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USE OF THE AQUACITY TEST AS A TOOL FOR ANALYZING THE LEVEL OF BEGINNER SWIMMING STUDENTS

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ABSTRACT

Swimming is a popular, low-impact activity that can be practiced throughout life. Furthermore, it is a sport that can contribute to the development of skills that can prevent drowning by improving aquacity. Even so, its practice requires precautions and constant monitoring. Creating suitable environments for swimming, combined with the choice of effective pedagogical assessment and monitoring strategies, can favor children's learning, promoting both their well-being and safety. The aim of the study was to identify potentialities and limitations in the use of the "aquacity test" as a tool for analyzing the progress of students aged 10 to 13 who are starting swimming lessons. The methodology is a qualitative-quantitative longitudinal study carried out from 2022-25, with swimming students, adolescent students of Elementary School (6th grade) from the public network, from Colégio de Aplicação Fernando Rodrigues da Silveira (CAp UERJ) located in the State of Rio de Janeiro, Brazil. All 6th grade elementary school students at the school investigated who were interested in participating in the safer swimming project with free classes were considered eligible. The results showed that it was possible to compare the students' changes after 12 weeks of swimming lessons using the aquacity test tool. Using records of 10 pedagogical contents and their evolution allowed providing feedback to students, parents and swimming teachers regarding students' worsening, stagnation and improvement. The evaluator's lack of knowledge of the ten test items may limit the tool's effectiveness. Applying the test with trained teachers is a free and useful way to monitor the performance of beginner swimming students. It is noteworthy that 90% of individuals who are beginning to swim, on their first day of lessons, are able to move through the water "doggy style" for 3 meters, even without having ever taken swimming lessons and without mastering other essential skills for swimming and preventing drowning. These results reinforce the need for constant attention in young people who think they know how to swim, but do not have essential aquatic survival skills and can drown in deep water. It can be concluded that the assessment tool called the aquacity test is easy to apply and provides the result of ten contents that can be, in addition to being measured, developed in swimming classes with a focus on preventing drowning.

Keywords: Aquatic skills. Assessment. Water safety. Swimming. Aquacity.

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INTRODUCTION

Swimming provides numerous health benefits, it is a popular, low-impact activity that can be practiced throughout life (SANTIBÁNEZ-GUTIERREZ et al., 2022). It is possible to use the practice of this modality for health, recreational, leisure, therapeutic purposes and for developing survival skills.

Swimming is an important practice for the development of several aspects, as it contributes to improving physical, mental and social capacity, in addition to other skills of those who practice it. This activity encourages the development of coordination of the upper and lower limbs, agility, balance and laterality. Swimming is considered a complete activity, as it presents fewer restrictions and contributes to physical development and body maturation in an integral way (BORGES, 2016).

However, despite the benefits mentioned, children under 15 years of age are responsible for 43% of all drowning deaths worldwide (PATI et al., 2025). Brazil still faces high drowning rates (SOBRASA, 2024), especially among children and adolescents, which makes it urgent to promote practices that effectively teach aquatic skills.

Therefore, swimming lessons need to take on a leading role in prevention. The Global Report on Drowning Prevention points out that the most effective intervention for drowning prevention is swimming and water safety training for school-aged children (PATI et al., 2025).

Aquatic initiation must be carried out with precautions, because, according to Vasconcellos (2019), the teacher needs to interview the student at the first contact, in order to obtain prior information to identify whether he has already swum, for how long, where, if he has any health problems and what his level of aquacity is, that is, how accustomed to the aquatic environment he is.

The swimming pool can be a pleasant, fantastic, relaxing, exciting, invigorating, playful place, however, there are risks when using the aquatic environment if there is no preventive care to avoid accidents such as drowning, bruises and even death (VASCONCELLOS et al., 2024). In fact, learning to swim through a structured program is important for drowning prevention (LUO & MEI, 2025) and aquatic development (PEDEN & FRANKLIN, 2020).

Unlike other environments where young people play alone and explore the environment, in water, for those who are not adapted, carelessness can lead to drowning, even in shallow areas. A child who is still unable to return to a standing position after

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slipping into the pool may end up lying face down and unable to turn over, resulting in water aspiration and, consequently, drowning. Therefore, it is important to identify the water level of all children.

Aquacity, according to Vasconcellos (2019), is related to the degree of adaptation of a person to the aquatic environment and their conditions to sustain themselves, master aquatic breathing, move around the aquatic environment, have body awareness and little chance of drowning. According to the author, it refers to the diagnosis and the way of monitoring and recording the student's learning in beginner swimming.

For Costa et al. (2015), the initial assessment allows the teacher to make the most efficient decision so that the beginner student is considered, given their needs, and allows the prescription of intensities and volumes appropriate to their level of aquacity. Therefore, assessment and data recording of beginning students should be improved in all locations offering swimming lessons.

In 2004, concern about the topic began (VASCONCELLOS & SANTOS, 2004) and, in order to fill this gap, a test for swimming beginners was developed in 2013, called the aquacity test, with the aim not only of diagnosing the student's level of aquatic ability and adaptation to the aquatic environment, but also to monitor their progress, as well as a way to prevent drowning and trauma (VASCONCELLOS, 2013).

