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Physical fitness of water lifeguards and the structure of a classical rescue operation

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Abstract

Background and Study Aim. Water-based leisure activities continue to grow in popularity, increasing the demand for effective water rescue services and placing high physical and technical requirements on lifeguards. Although existing systems of lifeguard training and certification widely use standardized tests of general physical fitness and swimming performance, previous research indicates that such assessments may not adequately reflect the real demands of rescue operations. Water rescue ac-tions are complex motor tasks performed under conditions of fatigue, time pressure, and environmental resistance, requiring the integrated application of strength, endurance, speed, coordination, and technical skills. However, discrep-ancies persist between formal fitness evaluation criteria and actual professional requirements. Therefore, the aim of this study was to assess the relationship between general physical fitness indicators and performance in a task-specific rescue test simulating a classical water rescue operation without specialized equipment. The study sought to determine whether commonly used fitness tests adequately predict lifeguards' operational readiness.

Material and methods. The study involved 100 certified and physically active lifeguards (54 females and 46 males) with professional experi-ence in water rescue. Participants voluntarily took part in a pedagogical experiment approved by an ethics committee. Anthropometric measurements were collected, including body height, body mass, and body mass index (BMI). General physical fitness was assessed using a 400 m freestyle swimming test and five selected EUROFIT tests evaluating flexi-bility, explosive power, muscular endurance, functional strength, and agility. In addition, an original comprehensive test was developed to simulate a classical rescue action, combining land-based exercises, swimming to a victim, victim con-trol and towing, evacuation to shore, and final physical effort. Descriptive statistics and correlation analyses were ap-plied to examine relationships between test outcomes.

Results. The majority of participants achieved satisfactory results in general physical fitness tests and the 400 m swimming test. However, average completion times in the original rescue test exceeded the accepted performance norm for both fe-males and males. No strong correspondence was observed between passing standard fitness tests and successful per-formance in the task-specific rescue test. Positive relationships were identified between the shuttle run, the 400 m swimming test, and the original test ($p < 0.05$). Sex-related differences were observed, with females achieving better results in flexibility and agility, while males demonstrated higher absolute strength and faster average swimming times.

Conclusions. The findings indicate that general physical fitness tests alone are insufficient to assess lifeguards' readiness for real res-cue operations. Task-specific assessments that integrate multiple motor abilities provide a more valid evaluation of operational performance. The implementation of comprehensive rescue-oriented fitness tests may improve training effectiveness, certification quality, and long-term safety outcomes. Future research should focus on developing age- and sex-adjusted normative values and validating such tests in open water conditions.

Keywords: fitness, motor skills, rescue operation, rescue.

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Анотація

Фізична підготовленість рятувальників на воді та структура класичної рятувальної операції

Передумови та мета дослідження. Зростання популярності дозвілля у водному середовищі зумовлює підвищені вимоги до ефективності діяльності служб водного рятування та рівня професійної підготовленості рятувальників. Незважаючи на широке застосу-вання у системах підготовки та сертифікації стандартизованих тестів загальної фізичної підготовленості та плавальної працездатності, результати попередніх досліджень свідчать про обмежену відповідність таких оці-нювальних процедур реальним умовам проведення рятувальних операцій. Рятувальні дії на воді є складними руховими актами, що виконуються в умовах втоми, дефіциту часу та змінних факторів навколишнього середо-вища і потребують інтегрованого прояву сили, витривалості, швидкості, координації та спеціальних технічних умінь. У зв'язку з цим метою дослідження стало з'ясування взаємозв'язку між показниками загальної фізичної підготовленості та результативністю виконання спеціального комплексного тесту, що моделює класичну ряту-вальну операцію на воді без використання спеціального спорядження.

Матеріал і методи. У дослідженні взяли участь 100 сертифікованих рятувальників на воді (54 жінки та 46 чоловіків), які мали досвід професійної діяльності та добровільно погодилися на участь у педагогічному експерименті. Проведено антро-пометричні вимірювання (довжина та маса тіла, індекс маси тіла). Загальну фізичну підготовленість оцінювали за результатами плавання вільним стилем на дистанції 400 м та п'яти тестів батареї EUROFIT, спрямованих на визначення гнучкості, вибухової сили, м'язової витривалості, функціональної сили та спритності. Додатково застосовано авторський комплексний тест, який імітує класичну рятувальну дію та включає поєднання вправ на суші, підплив до потерпілого, контроль і транспортування потерпілого у воді, евакуацію на берег і заверша-льне фізичне навантаження. Для аналізу результатів використано методи описової статистики та кореляційний аналіз.

