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Motor Competence in Self-Defence of Students of a Detectives' School during Their Course of Studies

Roman Maciej Kalina[1ABCDEF], **Władysław Jagiełło**[2ABCDEF], **Przemysław Wiktorek**[3ABCDEF]

[1] Faculty of Physical Education, Rzeszow University, Poland
[2] Academy of Physical Education and Sport, Gdansk, Poland
[3] The Josef Piłsudski Academy of Physical Education, Warsaw, Poland

Authors' contributions:
A Study design
B Data collection
C Statistical analysis
D Data interpretation
E Literature search
F Manuscript preparation
G Funds collection

Summary

Study aim: The issue whether in the course of training candidates for security services their motor competence in self-defence is significantly improved was discussed.

Material/methods: The assessment of this competence was based on the results of the basic self-defence skills test, which consists of three groups of defence actions. 50 students of a detectives' school at the age of 19-22 were subject to the study.

Results: During the first two semesters of the training the students developed their motor competence at an average level. After another year of training statistically significant ($p<0.01$) improvement in this competence was observed.

Conclusions: There are empirical grounds to recommend the basic self-defence skills test as an accurate tool of a periodical assessment of professional competence of security staff, police officers, employees of penitentiary services, municipal police, etc.

Key words: **candidates for security staff • basic self-defence skills test • specific motor competence**

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Author's address: Roman Kalina, Faculty of Physical Education, Rzeszow University, ul. Towarnickiego 3C, Rzeszow, Poland, e-mail: kom.kalina@op.pl

Background

The term "motor competence" [7] is very wide as it encompasses both specific motor skills and capabilities (features). Using the term "motor competence" is then very useful during an analysis of phenomena connected, among other things, with a preparation of a human being to such types of sports fight in which it is difficult to pinpoint one dominant motor capability (e.g. in sports games, combat sports, Alpine skiing, biathlon) as well as in situations of self-defence. It is justified to claim that an optimal level of both specific motor skills and capabilities (features), or speaking more broadly – functional capabilities of an organism conditions dealing competently with motor tasks connected with a fight carried on in such situations. One type of compilation of skills and functional capabilities determines specific motor competence (de facto: psychomotor ones) of, for example, a volleyball player, another one of a commando, and yet another one of a VIP bodyguard. Experts do not question the fact that it would be a mistake to connect the success in the mentioned varieties of sports fight and self-defence primarily with skills, i.e. with mastering a narrowly-understood technique of fighting – a sports technique and the so-called hand-to-hand fighting techniques respectively. The proof lies, for instance, in norms of physical preparation (or the ones used during recruitment to a particular sport), e.g. standing long-jump attempts for 11-year-old footballers amount to 180 cm while for 10-12-year-old fencers 165-180 cm [9]. The result of this attempt corresponding to 50 points according to the norms of the International Physical Fitness Test [13] for boys at the age of 10, 11, 12 is: 148 cm, 155 cm, 164 cm, respectively. However, the accuracy of motor criteria of evaluation of overall physical fitness still remains an open issue. Years ago, during a multi-discipline contest of sports stars very popular on Mexican TV, a world leading competitor of one of the most popular sports disciplines had problems with swimming a short distance – is it valid, then, to consider a man generally fit if he or she cannot swim?

Self-defence is not a sport. It is difficult, however, to challenge a theory that the best prepared *en bloc* for self-defence are people training sports or martial arts. Still, in many practical areas (army, police, anti-terrorist groups, security services, etc.) sports experience cannot be the only criterion of qualifying a candidate for the profession. In this type of professional activity (service) there are intensive trainings in close combat, and in many cases combat sports are preferred as a complementary element of training. It has been proved, calculating a multiple correlation coefficient, that altogether the results of free fighting and the level of carried out hand-to-hand fight exercises while covering an obstacle course are characterised by the greatest accuracy (87.5%). Both variables were associated with an external criterion (a certain frame of reference), i.e. the result of 10 free fights with an armed opponent carried out immediately after a cross-country run on a 3000m distance [1].

