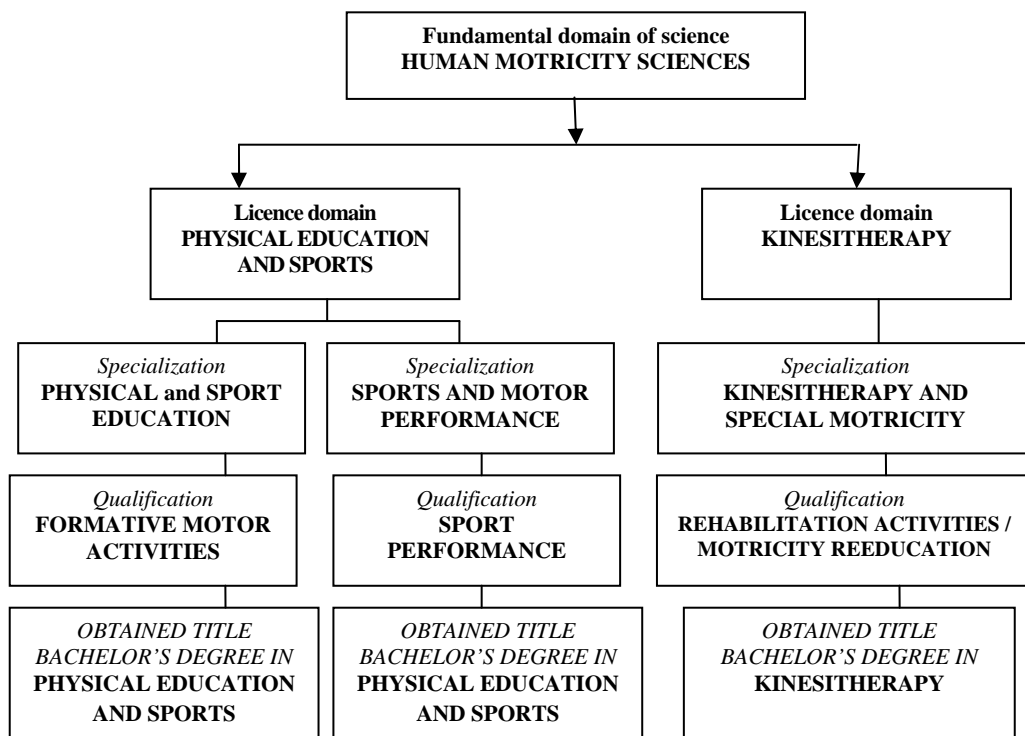
## CONCLUSIONS

1. **Human motricity sciences** describe some phenomena related to man's movement and favor their analysis through explanation and prediction, fact that has a double advantage: the knowledge generation, determined by the phenomena understanding, and the knowledge practical valorization for the social welfare.

2. As a fundamental domain, **human motricity sciences** provide a full image of those social life fields which include physical activity: education, health, competition, leisure, profession, expression and communication, functional independence, they allowing thus the subsequent delimitation of new graduation and specialization fields.

3. A coherent conception about this science and its application in order to form specialists in the field allows a better correlation with the labor market, by providing an increased flexibility to its exigencies; it becomes thus possible to extend and diversify the future professionals' knowledge, abilities and competences. (figure no.1)

4. The presented data show that the “**Human motricity sciences**” syntagma is accepted by the international academic environments, fact that would facilitate the compatibilization of the university studies and diplomas, as well as the acknowledgment of the Romanian graduates’ training.



**Figure no.1.** Licence domains, specializations, qualifications and titles within fundamental domain of science „Human Motricity Sciences”

To conclude, we think this moment is favorable to introduce the “**Human motricity sciences**” syntagma, which relies on scientific arguments and on the practical realities, by guaranteeing thus the international acknowledgement and visibility of the science field and of the profile Romanian education.

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## THE HISTORY OF JUDO TECHNIQUES. O-SOTO-GARI (BIG OUTSIDE CLIP)

BARBOS PETRE

**ABSTRACT.** The O-Soto-Gari technique is part of the Ashi waza (foot art) techniques. It is one of high performance techniques. Since the time of Jigoro Kano (1860-1938) O-Soto-Gari has known various forms of approach. Most experts think that this technique comes from the schools of jujutsu and that it was taken over by Kano due to its efficiency. Our studies in the history of martial arts have shown that this technique was in fact in Daito-ryu school as the Tenchi-nage (throwing Heaven and Earth). Today O-Soto-gari is present in the techniques required for the yellow belt (5 Kyu), even if it is difficult to approach. Today we know two major forms of O-Soto-Gari, Japanese and Korean.

**Keywords:** judo technique; judo history; o-soto-gari.

**REZUMAT. Istoricul tehnicilor de judo. O-soto-gari (Marea aruncare exterioară).** Tehnica O-soto-gari prezintă o istorie foarte veche. A apărut în școala daito-ryu, apoi a fost preluată de numeroase școli de jujutsu, ca în cele din urmă să fie preluată de profesorul Jigoro Kano (1860-1938), cunoscând diferite forme. Maeștrii care au perfecționat această tehnică au fost: Jigoro Kano, Kyuzo Mifune, Kimura Masahiko, Yamashita Yasuhiro, și alții. Tehnica O-soto-gari necesită o bună coordonare între brațe și piciorul de atac dar și o bună mișcare a bazinului în timpul atacului. Această tehnică a adus victorii nenumărate marelui campion japonez Yamashita Yasuhiro, care a intrat în cartea recordurilor cu cele 8 titluri de campion mondial și olimpic, singurul luptător din istoria artelor marțiale care nu a fost învins niciodată în toată cariera sa.

**Cuvinte cheie:** tehnică istoria judoului; judo; o-soto-gari.

The Daito-ryu form, Tenchi-nage Position: Migi ai-hanmi (right foot forward) Attack: Uke catches with both hands on the arms of Tori (Tori ryote-migi-ai-hanmi). Kuzushi (unbalance): back-right. Tsukuri (entry): Tori moves his right foot diagonally right-forward at 45 degrees, while fully extending uke's left arm down and behind him, for unbalancing him to the left heel. At the same time raise your left hand in a circular motion to the neck of uke. Kake (projection): Tori lead left leg behind uke's left foot while pressing down the left shoulder of his left hand. I consider that O-Soto-gari technique comes from Tenchi-nage, and that it

has been taken over by Jigoro Kano. The Professor Kano introduced the technique in judo after one of his best students, Kyuzo Mifune (April 21, 1883 - January 27, 1965) was for several months the student of the master Morihei Uyeshiba (14 December 1883-26 April 1969), the father of Aikido. Morihei Uyeshiba took the technique for the future Aikido, from Daito-ryu. Kano with Mifune also took from Daito-Ryu, Tai-Sabaki techniques.

Traditional form (the Japanese form) Jigoro Kano executed the technique as: Kuzushi (unbalance): back-right. Opportunity: You can perform the following circumstances: a) uke is in static position with the right leg forward, b) advancing the right foot, c) left leg moves, d) moving laterally, e) the other. Tsukuri (entry): Tori moves his left foot oblique, forward left, to get along with uke's right leg, at an angle of about 45 degrees. The right foot goes to the uke's right leg with knee slightly raised. Right arm at the Uke's left reverse oblique pushes forward left and to the ground. The left arm twitches straight to unbalance uke kimono as much as to right heel. Kake (projection): The right foot down and touch with the fingertips mattress. Without putting the heel on the floor, Tori squares leg as the practice for the clip. Along with vigorous action of the arms (left arm leading down, right arm straight up and left circular), uke will be thrown. The movement must be continuous, and for the final phase, the torso proclivity to the left. The Grand judoka Masahiko Kimura (September 10, 1917-18 April 1993), used very effective option, which is practical also with successfully today. The Romanian sportswoman Alina Dumitru has managed to become Olympic champion in the Olympic Games, Beijing, 2008, using the Japanese form of O-Soto-gari.

Current form (Korean form) Kuzushi (unbalance): back-right. Opportunity: a) the uke is in static position with right leg forward, b) advancing the right foot, c) left leg moves, d) moving laterally, e) the other. Tsukuri (entry): Tori moves his left foot oblique forward left, to get along with uke's right leg, with the top leg facing inwards. The right foot goes to the uke's right leg, with knee high. Right arm at the Uke's left reverse oblique, pushes forward left and to the ground. The left arm twitches straight to unbalance uke kimono as much as the right heel. The right side of the trunk is joined by uke's right side, being in direct contact with Tori's body. Kake (projection): The right foot is stretched to the back of the uke's outside part of the heel. By moving the right foot forward and backward, while vigorous action of the arms (the left arm leading down, the right arm straight up and left circular), uke will be thrown.

### **The Kimura's variant**

Kuzushi (unbalance): back-right. Opportunity: Uke moves the right leg back. Tsukuri (entry): Tori moves his left foot oblique forward left, behind the uke's right foot. The right arm pushes strong oblique forward left, while the left hand shoots down toward the left side. The pelvis rotates 90 degrees to the left, while the right leg is flexed and the heel rises. Using his arms Tori attacks with the

side of his right leg the uke's right foot, placing the heel on the block maleolei to stepping into the side or oblique backward. Kake (projection): When Uke tries to step backward or toward his right side in order to restore his balance, Tori continues his arms movement. By carrying right leg from the left to the right, consecutive with his strong arms pull, uke is thrown.

Difficulties of approach in the O-Soto-gari technique. Learning difficulties appear regardless of the practitioner's age. Both, children and adults, make the same mistakes. They are caused by several factors: 1. The two important moments of the technique, Kake and Tsukuri, do not synchronize. 2. The tori's hip remains far from uke's hip, resulting in missing the fair and efficient unbalancing and the consequence is self-unbalancing. 3. Weak unbalance. 4. The arm from its shoulder stretches instead of bending. 5. The support leg is in extension, and placed either too close or too far from uke. 6. The attack leg slams against the ground remaining motionless. 7. Weak leg action. 8. The trunk does not bend forward or while throwing with lack of control falls over the opponent. 9. Many interruptions and hesitations. 10. The attack leg is rigid. 11. During the transition of the right foot to attack, the body leans against the left heel that leads to lack of self balance. The beginners have difficulties with maintaining the balance because of the transition from one leg to another and that the attack leg swinging requires standing on one leg. Children mostly have a higher level of instinct of preservation than adults have, prompting them to push, to adopt a defensive position with legs apart and arms outstretched, thus stopping any advance of the partner.

Means of learning: 1. Tandoku-renshu - implementation of the techniques without a partner, 8 sets x10 repetitions. 2. Ushiro Ukemi - falling backward, 3 sets x 10 repetitions. 3. Uchi komi - a. tsukuri, 3 sets x 10 repetitions; b. kusushi, 3 sets x 10 repetitions; c. tsukuri and kusushi - uke stands with left leg forward, right leg backward (migi ai-hanmi), entry as at the basic technique, swing the attack leg; d. Kake (projection) in static position. Judo practitioners can consider that they have learned this technique if they reached these points: 1. Hardness (gived by the stability, flexibility and muscular endurance).

2. Flexibility (given by the mobility of spine and other joints, along with all the elasticity of muscles).

3. Dexterity (speeding the motor nerve functions and implementing the rapid movements, static or in motion).

Applying the technique in training first and then in the competition involves:

1. Sen-sen-no-sen (superior initiative). It is a principle of the Japanese martial arts schools and is given by the ability of judoka to intuit, to anticipate the opponent action. This way the practitioner can surmount uke's attack. Although in theory this principle seems quite simple, in reality only those who surpass their emotions are likely to succeed. Mental education is needed so that the technique is



applied even before the opponent prepares an attack. The Japanese judo school says that the mind must be "clean as an immaculate mirror, calm as still water."

2. Sen (initiative). Surprising the opponent by setting up an action before he attacks.

3. Ato-no-sen (initiative in defense). In any attack that includes two or more techniques there are "cracks" or "dead" moments, at which point the opponent is unable to act. These very short moments can be noticed only by those well trained and represent the time in which the opponent is concerned either to keep his balance or to change his catch. In those moments tori must do the attack.

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## THE IMPORTANCE OF PHYSICAL THERAPY IN PRADER-WILLI SYNDROME (PWS) REHABILITATION

**BERINDE RAMONA\*, ACIU MARIA\*, VARGA MONICA\***

**ABSTRACT.** Many rare diseases, genetic or not, are neglected or treated inadequately due to a low frequency of symptoms or because they are not well known. One example is Prader Willi Syndrome- the most common genetic cause of lifethreatening obesity, affecting appetite, growth, metabolism, cognitive functioning and behavior. PWS is a lifelong condition in which there is no known cure... yet! We wish to describe what is meant by Prader Willi Syndrome and we chose to illustrate the general data through presenting a case. The case described is characteristic for Prader Willi Syndrome but due to the complexity of the associated conditions it is a real challenge for therapists. We focused on physical therapy – our profession, but we must not forget that treatment of SPW is complex, provided by a multidisciplinary team and subject to continuous collaboration with the patient's family, all converging towards a better quality of life and more active involvement in society

**Keywords:** physical therapy, rehabilitation, Prader-Willi Syndrome, obezity

**REZUMAT.** Importanța kinetoterapiei în recuperarea pacienților cu sindromul Prader Willi (SPW). O mare parte dintre bolile rare, genetice sau nu, sunt neglijate sau tratamentul acordat este necorespunzător fie din cauza frecvenței reduse fie din cauza necunoașterii lor. Un exemplu în acest sens este sindromul Prader Willi – cea mai comună cauză genetică de obezitate morbidă, cu afectarea apetitului, a creșterii, a metabolismului, a proceselor cognitive și a comportamentului. Sindromul Prader Willi este o afecțiune permanentă pentru care nu există tratament... încă! Dorim să facem o descriere a ceea ce înseamnă sindromul Prader-Willi și am ales să ilustrăm datele de ordin general prin prezentarea unui caz. Cazul descris este caracteristic pentru sindromul Prader-Willi dar prin complexitatea afecțiunilor asociate o adevărată provocare pentru terapeuți. Am pus accentul pe kinetoterapie-specializarea noastră, dar nu trebuie uitat că tratamentul sindromului Prader-Willi este unul complex asigurat de o echipă pluri-disciplinară și este condiționat de o colaborare permanentă cu familia pacientului, toate acestea convergând spre o bună calitate a vieții și implicare activă în societate.

**Cuvinte cheie:** kinetoterapie, recuperare, sindromul Prader-Willi, obezitate

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## **Introduction**

A good deal of genetic diseases go untreated or are treated inadequately due to ignorance or a lack of understanding about them. One of these conditions is Prader Willi Syndrome, which is why we selected this topic.

SPW is a genetic disease first described in 1956 by Swiss doctors Prader, Lebhart and Willi. This syndrome occurs equally in both sexes and all races.

Many symptoms of PWS are caused by dysfunction of the hypothalamus. The hypothalamus controls hunger and satiety, controls and releases pituitary hormone (hormonilor hipofizei anterioare), growth hormone, gonadotropins, thyroid stimulating hormone, prolactin and adenocorticotrop.

In general, individuals with PWS have common symptoms but their number and severity may differ.

## ***Genetic Cause***

PWS is a secondary chromosomal abnormality of gene deletions on the short arm of chromosome 15 by maternal disomy or paternal origin of chromosome 15.

***The clinical portrait*** changes with age.

**Neonatal period:** Infants born with SPW are described as "floppy" (soft) with a weak or absent cry. The neonatal hypotonia may be a universal symptom.

Infants show weak facial expressions. Decreased facial muscle tone leads to eating difficulties lasting several weeks or months. The infants often require special assistance in feeding.

This motor deficiency is evident even before birth as fetal movements are fewer than usual.

Other features of neonatal PWS may include enlarged chest, narrow forehead, almond eyes and a narrow upper lip "triangle" shaped mouth, viscous and sticky saliva. Underdeveloped sexual organs (small labia majora in girls, small penis & undescended testes in boys) is also a common feature.

Although hands and feet can have normal size, cubits edge of the hand and the inside of the foot are usually straight.

## **Infant Period**

Many clinical features are easily recognizable during this period.

Hypotonia is less severe so that assistance with eating is no longer required. Motor activity improvement and general motor development is delayed compared with normal infants.

Difficulties with language expression and articulation lead to delays in language development and a high-pitched voice.

## **Childhood**

Starting at 2-3 years, PWS is characterized by increased appetite and excessive weight gain. Children may begin to talk and develop behavioral disorders characterized by bursts of anger or fits of hysteria.

Infants and children with PWS have exaggerated body fat and reduced muscle mass regardless of their weight.

Children may continue to show problems articulating words, Some may exhibit an autistic personality.

During this time leave may be manifested somnolence, decreased sensitivity to pain, skin-picking and decrease the growth rate.

### **Adolescence and adulthood**

Inactivity leads to obesity which leads to sleep and breathing abnormalities.

Behavioral problems, learning difficulties and fits of rage are becoming more apparent in adolescence. Maximum growth and sexual development lack at most of these individuals due to lack of sex hormones.

The final size of a boy with PWS is about 155 cm and 148 cm for girls.

Regardless of IQ, these individuals require strict 24 hour supervision of caloric intake. Permanent food search behavior and cognitive decline may affect chances for independence in adulthood. Subjects with PWS and especially those who lose weight may be very prone to osteoporosis and increased risk of bone fracture.

### **Other physiological traits:**

- Deficiencies of strength, balance, motor coordination and planning;
- Hyperphagia;
- Gastrointestinal problems such as gastroparesis, slow intestinal transit, and the inability to vomit;
- Hyper-hypothermia and thermoregulatory dysfunction in the system;
- Hypopigmentation;
- Dental problems;
- Pinching and scratching the skin;
- Issues of social / psychological and psychiatric care;
- Scoliosis, strabismus, sensitivity to medication, orthopedic problems.
- High pain threshold with increased risk of bruising.

In terms of **cognitive function** most individuals exhibit low intelligence. Most individuals with PWS have decreased intellectual functioning. Average IQ typically 55-70. Distribution generally 5% IQ 85+; 25% Borderline MR; 35% Mild MR; 25% Moderate MR; 5% Severe MR.

People with PWS have difficulty recognizing images, performing mathematical operations, and carrying out ADL. Short-term memory is also poor.

On the other hand, they have increased networking capacity, they are friendly, affectionate, eager to please and assist. Also, long-term memory is good and shows outstanding ability in recognizing and evaluating forms and figures and solving puzzles.

### ***Treatment***

PWS is a multi-systemic condition for which there no treatment at this time, but early recognition and intervention may improve prognosis by reducing or even eliminating certain symptoms.

Positive results can arise from a multidisciplinary approach involving the following specialists: geneticist, endocrinologist, nutritionist, ophthalmologist, dentist, social worker, teacher, psychologist, psychiatrist, neurologist, urologist, gastroenterology, orthopedics, occupational therapist, kinesiotherapist, speech therapist and the entire medical staff.

#### **Stages of Treatment:**

- Early diagnosis through genetic testing;
- administration of growth hormone that can lead to;
  - o improved growth rate in height;
  - o near normal size hands and feet;
  - o normalization of facial characteristics;
  - o decreased body fat and BMI;
  - o improved respiratory function;
  - o improved physical performance;
  - o increased energy consumption;
  - o improved cholesterol levels;
  - o higher bone density;
  - o improved cognitive functions;
  - o increased self-esteem;
- continuous education of family members regarding the syndrome;
- Physical Therapy;
- occupational therapy;
- multisensory stimulation;
- speech therapy;
- socialization;
- therapy for parents and family to deal with the stress;
- special oral hygiene products that relieve symptoms of "dry mouth";
- weight control strategies with a custom-calorie diet and continuous control of the environment;
- daily gymnastics;
- behavioral therapy;
- psychopedagogy;
- administration of sex hormones in adolescence;
- developing healthy leisure activities.

