Training of judoists using the means of rhythmic education and music

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Summary

The analysis of scientific publications content shows that the present system of judoists’ technical training has a set of unsolved problems that require analysis of the entire sport training with the aim of its correction and identification of the most effective means and methods. Furthermore, special attention must be paid to the rhythmic structure of technical and tactical actions of judoists since the method of creation has not received enough attention in specialized literature. And from this perspective, in our opinion, a selection of non-traditional means and methods will contribute to the development of rational motor structure of specific elements in judo fighting in conformity with their rhythmic organization as separate acts of an integral action.

The aim of this research is to analyse the effectiveness of rhythmic education means and music use in the learning and training process of judoists. Material and methods: theoretical analysis and generalization of literature and document data; analysis of learning and training process in judo; methods of testing the parameters of fitness, conditioning, psychomotor, technical and tactical training; method of mathematical processing and interpretation of statistical data. Research was made on the basis of the State University of Physical Education and Sports of the Republic of Moldova. 30 persons participated in the research: experimental and control groups consisted of 15 students-judoists in each of them. Effectiveness of the use of rhythmic education means and music within the frame of the experimental program was confirmed by the results of pedagogical experiment and this fact was visible in the dynamics of average performance of the group in all types of training where a significant difference could be attested in the achieved levels of students’ development.

Results: all the indicators demonstrated veridicity of differences of initial and final data (p<0,05-0,001) in judoists from experimental group while only 6 indicators out of 12 parameters revealed statistical veridicity (p<0,05) in the control group. The other 6 results were not indicative (p>0,05).

Conclusion: it can be stated that elaborated judo program that used the means of rhythmic education and music, in our opinion, corresponds to the requirements for the organization and elaboration of learning and training process in judo and solves set problems.

Keywords: judo, training, means of rhythmic education, music.

Introduction

Judo as a complex coordinative type of sport has changed over the last years and at the moment higher requirements are set for it (Drid, Ostojic et al., 2009; Lech, Jaworski et al., 2011; Manolachi, 2015; Miarka, Panissia et al., 2012; Polevaia-Secareanu, 2015). In that context, training under this type of fighting must reflect a clear course in the achievement of settled aims based on the rules of motor development of athletes and their individual physical abilities (Manolachi, 2015; Rodney, Imamura et al., 2007; Полевая-Секэрн, 2013; Садовски, 2000). Besides this, the efficiency of judoists’ actions is determined by mastery in fighting that itself influences a perfect coordination of the motor act (Lech, Jaworski et al., 2011), having rhythm, tempo, sense of equilibrium, space orientation, etc. as its most important characteristics (Polevaia-Secareanu & Aftimciuc, 2007; Садовски, 2000; Полевая-Секэрн, 2013).

The process of coordination training is based on the development level of sense of rhythm (Leah, 1989; Aftimciuc, 2005, 2015; Teplov, 1966). Within this framework, music is a very powerful training source for the sense of rhythm (Полевая-Секэрн & Афтимичук, 2008). It was proved that musical rhythm has the ability to influence human mind and this ability is interconnected with emotional centre that regulates behaviour, hence, any human activity (Kodjaspirov, 1987; Teplov, 1966).

In this regard, the aim of the research is to analyse the effectiveness of rhythmic education means and music use in the learning and training process of judoists.

Task of the research is experimentally to demonstrate the effectiveness of use of rhythmic
education means and music in sport training process of students specialized in judo.

**Material and methods**

Theoretical analysis and generalization of literature and document data; analysis of learning and training process in judo; methods of testing the parameters of fitness, conditioning, psychomotor, technical and tactical training; method of mathematical processing and interpretation of statistical data.