However, in daily coaching practice self-defence skills are evaluated mainly on the basis of specific tests of analytical nature, or predominantly analytical one. In scientific research and in sports practice also the assessment of general physical fitness is mainly based on results of recommended analytical tests (e.g. the International Physical Fitness Test). The advantage of this type of tests lies in a possibility of repeating measurements in similar conditions and correlating the results. In a study on students of a detectives' school (n = 68), by associating results of this type of tests, i.e. basic self-defence ability test and a battery of attempts assessing functional capabilities of an organism (visual-motor coordination, spatial orientation, flexibility, balance, grip strength, strength of upper and lower limbs, abs strength, and speed – by means of five different attempts), it has been determined that results of standing long-jump attempts and the ones assessing flexibility and balance are the most strongly correlated with self-defence skills [14]. Recommendation of authors of these studies that on the basis of general fitness tests one can anticipate the effectiveness of detectives and security personnel's actions is only partially justified. Results of other studies provoke a more cautious conclusion, or even justify reversing the sense of this recommendation at least due to four reasons. Firstly, defeating opponents in direct combat – comparing results within particular competing groups of a few or several members is in question here – is not conditioned by surpassing them in physical fitness measured in an analytical way. This regularity refers to both 11-year-old boys starting judo trainings and adults (military academy students, security employees from Lithuania, police officers) intensively trained in close combat [3, 6, 12]. Secondly, the correlation between the effectiveness of fight in direct combat and general physical fitness is relatively low (or there is lack thereof) [2, 4, 5, 12, 15]. Thirdly, a significant positive correlation between the result of the basic self-defence skill test and the effectiveness of the carried out test fights takes place [4, 15]. Fourthly, the longer the period of specific military training, the lower the correlation between the effectiveness of carried out specific tasks and the efficiency and general physical fitness [10].

Originating from the above-presented scientific and partially common-sense premises, we put forward

the following assumptions for our study: (1) the assessment of motor competence in self-defence on the basis of a reliable specific test encompasses general information about functional capabilities of an organism; (2) motor competence tests in self-defence documented by validation procedures function as more accurate tools of periodical evaluation of professional usefulness of a security staff than motor tests of analytical nature.

The aim of the study is to settle a dispute whether in the course of training of candidates for security staff their motor competence in self-defence is really improved.

METHODS

The assessment of motor competence in self-defence has been based on the results of basic self-defence skills test [11], which comprises three groups of defence actions. Each group consists of one-, two-, or multi-element tasks (all in all twelve tasks): G1 – safe fall technique; G2 – defence by pre-emptive strike; G3 – defence against embrace, strangling and strikes.

The performance of each task is subject to assessment by points on a four-grade scale: 25; 20; 15; 0. Tasks are performed in a given order (from 1 to 12); however, in order to be able to start completing G2 tasks, first one must complete at least three G1 tasks with a minimal sum of 55 points. The possibility to start carrying out G3 tasks is dependent on completing at least three G2 tasks with a minimal sum of 45 points (i.e. the minimal assessment of each one is to be 15 points).

The assessment of particular tasks is based on the following criteria: 25 points (faultless and dynamic performance of all elements of a given task); 20 points (faultless, smooth, but not dynamic or dynamic but with some technical errors performance of all elements of a given task); 15 points (little dynamic and with errors, still not influencing the change of the essence of movement – in the case of two-element tasks of at least one element and in the case of multi-element ones of 2/3); 0 points (the essence of movement is incompatible with the motor model adopted in the art of self-defence). For G1 the method of performing particular tasks is unspecified – the tested person may defend himself/herself in any way, but still meeting two basic conditions: a) he/she must be convincing that the behaviour demonstrated in the simulated episode of hand-to-hand fight may be effective in a real self-defence fight; b) he/she cannot endanger the partner's life or health by his/her behaviour.

The sum of G1 to G3 points contained in a specified bracket constitutes a conventional general assessment of motor competence in self-defence (verbal assessment/test points): excellent/285-300; very high/255-280; high/175-250; average/85-170; poor/55-80; unsatisfactory/0-50.

The test was run twice: as part of completing the second and the fourth semesters.

In statistical analysis basic measurements of estimation were used and the significance of differences between pairs of considered empirical variables was calculated.