## **PHYSICAL THERAPY**

Kinesthetic treatment should be secondary to treating the origins of the syndrome (etiologically) permanently respecting the objectives and principles of treatment for patients with PWS.

- ⇒ Physical therapy objectives in treating patients with PWS are:
- ⇒ stimulating catabolic processes;
- ⇒ improve breathing;
- ⇒ improve general vascular circulation;
- ⇒ increase muscle strength and endurance;
- ⇒ improve and increase the capacity of effort;
- ⇒ creation and maintenance of healthy habits for an active life;
- ⇒ correction or improvement of sedentary disorders;
- ⇒ reduce weight.

In order to choose the exercises that compose the physical therapy program for patients with SPW, the patient's clinical picture must be considered. It will focus on the following factors: cardiovascular and respiratory disorders, associated afflictions, gender and age, and the patient's physical capacity. Both duration and intensity of exercises should be determined based these features. The further expansion of the exercise program will be made only in accordance with the patient's physical improving.

Intensity and duration of exercises should be established so as not to result in appetite stimulation. It is recommended that exercises be done at least 2-3 hours before the main meals, the best results occurring in the second half of the day.

The exercises will be executed at a fast pace with breaks in between. Patients should wear thick equipment to promote perspiration.

Physical Therapy means:

- Gymnastics of maintenance;
- Self- massage, wet and dry;
- Medical gymnastics:
  - free exercises of the trunk and limbs in the form of contraction and relaxation with an analytical and synthetic structure, which moves various muscle groups;
  - -exercises with portable objects, such as: medicine ball, dumbbells, clubs, elastic cord, weights of different shapes and sizes;
  - exercises with fixed apparatuses: a fixed scale, gymnastic bench;
  - - simple, everyday exercises in different structures and places: running, jumping, lifting or wearing weights, creep;
  - athletic exercises: sprinting, running for strength, running on varied terrain, leaping (with weight) in a series, long jump;
  - free breathing exercises, sometimes connected to limb and trunk movements;

- exercises to stimulate the functions of excretion and elimination: analytical exercises executed in dense equipment, which should be changed at least twice in a lesson, isotonic and isometric exercises for the abdomen ;
- occupational therapy - walking;
- hydrotherapy;
- playing sports;
- massage.

Since with PWS obesity is a defining feature, physical therapy will be based on fighting obesity. From a technical and methodological point of view, physical therapy treatment of obesity is divided into three stages:

**1. Weight Loss Phase (Lipolytic Phase)** – aims to activate the consumption of energy. In the first part of this phase the body's reaction to the exercises will be monitored. If improvement is achieved (within the physical capacity of an obese person) then increases may be made in the intensity and amount of exercise, based on the principle of individualization, accessibility and level of exercise.

The exercises will be executed at a lively pace, maintained for a period of time, and interspersed with breaks for rest and relaxation exercises. They have an analytical character at first, and then they will use synthetic exercises that will be moving muscle groups and muscle chains with as large an amount as possible. Technical structure of the exercises will combine isometric muscle work with isotonic. The exercises will be executed in different positions so the legs will bear weight through the force of gravity as long as possible.

**2. Muscle Development Stage** - will be focused on the morphological and functional development of trunk muscles (back, chest, abdomen) and the limbs.

Exercise is executed with an increased amplitude, causing the groups of muscles to contract in as large a segment as possible. These exercises will be performed with growing peripheral resistance, resulting in muscle work that is both isotonic and isometric. The exercises will have an analytical and synthetic structure. By executing them in positions with a large support area and will be accomplished at a slow pace, with the final tensions marked.

**3. Maintenance phase** – has the objective of maintaining and consolidating the achieved results in order to prevent relapse. This phase will require the participant to give their full attention and full adherence to the physical therapy regime for the purpose of maintenance.

***1. Presentation of a case***

Name: R.R. (Fig. 1)

Date of birth: January 29 1995;

Sex: F

Diagnosis: Prader Willi Syndrome, motor retardation, mental retardation, puberty retardation, senzitivo-motor neuropathy of the legs, kyphoscoliotic attitude, epilepsy.

Associated diseases: genetic obesity, mixed hyperlipidaemia, systolic blowing degree, dental dystrophy, epilepsy, generalized hypotonia, pelvis bifida. Reason for hospitalization: psycho-motor deficit.



**Fig. 1.**

Girl aged 14 years and 8 months, is admitted on 29/09/2009 at Foundation "Acasa" - Center for Recuperation, Treatment and Care in the city of Zalau, Salaj County, for recuperation treatment of psycho-motor deficit. The patient case is known for the Center since September 2008.

The physical examination performed at admission revealed short stature, overweight, kyphoscoliotic attitude, phenotype characteristic, hypotonia and generalized muscle hypertrophy, limited mobility of the spine, unequal legs (right < left 2 cm), joint stiffness in passive mobilization of the knee and hip and feet evers with flattened arches deflected in planting, hyperphagia, leg areflexia, and hyporeflexia on left leg., active motility reduced by gait deficiency, emotional lability, cognitive dysfunction, pubertary retardation.

During hospitalization (21 days) the Center established a complex program of physiokinetotherapy, speech and psychotherapy, and a low-calorie diet.

The objectives were as follows:

- improve overall muscle tone;
- improve posture and breathing;



- improve standing and walking;
- improve balance and coordination skills, training skills related to senzitivo-motor function;
- sensory integration;
- training in self-care skills;
- training related to language skills, memory, orientation, perception and attention;

Based on data collected over time the following weight is noted (Fig. 2).

11.6 ani	?	71 kg	?	
12.6 ani	?	62 kg	?	
13.4 ani	145 cm	59 kg	28.85	
13.8 ani	152 cm	57 kg	24.67	
14.2 ani	155 cm	52	21.64	
14,3 ani	155 cm	56.5 kg	23.54	CRTI (3. 03.09)
14.3 ani	155 cm	54.4 kg	22.66	CRTI (20.03.09)
14.5 ani	155 cm	55 kg	22.00	
14.9 ani	156 cm	63 kg	25.88	CRTI (28.09.09)

**Fig. 2. Development of weight over time**

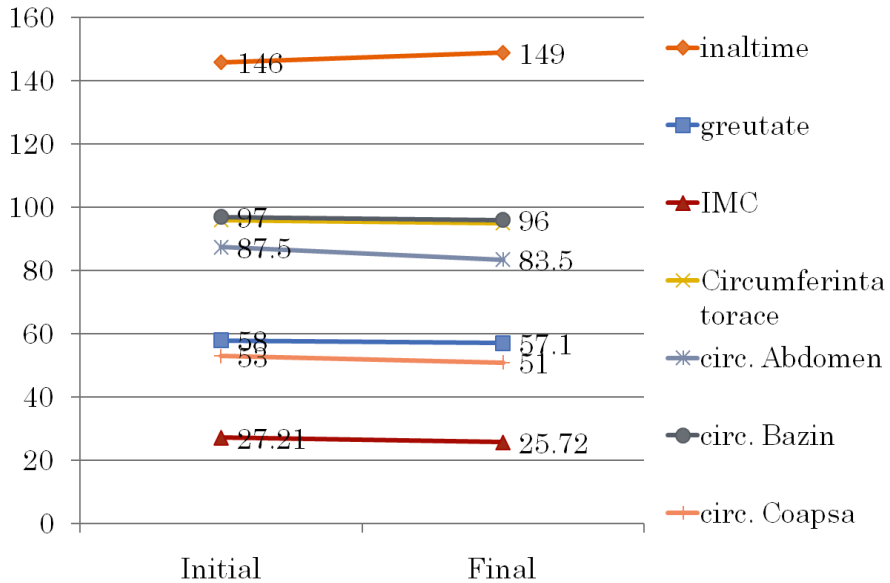
After confirming the PWS diagnosis, the patient was treated with growth hormone and followed a personalized diet, with evident results, continuing psycho-motor recovery.

All three periods of hospitalization lasted 21 days and were taken into account: September '08, March '09, September '09.

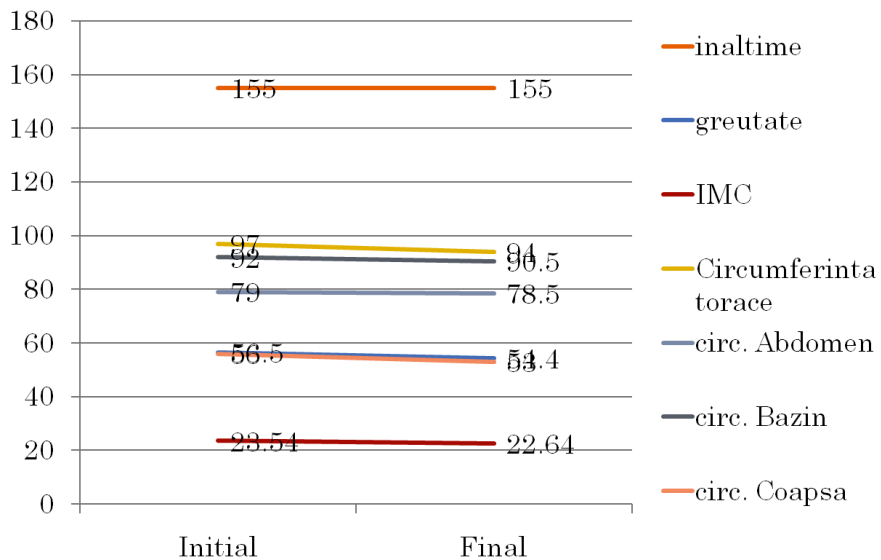
Evaluation was conducted by measuring height, weight, circumference of chest, thighs, pelvis, abdomen and BMI

In the kinetic treatment were used treatment kinetic principles applied to obesity, with the particularity that had to be adapted to associated neurological diagnosis.

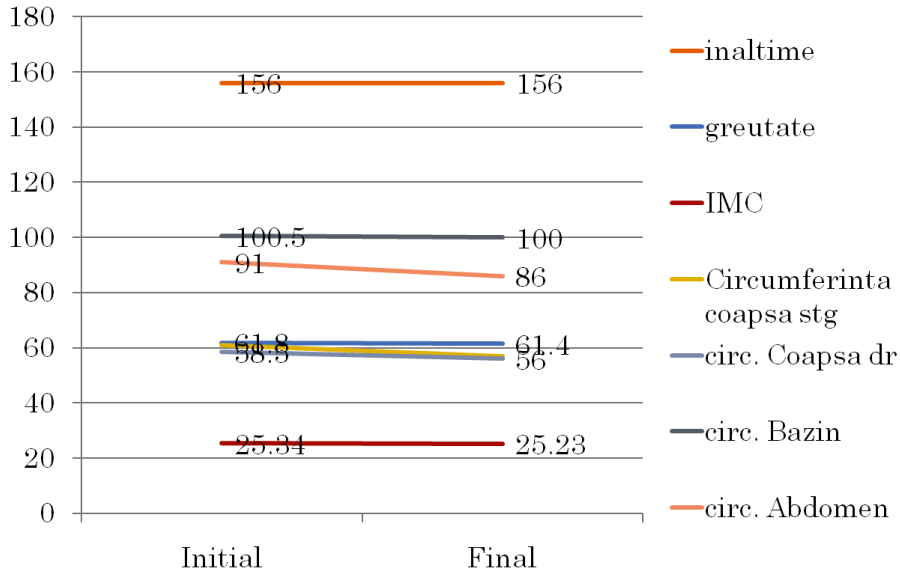
The following charts illustrate the evolution observed in each case:



**Fig.3. Kinetic Program Results September '08**



**Fig. 4. Kinetic Program Results March '09**



**Fig. 5. Kinetic Program Results September '09**

### **Results**

The graphs show a slight decrease in BMI for each hospitalization, but perhaps the most relevant result is decrease in the circumferences taken into account in all cases.

Also, from the kinetic point of view, improvements were observed in other areas:

- Standing with support on a fix scale to maintain orthostatic position for a longer period;
- improved muscle strength at the legs level;
- improved amplitude of motion at the legs level;
- improved balance;

### **Conclusions**

PWS is a debilitating genetic disease with special symptoms, mainly due to morbid obesity.

Physical therapy is required as an important element in the treatment of patients with PWS, provided they are combined with a proper diet and appropriate treatment.

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## ASPECTS OF PHYSIOTHERAPY PERFORMED AT THE LEVEL OF THE SCAPULOHUMERAL ARTICULATION FOLLOWING A RADICAL MASTECTOMY

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**ABSTRACT.** Physiotherapy in Oncology is a new area in romanian health care system. This study is ment to reveal the importance of physiotherapy in maintaining the optimal amplitude of the motion of the scapulohumeral articulation after a mastectomy. Our research focuses on creating a physiotherapy program that helps patients to recover after the surgery.

**Keywords:** mastectomy, scapulohumeral articulation, amplitude of motion, physiotherapy.

**REZUMAT.** Condiții privind kinetoterapia aplicată la nivelul articulației scapulohumerale în urma operației de masectomie radicală. Kinetoterapia in oncologie este o componenta noua in cadrul procesului de ingijire a pacientilor in Romania. Acest studiu are ca scop sublinierea importantei kinetoterapiei in a pastra amplitudinea de miscare optima a articulației scapulohumerale in urma mastectomiei. Studiul nostru se concentreaza pe crearea unui program de kinetoterapie care sa ajute pacientii in perioada de convalescenta imediat urmatoare operatiei.

**Cuvinte cheie:** mastectomie, articulatia scapulohumerala, amplitudinea miscarii, kinetoterapie

Physiotherapy is a health care profession, having as main purpose the functional recovery and rehabilitation of the human body and maximizing its potential. It plays a particular role in the process of taking care of breast cancer patients, from the moment of receiving the diagnosis until their healing or until the final phase of the disease, within the palliative treatment. (<http://csplis.csp.org.uk>-The Chartered Society of Physical Therapy)

A *mastectomy* is a surgical procedure, an operation to remove a breast, usually because of breast cancer or occasionally because there is a strong family history of breast cancer.

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Specific complications of mastectomy are rare but can include:

- pain from the armpit to the hand (cording);
- a build up of fluid (lymphoedema) the arm making it swollen and painful - it can occur months or years after surgery;
- pain and sensations, such as numbness or "pins and needles" around the operation site;

It's important to use the arm on the side of the surgery to prevent it getting stiff. The exercises from the physiotherapy program should continue at least four weeks after the procedure. ([http://hcd2.bupa.co.uk/fact\\_sheets/html/mastectomy.html](http://hcd2.bupa.co.uk/fact_sheets/html/mastectomy.html))

The physiotherapist's purpose, who works with breast cancer patients, is to minimize some of the effects that the disease or its treatment have on the patients. The obtained effect is that of improving the life quality of the patients, independently from the disease prognosis, helping them to achieve: the maximum potential of the functional capacity, the self-care independence and relief the painful symptoms. (<http://csplis.csp.org.uk>-The Chartered Society of Physical Therapy)

Breast cancer patients are offered different types of surgical treatments:

- Breast lump biopsy
- Sentinel lymph node biopsy
- Breast conservative surgery: partial mastectomy (lumpectomy or segmental mastectomy)
- Simple or total mastectomy

Halsted radical mastectomy ([http://hcd2.bupa.co.uk/fact\\_sheets/html/mastectomy.html](http://hcd2.bupa.co.uk/fact_sheets/html/mastectomy.html))

### **Materials and methods**

We applied a practical case study on a group of 30 patients hospitalized within the Institute of Oncology - "Ion Chiricuta" in Cluj-Napoca, who had been diagnosed with breast cancer and had been performed Halsted's radical mastectomy. We used a control group of 10 patients who had not received physiotherapy following surgery and 20 patients who received physiotherapy and we divided the group in the following manner: 10 patients who had not received any additional therapy besides the surgical intervention and 10 patients who received chemotherapy.

The physiotherapy procedures applied to patients are based on the physical therapy program of the Canadian Cancer Society- Exercises after Breast Surgery, a guide for women (<http://www.cancer.ca/canada-wide/publications>) and the one recommended by the Oncology Section of the American Physical Therapy Association- developed with assistance from the Oncology Section of the American Physical Therapy Association. (<http://www.cancer.org>). We started the application of the program of functional recovery of the scapulohumeral articulation, on the second day after surgery and having the approval of the surgeon.

## Program

### Exercise 1: Breathing exercise

- Sit or stand in a relaxed position.
- Slowly inhale through your nose, counting to five in your head.
- Let the air out from your mouth, counting to eight in your head as it leaves your lungs.
- Repeat several times

### Exercise 2: Posture (Figure 1)

- Sit in a chair facing straight ahead without resting your back on the chair, or stand up. Your arms should be at your side with your elbows straight and your palms facing your sides.
  - Open your chest, gently squeeze your shoulder blades together, and rotate your thumbs so your palms face forward.
  - Hold for 5 to 10 seconds. Relax and return to the start position.
  - Repeat 5 to 10 times.
- (<http://www.cancer.ca/canada> )

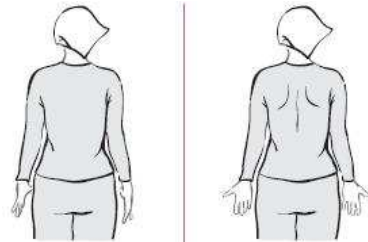


Figure 1.

### Exercise 3: Shoulders shrugs and circles (Figure 2)

- Lift both shoulders up towards your ears. Hold for 5 to 10 seconds and then slowly drop them down and relax. Repeat 5 to 10 times.
  - Gently rotate both shoulders forward and up, and then slowly back and down, making a circle. Switch and repeat in the opposite direction.
  - Repeat 5 to 10 times.
- (<http://www.cancer.ca/canada>)

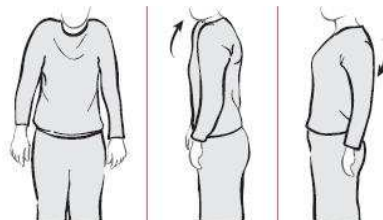


Figure 2.

**Exercise 4: Pump it up (Figure 3)**

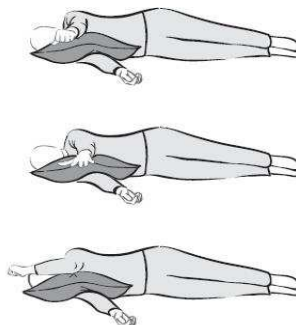
- Try lying on your unaffected side with your affected arm straight out, above the level of your heart (use pillows if you need to).

- Slowly open and close your hand. Repeat 15 to 25 times.

- Then slowly bend and straighten your elbow.

Repeat 15 to 25 times.

(<http://www.cancer.ca/canada> )



**Figure 3.**

**Exercise 5: Wand exercise (Figure 4)**

These exercises should be done on a bed. Lie down on your back with your knees and hips bent and your feet flat.

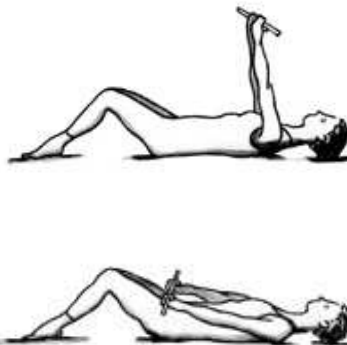
- Hold the wand in both hands with your palms facing up.

- Lift the wand up over your head as far as you can. Use your unaffected arm to help lift the wand until you feel a stretch in your affected arm.

- Hold for 5 seconds.

- Lower arms and repeat 5 to 7 times.

(<http://www.cancer.org> )



**Figure 4.**

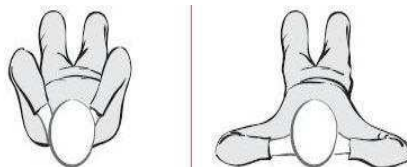
**Exercise 6: winging it (Figure 5)**

- Lie on your back with your knees bent. Clasp your hands behind your neck with your elbows pointed up to the ceiling.