Research was conducted under authorization of the State University of Physical Education and Sports of the Republic of Moldova. 30 persons participated in the tests: experimental and control groups consisted of 15 students-judoists in each of them. The appreciation of motor abilities was made with the use of tests that determined the level of fitness and also determined the quality of sensomotor reaction to light, sound, reaction to a moving object with the identification of anticipatory and deferred reactions, general appreciation of the rapidity of motor actions executed within the interval of 4х30 s (tapping test) and their dynamics (from the 1st to the 4th interval). From this perspective, we elaborated experimental judo program tested on the students of the State University of Physical Education and Sports of the Republic of Moldova (Polevaia-Secareanu, 2015). Its distinguishing feature is the fact that for a purposeful formation of the rhythmic structure of motor actions in fighting means of rhythmic education and music, which allowed us to project the algorithm of training of judoists at the stage of initial sport specialization, were tested (Polevaia-Secareanu & Aftimciuc, 2008; Table 1).

![Table 1](image)

<table>
<thead>
<tr>
<th>Stage</th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training</td>
<td>OPT + SPT</td>
<td>SPT + TT</td>
<td>TTT</td>
</tr>
<tr>
<td>Rhythmic structure of motor activity</td>
<td>Coordination and rhythmic activity</td>
<td>Rhythmic structure of motor activity</td>
<td>Rhythmic and structural organization of the whole motor activity</td>
</tr>
</tbody>
</table>

**Note:** OPT - overall physical training; SPT - special physical training; TT - technical training; TTT - technical and tactical training

The identification of consecutive and interrelated stages of training oriented towards the formation of rhythmic structure of motor activity of judo students is essential for the elaboration of the present algorithm.

At the first stage, the tasks of psychomotor abilities creation, especially the formation of motor coordination, based on the sense of rhythm were set. During the first stage, process of special and overall physical training consisted of general and special exercises, action and music games. During the educational and training process, musical tracks of different genres, after which these rhythmic patterns were reproduced by means of clapping, stomping, and snapping, were played. During the circuit training in the fitness room, coordination and rhythm tasks that were executed with the accompaniment of music tracks were used. The given stage is basic for the formation of rhythmic structure of the motor act in the future.

At the second stage, special training also included coordination and rhythmical exercises with the use of music that were elaborated on the basis of technical and competitive type elements and the structure of concrete technical act was created.

The third stage presupposed the realization of technical and tactical actions in “Randori” sparring and matches during competitions where the entire rhythmic and structural organization of specialized motor actions was shown.

For the creation of rhythmic structure of judoists’ motor action we used the means of musical expression: rhythm, rhythmic pattern, and tempo (Polevaia-Secareanu & Aftimciuc, 2008). The combination of exercises with different structure, completed with hands positions, gesticulation, and sound accompaniment (claps, stomps, and snaps), contributes to the development of motor coordination. The complexity of motor actions structure is caused by the necessity to remember a big amount of comparatively independent movements. This requires the development of professional memory as well as such qualities as diligence, clarity, and completeness of visual representation, accuracy in movement reproduction.

**Musical and rhythm games** – both means of musical and physical education – were included in the educational and training process. With their help the sense of rhythm and tempo, ear for music, and musical memory were developed. Students acquire
skills in execution of movements in conformity with means of musical expression, correct understanding of music and execution of movements in conformity with its content and type. Musical and rhythmic games contribute to the improvement of movement coordination and space orientation (Aftimciuc & Sipilova, 2003; Polevaia-Secareanu, Aftimciuc, 2008).

The presented means have their internal integration, which manifests itself in the cumulative effect of the lessons, where one mean completes the other with the aim of the consolidation of the skill acquired during the training. First of all, this refers to the complex psychomotor skill of motor coordination including visual and hearing coordination.

Within the frame of our program, with the help of means of musical and rhythmic training the following groups of exercises were elaborated (Polevaia-Secareanu, 2015): exercises that form the sense of rhythm; exercises that form the sense of tempo; exercises that develop complex coordination and activate attention; exercises oriented towards the development of the sense of equilibrium; games for the development of the sense of rhythm, tempo, and coordination. The exercises were used at the preparatory, basic, and final parts of the learning and training process of judoists.