Through the initial anamnesis and the aquacity test, it is possible to get to know the student, find out if they have any health problems or limitations, what their goals are and how each individual reacts in the aquatic environment.

Peden et al. (2020) state that this investigation is fundamental, as previous negative experiences in the aquatic environment can generate fear, manifesting as phobic behavior towards water, which affects the ability to learn to swim. According to the authors, these negative aquatic experiences persist and have an impact on all age groups.

In this context, the safer swimming methodology, developed by UERJ researcher Marcelo Barros, aims to make contact with water safer for children aged 10 to 13, by promoting water safety practices. Safer swimming was launched in 2013 (VASCONCELLOS, 2013), prescribed in 2015 (VASCONCELLOS, 2015) and began to be used in 2017 as a test on the first day of class (VASCONCELLOS et al., 2017) or to identify the level of adaptation of beginner swimming students (VASCONCELLOS et al., 2025).

According to Vasconcellos (2019), the methodology of safer swimming classes primarily values student safety and familiarization with the aquatic environment before

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teaching the four styles. The approach highlights actions that prevent drowning, trauma or situations that harm the learning of the four strokes, right from the first months of class, thus promoting an adaptive progression for the students.

Considering the risks and benefits related to swimming and the importance of initiatives that promote the safety of children in water sports, the objective of this study was to identify potentialities and limitations in the use of the “aquacity test” as a tool for analyzing the evolution of students aged 10 to 13 years old who are starting out in swimming lessons.

ADAPTATION TO AN AQUATIC ENVIRONMENT AND THE RISK OF DROWNING

A child who has their first contact with the aquatic environment needs to overcome a series of challenges to develop their autonomy. In the traditional approach to teaching swimming, "knowing how to swim", generally focused on performing formal strokes, students go through a phase called adaptation to the aquatic environment. Within this model, this stage aims to promote familiarity with water, allowing formal swimming to be taught as soon as possible (TUCHER, 2024).

Adaptation to the aquatic environment is a crucial phase for the development of motor skills and building safety in the aquatic environment. According to Langendorfer & Bruya (1995), this process involves the acquisition of fundamental aquatic skills, attitudes and learning that culminate in the mastery of more advanced techniques, such as swimming styles and safety measures in the aquatic environment.

Cabrita et al. (2017) reinforce that adaptation to the aquatic environment implies the development of these basic skills, which, as the individual adapts, enable the acquisition of more complex techniques, such as swimming itself, and the understanding of the importance of safety in the water.

For effective adaptation, the interaction between the individual and the aquatic environment is essential. This interaction depends on how the learner experiences the aquatic environment and their psychological state when facing this new challenge, which is often neglected (BARROS & CANO, 2022).

Emotional state plays an important role, as overcoming fear and insecurity in the aquatic environment is essential for the adaptation process to happen in a positive and effective way.

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Furthermore, before starting to learn swimming techniques, it is essential that the individual is adequately adapted to the aquatic environment. Recognizing possible movements and experiencing the environment in a pleasurable and motivating way are fundamental for the development of more advanced skills, such as swimming styles.

In this sense, Cabrita et al. (2017) point out that the objective of adapting to the aquatic environment is precisely the development and improvement of essential motor skills, such as balance, breathing, propulsion, immersion and jumping.

This period of adaptation can be described as a phase of discovery, an approach to the new environment, as stated by Corazza et al. (2005). During this phase, the learner explores the aquatic environment in search of safety, autonomy and an emotional relationship with the environment. Building this emotional relationship is fundamental, as it allows the individual to feel comfortable and confident, encouraging continued learning and the acquisition of more advanced skills in the future.

Therefore, adaptation to the aquatic environment is not only a physical process, but also a psychological and emotional one, which involves overcoming challenges, developing fundamental motor skills and building a positive relationship with water. This process is essential for the learner to progress in learning swimming and other aquatic activities, always focusing on safety and well-being.

CHILDHOOD DROWNING RISK

Swimming is also associated with the risk of drowning when the ability to swim is overestimated, which is one of the main causes of water accidents. According to Santibánez-Gutierrez et al. (2022), aquatic events are the third largest cause of unintentional injuries and deaths in the world, with approximately 236,000 annual deaths from drowning.

Drowning, although often treated as an "unavoidable accident" or fatality, is in reality an event that can be prevented with appropriate measures. Awareness of risks and preventive measures is essential to reduce fatalities. Drowning is not an accident, it does not happen by chance, it can be prevented, and this is the best form of treatment (SZPILMAN, 2005).

Although the word "accident" is widely used to describe drownings, this phrase suggests that drowning should not be viewed as something completely random or out of control. Many drownings occur due to preventable behaviors or situations.

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This may include a lack of supervision of children in aquatic environments, a lack of knowledge of how to react in risky situations (such as in rip currents or deep pools), among other factors.

Understanding that drowning does not happen by chance reinforces the idea that the occurrence of drowning generally involves predictable factors, such as the behavior of the victim and the people around them. Most drownings can be prevented with education, vigilance and preparation. The risk of drowning is lower among children who have some degree of swimming ability, usually obtained through swimming lessons (MERCADO et al., 2016).