- Move your elbows apart and down to the bed. Hold for 1 to 3 seconds.

Repeat 5 to 10 times.

(<http://www.cancer.ca/canada> )

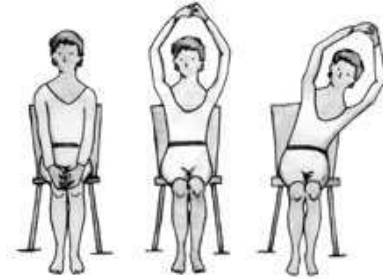


**Figure 5.**



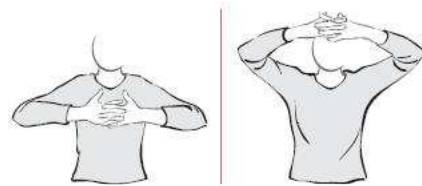
**Exercise 7: Side Bending**  
(Figure 6)

- Clasp your hands together in front of you and lift your arms slowly over your head, straightening your arms.
  - When your arms are over your head, bend your trunk to the right. Bend at your waist and keep your arms overhead.
  - Return to the starting position and bend to the left.
- Repeat 5 to 7 times.  
(<http://www.cancer.org> )



**Figure 6.**

- Exercise 8: Arm lifts** (Figure 7)
- Clasp your hands together in front of your chest. Extend your elbows out.
  - Slowly lift your arms upwards until a gentle stretch is felt.
  - Hold for 1 to 2 seconds and then slowly return to the start position.
- Repeat 5 to 10 times.  
(<http://www.cancer.ca/canada> )



**Figure 7.**

**Exercise 9: Chest wall stretch** (Figure 8)

- Stand facing a corner with your toes about 8 to 10 inches from the corner.
  - Bend your elbows and put your forearms on the wall, one on each side of the corner. Your elbows should be as close to shoulder height as possible.
  - Keep your arms and feet in place and move your chest toward the corner. You will feel a stretch across your chest and shoulders.
  - Return to the starting position and repeat 5 to 7 times.
- (<http://www.cancer.org> )



**Figure 8.**

**Exercise 10:** Shoulder stretch  
(Figure 9)

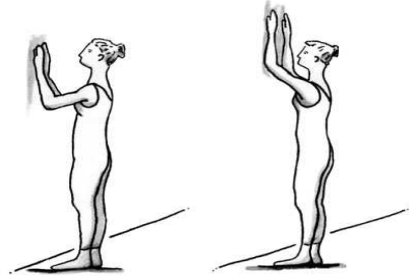
This exercise helps increase the mobility in your shoulder.

- Stand facing the wall with your toes about 8 to 10 inches from the wall.

- Put your hands on the wall. Use your fingers to "climb the wall," reaching as high as you can until you feel a stretch.

- Return to the starting position and repeat 5 to 7 times.

(<http://www.cancer.org> ).



**Figure 9.**

**Results**

At three and six months after the surgical intervention we evaluated the patients. The patients that received physiotherapy (mobility, force exercises and massage) applied at the level of the scapulohumeral articulation in comparison with the ones that received only written suggestions for the exercises, have:

- lower pain percentage
- better mobility
- more strength in the arm and hand
- life quality improvement
- better mental state
- faster resumption of the habitual daily activities
- muscle contracture reduction
- muscle tone improvement
- prevention of the articular stiffness
- amelioration of symptoms caused by vasomotor disorders
- prevention of lymphedema or the early cure of this complication through lymphatic massage and drainage

The global functional tests show that the following movements are being significantly improved: abduction, flexion, extension, internal and external rotation.

The most significant difference can be noticed in the abduction and flexion movement. Therefore, the following average values are achieved:

Movement	Control group: MRM without Physiotherapy	MRM Group + Physiotherapy	MRM Group + Chemotherapy + Physiotherapy
Abduction	125 degrees	168 degrees	162 degrees
Flexion	95 degrees	169 degrees	64 degrees

The average difference between the patients that received chemotherapy and the ones with radical mastectomy, but who followed the physiotherapy program, is 5 degrees; the difference between the patients with physiotherapy and the ones that did not receive the physiotherapy procedures following the surgery is 55 – 60 degree.

### Conclusions

The early mobilization after surgery and the application of physiotherapy procedures helps the rehabilitation of the optimum functionality of the body, the recovery of self-care independence, the regaining of mobility in the affected segment following an immobilization, it prevents the main complications of prolonged immobilization (decubitus eschars, venous thromboses, thromboembolia), it contributes to the amelioration of the symptoms induced by thoracic cavity infections and/or breathing difficulty and lymphedema and also to the amelioration of the state of anxiety by breathing and relaxation exercises.

Oncological patients can show a large category of problems : breathing, neurological, lymphatic, orthopaedic, musculoskeletal and regarding pain; each of these can be solved through physiotherapy.

By the fulfillment of these primary needs, the final result will be the improvement of life quality.

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[http://www.ecancermedicalscience.com/news-insider-news.asp?itemId=533;](http://www.ecancermedicalscience.com/news-insider-news.asp?itemId=533)

## **EXAMINING THE RELATIONSHIPS BETWEEN MOTIVATION AND BEHAVIORAL INTENTIONS THROU PARTICIPATION IN MINI FOOTBALL GAMES IN GREECE**

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**ABSTRACT.** This study examined motivations among mini football players and additionally determined if future behaviour can be predicted by player's motivations. One hundred and sixty one (N=161) football players participated in the study and filled an adjusted version of the Recreational Experience Scale (Manfredo et al., 1996). A principal component analysis of the motivation scale revealed five dimensions: a) Achievement (6 items), b) Escape from daily routine (6 items) c) Fitness (3 items), d) Excitement (3 items) and e) Self-expression (3 items). The regression analysis indicated that the escape and fitness dimensions offered the most significant and powerful contributions to the prediction of behavioural intentions. Statistical significant contributions were also offered by the Achievement and Excitement dimensions. These results are discussed in terms of profiling football players according to their motivations, developing marketing strategies for satisfying their expectations, and building customer loyalty

**Keywords:** Mini football games, motivation, intention for future participation

**REZUMAT.** Examinarea legăturii dintre motivație și intențiile comportamentale prin participarea în jocuri de minifotbal în Grecia. Studiul examinează motivația jucătorilor de minifotbal și a stabilit dacă comportamentul viitor poate fi prezis de motivația jucătorilor. În studiu au fost cuprinși un număr de 161 de jucători de fotbal (N=161) care au completat o versiune a Recreational experience Scale (Manfredo și colab., 1996). Analiza a relevat 5 aspecte: a) realizare (6 itemi), b) evadare din rutina zilnică (6 itemi), condiție fizică (3 itemi), d) emoție (3 itemi) și autoexprimare (3 itemi). Analiza regresiei a arătat că evadare din rutina zilnică și condiția fizică au oferit cei mai puternici factori de predicție a intențiilor comportamentale. Din punct de vedere statistic și realizarea personală și emoția au oferit date semnificative. Aceste rezultate sunt discutate ținând cont de descrierea jucătorilor de fotbal în funcție de motivațiile lor, de dezvoltarea de strategii de marketing pentru satisfacerea speranțelor lor.

**Cuvinte cheie:** Minifotbal, motivație, dorința de participare viitoare

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## Introduction

Academic research on consumer behaviour aspects of team sport recreation activities is still limited (Kemperman, 2000; Lewis & Clacher, 2000). Little is known about the profile of sport recreation players, their expectations, and factors that influence their decision-making. One of the key variables for understanding tourism and leisure behavior is motivation (Alexandris, Kouthouris, Funk & Giovani, 2009; Bansal & Eiselt, 2004; Kurtzman & Zauhar, 2005). Motivation research can help practitioners create psychographic profiles of sport recreation participants.

According to Iso-Ahola (1999), motivation refers to the forces that initiate, direct and sustain human behaviour. Motivation research aims to answer the question of “why” with respect to specific behaviours. In the context of active recreation, motivation has been linked with the construct of “experience”. Recreation experience was viewed as ‘the package or bundle of psychological outcomes desired from a recreation engagement’ (Manfredo, Driver, & Tarant, 1996; p. 189). This simply means that individuals are engaged in recreation activities (e.g., swimming, basketball, trekking) in order to achieve certain psychological outcomes (e.g., stress relief). Based on this notion Manfredo et al. (1996) developed the Recreation Experience Scale. The same authors conducted a meta-analysis of the studies using the RES (1976-1986) and provided evidence for its validity and reliability. The same authors also suggested that since the psychological outcome dimensions covered by the scale are extensive, researchers can determine which ones are applicable in the context of their studies and use shortened versions of the scale (eighteen domains and 108 items). Shorter versions of this scale have been used in other studies (e.g., Kyle, Absher, Hammit, & Cavin, 2006; Alexandris et al. 2009). In the present study we adopted Manfredo’s et al. (1996) approach, using the Recreational Experience Scale. This approach was judged to be the most appropriate, considering the context of the study (mini football court 5X5) and the players (active recreation visitors).

Mini football is well known internationally as 5X5-football. It was presented in America decades ago, where teams with fewer than the normal members, played “football” in grounds of basketball. In England respectively it was presented in the end of ’70. In Greece football in playgrounds of small dimensions 5X5 made his appearance from 1995 and nowadays this sport recreation activity is very popular. At the last ten-year period mini football presented rapid growth primarily in urban centers of Greece. Mini football has acquired a lot of fans as it is easy to be played from a big mass of individuals, it is relatively low cost, it is not addressed only in individuals that have played in the old days football but also in individuals that they like to participate in activities that offer exercise, entertainment and amusement. Participant’s practice their skills, develop their fitness abilities and enjoy the company with other fans. As a recreational activity it is joined by two fivefold or sixfold teams, usually in grounds of dimensions 22x45 meters and is addressed in individuals of all ages and all social and economic

orders. Playgrounds dimensions are differentiated in 6X6, 7X7, 8X8, 9X9 meters, depending on the number participating. Mini football (5X5) constituted a entire leisure industry that trades associated athletic products and services, as athletic equipment and clothing, foodstuffs, amusement of participant members ect. The particular centres of exercising and recreation are not included in certain concrete trade-union, athletic institutions or sport federations. All similar enterprises that offer services of mini football in Greece they are commercial companies without control from equivalents athletic or educational institutions of state. Basic problems that constraint the growth of mini football market in Greece , are related with the small duration of operation because the climatic conditions (cold and heat of proportionally season), the most customers are male and that the particular recreational sport market is not conditioned by concrete legal frame.

The present study aimed to investigate a) motivations of mini football players in Greece and b) test the degree to which behavioural intentions for visiting the mini football court in the future can be predicted by the knowledge of these motivation dimensions.

## **Methodology**

### *Participants and Procedures*

One hundred and sixty one (N=161) adults participated in this research. Data were collected at an open-air sport centre, named 'Arena' , near Kalambaka a small city located in midlands Greece . Two hundred questionnaires were distributed and one hundred sixty one were returned (response rate 72.5%). In terms of the demographic characteristics of the sample, 57 % were Kalambaka residents and 53% were single individuals. In terms of occupation, 16% were students, 33% were private employees, 18% were public employees, 29% business men, and 4% unemployed. Finally, in terms of the age, 21% of the respondents were between 15-24 years old, 29% were between 25 and 34 years old, 34% were between 35 and 44 years old and 16% were older than 45 years old.

### *Instruments*

Motivation was measured with 21 items selected from the Recreation Experience Preference (REP) scale originally developed by Driver (1977, 1983). Manfredo et al. (1996) conducted a meta-analysis of the articles that used REP, and provided evidence for the reliability and validity of the scale. For the purpose of the present study 21 items were selected on the basis of being applicable to team sports (basketball, volleyball, football) activities. Respondents were asked to evaluate the importance of the 21 motives, as driving forces for participating in mini football games, on a seven- point Likert-type scale ranging from "strongly disagree" to "strongly agree".

Behavioral intentions were measured with three items: "I will try to participate in Mondialito mini football games during the next 3 months", "I intent to participate in Mondialito mini football games during the next 3 months" and "I

am convinced that I will participate in Mondialito mini football games during the next 3 months". A five point Likert-type scale ranging from "possible" (5) to "impossible" (1) was used. A composite score was produced for the whole scale. The Cronbach's alpha for this scale was high (.91).

## Results

A principal component analysis was performed on the 21 items of motivation scale. The components with eigenvalues greater than 1.0 were retained and rotated with both orthogonal and oblique rotations. Both methods gave similar results. Orthogonal rotation was retained for conceptual simplicity and ease of description (Tabachnick & Fidell, 1989). The analysis revealed a conceptually clear factor structure. Five factors emerged, which accounted for 62.65% of the variance. None item were dropped. The factors were defined as follows:

Achievement and Skill development (6 items): individuals who scored high on this dimension were driven by learning and improving their football skills and as an opportunity to achieve personal goals and improve their self-esteem

Escape from daily routine (6 items): individuals who scored high on this dimension were driven by the opportunity to rest, escape from urban places and enjoy open air environment.

Fitness (3 items): individuals who scored high on this dimension perceived outdoor activities as an opportunity to improve their physical conditions.

Excitement (3 items): individuals who scored high on this dimension were looking for excitement and high quality football technique.

Tell others (3 items): individuals who scored high on this dimension were driven by the chance to share their experiences with friends.

The values of alpha for the sub-scales were satisfactory, as they ranged from .87 (tell others) to .93 (Achievement and Skills development). The descriptive statistics indicated that the 'Escape from daily routine' and 'Excitement' sub-scales achieved the highest mean scores (5.55 & 4.15, respectively), followed by the 'Fitness' scale (3.83). The results of the principal component analysis, the descriptive statistics of the sub-scales, and the alpha scores are presented in Tables 1, 2.

### *Predicting Intentions from Motivational Factors*

Regression analysis indicated a statistical significant effect ( $F=5.7$ ,  $p<.001$ ,  $R^2 = 3.1$ ). The fitness dimension ( $b= .46$ ,  $t=3.2$ ,  $p<.001$ ) offered the most significant and powerful contribution to the prediction of behavioural intentions, followed by the escape from daily routine dimension ( $b=.34$ ,  $t=2.5$ ,  $p<.01$ ), and the Excitement ( $b=.25$ ,  $t=2.1$ ,  $p<.05$ ) and the Achievement/Skills ( $b=.18$ ,  $t=2.1$ ,  $p<.05$ ) dimensions. The results are presented in Table 3.

## Discussion

The results provided support for the value of collecting consumer behaviour data in mini football context, since they predicted significant amount of variances



in behavioral intentions. In terms of the specific motivation dimensions, the results indicated that fitness related motives are the most important ones in developing football players future participation. The important role of the fitness dimension relates to the characteristics of the mini football sport recreation activity. Since it is an open air playfield, which offers opportunities for active participation in a number of different climate conditions, such as sunshine, hot, cold, wind, rain, or clear from pollution environment, players it as an opportunity to do active recreation, which can bring physical and psychological benefits. Visitors of this specific sport centre also see their visit there as a way to escape from their daily routine and live a different experience. The managers of the sport centre should therefore make any attempt to build the “escape” dimension. They should provide opportunities for visitors/players to feel that they try a new experience in an interesting, exciting and fun environment. The last two dimensions that offered significant contributions were achievement and excitement. Achievement relates to achieving personal goals and meeting football challenges. Once again since the sport centre promotes active recreation, these results mean that visitors/players feel that it is challenging to participate to some of the activities offered and they expect to see personal development and improvement of their football skills. The contribution of the excitement dimension was expected, considering that mini football playfields and the whole sport centre are supposed to offer new experiences for participants, who are built based on the uniqueness, the enjoyment, and the social interaction. Subsequently, the managers should make any effort to persuade visitors/players to participate actively in all the other activities and happenings of the park, like swimming pool, spa, cocktail evening, cine nights ect.

In conclusion, the present study provided evidence for the value of doing consumer behavior research in the settings of sport centers and particular at mini football playgrounds, which is a new area for academic research in the leisure industry. More research is required with the inclusion of more psychological factors such as attitudes, constraints, perceptions, involvement and personality in order to further understand consumer behavior in this setting.

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## **AUTONOMY DURING THE PHYSICAL EDUCATION AND SPORT, IMPORTANT MEAN FOR THE DEVELOPMENT OF THE ANAEROBE EFFORT'S CAPACITY**

**FINICHIU MARIN<sup>1</sup>**

**ABSTRACT.** Autonomy is defined by DEX as representing the situation of the one that does not depend on anyone, that has full liberty for his actions. During the physical education class, autonomy implies respecting certain rules and regulations specific to the domain that assures the efficiency of realized actions. Autonomy can be manifested both in the case of the teaching staff and of the student. The autonomy of the teaching staff implies: the large liberty in choosing the sport branches of which elements will be mastered; choosing the most appropriate (that depend very much on the experience of the teaching staff), means and didactic and organizational methods that can make efficient the instruction process and the creativity during the elaboration and the design of the planning documents. Students' autonomy has been encouraged in the sense of leading certain links from the class, of organizing the motor activity zone, observation and giving the support in the execution of certain physical exercises with high difficulty level, coaching bilateral games from the fundamental part of the class but also of the local or other competitions, etc. In realizing these researches the proper investigation methods have been used among which: the observation method, the questionnaire method, the experimental method and the obtained data processing and interpretation: the statistic-mathematic method and the graphic method. By using these modern methods of education we noticed the increase of the anaerobe effort's capacity during the physical education class and, at the same time, the removal of apathy and the monotony of the physical education and sport classes by increasing the level of active and aware participation level of the students. Measuring the maximum anaerobe power, by the Sargent test, has pointed out the fact that the development of the anaerobe effort's capacity can have at the base the use during the physical education and sport class of the self-organizing capacity, self-leading and self-evaluation of the students.

**Keywords:** autonomy, class, mean, anaerobe effort's capacity.

**REZUMAT.** Autonomia în lecția de educație fizică și sportivă, mijloc important pentru dezvoltarea capacității de efort anaerob. Autonomia este definită de DEX, ca reprezentând situația celui care nu depinde de nimeni, care are deplină

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libertate în acțiunile sale. În cadrul lecțiilor de educație fizică și sportivă, autonomia implică respectarea unor reguli și legități specifice domeniului care asigură eficiența acțiunilor realizate. Autonomia se poate manifesta atât în cazul cadrului didactic, cât și al studentului. Autonomia cadrului didactic presupune: libertate largă în alegerea ramurilor de sport a căror elemente vor fi însușite; alegerea celor mai potrivite (ce depinde foarte multe de experiența cadrului didactic), mijloace și metode didactice și organizatorice ce pot eficientiza procesul de instruire și creativitate în elaborarea și proiectarea documentelor de planificare. Autonomia studenților a fost încurajată în sensul conducerii anumitor verigi din lecție, organizării zonei de activitate motrică, observației și acordarea sprijinului în execuția unor exerciții fizice cu grad sporit de dificultate, arbitrării jocurilor bilaterale din partea fundamentală a lecției, dar și a competițiilor locale sau alte competiții etc. În realizarea acestei cercetări s-au utilizat metode de investigație propriu-zise din care fac parte: metoda observației, metoda măsurătorilor și înregistrărilor, metoda experimentală și metode de prelucrarea și interpretarea datelor recoltate: metoda statistico-matematică și metoda grafică. Prin utilizarea acestei metode moderne de învățământ, s-a constatat creșterea capacității de efort anaerob în lecției de educație fizică și sportivă, dar și totodată înlăturarea apatiei și monotoniei lecțiilor de educație fizică și sportivă prin creșterea gradului de participare activă și conștientă a studenților. Măsurarea puterii maxime anaerobe, prin testul Sargent, a scos în evidență faptul că, dezvoltarea capacității de efort anaerob, poate avea la bază utilizarea în lecția de educație fizică și sportivă a capacităților de autoorganizare, autoconducere și autoevaluare ale studenților.