In conformity with the elaborated algorithm of the motor activity formation for judoists, we projected three blocks of learning and training lessons united by their orientation towards gradual education of the abovementioned activity with the use of a system of specific tasks since the execution was made with the use of rhythmic education and music.

The first block of elaborated exercises implied circuit training that included eight stations, out of which two solved tasks of coordination and rhythmic movement formation on the basis of the execution of exercises from the overall and special physical training sections.

The schedule of assignments that determine the realization of the tasks imply the gradual complication of the coordination exercises from quadruple to semiquaver meter. Some of them were presented by coordination and rhythmic bridges that presupposed the identification of musical accents by claps, stomps, snaps, and flaps. The execution of this type of tasks was accompanied by specially selected musical compositions.

The set of exercises oriented towards motor coordination development were elaborated with the use of skipping and rubber ropes. There were also included musical and rhythmic games such as “Game with rhythm”, “Clap-Clap, Pit-a-Pat”, “Identify the Tempo”, “Forbidden Pauses” (Polevaia-Secareanu, 2015) that ensured the consolidation of special skills.

The second block of learning and training lessons included tasks that correspondingly determined the solving of problems related to the formation of the rhythmic structure of the motor actions specific for judo. In this perspective, special preparatory exercises oriented towards the education of the movements that appeared directly in the process of sparring were synthesized. In conformity with them, the following technical actions were selected (Table 2): Double Shoulder Throw (Morote-Seoi-Nage), Major Outer Sweep (O-Soto-Gari), Body Drop (Tai-Otoshi), and Advanced Foot Sweep (De-Ashi-Barai). Such elements of technical acts as Uchi-Komi that were made in front of the mirror with counting, under the accompaniment of music tracks with strictly determined accentuated moments and pauses, culminations, and diminuendo, also can be included.

### Table 2

<table>
<thead>
<tr>
<th>№</th>
<th>Technical action</th>
<th>Rhythmic pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>In sparring</td>
</tr>
<tr>
<td>1</td>
<td>Double Shoulder Throw (Morote-Seoi-Nage)</td>
<td>4/4</td>
</tr>
<tr>
<td>2</td>
<td>Major Outer Sweep (O-Soto-Gari)</td>
<td>2/4</td>
</tr>
<tr>
<td>3</td>
<td>Body Drop (Tai-Otoshi)</td>
<td>4/4</td>
</tr>
<tr>
<td>4</td>
<td>Advanced Foot Sweep (De-Ashi-Barai)</td>
<td>2/4</td>
</tr>
</tbody>
</table>

On the basis of rhythmic patterns, special exercises that were included in the process of technical training of students-judoists were elaborated. They had a positive influence on learning of Double Shoulder Throw (Morote-Seoi-Nage), Rear Hip (Uki-Goshi), Inner Thigh (Uchi-Mata) and also helped the formation of the Major Outer Sweep (O-Soto-Gari) structure. For the
consolidation of the acquired skills, the following didactic games: “Break the balance”, “Catch the rhythm”, etc. (Polevaia-Secareanu, 2015) - were practiced.

The third block of experimental lessons in the system of the present elaborations was oriented towards the improvement of the created motor action structure of judo students for the synthesis of the rhythmic and structural organization of an integral motor activity that determined the competitive aspects of the given type of fighting (Polevaia-Secareanu, Aftimciuc, 2008).

The projecting of the integral activity was made with the accompaniment of specially created music track that presupposed the change of dynamic accents, musical intensification, culmination, and also chords in fortissimo; for example, the „Randori” fragments, so, when hearing piano music, the competitors are in the process of fighting for hold. After a certain period of time (7-10 s), a chord with maximal sound volume (ff) comes, when TORI must break the balance of the competitor and UKE- combat him.

The homogeneity of the group was confirmed by the testing (p>0.05) made at the beginning of pedagogical experiment.

Results and discussion

Upon the completion of the pedagogical experiment, we performed repeated test of studied general and special physical training parameters in each judo student from experimental group (Table 3).

