

Abstract
of the Monograph

Chanev, S. (2021). Model characteristics and competitive efficiency in handball. Monograph, Bolid Ins, Sofia, ISBN: 978-954-394-350-0, pp. 1-136.

Abstract

The monographic work is developed in a total volume of 136 pages. It is illustrated with the help of 22 tables (including 4 normative ones), 26 figures and 4 appendices. In the process of working on the problem, a total of 120 literature sources were studied, of which 105 in Cyrillic.

The development is structured in three main sections.

The first section ("Peculiarities of handball selection"), on page 22, presents the problems of handball selection, as the author believes that making a quality selection of athletes for children and youth is an important moment in the implementation of activities, provided in the System of Physical Education and Sports in our country.

The selection is a multifaceted sports-pedagogical and medical procedure, which the author considers as a system in which the following three subsystems are the most important:

- *sports orientation* (initial selection);
- *current selection*;
- *formation of a team* for participation in organized competitions.

In the process of sports orientation in handball, the two main forms of organizing the selection are considered: *spontaneous* and *organized*.

The three main stages envisaged in the current Unified Handball Program (Krastev, N., Varbanov, I., 2014), developed for the needs of the BF Handball, are presented: *initial* selection (primary selection), *current* selection and *final* selection.

The main factors of heredity and environmental factors (social, natural, sports), which characterize sports abilities, are considered, according to a number of sports experts, but the author specifically notes, that anthropometric indicators, according to him, are only a preference related to the specific requirements of the handball game, and not a major sign of prospects.

The normative base for assessment of the physical development and the specific working capacity of the applicants for admission to the profile "Handball" of the Bulgarian sports schools of boys and girls, as well as the System for evaluation of the results of sports

training, developed by the author, are presented (Tzarova, R., Miladinov, O.,... Chanev, S., ..., 2012).

For the needs of the final selection of handball players, related to their inclusion in the representative teams of sports clubs or in the national teams of the respective age group to participate in official competitions, the author offers an original test battery, which includes a total of 8 sports and pedagogical tests.

In the second section of the monographic work ("Model characteristics of the modern handball player"), on 41 pages, the problems related to the structural development of teams are considered as an important factor for the success of handball. On this basis, the author presents the anthropometric profiles of Bulgarian handball players, playing in various playing positions, developed by I. Varbanov (2015), and emphasizes the need for good knowledge of the basic morph-functional features that determine the specifics of physical development of modern handball. The comparative analysis, performed by S. Chanev, gives an opportunity to get an idea of the dynamics of development of the general anthropometric profile of the Bulgarian handball players in terms of age.

An important point in building a player is his correct orientation to the most suitable for his characteristics playing position. On this issue, the author presents evidence, formulated by E. Avramov (2017).

In handball, each game function is related to certain requirements for the somatotype of the players, which determines the effectiveness of the performance of the various position-specific functions in the game. In this regard, the author presents data on the research of a number of sports specialists and sports physicians conducted with Bulgarian (Toteva, M.), Greek (Bayios, A., Bergeles, N. K., Apostolidis, N. G., Noutsos, K. S., Koskolou, M. D., Giannaku, J.), Serbian (Petković, E., Bubanj, S., Marković, Kr., Kocić, M., Stanković, D.) and other handball players.

According to the author, the issues related to the level of development of the main signs of physical fitness, building the so-called „handball athleticism“, occupy an important place in the model characteristics of the modern handball player. The reason for this is the high variability of the game situations, requiring, in addition to mastering specific handball skills, the special physical qualities to be developed at a high level. Own researches on this issue are presented (Chanev, S., 2017), as well as the opinions of a large number of other sports specialists, such as Tz. Zhelyazkov (1968, 1998), I. Yotov (1999), Tz. Tzankov, (2005)., M. Bachvarov (2000), S. Matthys et al. (2011), K. Krüger et al. (2014), M. Chelly et al. (2014), I. Varbanov (2015), Hermassi et al. (2015), Tz. Zhelyazkov, D. Dasheva, (2017) and others.

