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# TABLE OF OBSTACLE COURSE SCORING RESULTS FOR MILITARY ACADEMY FEMALE CADETS

Mile P. Randelović<sup>a</sup>, Bojan Č. Milanović<sup>b</sup>

University of Defence in Belgrade, Military Academy, Belgrade, Republic of Serbia

<sup>a</sup> Department for Physical Education,

e-mail: milelampas@gmail.com,

ORCID iD:  <http://orcid.org/0000-0002-0561-1332>

<sup>b</sup> Department for Military Electrical Engineering,

e-mail: bojan.milanovic@va.mod.gov.rs,

ORCID iD:  <http://orcid.org/0000-0003-0683-4500>

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## Abstract:

*This paper presents the creation of a table for obstacle course scoring results, for female cadets. The table is created based on the results obtained by female cadets during four years of studying at the Military Academy in Belgrade. After creating and applying the scoring table, its influence on female cadets scoring results is investigated. The investigation has shown that the implementation of the scoring table has improved the results of female cadets in the obstacle course test for more than 45 seconds but less than 56 seconds in average.*

*Key words: scoring table, obstacle course, female cadets, z-test, cumulative distribution, repetition frequency.*

## Introduction

A standard obstacle course is used in the Serbian Army for training, obtaining, developing and maintaining physical activity as well as some of motor skills and personality traits. An obstacle course is made of artificial obstacles where the members of the Serbian Army are practicing in order to develop skills useful for performance of specific tasks during the peacetime (reconnaissance, field trips, camping, overcoming natural

obstacles) and in war conditions (Ministarstvo odbrane, 2011), (Generalštab Vojske Jugoslavije, 1995a).

At the end of each year, for the evaluation of the physical skills of the Military Academy cadets, specific groups of tests are used. One of these tests is an obstacle course. An obstacle course is a test used for the evaluation of general physical readiness (aerobic anaerobic endurance) of cadets, by measuring the time required for correctly overcoming the obstacles. The time necessary for completing the obstacle course successfully is transformed into points and, together with the points from other tests (pull-up, push-up, crunch and 2400m running), used for the evaluation for the final mark in the subject Physical Education.

The obstacle course has to be passed by running, crawling, climbing, jumping, swiping, bowed movement, and skipping. In an obstacle course, specific motor skills (strength, speed, stamina, coordination, agility, flexibility) and personality traits (confidence, resourcefulness, perseverance, determination, courage, boldness, courage) are developed (Ministarstvo odbrane, 2011), (Generalštab Vojske Jugoslavije, 1995a), (Kukolj, 2006).

After accepting the first generation of female cadets at the Military Academy (year 2007/08), the content of the Physical Education syllabus had to be adapted for female cadets. Besides the adaptation of class methods, due to the specificity of female population, the criteria for evaluating knowledge had to be adapted as well as the criteria for motor skills evaluation in female population, i.e. an appropriate scoring table for female cadets had to be created.

There are few precise data about research works on the participation of females in sports education and sports activities at the Military Academy and the Serbian Army. There are presumptions that research had been carried out, but there are no published papers on this subject (Rodić et al, 1985), (Perić, 2000), (Zorić, Đukić, 2010). During the first generations of female cadets testing, the only criterion for the satisfactory grade was passing the obstacle course test regardless of the time. The lack of time restrictions for taking the test led to significantly worse results in average for female cadets in comparison to male cadets. Because of that, a table showing obstacle course scoring results became necessary. The additional research showed the influence of the introduction of such a table into a testing process on average scoring results.

The aim of this paper is the creation of a table for the evaluation and assessment of the general physical readiness of female cadets based on the time achieved in the obstacle course test and testing the influence of such a table on the achieved results. This research has been done under

the assumption that the table is going to be officially used in the subject of Physical Education at the Military Academy.

## Methodology

Taking in to account that, there were no tables for female cadets for the obstacle course test, there was a necessity to collect data needed for a statistical analysis. For that purpose, a sample group of female cadets tested without time limitation was formed. The only condition for this sample group was to overcome all the obstacles in an appropriate manner. The time was recorded in seconds.

The collected data were statistically processed. The repetition frequency was calculated, and a visual inspection of the repetition frequency was used to check whether the data distribution can be considered normal. Numerical normality distribution tests were not implemented.