**Cuvinte cheie:** autonomie, lecție, mijloc, capacitate de efort anaerob

### **Introduction and research objectives**

The more and more often use of cyber net technology, of instruction programming, of audio-visual techniques have made the educational methodology to be more serious, implying the teaching staff in relations more subtle, of more profoundness. The didactic of our days realizes the passing from autocrat relationships, rigid ones to the relationships of a democratic type that allow a higher collaboration and co-working between the teacher and the students, so the students passes from the status of education's object to the one of its subject, reflecting a new position of the students towards the instruction and education process and implicitly the one of the teacher's [Firea, E., 1979, pg.119].

By its specific, physical education is in favor of the implementation of a new report with the common effort teacher-students, through which: the teacher has leading role at the level of the class, so that the students would want to make everything, not to make everything they want to, leading to the increase of his autonomy; the teaching staff is the main factor in the elaboration, programming and leading of the instruction process; the use in a limited manner of the commands; the creation of habitude of the students for the work with a partner, in

groups, in team in order to establish new group relations; students to be accustomed to self-educate himself, to self-organizing; self-evaluating; during the instructive-educational process, the student next to the processing of the instruction content must also collaborate as an active part, in an inventive manner.

All these aspects are translated by applying during the physical education and sport class new orientations and methodological tendencies in the physical education, known as the term of „Autonomy”.

Autonomy is defined by DEX as representing the situation of the one that does not depend on anyone, that has full liberty for his actions. During the physical education class, autonomy implies respecting certain rules and regulations specific to the domain that assures the efficiency of realized actions.

Autonomy can be manifested both in the case of the teaching staff and of the student. The autonomy of the teaching staff implies: the large liberty in choosing the sport branches of which elements will be mastered; choosing the most appropriate (that depend very much on the experience of the teaching staff), means and didactic and organizational methods that can make efficient the instruction process and the creativity during the elaboration and the design of the planning documents.

Students' autonomy has been encouraged in the sense of leading certain links from the class, of organizing the motor activity zone, observation and giving the support in the execution of certain physical exercises with high difficulty level, coaching bilateral games from the fundamental part of the class but also of the local or other competitions, etc.

In realizing this research I have started from accomplishing the following research objectives:

- Realizing an adequate environment so that the student can manifest freely, creatively, to discover, to acquire initiative.
- Choosing and using the most efficient methods and means, necessary to the increase of the maximum anaerobe power, during the physical education and sport.

### **Research hypotheses**

- The increase of physical education's efficiency can be realized by knowing the self-organization, self-leading and self-evaluation capacity of the students.
- The development of the maximum anaerobes power can have at the basis the formation of self-organization, self-leading and self-evaluation capacities of the students.

### **Research procedures and methods**

The research has been developed during the instructive-educational process at the Petroleum and Gas University of Ploiesti and included a number of 5 groups of study second year, with different specialties made of 65 female students and 48 male students, that will have, the most, the age 20 in 2009. The physical education

classes are compulsory in the education program of the first and second years, 2 hours/week (1 module), representing 58 hours/university year. For the good development of the experiment we used proper investigation methods among which – the observation method, the measurements and recording methods, the experimental method and the obtained data processing and interpretation method – the statistic-mathematic method and the graphic method. In October we evaluated, by applying the Sargent Test [Bota, C., 2000, pg. 133], the manifestation level of the maximum anaerobe power – the initial testing. Students, on the basis of a thorough selection across the first year of studies, have been prepared in what concerns the unfolding of the physical education classes on the basis of new orientations and methodological tendencies during the physic education and sport, autonomy. Implementing these modern educational methods, developed across the second year of studies in the university year 2008 - 2009, we followed:

1. From the self-organizing point of view:
  - choosing the sport branches that were involved across the entire university year, taking into account the material conditions of the university's sport base;
  - ordering the material base depending on the requirements of the sport branch for which we have opted for;
  - the structure of the competition calendar for the development of sport competition on a local plan.
2. From the self-leading point of view:
  - leading the 2<sup>nd</sup>, 3<sup>rd</sup> and 5<sup>th</sup> links for the use of means specific to each link and that have included the most efficient means for the adaptation to effort and recovery after effort..
  - coaching competitions, from the fundamental part of the class (when it is the case), of local competitions.
3. From the self-evaluation point of view:
  - the use of self-evaluation in order to satisfy certain individual tendencies – the personal satisfaction, the auto-knowledge need; - obtaining the formative effects by being aware, motivation, development, affective-motivational, will education; respecting the right to an opinion and assuring the evaluation's objectivity.

In June 2009, the 5 groups have been evaluated in order to establish the manifestation level of the maximum anaerobe power – the final testing. The calculus of the maximum anaerobe power have been made on the basis of the formula:  $P = \sqrt{4.95 \times G \times \sqrt{D}}$ ; where **P** = the maximum anaerobe power expressed in kg/s; **G** = corporal weight expressed in kg; **D** = detente expressed in cm; **4,95** = represents a constant. The appreciation scale after Dal Monte (1998):

*Male students:* weak mark <113; satisfying 113-149; medium 150-187; good 188-224; very good >224. *Female students:* weak mark <92; satisfying 92-120; medium 121-151; good 152-182; very good >182. Subjects with ages  $\leq 20$  years.

### Research results and their interpretation

The obtained data processing and interpretation (table 1) has been realized by calculating the arithmetic mean (X), the standard deviation (S), the variability coefficient (Cv%) and the significance of the difference between the means by calculating the „t” [Dragnea, A., 1984, pg. 27].

The calculated arithmetic means (Figure 1) for the two patterns, female students – male students, present us the following situation, according to the appreciation scale of the maximum anaerobe power:

➤ After initial testing, the mean value of the students ( $X = 91.03$ ) represents the „weak” mark; after final testing the mean value of the students ( $X = 98.12$ ) represents the „satisfactory” mark;

➤ After initial testing, the mean value of the students ( $X = 111.33$ ) represents the „weak” mark; after final testing the mean value of the students ( $X = 141.98$ ) represents the „satisfactory” mark

The variability coefficient computed for the two batches, female students – male students, offer us the measure of the degree of homogeneity, which is „high” for both collectives and in both testing.

**Table 1.**

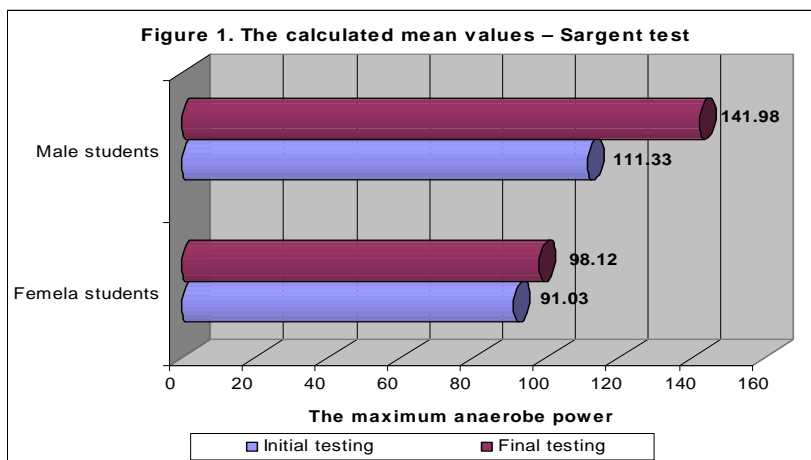
The computed statistical indicators

Statistical Indicators	Female Students		Male Students	
	Initial Testing	Final Testing	Initial Testing	Final Testing
<b>X</b>	<b>91,03</b>	<b>98,12</b>	<b>111,33</b>	<b>141,98</b>
<b>S</b>	<b>7.81</b>	<b>6.47</b>	<b>6.59</b>	<b>6,11</b>
<b>Cv%</b>	<b>8,57%</b>	<b>6,59%</b>	<b>5,91%</b>	<b>4,30%</b>
<b>„t”</b>		<b>5,71</b>		<b>23,75</b>

The computed „t” value,  $t = 5.71$ , is higher than the value of „t” in the tables on the verge of meaning  $p < 0.01$  and so the mean values are significantly different with a trust of 99%, chance acting only in an 1% for the female students batch.

The value of „t” calculated,  $t = 23.75$ , is greater than the value of „t” in the tables on the verge of meaning  $p < 0.01$  and so the means are significantly different with an 99% trust percentage, chance acting only in 1% for the male students batch.

The trust limits are in the value interval of 88,45 – 93,61 of the arithmetic mean for the female students after initial testing representing the trust interval of the mean on the verge of meaning  $p < 0.01$ .



The trust limits are in the value interval of 96,06 – 100,18 of the arithmetic mean for the female students after the final testing representing the trust interval of the mean on the verge of meaning  $p < 0.01$ .

The trust limits are in the value interval of 108,88 – 113,78 of the arithmetic mean for the male students after the initial testing representing the trust interval of the mean on the verge of meaning  $p < 0.01$ .

The trust limits are in the value interval of 139,71 – 144,25 of the arithmetic mean for the male students after the final testing representing the trust interval of the mean on the verge of meaning  $p < 0.01$

### Conclusions

- The use in the physical education and sports class of the capacities of self organization, self leadership and self evaluation of the students, contributes in increasing the physical education and sports classes efficiency.
- The measurement of the maximum anaerobic strength, through the Sargent test, has outlined the fact that, the development of the anaerobic effort capacity can have at its basis the utilizing in the physical education and sports class of the capacities of self organization, self leadership and self evaluation of the students.
- The low value of the maximum anaerobic strength for all the subjects of the batch researched, situated on the appreciation scale, at the „weak” mark.
- The removal of the apathy and the monotony of the physical education and sports lessons and the increase in the degree of active participation and conscience of the students.
- On the basis of these results and own experience, we recommend the increase of the number of classes, for the physical education discipline, with respect to the upper high school cycle.



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## SPORT AND DANCE VERSION OF A LEISURE ACTIVITY: AN INTERDISCIPLINARY APPROACH

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**ABSTRACT.** The leisure activity through jazz music and dance for lyceum students contribute to: involve the interest for practice physical exercise in an organized way and permanent; to stimulate the student for participate active and conscient for the lessons; to stimulate creativity and independent activity and intelligence and motoric memory. To develop artistic sense and rhythmic, to educate special perception and to increase space orientation.

**Keywords:** music, dance, jazz, coreographic structure

**REZUMAT.** Sportul și dansul ca variante de loisir. O abordare interdisciplinară. Activități de loisir prin intermediul muzicii de jazz și a dansului la elevii de liceu prin conținutul cu particularitățile sale, contribuie la: creșterea interesului pentru practicarea exercițiului fizic în mod organizat și permanent, stimularea participării active și conștiente a elevului, stimularea creativității și a activității independente, dezvoltarea inteligenței și memorie motrice, dezvoltarea simțului artistic și perfecționarea simțului ritmic, educarea esteticii corporale, educarea percepțiilor spațiale prin creșterea capacității de orientare în spațiu, etc.

**Cuvinte cheie :** muzică, dans, jazz, structuri coregrafice

Motto: *"Dance is the most beautiful art, because it is not the translation or abstraction of life, it is life itself"*(Havelock Ellis)

**The concept of "music"** The discovery of music is attributed to the Greeks (Apollo, Cadmus, Orpheus, Amfion), and Egyptians (Toth and Osiris). Thousands of years ago, the Chinese had knowledge about a musical system that reached a peak of perfection. Through music, through its various timbre values, through its tonalities and rhythms and through the different instruments that are used, the man

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can participate to the cosmic life. In all civilizations, the most intense acts of the social life are sung in the rhythm of manifestations in which music plays the part of a mediator capable to enlarge, up to the touch of the divine, the communication.

The music represents the science of sounds, considered in terms of melody, rhythm and harmony, and the art that expresses feelings, ideas, mental states in sound art images. Music, in the generic sense, refers to vibration first, then to any arrangement of sounds generated deliberately or not. The definition of music in particular is a controverted subject, but, usually, it is about organized sounds, of temporal nature, associated with a certain degree of rhythm, melody and harmony, than impress the auditory analyzer of beings due to the emotional-affective substrate.

Jazz is a musical style that emerged at the beginning of the XX<sup>th</sup> century in the Southern states of the United States, deriving from the songs of the coloured population, descendant of slaves of African origin. In jazz music, two styles are recognized in particular: blues and ragtime, to which elements of European music are added. Later, the rhythms of Latin-American music were taken in. Jazz is considered to be the first, and until now, the only form of artistic manifestation in the history of the culture that developed in the new world.

**Characteristic elements of jazz:** It is not possible to have a definition that comprises all the characteristic elements of jazz, from its beginnings to our time, that applies to all the styles and all musicians. In its history of over one hundred years, jazz has suffered numerous transformations and divided in different styles, with different meanings, and it is hard to tell what is typical for jazz. We can, however, mention a few elements:

- Tone – in jazz music, unlike traditional European music, the accent is put on expressivity and less on the beauty of sound.
- Improvisation – is perhaps the most typical element in jazz music. Originally sung without notes, the interpreters improvised on different themes and harmonies, individually or alternative in small formations (combos), each having its own style of improvisation, easily recognized.
- Pace – always accompanies the execution of jazz music, which is “ragtime” music. The rhythm offers the music a typical *swing*, sometimes occupying the foreground, leaving the tonality of music and phrasing.
- Blues – belonging to the African-American folklore, characterized by a constant harmonic formula and a four-stroke pace, it is an essential component of jazz music, which offers a certain disposition, in the slow and faster forms.

After being considered a decadent manifestation of the American imperialism in the communist period, starting with the cultural “thaw” in 1964, jazz clubs were opened, on the radio and on television jazz shows were transmitted, Benny Goodman, Louis Armstrong, Woody Herman had concerts in Bucharest. The national Jazz festival from Ploiești (1969-1971), The International Festivals

from Sibiu (from 1974 until now), The International Jazz festival “Richard Oschanitzky” from Iași, The International Jazz festival from Gărdana, etc followed.

**The concept of “dance”:** We think that there is no strict definition of dance. There are some that try to limit dance to a strict specific of steps and patterns, but the true connoisseurs of the phenomenon know that the beauty of dance lies in the continuous adaptation, change and development. New dances and variations continue to be added to those already known. Dance is a social phenomenon due to its mass impact, but also due to the encouragement of interaction between partners. Dance can be defined as an ensemble of rhythmic and diverse movements of the human body, executed in the rhythm of a song and having a religious, art or entertaining meaning.

**The proper and harmonious physical development, basic component of the educational – instructive process** is the result of multiple favorable influences exerted on the human body on a somatic and functional plan during the physical education classes, and especially the consequence of acting deliberately, through exercises with analytical structures and precise influences located at the level of each segment: muscular chain, region or articulation. The physical education in schools acts at ages in which the organism passes an important time in its growth, development and maturization, of organs, apparatus, functions and systems, which are subject to continuous improvement. The proper gait implies maintaining the body and its segments in the right position. The kinesthetic sensations (muscular tonus and the balance created by the contraction of various muscle groups – antagonist, agonist and synergic) are the main factors that contribute to the forming of the proper attitude reflex, through which this is controlled.

Due to its overlapping rhythms, jazz imposes a permanent alternation, equally rhythmic, between the muscle contractions and relaxations. This alternation is imposed by the particularities characteristic to jazz music and by the beat, which possesses a wide variety of rhythms that succeed equally. It represents a new content of movements that are executed „isolated” and „polycentric” with musical accompaniment, which allows the permanent alternation between the contractions and relaxations of all muscle groups, allowing in the same time to perfect rhythmicity and space orientation. These new motion content is available at any age, regardless of the level of motive practice, due to a large possibility of constructing the movements in a simple form and to the stimulant for movement, that the modern music exerts on the youth.

Through this paper we aimed the following:

1. The selection of an accessible motive repertoire from rhythmic gymnastic in a jazz rhythm.
2. Developing the content of some motive models, that would contribute to the increase in interest for practicing physical exercises and would positively

influence certain parameters that define the proper and harmonious development of the body of high school students.

3. The motive content that is specific to gymnastics in jazz rhythm can realize one of the educational - instructive objectives of the chain: "the optimization of harmonious physical development".

4. The specific content of movement accompanied by musical rhythm contributes to the development of rhythmic motivity.

5. Through dance one can develop the aesthetic sense.

The methods of forming the characteristics of similar physical development specific to women are: 1. basic exercises for strength, stretching and relaxation for all the segments of the body; 2. exercises with alternation between the contraction and muscle relaxation; 3. exercises for developing synchronized movements; 4. arching exercises; 5. exercises of facial and motive expressivity. (experience and interpretation)

The optimal model of harmonious physical development in highschool students: they have to reach, in the last two years of highschool, to superior indices of somato-functional development, to master the neuromuscular and psychic reflex for correct corporal attitude in the maintaining of ortostatic positions, sitting or during walking, to perfectly coordonate the respiratory act, including the times when they effectuate moves with high intensity, to selectively relax the scheletic muscles.

For students with mild physical deficiencies, the end of this learning step must represent their remedy or at least their improvement. High school students must have the conscience of their own insufficiencies concerning the physical development and they must own the knowledge and remedy techniques to improve them, especially they must master some complex exercises for harmonious and proper physical development. Also, high school students have to have the habit of practicing with regularity the exercises for physical development.

The gymnastics in jazz rhythms – despite the fact that it has great influences over the proper and harmonious development of the body – it is not used in the lessons of physical education. In this sense we can say that the structures of exercises specific to gymnastics in rhythm of jazz may constitute means of optimizing the physical development in the physical education lessons, and may contribute to the realization of this link of the lesson. Therefore, dance has a complex and multilateral influence on the individual, both from a motive point of view and from a psycho-social point of view. He develops the motive memory required to reproduce structures in the rhythm of the music. He borrows steps that are specific to gymnastics, sometimes even elements of rhythmic gymnastics or acrobatic elements that offer a certain degree of difficulty, spectacular and outlet to the public.

**The dance – factor of knowledge and harmonious physical development of students and way of spending the free time.** Dance represents a factor of knowledge of the informational luggage transmitted by the professor, primarily, but

also the skills and habits transmitted by the group members. Through this activity the following are developed: the cooperation and team spirit, the personality traits, the aesthetic sense, flexibility, mobility and coordination, imagination and creativity, rhythmic sense, self knowledge of personal potential, the desire to affirm oneself.

**The corporal and choreographic language:** choreography is a succession of motive sequences, logically combined, compiling choreographic drawings in the scenic emplacement; the directing of a choreographic moment, considering entering, evolution and exiting the stage. It can be sinusoidal, but must realize a growth of the intensity of movements and feelings, in the end that must be explosive.

The corporal and choreographic language – represents the supreme mean of communication and expression of corporal movement. The corporal attitude, determined by the feelings inspired by the music on which the choreographic act is developed, the mimic and expressivity of movement, define the choreographic language. Through it, the spectator perceives the message transmitted by the dancer and the choreographer. A choreographic moment without a message, without an idea, that can be transmitted to the spectator is ambiguous and without content. Unfortunately, many teachers or choreographers do not take into account this basic principle.

The musical support can be realized from a single piece of music or from a collage, with a different tempo, but energetic in the end. Of course, one cannot exclude a slow beginning and a slow end – like a “remember”. *The choreographic moment can be realized:* with all the members of the group in a synchronized movement, with effects of question – answer type (one part works, while the other one awaits the rejoinder in a static position, after which the roles are reversed); with two groups that work simultaneously to another structure of sequences; with entrances and scene exits of a group, but with a common ending, of great intensity and high emotional charge.

