

Level of swimming ability of primary school pupils

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ABSTRACT

This study is aimed at determining the relationship and influence of different forms of basic swimming training on the swimming ability of primary school children in the Bansko-Bystrica region. The research was carried out in the school years 2023/24 and 2024/25 and involved 332 second and third year primary school pupils with an average age of 7.6 years, an average body height of 132 cm and an average body weight of 26.5 kg. Swimming ability was assessed by 5 tests of swimming skills (deep water dive, deep water exhalation, breaststroke and backstroke, catching objects) and 5 tests dealing with the mastery of swimming techniques, starts and turns. The testing was conducted after the completion of the swimming training, and the pupils scored an average of 1.9 points on the swimming skills tests (T1 - T5), with girls showing better average results than boys (2.1 / 1.7). The results from the tests focusing on mastering the basics of the starting dive (T6) indicate a set level of 1.6 points, and 2.3 points in the swimming stroke (T7), with the breaststroke stroke being the most frequently chosen stroke although most pupils were able to correctly perform the crawl pendulum stroke. Pupils mastered the gross form of the breaststroke stroke at an average of 1.94 points, the crawl stroke at an average of 1.64 points and the breaststroke at an average of 1.66 points. On the basis of the results and average scores of probands we evaluate the level of swimming ability of the children of the monitored groups, especially due to the insufficient time subsidy of the implemented swimming training as adequate and corresponding to the requirements and performance standard.

Keywords - level of swimming ability, swimming skills, testing.

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INTRODUCTION

Basic swimming is the initial stage of teaching swimming, mainly focused on improving swimming ability, acquiring basic swimming skills as well as acquiring movement habits or mental regulation related to the internal and external activity of the swimmer (Mandzák, 2007). According to Konrády (2018) or Dvořáčková et al. (2021), the main goals and tasks of

basic swimming are defined as the ability to teach children to move without fear and confidently in the water, to contribute to the harmonious development by developing movement abilities, acquiring new movement skills, strengthening health and resilience, education to overcome stressful situations, mutual assistance and creating a positive relationship with swimming. Bence et al. (2005) and Hric (2014) define the main goal as to teach a non-swimmer to swim at least one stroke at an appropriate level and at the same time to create the prerequisites for practicing other swimming strokes. In contrast, Modrák (2011) describes the goal of basic swimming as mastering the movement in the water. In Slovakia, basic swimming training is most often carried out in the second or third year and advanced swimming training in the fifth or sixth year in primary schools. As the main means of training we use games of all kinds and exercises focused on the technique of individual swimming techniques. Based on children's mentality and from a psychological point of view, games are the most suitable means for beginners to overcome their fear of water and to learn new activities. They help to teach pupils basic swimming skills as a prerequisite for successful mastering of swimming techniques and diving into the water. In addition, they form and strengthen positive relationships to movement and the aquatic environment.

According to the current version of Directive No 49/2023 (still in force) of the former Ministry of Education, Science, Research and Sport of the Slovak Republic, the scope of basic and advanced swimming training is no more than 20 hours. The daily range shall be determined by the head of training or course leader, taking into account the physical level and health of the children or pupils. The maximum number of children per trainer/teacher is 8 pupils. However, based on our experience, swimming training is most often carried out in a range of 10 lessons (most often for financial and organizational reasons), which are spread over 2 hours a day during one week. In our view, this scope is insufficient or minimal to achieve and cover the content of the individual swimming training sessions. Moreover, it is often assumed that the children have already completed pre-swimming training in kindergarten and thus have already acquired basic swimming skills. A great advantage is that the sets we observe are implemented by experts and trained coaches and teachers of physical and sports education. Another novelty is the co-financing or contribution from the Ministry of Education and Science of the Slovak Republic to finance sports activities of pupils of the second level of primary schools, which allows more children to undergo advanced swimming training. On the basis of the wording of the State Educational Programme, the content standard of swimming training

at the first level of primary school is focused on exercises and games to familiarize with the aquatic environment (swimming, breathing and orientation in water, jumps into the water from different positions, training of swimming techniques of the kraul, sign and breaststroke). At the second level of primary school, the content standard of the advanced swimming training is to swim technically correct 50 m in a selected swimming manner. Ideally, at the beginning and at the end of the swimming training there should be a diagnosis of swimming competence and the level of its acquisition or improvement. This is mainly to be able to analyse and evaluate the effectiveness of the content and scope, or other factors such as the use of swimming aids, the depth of the water and the environment of the swimming training, the organisation or e.g. the qualification of the coaches and teachers. Also for the possibility to develop or change the planned training content taking into account the findings. There are quite a lot of possibilities of scale evaluation, but for our research we have chosen to create a new scale that includes all the components that can be found in the content standard of the state educational program at present and in connection with the years of experience and knowledge from the previous swimming training.

