SELF – ASSESSMENT OF MOTOR SKILLS BY THE STUDENTS AT THE FACULTY OF SECURITY STUDIES IN BANJA LUKA

Original Scientific Article

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Abstract: The research sample consisted of 43 first-year male students at the Faculty of Security Studies Banja Luka. This study was conducted to with the aim of determining the relationship between student self-assessment of motor skill performance and the results of the same obtained based on the application of appropriate tests for the assessment of students' motor status. The assessment of motor skills was performed through a battery of seven tests: maximum number of push-ups in 10 seconds (MSKL) – used to assess the dynamic strength of the arm and shoulder girdle, standing long jump (MSDM) – used to assess the explosive power of the lower extremities, agility with a stick (MOKP) – used to assess coordination, the maximum number of trunk lifts in 30 seconds (MPTR) – used to assess the dynamic strength of the trunk, hand tapping (MTAR) – used to assess the frequency of hand movements, forward roll - backward roll – running (MKNT) – used to assess agility, and the Cooper's 12-minute running test (MKUP) – used to assess aerobic endurance. For the self-assessment of motor skills, a constructed questionnaire with six responses was used: excellent (5), above average (4), average (3), below average (2), poor (1), and very poor (0). The obtained results showed a positive transfer of the Special Physical Education (SPE) curriculum to body coordination, agility, and the dynamic strength of the arm and shoulder girdle. Students' self-assessments of motor skills in the test for the assessment of trunk dynamic strength, dexterity and agility were excellent. The students provided poor self-assessments regarding the test for the assessment of explosive power of the lower extremities, speed, and the frequency of movement, the dynamic strength of the arm and shoulder girdle and body coordination. The students provided overestimated self-assessments in the aerobic endurance test. The obtained results indicate

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the need to enrich the teaching content of SPE, primarily in the area of motor skills aimed at the development of aerobic endurance, as well as the implementation of the self-assessment method in the same.

Keywords: motor skills, assessment, self-assessment of results.

INTRODUCTION

Special physical education, as part of the system of the teaching process of the Faculty of Security Studies, whose basis are martial arts such as judo, karate and jiu jitsu, as well as the combination of the techniques of the mentioned sports, aims to improve and maintain basic motor skills,[2] as well as the acquisition of specific techniques and motor skills, which can indirectly affect the development of basic motor skills. An appropriate teaching and training process enables general and specific motor skills to be transformed and adapted to the professional needs of security workers. The modern way of life and the challenges posed to members of the security forces require highly developed basic motor skills, specific motor skills and functional skills. We can conclude that one of the basic factors for the successful functioning of institutions and agencies and for security personnel to be successful in their work is well-developed motor skills and good performance of specific motor tasks (Milošević, 1985; Dopsaj et al., 2002; Blagojević, Dopsaj & Vučković, 2006).

In order for them to act rationally and with maximum efficiency in everyday situations, it is necessary for members of the security forces to be involved in organized or individual training activities. Also, it is necessary that persons dealing with security work develop awareness of the positive impact of physical exercise on health and improvement of general physical wellness. Numerous studies point out the importance of regular physical exercise: Stojičić (1994), Milošević (1985), Milošević et al. (1994), Božić, Milošević and Zulić (1990), Mudrić, Jovanović, Milošević and Ćirković (1994), Blagojević and et al., (1994), Blagojevića (1996), and (1997), Dopsaj, et al., (1996), Milošević, Mudrić and Amanović (2002), Dopsaj et al., (2002), Amanović, Mudrić and Jovanović (2002), Suboticko (2003), Amanović, Milošević and Mudrić (2004), and Gužvice (2005), (2006), (2007), and (2008). Also, Paspalj (2008), (2009), (2010), (2012), (2013), as well as Janković, Vučković and Blagojević (2014), reached similar research results. Studies conducted by the above-mentioned authors confirmed that well-developed motor skills are of great importance, not only in mastering the Special Physical Education program, but also in their effective practical application in a real life situation.

2 The term motor skills often refers to human abilities that participate in solving motor tasks and condition successful movement (Malacko, 1991).

Regarding basic motor skills, we mean first of all motor skills that are, more or less, genetically determined, which are manifested, to a greater or lesser extent, in the daily motor functioning of a person. Unlike basic motor skills, specific motor skills are acquired over the course life and are the result of a specific training process. According to Nićin and Lolić (2010), the following division of basic motor skills is accepted today: strength, speed, endurance, coordination, flexibility, balance and precision. It is certain that the aforementioned motor skills, that is, their subsystems, play a significant role in the performance of everyday work activities, which are full of uncertainty and require police officers to quickly solve whatever problems arise. The effectiveness of throwing techniques, kicks, avoiding the opponent's attacks, quick entrances is conditioned by the development of explosive power. Speed plays a very important role when hitting and moving in the guard, and when making blocks efficiently. Often, police officers find themselves in a situation in which they need to perform attacks or defenses for a longer period of time, and if they do not have well-developed endurance, they will certainly not be able to act appropriately and make rational decisions. Speed in all its manifestations (speed of reaction, speed of individual movement, frequency of movement) is extremely important for the effective execution of various throwing techniques, movement, levers, kicks, evasion and blocks, avoiding opponent's attacks, timely blocking, back kicks, execution of combination and technical elements (kicks, sweeps, levers, throws).