*The content of gymnastics in a rhythm of “jazz”* is comprised from a large variety of analytic movements that exert a selective influence over the musculoskeletal system that comprises isolated movements, opposed polycentric, contractions, stretching and step variations. *Isolated movements* – comprise movements for the body, neck, shoulders, elbows, hip, knee, ankle, vertebral spine, effectuated under the form of swings (balancing), rotations, lifting, descending. *Polycentric movements* are more complex actions simultaneously executed at the level of two or more articulations, for example: shoulders and hip, elbows and knees. *The contractions and stretching* of different segments will be realized in different positions (sitting, lying on the back, sitting and their derivatives), maintaining the contraction for a longer period of time. All these movements can be executed in different plans and direction, in simpler forms or with a certain degree of complexity, depending on the group's level. All the movements from the content of gymnastics in rhythm of jazz can be effectuated from varied initial positions: standing, moving, with the

modification of the height of the weight center on the vertical. Practicing this style, with correct technical execution, favourable influences the increase in mobility at the level of all articulations, the qualitative modification of the muscle flexibility, determining the improvement of rhythmic motivity, of space-time orientation and, in the same time, develops and improves the body's motivity and aesthetic.

**The importance of music:** music, by its optimal excitability of the nervous system, by the increase in receptivity and perceptibility of the auditory analyzer, by its stimulation of the great functions of the organism (breathing and circulation), constitutes an important methodic processes of realization and improvement of a motivity based on a high neuromuscular coordination. It facilitates the proper and rapid formation of complex motive dexterities. The real gymnastics in rhythm of jazz is in close relation with modern music, from it receiving its impulse. There must be a focus on the accompaniment, too. "Live music", due to its spontaneity is preferred over recordings.

A good pianist represents a real support for the teacher, because he or she can maintain the creative interaction between music and movement through provocative accents. Unfortunately, for most cases, the lessons that are presented on "live music" are not possible, using the recordings on audio cassettes, CDs, etc and by other means, the election must be made with caution, taking into consideration the grounding of the group. What characterizes this type of music is the large and varied number of rhythms in the same track. The more overlapping rhythms, the harder it is to find the right movements. Because of this light conception about harmony, diversity and complexity of the rhythms, "modern jazz" and "free jazz" are not recommended for beginner groups, and not only.

The movement underlines the entrance of a certain instrument, emphasizing its effect; so a unitary whole is realized between the sound and the motive action. Music represents, in any type of dance, the support and fundamental motivation of movement, determining the motive, psychometric and spiritual behaviour.

### **The motive content specific to gymnastics in rhythm of jazz**

The structures of exercises characteristic of gymnastics in rhythm of jazz are developed on the basis of analytic movements, that exert a certain selective influence, looking to enlarge the capacity of contraction and relaxation of the muscle, the strengthening and growth of the mobility of articulations, the flexibility and their elasticity.

These exercises combined with adequate music "jazz" have a great popularity between young people, considering the fact that it represents something new, something that has not yet been studied from the motive structures' point of view, and of musical illustration, too; being perceived as positive.

*The main characteristics of this group of exercises are:* - a great variety of exercises, the learning of different positions and movements, components of structures

of exercises, being connected in endless combinations, offering the possibility of elaborating a great variety of exercises; - the possibility to selective act on the body, to dose and locate the precise influence of the exercise, widening their sphere of applicability; due to the analytic character of the exercise it is possible to precisely lead the influences; - the education of motivitz and capacitz to multilateral master the musculoskeletal system; the education of the aesthetic sense – the education of correctitude and precision of movement, the capacity of space orientation and balance, the forming of the aesthetic sense; - the possibility to increase the influence of effort, especially due to the complexity without eliminating the possibility of dosing, using the other components (volume and intensity). The main criterion in choosing and using the structure of exercises in gymnastics in rhythm of jazz in order to achieve the purpose is: the modernization of the content and methodology of the third chain of the lesson and the acknowledgment of its influence over the students' bodies.

**Movements specific to jazz: Isolated movements:** through these movements we understand the movements of different parts of the human body. The whole technique of gymnastics in rhythm of jazz is based on these isolated movements; they contribute to the increase of the body's mobility. In gymnastics in dance rhythm, the body does not participate to the movement as a whole, but it uses the mobility of all its component parts. If the opposites move independently from one another, we talk about polycentric movements. In different competitions, isolated movements are consciously used as special means of expression.

**Opposing movements:** in these movements two parts of the body move one towards the other. For example: the right shoulder turns to the left hip or the left arm is taken to the right foot. Opposing movements can be distinguished by the degree of straining. For example: the right shoulder is turned relaxed in front, but the left hip rises with all the muscles of the leg in tension, and so, only the tip of the leg touches the ground. Opposing movements are used for relaxation and straining of muscles and to make the isolated movements more intense.

**Contradictory movements:** one part of the body moves towards another part of the body that is static. These movements are done from standing or lying positions and are usually followed by fast turns. Example 1: a fast overturn of the upper body to the right or left hip with immobile arms. Example 2: from the position of lying on the back, with the knees bent, the knees "topple" on one side, followed by a quick turn of the head, the knees remain bent.

**Movements of contractions (straining and relaxation):** through straining we understand the contraction of the muscles. In modern dance and jazz dance they have a great importance, through these we understand the changing from a



relaxation position to a straining position, by contracting the abdominal muscles and rounding of the back. At these movements, which start from the pelvis, the entire spine participates.

*The contractions are closely related to breathing.* These movements can be done standing, lying on the back or on the front. The contraction must be exercised a lot; they contribute to the increase of safety and represent one of the most important means of expression.

*Straining or contractions* may have different degrees of intensity. One can strain certain parts of the body or the entire body; they can be done standing, lying, sitting or moving, on a short or long term. As a mean of expression they are frequently associated with pulling.

**The stretching of the entire body:** legs spread, on the tips, arms lifted up (or inclined up) and stretched to the tips of the fingers. *Partial stretching:* legs spread, knees bent, arms lifted up, bent or sideways. Besides these characteristic movements, there are other means of expression like the sudden change of position and direction of the body. These changes in position and direction can be executed through fast turns of 90, 180 or 360 degrees, alternating crouch positions and standing through contraction and relaxation. In the following, we will present the technical terms for the initial positions, for posture and for motive actions: 1. **Standing with variants:** standing close, standing spread, standing lunge (forward or sideways – right, left), standing on the sole or on the tips. 2. **Balance positions:** balance on one foot, balance on one knee. 3. **Sitting:** sitting on the knees, sitting with the legs stretched forward, sitting with the legs spread, sitting, support on the palms, with the legs (close or spread) lifted to different angles from the ground, sitting on the calf with the knees close, sitting on the calf with the knees bent, with one leg in front of the body, and the other one in the back, sitting with the legs crossed, sitting with the soles stucked (butterfly). 4. **Crouched:** crouched on the tips, crouched on the entire sole. 5. **Lying:** lying on the back, lying on the front, lying on one side. 6. **Position of arms:** by the side of the body, in front at 90 degrees, sideways, up, oblique up, oblique down, in diagonal. To the arms' position there are derivations: arms stretched, bent, rounded, with the palms in the extension of the forearm, with the palms turned in pronation or supination, with the fingers stretched and close, with the fingers stretched and spread, relaxed or contracted, closed in a fist. The movements of the arms can be characterized by *plans*: in a frontal plan, sagital, transversal or eights (transversal or sagital); *acting mode*: with one arm, with both arms, simultaneously – with both arms in the same time (in the same direction or in different directions); alternatively – with both arms on turn (in the same direction or in different directions). *The segment that is in action*: the palm, the forearm, the arm, *the type of movement*: flexion – extension, pronation – supination, lifting – descending (abduction - adduction), turnings.

**Proposals:** 1. Considering the accesibility and the variety of movement structures in the rhythm of jazz that act over all the segments of the body, we propose that the elaborated structures to be applied in the lessons of physical education in the high school education, according to the algorithmic programme.

2. To assure a proper understanding of practicing these exercises, for realizing the increase of the parameters of harmonious physical development the following premises are needed: the selection of these means that shoul efficiently act on all the segments of the body, the establishment of a succession of means, which should ensure the alternative solicitation of different muscle groups, using these means, gradually and differentially, according to their difficulty and the componence of the group, the proposed means for each chain and the number of repetitions, to respond to the instructive-educative objectives of these link chains.

3. After mastering the basic technical elements and different structures it is indicated to realize new structures, that should solicitate the creative participation of the group, developing the creativity of each student.

4. The execution of motion structures must be preceeded by a short program of warming all the muscle groups, which can be made during the second chain link, or it can be the objective of the third chain link.

5. The musical pieces that will be used must apply to the following criteria: to containa melodic line, that shoul impulsionate movement, to be arranged equally, to contain different rhythms in equal alternation, with accents on strokes 1 and 3 or 2 and 4, to present variety in tempo and intensity.

6. Gymnastics in rhythm of jazz can be mastered and practiced by all the youth, no matter the tehcnical level of their preparation. They must respect and take into account the characteristics of age, sex and the level of preparation of the group in the realization of a choreographic moment.

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## THE FENCING LIFE ON THE FERENCZ JÓZSEF UNIVERSITY

KILYÉNI ANDRÁS

**ABSTRACT.** After the foundation of the University of Cluj in 1872, the students of the institution claimed the right to fencing as a form of exercise. Since this could not be solved within the frameworks of the university, for training the students attended the Gymnastics and Fencing Club founded in 1872, the new Gymnastics Hall of which had just been finished. After the foundation of the Athletic Club of Cluj in 1884, the fencing activities took place within the frameworks of this association until 1891.

**Keywords:** The University of Cluj, The Gymnastics and Fencing Club, The Athletic Club of Cluj, Mihály Kővári , Lajos Vermes, University Athletics Club of Cluj, Sándor Posta

**REZUMAT.** După înființarea din 1872 a universității din Cluj, studenții au simțit nevoia de mai multă mișcare, în special a antrenamentelor de scrimă. Organizarea acestor antrenamente în cadrul universității nu era posibilă, din acest motiv studenții s-au înscris în Clubul de Gimnastică și Scrimă (înființat în 1872), care în acea perioadă a inaugurat o sală nouă de sport. După înființarea în 1884 a Clubului Athletic din Cluj antrenamentele de scrimă au fost organizate în cadrul acestui club până în 1891. În viața sportivă universitară clujeana anul 1896 reprezintă începutul unei noi ere. Lajos Vermes a fost numit în funcția de profesor de gimnastică și scrimă a universității clujene. Vermes a reorganizat predarea scrimei, iar în 1902 a înființat Clubul Athletic Universitar din Cluj. În cadrul clubului s-au evidențiat scrimeri renumiți, cum ar fi Sándor Posta, sportivul care, după plecarea din Cluj, a câștigat pentru Ungaria medalia olimpică de aur în proba de sabie la jocurile olimpice din 1924.

**Cuvinte cheie:** Universitatea din Cluj, Clubul de Ginastică și Scrimă, Clubul Athletic din Cluj, Mihály Kővári, Lajos Vermes, Clubul Athletic Universitar din Cluj, Sándor Posta

From the point of view of the university sports life in Cluj, the year 1896, when Lajos Vermes was appointed gymnastics and fencing master at the Ferencz József University, can be considered a milestone. Vermes re-organized the fencing life of the university, and in 1902 he founded the University Athletics Club of Cluj, which trained numerous famous fencers at the beginning of the 1900s. Sandor Posta, who in 1924, after leaving Cluj won Olympic gold medal for Hungary in sword competition, is the most outstanding of all.

### **The University of Cluj**

The idea of founding a university in Transylvania first arose in the 1840s, but after the suppression of the Revolution of 1848 the foundation of the university was canceled. In the following years series of Academies of Law were founded in Transylvania (Sibiu, Oradea, Cluj).

After the Conciliation of 1867 it became obvious that there aren't enough universities in Hungary. In Cluj there were two colleges (The Medico-surgical Educational Institution and The Royal Academy of Law) and three prestigious religious educational institutions (the catholic, the reformed and the unitarian high schools), besides which the Transylvanian Museum Society (TMS) founded in 1859 disposed of a serious library and collections. Besides, Transylvania was far from the capital, so the need for a university was the greatest here.

On 7th April, 1870 The Minister of National Education presented his Bill in front of the House of Representatives. But the passing of the Bill was postponed until 1872 due to the unexpected death of Eötvös: the king sanctioned the foundation article on 12th October.

The new university started with four faculties: Law and Political Science, Medicine, Philology, Linguistics and History and Mathematics and Science. Teacher training institutions were assigned to the Philology and Mathematics Faculties, as well. The teachers took the oath on 19<sup>th</sup> October, 1872. Áront Berde, professor of law was elected to be the first rector. 158 students enlisted in the 1872/73 school year.<sup>1</sup>

### **The Gymnastics and Fencing Club**

Dr. Károly Haller, the later mayor of the town, as a young teacher (in 1867) attracted attention, that in Cluj needs for a sport club, where different sports – first of all fencing and gymnastics – can be practiced both by the younger and the older generations as well. This room would solve the fencing school's problem – lack of place and professional trainers –, it would offer a place for the local schools to make sports in an organized way, and people with health problems could strengthen their bodies.

His message was first received by the young, but in spite of all support five years had to pass, until shares had been issued, and the necessary financial means were together for their plan. Meanwhile Dr. Haller was popularizing his ideas, and he was preparing concrete plans how to organize the building. Seeing that the students and the citizens of the town are supporting the idea, many wanted to profit from it. István Kuskó remembers them like this: *everyone had some land to sell, many wanted to profit from the plan, from its building, until the club was built up by Balázs Debreczeni's company.*<sup>2</sup> In 1872, 378 shares were issued, each worth of

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<sup>1</sup> Gaal György, *The University in the Farkas Street, Cluj*, 2002, 38-46

<sup>2</sup> Kuskó István, *Dr. Haller Károly's album*, Cluj, 1906, 154.

100 forints, and in the field donated by the town's superiors, in the Széchenyi square (today Mihai Viteazu square), they built up the new, modern gymnastics and fencing club, which became the first sport center of Cluj. The building was demolished at the end of the 30s by the actual city council.

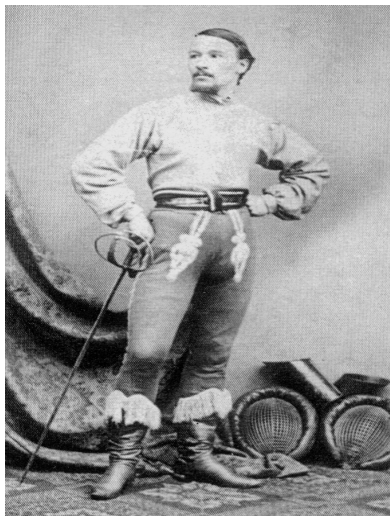


**The old Széchenyi Square (nowadays Mihai Viteazul Square), with the Gymnastics and Fencing Club's Gym**

In the new building, the Fencing and Gymnastics' Association held his first meeting on the 18th of December, in 1873, where many 'friends' of sport were present. The meeting was led by Lajos Felméri; they discussed and voted the rules of the new association, and elected the new officials. The admiral (the president of the association) became Dr. Lajos Jósika, the commanding officer Mihály Kővári and Lajos Felméri, the treasurer Pál Deák, the lieutenants Mór Nagy and Károly Békéssy, foremen Lajos Nyárádi and Mihály Tompa. Between the heads of the school we can find Dr. Győző Concha as well, the professor of law at the University of Cluj, who was also a great lover of sports.

The new association was greeted by the local press as well. The 'Hungarian Civil' in its number from 1873 at the 21st of December said about the aims of the association: *between the members of the gymnastics and fencing club from Cluj the spirit of partnership and its maintenance by the development of*

*fencing and gymnastics.*<sup>3</sup> The author of the article gave voice to his hope, that the young people will profit from these occasions to practice sports.



**Mihály Tompa**

The high schools for boys from Cluj (The Roman Catholic, the Reformed and the Unitarian High schools, The Civic Boy's Gymnasium, and the Teacher Trainer School for Boys) signed a contract with the club for the regular teaching of gymnastics. In this contract it was drafted that for a given amount of money the fencing school had to provide room and teacher. In the club the gymnastics classes were held by Lajos Nyárádi and fencing was taught by the lawyer Mihály Tompa. The famous Hungarian thruster, Lajos Chappon, after he had moved to Cluj, was asked by the association to be the thruster of the school as well, so until Chappon's death they taught fencing in turns with Tompa at the association. The students from the university were also fencing in this club.

On the first floor of the building, finalized in 1873, was functioning the historical and relic museum of the 1848 Revolution, the rooms of which, after the First World War came into the possession of the Romanian Ethnographical Museum. The building was demolished in the 1930's, nowadays in its place stands the city market.

In the institution there were regular gymnastic classes until the middle of the 1890's, when the building of gyms started in the whole town, so each school hired its own so called sport teacher and they broke their contracts with the gymnastics and fencing club. In spite of this, during 20 years, the students gathered unforgettable memories at the classes in the institution, at competitions and at the shows held at the end of each school year. The baron Dr. Emil Petrichevich-Horváth as a member of the Parliament in 1926 related about the sport life of the Piarist secondary-school: *I don't have many memories about the first year. We have learned, practiced sports, have fought mostly with the students of the Unitarian secondary-school. Not because we had any particular problems with them, simply because they were in our way as we were going to fencing or gymnastic classes to the club. The silent Bolyai or the Görbeszappany streets were the perfect locations for these small occasional fights.*<sup>4</sup>

<sup>3</sup> Magyar Polgár (Hungarian Civil), 21<sup>st</sup> December 1873

<sup>4</sup> Dr. György Lajos, The Graduate Looks Back, Cluj, 1926, 142.

In January 1897 in court of the club a skating rink was made, following the model of the Reformed High School, so that the young people could have the opportunity to skate as cheap as possible (few of the students could afford themselves to skate in the Central Park of the town). Lajos Vermes, the academic thruster, made a plan for the teaching of children and students.

Quoting from Ödön Adorján's memoirs: *the building of the gymnastics and fencing club is between my pleasant memories. The building was at the Mihai Viteazul (Széchenyi in Hungarian) square, where the market is now, and the first coliseum of Cluj. How much have I waited to become a secondary-school student, so that I could go there to do gymnastics. How wistfully was I looking at the students of the Reformed or Unitarian High school, going there in lines. I have spent many good times of my youth in this building, in the summer I was going there to play tennis, and in the winter to ice-skate.*<sup>5</sup>

So the club wasn't only a place provided only for the schools or the sport association, it was open for any person willing to take exercise, and thanks to the very good teachers it made sport and games attractive. In the next articles I will present some of those sport teachers, who were the pioneers of the modern physical training in school, and because of their savvy and their love for their students, they have remained in the soul of their students for ever.

### **Fencing in the Athletic Club of Cluj**

In the Athletic Club of Cluj (ACC), founded in 1885, the fencers were forming a separate group. At the beginning most of the sportsmen were practicing fencing as a winter sport, the association could use the building of the club for 10 forints per month. The group of sword and dirk fencers was led by Zoltán Páska, and they had regular trainings twice a week, on Mondays and Thursdays.<sup>6</sup>

Beginning with 1888 they have organized regularly competitions as well in both fields. The first encounter took place on the 12th of May in 1888, having the winner with the sword Jenő Tiltscher and with the dirk Árpád Kemény. The importance of fencing was highlighted by many important men. Lajos Felméri said that *the usage of the dirk and of the sword makes the body feel light, elegant and gives a feeling of wellbeing, and while it gives to the face and body the look of intelligence, it teaches forbearance, self-control, and controls the temperamental self.*<sup>7</sup> István Kuszko praised this sport in the third annual of the KAC: *in this room has cleared in the soul of the young people the notion of chivalry and this feeling grew in them.*<sup>8</sup>

In the winter period the fencing trainings enjoyed a great popularity, having been led by Ferenc Kövári in the 1880s. The contemporary newspaper articles noted that the interest towards fencing has never been so great, as lately. In

<sup>5</sup> Adorján Ödön's memories – the Reformed High school keeps the manuscript.