MATERIAL

The study involved 50 students of the Elitist School of Security Services "Delta" in Łódź aged 19-22 (mean age 20.43). Body mass of the examined students was 67-102 kg (mean weight 78.24), and the height 172-191 cm (mean height 180.16).

The students carried out a curriculum specified by the standards of the Ministry of National Education – basic curriculum for the profession of "Technician of protection of persons and property" identification 516 /01/ (Journal of Laws No78 from 22.09.2000) and the Regulation of the Ministry of Internal Affairs and Administration from 7.08.1998 (Journal of Laws No 113, item 131).

Among numerous subjects, self-defence and intervention techniques stand out with a substantial number of teaching hours (60 hours in the first semester and 50 hours in each of the remaining three semesters). Both subjects constitute 61% of hours of the block of subjects including also: developing general physical fitness (19%), using statutory means of coercion (16%); credits (4%). Classes during the first semester focus on developing general physical fitness, during the second semester on more intensive teaching of self-defence and intervention techniques, while during the remaining semesters on mastering these skills.

RESULTS

It was determined that in the course of two first semesters of detective training students developed their motor competence at an average level, understood as a mean result of the test (Tab. 1). Results falling between the poor and the very high levels prove a significant differentiation among candidates for employment in security structures as far as predispositions for effective fight in close combat. The students

Table 1. The level of motor competence in self-defence of students of a detectives' school (n = 50) at different stages of education estimated by means of the basic self-defence skills test.

Semester	Statistical indicator	Test result [points]			
		G1	G2	G3	General result [sum of points]
second	mean value	**66.7**	**62.8**	**41.8**	**168**
	standard deviation	12.6	18.3	22.7	47.6
	minimum –maximum	50-100	20-95	0-75	80-265
fourth	mean value	**79.2**	**75.7**	**57.9**	**212.8**
	standard deviation	9.3	12.8	20.5	38.9
	minimum –maximum	55-100	50-100	15-95	120-295
Difference		**12.5***	**12.9***	**16.1***	**44.8***

*p<0.01

mastered the technique of a safe fall the best, and defence against embrace, strangling and strikes the worst. The scale of differentiation of motor competence in dealing with tasks qualified as G2 and G3 is in fact identical (75 points), but the level discredits the students' ability to defend against embrace, strangling and strikes (this falls between 0 and 75 points). After the following year of training, the mean result of the test proves the improvement of the studied motor competence to a high level, when the lowest nominal result of the test (120 points) falls in the middle of the bracket of average competence while the result of 295 points approaches the upper limit of the test (one of the students revealed excellent predispositions to the art of self-defence). A decrease in interpersonal differentiation within each group of performed defence tasks confirms the correct course of training characteristic of security staff.

In the course of two first semesters of training two thirds of the students developed their motor competence in self-defence at an average level (Fig. 1). The identical proportion of students proved high defence competence in the fourth semester. A detailed

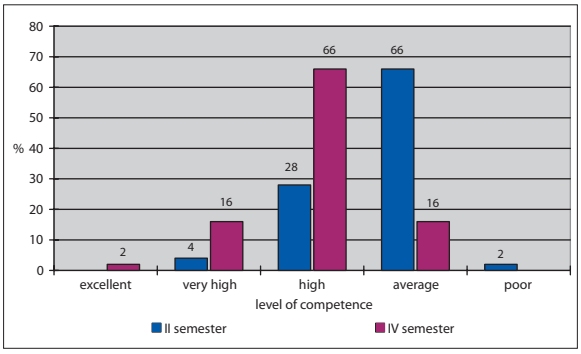

Figure 1. Proportions of students (n=50) who revealed a certain level of motor competence in self-defence in the course of detective training.

analysis of individual results of the test shows a very close correlation between people in both groups. This means that an overwhelming number of students who developed their defence skills at an average level during the first year of training, increased these skills to at least a high level (and some of them even to a very high level).

DISCUSSION

The obtained results prove that the training of students of a detectives' school, based mainly on self-defence tasks and the so-called intervention techniques (which together constitute over 60% of the curriculum) is an appropriate didactic approach. The results of the studies we quote in the introduction are a proper justification of the proposal that this curriculum be supplemented with elements of combat sports. Due to the complexity of the phenomenon of necessary intervention requiring the use of coercion [3, 8] it seems rational to teach combat in a reasonably gentle way (elements of sumo and judo), but also with a use of even extremely rough ones (karate, kick-boxing, etc.).