As for the self-assessment of motor skills, that is, this type of research, it is mostly related to adolescents' self-assessments, who were involved in organized forms of physical exercise. Previous studies (Eccles et al., 1993; Marsh 1993; Crocker et al., 2000; Jürimäe & Rego 2002; Raudsepp et al., 2002; Daley 2002; Planinsec et al. 2005; Bosnar and Vukmir 2008) showed a high level of correlations on the development and self-assessment of the state of motor skills, with special emphasis on endurance, strength, flexibility and physical structure. According to Lintunen (1995), self-assessment is a very important indicator that characterizes physical and psychological adaptation to the world. Research conducted by Marsh (1993), on a sample of Australian school children aged 9-15 years, in which answers to general questions about self-assessed physical abilities (fitness) were given, a significant correlation of self-assessment with numerous indicators of general physical skills (fitness) was determined, such as cardiovascular endurance, muscular strength and body composition.

In order to carry out quality research of the human motor area, it is necessary to apply tests with good metric characteristics, that is, the use of tests that are objective, reliable, valid, calibrated, sensitive and economical. Also, the condition of the motor area can be predicted using the self-assessment method. According to Sporiš et al., (2011), self-assessment contributes to the self-actualization of the individual, who thereby additionally builds awareness of his/her values, physical skills, and his/her own body. Also, a large number of authors believe that the ability to self-assess depends on the level of self-confidence and

their involvement in physical activity programs. It is evident that people who regularly do physical exercise have a higher level of self-confidence, act more rationally and make more effective decisions in specific situations.

The aim of this paper is to determine the relationship between the self-assessment of the motor skills involving students at the Faculty of Security Studies, and the results obtained based on the application of appropriate tests for the assessment of the students' motor status. This research includes tests that evaluate the explosive strength of the lower extremities (long jump), dynamic strength of the arm and shoulder girdle (maximum number of push-ups in 10 seconds), dynamic trunk strength (maximum number of trunk lifts in 30 seconds), body coordination (agility with a stick), agility (forward roll, backward roll, running), speed of movement (hand tapping), and aerobic endurance (Cooper's 12-minute running test), which are an integral part of the curriculum within the Special Physical Education course.

The obtained and objective results of the motor skills self-assessment will enable students at the Faculty of Security Studies to more realistically assess their own skills and knowledge, and more adequately apply them in real situations.

RESEARCH METHODS

Sample of respondents

The sample consisted of the respondents, that is, 43 first-year male students at the Faculty of Security Studies in Banja Luka. The average age of the students was 19 ± 0.6 years, body height 181.85 ± 6.13 cm, body weight 78 .43 ± 9.83 kg, and body fat index 23.71 ± 2.43 kg/m2. All respondents were healthy with no visible physical defects. It is necessary to emphasize that all of the respondents who participated in this research successfully passed the medical examination and psychological tests as part of admission to the Faculty of Security Studies.

Sample of variables

The assessment of motor skills among the respondents was carried out on the basis of a battery of seven tests, which are used as entrance exams, when enrolling at the Faculty of Security Studies, such as standing long jump (MSDM) – used to assess the explosive power of the lower extremities, maximum number of trunk lifts in 30 seconds (MPTR) – used to assess trunk dynamic strength, hand tapping (MTAR) – used to assess frequency of hand movement, maximum number of push-ups in 10 seconds (MSKL) – used to assess dynamic arm strength and shoulder girdle, agility with a stick (MOKP) – used to assess coordination, forward roll -backward roll - running (MKNT) – used to assess agility,

and a test to evaluate aerobic endurance – the Cooper's 12-minute running test (MKUP). All tests for the assessment of motor skills contain the necessary metric characteristics with a clearly defined protocol and application conditions.

Data-processing methods

Statistical processing and arrangement of data was performed using statistical software program SPSS Statistics 17.0 (Hair, Anderson, Tatham & Black, 1998). Comparative and descriptive statistical procedures were used for the statistical processing of the obtained data. Using the method of primary data processing, information was obtained on the distribution of variables within the examined area, where the arithmetic mean was determined as a measure of the average value of the results, and the standard deviation as a measure of the deviation from the results of the mean of the achieved results. The regularity of the data distribution was tested using the Kolmogorov-Smirnov test. The Student's t-test for dependent samples was used to test the difference in average values during the initial and final measurements. In order to obtain the best possible research results, in addition to the numerical indicators, a qualitative assessment of the results achieved during the initial and final measurements was performed. Before the final assessment of motor and functional abilities, students used a self-assessment questionnaire to anticipate their explosive power of the lower extremities, dynamic power of the arm and shoulder girdle, the dynamic power of the trunk, coordination, agility, the frequency of hand movements and aerobic endurance. The constructed self-assessment questionnaire contained six answers: excellent (5), above average (4), average (3), below average (2), poor (1) and very poor (0), whereby the students were explained only the statistical status of the numerical symbol with self-assessment of each individual manifest variable. The reliability of the self-assessment questionnaire was determined by the Cronbach's coefficient.