<sup>6</sup> 1<sup>st</sup> Annual of the Athletic Club of Cluj. Cluj, 1886, 30-31.

<sup>7</sup> 2<sup>nd</sup> Annual of the Athletic Club of Cluj. Cluj, 1888, 28-34.

<sup>8</sup> 3<sup>rd</sup> Annual of the Athletic Club of Cluj, Cluj, 1890, 8-10.





**The fencers of the Athletic Club of Cluj**

this the great merit is to be given to the thruster, Mihály Kővári, who by handling beautifully the sword and with marvelous patience was initiating his students into the secrets of fencing. Kővári introduced into his trainings the fencing sessions in teams, which had a great success between the fencers.



**Mihály Kővári**

The contemporary press wrote about this that on Mondays the thruster used to organize 'multitudinous fencings'. The twelve fencers were divided in two groups, everyone had on his chest a heart shaped white paper and the ends of the swords were merged into black paint. Whose 'heart' was stabbed with the black sword had to get out from the team, as a 'dead' man. The hard battle lasted even for 45 minutes – says about the process the reporter of the 'Ellenzék'.

Kővári used to organize team activities on other days as well. This kind of exercise was the one, when at first two fencers had attacked one, and then three attacked two. Who was 'stabbed' had to leave the fight. The thruster has soon observed that fencing in teams gives more pleasure to the beginners and to the advanced students as well. Besides this the fencer can learn how to defend himself when he is attacked from more sides.

The exercise named the castle fencing had also a great success, which was usually organized on Saturdays. The fencers, from their desks, made a closed square in the center of the room; this was the castle, defended by the four oldest fencers. The castle was assaulted from the outside by 10-16 offenders in turns, until they could stab the ‘white hearts’ of the four defenders. When the four defenders ‘died’ other four could take their places.

During the trainings and competitions Mihály Kővári emphasized the teaching of the rules of chivalry, which had to be applied during the trainings but in the real life as well. The thruster and the sport men from Cluj were proud, that in the town instead of the inefficient duels the young people took part on fencing trainings and competitions, which is fit to the chivalrous men.

### Fencing in the University Athletics Club of Cluj



**Lajos Vermes**

In 1896 the University of Cluj had announced that they are hiring a gymnastic teacher and thruster at the university level, this job being occupied by Lajos Vermes, the famous sport man. His first measure was to restart the decaying fencing life. He had started to organize trainings and later from 1898, he invited regularly the famous thruster, Frederico Giroladini. Vermes and Giroladini used to organize many activities on which students and thrusters could learn and show their talents as well. On these ‘academies’ could meet the fencers familiar with Hungarian and Italian fencing schools, and they were regularly taking part on different competitions. On these academies were discovered great talents as Béla Garzó and József Bagaméry, who became thrusters later.<sup>9</sup>

Vermes realized soon that the decaying ACC is not convenient for the university sport life and he was promoting the idea of the foundation of a university sport club in Cluj as well, following the example of the University Athletics Club from Budapest. For the good of this in May 1901 he organized a university athletic competition. In spite of the fact that just a few sport men took part on it, after the competition the supporters of athletics realized, that Vermes was right and in 1902 the University Athletics Club of Cluj (KEAC)

<sup>9</sup> Killyéni A., Sallai A., Kovács Hont I., Illustrated History of the Fencing in Cluj, Cluj, 2009, 31.

was founded, which was the third academic sport club from Hungary, and which had defined for a long period the sport life from Transylvania.<sup>10</sup>



**Sándor Posta**

After Lajos Vermes' retirement, in 1904 László Gerentsér, the famous Hungarian athlete became the trainer of modern sports and the teacher of Italian fencing at the university of Cluj. He has been teaching in our town until 1907, when he got his PhD degree too. When he left he had behind him a very good fencing team at the university, which from 1911 was trained by Gusztáv Tornanoczy. This was the period when the strongest fencing team, before the I World War, was made: Andor Repecy, Sándor Posta, Dr. Marcell Fischer and József Száva, and by 1911 they have won at a national competition.<sup>11</sup> Posta was one of the best fencers from the university, whose talent was famous by now. At the end of the I WW he left Cluj and a few years later, in 1924 he won the golden medal at Olympic Games from Paris.

The first century of fencing at Cluj has defined the development of sport life, the then founded fencing schools are important steps in the history of Cluj's sport life. Fencing has a 190 years tradition in Cluj, where after the I World War as well brilliant sportsmen have activated, from which many – the older Béla Guráth, Mihály Kökösy, János Szántai, Zoltán Uray, the younger Béla Guráth, László Rohonyi, Pál Szabó, János Pap, from the ladies Olga Orbán (with silver medal), Katalin Orb – had good results at the Olympic Games, making the name of the fencing school from Cluj even more famous.

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<sup>10</sup> Killyéni András, Biographical collection of the sports life of Cluj (1818-1918), Cluj, 2006, 20-21.

<sup>11</sup> Ellenzék (Opposition), 27<sup>th</sup> November 1911

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1<sup>st</sup> Annual of the Athletic Club of Cluj (1886). Cluj

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## THE TRUNK AND ITS IMPORTANCE IN CHILDREN'S NEUROLOGICAL – REHABILITATION

MOGA BOGDAN\*, CORETCHI ANAMARIA, CĂTINAS ROXANA

**ABSTRACT.** Present study desires to present the role of the trunk not just of the limbs in the context of different clinical diseases of the neuropsychiatric field. Subjects presented in the study are children with cerebral palsy compared with normally developed children. The study proceeds from **observation**. For better success in rehabilitation, we have to approach the trunk, not just the limbs; through the trunk we shall reach to the limbs. Human body movements are determined by muscle chains with origins leaving from the spinal column across the girdle towards the limbs. If the alignment and functionality of the spinal column, as well as those of the girdle are incorrect, the muscle chain leaving from the spinal column towards the limbs will not be able to correct abnormal or pathological types.

**Keywords:** spinal column, pelvic girdle, scapular girdle; plan, axis; pediatric neurology rehabilitation

**REZUMAT. Trunchiul și importanța lui în recuperarea copilului cu patologie neurologică.** Prin lucrarea de față se dorește să se abordeze trunchiul și nu doar membrele în cadrul diferitelor tablouri clinice din domeniul neuro-pediatric. Toate tratatele explică cum și câte membre sunt afectate în diferitele patologii din cadrul paralizii cerebrale. Cazurile expuse în lucrare sunt copii cu diferite forme de paralizii cerebrale comparate cu cazuri normale. Lucrarea se bazează pe **observație** prin comparare. Se prezintă pe etape de vârstă posturile și mișcările generate din ele, unde se urmărește trunchiul cu: coloana vertebrală, centurile scapulară și pelviană din punct de vedere biomecanic. Pentru un mai bun succes în recuperare trebuie abordat și trunchiul, nu doar membrele, prin intermediul trunchiului ajungându-se la extremități. Mișcările corpului omenesc sunt determinate de lanțurile musculare cu origini ce pleacă de pe coloană prin centuri spre membre. Dacă nu se corectează aliniamentul coloanei vertebrale și funcționalitatea ei și a centurilor, lanțurile musculare ce pleacă de la coloana vertebrală spre membre, nu vor reuși să corecteze modelele anormale sau patologice.

**Cuvinte cheie:** coloana vertebrală, bazinul, centura scapulară; Biomecanică Recuperare

### Study Motivation

Usually, romanian neuropsychiatric books, especially in the field of cerebral palsy, treat the subjects of tetraparesis, hemiparesis, diparesis, mono - and triparesis,

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and too little or not at all that of the trunk. All books explain how and how many limbs are affected by different neurological pathology in children with cerebral palsy.

But one must not forget, that the limbs are just an extension of the human body. The trunk must be seen like a house's foundation.

### **Objective**

This study desires to present the trunk's biomechanics in children with neurological pathology, here we will present the trunk's biomechanics in static posture and in dynamic movement.

### **Method and Work**

Subjects presented in the study are children with cerebral palsy and normally developed children.

The study proceeds from observations made on normal development and on pathological models in kids. I shall present at the stage of age: position and movement (proceed from position), some of them - not all, the most representative position and movement from a physiotherapeutic view point. All suckling positions and movements in the first year of life correspond, from the biomechanics point of view, with cases that will be presented below. Here I follow at trunk level: spinal column, pelvic girdle, shoulder girdle, center of gravity, plan and axis. By this comparative manner between normal models and pathological models, I try to explain, from a physiotherapeutic viewpoint, the difficulty in movement and abnormal position in pathological cases. Within the contents of this study I shall spotlight: the spinal column and pelvis, in particular, but also the shoulder girdle, pelvic girdle, girdle axis, and the abnormal curvature of the spinal column and any positioning of these structures that are other than physiological. I will first spotlight possible body movements of the spine when it is in a physiological position, and then I shall try to explain them at pathological type, emphasizing on the origin of the mistakes in movement.

Also this study will refer to how changes in the center of gravity influence movement, leading to the appearance of alterations in the type of movement. The study contains a presentation of neurological development at almost every stage: correct and pathological models beginning with the first month of life, and all the way to the age when children obtain that model of coordinated walk. Within the contents of the study I present representative pictures of the normal type, as well as of the abnormal or pathological type of development, together with pictures of the therapeutic approach. Because the first three months are not representative from the view point of biomechanical positioning and movement I will not insist on this period. In the first semester of the first year, a suckling in supine position or prone position lies in a lop-sided global position while his movements are aimless.

But starting with the third month of life, the suckling adopts a symmetrical position



**Img. 1.** *Symmetrical position of girdle in supine position*



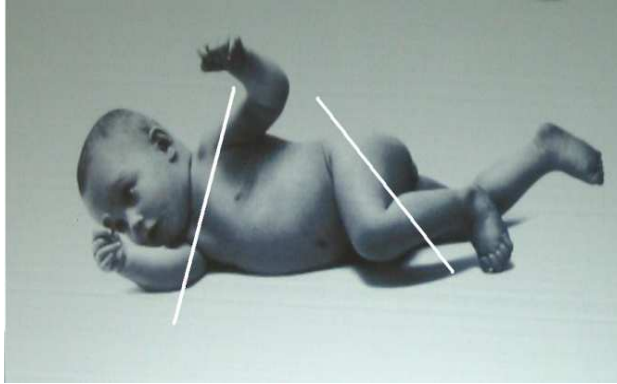
**Img. 2.** *prone position girdle are parallel spine are perpendicular on it*

As can be seen in these two images, the shoulder girdle and pelvic girdle are parallel, and the spinal column is found perpendicular to them. In this symmetrical position, the spinal column is found to be stretched out, an important aspect that allows for maximal movement in the spinal column, meaning therefore great mobility in the trunk. Here an important role is played by the rotation in the spinal column, which imparts rotation onto the trunk, leading to coordinated movement, starting from this position. Typical for this 3 month position is stability. It is achieved by raising the legs from the support surface towards the abdomen thus moving the center of gravity cranially. Now, the spinal column is stretched and the entire back “sticks“ onto the support surface.

The following motor development stage which I want to present is **rolling** from supine position to prone position. In the case of normal development this motor activity is coordinated, meaning that the lower extremities work differently, one bending while the other extends when the child reaches the side position during the rolling movement. If at the beginning of the rolling activity the child is found in a symmetrical position with the two girdle axes parallel, as the child rolls from supine position towards one side the girdle axes become trapezoidal in form.

Because the support points of gravity are on the homolateral side (when child is one side lay during this rolling) the muscle chains alter girdle axes thus: at shoulder girdle the axis moves cranial, and at the pelvic girdle the axis moves caudal (see image 3)





**Img. 3.** *Girdle axis build an trapezoidal form in rolling process*



**Img. 4.** *Uncoordinated rolling, both lower limbs are extending*



**Img. 5.** *Spine rotation is change with lateral flexion of trunk*

If normal motor development shows a convexity curvature at the entire level of the spinal column, this being minimal and still allowing for vertebral rotation in the transversal plan, rolling is coordinated; in neurological disease states (CP) rolling is uncoordinated or occurs in a pathological way. In this situation a hyper convexity curvature can be observed at the spinal column, which limits or obstructs vertebral rotation while the trunk works “on block”.

Images 4 and 5 portray this uncoordinated model of rolling (pathological) in which the lower extremity is found extended throughout the entire time.



Next stage of development: **sitting**. Image 6 shows a normally developed child in sitting position. Here the girdle axes are parallel and the spinal column is perpendicular to them and stretched. The following picture (image 7) displays a child with hemiparesis in static position. Notice that the girdle axes are not parallel. This is not a normal situation we meet it in pathology. In the next picture (image 8) a hyper curvature in the sagittal plane is shown, of a child with spastic diparesis. The last two cases present a single pathologic model, which limits or obstructs movement in the sitting position, making it difficult to sit up from supine position, or to sit up to one side (right or left depending on which side is paretic), and decreasing sitting stability.



**Img. 6.** *Normal sitting position*



**Img. 7.** *Asymmetrical position of girdle in sitting at hemiparesis*

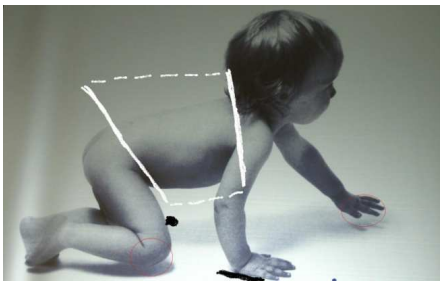


**Img. 8.** *Hyper curvature in sagittal plan with pelvic girdle axis in dorsal extension, at diparesis*

Next stage, which I will present: **crawling**.

In normal motor development, the crawl is performed in a coordinated model from the beginning, meaning that there are two diagonals which work differently. One diagonal includes a lower extremity from one side + an upper extremity from the other side of the body. These two extremities perform the same movement, while the other two extremities - of the opposite diagonal - support the body's weight on them. This is shown in image 9, where we can see two extremities in dynamic action and two that are used for support. Looking at the girdle axes, because the child is involved in a dynamic action (crawling) they are not in parallel, making for an asymmetrical position. Girdle axes (pelvic and shoulder) build a trapezoidal form with the lateral edge of the trunk. Next picture, image 10, presents a pathological type of crawling.

It shows uncoordinated crawling at a child with spastic diplegia, where girdle axes are parallel, in spite of performing a dynamic action. There is no one diagonal extremity movement.



**Img. 9.** *Four point crawling describe an trapezoidal form of those 2 girdle axis, normal situation*



**Img. 10.** *Girdle axis are parallel in homolog crawling at diparesis*

As a last example I discuss the **coordinated walk**.

From the beginning of the first alone step, walking is not coordinated, girdle axes are found in a parallel position. However, starting with 18 months of age a coordinated model of walking appears: hand –opposite leg. Now the girdle axes are positioned asymmetrically, thus forming that trapezoidal shape with the lateral edge of the trunk. Spinal column is found to be stretched, allowing for maximal rotation at vertebral joints, which is translated into a maximal rotation at the thoraco-lumbar level. The resulting opposite rotation of shoulder girdle and pelvic girdle influences extremity movement and a coordinated type of walking is achieved. This can be seen in image 11.

Image 12 presents an uncoordinated type of walk by a child with spastic diplegia.

This picture illustrates this walk. The trunk is in lateral flexion, the spinal column in hyper extension, while both arms are being extended. Why does a child with spastic diplegia perform this walk? Because lower extremity muscles are spastic, thus pulling the pelvis in a ventral flexion, followed by a hyper extension in the spinal column. This

hyper extension obstructs or limits vertebral rotation at thoraco-lumbar level and girdle rotation is no longer possible.

The two girdle axes are shown in parallel here (normal just in static position), and the spinal column in left convex curvature. Whenever a hyper curvature is present in the spinal column (a curvature bigger than physiological), a decrease in trunk mobility will be observed.



**Img. 11.** *Coordinated walk, rotation in trunk*



**Img. 12.** *Incapacity of trunk rotation , because of spine hyper lordosis*

For a better understanding of the **therapeutic intervention** at one child with hemiparesis, I show how his walk can be corrected from the level of the trunk. Image 13 shows how this child walks with one hand support. The entire left side of the trunk remains behind. Left lower extremity makes an adduction movement from the hip joint, this is not a real flexion. Also his step is so small, that girdle axes are parallel. Image 14 follows him as he is changing his step like orientation of the foot, and his step becomes longer. Additionally, through trunk intervention, good results are obtained all the way to the extremity.



**Img. 13.** *Left lower limb , pathological step at hemiparesis child*



**Img. 14.** *Improve this left step by trunk rotation at the same child*

### **Result of study**

- It was observed that, in normal motor development, girdle axes (pelvic and shoulder) are parallel in static position,
- In dynamic movement these girdle axes change giving a trapezoidal form,
- When spinal column is stretched in physiological position, trunk has maximal mobility and extremities can move normally,
- Pelvis and spinal column are found in close connection to each other, both in dynamic and in static position,
- In neurological pathologic cases, during static positioning girdle axes are not parallel, thus not leading to a trapezoidal form in dynamic movement, and changing the spinal column which is no longer found in a stretched position,
- Coordinated movement models require a physiological stretching of the spinal column, which allows for vertebral rotation, followed by rotation at the girdle level - this rotation facilitates a coordinated movement of the limbs.

### **Conclusion**

- In all pathological cases, due to muscle tonus alteration, there is pathological positioning of the limbs because of spasticity. This changes girdle axes and influences spinal column position, giving the appearance of a pathological hyper curvature. This entire abnormal curvature will limit or obstruct any movement that starts from this pathological position,
- When the trunk was involved in therapy, pathological position or movement was converted to correct the model or near to it,

- Muscle chains of the trunk “surrounding “ it in a diagonal way give stability and mobility,
- These muscle chains have their origin on the spinal column and are aimed at the girdle, onwards to the limbs all the way to the distal side, meaning that there is a spiral orientation, which makes possible for a 3D movement,
- The trunk has to be regarded as a house's foundation, the limbs being just an extension of the trunk. In neurological rehabilitation, education or reeducation of one model proceeds from proximal to distal, not reverse.

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## NUTRITION SUPPLEMENTS - OPPORTUNITIES AND RISKS IN SUPPORT SPORTS PERFORMANCE

NICA - BADEA DELIA\*

**ABSTRACT.** This paper addresses the issue of nutritional supplements that should not be confused with food or medicines, are a fact of widespread use in both sports as an alternative to sustain physical effort, as well as outside it to counter the thrilling aspects of contemporary society. Developing this theme is linked to the ability to provide performance athletes with an adequate nutrition food supplements as an alternative to support the physical effort in terms of rigorous doping control. The material emphasizes the data reflected in the literature: norm, motivations, characteristics, opportunities, risks and effects - that the use of nutritional supplements by athletes, in addition to the physiological effects of specific nutrients, may represent a serious risk that assume the concerned. Are examples and interference issues that some products may lead to positive tests for doping with or without intention on the part of athletes, the sporting environment or manufacturers. Mission specialists in doping control is to assess risk and use of nutritional supplements to provide thus information athletes to prevent consumption of products containing banned substances by IOC/WADA.

