**SUMMARY**

of peer-reviewed scientific publications

of Chief Assistant Bilyana Krasimirova Rangelova, PhD

in Bulgarian and English,

submitted for participation in a competition for the academic position of

"associate professor", announced in SG no. 35/18.04.2023 from Sofia University “St.

Kliment Ohridski” in professional field 1.3. Pedagogy of education in... (Physical

education and sports - swimming).

*Group B – Indicator – 3: Habilitation thesis – monograph*

1. **Rangelova, B. Improvement of some physiological indicators and motor qualities among students through swimming sports.**

**Abstract:** The monograph "Improving some physiological indicators and motor qualities among students through the means of swimming" published by the University Publishing House "St. Kliment Ohridski", has a volume of 119 pages and is illustrated with 10 figures, 45 tables, 16 graphs and 13 illustrations. 88 literary sources in Latin and Cyrillic were used.

The monographic work is developed in the following sections - Statement of the problem; Conceptual framework; Swimming as a means of improving some physiological indicators and motor qualities; Empirical research and a swimming program to improve the functions of the respiratory system, the strength of the upper limbs and the shoulder girdle, as well as improving the flexibility in the shoulder joints; Conclusion and References.

The *object* of the research is the process of the Physical Education and Sports activities and in particular swimming in the Higher School.

The *subject* of the study are:

• chest girth development,

• development of motor skills – strength of upper limbs and shoulder girdle and flexibility in the shoulder joints.

The *persons* of the research are students practicing swimming, during the period of their studies - 1st, 2nd, 3rd and 4th year.

The main *task* of the research is to check the effectiveness of the model proposed by the author with a tendency for its implementation in practice.

100 people (60 men and 40 women) who decided to participate of their own free will, using a survey method, were studied. They were divided into two groups - experimental and control, 30 men and 20 women in each group. The participants in the study were students from three universities in Sofia. During the study, between the 1st and 4th course, a total of 7 people dropped out, three from EG and four from CG. Thus, the experiment was completed with 93 participants. The research was conducted over eight semesters in four academic years. The subjects who completed the experiment participated in a 112-week training program. Students from both groups are tested on selected indicators at the end of each course in a total of 4 stages. The intermediate results of the anthropometric and motor development of the participants in the experiment were reported at the end of each of the school years.

In the first part, "Statement of the problem", questions related to the low motor activity of the modern young person and its consequences are considered. An important place is given to physical fitness (ability to act) in the Higher School, as an indispensable part for a better general functional state of the student and his motor abilities. The historical aspects of swimming and its appearance in Higher Schools around the world and in our country are described. A concept for health promotion through swimming is presented. The possibilities of swimming as a system of physical education and development with the aim of improving the quality of life of young people, as well as the peculiarities of swimming and the aquatic environment and its influence on the development of the body, are examined in detail.

The second part of the monograph, entitled "Conceptual framework", describes in detail the research material of a scientific and informative nature, aimed at the swimming training of students and its connection with the development of certain physiological indicators and motor qualities emphasizing the strengthening of the health of those involved and improving their health status. A working hypothesis was formulated, which assumes that the use of the proposed program will lead to a greater effect in terms of the indicators determining the improvement of the functions of the respiratory system and lungs, the strength of the upper limbs and the shoulder girdle, as well as the flexibility of the shoulder girdle in comparison with the standard methodology for teaching swimming in Universities. The proposed exercises in the program also include the use of auxiliary swimming accessories (pedals) as part of the training program. This chapter describes the research methods, the object, the subject, the main task, the contingent and the purpose.