In most cases, athletes do not have ready-made models of pre-thought-out motor combinations, which require such to be formed during the action. This requires mastery of a large arsenal of motor elements that characterize the technique of the game, which can be easily assembled in temporary combinations (Gavriyski, V., 1993). The current trends in the development of the handball game, however, are aimed not so much at increasing the quantitative, but at increasing the qualitative parameters of the game. Players are required not just to have a rich arsenal of technical and tactical actions, but "high-speed equipment". The so-called "Handball universalism" must be complete in terms of ball-free movement, hunting and passing, as well as defensive play, and partial in terms of ball grips, which are specific to different playing positions and lines of attack. This problem was developed on the basis of the research of I. Yotov (1997), I. Yotov, S. Markovich, E. Avramov (1997), T. Valchev (1999), E. Avramov (2008), I. Varbanov (2011, 2013, 2015), R. Koprivlenski (2016), as well as on the basis of the author's own research.

Along with the issues of special motor skills and technical and tactical skills of athletes, the problem of their mental training is also addressed. The model characteristics of the successful handball player include high motivation of the athletes, self-control over their emotional state, quick and accurate assessment of game situations and making adequate decisions, high mental resilience, the need to coordinate their actions with those of partners, to coordinate efforts and to adapt individual behavior to the requirements arising from the common goal and the collective result.

The conducted own (2017, 2019) ascertaining psychological experiment to establish the coordination-motor abilities, concentration, distribution and flexibility of attention, as well as the short-term memory of 17-, 18- and 19-year-old handball players shows that in terms of greater part of the studied parameters of mental qualities, in general, there are no significant differences between the studied age groups. The only exception concerns a significantly higher level of development of concentration, distribution and flexibility of attention of 18- and 19-year-olds than 17-year-olds.

The application of the so-called Factor analysis makes it possible to get an idea of the most important (priority) characteristics of athletes and arranged according to their contribution to the overall development of the successful handball player. The conducted own research (Chanev, S., 2017, 2019) allows the author to reveal the factor structure and to identify the main factors of physical development and specific performance in 17-, 18- and 19-year-old handball players, who are a reserve for high sportsmanship. On this basis, he determines the most significant characteristics of physical development and specific

performance of the three studied age groups. It is an important moment in the work of sports educators.

An essential part of the monographic work is the third section "Peculiarities of the game activity and competitive realization in handball". It is developed on 47 pages.

The penetration of the structure of the handball game and the revelation of its regularities is an important moment in the work of sports educators. This can be achieved to a large extent by monitoring and recording the performances of the players in the extreme conditions of the competition. Here the author presents a number of methods for collecting information about the game activities of handball players, both manually and with the help of computer technologies.

The following pages of the Monograph provide a comparative analysis of the game efficiency of elite handball teams during the World Handball Championship in 1999, with the participation of the Bulgarian national team, which allows the main guidelines for increasing the attacking efficiency of high-class Bulgarian teams to be outlined. The game manifestations of the young handball teams, participating in the World Cup 2019 for juniors under 19, are traced and on this basis the structure of the offensive actions, the peculiarities of the defensive game, the influence of the characteristics of the defensive game on the ranking of teams and more - an individual model for evaluation of the defensive game of the world champion Egypt, which can serve as a benchmark for young handball teams, has been developed.

The factor structure is revealed and, in comparative terms, the main factors of the competitive efficiency of the teams from the world elite and Bulgaria in three directions are identified: the game in attack, the final phase of the attack, technical and tactical skill.

Abstracts

**of publications and reports, published in scientific journals,
referenced and indexed in world-famous databases with
scientific information (3 issues)**

1. Giannakou, I., Chanev, S. (2019). Anthropometric performance characteristics of female Greek handball players. International Scientific Congress "Applied Sports Sciences", Proceeding book, NSA Press, Sofia, ISBN: 978-954-718-602-6, pp. 29-36.