**Keyword:** nutritional supplements, opportunities, risks, doping

**REZUMAT. Suplimente nutriționale – oportunități și rescuri în susținerea performanței sportive.** Lucrarea abordează problematica suplimentelor nutriționale care nu trebuie confundate cu alimentele sau cu medicamentele, fiind o realitate a utilizării pe scară largă atât în sport, ca alternativă în susținerea efortului fizic, cât și în afara acestuia pentru a contracara aspectele trepidante ale societății contemporane. Dezvoltarea acestei teme este legată de posibilitatea de a oferi sportivilor de performanță o alimentație adecvată cu ajutorul suplimentelor alimentare ca o alternativă pentru susținerea efortului fizic în condițiile unui control doping riguros. Materialul subliniază prin datele reflectate în literatură: normativitate, motivații, caracteristici, oportunități, riscuri și efecte - faptul că utilizarea acestor suplimente nutriționale de către sportivi, pe lângă efectele nutritive fiziologice specifice, pot reprezenta și un risc major pe care și-l asumă cei în cauză. Sunt prezentate exemple și aspecte legate de interferențele pe care unele dintre produse pot conduce la teste pozitive privind dopingul cu sau fără intenție din partea sportivilor, a mediului sportiv sau a producătorilor. Misiunea specialistilor în controlul doping constă în evaluarea riscului utilizării unor suplimente nutriționale și de a furniza, astfel, informații sportivilor, pentru a preveni consumul unor produse ce conțin substanțe interzise de CIO/WADA.

**Cuvinte cheie:** suplimente nutriționale, oportunități, riscuri, doping

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## **Introduction**

Proper nutrition, appropriate to different conditions of life and effort is a topical issue that concerns researchers in many fields of activity. This concern is enhanced with new kinds of food range from the desire to fully satisfy the nutritional demands of different groups of consumers, depending on specific physiological conditions, age and effort.

Modern design of food nutrition must take into account all four sides of the inherent nutritional value: value psychosensory, energy, biological value, the toilet, and shaping and balancing the need to cover it all, as each is interdependent. Issues related to ensuring food supplies for their safety throughout the food chain acquires a special importance because traders always resort to practices of the most honest, which requires state agencies - through various regulations (laws, rules, standard, etc.) imposing specific requirements throughout the feed chain, giving consumers confidence that the goods they purchase will not affect the safety, health and their legitimate interests.

Food functions are determined by three fundamental requirements: information exchange, energy exchange and the exchange of substances. The exchange of information aimed at the food structure, which should be as close to the possibilities of body digestive and metabolic process, having a high bioavailability, energy exchange relating both to energy rich nutrient content, as well as bioavailable. Exchange of substance made to the general content of nutrients and proportional balance between them.

Nutritional supplements should not be confused with food or medicines, are a fact of widespread use both in sports as an alternative to sustain the physical effort and outside it to counter the thrilling aspects of contemporary society. Nutritional supplements can be defined as food whose purpose is to supplement the normal diet and which are concentrated sources of nutrients or other substances with nutritional or physiological effect, alone or in combination, marketed as wrapping ..., those foods that contain added nutrients with high bioavailability, for to meet the needs of specific physiological nutrition [7].

Addressing this issue is related to the ability to provide performance athletes with an adequate nutrition food supplements. Research on sports performance underlines the great complexity of biochemical mechanisms in these conditions, provides: cardiovascular activity, respiratory activity, neuromuscular activity, metabolic activity, the activities of neuroendocrine and neuropsychological. Better understanding of these physiological mechanisms, able to update the biological potential of the body, the current sports high performance at higher levels than those achieved in previous decades.

Today, we know that athletes is a subject not only an increased muscular effort, but above all, a neuropsychological intense effort, which requires entry into action of all physiological and biochemical mechanisms mentioned. Ensure only able to replace the nutrients lost from the muscle is substantially far from satisfying

the real needs of performance athletes. It is recognized by all nutritionists that feeding function, representing the exchange of information, energy and substance, is breathing with the most closely related to the human body with its living environment. Hence, in terms of specific sports performance, this link should be made as appropriate. Issues covering quality and safety requirements for athletes performing nutritional supplements are studied and regulated basis.

Looking in this way nutritional properties of food supplements, can identify substances, products not indicated for use in such conditions in food products is difficult to digest and / or metabolised, even if they are rich in nutrients are not given food or energy or substances which the human body to process consumes a high amount of enzymes and vitamins.

### **Implications the use of nutritional supplements to support sports performance.**

#### **Classification effects**

Nutritional supplements for athletes can be classified according to two criteria:

- energy requirements in various stages of training athlete;
- chemical composition.

The energy requirements at different stages preparation of athletes are in:

- a diet for training;
- a diet in sports competitions;
- a recovery diet and rest;
- a diet to maintain body mass;
- a specific problem of nutrition of athletes.

Distinguished by their chemical composition:

- a carbohydrate-rich energy food;
- a mixed solution electrolyte-carbohydrate;
- protein and a protein compounds;
- a supplement (essential nutrients and other food compounds).

Classification of nutritional supplements by type, concentration and its effects shows the following categories:

- add a high concentration of carbohydrates (from 70%), low protein (10-25%), recommended, in particular, those who want to take rapid weight . This category includes: Mega Mass, Gain Fast, etc.;
- an average concentration of supplemental protein and carbohydrate (30-50% protein, carbohydrates 60-40%), which contain an appreciable amount of fiber, and which are considered to be useful both athletes and those who just want to maintain a perfect health, it: Met-Rx, Siluet-R, Mass.-R2, Super Mass-R;
- add a protein with a high concentration (60-99%) and low-carbohydrate (0-35%), this product is recommended for athletes with increased need for protein,



bodybuilders, weight lifting, fighters, rower, etc., branches sports of force in general, not-and can provide the nutrition required amount or to be to maintain or build muscle mass without fat gain. This category includes Ideal Protein, Milk & Egg, Prot-R 65, R 85 and Super-Prot Protein-R 90;

- free amino acids are a form of capsules, pills, powder, or more rarely, liquids. Advantage of these products to protein concentrates is that the body simply absorb amino acids, which takes about five minutes, compared with about 30 for protein concentrates. By using free amino acids thus shortening the time between the end of training, at which amino acids the body needs is acute and their absorption when compared with the use of proteins.

Consumption of nutritional supplements generates a series of positive effects on health, physical performance or mental state, improve the health and general welfare. The negative effects due, in particular functional food and nutritional supplements toxicity include: overage of active principles, interaction with other components of the product, the presence of substances used in the extraction or basic product formulation. Ways in which one component can affect the human body are numerous: adverse reactions and interrelationship with other components, which can lead either to destroy or reduce the availability of nutrients, interfering with digestion and nutrient use, interference or interaction with pharmacological therapeutic substances.

### **Pros and cons**

Of today, nutrition supplements are used widely in sport, as an alternative to support the physical effort in terms of rigorous doping control. The material emphasizes the data reflected in the literature: norm, motivations, characteristics, opportunities and effects - that the use of nutritional supplements by athletes, in addition to the physiological effects of specific nutrients, may represent a serious risk that people assume that.

Research on performance in sport, it shows an aspect that the athletes be subject not only an increased muscular effort, and, especially, a neuropsychological intense effort, which calls into action all physiological and biological mechanisms. Ensure only able to replace the nutrients lost from the muscle is substantially far from satisfying the real needs of performance athletes. The present study concerns the possibility of providing information about athletes performing a proper nutrition through food supplements, the effects and possible risks. It was found that athletes are tempted to use substances called ergogenes that might influence positive force, driving qualities, ability to respond to training, recovery from effort, body composition [1].

Basic components of athlete performance is native talent, along with other random factors such as effective training and constant through training, psychological and cognitive components, resistance to injury and an adequate food support area. In the sport, nutrition is a special component in that food that you select a player

can contribute to success or failure. Experience has shown that a well-chosen diet can not turn into a champion, an athlete who has the talent and motivation for performance, but an inadequate diet can become an impediment for a talented sportsman who wants to reach the top [3].

We are witnessing the development of the world and in Romania has a strong industry producing nutritional supplements for athletes who sells a variety of compounds or combinations of nutrients, whose effects are often questionable. Athletes are a significant share of consumers of supplements nutrition, a variety of supplements, designed both the active population and those involved in sports. It is very important to choose sources of information with discretion. The decision to resort to the use of nutritional supplements is strongly influenced by the environment found Athlete: coaches, parents, doctors, colleagues of the team. From the research phenomenon related to the use of nutritional supplements in sports, we selected the main motivations, characteristics, opportunities and risks reflected in the literature [7], [1], [3] we will find a brief, below.

Motivations of athletes linked to the use of nutritional supplements to support a competitive effort.

- Clearing an inadequate diet.
- handy alternative to regular foods.
- Response to low quality of food in commerce and their safety.
- Competitive efforts of many athletes who are considered too large for be covered only by eating a "normal".
- Competition with opponents or colleagues who use these products, they form the belief that supplements can offer an advantage in training or in competitions.
- Recommendations offered by the coach, parents or other influential people.
- To improve physical performance: in competitions, encouraging development of muscle mass, recovery after training and competitions, weight loss and reducing fat content, maintaining health by enhancing immune response, resistance to infection, maintain healthy joints, central nervous system effects.

Opportunity of using nutritional supplements is linked to three basic elements to be answered by both athletes, coaches and policy makers.

- Efficiency and quality determined by practical conditions of use.
- Security of reflected short-term side effects and long term, doses and rhythm administration.
- Ethical issues in sport and doping regulations determined.

The sport environment is highlighted both opportunities and risks.

□ Opportunity: Nutritional support in achieving objectives, directly improving performance, the placebo effect.

□ Risks: Side effects, contamination with doping substances, reducing the attention paid to real factors that enhance performance, price. Pointing to the use of supplements in the nutrition of athletes, the risks for certain nutritional tabelul1.

The main features related to the effects of nutritional supplements for athletes are:

- □ ergogene supplement regime;
- □ risk of toxicity and side effects;
- □ contamination with banned substances on the list doping;
- □ aspect of sports ethics.

It was shown that nutritional supplements can obviously influence performance, having ergogene effect when used as a supplement in addition to diet, as the example of rehydration drinks which may bring an essential contribution during exercise by the content in carbohydrates, minerals, water. Their use is appropriate to the type of product awareness for the category of sports, but of particular requirements and management strategies. In some cases, even if a dietary supplement is not a real physiological effect, athletes can record one percentage performance improvement by the placebo effect, the individual believes that he received a product that helps. The placebo effect can not be quantified, but is accepted, explaining that the athletes report improved performance when trying a new supplement or diet.

Opportunities for use in food supplements are related to risks that may be exposed subjects, which require careful oversight by the competent bodies. Reflected in literature studies show that in general, the overall risk of the population consuming dietary supplements and traditional remedies is low, though there are cases of toxicity and side effects: allergy, overdose or poisoning by contamination self administration products. Entry under the provisions of doping is possible if some of the ingredients found in nutritional supplements enter the list of substances banned under WADA (prohormones example). It is important that athletes are trained to carefully read labels of nutritional supplements, ensuring that they do not contain banned substances. Even if the correct information, athletes who are aware of this responsibility may be the victims of doping cases caused by prohibited substances not declared by manufacturers of supplements.

### **Interference in doping control**

Link between nutritional supplements and doping was reported accidental doping control laboratory in Paris by detection of nandrolone metabolites in urine of professional sports, culminating with 2000 proving a significant number of athletes tested positive, from drinking nutritional supplements contaminated with hormone precursors. Research results presented by Geyer [10] classifies nutritional supplements that can cause positive results in doping control in three categories.

1. Nutritional supplements and herbal Ma Huang Guarne that can cause positive for ephedrine and pseudoephedrine.

2. Supplements containing anabolic steroids nutritional androgens and/or hormonal precursors on the label.

3. Nutritional supplements contaminated with hormone precursors and/or androgen anabolic steroids without specifying the label (Guarne, A-carnitine, creatine, chrysin, Tribulus terrestris, etc..)

In recent years, Doping Control Laboratory in Romania studies on contamination by banned substances for athletes with nutritional supplements sold on the Romanian market. In work published, were presented the results of tests carried out by gas chromatography / mass spectrometry (GC / MS) for compounds of type prohormones steroid nandrolone, testosterone and dihydrotestosterone (DHT). Add newer generation, easily obtained from the Internet such as Equi-Bolan, Equi-Gan is part and androstadien-1.4-3,17-dione (boldione), for transformation in endogenous boldenone (1,4 -- androstadien-17beta-ol-3-one), anabolic androgenic steroid. Both the steroid compound, as well as its precursor, is on the list of banned substances [10].

Another example is plasma substitutes - hidroxietilamidon. This class of substances including protein structure (gelatin, human albumin), polymers of carbohydrates found in naturally - polysaccharides and chemically modified dextran - hidroxietilamidon. The latter, in particular, is widely used due to adverse events and limited half-life that can be carefully controlled the degree of molar substitution, allowing the lapse of time in which the remedy is working. Hydroxyethylstarch is misused by athletes to prevent dehydration, thus increasing resistance. Used alone or combined with recombinant erythropoietin, the advantage of obtaining an increased blood volume and hemoglobin, while the critical blood remains the legal limits.

Consequently, HES analysis have developed two analytical methods based on gas chromatography coupled with mass spectrometry [9]. Later other methods were proposed and the analysis of polar compounds, such as LC / MS / MS, and enzymatic colorimetric methods. Tea (*Camellia sinensis*), coffee (*Coffea arabica*), cocoa (*Theobroma cacao*), cola (*Cola nitida*) are plant products containing the active principle xanthine alkaloids: caffeine, theophylline, theobromine. In terms of food, they are processed and used for preparation of tea, soft drinks and beverages, meals, chocolate, food supplements, etc.. In terms of implications in doping control samples in sports, caffeine is used as food and nutritional supplements graded unknown risk (drink caffeine and guarana in concentrations below 150 mg / l) or high risk (with coffee and guarana drinks at levels above 150 mg / l eg (Red Bull) [11].

Caffeine has long been considered useful as a supplement only sport strength, recently found to be useful in sports and bodybuilding, currently (2009) has a monitoring station in the list of WADA. Its use is based on stimulating properties: high energy levels, improving athletic performance, increasing metabolic rate, reduce nasal congestion. Active ingredients: caffeine, theobromine, theophylline, xanthine compounds characterizing coffee, tea, food preparations, pharmaceuticals, were examined using chromatographic separation and identification methods, coupled with mass spectrometry [5], [6]. Experimental research has left the finding that a number of food preparations, soft drinks, extracts contain

appreciable amount of incentives that can interfere and generate evidence of doping in sport, as food-medicine, nutritional incentives. Identification of substances of Class incentives in doping control samples based on the principle of gas chromatography detection technique specifically nitrogen - phosphorus [8]. Once highlighted the doping substances, their confirmation is required, which is performed by gas chromatography technique coupled with mass spectrometry.

Based on these data, we have developed simple methods for identification and dosage of caffeine, theophylline, theobromine of certain products and preparations of coffee and tea, substances in the category of incentives, stimulating principles, by thin layer chromatography, gas chromatography coupled mass spectrometry [5], [6], [4]. Experience, to proceed to the separation, identification and quantification of active compounds and xanthine products with standards prepared chromatographic plates. After development, the plates are examined under UV light at 254 nm. Spots are seen in the intense blue color green amid the chromatography plate. Spots corresponding to caffeine and **theophylline** in products made in the study were extracted with chloroform and extract the plate was analyzed using a gas - HelWet Packard 5890 chromatograph equipped with mass detector MS 5972.

Mission specialists in doping control is risk assessment use of nutritional supplements and athletes to provide such information to prevent the consumption of products containing banned substances by IOC / WADA. Another characteristic related to the use of nutritional supplements, is unbalancing the hierarchy of priorities of athletes. Athletic performance is a combination of several factors: genetic potential, training, optimal nutrition, adequate sleep and recovery, performance equipment and emotional involvement. In many cases, the use of nutritional supplements seems to be the first step in the decision to use banned products, often accompanied very serious side effects. A summary of risk assessment studies using nutritional supplements is presented below, table 1. [11].

**Table 1.**

Risk assessment for nutritional supplements consumption

<b>Firefox Low-risk</b>	<b>Firefox with unknown risk</b>	<b>Supplements increased risk</b>	<b>Firefox banned or their precursors</b>
Vitamins, minerals, trace elements creatine, HMB, carnitine, antioxidant, fatty acids, cod liver oil, energy drinks, protein, carbohydrates, based on colostrum supplements.	Free amino acids supplements herbal preparations, for example. Ginseng, echinacea, guarana and caffeine beverages in concentrations below 150 mg / l.	Of incentives to companies that manufacture substances, hormones or hormone precursors of these substances, drink coffee and guarana in concentrations greater than 150 mg / l (Red Bull).	Herbal supplements with ephedrine (Ma Huang), plant products anabolic effect (Tribulus Terrestris), supplemental hormone precursors (DHEA, androstenedione, 19-norandrostenedione, 19 norandrostenediol).

A study conducted in the IOC doping laboratory in Cologne to a total of 634 nutritional supplements, from 13 countries and 215 companies from producing notes that:

- 289 (45.6%) came from companies which do not produce prohormones and 345 (54.5%) of the companies that produce prohormones and their precursors.
- 94 (14.8%) positive, 475 (54.8%) negative, 66 (10.4%) due to irrelevant results matrix.
- 33 products found positive were not printed on the label banned substances.
- 94 of the positive nutritional supplements, 23 contained precursors of nandrolone and testosterone, testosterone precursors and 64 only 7 of them only precursors of nandrolone.
- shows that the more nutritional supplements from the U.S. (240) and Germany (129). Most good products from the U.S. (45).

### **Conclusions**

Considering the literature, experienced specialists recommended that the use of nutritional supplements by athletes should be made only if accompanied by a certificate of quality and after consulting the doctor and specialists in doping control, because the risk of their contamination prohibited substances depends on the quality of their manufacture or processing. The use of these nutritional supplements to support sports performance is a major risk that athletes assume, because until the girl is not unequivocal scientific evidence showing beneficial effects than the percentage small (1-3%), and as food and beverages to rehydration and food before and after competitions and training (5-10%). High risk or nutritional supplements banned in sport are: incentives, hormones or hormone precursors of these substances, drink coffee and guarana in concentrations greater than 150 mg/l, plant products with ephedrine, anabolic effect, hormone precursors. The world of sport should be aware that the proper determination of doping substances in doping control sample is treated as positive even if the substance comes from using a nutritional supplement. Because nutritional supplements production is not subject to regulatory Good Manufacturing Practices (GMP), as the medicines may be differences between the label and content (qualitative and quantitative). It is possible that some of these products, be inserted in the category –medicine- and probably will be included in the list of doping.

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## COHERENT EXAMINATION BETWEEN THE STATE OF HEALTH AND PHYSICAL ACTIVITY OF THE SPANISH SECONDARY AND HIGH SCHOOL ATTENDANTS

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**ABSTRACT.** In this dissertation the aim of the applied pedagogic test is the examination of the state of health, the physical activity level and healthkeeping behaviour of the Spanish secondary school and high school attendants. We are looking for connections between the results of the components of the life quality (SF-36), physical (PCS) and mental (MCS) self evaluation questionnaires, and the level of moderate and vigorous physical activities (IPAQ), divided on age-groups. During the 2008-2009 academic year the standard questionnaires were filled in by 3012 (1445 boys and 1521 girls, average age  $\pm 15,81$ ) Granadian secondary and high school students. The frequency by age-groups and the distribution of the evaluated persons is 5,64% representative. As a first approach we may declare that the evaluated Granadian student's state of health is adequate, and their level of physical activity is medium sufficient. The state of health of the students from the first cycle of the secondary school is better. During the three evaluated school cycles, the results show a continuously decrease tendency by the increasing of age. Dividing the students by gender, the men's state of health is significantly better, and they exercise more than women. In order to achieve an ideal body weight, state of health, maintenance of physical strength of the age dependent increasing cycle, children and teenagers need at least a 60 minutes moderate or vigorous physical activity.