Afterwards, cumulative distribution was calculated. On the basis of the calculated cumulative distribution, top 5% of the results were discarded. Since the scoring table ranges from 20 to 100 points, the worst 25% of the results were also discarded from the initial sample. Thus obtained time limit values corresponded to 20 i.e. 100 points. Since the points are integer numbers, as well as the achieved time values, the linear distribution of the points was not possible. The point interval for worse results is larger than the one for better results. The larger interval for worse results was taken since it is easier to improve worse results than better ones.

The influence of the existence of the scoring table on the achieved results was tested by the help of a female cadets sample tested with the implementation of the table. The results of female cadets tested with the table are compared with the results of the female cadets tested without the scoring table. For the comparison of the obtained results, the z-test was used (Winer et al, 1971), (Moore, 2007), (Kanji, 2006).

Four hypotheses were set and tested. The first zero hypothesis was: the average results of these two samples is equal. The next zero hypothesis: these two samples differ by a difference in their average results. Afterwards, a series of tests with diverse values of average results differences was conducted. The aim of these tests was to determine a difference of the average results for which it can be said that the hypothesis can be rejected. In such a manner, last determined limit can be used as limit of results improvement.

## Test sample

The test sample used for table creation consisted of 189 female cadets (out of 202) from the generations enrolled between 2008 and 2012, aged from 18 to 24. Measurements were conducted at the end of each academic year (Jun, July), so each female cadet had at least one and at most four measurements (Table 1). From this sample, 734 results (measured times) were used for statistical processing.

*Table 1 – Test sample of female cadets used for table creation*  
*Таблица 1 – Образец, на основании которого разработана оценочная таблица*  
*Табела 1 – Узорак на основу којег је израђена таблица за бодовање*

No	Sample	Enrolled in year	Total number of female cadets	Tested female cadets	Testing year without the table			
1	A	2008/2009	34	32	2009	2010	2011	2012
2	B	2009/2010	32	28	2010	2011	2012	2013
3	C	2010/2011	58	56	2011	2012	2013	2014
4	D	2011/2012	37	35	2012	2013	2014	
5	E	2012/2013	41	38	2013	2014		
Total			202	189				

For testing the scoring table influence on the accomplished results, a sample consisting of 114 female cadets (out of 122) enrolled in 2011, 2012, 2013 and 2014, aged between 18 and 24, was used. This sample was tested according to the scoring table formed from the previous sample. The testing of this sample was conducted at the end of school year 2014/2015 (Table 2). For statistical processing of this sample, 114 results (measured times) were used.

*Table 2 – Test sample of female cadets used for checking the table influence on the achieved results*  
*Таблица 2 – Образец для анализа влияния оценочной таблицы на осуществление результатов*  
*Табела 2 – Узорак за тестирање утицаја таблице за бодовање на остварене резултате*

No	Sample	Enrolled in year	Total number of female cadets	Tested female cadets	Testing year with the table
1	D	2011/2012	37	35	2015
2	E	2012/2013	41	38	2015

No	Sample	Enrolled in year	Total number of female cadets	Tested female cadets	Testing year with the table
3	F	2013/2014	28	28	2015
4	G	2014/2015	16	13	2015
Total			122	114	

All female cadets were located at the Military Academy campus. All of them had the same living and working conditions. All of them were healthy and regularly attended the classes of Physical Education.

## Test description

The obstacle polygon consists of 18 different elements, obstacles, which are positioned in three lines on a 240m long course. The obstacles are set in the following sequence: belly crawl, twigs fence, wall, balancing beam, two beams, scaffolding, horizontal ladders, wire fences, horizontal bar, combined ladders, three beams, apertures doors and windows, tunnel, stumps, hallway, inclining wall, foot beam and trench. There is more than one way for passing these obstacles and each female cadet chooses an allowed one which best suits her. A way of passing obstacles for female cadets is slightly different from the way of passing them by male cadets.

