



Factors of forming safety competencies on water areas in student youth

UDC 797.2

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Received by the editorial office on 22.05.2026

Abstract

Objective of the study is to identify the factors that reduce the risk of accidents based on students' mastery of swimming competencies.

Methods and structure of the study. The study was conducted using a cross-sectional design with a questionnaire that included questions related to socio-demographic data, organizational factors, and the level of swimming competencies. A survey was conducted of 125 students of a managerial university of all years of study: 57 (47.7%) female students and 68 (52.3%) male students.

Results and conclusions. Students' mastery of swimming skills before entering a higher educational institution ensures the effective formation of competencies related to safety on water bodies. By the end of their studies, senior students have a better command of competitive and applied swimming skills. The formation of skills in performing applied techniques and actions is a priority in the field of safety on water bodies.

Keywords: university students, swimming skills, applied actions, safety factors, injury-prone situations.

Introduction. Numerous studies show that uncontrolled presence at unequipped water bodies poses a real threat to the life and health of young people. Serious incidents on the water also occur in swimming pools. Safety factors must be studied in depth in order to prevent accidents on the water.

An analysis of modern literature leads to the conclusion that the existing methods for assessing the level of students' swimming preparedness are somewhat limited. A number of applied skills are not taken into account in the assessment, for example, the ability to cover long distances by swimming and the basic skills of survival in water [4]. As a rule, the level of swimming preparedness is assessed on the basis of mastery of the technique of competitive swimming styles [2]. The studies performed showed that the level of mastery of swimming skills can be influenced by gender, length of training, age, region, and availability of pools [1]. In addition, the ability to keep oneself afloat by means of

stroking movements reduces the number of accidents in water areas [5].

Nevertheless, a representative database is required for further study of this serious problem. The need to assess the factors of the formation of swimming skills is due to the correlation of the ability to swim with safety on the water and the reduction of accidents and drownings [3].

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Methods and structure of the study. A survey was conducted of 125 students of a managerial university of all years of study: 57 (47.7%) female students and 68 (52.3%) male students. The age of the students who participated in the study was 19.7 ± 1.1 years.

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related to socio-demographic data, organizational factors, and the level of swimming competencies.

The socio-demographic data included age, gender, year of study, and the level of education of the parents.

The organizational factors were characterized by the age of starting swimming lessons, the total length of training, the duration of an individual training session (in minutes), and the number of pool sessions during a month.

The swimming competencies reflected the abilities in swimming the maximum distance using any style; swimming with a kickboard while working with the legs only; holding one's breath underwater; lying on the water; staying on the surface of the water with the help of supporting (sculling) strokes; and diving for distance. The maximum swimming distance was considered to be the distance that the subjects could swim independently without rest.

When studying injury-prone situations while in the water, the participants answered questions related to accidents or injuries received while in open water bodies. The answers were coded as follows: 1 – the subject was a participant in an incident on the water; 0 – there were no negative cases on the water in the subject's practice.

To assess the relationship between the level of mastery of swimming skills and the possibility of reducing injury-prone situations in the water, regression analysis was used with the construction of a logistic and hierarchical multiple model.

The beta-distribution coefficient (β) was used to model the probability of accidents under the influence of a certain factor. The confidence interval (CI) reflected the true value of the regression coefficient with a probability of 95%. To assess the differences between the groups, a two-way analysis of variance based on

the calculation of the Fisher F-criterion was used. The quality of the model was assessed on the basis of the coefficient of determination R^2 . The analysis was carried out using SPSS software version 24.0.

Results of the study and discussion. The results of the study indicate that male students can swim an average of 102.3 m, and female students – 76.5 m. It was revealed that the swimming distance increases with each year of study. More than 80% of the participants were able to perform the initial exercises for water familiarization (swimming with a kickboard, staying on the water, diving). About 35% of the students reported that they were unable to swim more than 5 meters using stroking movements. Even more students were unable to perform applied swimming techniques.

The results of the study make it possible to assess the current state of the swimming skills of higher-school students. Considering that the specialized literature mainly studies factors reflecting the causes of serious incidents on the water, the data of the conducted study establish a significant connection between mastery of swimming skills and safety on natural water bodies, which helps to expand the understanding of this issue and to contribute to the theory and methodology of the mass teaching of applied swimming skills to higher-school students.

The results of the conducted study indicate that more than 65% of the respondents are able to perform the proposed tasks, and 31.5% of them cannot swim a distance of more than 10 m.

The conducted study showed that male students have a higher level of swimming preparedness than female students.

The factors influencing the mastery of swimming skills are the location of the pool and the availability of swimming facilities (public, school, sports clubs),

Table 1. Parameters of the hierarchical linear models of multiple regression

Factors	β	CI	F	R^2
Age of starting swimming lessons	0.139	0.07:0.34	10.34	0.73
Gender	0.043	0.03:0.47	7.66	0.62
Level of parents' education	0.327	0.14:0.46	9.53	0.57
Length of swimming training	0.138	0.03:0.32	17.48	0.66
Frequency of sessions per week	0.126	0.03:0.32	14.32	0.83
Duration of a training session	0.255	0.17:0.47	22.84	0.71
Sessions in the pool	0.335	0.15:0.49	18.52	0.69
Sessions in an open water body	0.246	0.11:0.45	9.65	0.70
Skills of competitive swimming styles	0.543	0.15:0.62	18.97	0.52
Mastery of applied techniques in water	0.428	0.26:0.57	24.24	0.84



which positively correlated with the level of swimming preparedness.

Despite the fact that the duration of an individual session, the frequency of sessions per week, and the duration of training in swimming skills were significant factors influencing the level of students' swimming preparedness, they cannot fully ensure the neutralization of risks associated with the unpredictability of the physical conditions of the aquatic environment (temperature, currents, water transparency, depth and relief of the water body bottom, and the presence of underwater objects).

A significant factor influencing the effectiveness of teaching swimming skills was the age of starting lessons. Starting to learn swimming in high school is less effective than in primary school.

No differences were found in the risks of injury-prone cases while in the water between male and female students.

Each of the factors, including the duration of the initial training, the availability of lessons, the length of swimming training, and the level of mastery of swimming skills, was a significant precondition reducing the risk of accidents on the water. Most students visited bathing places in open water bodies or pools under the supervision of duty instructors and physical education teachers, which could have influenced the low level of risk of potentially dangerous cases.

Conclusions. Students' mastery of swimming skills before entering a higher educational institution ensures the effective formation of competencies related to safety on water bodies. By the end of their

studies, senior students have a better command of competitive and applied swimming skills. The formation of skills in performing applied techniques and actions is a priority in the field of safety on water bodies.

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