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Elena-Diana SIMA

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Swimming Lesson in "Physical Education and Sport" Discipline for First-Year Students in the Higher Education of other Profiles

Elena-Diana SIMA[1]*

Abstract

The main purpose of this paper is to highlight the muscle strength influence on movement amelioration in aquatic environment in the swimming styles practiced in the "Physical Education and Sport" discipline for first-year students in the higher education of other profiles. This scientific approach led to the organization of an experimental study conducted in „Carol Davila" University of Medicine and Pharmacy of Bucharest during the academic year 2016-2017. The subjects of the research were the first-year students (141 students - 61 from the Faculty of Dentistry and 80 from General Medicine), in the discipline of Physical Education and Sport. The swimming lessons aimed at improving students' muscle strength level in each off-water training session. The in-water training used exercises for learning and improving the chosen swimming styles (freestyle, breaststroke and backstroke). The study findings highlight the development of arms, abdomen and legs muscle strength in both girls and boys – subjects of the study, the attendance at classes, the participation in sports activities and the final grade. The effective use of exercises for muscle strength development in the off-water training within the swimming lessons in the "Physical Education and Sport" discipline for first-year students contributed to movement development in aquatic environment in the chosen swimming styles and to successful participation in competitions.

Keywords: *Swimming, test events, strength, learning, performance.*

[1]„Carol Davila" University of Medicine and Pharmacy of Bucharest, Romania, dianasima@yahoo.com.

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Corresponding Author: Elena-Diana SIMA
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1. Introduction

The need to revise the concept of physical education and the test events and norms necessary for students' evaluation during the activity of physical education for other profiles in the higher education has included the more attractive practice of swimming involving also the students with medical exemption and the practice of swimming at any age during the physical education class and in leisure time as well [6].

The activity of physical education and sport in the higher education bears the mark of each institution, including a large range of forms such as [19]: practical lessons, training classes, lessons of Medical Physical Culture and internal competitions within institute.

In the higher education institutions, the activity of Physical Education and Sport is carried out in the classes stipulated by the curricula for first-year and second-year students, during the representative teams training for student competitions in various sports branches and also by promoting the idea to practice constantly and independently the physical exercises and favorite sports [18].

The practice of swimming develops the heart and lungs, besides all muscle groups; it improves the circulation of oxygenated blood in the body and is considered the healthiest and most relaxing sport [14]. Swimming aroused great interest (in the academic environment inclusively) and is demanded by a growing number of students in the last few years [16].

Evaluation is a complex action integrated in the educational process that reflects the proposed objectives and tasks and also the effectiveness of the didactical activity. There is a strong correlation between choosing the evaluation strategies and directing the didactic process of physical education. The evaluation, as a didactic operation, helps to appreciate the quantity, quality and efficiency indicators [15].

2. Problem Statement

The formative-educational potential of swimming is fulfilled by educating these positive aspects and also by educating those traits of character involved in a series of attitudes imposed by the society towards work, collectivity and oneself [4].

The biological and motor development of students allows the practice of all sport branches and the competitiveness is an important feature of the age. Taking all these factors into account, it is preferable to carry out the Physical Education classes per sport branches, depending on

students' inclinations and options and in accordance with the existing material resources [5].

In sports, the physical development serves as the main element in the selection for a particular sports branch. In conformity with physical development participation in the achievement of performance, which requires a harmonious physical development, the following sport branches can be mentioned [3]: sports gymnastics, modern rhythmic gymnastics, bodybuilding, figure skating, sports swimming, artistic swimming and other sports. As in most disciplines of nautical sports, physical training is divided into two basic components [17]: general physical training and specific physical training. The general physical training ensures the development of basic motor skills and functional capabilities of the body.

The training process (meant to strengthen and improve the motor skills and abilities that are dominant in the swimming styles available in school (freestyle, breaststroke and backstroke) will focus on [7[, [8], [9], [14], [17]: technique of floating and breast or back slipping, movement of arms and legs – their coordination, improvement of breathing etc.

3. Research Questions/Aims of the research

The main *purpose of this paper* is to highlight the muscle strength influence on movement amelioration in aquatic environment in the swimming styles practiced in the "Physical Education and Sport" discipline for first-year students in the higher education of other profiles.

Hypothesis of the research: we consider that the efficient use of the exercises for muscle strength development during the off-water training of the first-year students in their swimming lessons at Physical Education and Sport discipline will contribute to movement optimization in aquatic environment in the selected swimming styles and the successful participation in competitions.