RESULTS AND DISCUSSION

The results of the respondents related to assessment of the status of students' motor skills in the entrance exam and the status of students' motor skills at the end of the second semester are shown in Table 1.

Table 1: Results of motor skills in the entrance exam and at the end of the second semester

Variable	Measurement results in the entrance exam				Measurement results at the end of the second semester			
	Number of respondents	Mean value of the results	Deviation from the mean	Significance of the Kolmogorov-Smirnov test	Number of respondents	Mean value of the results	Deviation from the mean	Significance of the Kolmogorov-Smirnov test
MSDM	43	228.81	22.18	0.73	43	232.48	21.97	0.68
MSKL	43	13.65	2.18	0.01	43	12.93	2.63	0.16
MPTR	43	28.88	3.38	0.46	43	29.16	5.17	0.83
MOKP	43	6.58	1.74	0.51	43	5.87	1.61	0.04
MKNT	43	6.18	0.74	0.11	43	5.99	0.53	0.85
MTAP	43	53.00	4.29	0.48	43	53.95	3.57	0.74
MKUP	43	2624.53	363.38	0.90	43	2537.67	353.16	0.91

Notes: MSDM – standing long jump, MSKL – number of push-ups in 10 seconds, MPTR – number of trunk lifts in 30 seconds, MOKP – agility with a stick, MKNT – forward roll-backward roll-running, MTAP – hand tapping, MKUP – Cooper's 12-minute running test.

The differences in the results of motor skills obtained in the entrance exam and the results the of motor skills measurement at the end of the second semester, which are listed in Table 1, according to the dependent samples t-test, an increase in the arithmetic means of the results achieved in the long jump (MSDM) may be observed between the measurements in the entrance exam (M = 228.81) and at the end of the second semester (M = 232.48). The increase in the arithmetic means between the two measurements was 3.67. The obtained results of trunk dynamic strength (MPTR) also showed an increase in the arithmetic mean between the measurement in the entrance exam (M = 28.88) and the measurement at the end of the second semester (M = 29.16), which was 0.28. An increase in the arithmetic mean is also observed in hand tapping (MTAR) between the measurement in the entrance exam (M = 53.00) and the measurement at the end of the second semester (M = 53.95). The increase in the arithmetic means between the two measurements was 0.95. The obtained results in Table 1 show that there was a decrease in the arithmetic means of the results achieved in certain motor skills tests. When performing the arm and shoulder girdle dynamic strength test (MSKL), there was a decrease in the arithmetic mean between the measurements in the entrance exam (M = 13.65) and the measurements at the end of the second semester (M = 12.93), and this difference was 0.72. A decrease in the arithmetic mean is observed in the stick agility test (MOKP) between the measurements in the entrance exam (M = 6.58) and at the end of the second semester (M = 5.87), which is 0.71. Bearing in mind the fact that, regarding this test, a lower value represents a better result, this difference can be considered as an improvement in the results measured at the end of the second semester compared to the measurement in

the entrance exam. The obtained results of the agility test (MKNT) also show a decrease in the arithmetic mean between the measurement in the entrance exam (M = 6.18) and the measurement at the end of the second semester (M = 5.87), which amounts to 0.19. Also, as with the previous test, a lower value represents a better result, and this difference can be considered as an improvement in the results measured at the end of the second semester compared to the measurement in the entrance exam. The results of the aerobic endurance test (MKUP) also show a decrease in the arithmetic mean between the measurements in the entrance exam (M = 2624.53) and at the end of the second semester (M = 2537.67). The reduction of the arithmetic mean between the two measurements was 86.86.

Numerical data on the scores achieved on the motor skills test as a part of the entrance exam and at the end of the second semester are shown in Table 2.

Table 2: Scores for the results of motor skills measurement in the entrance exam and motor skills measurement at the end of the second semester

Variables	Scores for the results of measurements in the entrance exam							Scores for the results of measurement at the end of the second semester						
Scores	0	1	2	3	4	5	AS	0	1	2	3	4	5	AS
MSDM	16	5	4	9	3	6	**1.90**	11	10	4	6	6	6	**2.03**
MSKL	1	0	2	5	16	19	**4.13**	1	1	5	8	14	14	**3.74**
MPTR	0	2	4	10	15	12	**3.72**	1	2	5	10	9	16	**3.67**
MOKP	6	3	7	14	8	5	**2.69**	4	0	5	9	18	7	**3.34**
MKNT	2	0	3	22	13	3	**3.23**	0	0	9	18	11	5	**3.27**
MTAP	0	1	4	13	15	10	**3.67**	0	0	4	12	17	10	**3.76**
MKUP	19	7	7	4	3	3	**1.39**	24	10	4	1	2	2	**0.90**

Notes: MSDM – standing long jump, MSKL – number of push-ups in 10 seconds, MPTR – number of trunk lifts in 30 seconds, MOKP – agility with a stick, MKNT – forward roll-backward roll-running, MTAP – hand tapping, MKUP – Cooper's 12-minute running test, AS – average score.