Результати. Більшість учасників продемонстрували задовільні показники у тестах загальної фізичної підготовленості та плаванні на 400 м. Водночас середній час виконання авторського комплексного тесту перевищував установлені нормативні значення як у жінок, так і у чоловіків. Не виявлено тісного взаємозв'язку між успішним виконанням стандартних тестів фізичної підготовленості та ефективністю виконання комплексної рятувальної дії. Встанов-лено позитивні кореляції між результатами човникового бігу, плавання на 400 м та авторського тесту ($p < 0,05$). Зафіксовано статеві відмінності, зокрема вищі показники гнучкості та спритності у жінок і кращі результати за показниками абсолютної сили та швидкості плавання у чоловіків.

Висновки. Отримані результати свідчать, що використання лише тестів загальної фізичної підготовленості є недостатнім для об'єктивної оцінки готовності рятувальників до виконання реальних рятувальних операцій. Комплексні спеціалізовані тести, що інтегрують різні рухові якості та технічні навички, забезпечують більш валідну оцінку професійної готовності. Доцільним є впровадження таких тестів у систему підготовки та періодичної атестації рятувальників. Подальші дослідження мають бути спрямовані на розробку вікових і статевих нормативів та ап-робацію тестів в умовах відкритих водойм.

Ключові слова: фізична підготовленість, рухові якості, рятувальна операція, рятування.

Introduction

Water recreation safety, which is becoming an increasingly popular form of leisure activity worldwide, constitutes a critical responsibility of professional water rescue services. Lifeguards are not only responsible for immediate rescue interventions but also play a key preventive and educational role, promoting safe behavior during swimming, bathing, and water sports. Their duties include continuous monitoring of aquatic environments, prevention of hazardous situations within their designated areas, rescue of drowning victims, and the provision of qualified first aid in emergency conditions. Effective rescue operations, particularly when performed without specialized equipment, require a high level of technical competence, motor coordination, and physical preparedness on the part of the rescuer.

Recent epidemiological studies confirm that water-related injuries and drowning remain a significant public health problem worldwide, particularly in open water environments where environmental and situational risk factors are difficult to control [1, 2]. Large-scale retrospective and population-based analyses demonstrate that demographic characteristics, environmental conditions, and insufficient water safety competencies substantially increase the likelihood of fatal incidents, emphasizing the critical role of well-prepared rescue services in drowning prevention and emergency response [2, 3].

Consequently, individuals undertaking life-

guard duties are expected to demonstrate exemplary physical fitness and maintain constant readiness to perform rescue actions under demanding conditions. However, analyses of professional lifeguard activity, as well as existing systems of training, retraining, and certification, reveal a number of contradictions between the standardized tests used to assess physical fitness and the actual requirements imposed by real rescue operations. In many cases, fitness assessments focus on isolated motor abilities, while professional rescue activity requires the integrated execution of complex movement patterns under fatigue and psychological stress.

Leisure at water basins continues to gain popularity, increasing both exposure to aquatic risks and the operational demands placed on rescue services. A person assuming the role of a lifeguard should, through their attitude toward personal physical fitness, set a standard of readiness and professionalism, demonstrating the ability to perform rescue tasks effectively and safely [4, 5]. A typical rescue action carried out without additional equipment requires not only swimming proficiency but also high levels of overall physical fitness, strength, endurance, speed, and technical preparation [6, 7].

Physical training represents an integral component of human activity across multiple domains, including household tasks, occupational work, military service, sport, and recreation. The outcome of systematic physical training is physical fitness, understood as a multidimensional construct enabling effective execution of movement tasks in diverse life situations. According to previous research, physical fitness is defined as a set of skills and abilities that ensure efficient motor performance and functional effectiveness [5]. Importantly, physical fitness is not a fixed attribute; rather, it develops dynamically across the lifespan and requires continuous, proportionate improvement adapted to individual and professional demands [4, 8]. Researchers emphasize the necessity of balanced development of motor abilities, as disproportionate training may limit functional performance and reduce occupational effectiveness [9, 10].