Table 3 shows that there is a positive dynamics of the physical training parameters in all researched tests in both groups. In the control group as for the overall physical training, there were identified

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Motor training test</th>
<th>№</th>
<th>Control group</th>
<th></th>
<th>Experimental</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>initial</td>
<td>final</td>
<td>initial</td>
<td>final</td>
</tr>
<tr>
<td>Overall physical training</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed</td>
<td>100 meter race, s</td>
<td>1</td>
<td>14,08 ± 0,11</td>
<td>14,02 ± 0,10</td>
<td>0,60</td>
<td>&gt;0,05</td>
</tr>
<tr>
<td>Coordination</td>
<td>Rope jumping for 30 s (number of times)</td>
<td>2</td>
<td>60,00 ± 2,46</td>
<td>64,93 ± 2,35</td>
<td>2,17</td>
<td>&lt;0,05</td>
</tr>
<tr>
<td>Speed and strength endurance</td>
<td>L- seat for 30 s (number of times)</td>
<td>3</td>
<td>30,26±0,52</td>
<td>31,13±0,50</td>
<td>2,20</td>
<td>&lt;0,05</td>
</tr>
<tr>
<td>Arm pumping in front lying position 30 s (number of times)</td>
<td>4</td>
<td>32,93±0,82</td>
<td>34,60±0,67</td>
<td>2,28</td>
<td>&lt;0,05</td>
<td>33,27±0,82</td>
</tr>
<tr>
<td>Knee bending in 30 s (number of times)</td>
<td>5</td>
<td>31,66±0,59</td>
<td>33,04±0,54</td>
<td>2,76</td>
<td>&lt;0,05</td>
<td>31,46±0,59</td>
</tr>
<tr>
<td>Motor coordination (points)</td>
<td>6</td>
<td>8,86 ± 0,40</td>
<td>7,01 ± 0,41</td>
<td>0,46</td>
<td>&lt;0,05</td>
<td>6,99 ± 0,38</td>
</tr>
<tr>
<td>Special physical training</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexibility, agility</td>
<td>Running to 5x5, s</td>
<td>7</td>
<td>50,40±1,73</td>
<td>49,45±1,72</td>
<td>0,58</td>
<td>&gt;0,05</td>
</tr>
<tr>
<td>Speed, space, time, and strength endurance</td>
<td>15 back arch throw of the punch dummy, s (number of times)</td>
<td>8</td>
<td>61,80±2,12</td>
<td>60,18±2,11</td>
<td>0,81</td>
<td>&lt;0,05</td>
</tr>
<tr>
<td>Speed and strength skills</td>
<td>Hip-roll of the punch dummy in 30 s (number of times)</td>
<td>9</td>
<td>7,00 ± 0,37</td>
<td>7,27±0,36</td>
<td>0,79</td>
<td>&lt;0,05</td>
</tr>
</tbody>
</table>

Note: n=15, n=15, (f=14) with p < 0,05, t = 2,145; p < 0,01, t = 2,977; p < 0,001, t = 4,140.
statistical differences (p<0.05) of the majority of the studied motor skills (tests № 2, 3, 4, 5) to their increase. An exception was only test № 1 that determined the velocity development of judoists and also tests № 6, 7, and 8 that reflected the special training, where unreliable increase tendency for the experiment period was identified (p>0.05).

That way the development of special motor skills dynamics in control group proves that traditionally used program for the sport improvement of students, from the perspective of the used methods and means, basically is oriented towards the development of overall physical training of students and, from the perspective of strength, the special training of judoists is not significantly influenced by it.

Analysing the dynamics of testing results in the experimental group during the experiment period, it is worth mentioning that the program elaborated by us for the training course of sport improvement of students, having the rhythmic and musical content as its distinctive feature, allowed significant improvement of the motor skills of students for overall and special training (p<0.05–0.001).

A similar situation can be attested in the block of technical training (Table 4). Out of three tests that reflected the level of technical training of the control group of judo students, only SPURT confirmed the validity of the obtained results (t=2.15; p<0.05).