Table 2 shows that, when performing the standing long jump test (MSDM), 16 respondents when measuring their motor skills in the entrance exam and 11 respondents when measuring their motor skills at the end of the second semester received 0 points, while six respondents when measuring motor skills in the entrance exam and six respondents at the end of the second semester were awarded 5 points. The mean of scores, when measuring motor skills in the entrance exam is **1.90**, and **2.03** when measuring motor skills at the end of the second semester.

In the test for assessing the dynamic strength of the arms and frame girdle, that is, the number of push-ups in 10 seconds (MSKL), one respondent, when measuring motor skills in the entrance exam, and one respondent, when measuring motor skills at the end of the second semester were awarded 0 points, while 19 respondents, when measuring motor skills in the entrance exam and 14 respondents, when measuring motor skills at the end of the second semester,

were awarded 5 points. The mean value of the scores, when measuring motor skills in the entrance exam is **4.13** and **3.74** when measuring motor skills at the end of the second semester.

When performing the test for the assessment of dynamic strength of the trunk – trunk lifts in 30 seconds (MPTR), one respondent was awarded 0 points when measuring motor skills at the end of the second semester, while 12 respondents were awarded 0 points when measuring motor skills in the entrance exam, while 16 respondents, when measuring motor skills at the end of the second semester, were awarded 5 points. The average value of scores regarding the measurement of motor skills in the entrance exam is **3.72**, and the measurement of motor skills at the end of the second semester is **3.67**.

In the test for the assessment of body coordination – agility with a stick (MOKP), 6 respondents, when measuring motor skills in the entrance exam, and 4 respondents, when measuring motor skills at the end of the second semester, were awarded 0 points, while 5 respondents, when measuring motor skills in the entrance exam and 7 respondents, when measuring motor skills at the end of the second semester were awarded 5 points. The mean value of the scores when measuring motor skills in the entrance exam is **2.69**, and **3.34** when measuring motor skills at the end of the second semester.

In the test for the assessment of agility and forward roll – backward roll - running (MKNT), 2 respondents were awarded 0 points when measuring motor skills in the entrance exam, while 3 respondents, when measuring motor skills in the entrance exam, and 5 respondents, when measuring motor skills at the end of the second semester, were awarded 5 points. The average value of scores when measuring motor skills in the entrance exam is **3.23** and **3.27** at the end of the second semester.

For the assessment of the speed of movement frequency – hand tapping (MTAR), none of the respondents, when measuring motor skills in the entrance exam and at the end of the second semester were awarded 0 points, while 10 respondents, when measuring motor skills in the entrance exam, and 10 respondents, when measuring motor skills at the end of the second semester, were awarded 5 points. The mean value of the scores when measuring motor skills in the entrance exam is **3.67**, and **3.76** when measuring motor skills at the end of the second semester.

The obtained result is expected in view of previous research results obtained by authors who dealt with similar issues. Positive transformations of the teaching process of the Special Physical Education course are especially visible in the respondents who achieved poor scores when measuring motor skills in the entrance exam, and they made more progress than the respondents who also achieved results in the measurement of motor skills in the entrance exam. Precisely because of this, the authors believe that the respondents who performed poorly in the entrance exam during the motor skills test statistically contributed the most to the differences between the same measurements in the entrance exam and at the end of the second semester.

Lower results on the measurement of motor skills at the end of the second semester, in relation to the same results in the entrance exam, were shown by the respondents in the test for the assessment of aerobic endurance – Cooper's 12-minute running test (MKUP). The mean of the scores when measuring motor skills in the entrance exam is **1.39**, and **0.90** when measuring motor skills at the end of the second semester. A large number of respondents performed poorly in this test. When measuring aerobic endurance in the entrance exam, 19 respondents were awarded 0 points and even 24 respondents at the end of the second semester. Considering the small number of lessons, which were not aimed at the development of this motor skill, and due to the teaching process dominated by the adoption of new motor programs, the obtained results are not surprising.

Analysis of the results obtained through the implementation of the Special Physical Education program, that is, the mean value of the final measurement of all variables, indicates that the mean value of the achieved results has increased compared to the initial measurement of the motor skills of trunk dynamic strength, coordination, agility and the frequency of hand movements. Decreases in the average score of the achieved results compared to the initial measurement may be observed in the explosive strength of the lower extremities, dynamic strength of the arm and shoulder girdle, and aerobic endurance.

The Student's t-test results for paired samples for the observed variables of motor skills after the measurement in the entrance exam and the measurement at the end of the second semester are shown in Table 3.