4. Research Methods

Research methods used: bibliographic study of specialized literature, pedagogical observation, pedagogical experiment, method of tests, statistical-mathematical method and graphical representation method. This scientific approach led to the organization of an experimental study conducted in „Carol Davila" University of Medicine and Pharmacy of Bucharest during the academic year 2016-2017. The subjects of the research were the first-year

students (141 students - 61 from the Faculty of Dentistry and 80 from General Medicine), in the discipline of Physical Education and Sport.

The swimming lessons aimed at improving the muscle strength for the test events as follows: abdominal strength evaluated by torso raise from supine position in 30 sec.; arms strength (upper limbs) evaluated by continuously executed push-ups and legs strength (lower limbs) evaluated by jump squats in 30 sec. These exercises were used in each class during the off-water training of the students. The training in water used exercises to learn and improve the chosen swimming styles (freestyle, breaststroke and backstroke) and to assess the technique of starting and returning, the work of arms and legs and their coordination with breathing. Students' attendance at classes and their participation in competitions were also monitored.

5. Findings

In order to highlight the influence of muscle strength on improving the movement in aquatic environment in the chosen swimming styles within the "Physical Education and Sport" discipline for first-year students in the higher education of other profiles, an experimental study was conducted in "Carol Davila" University of Medicine and Pharmacy of Bucharest.

The study results are listed in the tables no. 1, 2, 3 and 4 and divided into two parts, namely for the students of the Faculty of Dentistry and the Faculty of General Medicine (girls and boys as well) - both faculties included in the „Carol Davila" University of Medicine and Pharmacy of Bucharest.

Table 1. Results of the female students from the Faculty of Dentistry (n=31)

Statist. Ind.	Attendance (no.of lessons)	Improved style			Competitions			Test events (reps no in 30 sec)			Final score (pt.)
		L	B	S	CAI	CCD	CU	Abd	Arms	Legs	
Mean	8.52	1	1	1	1	1	-	23.84	19.03	13.42	10
SEM	0.27	0	0	0	0	0	-	0.65	1.16	0.70	0
SD	1.50	0	0	0	0	0	-	3.65	6.47	3.91	0
Cv%	17.65	0	0	0	0	0	-	15.32	34.01	29.16	0
N	31	11	16	4	4	5	-	31	31	31	31

Note: SEM – standard error mean, SD – standard deviation, Cv – coefficient of variation, N – number of cases, L - freestyle, B – breaststroke, S - backstroke, CAI – Championships of first year, CCD –"Carol Davila" Championships, CU – University Championships, reps no - number of reps, Abd – abdomen, Legs – Lower limbs, pt.- points.

Table 2. Results of the male students from the Faculty of Dentistry (n=30)

Statist. Ind.	Attendance (no of lessons)	Improved style			Competitions			Test events (reps no in 30 sec)			Final score (pt.)
		L	B	S	CAI	CCD	CU	Abd	Arms	Legs	
Mean	8.56	1	1	1	-	1.33	-	24.96	27.77	20.03	10
SEM	0.22	0	0	0	-	0.33	-	0.85	1.06	0.84	0
SD	1.22	0	0	0	-	0.57	-	4.70	5.83	4.57	0
Cv%	14.27	0	0	0	-	43.33	-	18.83	20.99	22.84	0
N	30	24	2	4	-	3	-	30	30	30	30

Note: idem table 1.

Table 3. Results of the female students from the Faculty of General Medicine (n=37)

Statist. Ind.	Attendance (no of lessons)	Improved style			Competitions			Test events (reps no in 30 sec)			Final score (pt.)
		L	B	S	CAI	CCD	CU	Abd	Arms	Legs	
Mean	17.94	1	0	0	1	1	-	22.27	15.18	11.97	10
SEM	0.28	0	0	0	0	0	-	0.76	0.88	0.51	0
SD	1.75	0	0	0	0	0	-	4.61	5.38	3.09	0
Cv%	9.74	0	0	0	0	0	-	20.70	35.41	25.85	0
N	37	15	15	8	4	1	-	37	37	37	37

Note: idem table 1.

Table 4. Results of the female students from the Faculty of General Medicine (n=43)

Statist. Ind.	Attendance (no of lessons)	Improved style			Competitions			Test events (reps no in 30 sec)			Final score (pt.)
		L	B	S	CAI	CCD	CU	Abd	Arms	Legs	
Mean	17.84	1	1	1	1.16	1	-	21.53	24.65	20.23	10
SEM	0.31	0	0	0	0.09	0	-	0.78	1.12	0.78	0
SD	2.07	0	0	0	0.38	0	-	5.17	7.34	5.14	0
Cv%	11.60	0	0	0	32.87	0	-	24.01	29.78	25.43	0
N	43	32	11	8	18	5	-	43	43	43	43

Note: idem table 1.