According to Willcox-Pidgeon et al. (2020), swimming lessons should incorporate a wide range of swimming and water safety skills to ensure children have the skills needed to reduce drowning, especially for those considered at increased risk.

Although some students may demonstrate initial aquatic skills when they begin swimming lessons, this does not mean that they are completely prepared. Even with some aquacity, it is still necessary to provide preventive guidance on appropriate behaviors in the aquatic environment, in addition to ensuring attention and monitoring during the learning process, in order to promote safety and effective development (VASCONCELLOS & MACEDO, 2021).

Therefore, according to Vasconcellos (2019), the concern with preventing drowning using swimming lessons as a prevention tool encouraged the creation of a swimming methodology called safer swimming (VASCONCELLOS et al., 2017) which primarily values student safety and their full adaptation to the aquatic environment with an improvement in the level of aquacity measured on the first day of class.

THE “SAFER SWIMMING” METHODOLOGY AND THE AQUACITY TEST

The “safer swimming” methodology was designed as a tool to mitigate the risk of drowning in children by raising awareness about risks and promoting safe swimming practices. The methodology aims to provide students with knowledge about drowning prevention.

Classes take place in 12 meetings, once a week, as part of the safer swimming program, where the first class is to assess the student's level of aquacity, measuring 10 items related to the degree of adaptation to the aquatic environment and the chances of drowning. Each item in the aquacity test is procedural content that the student develops

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over the course of the following classes. Parallel to the 10 procedural contents included in the aquacity test, conceptual and procedural contents are inserted into the classes (VASCONCELLOS & VIANA, 2024).

The safer swimming methodology advocates essential knowledge, skills and attitudes to avoid drowning, which should be taught prioritised over swimming itself, in addition to contributing to the development and learning of existing swimming skills. The educational proposal of the methodology is established through the progressive construction of a framework of knowledge on three dimensions: (attitudes, concepts and procedures) that provide a safer experience in contact with the aquatic environment (VASCONCELLOS et al., 2025).

There is no hierarchical relationship between these three dimensions, since together they serve as a basis for students' development and gaps in any of them can compromise the ability to recognize, interpret and overcome risk factors.

CONCEPTUAL CONTENT

In this content, concepts and theories are learned that can be applied in practice. The meaning of signage, flags placed on beaches and words such as “shallow” and “deep”, “safe” and “dangerous” is understood. In addition to understanding their meanings, it is necessary to understand how to apply them in the aquatic environment. In this way, students are empowered to make decisions about the type of behavior and care to be adopted in this context.

It is important for the teaching-learning process to use materials that students will find in the aquatic environment. Through signs and flags, for example, it is possible to teach such concepts and meanings, facilitating learning and the association of classes with everyday situations. According to Vasconcellos (2021), the teacher can work on the meaning of the colors of the flags placed on the beaches, which indicate the current level of danger at sea, allowing the student to learn to discern the risk of drowning. The green flag indicates a suitable place for bathing; yellow, risk of drowning; red, high risk of drowning; and the black one, an area unprotected by lifeguards. Signs are also covered in classes, as they are essential to ensure the safety and guidance of bathers and users.

Signs are essential to ensuring the safety of users in aquatic environments, helping to inform about the availability of supervision and the need for caution. Therefore, it is clear how important it is to provide guidance to students so that they look for some type of

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signage if they are in an unfamiliar environment, in order to obtain information about the environment and thus be able to determine their future actions.

The stage of learning the basic concepts is fundamental and precedes other choices that aim to consolidate the student's apprehension of this new knowledge. Vasconcellos (2021) also highlights the importance of clearly defining the concept to be learned to prevent drowning, such as what to know and what to do in certain situations. From this, this concept can guide the definition of objectives, the choice of content and methodology, aiming to consolidate it as knowledge to be acquired by the student.

ATTITUDINAL CONTENT

As attitudinal content, values such as empathy and respect, posture during classes and external environments, attitudes and rules for using the aquatic environment and respect for the teacher are taught, so that, at the end of the classes, they can adopt habits to prevent drowning and/or accidents and, finally, internalize something that will be carried with them for the rest of their lives. It is expected that the student will be able to discern and have an attitude of humility to recognize, for example, that even though he knows how to swim in a pool, he does not have the ability to swim across a river or enter rough seas. (VASCONCELLOS, 2021).

Still according to Vasconcellos (2021), at the end of each formative assessment, the teacher needs to check whether there was an attitudinal change, whether the student heard about these norms and behaviors in the aquatic environment and put this into practice, that is, whether there was a change in behavior.

For Vasconcellos & Macedo (2021), swimming students need to learn, in addition to the procedural content included in the aquacity test, two other contents: a) attitudinal content, which the actions are focused on teaching the student, so that he or she can be able to know how to respect and/or know how to live with (rules of use, teacher's guidelines, their limits, norms, postures, prevention habits and attitudes); b) conceptual content, which are the actions focused on teaching the student, so that he/she can be able to interpret and/or know about (signs, symbols, warnings, meanings, risks, danger and concepts).