### Ways of passing obstacles for female cadets:

1. belly crawl overcomes by crawling (stomach, back, sideways);
2. twig fence overcomes by jump (take off with one foot and landing on the other foot or take off with one foot and landing on both feet);
3. wall overcomes by hooking underneath the armpit and below the knee; by running, jumping and swinging over and by chinning and a push-up;
4. balancing beam overcomes by straight stepping, moving in astride posture, on the knees and hands (on all fours).
5. two beams overcomes by jumps:
  - by run-up, stepping on the one lower beam and by jump over the higher beam;
  - by run-up stepping with one foot on the lower beam and with other foot on the higher beam;
  - by run-up stepping with one foot on the lower beam and by leaning with one foot and one hand on the higher beam;
  - by take-off with both feet from the lower one with support with both hands on the higher beam with a lean jump over the higher one;

- by take-off with both feet from the lower beam, jumping on the higher beam by supporting on belly, jumping over the higher beam;
- 6. scaffolding overcomes by climbing:
  - climbing and by moving on hands upwards, catching each transverse and longitudinal rods, jumping over the horizontal rod and landing at the end;
  - by swinging and catching the fourth transverse rod jumping over the horizontal rod and landing at the end;
- 7. horizontal ladders overcomes by oversteps:
  - overstepping every transverse rod;
  - leaning on hands and by overstepping with legs in front;
  - leaning on hands and overstepping with legs in back;
- 8. Wire fence overcomes by:
  - front jump with leaning by one hand on the pylon;
  - side jump with leaning by one hand on the pylon;
- 9. horizontal bar overcomes by:
  - crossing the bar and the pylon by leaning on the stomach (it is allowed to use the vertical bar);
  - hanging on the bar, leaning below the knees and swinging rising body, crossing the bar with the other leg and landing at the end;
  - by frontal turn;
- 10. combined ladders overcomes by climbing (between the first and the second horizontal bar), and by passing the horizontal part by stepping, climbing with hands and feet along the vertical ladder, with alighting along the ladders from the opposite side with a jump;
- 11. three beams overcomes by:
  - leaning on one hand and foot, by a jump and a pull under;
  - leaning on both hands leaping on one side of hands and pulling under;
  - leaning on one hand, stepping over and pulling under;
- 12. apertures, doors and windows overcomes by passing through;
- 13. tunnel overcomes in the first part in a bent position, and in the second part by crawl;
- 14. stumps overcomes by jumps (stepping jump from one foot to another over each stump and stepping jumps from one foot to the other over each second stump) with obligatory stepping on the land line and a leap over the trench at the end;
- 15. hallway overcomes by passing (walking or running forwards, sideways, backwards);
- 16. inclined wall overcomes by:
  - hooking underneath the armpit and below the knee;
  - hooking underneath the armpit and below the knee, using the side bar;

- running, jumping on the wall with a support on the hands and leaning the body forwards and downwards and shifting legs over the wall, with landing;
  - running, raising the body using hands, stepping with one foot on the wall, jumping over the wall;
17. foot beam overcomes by a run-up stepping on one foot and landing on the other or both legs;
18. trench overcomes by a run-up jump, a take off with one foot and landing on the other foot or a take off with one foot and landing on both feet.

## Work description and measurement procedure

During regular classes, female cadets had obligatory classes of learning and exercising obstacle polygon passing and, during the year, opportunities for individual exercising. As precaution measures, before beginning of the obstacle test, the whole obstacle polygon functionality is checked and during the test, at some (more difficult) obstacles, cadets are placed as additional security. The warm up lasts from 10 to 15 minutes, with jogging and standing shaping exercises.

The equipment for obstacle polygon passing is military (shirt, trousers, military boots) without a beret and without a military strap (Ministarstvo odbrane, 2011), (Generalštab Vojske Jugoslavije, 1995a), (Generalštab Vojske Srbije, 2010), (Generalštab Vojske Jugoslavije, 1995b).

Female cadets start separately. The commands for the start are GET SET, READY, GO. On the command GET SET, a female cadet takes the starting position, lying down on stomach in such a way that the starting line is in line with her shoulder. On the command READY, she concentrates, and on the mark GO she moves towards the first obstacle. On the command GO, the teacher starts a stopwatch and observes the regularity of obstacle passing. In case some obstacle is not passed appropriately, the command is AGAIN, and a female cadet is obliged to go back and to repeat that obstacle until the obstacle is passed in the prescribed manner or to give up. The stopwatch is stopped when a female cadet passes the finish line with the whole body. Female cadets have two attempts, and a better score is recorded. Time is measured with 1s precision (Ministarstvo odbrane, 2011), (Generalštab Vojske Jugoslavije, 1995a).