Results of the basic self-defence skills test of the examined students of the detectives' school carried out in the second semester are very similar to the results achieved during military training of military academy students, who carried out the standard curriculum of close combat – after eight months of training the mean result of the test amounted to 170.13 points [11]. Incidentally, the mean result of this test amounting to 245.26 points was achieved after eight months of intensive training in self-defence, but supplemented with judo training which was realised by an experimental group of students of the same military institution. This result is nominally higher when compared with the examined students of the detectives' course

after four semesters. Mean results of both groups admittedly fall within the bracket showing a high level of the examined motor competence; however, interpersonal differentiation of the students of the detectives' school is slightly higher.

A comparative study of persons trained for the same type of professional activity is more significant. The publication of research by [14] lacks information on the system of detectives' training and the period of their education, the time when the study was carried out, and the overall mean result of the basic self-defence skills test (the latter one is the least significant problem here, as the from the mean results of G1, G2 and G3 tasks, one may estimate this result to be about 202 points). Still, one can presume that the training was realised in consistence with the ministerial standards. This comparative study confirms the regularity established by both Sterkowicz et al. [14] and the present authors as well as by other researchers using the basic self-defence skills test [15, 16] – persons trained for self-defence prove higher competence in the realm of safe fall techniques (G1), usually slightly lower one in the realm of pre-emptive attacks (G2) and decidedly the lowest ones as far as defence against embraces, strangling and strikes is concerned (G3). Also the differentiation within G3 tasks is the greatest. An almost identical result of the average level of the realised G1 and G3 tasks by the examined students of the fourth semester, and by students of a detectives' course studied by Sterkowicz et al. [14] may prove that in prestigious Polish detectives' schools similar standards of the candidates' recruitment and their further training are met. Furthermore, the result of this comparative study indirectly verifies the appropriateness of the test used in studying motor competence in self-defence. It turns out that this tool used by experts yields comparable results. There are grounds to claim that similar circumstances of the students' training took place in two different detectives' schools.

In view of this analysis, the adopted at the beginning research assumption seem highly true. It needs to be emphasised, however, that the conclusion by Sterkowicz et al. [14] that on the basis of general fitness tests correlated with the results of the basic self-defence skills test the effectiveness of detectives' and security staff be anticipated is important primarily with respect to the fact that at the recruitment stage for detectives' schools usually many candidates have no experience in close combat. Nevertheless, we sustain the view that motor competence tests in self-defence designed according to similar motor criteria are appropriate tools of periodical assessment of the usefulness of security staff for their profession. We also sustain the claim that this kind of specific tests contain general information about functional capabilities of an organism. Syska and Magnuska's research [16] proves that the time of effort of the carried out basic self-defence skill test and the intensity of this effort, measured by the frequency of pulse, show a certain similarity of the result of this specific test with the level of effort capabilities of persons of whom one can be sure the they were subject to the same training in the basics of close combat and did not undergo further specialist training (in martial arts or combat sports).

A separate discussion should be devoted to results of Dadeło's research [4] regarding security staff from Lithuania as well as Bukowiecka, Bukowiecki and Kalina's one [3] regarding Polish police forces in which it was proved that the assessment of the effectiveness of settling fights in close combat is a very accurate criterion of selecting candidates for these professions. Authors of these studies recommend and justify using test fights modelled on a sumo formula. These suggestions by no means negate the appropriateness of the conclusion expressed in the previous paragraph.

CONCLUSIONS

1. Own research data and of the research by authors dealing with similar issues allow recommending the basic self-defence skills test and tests designed according to similar motor criteria as accurate tools of periodical assessment of professional competence of security staff, police officers, employees of penitentiary services, municipal police, etc.

2. At the stage of selecting candidates for the mentioned professions, primarily tests measuring these functional capabilities of an organism are useful which are correlated with tests accurately assessing specific motor (psychomotor) competence of these employees.

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