The third part "Swimming - a means of improving the functions of the respiratory system, the strength and flexibility of the shoulder girdle and upper limbs" is divided into three subsections. In the first, the physiology of the respiratory system is examined in detail and how the functions can be improved through the means and methods of the swimming sport. An in-depth analysis of the results of the empirical study of the index of chest circumference during inhalation and exhalation was made. The obtained values ​​were subjected to variation and comparative analysis, the reliability of the differences in the increase was established and the evaluations of the obtained results were tracked. The second subsection of this section looks at quality strength and specifically upper limb and shoulder girdle strength. The anatomical features of the upper limb and shoulder girdle are described, as well as the role of swimming in improving their musculature. A thorough analysis of the results was made. The last subsection is devoted to the quality of flexibility in the shoulder girdle. The function and mechanics of the shoulder complex were examined, a thorough analysis of the obtained results was made, both on the right and on the left half of the shoulder girdle. In each of the three parts of this chapter, the tests for measuring each of the studied indicators are described in detail.

The fourth part of the monograph entitled "Swimming program to improve some physiological indicators and motor qualities" is the key moment of the presented work. Here the purpose of the program is stated, the means, methodological requirements and its advantages are described. The proposed swimming training model includes a four-year program.

Exercises in the swimming lesson are divided into sub-types:

• exercises for the development of the chest through the means and methods of swimming sports;

• exercises to improve the strength of the shoulder girdle and upper limbs;

• flexibility exercises.

Each exercise proposed by the author, be it on land or in water, is described in detail and the dosage required for it is suggested.

The research material presented in the monograph has a scientific-informational character with the aim of acquainting readers who are interested in the question with the scientific achievements in this field, deepening their interest in their own searches and purposeful scientific activity on these problems, and stimulating their attempts at their application in the immediate pedagogical activity. It is intended and addressed to those studying and working in the field of sports and especially to those who have a special interest in the sport of swimming. In combating stress and fatigue in the educational environment, exercises in a water environment combined with exercises on land, supporting the work of the respiratory system and the harmonious development of all muscle groups, are extremely appropriate and would increase the quality of life of learners. Swimming activities primarily develop chest girth, muscle strength in the upper limbs and shoulder girdle, and flexibility in the shoulder joints, which also acts as a prevention against spinal curvatures and obesity.

***Key words:*** students, swimming, pedals, respiratory system, strength, flexibility, upper limbs, shoulder girdle.

*Group G- Indicator 5: Published book based on a defended dissertation work for the award of the educational and scientific degree "Phd"*

1. Tumanova, B., **B. Rangelova**. **A book about swimming.**

**Abstract:** The book introduces the audience to the world of swimming in all its aspects of application. It is structured in separate sections representing learning and training programs in non-standard age groups – infants and elderly, as well as people with special needs. The proposed models aim to master the basic swimming technique and form motor habits for a healthier lifestyle in a pleasant and affordable way. Richly illustrated, the book could be of interest to university professors, sports professionals, coaches, physical education and sports’ teachers, athletes, as well as to all who are interested in optimizing the swimming training process. Bilyana Rangelova is the author of eight of the chapters in the book, namely "Swimming - a system of physical education and development and its application possibilities in all age groups", "Fundamentals of swimming technique", "Learning the styles", "Characteristics of training on Swimming in Open Water’’, ‘’Babies Love to Swim’’,’’Games’’, ‘’Adapted Baby Swimming Training Program’’and ‘’Conclusion’’. The book is very well illustrated with illustrations, structured in sections representing training and exercise programs in the non-standard age groups - babies and the elderly, as well as people with special needs. A contributing point in the book is the author's attempt to design and experiment with the application of different swimming methods on people of different age ranges and health conditions and at the same time not to deviate from the use of established means of swimming training.