## Results and discussion

Figure 1 shows the repetition frequency of the results of the female cadets tested without a scoring table. From Figure 1, one can see that excluding a few aberrations, the distribution can be considered normal.

The best score is 167 seconds, while the worst score is 15 minutes or 900 seconds.

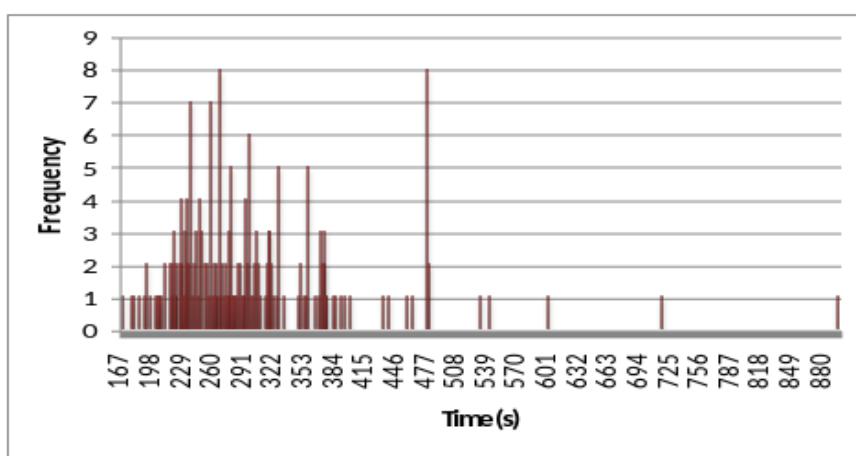


Figure 1 – Scoring results repetition frequency

Рис. 1 – Частотность повторяемости результатов

Слика 1 – Фреквенција понављања резултата

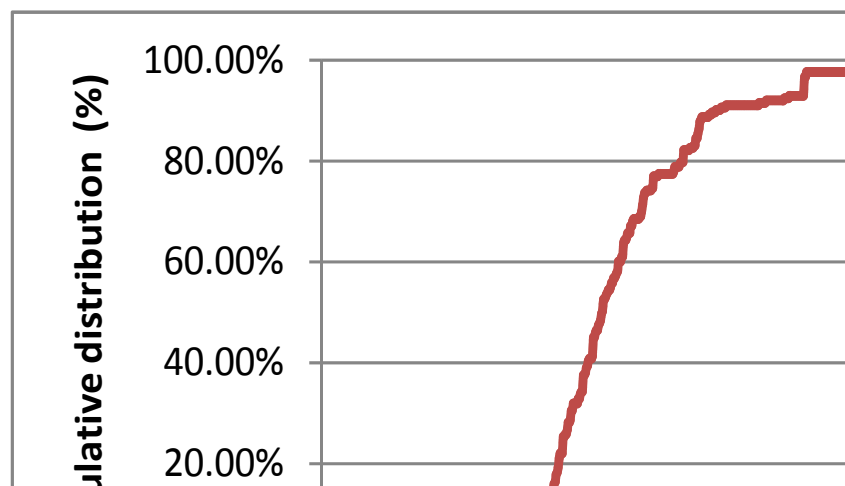


Figure 2 – Cumulative distribution

Рис. 2 – Кумулятивное распределение

Слика 2 – Кумулативна расподела

If, according to the cumulative distribution (Fig. 2), 5% of the best results are rejected, the best time 207s (3 min and 27s) is obtained, while the worst time obtained by rejection of 5% the worst results is 6 min and 18s.

*Table 3 – Scoring table for female cadets in the obstacle course test*  
*Таблица 3 – Оценочная таблица тестирования курсанток по прохождению*  
*полосы препятствий*  
*Табела 3 – Таблица за бодовање кадеткиња у тесту савлађивање полигона*  
*пешадијских препрека*