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PROCEDURAL CONTENT

In this type of content, the focus is on knowing how to execute. Throughout the classes, important movements are taught so that each student is able to develop aquatic adaptation skills and learn to swim. To this end, skills based on the aquacity test are developed throughout the classes, in addition to helping the student adapt to the aquatic environment, related to breathing control, buoyancy, body awareness, propulsion, changes between lying down and palming.

The gold standard method for assessing water survival skills is to test an individual's performance in the water (Mercado et al., 2016). To measure these skills, the aquacity test has been used, which presents the procedural content guidelines that underpin the skills to be mastered by the learner. The procedural contents are applied according to the aquacity test items. Classes are planned so that each one focuses on one of the procedures listed as essential for good interaction with the aquatic environment.

MATERIAL AND METHODS

This is a longitudinal study (VASCONCELLOS et al., 2025), qualitative and quantitative, carried out from 2022 to 2025, with swimming students, children and adolescents from Elementary School (6th grade) in the public network, from Colégio de Aplicação Fernando Rodrigues da Silveira (CAp-UERJ), located in the State of Rio de Janeiro, Brazil.

All 6th grade elementary school students at the school investigated who were interested in participating in the safer swimming project classes were considered eligible. 60 students in six classes have already been evaluated. Swimming lessons took place outside of school hours, as a prevention strategy adopted in extracurricular programs (MERCADO et al. 2016)

To assess the students' level of aquacity, the aquacity test (VASCONCELLOS, 2019a) was used, which is a pedagogical tool for procedural assessment (VASCONCELLOS & BLANT, 2024), used on the first day of swimming class (VASCONCELLOS, 2019b), and contains 10 items worth 1 point each. The more correct answers the student gets, the better their level of aquacity. The student is classified as very weak aquacity level category if he/she scores 0-2 points; weak water level is 3-4 points; average water level is 5-6 points; good water level is 7-8 points and excellent water level is 9-10 points.

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Initial assessments are also indicated by other authors (BADRUZAMAN et al., 2019), who state that swimming teachers, before starting to teach swimming to beginners, must first conduct tests to measure all basic skills, such as: diving, floating and gliding, so that the level of aquatic adaptation is known more clearly, as a potential that can support the achievement of swimming learning results and, above all, so that the learning program can be precisely determined according to the skill level that the new student is at.

The decision to teach swimming lessons to a group of 10 students using the safer group model (VASCONCELLOS & MASSAUD, 2022) was based on the analysis of three factors: 1. Students (height, aquacity and medical clearance); 2. Teachers (assistance in the water, prevention course in the aquatic area and experience); and 3. Pool environment (shallow depth, handrail on the edge, lifeguards and teaching materials).

The classes followed the standardization of the safer swimming class, which lasts three months, totaling 12 weeks, with classes once a week, with a class time of 1 hour. The size of the University pool used in this study was 18 meters long by 8 meters wide, with a shallow end 1.20 meters deep and a deep end 1.80 meters, with handrails for students to hold on to along the entire side of the pool and with pool lifeguards monitoring classes. Classes were held in the shallow end, except at certain times when the student was taken to the deep end to carry out educational activities.

All students had medical clearance to swim and were tall enough to have at least their shoulders out of the water. The classes had 1 coordinator and 5 teachers, all of whom taught classes inside the pool in every class. The team of teachers working on the safer swimming methodology receives theoretical and practical training on drowning prevention and on the model for applying the sequence of classes. Investment should be made in improving the qualities of swimming teachers, including empathy, to manage and prevent negative aquatic experiences during swimming teaching (PEDEN & FRANKLIN, 2020).

Before entering the pool to take the aquacity test, students are introduced to the aquatic space to experience it safely. To assess students individually, the teacher uses a clipboard, a pencil, a stopwatch and optionally a camera or cell phone to photograph each item. The evaluator makes notes according to the result in a dichotomous way by marking yes or no in relation to each of the ten items of the aquacity test.

The classes were very heterogeneous in terms of having taken swimming lessons before. Some students started classes in the project with swimming skills already developed, as they had previously taken swimming classes at another establishment.

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There were also students with Down syndrome and autistic students in the classes who were also assessed according to their level of aquacity. The latter two must have constant attention and supervision to avoid drowning (XIE et al., 2025).

The aquacity test is carried out twice in a period of 3 months, at the same time, place and using the same procedures, always with the same evaluator in both tests. The evaluator's lack of knowledge of the ten test items may limit the effective use of the tool. Therefore, familiarization with the test is necessary before applying it to students.

The initial assessment is carried out on the first day of swimming lessons in a welcoming manner and not as something traumatic. The student and his/her guardian are given explanations that the objective of this diagnostic evaluation using the aquacity test is for self-competition (the student is compared with himself/herself) and not hetero-competition (the student is compared with other students who have already swum or who are taking the test on the same day). At the end of the 2nd assessment, the student and guardian receive a certificate showing the before and after comparison of each test item.