***Key words:*** *swimming, training, babies, elderly people, people with special needs.*

*Group G- Indicator 7: Articles and reports published in non-refereed peer-reviewed journals or published in edited collective volumes*

1. **Rangelova, В.** Chest development at babies involved in swimming activities, International Journal Knowledge, vol:30, issue:4, 2019, pages:979-982, ISSN (print):25-45-4439, ISSN (online):1857-923X

**Abstract:** The article examines the development of the chest circumference of children engaged in our proposed adapted swimming program from the age of 6 months until they reach the age of 3 years. The analysis made proves the benefit of swimming on the development of the chest of the small child. Activities with swimming sports develop the child's organism as complex as possible - from building movement and breathing culture to forming healthy muscles. Swimming has a beneficial effect on physical development, an ideal sport for children of all ages, from the main growth process, to hardening and strengthening the body. After the analysis of the results of our research, it is concluded that through swimming activities, the chest circumference of the small child develops better than that of his peers who do not engage in water exercise and swimming, which favors work of the respiratory system, lungs and heart..

**Key words**: swimming, babies, chest

1. **Rangelova, В.** Improving the functions of the respiratory system of students engaged in swimming during their studies.

**Abstract**: Swimming is considered as one of the preventive sports, offering special conditions, such as a horizontal position of the body and maintaining a position of high pressure, which the water environment exerts on respiratory actions. During swimming, the water exerts pressure on the body, which causes the lungs and heart to work harder to maintain normal body parameters. This inevitably leads to an improvement in the functions of the respiratory and cardiovascular systems. One of the main methods of research in sports practice of physical development by means of measuring the human body is the anthropometric method. The article examines the development of chest girth of swimming students during their studies. The values ​​of the chest girth give an impression of the general development of the torso and lungs. A number of authors describe the existing relationship between impaired mobility of the spine and changes in various values ​​characterizing the respiratory function. In order to increase the vital capacity, static, dynamic and special breathing exercises are recommended. Swimming and rowing are recommended as suitable sports and the use of elements thereof. In our study, we included students practicing swimming once a week. In addition to practicing the swimming styles and related exercises, the participants in the study were tested on the program of exercises we developed, aimed at the development of the chest. The program included exercises on land and in water. In a water environment, the subjects performed exercises with pedals in order to increase the load on the musculature of the shoulder girdle and chest. In summary, analyzing the results of our research, we come to the conclusion that through swimming, a person's chest circumference develops much more, which favors the work of the respiratory system, lungs and heart. Regular swimming activities are a prerequisite for a slim figure and harmonious development of the body and all muscle groups, protect against spinal distortions and excess weight - two common problems nowadays.

***Key Words****:* swimming, benefits, students, chest development, respiratory, cardiovascular systems

1. **Rangelova, В.** Swimming - historical aspects and its appearance in universities.

**Abstract**: In the article, a retrospective review of historical information related to the emergence and development of the sport of swimming is made, with a special place being devoted to its emergence and development at VU. The cult of water and its healing and hardening properties has existed since ancient times. Swimming has been used throughout all eras in the development of humanity, as an applied, educational, healing and hygienic necessity. Depending on geographical conditions, religious beliefs, cultural and economic development, swimming developed differently among different peoples. Historical evidence suggests that swimming was a natural necessity of all peoples living near bodies of water. This skill, in addition to being a means of survival, also had a high value unknown to the ancients for achieving and consolidating good health, physical and spiritual development. Historically, the development of the sport of swimming began with the construction of the first swimming pool in Germany. Later, the first swimming school was founded. Swimming was included in the Olympic program in 1896. n Bulgaria, this sport marked a great upswing after the construction of the first covered swimming pool in the building of the Sofia Central Mineral Bath in 1900, and in 1931, the beginning of sports and competition activities according to the rules of FINA. It is no secret, nor anything new, that swimming is one of the most popular and desired sports among the student youth. In our country, this sport started at Sofia University in parallel with the creation of the Student Academic Sports Association.