Table 3: Differences in the results when measuring motor skills in the entrance exam and at the end of the second semester

Motor skills variables		Paired score differences					t test	Number of degrees of freedom	Significance (two-way)
		The mean of scores	Deviation from the mean	Standard error mean	95% confidence interval				
					Lower limit	Upper limit			
Pair 1	MSDM1 MSDM2	-3.67	14.74	2.24	-8.2130	.8649	-1.63	42	0.11
Pair 2	MSKL1 MSKL2	0.72	1.36	0.20	0.29	1.142	3.45	42	0.00
Pair 3	MPTR1 MPTR2	-0.27	4.42	0.67	-1.64	1.082	-0.41	42	0.68
Pair 4	MOKP1 MOKP2	0.71	1.37	0.21	0.28	1.136	3.38	42	0.00
Pair 5	MKNT1 MKNT2	0.19	0.53	0.08	0.02	.3586	2.35	42	0.02
Pair 6	MTAP1 MTAP2	-0.95	4.05	0.61	-2.20	.2938	-1.54	42	0.13
Pair 7	MKUP1 MKUP2	86.86	166.61	25.40	35.58	138.13	3.41	42	0.00

The results obtained when measuring the explosive strength of the lower extremities (MSDM) at the end of the second semester, regardless of the increase in the arithmetic mean, did not show statistical significance in relation to the initial measurement. The results obtained when measuring the dynamic strength of the arm and shoulder girdle (MSKL) at the end of the second semester showed significant deviations in relation to the measurement in the entrance exam, and they are statistically significant (**p=0.00**). Regardless of the increase in the arithmetic mean of the measurement of dynamic trunk strength (MPTR) at the end of the second semester compared to the measurement in the entrance exam, it is not statistically significant. The results of the measurement of coordination of the body (MOKP) at the end of the second semester showed a statistically significant difference in results (**p=0.00**) compared to the measurement in the entrance exam. Also, statistically significant increases in results (**p=0.02**) when measured at the end of the second semester are also visible in the dexterity and agility tests (MKNT) and the aerobic endurance test (MKUP) (**p=0.00**). The results obtained when measuring the hand movement frequency (MTAP) at the end of the second semester, regardless of the increase in the arithmetic mean, in relation to the measurement in the entrance exam, are not statistically significant.

Table 4 shows the differences in the motor skill scores obtained in the entrance exam and at the end of the second semester.

Table 4: Differences in the motor skill scores obtained in the entrance exam and at the end of the second semester

Motor skills variables		The mean score	Number of respondents	Deviation from the mean	Standard error of the mean
Pair 1	MSDM1	1.90	43	1.84	0.28
	MSDM2	2.09	43	1.81	0.27
Pair 2	MSKL1	4.13	43	1.05	0.16
	MSKL2	3.74	43	1.23	0.18
Pair 3	MPTR1	3.72	43	1.11	0.17
	MPTR2	3.67	43	1.34	0.20
Pair 4	MOKP1	2.69	43	1.52	0.23
	MOKP2	3.34	43	1.39	0.21
Pair 5	MKNT1	3.23	43	1.01	0.15
	MKNT2	3.27	43	0.93	0.14
Pair 6	MTAP1	3.67	43	1.01	0.15
	MTAP2	3.76	43	0.92	0.14
Pair 7	MKUP1	1.39	43	1.6	0.24
	MKUP2	0.90	43	1.39	0.21

Based on the results obtained in motor skill tests (Table 4), that is, measurements in the entrance exam and at the end of the second semester, it is evident that there was an increase in the arithmetic mean in the tests for the

assessment of explosive strength (1.90 - **2.09**), body coordination (2.69 - **3.34**), dexterity and agility (3.23 – **3.27**) and the test for the assessment of frequency of hand movements (3.67 – **3.76**). A decrease in the arithmetic mean of the score is visible in the scores for the repetitive arm and shoulder girdle strength tests (4.13 - **3.74**), trunk dynamic strength (3.72 - **3.67**) and the aerobic endurance test (1.39 - **0.90**).

The results of the motor skills scores achieved in the entrance exam and at the end of the second semester are shown in table 5, using the Student's t-test.

Table 5: Student's t-test – the results of motor skill scores obtained in the entrance exam and at the end of the second semester

Motor skills variables		Paired score differences					t test	Number of degrees of freedom	Significance (two-way)
		The mean of the score	Deviation from the mean	Standard error of the mean	95% confidence interval				
					Lower limit	Upper limit			
Pair 1	MSDM1 MSDM2	-0.18	1.15	0.17	-0.54	0.17	-1.05	42	0.29
Pair 2	MSKL1 MSKL2	0.39	0.65	0.10	0.19	0.59	3.93	42	0.00
Pair 3	MPTR1 MPTR2	0.04	1.23	0.18	-.33	0.42	0.24	42	0.80
Pair 4	MOKP1 MOKP2	-0.65	1.13	0.17	-0.99	-0.30	-3.77	42	0.00
Pair 5	MKNT1 MKNT2	-0.04	0.98	0.14	-0.33	0.23	-0.33	42	0.74
Pair 6	MTAP1 MTAP2	-0.09	1.08	0.16	-0.42	0.24	-0.56	42	0.57
Pair 7	MKUP1 MKUP2	0.48	166.61	0.15	0.18	0.79	3.25	42	0.00