Points	Result	Points	Result	Points	Result	Points	Result
<b>100</b>	<b>3:27</b>	<b>80</b>	<b>3:47</b>	<b>60</b>	<b>4:09</b>	<b>40</b>	<b>4:49</b>
99	3:28	79	3:48	59	4:11	39	4:51
98	3:29	78	3:49	58	4:13	38	4:53
97	3:30	77	3:50	57	4:15	37	4:55
96	3:31	76	3:51	56	4:17	36	4:57
95	3:32	75	3:52	55	4:19	35	4:59
94	3:33	74	3:53	54	4:21	34	5:01
93	3:34	73	3:54	53	4:23	33	5:03
92	3:35	72	3:55	52	4:25	32	5:05
91	3:36	71	3:56	51	4:27	31	5:07
<b>90</b>	<b>3:37</b>	<b>70</b>	<b>3:57</b>	<b>50</b>	<b>4:29</b>	<b>30</b>	<b>5:09</b>
89	3:38	69	3:58	49	4:31	29	5:11
88	3:39	68	3:59	48	4:33	28	5:13
87	3:40	67	4:00	47	4:35	27	5:15
86	3:41	66	4:01	46	4:37	26	5:17
85	3:42	65	4:02	45	4:39	25	5:19
84	3:43	64	4:03	44	4:41	24	5:21
83	3:44	63	4:04	43	4:43	23	5:23
82	3:45	62	4:05	42	4:45	22	5:25
81	3:46	61	4:07	41	4:47	21	5:27
						<b>20</b>	<b>5:29</b>

Having in mind that the scoring table starts from 20 points, 25% of the worst results were rejected so the newly obtained worst result was 329s (5 min and 29s). Since linear distribution was not possible with integer values of seconds, the scoring table was obtained by taking 1s for spacing time between better results and 2s between worse results. In such a way, the obtained boundary between better and worse results was at 62nd point (Table 3). Time values were distributed in such a manner that each point corresponds to integer time values in seconds.

The obtained table is used for ranking the female cadets from the test sample. Descriptive statistics (<http://www.excel-easy.com>, 2016), of both samples is shown in Table 4. From Table 4, one can see that the mean value of the results obtained by the female cadets tested with the table implementation (sample for testing) is  $309.3097 - 264.2632 = 45.0447$  seconds better than the mean value obtained by the female cadets tested without the table (sample for table creation).

*Table 4 – Scoring, descriptive statistics*  
*Таблица 4 – Дескриптивна статистика*  
*Табела 4 – Дескриптивна статистика*

Sample for table creation		Sample for table testing	
Mean	309.3079	Mean	264.2632
Standard Error	3.845998	Standard Error	5.580216
Median	285	Median	253
Mode	270	Mode	264
Standard Deviation	104.1974	Standard Deviation	59.5804
Sample Variance	10857.11	Sample Variance	3549.824
Kurtosis	7.763746	Kurtosis	0.535174
Skewness	2.262072	Skewness	0.84566
Range	793	Range	283
Minimum	167	Minimum	167
Maximum	960	Maximum	450
Sum	227032	Sum	30126
Count	734	Count	114

In order to confirm the claim that the table has influenced the improvement of the results, the zero hypothesis is set:

H0: The mean values of the obtained result of both samples are statistically equal.

Taking into account that the sample has more than 30 results, the z – test is used for hypothesis testing (<https://support.office.com>, 2016). The results of the test are shown in Table 5. From Table 5, one can see that the value of the z statistics is higher than the critical values of the z statistics, which means that the zero hypothesis can be rejected, meaning that the mean values are not statistically equal.

Table 5 – Z-test with the zero hypothesis that the mean values are statistically equal  
 Таблица 5 – Z-тест с нулевой гипотезой о том, что средние значения статистически равны  
 Табела 5 – Z-тест са нултом хипотезом да су средње вредности резултата узорака једнаке

Z-Test: Two Sample for Means		
	Without the table	With the table
Mean	309.3079019	264.2631579
Known Variance	10857.11	3549.824
Observations	734	114
Hypothesized Mean Difference	0	
z	6.646507348	
P(Z<=z) one-tail	1.50064E-11	
z Critical one-tail	1.644853627	
P(Z<=z) two-tail	3.00129E-11	
z Critical two-tail	1.959963985	

New zero hypothesis is set:

H0: The mean values of the obtained results of both samples are statistically different for 45s.

The results of testing this zero hypothesis are shown in Table 6. From Table 6, one can see that the z statistics for this zero hypothesis is smaller than the critical values of the z statistics. According to the results of the z statistics for this hypothesis, it can be claimed that the mean values are statistically different for 45s.