The same test (t=4.82) has presented a level of credibility with p<0.001 in the experimental group.

Table 4

<table>
<thead>
<tr>
<th>№</th>
<th>Parameters</th>
<th>Control group</th>
<th>Experimental group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Specialized test (number of times)</td>
<td>3.40±0,18</td>
<td>3.47±0,18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.37 &gt;0.05</td>
<td>4.00±0,17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.46±0,18</td>
<td>4.15 &lt;0.001</td>
</tr>
<tr>
<td>2</td>
<td>Specialized technical test (number of times)</td>
<td>32.20±1.06</td>
<td>32.73±1.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.53 &gt;0.05</td>
<td>32.06±1.05</td>
</tr>
<tr>
<td></td>
<td></td>
<td>35.73±1.00</td>
<td>3.57 &lt;0.01</td>
</tr>
<tr>
<td>3</td>
<td>SPURT, s</td>
<td>51.59±1.72</td>
<td>48.17±1.66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.15 &lt;0.05</td>
<td>50.85±1.68</td>
</tr>
<tr>
<td></td>
<td></td>
<td>43.47±1.54</td>
<td>4.82 &lt;0.001</td>
</tr>
</tbody>
</table>

Note: n1=15, n2=15, (f=14) with p<0.05, t=2.145; p<0.01, t=2.977; p<0.001, t=4.140.

The parameters of other two tests (“specialized test”: t=0.37; “special technical test”: t=0.53) did not confirm the possibilities of traditional method at the training of judoists in the control group at the stage of initial sport specialization (p>0.05). This implies that the existent judo learning and training program in the university is basically oriented towards the education of speed and strength endurance; SPURT test confirms the latter. In the case of special technical test, which is oriented towards the development of the same skill, it is worth mentioning that the realization of 10 s pauses between the series was a factor that disturbed the rhythmical execution of throws. In the experimental group, the given test (t=3.57) showed a reliability of the created skills with p<0.01 because the rhythm of throws established during the experimental lessons was undertaken as a specialized motor skill. Concerning the specialized test, it could be pointed out that it is oriented towards identification of the space orientation skill, maintenance of vestibular tolerance, manifestation of speed, and strength skills. After the analysis of its parameters, it should be noted that the content of learning and training lessons within the frame of the experimental program assured the creation of the complex skill to combine the motor actions of judo students from experimental group, which reflected different characteristics (t=4.15; p<0.001).

Thus, the present affirmation allows us to state that, during pedagogical experiment, the applied means and methods of the experimental program being oriented towards the education of the motor rhythm had a positive influence on the parameters of specialized perception and technical training of
judo students from the experimental group; this fact is confirmed by the mathematical calculations at the comparative analysis of the researched parameters in both groups (Table 4).

The abovementioned information can be a confirmation of the axiom that music is quite effective for the development and improvement of the human neuromuscular apparatus (Kodjaspirov, 1987; Teplov, 1966). The potential of the rhythm sense, which is developed by music, permits the coordination of motor skills formation both within the frame of overall and special physical training (Aftimichuk, 2005, 2015; Полевая-Секэрнну, 2013).

It is known that the improvement of psychomotor system plays a significant role in successful technical and tactical training of fighters, including judoists (Bleer, 2009). This problem especially arises in the case of student age athletes (Polevaia-Secareanu & Aftimciuc, 2008; Sousi & Borovok, 2004).

It was interesting to find out the efficiency level of the elaborated experimental program for the training of judoists in comparison with the traditional program concerning the state of psychomotorics of sport students. For the initial parameters of psychomotoric skills development there was no significant (veridical) difference in all tests (p>0,05) between the experimental and control group and this confirms their homogeneity.

After the investigation of obtained data, we can state that, during the experiment period in the control group, the tests of simple motor reaction to sound and light, complex motor reaction (“anticipatory”, “delayed”) and also tapping test (total number of movements) and motor coordination show a certain positive tendency of development, though, it is not veridical (p>0,05).