Swimming effectiveness, which constitutes a fundamental element of lifeguards' professional activity, depends largely on the level of muscular strength and its coordination with other motor abilities. Strength development is therefore a key determinant of rescue performance, particularly during victim towing, resistance swimming, and controlled handling of an aggressive or unconscious drowning person. At the same time, strength should be developed proportionally alongside endurance, agility, and speed to ensure optimal rescue efficiency [6, 8, 11]. Moreover, technical swimming skills-such as approaching a drowning person, maintaining visual control, and hauling the victim using various rescue techniques-must be systematically integrated into physical training programs.

Endurance capacity in lifeguards is closely associated with the body's ability to maximize oxygen uptake (VO_2max), which plays a decisive role during prolonged or repeated rescue actions. High levels of aerobic endurance enable lifeguards to sustain performance under conditions of physical exhaustion, environmental resistance, and time pressure. Therefore, the development and monitoring of general endurance through land-based exercises and comprehensive swimming training throughout the annual training cycle are essential. Such an approach supports the enhancement of special endurance required during professional water rescue activities and contributes to improved safety outcomes for both rescuers and victims [12].

Despite extensive recognition of these requirements, contemporary lifeguard training systems often lack assessment tools that accurately reflect the integrated physiological, biomechanical, and technical demands of real rescue scenarios. This methodological gap underscores the need for comprehensive, task-specific fitness evaluations that simulate classical rescue operations and provide a valid measure of special physical fitness in lifeguards.

Purpose of the study. The research presents a new method to solve important scientific and practical issue, which is preparation and approving specialist comprehensive test of physical fitness for lifeguards examining these elements which require maximum development of motor skills including typical rescue action without additional equipment. The research carried out on specialist literature, contents of the Internet and documents devoted to the control of the physical fitness of lifeguards and modeling of the rescue actions as well as the analysis of modern lifeguards training, re-qualification and certification systems allowed to identify a number of discrepancies between training recommendations and tests used to control lifeguards' physical fitness-one one side, and the specifics of the professional activities of lifeguards in real life, on the other side. Therefore, it was decided to conduct a research aiming at preparing a comprehensive test controlling special physical fitness and simulating carrying out a rescue action in conditions as close to real life as possible.

Materials and Methods

Research materials

1. Participants of the research have been cho-

sen voluntarily on a random base by managers of local Volunteer Water Rescue Service (the WOPR) units, who had send an offer of voluntary participation in the planned pedagogical experiment, which is important to improve the quality of water rescue service. Understanding the importance of the results of the research to improve the lifeguards' training system (and as a result improve safety of people while water leisure) all participants voluntarily agreed on paper to participate in the experiment. As a result the participants of the experimental research included 54 woman and 46 man, all physically active, qualified as WOPR lifeguards and with many years (up to 33) of water rescue experience, which experience allows to predict potential threats and effectively use water rescue equipment. The future participants of the experiment had been informed about the course of the planned research and potential negative consequences such as extreme fatigue etc. Because the participation in the original test leads to extreme fatigue, which posed some threat to health of the oldest participants of the experiment, all participants had been granted a doctor's approval to participate in the experiment. All participants voluntarily signed written consent to participate in the experiment on the protocol describing its course. The research was approved by the ethical commission of the Gdansk University of Physical Education and it was carried out in line with moral and ethical standards and in accordance with the Declaration of Helsinki in Ethical Principles for Medical Research Involving Human Subjects.

2. Methodology and organization of the research

3. Using special certified weight with altimeter before tests all participants were measured regarding their body weight (with the accuracy up to whole kilograms) and body length in full centimeters (both grams and milligrams were omitted, the numbers were not rounded.) Then the body mass index (BMI) was calculated for them. A day before the main test at 8 am. The participants swam at the distance of 400m and Eurofit tests (5 tests) were carried out at the time. The test consisted of swimming freestyle 16 lengths of 25-m swimming pool at a shortest possible time starting from a post. Before swimming the participants carried out ashore a 10-minute warm-up. Next they swam from 50 to 100m in the pool. From 8 am in various gyms at local sport and recreation units the participants of the pedagogical experiment carried out various tests chosen by the researchers from the spectrum of "Eurofit" tests, which aimed at evaluating levels of their physical fitness in various aspects. Before the tests the participants warmed up doing: 1km run, 20 forward lunges, 20 jumps with legs on the sides and hands clapping above head ("jumping jacks"), 10 burpees, 15 push-ups on the floor, 30-seconds of jumping on a skipping rope and 30-times raising torso from lying on a back with knees bent and hands behind one's head. The lifeguards underwent an original test in order to verify their special physical fitness.