Table 6 – Z-test for the zero hypothesis that the mean values differ for 45s  
 Таблица 6 – Z-тест с нулевой гипотезой о том, что средние значения статистически различаются на 45 сек.  
 Табела 6 – Z-тест са нултом хипотезом да се средње вредности резултата узорака разликују за 45 s

Z-Test: Two Sample for Means		
	Without the table	With the table
Mean	309.3079019	264.2631579
Known Variance	10857.11	3549.824
Observations	734	114
Hypothesized Mean Difference	45	
z	0.006602133	
P(Z<=z) one-tail	0.497366149	
z Critical one-tail	1.644853627	
P(Z<=z) two-tail	0.994732298	

Z-Test: Two Sample for Means		
	Without the table	With the table
z Critical two-tail	1.959963985	

Since the standard deviations of these two samples are different, a series of hypotheses which take other options of mean values differences into account was tested. The results of two characteristic hypotheses:

H0: The mean values of the obtained results of both samples are statistically different for 56s

and

H0: The mean values of the obtained results of both samples are statistically different for 57s

are shown in Table 7. From Table 7, one can see that the hypothesis stating that the mean values differ for 56 seconds can be accepted while the hypothesis stating that the mean values differ for 57 seconds should be rejected. This analysis leads to a conclusion that the introduction of the scoring table in the testing process improves the results of female cadets in the test, but not for more than 56 seconds.

Table 7 – Z- test with the zero hypothesis that the mean values differ for 56 seconds (left) and 57 seconds (right)

Таблица 7 – Z-тест с нулевой гипотезой о том, что средние значения статистически различаются на 57 сек.

Табела 7 – Z-тест са нултом хипотезом да се средње вредности резултата узорака разликују за 56 s, односно за 57 s

Z-Test: Two Sample for Means			Z-Test: Two Sample for Means		
	Without the table	With the table		Without the table	With the table
Mean	309.3079	264.2631	Mean	309.3079	264.2631
Known Variance	10857.11	3549.824	Known Variance	10857.11	3549.824
Observations	734	114	Observations	734	114
Hypothesized Mean Difference	56		Hypothesized Mean Difference	57	
z	-1.61648		z	-1.76403	
P(Z<=z) one-tail	0.05299		P(Z<=z) one-tail	0.03886	
z Critical one-tail	1.64485		z Critical one-tail	1.64485	
P(Z<=z) two-tail	0.10598		P(Z<=z) two-tail	0.07772	
z Critical two-tail	1.95996		z Critical two-tail	1.95996	

## Conclusion

Significantly worse results in obstacle course testing of female cadets compared to male cadets are attributed, among other reasons, to the fact that female cadets did not have standards in a form of a scoring table. Regardless of the absence of time limitation, the competitive spirit of female cadets provided the normal distribution of results, i.e. the results which could be used for table creation. Some of female cadets were not motivated to compete, so their results were significantly below the rest of the sample thus giving a higher mean value and a higher variance.

The table is made based on a sample of 189 female cadets from the population of 202 female cadets, which can be considered as a representative sample. The table testing was performed on the sample of 114 female cadets out of 122 female cadets, which also can be considered as a representative sample. The best time was determined by rejecting 5% of the best results, while the worst time, due to the fact that the scoring table starts from 20 points, was determined by rejecting 25% of the worst results. In such a manner, the best time was 3 minutes and 27 seconds for 100 points, while the worst time was 5 minutes and 29 seconds for 20 points.

Having in mind that time is measured in seconds, it was not possible to do linear distribution of time values according to the point table. That is why the spacing between neighboring points for better results is set to 1 second, while the spacing between neighboring points for worse results is set to 2 seconds.

The obtained table was used to test four generations of female cadets in 2014/2015 academic year. The descriptive statistics of the sample for table creation and the sample for table testing has shown that the mean values of the samples are different. By applying the z test, it is shown that the mean values are statistically different, meaning that the introduction of the table improved the mean value of the achieved results.

The zero hypothesis that the mean values differ for 45 seconds could not be rejected, meaning that it can be claimed with statistical confidence of more than 95% that the implementation of the table improved the achieved results in average for 45s.