Besides this, the amount of “anticipatory” reactions decreased by 4,6%, “delayed” – 6,67%, although the amount of “timely” reactions increased by 11,33%. The same dynamics of “movement frequency” decrease can be noticed for the “tapping

![Fig. 1](image1.png)

**Fig. 1.** Graphic presentation of the dynamics of average parameters of psychomotor skills of judo students from the control group

![Fig. 2](image2.png)

**Fig. 2.** Graphic presentation of the dynamics of average parameters of psychomotor skills of judo students from the experimental group
test” that is indicative of development of tiredness in students with the decrease by 2.33 % (Fig. 1).

This fact points out that the content of traditional training means and methods has a modest, insignificant influence on the process of creation of psychomotoric characteristics of judo students and this fact can be analyzed from three perspectives. Either the traditional methodology is elaborated for the contingent of sport school (there is a difference in teaching motor actions according to age category) or it (methodology) does not take into consideration the modern social and economic conditions, which is connected to the process of young people personality formation; or either it denies or ignores the innovative elaborations for their implementation to sport training process.

The dynamics of the psychomotor system parameters of the experimental group judoists is presented differently (Fig. 2). We determined that, during the experimental period in the experimental group, veridical changes of analyzed psychomotor skills had occurred (p<0.05-0.01).

More than that, the amount of “anticipatory” reactions declined by 14 % (compared to the control group it is 3.5 times better), the amount of “delayed reactions” declined by 31.34 % (compared to the control group this parameter is 3.2 times better), the amount of “timely” reactions was up by 35.13 % (compared to control group – 3 times), and the level of fatigue at the manifestation of elementary motor actions (tapping test) declined by 5.34 % (Fig. 2).

In this regard, the parameters of the motor coordination in the experimental group exceeded the control group by 1 point (correspondingly, X = 8.17; X =7.01), which allows us to identify the validity of the obtained results with the level p<0.01 (Table 2).

On the basis of the abovementioned analysis of the dynamics of psychomotor skills development in judo students from the experimental group, we can state that the music and rhythmic education means are efficient in the system of learning and training process, because they have an influence on psychic and motor system of the human body due to their structure and content.

The information presented above allows us to state that the level increase of physical and technical competence of athletes during the improvement of psychomotor skills and renewal of motor abilities and competences helps to the formation of new forms of competitive actions.

**Conclusion**

In such a way the obtained results allow us to make the conclusion that, during the pedagogical experiment period, used means and methods of rhythmic training and music not only did not have a negative influence on the physical and functional state of athletes’ bodies but, on the contrary, it revealed a considerable influence on the psychomotor development of judo students in the experimental group when compared to the control group.

Consequently, it can be stated that the judo program elaborated within the frame of the “Sport Mastery Enhancement Course”, using the means of rhythmic education and music, in our opinion, meets the requirements of organization and structuring of learning and training process in fighting and achieves the assigned objectives.

**REFERENCES**


**DZIUDO IMTYNINKŲ RENGIMAS NAUDOJANT MUIZIKINĮ IR RITMINĮ UGYDMĄ**

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*Moldovos valstybinis kūno kultūros ir sporto universitetas*

**SANTRAUKA**

Išanalizavus tyrimo rezultatus nustatytas statistiškai patikimas (p < 0,05–0,001) eksperimentinės grupės narių visų parengtumo rodiklių gerėjimo pranašumas, lyginant su kontrolinės grupės narių rodikliais, kurių tik šeši rodikliai iš 12 pakito statistiškai patikimai (p < 0,05). Kitų šešių kontrolinės grupės narių parengtumo rodiklių pokytis buvo statistiškai nepatikimas (p > 0,05).

Galima konstatuoti, kad taikyta dziudo imtyninių rengimo programa, kurioje naudojamos muzikinio ir ritminio ugdymo priemonės, tenkina treniruotės vyksmo tobulinimui, naujų rengimo priemonių paiešką keliamus reikalavimus.

**Raktažodžiai:** dziudo, muzikinio ritminio ugdymo priemonės.

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