AIM

The aim of the present paper was to investigate and analyze the level of swimming ability of children in the second and third year of primary schools in the Bansko-Bystrica region after completing basic swimming training.

METHODS

The study was conducted in the school years 2023/24 and 2024/25 and involved $n = 332$ second and third year primary school pupils (156 boys and 176 girls) with an average age of 7.6 years, an average body height of 132 cm and an average body weight of 26.5 kg. Pupils from Banská Bystrica primary schools and the surrounding area (Badín Primary School, Radvanská Primary School, Speak BB Primary School, Strážovská Primary School, Radvanská Primary School, Lazovná Primary School) took part in the study. Testing was conducted after the completion of swimming training using a scalar analysis according to Pupišová (2025), which includes 5 tests of basic swimming skills (jump into deep water, exhaling into the water, floating in the chest and back position, catching objects) and 5 tests dealing with the mastery of swimming technique, start and basic pendulum turn according to the chosen swimming

method. Swimming training took place at the city indoor swimming pool Štiavničky, at the swimming pool of the Faculty of Sports Science and Health in Banská Bystrica and at the swimming pool in Holiday park Kováčová. The study population received 10 hours of swimming training over 5 days (5 x 2 hours) in the morning. Diagnostic data were recorded after the completion of the swimming training, and we were interested in what the children knew after the training. At the beginning of the swimming training during the first day, we recorded only the entry level of swimming skills (T1-T5), mainly because only 34 children reported swimming at least 5 meters in any swimming stroke. The initial mean level of swimming skills in the T1 test was 1.53pts, in the T2 test a total of 1.27pts, in the T3 test a total of 1.23pts, in the T4 test a total of 1.19pts and in the T5 test only 0.76pts. The mean value of the tests was at 1.2 points. The testing was conducted by 3 examiners and the research included the average rounded result. For the analysis we used the scaling method, using the scale according to Pupisova (2025) and basic qualitative methods of data evaluation, where 0b, can not perform, 1b - more errors, 2b - 1-2 minor errors, 3b - can perform without errors. We present the results in mean scores, range of variation, with standard deviation and comparison of swimming ability level between boys and girls.

RESULTS

The results of the individual indicators of the level of swimming ability are presented in Table 1. The tests are divided into two components, the blue highlighted indicators of the level of selected swimming skills and the white and grey indicators of mastery of the gross form of the 3 selected swimming modes (stroke, breaststroke, breaststroke) and the techniques of the starting jump and the basic pendulum turn.

We observed an improvement in the T1 test, with 96.4% of the probands able to perform a leg jump at the end of the training during the last day (mean score was 2.9 points). At the beginning of the swimming training, the mean score of the ensemble was 1.53 points, which means that after the training the students were able to improve by 1.37 points. In the T2 water breathing test, 84.6% of the pupils were able to perform this movement task to full score, with an ensemble mean of 2.5 points. At the beginning of the training, pupils achieved an average total of 1.27 points in the T2 test, an improvement of 1.23 points. In the T3 test (backstroke), there was an improvement of 0.87 points from the initial measurements, which means that 70% of the pupils were able to perform this skill without error at the end of the swimming

training. The next skill observed was the breaststroke (T4), where pupils improved by an average of 1.21 points. In the exit testing, 81.3% of pupils managed to perform the skill without error. The final test of the swimming skills assessment was the retrieval of 5 objects from a depth of 1.5 m. The final test of the swimming skills assessment was the retrieval of 5 objects from a depth of 1.5 m. 63.3% of pupils were able to perform this skill, while we noted that the remaining pupils were able to fish out at least 3 objects (36.7%). The average score at the end of the training was 1.9 points. When comparing the mean scores of girls and boys, we observed a better level for girls (2.1 points) than for boys (1.7 points). Girls showed better results in T2, T3 and T4 tests and boys in T1 and T5 tests. Overall, we can evaluate that considering the average mastery of the movement task from tests T1 - T5 at 2.36 points, the swimming training was optimal. The entry level of the pupils was 1.2 points. The biggest problem for the pupils was to fish out 5 objects in one breath from a depth of 1.5 metres. On the other hand, the best children managed to perform a dive into the water from the edge of the pool with a minimum water depth of 1.5 metres. After learning to dive without catching their nose and mastering breathing, jumping became fun for the children and they all managed to jump to their feet from the starting bridge. During the training various games were implemented using jumping and various swimming aids such as swimming slips, balls, dive toys or boards and pontoons. These enhanced the children's motivation to master the movement task.