Two more hypotheses were set, where the mean values differ for 56 seconds and 57 seconds. By applying the z test, it was shown that the hypothesis in which the mean values differ for 56 seconds cannot be rejected, while the hypothesis in which the mean values differ for 57 seconds can be rejected, which leads to the conclusion that the implementation of the table improved results, but for not more than 56 seconds.

The conducted research has shown that the implementation of a table in the process of scoring of female cadets in obstacle course testing undoubtedly improves the achieved results. It is shown that better results, i.e. physical fitness of female cadets, are achieved by limiting the time for passing obstacles, which is done by introducing a table. For future research, it is suggested to keep track of scores of female cadets for the next four years and, according to the same methodology, to form a new table for the evaluation according to the proposed table from this paper. The table should be created periodically until the mean values of the results achieved by female cadets tested in accordance with new tables are not statistically different from the mean values of the results of the female cadets tested for table creation. In such a manner, after a few cycles of research, a table which would be a real description of physical skills of female cadets would be created.

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#### РАЗРАБОТКА ОЦЕНОЧНОЙ ТАБЛИЦЫ РЕЗУЛЬТАТОВ, ОСУЩЕСТВЛЕННЫХ КУРСАНТКАМИ ВОЕННОЙ АКАДЕМИИ, ПО ТЕСТИРОВАНИЮ ПРОХОЖДЕНИЯ ПРЕПЯТСТВЕННОЙ ПОЛОСЫ

Миле П. Ранджелович<sup>а</sup>, Боян Ч. Миланович<sup>б</sup>

Университет обороны в Белграде, Военная академия, г. Белград,  
Республика Сербия

<sup>а</sup> Кафедра физической культуры

<sup>б</sup> Кафедра военной электронной техники

ОБЛАСТЬ: междисциплинарная (психофизическая подготовка,  
психология, физическая подготовка)

ВИД СТАТЬИ: оригинальная научная статья

ЯЗЫК СТАТЬИ: английский

##### Резюме:

*В данной статье представлен процесс разработки оценочной таблицы по осуществлению результатов курсантками при тестировании прохождения препятственной полосы. Таблица разработана на основании результатов, осуществленных курсантками, в течение их четырехлетнего обучения в Военной академии в Белграде. По разработке и внедрению данной таблицы проведено исследование, с целью установления влияния оценочной таблицы на достижения результатов курсантками в процессе тестирования. Анализ исследования показал, что внедрение оценочной таблицы повлияло на улучшение результатов тестирования по прохождению препятственной полосы, в среднем ускорив темп прохождения на 45 секунд, но не превысив 56 секунд.*

*Ключевые слова: частотность повторяемости, кумулятивное распределение, Z-тест, курсантки, оценочная таблица по прохождению препятственной полосы.*



# ИЗРАДА ТАБЛИЦЕ ЗА БОДОВАЊЕ ОСТВАРЕНИХ РЕЗУЛТАТА КАДЕТКИЊА ВОЈНЕ АКАДЕМИЈЕ У ТЕСТУ САВЛАЂИВАЊА ПОЛИГОНА ПЕШАДИЈСКИХ ПРЕПРЕКА

Миле П. Ранђеловић<sup>а</sup>, Бојан Ч. Милановић<sup>б</sup>

Универзитет одбране у Београду, Војна академија, Београд,  
Република Србија

<sup>а</sup> Катедра физичке културе

<sup>б</sup> Катедра војноелектронског инжењерства

ОБЛАСТ: интердисциплинарна (развој психофизичке спремности,  
психологија, физичка обука)

ВРСТА ЧЛАНКА: оригинални научни чланак

ЈЕЗИК ЧЛАНКА: енглески

## Сажетак:

У раду је приказан поступак израде таблице за бодовање остварених резултата кадеткиња приликом савлађивања полигона пешадијских препрека. Таблица је израђена на основу резултата које су кадеткиње оствариле током четворогодишњег школовања у Војној академији у Београду. Након формирања и имплементације таблице спроведено је истраживање које је одговорило на питање да ли увођење таблице за бодовање у процес тестирања кадеткиња утиче на остварене резултате. Показано је да је увођење таблице за бодовање кадеткиња поправило остварене резултате на полигону пешадијских препрека у просеку за 45 секунди, али не за више од 56 секунди.

Кључне речи: фреквенција понављања, кумулативна расподела, Z-тест, кадеткиње, таблица за бодовање полигона пешадијских препрека.

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