4. In order to check the physical fitness of the lifeguards to carry out classical rescue action a comprehensive original test was developed consisting of the following tests:

- after a "start" command the lifeguards make ashore 20 burpees;
- then they run into water and using rescue technique (i.e. keeping constant eye contact with the drowning person) swim 100m to the drowning;
- they swim into a safe distance from an aggressive drowning person (in such a distance that the drowning cannot reach the lifeguard with their hands), take over control and prepare the drowning for being hauled (the lifeguards swim under the drowning, drag them by the legs underwater, pull extending arms to the torso and secure them behind drowning person's back by pushing one hand between torso and drowning person's arms (behind their back) and strongly holding their further arm);
- haul the drowning person for 100m to the shore in a way which is the safest for the lifeguard i.e. holding the drowning in the above described way, which eliminates the risk of unconscious attack of the victim on the rescuer;
- after hauling the lifeguards transport (push up) the victim on the shore and place them at a first-aid station in a position that allows cardiopulmonary resuscitation;
- finally, already ashore the lifeguards again make 20 burpiees.

Results

Table 1 below presents the following results of the tests carried out on the lifeguards participating in the pedagogical experiment: height and body mass, BMI, experience in water rescue actions, age as well as results achieved at 400m swimming, 5 tests from the "Eurofit" program (flexibility test, jump, standing long jump, sit-ups, rowing on a bar with bent arms and shuttle run 5 x 10 m), as well as the comprehensive original test.

The biggest difference between females and males is in the body weight, which results from the morphological differences between both sexes. The females achieved better results in the flexibility test and in the shuttle run. Male BMI was over 25, which according to the WHO standards is described as "overweight". In some cases it was the result of the muscle mass. However, the majority of males is overweight according to the

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Table 1. Descriptive statistics of measured variables for females (n = 54) and males (n = 46)

	$\bar{x}$	*Me*	*SD*	*Sk.*	*Kurt.*	*Min.*	*Maks*	*V*
Females								
Height	1.70	1.70	0.05	-0.30	-0.01	1.58	1.80	2.68
Body mass	61.56	61.00	6.04	0.26	0.45	50.00	80.00	9.82
BMI	21.32	21.41	1.46	0.43	0.13	18.82	25.83	6.86
Experience	11.13	10.00	5.65	0.39	-0.77	2.00	25.00	50.80
Age	33.22	32.00	6.82	0.21	-1.15	21.00	46.00	20.54
Flexibility test [cm]	13.50	12.00	5.84	0.30	-0.93	3.00	24.00	43.28
Jumping test[cm]	211.69	210.00	8.22	0.51	-0.58	200.0	230.00	3.88
Torso strength test [pow.]	23.87	23.00	3.30	0.29	-0.65	17.00	32.00	13.81
Functional strength test [sec.]	39.31	39.00	8.81	0.74	1.56	23.00	67.00	22.41
Shuttle run [sec.]	19.47	19.43	1.17	-0.06	0.33	16.49	22.08	5.98
400 m test[sec.]	408.60	420.60	23.40	-0.02	-1.47	370.0	453.00	5.67
Original test [sec.]	666.60	670.80	100.0	0.14	-1.30	500.0	856.20	15.12
Males								
Height	1.79	1.79	0.07	0.30	2.69	1.60	2.01	3.68
Body mass	81.13	80.00	9.46	0.80	1.32	63.00	110.00	11.66
BMI	25.38	25.46	2.41	1.31	4.32	20.98	34.75	9.51
Experience	14.50	14.50	9.09	0.42	-0.75	2.00	33.00	62.67
Age	36.70	36.50	9.90	0.26	-0.51	21.00	61.00	26.98
Flexibility test [cm]	12.78	12.00	5.33	0.54	-0.85	5.00	24.00	41.70
Jumping test[cm]	222.87	223.00	14.01	0.16	-0.91	200.0	252.00	6.29
Torso strength test [pow.]	24.98	25.00	3.52	-0.34	-0.61	16.00	30.00	14.08
Functional strength test [sec.]	46.76	46.00	7.78	0.20	-0.27	32.00	65.00	16.63
Shuttle run [sec.]	19.09	19.12	1.33	0.43	0.38	16.23	22.50	6.97
400 m test[sec.]	395.40	390.00	38.40	-0.29	-1.03	324.0	450.00	9.69
Original test [sec.]	609.60	573.00	120.0	0.18	-0.28	371.0	870.00	19.71

$\bar{x}$ – average; *Me* – median; *SD* – standard deviation; *Sk.* – skewness; *Kurt.* – kurtosis; *Min.* – minimum result; *Maks.* – maximum result; *V* – coefficient of variation.