Abstract

The **objective** of this study was to provide anthropometric performance characteristics of female Greek handball players. One hundred and one elite handball female players, playing in 1st divisions were tested. Testing consisted of anthropometric measures of 25 indicators (height, hand range, upper limb length, lower limb length, length of the span, width of the span, shoulder width, chest circumference, respiratory difference, lap circumference arm, circumference of the forearm, circumference of the contra-arm, circumference of contracted arm, dynamometry of a strong hand, dynamometry of a weak hand, weight, BMI, index, body mass %, total body water %, fat mass, muscle mass, metabolic age, bone mass and calories. Descriptive statistics, Correlation and Factor analysis and a multivariate correlation technique were used to provide insight into the anthropometric profile of female Greek handball players. Logical and statistically significant strong correlations were found between height and hand range; length of upper limbs and hand range; between circumferences and body composition variables. Principal factor analysis identified four factors that explained 50, 20, 6 and 5 % of the variance in the dataset, respectively. These factors were interpreted as: 1) "Circumferences and body composition" factor, 2) "Body proportionality factor", 3) "Vital capacity" factor and 4) "Hand strength factor". The anthropometric characteristics can be used for optimization of the process of selection of young female handball players in Greece.

Key words: *anthropometric profile, female handball players, selection*

2. Chanev, S., Giannakou, I. (2019). Factor structure of the technical-tactical preparedness of the elite female Greek handball players. International Scientific Congress "Applied Sports Sciences", Proceeding book, NSA Press, Sofia, ISBN: 978-954-718-602-6, pp. 77-81.

Abstract

The aim of the present study is to reveal the factor structure and to identify the main factors of the technical-tactical preparation of elite female Greek handball players. The subject of the study is sports handball preparation. The object of the study is the indicators of the technical-tactical preparedness. One hundred and one elite handball female players playing in 1st divisions were tested. The results of the study were performed by the modern mathematical and statistical methods, mainly factor analysis with VARIMAX rotation. The 6 basic factors were extracted which explain an extremely high percentage of the initial dispersion of the studied phenomenon (93.95%), and the factor structure of the technical-tactical preparation of the elite female Greek handball players was revealed. The factors were interpreted as: speed of the shot in the door (27,11 %); skills to move on the court with dribbling (18,99 %); skills to move in defence (12,94 %); accuracy of shots at the goal (11,74 %); speed of shots at the goal (11,69 %); strength abilities and long distance throw technique (11,48 %).

Key words: *handball, female players, elite, technical-tactical preparedness, factors*

3. Chanev, S. (2021). Normative framework for control and optimization of the physical development and the specific working capacity of 17-19-year-old handball players. Journal of Applied Sports Sciences, Zona Art Print Ltd, Sofia, ISSN 2535-0145, pp. 22-41.

Abstract

The purpose of this study is to develop a normative basis for control and optimization of the physical development and specific working capacity of the 17-19-year-old Bulgarian handball players. **The subject** of the study is the youth handball. **The object** of the study is the parameters of the physical development, special physical fitness, specific technical and tactical skills and some mental characteristics. The study sample composes the 115 handball players between the ages of 17 and 19 from the top 10 teams participating in the national championship for young under 19 year old. Anthropometric measurements and sports-pedagogical testing were conducted for the needs of the study on a total of 34 indicators for establishing the level of physical development, special physical and specific technical and tactical preparedness and some mental characteristics and qualities of the handball players of the studied age group. For the development of the normative basis, descriptive statistics analysis and a sigma method of assessment were used.

Key words: *handball, adolescents, physical development, specific working capacity, control, optimization*

Abstracts

of publications and reports, published in non-peer-reviewed journals with scientific review or published in edited collective volumes (12 issues)

1. Tzarova, R., Chanev, S. (2002). Comparative analysis of the game efficiency in attack of the Bulgarian men's handball teams. FIS Communications, Nis, ISBN: 86-906969-0-3, pp. 228-233.