**Key words:** swimming, history, universities, students, Sofia University

1. **Rangelova, В.** Swimming as a habit (pedagogical experiment)

**Abstract**: The activities in which a person is involved require him to master certain skills - physical, mental, behavioral. Through them, the individual copes with the emerging tasks and situations in his realization and development. One of the factors for the protection and strengthening of health and physical development - sports activity, is perceived not only as a cultural, socio-economic and political phenomenon, but also as a basic necessity for development and perfection. Physical education and sport are established forms of society that satisfy the vital human needs of movement, achievement and development. Is it possible that sports and more specifically swimming can be part of the habits among students? With the present study, we conducted a pedagogical experiment among students of Sofia University "St. Kliment Ohridski", who have chosen the sport of swimming. The results of the conducted experiment give us the right to make the following conclusions and recommendations: the signs that can trigger a given habit appear in different forms, but the most common ones refer to time and place. The preparation of a plan by the students on which days and hours and the stimulation by the sports pedagogue for its implementation would lead to the acquisition of lasting habits and a desire for sports; making physical exercise a habit among young people will increase their quality of life, by not only improving the physical functions of the body, but also increasing their psychological and emotional state of mind. In order for young people to be healthy, mentally stable, emotionally satisfied and able to work, the discipline "Physical Education and Sports" should be compulsory for every student in all higher education institutions.

**Keywords:** swimming, sport, habits, satisfaction, students

1. **Rangelova, В.** Swimming - a concept for health promotion.

**Abstract**: The impact of swimming on the health and quality of life of students, providing the opportunity to study and practice swimming is in essence the implementation of a program for health promotion in the early stages of human life, which is a strategic factor in increasing life expectancy of life, for a disease-free life and for a more successful professional career. The impact of swimming on young people's health brings together the following listed determinants – education, personal healthy coping practices, healthy childhood, culture, behavior, social support networks. Health promotion aims to create opportunities for people to control their health and health determinants and improve their quality of life, i.e. the success rate of a given health promotion intervention is measured by improving the quality of life.

***Key Words****: swimming, health, students, life without disease*

1. **Rangelova, В.** The influence of swimming on the emotional state and self-confidence of the young person.

**Abstract**: Sports activity is perceived not only as a cultural, socio-economic and political phenomenon, but also as a basic need for development and excellence, and is one of the factors for preserving and strengthening health and physical development. Physical education and sports are well-established forms of society that meet the vital needs of man for movement, achievement and development. The activities in which a person is involved require him to master certain skills - physical, mental, behavioural, through which to deal with emerging tasks and situations in their implementation and development. To obtain information about this study, we conducted a survey with 80 students practising swimming during their studies to determine how swimming affects their emotional state and self-confidence. The obtained results give us the right to draw conclusions and recommendations that swimming is a useful and desirable sport not only because of the possibility of achieving versatile and harmonious physical development and strengthening of health, but also because of improving the emotional state and mental fitness.

**Key Words**: swimming, benefits, students, emotional state, self-confidence

1. **Rangelova, B.,** V. Varbanova**.** An adapted early childhood swimming program improves children's physical fitness

**Abstract:** Sports activity strengthens and improves health and contributes to the development of physical, mental and behavioral skills. Swimming, a representative of the physical activity besides the common sport benefi cial effects on the adolescent organism, is used for hardening as a part of healing gymnastics and rehabilitation in children with disorders of the musculoskeletal system. In the present study, the effect of an adapted swimming program on physical fi tness in healthy children up to 3 years was assessed by measuring age-adjusted physical activity parameters in 18 infants divided into three groups according to the age of inclusion in a swimming program (group 1, at the age of 6 months, n = 6, group 2 – at the age of 12 months, n = 6, group – 3 at the age of 18 months, n = 6). The results showed a signifi cant difference in all assessed physical parameters, with the exception of left upper limb force. The differences are greatest between the earliest and the most recently started (started adapted swimming program at the age of 6 months compared to started at the age of 12 to 18 months: capacity before the age of 3: walking steadily 2.5 months earlier, getting up and down on stairs 2.38 months earlier, capacity after 3 years: up and down stairs alone 4.83 months earlier, smooth running 2.45 m/sec more, leap in length from a place with two legs 9.72 cm more, throwing a thick ball 80 g with reinforcement – right hand benefit 1.15 cm/left hand benefit 0.98 cm, 2.67 times more in the number of squats for 20 seconds). In conclusion, the adapted swimming program improves physical fitness at an early age. Group 1 babies are most effective.