The aim of the test is to take a snapshot of the student's current reality, something transversal, where the day they started swimming is recorded for later comparison. This assessment is carried out in a fun, relaxed and welcoming way. When realizing that the student was unable to complete some of the items proposed in the test, the teacher did not embarrass the student, on the contrary, he encouraged him by mentioning how he would learn this and other items over the course of the 12 weeks. After twelve weeks, a new formative assessment is carried out to compare the student's progress (Vasconcellos, 2021).

THE AQUACITY TEST

The aquacity test, a tool developed to assess students' adaptation to the aquatic environment and progress, can be crucial in monitoring and improving the performance of beginner swimmers. The use of the test, especially in swimming classes for children and adolescents, can significantly contribute to improving learning monitoring, providing more effective feedback for both students and teachers. However, despite its potential, the application of assessment tools is still not widely used, especially in the school context.

According to Santibánez-Gutiérrez et al. (2022), the safety of children in aquatic environments is crucial and depends on high awareness. However, according to the author, there is a lack of qualitative data on the swimming skills of children and

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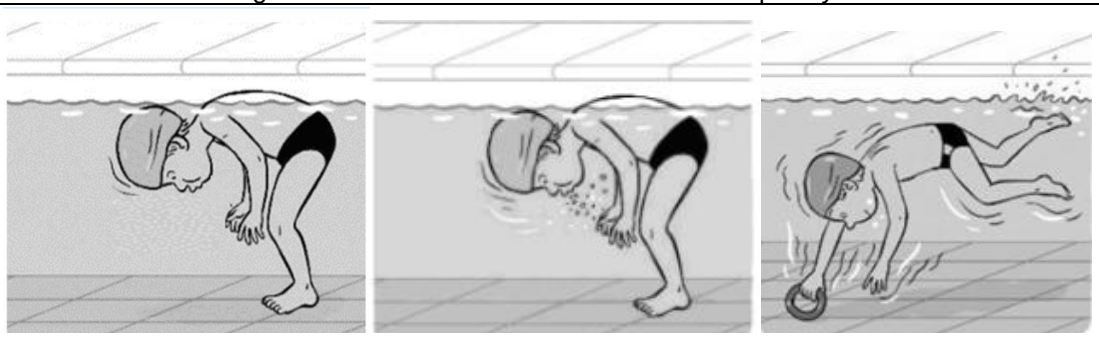
adolescents, and current assessment methodologies are limited, often not considering fundamental skills. Aiming to improve evaluation methodologies, the aquacity test was created.

The aquacity test is an assessment tool that seeks to identify affinity with the aquatic environment. According to Vasconcellos (2019), this test has been under construction since 2004 and has undergone several updates. It currently consists of 10 items, each worth one point when performed correctly, and which are preferably assessed in the first swimming lesson.

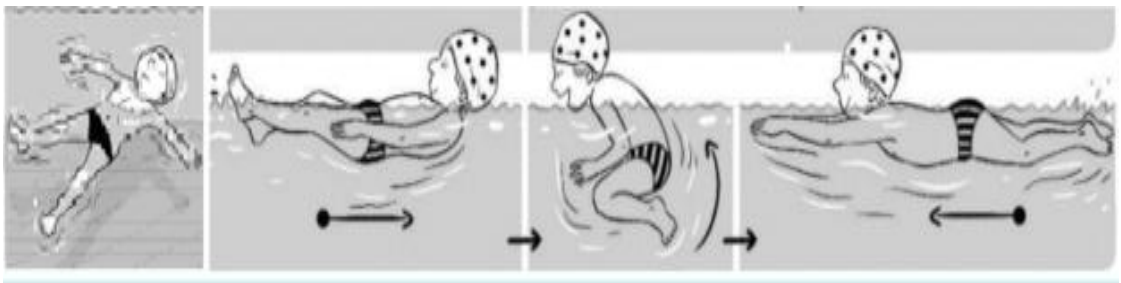
Vasconcellos (2022) states that the use of the aquacity test, on the first day of class, can help identify students who are not adapted to the aquatic environment and direct classes to improve what was identified as a lack of aquatic skills so that they progressively feel more confident and improve their aquacity. According to the author, the test became part of the safer swimming methodology, primarily valuing student safety and familiarization with the aquatic environment before teaching the four swimming styles.

Therefore, the current approach to the test assesses skills and actions that prevent drowning, trauma or situations that impair learning the four strokes. The 10 test items assess the student's degree of adaptation to the aquatic environment, related to mastery of breathing, buoyancy, propulsion, changes between lying down and palming.