Source: own research.

indicator. In case of the remaining fitness tests no significant differences were observed. Therefore, it may be concluded that females have higher level of their general physical fitness as confirmed by the points earned in the EUROFIT test. The male participants achieved higher average results in all tests. However, this group also had more representatives with very low results in the EUROFIT points. Despite the fact that the morphological construction predisposes males to achieve higher values, females achieved similar (or even better) results. The results of the tests for special fitness were on average 402.6 seconds for swimming, which is a passing result (the norm is 8 minutes, i.e. 480 sec.). However, for the original test the average time of 640.2 is too long to pass the test. Considering the results when divided into sexes, the female participants in the special fitness test achieved 408.6 and 666.60 in the original test. The male participants achieved 395.40 in the test, which is a part of a standard lifeguards' exam, and 609.6 in the original test for lifeguards' fitness. Both groups did not pass tests within the average results. Moreover, the number of results with very good and good results is also significant. Unfortunately, among males in the 400m swimming test standard variation (38.40) and skewness (0.29) show that the distribution of the results is not focused around the average and that there is leptokurtic distribution with many outliers. It was observed during the research that there is a group of male lifeguards with high physical fitness and swimming skills developed over many years starting from sport swimming classes. Others occasionally practice physical activities (most often swimming). The original test exposes these

differences even more. SD of 120 and skewness of 0.18 show that the results are moved to the left. Among females similar features occur only in the original test where SD is 100.80 and SK is 0.14. It should be noticed that for the standard swimming test the standard deviation for females is 23.4 and SK is -0.002 which is close to normal distribution.

Comprehensive physical preparation is necessary to perform a safe and successful rescue action. Water basins by themselves are unpredictable due to atmospheric conditions, structure of the water-bed, currents, whirls and other occurrences. Therefore, to optimize the potential to undertake a rescue, the action should take as short as possible through swift observation of the threat, swift reach to the drowning person, taking control over victim, swift evacuation from water and swift performance of the qualified first aid. Therefore, all lifeguards are responsible for their training and movement potential. The physical fitness was tested using chosen EUROFIT tests, while the original test was used to measure the effectiveness of the rescue action. In line with the accepted norm to pass the original test (600 seconds, i.e. 10 minutes) the researched group did not pass the test on a good level while at the same time they passed 5 tests of the general physical fitness. The rescue action is not a sum of individual tests of physical fitness but a whole movement construction ensuring safety of a lifeguard and the victim.

Discussion

The present study confirms that effective performance in water rescue operations cannot be adequately predicted solely on the basis of traditional general physical fitness tests. Although the examined lifeguards met the normative requirements of standard swimming and EUROFIT-based assessments, the majority failed to achieve satisfactory results in the original task-specific rescue test. This finding highlights a clear discrepancy between commonly used fitness evaluation protocols and the real functional demands of classical rescue actions, supporting earlier observations that rescue performance represents a complex motor structure rather than a sum of isolated physical abilities [4, 6, 7].

The lack of strong correspondence between general fitness indicators and rescue task effectiveness is consistent with previous research demonstrating that fatigue, coordination, and movement economy play a decisive role during rescue interventions. Abelairas Gómez et al. [12] showed that fatigue accumulated during rescue activities significantly reduces the quality of cardiopulmonary resuscitation, underlining the importance of integrated endurance and strength rather than maximal performance in isolated tests. Studies focused on towing effectiveness and mannequin carry velocity further emphasize that technical execution combined with strength endurance determines rescue efficiency in real conditions [6, 13].

The observed positive relationships between shuttle run performance, the 400 m swimming test, and the original rescue test suggest that speed–endurance and aerobic capacity are key determinants of successful rescue actions. These results align with previous findings indicating that the ability to sustain physical effort under resistance and stress is essential for lifeguards, particularly in unpredictable aquatic environments [8, 12]. Environmental factors such as water conditions and victim behavior further increase the physiological cost of rescue actions, reinforcing the need for task-specific assessment and training [13, 14].

Sex-related differences identified in the study also provide important practical insights. Despite morphological advantages favoring males, female lifeguards achieved comparable or superior results in agility and flexibility, which were positively associated with rescue performance. This supports earlier conclusions that flexibility and coordination contribute to movement efficiency and reduced energy expenditure during complex aquatic tasks [4, 5]. For males, flexibility and strength were more strongly linked to reduced rescue time, indicating that training programs should be differentiated rather than standardized across sexes [3, 5].