Regardless of the progress, that is, the increase in the arithmetic mean of the scores for the explosive strength test (MSDM) at the end of the second semester compared to the measurement in the entrance exam (-0.18), it is still not statistically significant. In contrast to the test of explosive strength, when measured at the end of the second semester, the increase in the arithmetic mean score (-0.65) in the body coordination test (MOKP) is statistically significant (p=0.00). Also, when taking measurement at the end of the second semester, there were visible increases in the scores regarding the arithmetic means of the dexterity and agility test (MKNT) (-0.04) and the speed of movement frequency test (MPTR) (-0.09), but these increases are not statistically significant. A statistically significant decrease in the arithmetic average score can be observed in the tests for the assessment of the dynamic strength of the arm and shoulder girdle (MSKL) (p=0.00), and aerobic endurance (MKUP) (p=0.00). In the trunk dynamic strength test (MPTR), there is also a decrease in the arithmetic mean score (p=0.04), but it is not statistically significant.

Table 6 shows scores for the self-assessment of motor skills test results and the results of the assessment of motor skills among the students at the end of the second semester.

Table 6: Grades for self-assessment of motor skills results and motor skills measurement results at the end of the second semester

Variables	Scores for the self-assessment of motor skills							Scores for the measurement results at the end of the second semester						
Score	0	1	2	3	4	5	AS	0	1	2	3	4	5	AS
MSDM	4	12	5	9	7	6	**2.48**	11	10	4	6	6	6	**2.03**
MSKL	0	0	2	8	14	19	**4.16**	1	1	5	8	14	14	**3.74**
MPTR	0	1	4	10	11	17	**3.90**	1	2	5	10	9	16	**3.67**
MOKP	2	4	9	15	7	6	**2.90**	4	0	5	9	18	7	**3.34**
MKNT	0	2	5	14	12	10	**3.53**	0	0	9	18	11	5	**3.27**
MTAR	0	0	1	10	17	15	**4.06**	0	0	4	12	17	10	**3.76**
MKUP	10	13	7	7	4	2	**1.72**	24	10	4	1	2	2	**0.90**

Notes: MSDM – standing long jump, MSKL – number of push-ups in 10 seconds, MPTR – number of trunk lifts in 30 seconds, MOKP – agility with a stick, MKNT – forward roll-backward roll-running, MTAP – hand tapping, MKUP – Cooper's 12-minute running test, AS – average score.

Based on the results, it is evident that in the first variable used to assess standing long jump (MSDM), the respondents' assessments when self-assessing motor skills in relation to the results achieved in the motor skills test at the end of the second semester, were beter than the achieved results. Thus, only 4 respondents chose a result worth 0 points and 12 respondents chose a result worth 1 point, while in the motor skills test at the end of the second semester, 11 respondents were awarded 0 points and 10 respondents were awarded 1 point, which represents a worse result compared to the self-assessment of motor skills based on one's own perception. The mean of self-assessment score is **2.48**, and **2.03** when measuring motor skills at the end of the second semester.

In the test for assessing the dynamic strength of the arm and shoulder girdle – the number of push-ups in 10 seconds (MSKL), none of student chose a result which awards 0 points or 1 point, while in the motor skills test at the end of the second semester 1 respondent was awarded 0 points and 1 respondent received 1 point. Also, in the self-assessment, 19 respondents chose the result awarded 5 points, while in the measurement of motor skills at the end of the second semester, 14 respondents were awarded 5 points, which represents a worse result compared to the self-assessment of motor skills, based on their

own opinion. The mean of self-assessment score is **4.16**, and **3.74** when measuring motor skills at the end of the second semester.

During the assessment of the dynamic strength of the trunk, that is, the number of trunk lifts in 30 seconds (MPTR), when performing self-assessment, no student chose the result, which is awarded 0 points, while 1 respondent chose a result which awards 1 point. In the motor skills test at the end of the second semester, 1 respondent was awarded 0 points and 2 respondents 1 point. Further, 11 respondents chose a result which awards 4 points and 17 respondents chose a result which awards 5 points, while at the end of the second semester, when measuring motor skills, 9 respondents were awarded 4 points and 16 respondents 5 points, which represents a worse result compared to the self-assessment of motor skills based on one's own perception. The mean value of the self-assessment score is **3.90**, and **3.67** when measuring motor skills at the end of the second semester.

In terms of the variable for agility with a stick (MOKP), the respondents' self-assessment of their motor skills results was poor compared to the results achieved in the motor skills test at the end of the second semester. Thus, 2 respondents chose a result which awards 0 points, while 4 respondents chose a result which awards 1 point, while in the motor skills test at the end of the second semester, 4 respondents were awarded 0 points while none of the respondents were awarded 1 point. Also, in the self-assessment, 7 respondents chose a result which awards 4 points and 6 respondents chose a result which awards 5 points, while in the motor skills test at the end of the second semester, 18 respondents scored a result awarded 4 points and 7 respondents achieved a result which awards 5 points. The mean value of the self-assessment score was **2.90**, and **3.34** when measuring motor skills at the end of the second semester.