**Key words:** swimming, babies, physical activity, physical capacity, physical fitness

1. **Rangelova, B.,** V. Varbanova. Swimming in babies improves physical development

**Abstract:** Sports activity is involved in physical development, refinement and improvement of movement habits, has socio-cultural significance and is a major factor in protecting and strengthening health. Motor activity mainly affects the younger generation, which is significantly different from older individuals. Although heredity is a determinant of major physical characteristics—height, body proportions, head circumference at birth, fast or slow gait—the overall phenotypic expression is influenced by environmental factors. The assimilation of certain social programs through the relevant activity, such as sports, play the role of a specific external factor of development. Swimming as a representative of physical activity is characterized by some features mainly related to the environment in which it is performed. The possibilities of movement of the baby in water are much greater compared to those outside it. Swimming activities develop the child's organism in a complex way - from building movement and breathing culture to forming healthy muscles and improving cognitive abilities. Exercising in an aquatic environment contributes significantly to the recreational impact on the body from an early neonatal age. Swimming improves the physical development of babies, psycho-social development and has a hardening effect. It contributes to faster physical development, improves muscle strength and coordination and overall performance. However, special conditions are necessary for its practice.

**Key words:** swimming, babies, movement and breathing culture

1. **Rangelova, В.** Improve the strength of the shoulders and arms of students engaged in swimming during their studies.

**Abstract:** Swimming is considered as one of the preventive sports because it offers special conditions: the horizontal position of the body and the supporting position of high pressure are extremely demanding on the respiratory actions. During swimming, the water exerts pressure on the body, this makes all muscle groups work harder, the respiratory and cardiovascular systems improve. Physical exercise is a biological irritant for the CNS as well. The aim of the present study was to demonstrate the benefit of swimming and our validated land and water exercise program aimed at improving shoulder girdle and upper extremity strength in undergraduate swimming students during their studies.

**Key Words:** swimming, benefits, students, strength, shoulders, arms

1. **Rangelova B.,** Research of the effect of adapted model for implementation in aquatic environment in toddlers at the age of 3

**Abstract:** Physical activity is a factor affecting mainly the younger generation. Swimming, as a motor activity with a healing character, is an effective and emotional means for solving the tasks related to the process of development, maturation, recovery, and readaptation after various diseases in the toddler. Exercises in water are useful for the development of the musculoskeletal system and physiology of the child, for the overall balance of body functions, and good mood. In the education and upbringing of the young child, it is necessary to use specific methods, tools, and organization of work, tailored to the individual characteristics of each. For the optimization and more effective course of the learning process in the swimming training of children at the age of 3, the selection of individual, accessible types of exercises and different procedures must be following the peculiarities of this age group. From a biological point of view, motor activity stabilizes and strengthens the child's organism. Swimming improves thermoregulation, increases the body's resistance to cold factors, and trains resistance to stress. In the present study, we investigate the success rate in learning the element "moving in water doggy paddle" in children over 3 years old. For this purpose, we have used exercises adapted to the characteristics of this age group for the study of this element. The testing of these exercises in practice will contribute to the optimization and more effective flow of the learning process when teaching swimming to children of this age group. The obtained results give us reason to claim that when teaching swimming to children at the age of 3, it is faster and easier to learn to move in the water environment, through the exercises we have adapted.