Figure 1: Illustration of the ten items of the aquacity test



Item 1 Item 2 Item 3



Item 4

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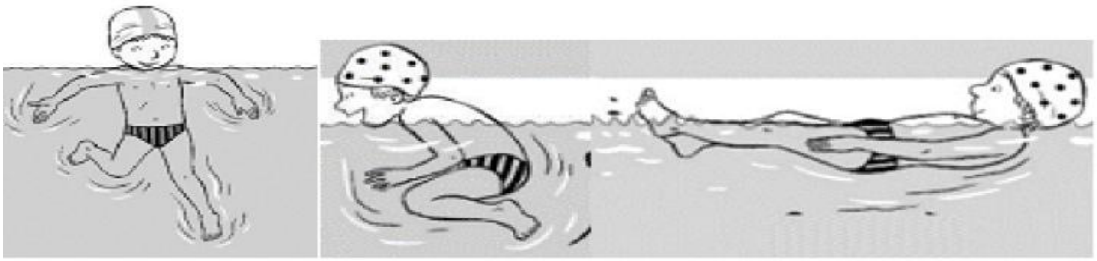
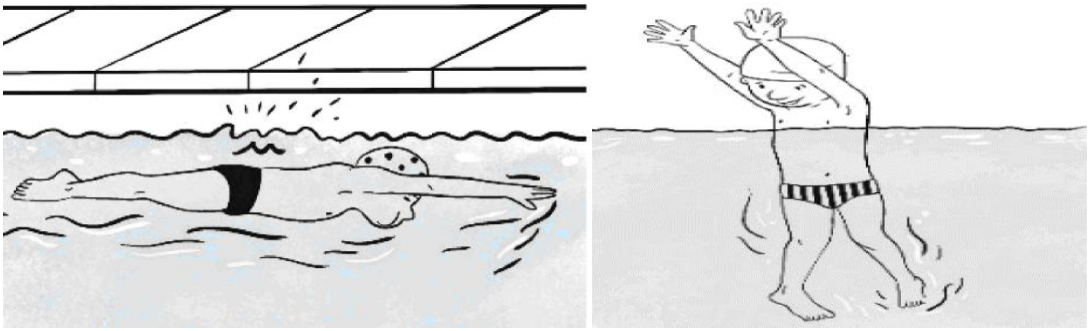


Item 5 Item 6

Item 7 Item 8



Item 9 Item 10

Figure 1 shows the aquacity test in the study by Vasconcellos & Viana (2024) and was adapted from the study by Morgado et al., 2020.

Each item in the aquacity test is content covered in safe swimming classes. In the 1st class, item 1 is taught regarding the static apnea procedure, which consists of performing (static apnea) breathing blocks underwater for 10 seconds, and must be repeated 3 times.

In the 2nd class, the content is based on the respiratory control procedure (item 2), the objective of which is to submerge the head in the water, without fear, and release the air 5 times, in addition to repeating the content worked on in the previous class (item 1 of the test).

In the 3rd class, item 3 is taught, which consists of sinking and picking up an object at the bottom without using glasses, at a depth of 1 meter, and is worked on in the 3rd class, in addition to repeating the content worked on in the previous classes (items 1 and 2 of the test).

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In the 4th class, item 4 of the procedural content of the aquacity test is taught, which is “changing from the floating position in dorsal decubitus (belly up) to ventral (belly down) twice”, in addition to repeating the content worked on in the previous classes (items 1, 2 and 3 of the test).

In the 5th class, item 5 of the procedural content of the aquacity test is taught, which consists of “changing from the vertical floating position with alternating leg kicks (Eggbeater) to horizontal floating in the supine position without placing the foot on the ground, twice”, in addition to repeating the content worked on in the previous classes (items 1, 2, 3 and 4 of the test).

In the 6th class, item 6 of the procedural content of the aquacity test is worked on in class, which consists of floating in a supine position without the aid of materials for 30 seconds, in addition to the previous items (1, 2, 3, 4 and 5).

In the 7th class, item 7 of the procedural content of the aquacity test is taught, which consists of “sustaining oneself floating vertically with alternating kicking (eggbeater), using palming, for 30 seconds”, in addition to the repetition of the content worked on in the previous classes (items 1, 2, 3, 4, 5 and 6).

In the 8th class, item 8 of the procedural content of the aquacity test is taught, which consists of using the four limbs as propulsive segments on the surface to the edge, at a distance of 3 meters. The movement can be equivalent to the “doggy style swim”, as it is popularly known. In addition to the repetition of the content covered in previous classes (items 1, 2, 3, 4, 5, 6 and 7 of the test).

In the 9th class, the dynamic apnea procedure is taught, which consists of moving 2 meters underwater while holding your breath, and is item 9 of the procedural content of the aquacity test. The procedural contents of previous classes are also covered (items 1, 2, 3, 4, 5, 6, 7 and 8 of the test).

Finally, in the 10th class, item 10 of the procedural content of the aquacity test is taught, in which the subject must squat, sink standing up and jump with their hands out of the water, twice, for 2 meters. In addition to the repetition of the content covered in previous classes (items 1, 2, 3, 4, 5, 6, 7, 8 and 9 of the test).

RESULTS

A Table 1 shows a percentage description of correct answers for each test item at two points in time (1st day of class and after 12 weeks). The skills of respiratory control,

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changing from dorsal to ventral decubitus and vertical support using palm support were the items with the lowest percentage of scores in assessment 1, with 55%. In assessment 2, these same skills had a score percentage of 100%, 95% and 90%, respectively, with a significant increase in correct answers by students.