Regarding the test for the assessment of dexterity and agility – forward roll – backward roll - running (MKNT), the respondents showed better results in the self-assessment of their motor skills scores compared to the scores obtained in the motor skills test at the end of the second semester. Thus, 12 respondents achieved a result which awards 4 points and 10 respondents achieved a result which awards 5 points, while in the motor skills test at the end of the second semester, 11 respondents achieved a result which awards 4 points, while 5 of them achieved a result which awards 5 points. The mean value of the self-assessment score was **3.53**, and **3.27** when measuring motor skills at the end of the second semester.

In the case of the hand tapping variable (MTAR), the respondents also achieved better results in the self-assessment of their motor skills results compared to the scores achieved in the motor skills test at the end of the second semester. Thus, 17 respondents achieved a result which awards 4 points and 15 respondents achieved a result awarding 5 points, while in the motor skills test at the end of the second semester, 17 respondents achieved a result which awards 4 points, while 10 of them achieved a result which awards 5 points. The mean

value of the self-assessment score was **4.06**, and **3.76** when measuring motor skills at the end of the second semester.

Regarding the variable for aerobic endurance – Cooper's 12-minute running test (MKUP), the respondents also showed better results in the self-assessment of their motor skills results compared to the scores obtained in the motor skills test at the end of the second semester. Thus, 10 respondents chose a result which awards 0 points and 13 respondents chose a result which awards 1 point, while in the motor skills test at the end of the second semester, 24 respondents achieved a result which awards 0 points and 10 respondents achieved a result which awards 1 point. The mean value of the self-assessment score was **1.72**, and **0.90** when measuring motor skills at the end of the second semester. A large number of respondents who achieved a poor result in this test were recorded, which leads to the conclusion that they did not work on maintaining aerobic endurance from the moment they enrolled in school, but that they had worked on developing it before enrolling in the Faculty of Security Studies.

The comparison of the mean values in the self-assessment of motor skills results and the achieved results in the motor skills test at the end of the second semester is shown in Table 7.

Table 7: Comparison of the mean values in motor skills self-assessments and the results achieved in the motor skills test at the end of the second semester

		Mean	Number of respondents	Deviation from the mean	Standard error of the mean
Pair 1	MSDM test score	2.03	43	1.81	0.27
	Self-assessment of MSDM	2.48	43	1.60	0.24
Pair 2	МСКЛ test score	3.74	43	1.23	0.18
	Self-assessment of MSKL	4.16	43	0.89	0.13
Pair 3	MPTR test score	3.67	43	1.34	0.20
	Self-assessment of MPTR	3.90	43	1.10	0.16
Pair 4	MOKP test score	3.34	43	1.39	0.21
	Self-assessment MOKP	2.90	43	1.32	0.20
Pair 5	MKNT test score	3.27	43	0.93	0.14
	Self-assessment of MKNT	3.53	43	1.12	0.17
Pair 6	MTAP test score	3.76	43	0.92	0.14
	Self-assessment of MTAP	4.06	43	0.82	0.12
Pair 7	MKUP test score	0.90	43	1.39	0.21
	Self-assessment of MKUP	1.72	43	1.46	0.22

The analysis of the results in Table 7 demonstrates that students self-assessed their results quite well in the trunk dynamic strength test (3.67 - **3.90**) dexterity and agility test (3.27 - **3.53**), in which their actual grade deviates the least from the self-assessed one. The students' self-assessment of the speed of movement frequency test results (3.76 - **4.06**) was good. Their self-assessment of the explosive strength of the lower extremities test results (2.03 - **2.48**) and

the dynamic strength of the arms and shoulder girdle test results (3.74 - **4.16**) was quite poor. In the coordination test, the students' self-assigned a poorer test result compared to the one achieved (3.34 - **2.90**). The students achieved the poorest average result in the aerobic endurance test (0.90), and they self-assessed the same skill by 0.82 more than the result achieved (1.72).

The results of the Student's t-test for the self-assessment of motor skills results and the the motor skills test results at the end of the second semester are shown in Table 8.

Table 8: Student's t-test, results of the self-assessment of motor skills test result and the result achieved in the motor skills test at the end of the second semester

		Paired result differences					t test	Number of degrees of freedom	Significance (two-way)
		Mean	Deviation from the mean	Standard error of the mean	95% confidence interval				
					Lower limit	Lower limit			
Pair 1	MSDM score Self-assessment of MSDM	-0.39	1.17	0.17	-0.75	-0.03	-2.20	42	0.03
Pair 2	MSKL score Self-assessment of MSKL	-0.41	1.05	0.16	-0.74	-0.09	-2.61	42	0.01
Pair 3	MPTR score Self-assessment of MPTR	-0.23	1.30	0.19	-0.63	0.16	-1.16	42	0.25
Pair 4	MOKP score Self-assessment of MOKP	0.44	1.07	0.16	0.11	0.77	2.69	42	0.01
Pair 5	MKNT score Self-assessment of MKNT	-0.25	0.90	.1375	-0.53	0.02	-1.85	42	0.07
Pair 6	MTAP score Self-assessment of MTAP	-0.30	0.88	.1353	-.5754	-0.02	-2.23	42	0.03
Pair 7	MKUP score Self-assessment of MKUP	-0.81	0.87	.1341	-1.084	-0.54	-6.06	42	0.00