**Keywords:** physical strength, mental health, life quality, moderate and vigorous physical activity.

**REZUMAT.** Interacțiunea dintre starea de sănătate și nivelul de activitate fizică a elevilor din învățământul școlar preuniversitar spaniol. Scopul acestei cercetări, din domeniul pedagogiei aplicate, este analizarea stării de sănătate, a nivelului de activitate fizică și a comportamentelor legate de menținerea sănătății în rândul elevilor

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spanioli, din școli generale și liceale. Apreciem relația dintre componentul fizic (PCS) și cel mental (MCS) prin intermediul chestionarului de evaluare a calității vieții (SF-36) și prin prisma activităților fizice moderate și intense (IPAQ) pentru fiecare categorie de vârstă în parte. Pe parcursul anului școlar 2008-2009 chestionarele standardizate au fost completate de 3012 elevi (1445 băieți și 1521 fete cu vârsta medie de 15,81 ani) din învățământul școlar preuniversitar din Granada (Spania). Frecvența grupurilor și cuantumul persoanelor evaluate este reprezentativ în proporție de 5,64%. Ca o primă concluzie putem afirma, că elevii implicați în acest studiu, prezintă o stare de sănătate adecvată și un nivel mediu-acceptabil de activitate fizică. În urma prelucrării rezultatelor s-a observat că starea de sănătate a copiilor din ciclul doi al școlii generale este mai bună decât în celelalte cicluri de învățământ. S-a evidențiat o tendință accentuată descrescătoare a rezultatelor până în anul doi de liceu. Starea de sănătate a băieților este semnificativ mai bună decât cea a fetelor. Pentru menținerea unui stil de viață sănătos, a unei stări fizice bune și controlul unei greutate corporale adecvate în procesul de creștere, copiii și adolescenții au nevoie zilnic de cel puțin 60 minute de activitate fizică moderată și/sau intensă.

**Cuvinte cheie:** component fizic, sănătate mentală, calitatea vieții, activitate fizică moderată și intensivă.

## INTRODUCTION

It is very important for us to understand, that the interaction of the physical activity (FA) and state of health decreases those riskfactors (danger factors) which could occur during our lifetime.

We should not confuse the exercise with the physical state and the physical activity with the state of health. Lots of national and international studies support the importance of the participation scale and the level of motivation. We put in the centre of our attention the application of the commitment towards sports and the measure of frequency. The frequent and repeated participation in the diverse physical activities and in the sports profession is highly important regarding physical performance and the influence over health (Piéron, 2005).

There are known such factors regarding health, which can influence the structure of the role model healthy way of life. The mostly studied variable by researchers, FA gets a high function. Since it is known that every day exercise has got a great effect on the avoiding of illnesses, and on the healthy growth of children, we can underline that the FA is a condition, which strengthens the psycho-physical state. Medicine, physiology, psychology, sports - and educational researches proved the positive effects of FA on health. (Mendoza, 2000)

Besides there are more than a few studies, which support the fact that there is a straight connection between the level of FA from adolescence, and the FA from adulthood. All this emphasises the absolutely necessary condition of the adopting of a healthy way of life and continuous exercises. (Meredith Y Dwyer, 1991).

On one hand FA has got a pozitiv effect on locomotor organs, on the heart, on the blood circulation, and on breathing, digestion and nervous system. On the other hand the FA is in connection with the mental state of health as well, because it determines selfesteem, selfvaluation, the formation of pozitiv selfimage, it decreases stress and agitation. The facts mentioned above are very important during adolescence and juvenile. (Pieron, 2005).

Despite of the emphasis on the importance of the effect of FA on health, the lack of exercises is still a largely extended problem. In Spain Las Helas's et al (2001) representative questionnaire examinations proved that less than 30% of the Spanish children do exercises in their free time. This result has been supported by the evaluation supervised by the *World Health Organization* (WHO, 2000), which evaluated the health maintainence behaviour among young European people.

On the evaluation they emphasis the procentage diversion, according to which 30-35% of the Spanish boys and 10-15% of the girls are adequate to the expectations (quantity and intensity during one week). These data are the same with the European average results at boys, and are underaverage at girls. The studies made in health domain prescribed a minimal FA level for school attendants and for the whole population to spare their state of health.

Sometimes the authors had different opinions on the minimum duration of the FA level, they brought up different models during their research. In Europe the Active Standard level was considered to be the correct one, according to which 3-5 times a week we should do moderate or intensive global exercises, which work out more or bigger muscles during 30-60 minutes.

The „American Health Association has published a material, in which it sent its offers to the learning institutions in order to maintain the students level of health. They gave a great deal about the minimum 30 minutes long physical activity, suggesting that the period of time intended to be used for exercises, should be at least in 50% moderate-intensive; thus, students would have such physical abilities, with the help of which they would like to do these exercises during their whole lifetime. This is why it is requested to be created a new national curriculum, and the extra-curriculum regular body exercise promotion. (Pate et al,2006)

The European Parlament also values such kind of documentary, which would correct the physical education of the European students (European Parliament, 2007). However, the Spanish school education orders 2 physical education lessons per week, and only 50-60% of the lesson is filled with body exercises, the rest of the time is filled with explaining and organizing the lessons, and preparing the tools. (Lozano, 2005).

The period of time for exercises (during the lessons) seems to be insufficient to achieve the minimum health level requested, and the developing of positive customs. Because of this it is needed for us to extend the lesson extra-curriculum, and with other sport activities. It is also needed to supervise the

connections between the whole activity and the factors which influence the FA (Vicente-Rodriguez et al, 2007).

## MATERIAL AND METHODS

The purpose of the presented dissertation focused on the evaluation of the Granadian students' physical and mental state of health. We evaluated these variables according to age, differences between gender, moderate and intensive physical activity.

The population, which we examined, was made of Granadian students of 4 secondary classes, and 2 high school classes. We divided the 4 secondary school classes into 2 study cycles: the 7th and the 8th class = first cycle, 9th and 10th class = second cycle. The 2 classes of the high school represent the third cycle. Totally N=3012 students filled in the standardized questionnaires, from which N1=1445 were boys and N2=1521 were girls, lacking data 46 (average age  $\pm 15,81$  years) (1 Table).

**Table 1.**

The division of the model according to gender, and cycles

		<b>Frequency</b>	<b>Procentage division</b>	<b>Actual procentage</b>	<b>Total procentage</b>
Gender	Boys	1445	48,0	48,7	48,7
	Girls	1521	50,5	51,3	100,0
	Totally	2966	98,5	100,0	
Lacking		46	1,5		
	<b>Totally</b>	<b>3012</b>	<b>100,0</b>		
School cycle	Secondary (1st cycle)	1020	33,9	33,9	33,9
	Secondary (2nd cycle)	953	31,6	31,6	65,5
	High school	1039	34,5	34,5	100,0
	Totally	3012	100,0	100,0	

The frequency according to age and the division of the examined persons represent in 5,64% the total 53386 Granadian students (42447 students from the secondary school, and 10939 students from high school). We established a 95% confidentiality period.

Our results are based on a quasi cross-sectional research, complying with the conditions prescribed in 1963 by Campbell and Stanley, meaning the representiveness without the influence of the variables and the control of the evaluation. The research follows a cross-sectional sociological evaluation model.

Totally 1973 secondary school students took part in the evaluation, 1020 students in the first cycle with the average age = 12,17, and 953 students in the

second cycle, with the average age =14,82, and from high school we evaluated 1039 students with the average age = 17,89. Totally we visited fourteen private schools, and eleven schools financed by the government and one Regional Adult Educational Institute.

For data recording we used as a method the Short Form Health Survey (Ware et. all, 1986) questionnaire Spanish version, completing the measurement of physical activity (FA) with the IPAQ (Internacional Physical Activity Questionnaire), and with series of questions selected from the Physical Self Description Questionnaire (Marsh et. all, 1994) and the Body Image Assessment Scale (Thompson and Gray, 1995) questionnaire. In order to evaluate these variables we used a range from one to four, the 1<sup>st</sup> value represents total contradiction, and the 4<sup>th</sup> total agreement.

The Short Form-36 Health Survey Questionnaire, called „Rand” Questionnaire is one of the mostly used type of questionnaire of the examination of connections between health and life quality. The questionnaire which evaluates general state of health has got 36 questions and was created by the Massachusetts Health Institute New England Medical Center from Boston. It has got 8 different examined variables: 1. physical function, which evaluates physical activity, 2. accommodation changing ability due to physical problems, which evaluates problems occurred at work, everyday activity because of physical status, 3. body pain, 4. general health feeling, which shows how a person evaluates his/her own health, and if he/she believes in its change for the better, or thinks that it would get worse, 5. vitality, tiredness, and energy evaluation, 6. social accommodation, which evaluates emotional and functional social activity problems, 7. accommodation changing ability due to emotional problems, which shows the problems occurred during work and everyday activity due to emotional disorientation, and 8. mental state, which evaluates agitation, depression or balance.

The questionnaire is especially adequate to international comparisons, but the so called norm values (those scores, which we refer to the healthy population and to some of the diseases) have to be established, meaning that the questionnaire needs to be adapted.

We get values between 0-100% for some of the variables due to the coding, scoring, and adding of the coherent questions. The higher values reflect better, the lower ones worse general state of health. We compared the results we have got with the healthy population's variable values according to gender and age specifications.

We used the International Physical Activity Questionnaire – Short Form questionnaire created in 2000 by Booth.

International Physical Activity Questionnaire is an instrument designed primarily for population surveillance of adults. It has been developed and tested for use in adults (age range of 15-69 years).

IPAQ assesses physical activity undertaken across a comprehensive set of domains including leisure time, domestic and gardening (yard) activities, work-related and transport related activity.

The IPAQ short form asks about three specific types of activity undertaken in the three domains introduced above and sitting. The specific types of activity that are assessed are walking, moderate-intensity activities and vigorous intensity activities; frequency (measured in days per week) and duration (time per day) are collected separately for each specific type of activity.

The items were structured to provide separate scores on walking; moderate-intensity; and vigorous-intensity activity as well as a combined total score to describe overall level of activity. Computation of the total score requires summation of the duration (in minutes) and frequency (days) of walking, moderate-intensity and vigorous-intensity activity.

Another measure of volume of activity can be computed by weighting each type of activity by its energy requirements defined in METS (METs are multiples of the resting metabolic rate) to yield a score in MET-minutes. A MET-minute is computed by multiplying the MET score by the minutes performed. MET-minute scores are equivalent to kilocalories for a 60 kilogram person. Kilocalories may be computed from MET-minutes using the following equation: MET-min  $\times$  (weight in kilograms/60 kilograms). The selected MET values were derived from work undertaken during the IPAQ Reliability Study undertaken in 2000-2001.

Using the Ainsworth et al. Compendium (*Med Sci Sports Med* 2000) an average MET score was derived for each type of activity. For example; all types of walking were included and an average MET value for walking was created. The same procedure was undertaken for moderate-intensity activities and vigorous-intensity activities. These following values continue to be used for the analysis of IPAQ data: Walking = 3.3 METs, Moderate PA = 4.0 METs and Vigorous PA = 8.0 METs and mtsi to measure the quantity of physical activities.

We used SPSS (Statistical Packet of Social Sciences) 15.0 software programme packet used for Windows XP for the analyses of the data. We used the variance analysis (ANOVA) test for the comparison of the averages, and the Bonferroni technic for the multiply comparison examination of it's belongings, and the non parametric examinations were made by the usage of the Kruskal-Wallis test. Thus in the establishment of the correlation level between the variables were done by the Pearson and Spearman correlation coefficients. We compared the results we have got with the healthy population's variable values according to gender and age specifications.

## RESULTS

At first sight we may declare, that the examined Granadian students have got adequate state of health on a medium acceptable physical activity (FA) level.

Regarding the differences in gender boys have reached better results with one higher self-evaluation level than girls at physical (86,19 vs 82,50,  $p=.000$ ) and as well as at mental (81,68 vs 76,51,  $p=.000$ ) components at the average of their four category.

From the 8 dimensions of the SF-36 questionnaire, at 7 we observed significantly strong differences ( $p=.000$ ), but regarding the component of the role restraint due to physical problems the evaluations were proportionally the same (95,62 vs 95,51,  $p=.792$ ) (2 Table).

**Table 2.**

The physical and mental component of the state of health and its dimensions, and significant level and the gender repartition between the moderate and intensive FA levels

	MEN		Number of cases	Women		Number of cases	Sig.
	%	SD		%	SD		
<b>Physical component</b>	86,19 $\pm$ 10,05		1443	82,50 $\pm$ 10,85		1519	.000
Physical function	94,19 $\pm$ 11,34		1445	92,06 $\pm$ 12,02		1521	.000
Physical problems	95,62 $\pm$ 10,77		1444	95,51 $\pm$ 10,74		1521	.792
Body pain	83,67 $\pm$ 17,89		1443	79,62 $\pm$ 18,71		1519	.000
General State of health	80,41 $\pm$ 13,72		1445	74,61 $\pm$ 13,62		1521	.000
<b>Mental component</b>	81,68 $\pm$ 10,48		1443	76,51 $\pm$ 11,56		1521	.000
Vitality	74,89 $\pm$ 12,92		1443	69,38 $\pm$ 13,61		1521	.000
Social function	89,10 $\pm$ 14,53		1444	85,69 $\pm$ 15,15		1521	.000
Emocional problems	91,18 $\pm$ 15,55		1444	83,75 $\pm$ 19,92		1521	.000
Mental health feeling	78,38 $\pm$ 12,62		1443	72,67 $\pm$ 13,47		1521	.000
	<b>Min.</b>	<b>SD</b>		<b>Min.</b>	<b>SD</b>		
Moderate FA W.d.	102 $\pm$ 73		923	99 $\pm$ 60		900	.294
Moderate FA W.e.	127 $\pm$ 83		883	117 $\pm$ 79		740	.019
Intensive FA W.d.	105 $\pm$ 70		935	91 $\pm$ 60		750	.000
Intensive FA W.e.	127 $\pm$ 84		860	99 $\pm$ 70		626	.000

Regarding the time meant for everyday moderate and intensive exercises it may be concluded that the boys have reached significantly better results and thus better METs values than the girls, the only exception being the moderate physical activity, for which boys intended to spend 102 minutes in average, and girls 99 minutes during a common weekday ( $p=.294$ ) (2 Table).

We can observe that the mental component (Mc) gets clearly weaker and weaker due to elderly advancing, and if the four average dimensions of the physical components (Fc) do not show significant differences at the distinction of the three school cycles. Since we get approximately the same evaluations regarding the Fc, between the first and the second (84,64% vs 84,39 %,  $p=1.000$ ), and the second and third (84,39 vs 83,61%,  $p=.143$ ) cycles, the difference between the first and the third school cycle was significant (84,64% vs 83,61%,  $p=.047$ ). The average value results of the Mc show strongly significant differences in the combinations of all the three school cycles. (3 Table)

**Table 3.**

The average results in percentage of the physical and mental components, and the minutes calculated value and significant level distinctions between the school cycles

Sch. Cycle	Physical comp.	sig.	Mental comp.	sig.	Moderate FA (Wd+We average)	sig.	Intensive FA (Wd+We average)	sig.
1 vs 2	84,64 vs 84,39	1.000	81,02 vs 79,38	.003	118' vs 113'	.731	109' vs 112'	.673
1 vs 3	84,64 vs 83,61	.047	81,02 vs 76,51	.000	118' vs 104'	.006	109' vs 102'	.562
2 vs 3	84,39 vs 83,61	.143	79,38 vs 76,51	.000	113' vs 104'	.130	112' vs 102'	.501

It can be clearly shown from the next results of our examination, that the period of time, which students intend to use for moderate and intensive physical activity, shows a continuously decreasing value since the first cycle of the secondary school following high school. This statement especially shown in the case of the everyday moderate exercises. Accordingly to the medium FA level and to the METs values, the first cycle students of secondary school intend in average to use 118 minutes per day for moderate exercises, which period of time is significantly more than of those from high school (104,  $p=.006$ ). Regarding the intensive FA level there isn't such a big difference with elderly advancing. Based on the results we have got the second cycle of the secondary school has reached the highest time units (112').

**Table 4.**

The correlation between the physical and mental component, and the moderate and intensive FA

		Physical component	Mental component	Moderate FA – Wd	Moderate FA – We	Intensive FA – Ha	Intensive FA – We
Physical component	Pearson Correlation	1	,546*	-,016	,057*	,024	,077**
	Sig. (2-tailed)		,000	,491	,027	,331	,004
	N	3008	3008	1850	1645	1706	1407
Mental component	Pearson Correlation	,546*	1	,012	,083**	,031	,102**
	Sig. (2-tailed)	,000		,610	,001	,383	,000
	N	3008	3010	1851	1646	1708	1408
Moderate FA – Wd	Pearson Correlation	-,016	,012	1	,454**	,370**	,251**
	Sig. (2-tailed)	,491	,610		,000	,000	,000
	N	1850	1851	1851	1520	1439	1184
Moderate FA – We	Pearson Correlation	-,016	,012	,454**	1	,248**	,407**
	Sig. (2-tailed)	,491	,610	,000		,000	,000
	N	1850	1851	1520	1647	1263	1200
Intensive FA – Wd	Pearson Correlation	,024	,031	,370**	,248**	1	,425**
	Sig. (2-tailed)	,331	,383	,000	,000		,000
	N	1706	1708	1439	1263	1709	1266
Intensive FA – We	Pearson Correlation	,077**	,102**	,251**	,407**	,425**	1
	Sig. (2-tailed)	,004	,000	,000	,000	,000	
	N	1407	1408	1184	1200	1266	1409

According to the results of the correlation examinations between life quality and FA levels, the total result of the four dimensions of Fc is in weakly negative relationship ( $r=-0,016$ ) with the period of time intended to moderate weekday exercises. During the calculation of the values of the Pearson leaner correlation coefficients the moderate weekend (M-We) ( $r=0,057$ ,  $p=.022$ ), the intensive weekday (I-Wd) ( $r=0,024$ ,  $p=.331$ ) and the intensive weekday (I-Wd) ( $r=0,077$ ,  $p=.004$ ) FA levels are in weakly positive relationship with Fc life quality (4 Table).

## DISCUSSION

Due to the presented results we may assess that there are significant differences at the distinctions by gender and by the three school cycles. The boys have reached better results with one higher self-evaluation level, than the girls. The life quality of the students from the secondary school is better than those from high school. The period of time meant for physical activity decreases according to elderly advancing, possibly because of the increasing number of everyday homework and other activities. We refer to such influencable factors, which rather manifest themselves through the transition from secondary school to high school. Besides, it is proved the fact that the student's intended period of time for FA continuously decreases with elderly advancing until adulthood. (Cocca et al, 2009).

Lots of studies have proved that there is a direct connection between being fit and the state of health. (Stephenson et. all, 2000; Meredith y Dwyer, 1991). The better physical fitness gives hope for a better life, regardless of age. The level of physical performance-ability is in higher connection with the quality of life than with the age of a person.

It is widely known that to reach and keep a good quality of life may be a goal to any age-group; the bad addictions of adulthood and elder hood can be eliminated in order to reach a better state of health (Rivlin, 2007). Regarding this as a consequence of the interference at the younger age-group, better results and higher successes can be reached, because the first interference eliminates the mediums of future addictions.

In order to reach an adequate state of health, to keep the physical strength and the ideal body weight adequate to the growing cycle depending of age, for children and adolescents at least 60 minutes moderate or intensive physical activity would be needed.

During one day the 60 minutes FA may be done within different periods of practice. In case of multiply repetition it is not important if only little exercise is done. This rating reflects the natural model of the children's FA, which would include walking or cycling to school, outdoor activities during school breaks, or the organized exercises like sport class, and other sports.

Parents need to be encouraged to decrease the time for TV watching, video games playing, and computer using with less than 2 hours, and make children move more than do static activities. The parent's active way of life serve as model for children, and because of this it is a good opportunity for the increasing of the FA.



The interest for the physical activity of children and adolescents is natural, because it makes possible the functional performance ability, which they will need during their lifetime to satisfy desired needs and to live a healthy way of life.

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