**Key words***:* swimming, toddler, adapting exercises*.*

1. **Rangelova, B.** Legs development and endurance at babies involved in swimming activities

**Abstract:** The topic deals with the development of the physical fitness of the legs and the endurance of children involved in the proposed swim program from 6 months to the age of 3. The purpose of this analysis is to prove the benefits of swimming on the development of the legs and the endurance of the young child. Swimming creates potential opportunities for high performance, good health and harmonious development of the body in adolescents. During the period of intensive growth of children, this type of motor activity would ensure proper physical development, prevent various deformations of the musculoskeletal system and serve to harden the body. By swimming, the muscle mass increases, the long muscles of the back, the abdominal press, the lower limbs are evenly developed and the posture is improved. Swimming develops and improves the functions of the cardiovascular system and creates perfect coordination between the blood supply to the muscles and the activity of the respiratory system. The study covered children engaged in swimming from 6 months of age to 3 years of age. From the obtained results, it is clear that in children who start swimming from an early age, the physical fitness of the lower limbs exceeds the values ​​accepted as the norm. We are left with the same impression regarding the durability indicator.

**Key words:** swimming, children, development, legs, endurance

1. **Rangelova, B.** Swimming as an extracurricular activity as a means of flexibility improvement for boys at age of 16

**Abstract:** One of the most painful problems of modern physical education is the static everyday life, which brings with it a number of problems for the physical and mental development of the young generation. The age between 12-16 years is one of the most complex periods in human development. This is the period of transition from childhood to adulthood. It is important at this age to lead an active lifestyle, to perform various physical exercises, to prevent the possibility of adverse changes in the physical condition, psyche and health. Carrying out the extracurricular activity in physical education and sports with the students is the only possibility for additional motor activity and for participation in various forms of sports and competitions. Motor qualities are manifested in a complex manner, but with a view to their study and purposeful development, they are differentiated. The purpose of the study is to improve the physical fitness of 14-16 year old students by applying a program developed by us for additional motor activity - swimming. Planned extracurricular swimming activities can be organized by schools, in sports teams or clubs, and take place outside the curriculum. The changes from the control study according to the characteristic we are considering, which occurred in the experimental group, prove the effectiveness of the program we developed for additional motor activity in extracurricular time, which would build on the results achieved in the lessons of physical education and sports at school.

***Keywords;*** swimming, extracurricular activities, motor skills, flexibility.

1. **Rangelova, B.** Swimming as an extracurricular activity as a means of improving arms and shoulder girdle strength for boys at age of 16

**Abstract:** We are witnessing a greatly reduced physical capacity of the population in childhood compared to previous generations. The online form of training in the last two years, the anti-epidemic measures related to the "Covid-19" pandemic, the closing of sports halls and playgrounds have further strengthened the insufficient physical activity. When considering the problem of making sense of and making full use of young people's free time, the "neural points" in the education and socialization of today's young generation in our country are laid down. The timely and qualitative solution of this problem is especially relevant now with the established disproportion between physical development and physical capacity, with significantly reduced motor activity and disturbed balance between mental and physical workload. The age between 12-16 years is the period of transition from childhood to adulthood. In it, significant changes occur in the nervous and mental development of the body. We hypothesize that by applying in extracurricular time a program developed by us to develop motor qualities (strength of upper and lower limbs and flexibility in the hip, shoulder joint and spine) through the means of swimming, the physical fitness of 14 - 16 year old students. Planned extracurricular swimming activities can be organized by schools, in sports teams or clubs, and take place outside the curriculum. The program offered by us provides an opportunity to combat the emerging negative trend in recent years to reduce the physical fitness of young people.

***Keywords;*** swimming, extracurricular activities, motor skills, strength

1. **Rangelova., B.** B. Tumanova**,** Swimming – a system for a healthy lifestyle.

***Abstract***: It has been historically proven that sport and movement favor human development, health and mental state, adaptive functions of the body, the acquisition of autonomy and independence in life. Physical activity is one of the factors for the preservation and strengthening of health and physical development. Swimming is a sport with a multifaceted influence on the human body, useful and desirable above all because of the opportunity to achieve a diverse and harmonious physical development and strengthening of health, equally necessary for all people at all ages. As a motor activity of a healing nature is an effective and emotional means of solving the tasks related to the process of recovery, healing prophylaxis and recreation.

***Key Words:*** *physical ability,* swimming, health