



# Pain tolerance versus competitive success in youth kickboxing

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## Abstract

**Objective of the study** was to rate and analyze the pain tolerance versus competitive progress in the youth kickboxing sport.

**Methods and structure of the study.** We used special research literature analyses, synthesis and analyses of the competitive records and training process observations as a basis for the tests. The pain tolerance of the 6-12 year-old sample ( $n = 40$ ) was tested by I.I. Kuznetsov test system with a blood pressure gauge. The system air pump exerts pressure on the subject's skin till refusal, with the top pressure fixed instantly  $n$  mm Hg. The pain tolerance was also rated by the Verbal Pain Rating Scale and Modified Facial Pain Rating Scale in points [3]. The pain tolerance rating tests were complemented by the competitive records analyses and practical observations. Individual fight styles with the pain tolerance elements were rated as follows: refusal to fight was scored by 0 points; uncontrolled pre-fight fever scored by 1 point; pre-fight fever followed by shaky confidence scored by 2 points; stable behavioral self-control scored by 3 points; and courage, initiative and full confidence in the fight scored by 4 points. The study was run at Patriot Sports Club in Belgorod and University of Innovation and Technology of Western Kazakhstan in Uralsk. The test data were collected and processed in 2018-2020 with conversion into non-parametric values, followed by a Spearman rank correlation analysis.

**Results and discussion.** The study found a highest correlation between the individual pain tolerance test rates obtained by the Kuznetsov skin pain test and competitive fight style ( $r_s = 0.875$ ). The pain tolerance versus fight style correlations for the Verbal Pain Rating Scale and Modified Facial Pain Rating Scale tests were somewhat lower ( $r_s = -0.783$  and  $r_s = -0.756$ , respectively); although still indicative of the significant correlation between the pain tolerance and competitive success in the youth kickboxing sport. The arithmetic means and standard deviations give the grounds to rate the junior sample pain tolerance as mean. The study data and analyses demonstrate the pain tolerance being in strong correlation with the competitive fight style. The findings and study data are recommended for application in the theoretical and practical trainings and competitions in youth kickboxing.

**Keywords:** *physical pain, pain tolerance, bouts, kickboxing, junior athletes.*

**Background.** Studies of pain and the relevant aspects have long been ranked among the priorities by medical and other sciences [2, 5-7]. Modern sports communities, with the growing athletic workloads, competitiveness and exposure to injury risks, are increasingly interested in the physical pain research. Competitive bouts in modern full-contract kickbox-

ing imply power punches and kicks to head and body allowed by the competition rules, with a successful competitor expected to be highly tolerant to pain. As demonstrated by practical success histories, the individual pain tolerance is critical for progress in modern full-contract martial arts on the whole and kickboxing in particular, although the relevant issues are still un-



derexplored by the research community. Therefore, we believe that an analysis of the pain tolerance test rates versus competitive progress could be beneficial for the youth kickboxing sport.

**Objective of the study** was to rate and analyze the pain tolerance versus competitive progress in youth kickboxing sport.

**Methods and structure of the study.** The pain tolerance of the 6-12 year-old sample (n = 40) was tested by I.I. Kuznetsov test system with a blood pressure gauge. The system air pump exerts pressure on the subject's skin till failure, with the top pressure fixed instantly n mm Hg. The pain tolerance was also rated by the Verbal Pain Rating Scale and Modified Facial Pain Rating Scale in points [3]. The pain tolerance rating tests were complemented with the competitive records analysis and practical observations. Individual fight styles with the pain tolerance elements were rated as follows: refusal to fight was scored by 0 points; uncontrolled pre-fight fever scored by 1 point; pre-fight fever followed by shaky confidence scored by 2 points; stable behavioral self-control scored by 3 points; and courage, initiative and full confidence in the fight scored by 4 points. The study was run at Patriot Sports Club in Belgorod and University of Innovation and Technology of Western Kazakhstan in Uralsk. The test data were collected and processed in 2018-2020 with conversion into non-parametric values, followed by a Spearman rank correlation analysis.

**Results and discussion.** The study was designed to complement the prior studies of the subject [1, 3, 4] that have partially addressed the issues of pain tolerance versus competitive fight styles in youth kickboxing. Subject for those prior studies, however, were only the maiden training bouts, whilst the pain tolerance versus competitive progress analysis was made solely on logical considerations of the individual qualitative characteristics. In this study, we expanded the sample and the number of bouts (24 bouts for every subject) and applied a standard mathematical statistics toolkit to put the analysis on a sound basis.

Having processed the data arrays, we found correlations of the pain tolerance rates yielded by the

Kuznetsov test with the Verbal Pain Rating Scale and Modified Facial Pain Rating Scale test rates, to verify the test data validity. We also found a clear correlation between the skin pain tolerance test rates and the actual individual fight styles: see Table 1 hereunder.

Our calculations rejected the null hypothesis and found a relatively high correlation of the test rates (rs = 0.875) for the Kuznetsov test – that means that the individual pain tolerance and competitive success rates are closely correlated for the age group. This result was then verified by the correlations between the Verbal Pain Rating Scale test rates and fight styles that was also high at rs = -0.783); and a slightly lower correlation for the Modified Facial Pain Rating Scale test data (rs = - 0.756). The negative sign is explained by the fact that the lower are the points on the test scales, the higher is the pain tolerance and more confident is the fight style. We also analyzed the study data by analyzing the arithmetic means and standard deviations, followed by the average pain tolerance calculations for every athlete. Thus the Kuznetsov test yielded the high pain tolerance correspondent to the mean pain tolerance in the Verbal Pain Rating Scale and Modified Facial Pain Rating Scale tests.

**Conclusion.** The study found a highest Spearman's rank correlation between the individual pain tolerance test rates obtained by the Kuznetsov skin pain test and competitive fight style (rs = 0.875). The pain tolerance versus fight style correlations in the Verbal Pain Rating Scale and Modified Facial Pain Rating Scale tests were somewhat lower (rs = - 0.783 and rs = - 0.756, respectively); although still indicative of the significant correlation between the pain tolerance and competitive success in the youth kickboxing sport. The arithmetic means and standard deviations give the grounds to rate the junior sample pain tolerance as mean.

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**Table 1.** Pain tolerance versus competitive progress/ fight style correlations

Pain tolerance test	Correlation ratio, r <sub>s</sub>	M±m., points	Average pain tolerance
Kuznetsov test	0,875	19,17±0,31	High pain tolerance
Verbal Pain Rating Scale test	- 0,783	7,65±0,25	Mean pain tolerance
Modified Facial Pain Rating Scale test	- 0,756	7,45±0,30	Mean pain tolerance



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