Abstract

The aim of the research is to make a comparative analysis of the game efficiency in attack of the Bulgarian men's handball teams and the teams from the world elite. **The object** of the study is highly qualified Bulgarian men's handball teams and the teams participating in the World Cup held in Egypt in 1999. The study was conducted in the period from June 1999 to October 2001. For the needs of the research, 58 game indicators, characterizing the game manifestations in attack, were monitored and recorded. The results are processed by variation and factor analyzes. Student's comparative t-test was used to test the working hypothesis. The analysis of the results is done in five directions:

- structure of the game in attack;
- completion of attacks by zones;
- assists;
- activity and efficiency of the various shoots on the door;
- mistakes made.

The conclusions made allow us to outline the main directions for increasing the offensive efficiency of the elite Bulgarian men's teams.

Key words: *handball, attack, game efficiency, comparative analysis*

2. Tzarova, R., Chanev, S., Sklavunos, H. (2003). Factors of the game in attack of the men's handball teams from the World elite and Bulgaria. // Sport, Society, Education, Volume 8, NSA PRESS, Sofia, ISBN: 954-718-107-6, pp. 695-703.

Abstract

The aim of the present study is to analyze the game effectiveness in attack of the Bulgarian men's handball teams and the teams from the world elite and to reveal the main factors of the attacking game in both groups. The study was conducted in the period from June 1999 to October 2001. **The object** of the study is the handball teams (men), participants in the Bulgarian "A" – elite group and the teams that participated in the World Handball Championship, held in Egypt in 1999. In order to study the game efficiency of the teams in attack, the game actions of the handball players during 10 matches of the observed World Championship and 10 matches of the State Championship of Bulgaria for men, were registered. A number of 58 game indicators, characterizing the game manifestations in attack in five directions, were monitored and registered:

- structure of the game in attack - 12 indicators;
- completion of attacks by zones - 16 indicators;
- activity and efficiency of the various shoots on the door -12 indicators;
- assists - 8 indicators and
- mistakes made - 10 indicators.

In processing the results of the research, modern **mathematical and statistical methods** were used: *variation analysis, hypothesis testing (using Student's t-criterion) and factor analysis*. The applied factor analysis allowed to reveal the factor structure and to identify the main factors of the handball game in attack.

Key words: *handball, attack, game efficiency, factors*

3. Petrov, L., Alexandrova, A., Chanev, S. (2015). Hart rate variability in experimental model of competitive stress in handball. // International Journal of Sport Studies, Vol. 5, ISSN: 2251-750, pp. 1194-1202.

Abstract

Modern trends in many sports, including handball, are associated with increasing their dynamism and attractiveness. These conditions lead to increased mental pressure on athletes and more pronounced reactions to stress. Assessing the stress reactions of athletes before and during a competition is of great interest for coaching practice. **The aim** of this study is to assess the reactions of stress in handball players, using an experimental model of competition with minimal physical activity and various stressors: refereeing errors, audience and others. To solve this goal, a comparison was made between heart rate (HR) parameters: minimum (HR_{min}), mean (HR_{avg}) and maximum (HR_{max}) and heart rate variability indicators: standard deviation from normal to normal (SDNN), and mean square of consecutive differences (rMSSD) for the same physical exercises, but with different intensity of psycho-emotional stress. The results show that blood pressure is significantly increased during the warm-up and during the competition compared to baseline. Despite the large differences between the HR_{avg} parameters of individual players, it is significantly lower during the competition compared to the warm-up (114.2 ± 14.9 vs. 107.1 ± 11.5). During the warm-up there was a slight increase in SDNN, and during the race - a significant decrease to baseline (85.3 ± 25.3 , compared to 70.42 ± 25.2). However, the mean rMSSD values remained unchanged. The high informative value of the HR_{avg} indicator is confirmed by the significant negative correlation between HR_{avg} and SDNN and rMSSD during the competition. In conclusion, HR_{avg} is the most informative indicator for accurate assessment of emotional stress.