The results achieved by the students (both girls and boys) of the Faculty of Dentistry are shown in the tables no. 1 and 2 in terms of the most common statistical indicators of the attendance at classes in the first semester (14 classes/semester at the most), chosen swimming style, participation in competitions, results of the test events and average final score.
The results obtained by the students (girls and boys as well) from the Faculty of General Medicine are presented in the tables 3 and 4 regarding the most common statistical indicators of the attendance at classes in the first and second semester (maximum 28 classes), chosen swimming style, participation in competitions, results of the test events and average final score.

Figures 1, 2 and 3 show the comparative results in the test events for girls and boys, as well as the preferences for the swimming styles chosen by the first-year students of the Faculty of Dentistry and General Medicine Faculty in „Carol Davila" University of Medicine and Pharmacy of Bucharest.

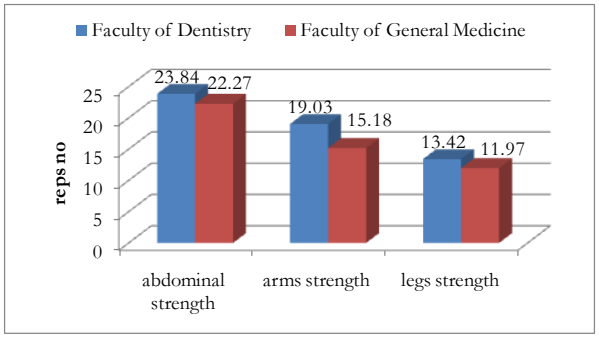

Fig. 1. Comparative results of girls' test events

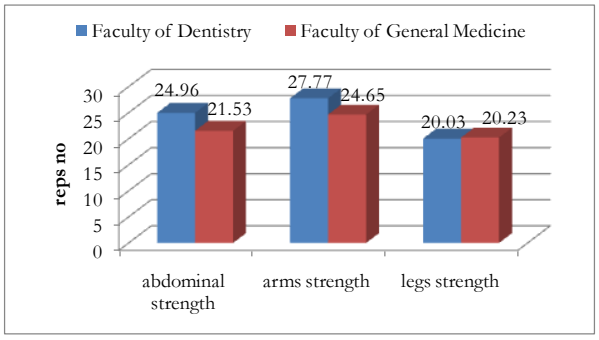

Fig. 2. Comparative results of boys' test events

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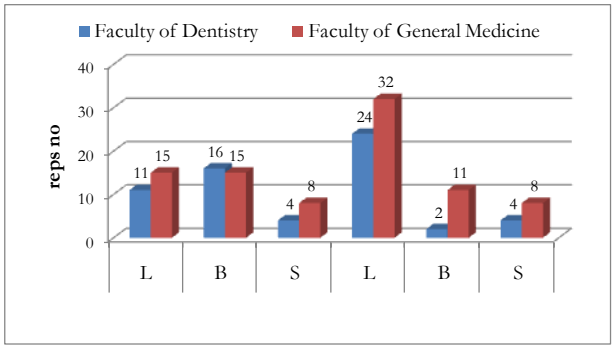

Note: L - freestyle, B – breaststroke, S - backstroke

Fig.3. Preferences of first-year students among the swimming styles

The comparative results in the test events of first-year students highlight differences between faculties (girls and boys) regarding the development of the strength of abdominal, arms and legs muscles and regarding the preferences for a chosen swimming style.

6. Discussions

Like any class of Physical Education, the lesson for learning to swim must be continuous, avoiding the long breaks (downtimes), it must be progressive and respect the physiological and pedagogical principles of learning [17].

The preparatory part (the link) of the swimming lessons used free exercises for general physical development [11], with the main purpose of selectively influence the locomotor system. Also, exercises for muscle strength development were used during the off-water training; these exercises were test events for evaluation of the strength of abdominal, arms and legs muscles [1], [2], [5], [9], [10], [12], [13].

For the in-water training there were used exercises for learning and improving the chosen swimming styles (freestyle, breaststroke and backstroke) and for assessing the starting and returning technique, the arms and legs work and the coordination of these ones with the breathing [7], [9], [14], [17].

