New idea of development movement coordination abilities in water of high level athletes practicing selected combat sports

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Summary

Introduction. Achieving significant success in wrestling requires a high level of movement co-ordination abilities. In wrestling these abilities should be developed at the same time with strength abilities, because of them the success on the mat depends on. Reserves relating to the ways and means of developing movement coordination abilities become very quickly exhausted. Standard training conditions of wrestlers have been recently slightly changed, and water environment has been introduced. Hence, the aim of the investigations herewith was to: establish the effect of the special set of movement coordination complex exercises performed by wrestlers in natural and in water environment.

Material and methods. The experiment was carried out with 31 wrestling champions (athletes of master class), who were divided into two groups: the control group and experimental group. Training session of each of the groups comprised a set of exercises developing movement coordination. Wrestlers from the control group (n=16) performed a set of movement coordination complex exercises. In the experimental group (n=15) an analogical set was used but performed in water with three kinds of body submerging: at the water surface, under the water and on the bottom of the swimming-pool. Technical elements and fragments of fights were performed during the training. The ability to maintain balance was evaluated in two ways: in the vertical and horizontal body position. The balance keeping (s) was assessed on a decreased support surface, and with eyes closed. The attempts were affected in the natural environment and in water.

Results. The results of the researches showed an improved movement coordination as a consequence of the performed set of proposed exercises. The time of maintaining vertical position was longer than when performing attempts in horizontal position, and that applied both to attempts in natural conditions, as well as in water.

Conclusions. In order to develop movement coordination among those practicing combat sports, it is suggested that exercises in a swimming-pool with various kinds of body submerging should be applied during training sessions (e.g. with wrestlers). This specific and versatile environment enables competitors to obtain immediate information serving the evaluation of the results of future reactions.
Material and methods

The experiment was carried out with 31 students from the university in Grodno, who were athletes of the champion – master class (aged 18-22), and who practiced various combat sports: classical and free style wrestling, sambo, judo. Those tested were divided into two groups: control (n=16) and experimental (n=15). The experiment involved one training micro cycle (12 two-hour sessions). Each of the training session included a special set consisting of 9 groups of exercises (motor tasks) which developed movement coordination abilities (Tab.1). Competitors from the control group performed the set in standard training conditions, that is on the mat. The experimental group performed the set in the water with three kinds of body submersion: on the surface, under the water, at the bottom of the pool. While performing the set, irrespective of the environment, the following methodical principles were applied: 1. Various forms of respiration was used in the exercises: free, with a halt, controlled, cyclical. 2. The exercises were performed first in one spot, next with a translocation, and finally in a combination. 3. Each of the exercises was repeated from 10 to 20 times (depending on the capacities of the tested individual). The ability to maintain static balance was evaluated in two attempts: with the vertical and horizontal body position*. The time of balance keeping was assessed on a smaller supporting surface, and with eyes closed (s). The attempts were carried out prior and after the execution of each of the motor tasks, in natural training conditions and in water.

Results

The performance of various attempts (motor tasks), affected in a different way the ability to keep the balance in a verti-
cal body position of those tested from the control group (Fig. 1). A considerable deterioration in the performance of the attempts was noted when various rolls from squatting position, side rolls, or jumps were introduced. Those exercises which stimulated the balance apparatus lowered the ability of the athlete to maintain a vertical body position, and specifically when the supporting surface was limited (the attempt required standing on the toes). It is interesting that the performance of various forms of somersaults (forward, backward, sideways) favoured the lengthening of the balance keeping time. The curve representing the results of the average balance keeping time in vertical body position in the gym, and in the water was quite similar, but in all of the 10 tasks worse results were obtained when tasks were performed in water. A nearly analogous tendency of the results appeared when performing attempts in the horizontal body position, both in water and in the gym. A slightly different curve course of the average results was observed among athletes of the experimental group (Fig. 2). Firstly, all the curves, therefore those concerning the vertical and the horizontal body position, both in the gym and water, showed a very similar course. Secondly, the curves presented higher values. Thirdly, the execution of motor tasks after turns, rolls from a squatting position and sideways, and after jumps caused a lesser decline in balance keeping time. Fourthly, similarly to the control group, the balance keeping time in the vertical and horizontal position in the gym was always longer in the water. It proves that the execution of exercises in the water, hence in the environment where training sessions are rather seldom carried out, and particularly with such a varied content, stimulated strongly the balance apparatus, thus extending the time of the vertical and horizontal body position maintaining.

The comparison of the average results of the control and experimental groups, separate for the values of balance

![Figure 1. Results of the performance motor tasks by competitor of various martial art sports – control group (n=16)](image1)

![Figure 2. Results of the performance motor tasks by competitor of various martial art sports – experimental group (n=15)](image2)
maintaining in vertical position (Fig. 3) and in horizontal posi-
tion (Fig. 4) confirms the before observed tendencies. How-
ever, the predominance of the results obtained by the experi-
mental group in nearly all attempts (see Fig. 4), both in the
gym and in the water in the vertical body position, is clearly
visible. A quite similar inclination of results is being observed
in the case of the horizontal body position.

**Discussion**

The results of the short-term experiment carried out among
athletes of champion class reveal a favourable influence of
the environmental change on the level of the movement co-
dordination abilities. It was manifested by an improvement, that
is extension of the balance maintaining time in the vertical
and horizontal position. It is common knowledge, though, that
obtaining any improvement of the movement coordination
abilities of the competitors of the highest rank is not easy.
There is now doubt, whatsoever, that the increase of such
abilities recorded with the aid of time attempts of balance
keeping does not reveal the entirety of the investigated phe-
nomenon. Carrying out tests concerning other movement co-
dordination abilities, as well as special (technical) skills, could
have also demonstrated their improvement. This is the hypo-
thesis which may be verified in various researches dealing
with the development of movement coordination abilities.

Slighter increases of results as far as the time of balance
maintaining in horizontal position may be explained by the
fact that for a human being a vertical body position is more
typical since it is more commonly assumed in the everyday
life. Even if the horizontal position occurs quite often among
those practicing combat sports, the proportion of the training
time to the time of the everyday activities is too small to affect
in any way the domination of this position. The results obtain-
ed demonstrate that the proposed original set of special exer-
cises together with the attempts evaluating the ability to main-
tain the body balance may be used in the training of athletes.
practicing different combat sports. A considerably higher increase of the movement coordination ability level may be expected among younger athletes at a lower level of sport advancement and after an extended time of the application of the proposed set of exercises.

Conclusions
1. The special set of exercises applied in the experiment, both in the gym and in water, affected the level of the balance maintaining ability of the athletes in a varied way. Its considerable improvement was observed among the investigated of the experimental group.

2. The attempts serving to assess the ability to maintain balance in the vertical and horizontal body position used in the researches, as well as the special set of exercises focusing on the development of movement coordination abilities, are appropriate to be applied in the training of athletes at divers levels of advancement, and practicing various combat sports. They account for a reserve to be availed of.

3. Performing technically complex exercises with three stages of body submersion may increase the level of kinesthetic impressions of the athletes, and through that may favour a better „feeling of the opponent” [11]. It is of utmost importance in the success achieving.

References
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