Key words: *goalkeepers, penalty throws, sports physiology, sports stress, wireless heart rate monitoring*

4. Chanev, S., Yordanov, K. (2017). Comparative analysis of the specific working capacity of 14-year-old basketball and handball players from the sports schools in Bulgaria. // Sport and Science, Extraordinary issue 2, BPS Ltd., Sofia, ISSN: 1310-3393, pp. 191-197.

Abstract

The aim of the study is to optimize the sports training in basketball and handball in sports schools in Bulgaria, through a comparative analysis of the signs of specific performance of 14-year-old students from the profiles "Basketball" and "Handball". The survey was conducted in the period of October 2013 - December 2015. **The subject** of the study is the special physical and specific technical and tactical preparedness of basketball and handball players from 7th grade (14-years-old) at Sports schools in Bulgaria. **The object** of the study is the main signs of special physical and specific technical and tactical preparedness in the basketball and in the handball. **A contingent** of research is a total of 52 boys from 7th grade (14-years-old) at sports schools in Bulgaria, of which 30 from a profile „Basketball“ and 22 - from a profile „Handball“. For the needs of the research, testing was conducted on a total of 17 indicators, carrying information on the main signs of specific performance in the basketball (10 indicators) and in the handball (7 indicators). The following research **methods** have been applied to achieve the set goal and tasks of the research: *review study of the specialized literature, sports-pedagogical testing*. For the needs of the research the following **mathematical - statistical methods** are applied: *variation analysis, comparative analysis (using the Student's comparative t-test), index method*. The results of the study allowed the reliability of the observed differences between the levels of the main features of the specific working capacity of 14-year-old basketball players and handball players from Bulgarian sports schools to be established.

Key words: *sports schools, basketball, handball, specific ability to work*

5. Arahchiiski, Z., Chanev, S., Dimitrov, V., Chalakov, M. (2017). Experimental parametric evaluation of the hits in the handball door. // Sport and Science, Extraordinary issue 2, BPS Ltd., Sofia, ISSN: 1310-3393, pp. 25-34.

Abstract

The aim of the development is to experiment with the application of a system for registration and statistics of hits in the handball door and on this basis to outline its possible applications for management and optimization of the training process. The experiment involved 6 players from the NSA handball teams. The system consists of three modules: removable registration frame with opt-electronic elements, mounted on the handball door - HB-001 / A2; device for automatic measurement and indication of the speed of the ball and the accuracy of the hit - HB-001 / A1 and software module for personal computer, designed to store information in a database, visualization of the parameters of the hits in real time, reports on various criteria. The results of the experiment prove the possibilities of this system in the process of sports training and sports and technical improvement of handball players. They provide an objective basis for new methodological solutions and specific models for shooting at the door in zones. **In conclusion**, it may be recommended to conduct experiments on shooting in the door in the presence of passive or active defense, which would significantly bring the research closer to the real competitive situation.

Key words: *handball, system for registration and statistics of hits in the handball goal, parametric evaluation*

6. Chanev, S. (2018). Comparative analysis of the indications of the special physical preparedness of 17-19-year old handball players. // Sport and Science, Issue 6, Sofia, ISSN: 1310-3393, pp. 57-63.

Abstract

The aim of the study is to reveal the age dynamics of the development of the signs of special physical fitness of 17-19-year-old Bulgarian handball players. The study was conducted in the period of February 2014 to September 2017. **The subject** of the study is the special physical fitness of adolescent handball players. **The object** of the study is the main signs of special physical fitness in the age period 17-19 years. **The contingent** of the study is 115 young handball players, of which 39 at the age of 17, 38 - at the age of 18 and 38 - at the age of 19, included in the 10 teams, participating in the final tournament of the state championship for juniors under 19. To establish the level of special physical fitness, with the participants in the study, a sports-pedagogical test was conducted. The used test battery includes 8 sports-pedagogical tests. The results of the study were processed *by variation analysis and hypothesis testing (using Student's comparative t-criterion)*. The analysis of the results reveals the age dynamics of the development of signs of special physical fitness of 17-19-year-old Bulgarian handball players.