Further analysis, and the obtained research results in Table 8, clearly show that the students' self-assessed their motor skills in the aerobic endurance tests as very poor – Cooper's 12-minute running test (**p=0.00**), body coordination – agility with a stick (**p=0.01**), the dynamic strength of arm and shoulder girdle – maximum number of push-ups in 10 seconds (**p=0.01**), speed of movement frequency – hand tapping (**p=0.03**), and the explosive strength of lower extremities – standing long jump (**p=0.03**), and as excellent in the tests of dynamic

trunk strength – trunk lifts in 30 seconds, that is, body dexterity and agility – forward roll - backward roll - running.

DISCUSSION

The results of the motor skills tests, that is, the difference between the initial and final measurements indicate that certain motor skills in the students at the Faculty of Security Studies remained at the same level, while some made significant progress. Although there was an increase in the arithmetic means between the initial and final measurements, in the tests for the assessment of explosive power of the lower extremities and the frequency of hand movements, they were not statistically significant, that is, there was no statistically significant increase in the value of these motor skills. The results of the mentioned tests should not be worrisome, considering that the measurement of the mentioned motor skills was made during the entrance exam, in the period when students were better physically prepared. Also, it is necessary to emphasize that speed and explosive power are genetically determined and there is very little possibility of influencing them through physical training. According to Nićin and Lolić (2010), speed is 95% genetically conditioned and explosive power 70%. The mentioned motor skills are in direct correlation. There was an increase in the values, which are statistically significant, in the tests for the assessment of dynamic arm and shoulder girdle strength, body coordination, dexterity and agility. A statistically significant decrease in values compared to the initial measurement is visible in the aerobic endurance test. It is evident that the program aimed at the development of aerobic endurance alone is insufficient to improve this motor skill, and requires students to self-actualize and additional individual work in order to improve this motor skill. Additionally, the development of this and other relevant skills provided by the curriculum is possible with increased intensity and a large number of repetitions of specific motor programs in SPE classes, which requires their complete adoption, that is, their automation. Certain changes in the teaching content of SPE, that is, individualization of teaching, would contribute to more effective application of specific motor programs characteristic of security professionals. Improving aerobic endurance will indirectly lead to the improvement of other motor skills. The obtained results of the motor skills tests were also confirmed by the final grades on motor skills tests.

The students provide excellent self-assessments regarding motor skills test results and the results achieved in the tests for the assessment of trunk dynamic strength and dexterity and agility tests. Good results of the assessment of the dynamic strength of the trunk correlate with the modern trends of aesthetic criteria on appearance. Taveras et al., (2004), indicate that adolescents want to look like celebrities and therefore exercise more frequently. The students self-assessed the results in the test of speed, frequency of movement and explo-

sive power of the lower extremities slightly worse. Regarding the self-assessment of the dynamic arm and shoulder girdle strength test results, the students underestimated the result achieved. According to Sollerhead et al., (2008), continuous physical activity, as an everyday occurrence, is perceived by boys as pleasurable and an integral part of growing up, which can be one of the reasons for overestimating one's own abilities. The students underestimated self-assessment of the result achieved in the body coordination test. It is evident that the students did not have, or a small number of them had, contact with martial arts (judo, jiu jitsu and karate) which, in their introductory preparatory part, pay great attention to the improvement of coordination and flexibility of the whole body, and therefore their self-assessment is underestimated. The students particularly overestimated self-assessment of their results in the aerobic endurance test. The obtained results of the overestimated self-assessment of the motor skills test results are also in line with the findings from studies by Fox and Corbin (1989) and Sonstroem et al., (1992) that boys are more self-confident, more confident and less self-critical compared to girls during the assessment of their skills. Eccles et al., (1993) reported the same results and concluded that boys, compared to girls, assess their skills with more self-confidence.

CONCLUSION

The results of this research emphasize the importance of the application and implementation of the Special Physical Education program in the education of persons in the field of security. It is evident from the results that the content of the Special Physical Education program should be upgraded and directed towards the improvement of specific motor skills and functional abilities of students, which will enable more efficient work in the field. In addition to modern measuring instruments and objective tests, in the field of human motor skills, the authors also propose the implementation and application of the self-assessment method in the field of Special Physical Education. In addition to the above, the authors believe that through the interpretation of actual results, that is, the assessment of motor skills, and self-assessment results, students can be shown the importance of regular physical exercise, and gain a realistic picture of the physical and health status of a person working in the field of security. In most tests, students' self-assessment of motor status was overestimated, which ultimately can produce self-confidence that is not accompanied by adequate motor status, and as such can lead to unwanted consequences when performing professional duties and obligations. It follows from the above that every police officer should develop an awareness of improving his health and motor skills through self-actualization and individual work in the field physical exercise.

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