Table 1 Swimming skills assessment scale for basic swimming training (Pupiřová, 2025)

| Test No. | Name of the Physical Task | Description of Swimming Competence | Task Performance Score | Task Performance Rate (%) |
|----------|--------------------------------|---|------------------------|---------------------------|
| T1 | Jumping into the water | The pupil is able to jump into water with a minimum depth of 1.5 meters from the edge of the pool, landing on their feet, without holding their nose. | 2,9 | 96,4 |
| T2 | Exhaling into the water | The pupil is able to take a breath, submerge the entire head, and exhale into the water regularly and smoothly at least 5 times. | 2,5 | 84,6 |
| T3 | Floating in the back position | The pupil is able to push off from the edge of the pool and float in a horizontal back position with arms extended overhead and legs straight and together for a minimum distance of 5 meters. | 2,1 | 70.0 |
| T4 | Floating in the prone position | The pupil is able to push off from the edge of the pool and float in a horizontal prone (chest) position with arms extended overhead and legs straight and together for a minimum distance of 5 meters. | 2.4 | 81.3 |

| | | | | |
|----|--------------------|---|-----|------|
| T5 | Retrieving objects | The pupil is able to dive and retrieve at least 5 objects from a depth of 1.5 meters (3 points), 3 objects (2 points), or 1 object (1 point). | 1.9 | 63.3 |
|----|--------------------|---|-----|------|

Table 2 shows the percentage and score mastery of the selected basic swim stroke, with only 12 pupils choosing the crawl roll stroke (these pupils attend swimming school throughout the school year). 76.7% of the pupils managed to perform the swimming flip without error, and we focused our assessment on compliance with the applicable swimming rules and bouncing with both feet off the flip wall. The T6 test, which was the mastery of the starting jump from the bridge, could be performed by 53.3% of pupils (62% of boys and 48% of girls). The remaining 46.7% of pupils were able to perform the starting jump steeply from the edge of the pool. The most common error was a smaller rebound and thus a worse (smaller or, conversely, larger) body angle when entering the water, with the optimal one appearing to be from 15° - 20°. In Table 2 we also present the results of the evaluation of the gross form of the 3 selected swimming modes. We can see whether the most pupils were able to swim 25 metres in the breaststroke stroke, followed by the breaststroke mark and then the breaststroke crawl. However, it was in the breaststroke swimming method that the pupils showed the most errors in mastering the gross form technique of the swimming method. On average, the girls mastered the technique of the breaststroke and breaststroke stroke stroke better and the boys mastered the technique of the breaststroke stroke stroke better than the technique of the breaststroke stroke.

In the test of swimming 25 meters, 58.1% of pupils managed to swim the distance in the character swimming method, the crawl method the least (46.7%) and the breaststroke method a total of 70% of pupils. In the swimming way of the character we noted the greatest deficiencies in the arm movement, where the problem was mainly the catching up of the arms, the irregularity of the shots and that the shot phase was not realized with the bent arm, first with the forearm and then not pushing it to the level of the thighs. In the swimming method of the kraul, we noted the most frequent error in the body position, where the body was not almost horizontal (0° - 10°), the head was not in extension of the spine, and the body rotation was realized at too large an angle. In the breaststroke swimming method, the greatest deficiencies were observed in the timing of the interplay of upper and lower limb movements and breathing as well as in the movement of the lower limbs, which were not simultaneous and symmetrical, the feet were not extended outwards in the adduction phase, the knees

were not shoulder width apart in the crouching phase, or there was alternating movement (shearing) of the lower limbs.