Below are descriptive data based on the results of the skills mentioned, calculating the percentage of points in the initial assessment and in the final assessment. The results of the skill tests from this study are displayed in Table 1 below:

Can you perform the activity to be tested?	Reviews	
	1st	2nd
	% hits	% hits
1. Perform (static apnea) breath holds underwater - 10 seconds - repeat 3 times	90%	95%
2. Dip your head into the water without fear, release the air (breathing control) - 5 times	55%	100%
3. Sink and pick up an object from the bottom without using glasses - 1 object at a depth of 1 meter	60%	100%
4. Change from supine to prone position - 2 times	55%	95%
5. Change from vertical to horizontal position without placing foot on the floor - 2 times	65%	95%
6. Floating supine without the aid of materials - 30 seconds	75%	100%
7. Hold yourself upright using palms - 30 seconds	55%	90%
8. Use the four limbs as propulsive segments on the surface to the edge “doggy style” - 3 meters	90%	90%
9. Perform underwater movement (dynamic apnea) - 2 meters	85%	90%
10. Squat, sink standing up and jump with hands out of the water - 2 times - 2 meters	70%	100%
When the student is able to complete the activity alone, the answer yes will be worth one (1) point.		

Table 2 shows the level of aquacity of students from all classes together that were assessed using the swimming + safe methodology according to the aquacity categorization very weak, weak, average, good and excellent. The result of the aquacity level is the sum of each yes (1 point) obtained in the 10 activities tested.

Table 2 shows the results of the comparison of the prevalence of correct answers in the 1st and 2nd assessment of the aquacity test. It was noted that the prevalence of students who scored from 0 to 2 points, considered to have “very weak aquacity”, was 0%, while in the 2nd assessment there remained no one in this group.

Regarding the levels of “weak aquacity” and “medium aquacity”, between 3-4 points and 5-6 points, respectively, it was found that 14.3% were in this group in the 1st assessment and that in the 2nd assessment no one else belonged to this group.

Regarding the level of “good aquacity”, between 7 and 8 points, it was found that ¼ of the students were in this group in the 1st assessment, while in the 2nd assessment,

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students who had weak and medium aquacity became part of it, with a prevalence of 7.2%; Finally, a significant change was observed in the “excellent aquacity” group, which had 100% improvement in this group and reached the end of the studies with 92.8% of students with the best level of aquacity.

Aquacity level	Comparison of the two assessments	
	1st evaluation	2nd evaluation
0-2 points - Very Weak Aquacity	0%	0%
3-4 points - Weak Aquacity	14,3%	0%
5-6 points - Aquacity Average	14,3%	0%
7-8 points - Good Aquacity	25%	7,2%
9-10 points - Aquacity Excellent	46,4%	92,8%

These data show that the aquacity test tool was useful for comparing and leveling the degree of adaptation to the liquid environment of the student, when starting swimming (1st day of class) and after 12 weeks of class (last day of class). It is possible to state, based on the test results, that the tool allows measuring the student's performance in terms of deterioration, stagnation or improvement and, above all, leveling the student.

The “aquacity test” tool allows each student to be monitored and can also be used to level beginner classes in terms of their categorization and, subsequently, to standardize classes with specific content linked to the needs identified in each student.

For many years, swimming has been cited as a sport that is good for students. However, there was no easy-to-apply tool that could provide feedback to parents, teachers and students themselves regarding their level of performance at the start of classes. Many considerations about the results of swimming lessons were focused on knowing how to cross the pool, “knowing how to swim”. My son already “knows how to swim”. The proposal of the aquacity test tool goes far beyond the popular “knowing how to swim”. The premise is the investigation of 10 items that make up adaptation to the liquid environment focused on preventing drowning. Each item was researched for decades to identify what could, together, be diagnostic and then worked on in swimming lessons so that the beginner student had an excellent degree of aquacity and thus avoided the risk of drowning.

A visual example of the aquacity test tool that was presented to the student and his guardian is exemplified in figures 2 and 3. In figure 2, the student performing the 1st assessment and had no visual adaptation, was unable to open her eyes underwater and hold her breath for 10 seconds. In figure 3, the student was already more “at ease in the

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water", she was able to stay underwater with her eyes open and holding her breath for 10 seconds, according to the criterion of item 1 of the aquacity test.

Figure 2

Figure 3

Figures 2 and 3 compare the 1st test with the reassessment in item 1 of the aquacity test (holding breathing underwater for 10 seconds, 3 repetitions).

DISCUSSION

From the analysis of the data obtained, it was observed that the application of the test made it possible to clearly identify the students' level of aquacity, as well as to measure their evolution after 12 weeks of classes.

The data demonstrated significant improvement in students' aquatic skills between the first and second assessments. For example, the respiratory control skill was particularly beneficial when practicing the protocol applied during classes, showing an improvement between the first and second assessments. In other words, the skill, which initially had 55% correct answers, reached 100% after the class cycle, resulting in a leveling of students and the class's full use of this skill. This result reflects the effectiveness of the pedagogical proposal and confirms the statement by Mercado et al. (2016), that continuous practice is essential for the consolidation of aquatic survival skills.

Other skills that showed significant growth were: changing from dorsal to ventral decubitus (from 55% to 95%) and vertical support with palming (from 55% to 90%). Such skills are considered fundamental by Vasconcellos (2019) in the process of adapting to the liquid environment and preventing drowning. The students' progress in these items

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highlights the success of the methodological proposal based on the aquacity test and, above all, the tool's potential for comparison.