The comparative results of the first-year students of the Faculty of Dentistry (tables 1 and 2), girls and boys as well, reveal an average attendance at classes of 8.52 classes in girls and 8.56 classes in boys (maximum 14 hours-semester); as for the improvement of the chosen swimming style in girls (n=31) – 11 preferred the freestyle, 16 – breaststroke and 4 – backstroke while in boys case (n=30) – a number of 24 preferred the

freestyle, 2 – breaststroke and 4 backstroke; participation in competitions for girls: 4 – in First-Year Championship (CAI), 5 – in "Carol Davila" Championship(CCD) and 3 female students volunteered to be referees. In boys' case, a number of 3 participated in CCD (one student participated in breaststroke event out of the two preferred styles); the abdominal strength has an average of 23.84 reps in girls and 22.27 reps in boys; arms strength has an average of 19.03 reps in girls and 27.77 reps in boys; legs strength has an average of 13.42 reps in girls and 20.03 reps in boys; as for the final grade at "Physical Education" discipline, all students – girls and boys as well – got the grade 10.

Concerning the first-year students of the Faculty of General Medicine, their comparative results (tables 3 and 4), for girls and boys as well, highlight an average attendance at classes of 17.94 classes in girls and 17.84 classes in boys (maximum 28 classes); in terms of improvement of the chosen swimming style by girls (n=37) – 15 preferred the freestyle, 15 – breaststroke and 8 – backstroke (one student improved 2 styles, breaststroke and backstroke) while in boys case (n=43) – 32 preferred the freestyle, 11 – breaststroke and 8 backstroke (two students perfected 2 styles – butterfly and freestyle); participation in competitions - girls 4 – at CAI, 1 – at CCD and 1 student participated as volunteer referee, while the boys – 18 at CCI and 5 at CCD; abdominal strength has an average of 22.27 reps in girls and 21.53 reps in boys; arms strength has an average of 15.18 reps in girls and 24.65 reps in boys; legs strength has an average of 11.97 reps in girls and 20.23 reps in boys; final grade - at "Physical Education" discipline, all the students – both girls and boys – got the grade 10.

The comparative results of the girls at the test events between faculties (fig.1): the abdominal strength at the Faculty of Dentistry (MD) has an average of 23.84 reps, higher by 1.57 reps than the students in General Medicine (MG – 22.27 reps); arms strength in the girls of MD has an average of 19.03 reps, higher by 3.85 reps than the students in MG – 15.18 reps; legs strength in the girls of MD has an average of 13.42 reps, higher by 1.45 reps than the students of MG – 11.97 reps.

The comparative results in boys' test events between faculties (fig.2) in terms of abdominal strength in the boys of the MD Faculty has an average of 22.27 reps, higher by 0.67 reps than the students of the MG Faculty – 21.53 reps; arms strength in the boys of the MD Faculty has an average of 27.77 reps, higher by 3.12 reps than the students of the MG Faculty – 24.65 reps; legs strength in the boys of MD Faculty has an average of 20.03 reps, lower by 0.2 reps than the students of the MG Faculty – 20.23 reps.

The comparative results regarding the improvement of a chosen swimming style between faculties, girls and boys as well, (fig. 3) reveal that a smaller

number of students of the Faculty of Dentistry chose the freestyle, a different number of girls and boys chose the breaststroke and an equal number chose the backstroke style.

7. Conclusions

The study results reveal that the subjects of the study - both girls and boys –developed their strength of arms, abdomen and legs muscle, improved their attendance at classes, their participation in sports activities and the final grade.

The comparative results of the test events, analyzed in conformity with the preferred swimming styles, show their influence on the optimization of the displacement in aquatic environment learnt in the "Physical Education and Sport classes" by first-year students of the higher education institutions of other profiles.

The effective use of workouts for muscle strength development in the off-water training within the swimming lessons in the "Physical Education and Sport" discipline for first-year students contributed to movement development in water practicing the chosen swimming styles and to successful participation in competitions, which validates the proposed hypothesis of the paper.

8. Acknowledgment

As author – researcher, we are grateful to the first-year students of the academic year 2016-2017, in the 9th Department –Medical Recovery, discipline of Physical Education and Sport, from "Carol Davila" University of Medicine and Pharmacy of Bucharest, for their agreement to participate in the study conducted. I hereby declare under my own responsibility that the subjects participating in the research have been informed of the voluntary nature of participation in the research, of the understanding of the information received and of the understanding that withdrawal can be done at any time, without any negative consequences on the participant. The research respected the ethical standards of the research, the participants / the next of kin of the participants gave their consent to take part in the research.

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