Table 2 Scale for the assessment of gross form technique of swimming strokes, stroke turn and start jump for basic swimming training (Pupiřová, 2025)

| Test No. | Name of the Physical Task | Description of Swimming Competence | Task Performance Score | % completion of the motor task |
|----------|--|--|------------------------|--------------------------------|
| T6 | Starting dive | The pupil is able to perform a starting dive from the starting block (3 points), with minor errors (2 points), or from the edge of the pool (1 point). | 1.6 | 53.3 |
| T7 | Swimming turn | The pupil is able to perform a basic (pendulum) or tumble swimming turn in the selected swimming style. | 2.3 | 76.7 |
| T8 | Basic form of the BACKSTROKE swimming style | The pupil is able to swim at least 25/50 *meters using the backstroke swimming style (0 points – unable to perform, 1 point – swims 10 m, 2 points – swims 15 m, 3 points – swims 25 m). | 1.7 | 58.1 |
| | | The body position is almost horizontal, the water level is at ear height, and body rotation is natural | 1.9 | 63.3 |
| | | Breathing is regular and smooth, the pupil does not hold their breath, inhaling and exhaling within one stroke cycle. | 2.4 | 80.0 |
| | | The arm movement is smooth and regular. The pulling phase is performed with a bent arm, starting with the forearm and continuing until the hand reaches thigh level. The hand enters the water with the little-finger side first, while one arm pulls and the other recovers above the surface. | 1.7 | 58.1 |
| | | The leg movement is regular, the toes break the water surface, and the knees remain at water level. | 2.0 | 66.7 |
| T9 | Basic form of the FREESTYLE swimming style | The pupil is able to swim at least 25/50 *meters using the backstroke swimming style (0 points – unable to perform, 1 point – swims 10 m, 2 points – swims 15 m, 3 points – swims 25 m). | 1.4 | 46.7 |
| | | The body position is nearly horizontal (0° - 10°), the head is in line with the spine, and the back is straight; body rotation is natural (40° - 45°). | 1.3 | 43.3 |
| | | Breathing is regular and smooth. The pupil does not hold their breath or exhale above the water, and inhales sideways. | 2.4 | 80.0 |
| | | The arm movement is regular and alternating. The pulling phase starts with the forearm and is completed at the thigh, with the pull performed beneath the body. | 1.5 | 50.0 |
| | | The leg movement is alternating, in a vertical plane, originating from the hip joint, continuing with flexion and extension of the knee and ankle joints. The kick range is 40–60 cm, and the feet do not break the water surface. | 1.6 | 53.3 |
| T10 | Basic form of the BREASTSTROKE swimming style | The pupil is able to swim at least 25/50 *meters using the backstroke swimming style (0 points – unable to perform, 1 point – swims 10 m, 2 points – swims 15 m, 3 points – swims 25 m). | 2.1 | 70.0 |
| | | The body position is streamlined, during floating, the head is positioned between the arms. | 1.3 | 43.3 |
| | | Breathing is regular and smooth. The pupil does not hold their breath, does not exhale above the water, and inhales with each arm stroke. | 1.9 | 63.3 |
| | | The arm movements are simultaneous, symmetrical, and dynamic. During the pulling phase, the arms are bent, the palms face downward, and the pull ends at shoulder level. | 1.8 | 60.0 |
| | | The leg movements are simultaneous and symmetrical. During the recovery phase, the feet rotate outward, and the knees bend to shoulder-width apart. | 1.2 | 40.0 |

* 25 metres applies to basic swimming training and 50 metres applies to advanced swimming training

DISCUSSION

The research conducted points to two key variables. On the one hand, it is the mastery of basic swimming skills (breathing, floating, orientation underwater), which our study group has mastered 63% which is positive, but given that the pupils should have already mastered it after completing pre-swimming training in kindergartens, we evaluate it as average. The entry level of the children should have been higher than 1.2 points which is 40.5%. The level of mastering the gross form of the selected swimming techniques we evaluate not positively, as this should have been the main content of the swimming training and not the mastering of swimming skills, which took up about 30% of the training time, as the children had not mastered them sufficiently. The best children mastered the gross form of the swimming stroke, followed by the crawl and the greatest deficiencies were observed in the breaststroke. Nevertheless, most children swam the breaststroke test to master the 25m swim. In the future it will be necessary to increase the time allotment for swimming training from 10 hours to a minimum of 254 hours, with a maximum of 2 hours per day. In addition, it will be necessary to master swimming skills already during pre-swimming training and only to improve them during basic swimming training and to devote more time to the technique of swimming techniques.

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