Analysis of the students' overall classification also shows a direct impact of the intervention. Initially, 14.2% had weak or medium aquacity; After the cycle of classes, 92.8% of the students began to show excellent aquacity. This data is especially relevant from a prevention point of view, considering that, according to SOBRASA (2024), most cases of drowning occur with people who do not master basic water safety skills.

It is important to highlight item 8 of the test, referring to "using the four limbs as propulsive segments on the surface to the edge "doggy style" for 3 meters". There was no percentage increase in this item, remaining at 90% correct. However, it is noteworthy that individuals who arrived on their first day of swimming lessons (beginner swimmers) were able to move around in the water (rudimentary crawl swimming), even without mastering other essential skills for swimming and preventing drowning. These results reinforce the importance of paying constant attention to young people who think they know how to swim, but do not have essential aquatic survival skills.

The acquisition of mastery of aquatic skills is a dynamic process that depends on the interaction between the individual, the aquatic environment and the individual's actions in that environment. While swimming ability is a key component to being categorized as excellent aquaskill, it is not the only one. Therefore, it is important to avoid uncritical belief in swimming ability, as this can lead to dangerous situations. Overestimating one's ability is a common cause of fatal accidents on the water. Therefore, the objective of the swimming teacher's pedagogical intervention should not be limited to teaching swimming techniques (strokes). Instead, it should raise awareness of the inadequacy of focusing on strokes in the context of safety in and on the water. The process of learning to swim only makes pedagogical sense if it leads to the acquisition of mastery of water skills and its subsequent improvement with the intention of preventing drowning (Rejman et al., 2024).

Therefore, it is understood that simply mastering some swimming skills is not enough for survival and aquatic autonomy, as stated by Tucher (2024). Initially, it is important to develop and improve these basic aquacity items so that, later, specific swimming strokes can be learned more efficiently with autonomy and safety, as highlighted by Cabrita et al. (2017).

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Still, it is necessary to improve the application of the aquacity test. Although the procedural contents are well defined, there are some practical details that could be better developed.

Regarding the logistics of applying the test, it was observed that the performance of two trained teachers was satisfactory. Even so, it is suggested that there be at least one evaluator in the pool. In this way, an evaluator outside the pool provides the command, observes the student's execution, counts the time and makes necessary notes, while the evaluator inside the pool demonstrates the execution for the students, also helps to observe the execution and can take photographs when he deems it appropriate.

In addition to time control and careful observation, the presence of two evaluators allows for a more precise and safe analysis of students' movements. This finding reinforces the need for adequate team sizing in practical assessments, as advocated by Vasconcellos and Macedo (2021).

It was also identified that applying the test to large groups simultaneously requires assistants to avoid compromising the quality of the analysis and the understanding of the commands. This highlights a practical limitation of the test, requiring adaptations when applied in school contexts with few teachers or large classes.

Furthermore, research suggests that student performance may be influenced by attitudinal and conceptual factors, not just procedural ones. In other words, insecurity, fear or lack of understanding of the instructions can also interfere with the results. This reinforces the importance of integrating the three pedagogical pillars of the project (conceptual, attitudinal and procedural), as proposed by Vasconcellos (2021).

These suggestions aim to improve the application of the test for a more reliable assessment. In summary, the application of the aquacity test proved to be an effective, accessible and free tool to assess the progress of beginner swimming students, allowing objective diagnoses and promoting aquatic safety.

The effectiveness of the test depends on the presence of qualified professionals and the appropriate structure for its application. Future studies could investigate, for example, the impact of the test in different age groups and school contexts.

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FINAL CONSIDERATIONS

Drowning among young people is a major concern. The results analyzed here seem promising, but future analyses can enrich the interpretation and even propose strategies for improving and adapting the aquacity test tool.

This work demonstrated the viability of a quick and free initiative, with the potential to measure the level of adaptation to the liquid environment on the first day of swimming lessons. It is expected that initial diagnosis and teaching during classes can contribute to reducing deaths from drowning in childhood, through teaching aquatic skills, which were defined as prolonged floating in the supine position; self-propelled; autonomic changes in direction; conscious respiratory exchanges; position changes; mastery of the technique of getting out of the pool and experience with adverse situations.

Therefore, it is notable that the data found in the test, when added to the awareness raised by professionals among parents and family members about the risks involved in the relationship between the aquatic environment and children, can contribute to prevention. The use of procedural testing, as a form of preventive diagnosis, allows us to identify the level of aquacity on the first day of class and also the progress of each student, when applied at the end of classes. Therefore, it makes the student's progress in swimming something measurable, tangible and objective.

The aquacity test tool has the potential to identify each student's level regarding the degree of adaptation for later teaching of content that the student does not perform correctly, in order to prevent drowning.

Assessment and data recording of beginning students should be improved in all locations offering swimming lessons.

Finally, it is possible to state that the aquacity test can be considered an efficient assessment tool, and its development and application throughout the classes was crucial for the prevention of drownings, adaptation and evolution in swimming, as it is considered a free assessment method, simple to apply and with easily overcome limitations.

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