In addition to physical and technical preparedness, contemporary water rescue systems increasingly incorporate technological solutions aimed at improving victim detection and response efficiency. Recent advances in multi-modal detection systems and marine search-and-rescue technologies demonstrate the growing role of early identification and situational awareness in reducing rescue time and improving survival outcomes [15]. Nevertheless, even the most advanced technologies cannot compensate for insufficient physical readiness of rescuers during direct-contact rescue actions, highlighting the continued importance of functional fitness.

The importance of minimizing rescue and response time is further supported by clinical and emergency medicine research, which indicates that delayed intervention significantly reduces the likelihood of favorable neurological outcomes in drowning-related cardiac arrest cases [16]. These findings reinforce the practical relevance of task-specific fitness assessments, as even minor delays caused by physical fatigue or reduced movement efficiency may have critical consequences for victim survival.

From an applied perspective, the results question the ecological validity of existing lifeguard certification and recertification systems. Similar concerns have been raised in previous analyses of lifeguard training models, which point to insufficient emphasis on integrated physical preparation and long-term fitness maintenance [5, 11]. The proposed original test offers a more realistic assessment of operational readiness by combining strength, endurance, speed, coordination, and technical skills within a single performance task, thus better reflecting real rescue conditions.

Several limitations should be acknowledged. The study was conducted under controlled conditions and did not account for environmental variability such as waves, currents, or adverse weather, which may significantly affect rescue effectiveness [8, 14]. In addition, psychological factors related to stress perception and decision-making under time pressure were not directly assessed, despite their recognized importance in emergency response situations [17, 18]. The sample, although consisting of experienced lifeguards, was limited to selected rescue units, which may restrict generalizability.

Future research should focus on refining task-specific rescue tests by establishing age- and sex-adjusted normative values and validating their application in open water environments. Longitudinal studies examining the effects of progressive, integrated training programs on rescue performance would further support evidence-based improvements in lifeguard training and assessment systems [3, 19, 20]. Such an approach aligns with contemporary trends emphasizing functional readiness and safety outcomes in water rescue services [1, 2, 13, 14].

Conclusions

Passing physical fitness tests and 400m swimming test did not align statistically with passing the original test.

The results of the shuttle run, 400m test and the original test were positively correlated. Namely, the shorter time was in one test, the shorter time it in the other.

During training of all lifeguards the attention should be paid to determinants such as flexibility, strength, speed as specified for each sex. For females the flexibility test was positively correlated with the jumping, strength and torso tests, and negatively correlated with the shuttle run test, the original test and 400m test. It means that the higher the flexibility test results, the higher the jumping test and the strength test results, while the time needed to finish the shuttle run, the original test and the 400m test was shorter. Females should focus on the strength, speed and strength understood as jumping potential. Among males the higher the result in the flexibility test, the higher the result in the torso strength test, and the shorter the time of the 400m test and the original test. The result of the jumping test was positively correlated with the result of the torso strength test and the functional strength test and negatively correlated with the shuttle run test and the original test. The higher the result of the jumping test, the higher the results were achieved for the torso strength test and the functional strength test and the shorter were the times of the shuttle run test and the original test. Males should focus on improving flexibility and strength.

Adding theory and methodology of sports to the lifeguards training courses will result in learning by the course participants and future lifeguards how to take care of one physical fitness. It was confirmed by the positive correlation between age of the subjects and the lengthening time of the original test.

An exam consisting of the original test verifying the lifeguard skills should be implemented every 5 years, which will result in creating a habit of taking care of the physical fitness of lifeguards.

The research should be continued to define passing levels of the original test according to age groups.

A progressive training program to pass the original test should be prepared and implemented after finishing lifeguards courses.

Tests for individual motor skills allowing to pass the original test should be prepared.

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Supplementary Information

Article details

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Ethical statement
The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and was approved by the Ethics Committee of the Gdansk University of Physical Education and Sport. All participants were informed in de-tail about the purpose, procedures, and potential risks associated with the study, including the possibility of extreme physical fatigue. Participation was voluntary, and all lifeguards provided written informed consent prior to inclusion in the study. Medical clearance was obtained for all participants before the experimental procedures.

Conflict of interest
The authors declare no conflict of interest.

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