Key words: *handball, grown up, special physical preparedness, comparative analysis*

7. Chanev, S. (2018). Features of the physical development of 17-year-old handball players. *Kinesiology, I&B, Veliko Tarnovo*, ISSN: 2534-9317, pp. 180-186.

Abstract

The aim of the study is to reveal the peculiarities of the physical development of 17-year-old adolescent handball players. **The subject** of research is the physical development of adolescent handball players. **The object** of research is the main signs of the physical development of 17-year-old Bulgarian handball players. **The contingent** of the study is 39 (17-year-old) handball players from 10 teams participating in the state championship for the studied age group. Anthropometry and dynamometry were used to reveal the condition of the main morph-functional features of the studied handball players. For the needs of the research, information on 10 anthropometric features was collected. When measuring the grip strength of two (the comfortable and uncomfortable) upper limbs, the so-called manual dynamometry was attached. The measurements were performed with standard instruments and standard methods. For a more complete description of physical development, the so-called Body Mass Index (BMI) was calculated. *Variation analysis and body mass index (BMI)* were used to process the baseline data from the study. The analysis of the results allows the peculiarities of the physical development of the 17-year-old Bulgarian handball players to be revealed.

Key words: *handball, adolescents, physical development*

8. Chanev, S. (2019). Comparative analysis of the indications of the specific technical-tactical preparedness of 17-19-year-old Bulgarian handball players. Annual of NSA, Vol. 1, Es Print Ltd, Sofia, ISSN: 2682-9908, pp. 375-382.

Abstract

The aim of the study is to reveal the age dynamics of the development of the signs of the specific technical and tactical readiness of adolescent handball players in the period of 17-19 years. The survey was conducted in the period 2014-2018. **The subject** of the study is the technical and tactical preparedness of adolescent handball players. **The object** of study is the main signs of specific technical and tactical preparedness, as well as their features in 17-, 18- and 19-year-old handball players. **A contingent** of research is a total of 115 adolescent handball players, of which 39 at 17 and 38 - at 18 and 19, included in the finalist teams of the state championship for juniors fewer than 19. To reveal the state of the main signs of the specific technical and tactical readiness of the handball players from the three studied groups, they are subjected *to sports and pedagogical testing*. The test battery used includes 6 main features. In the processing of the initial data from the conducted research were used: *variation analysis and hypothesis testing, using the comparative t-criterion of Student*.

The results of the study show that in general, the variability of the studied signs of technical and tactical preparedness does not change significantly in the age period 17-19 years, but with increasing the age increases the inhomogeneity of the study population in terms of the ability of young handball players to perform accurate 7-meter throws at a target. Moreover, significant differences between the three age groups studied which were observed in terms of the ability to move on the field with dribble and the performance of long throws, and the effectiveness of 7-meter throwing in target, as well as the ability to moving in defense, does not depend on the age of the players.

Key words: *handball, adolescents, specific technical and tactical training, age dynamics*

9. Chanev, S. (2019). Factor structure and main factors of physical development and specific performance of 18-year-old handball players. // Sport and Science, Issue 1/2, EU SPRINT, Sofia, ISSN: 1310-3393, pp. 45-54.

Abstract

The aim of this study is to improve the training process in handball by revealing the factor structure and identifying the main factors of physical development and specific performance of the best 18-year-old handball players. **The subject** of research is the physical development and the specific working capacity of adolescent handball players. **The object** of study is the main signs of physical development, special physical and specific technical and tactical fitness, as well as some mental abilities and qualities of 18-year-old handball players. **A contingent** of research is 38 of the best 18-year-old handball players from the youth teams of Bulgaria. To reveal the state of the main morph-functional indicators, as well as the signs of the specific performance of the studied handball players, the **following research methods were applied**: *anthropometry, dynamometry and sports-pedagogical testing*. The test battery used in the sports-pedagogical testing includes a total of 24.

The following **mathematical and statistical methods** were applied in the processing of the initial data from the conducted research: *variation analysis, body mass index (BMI) and factor analysis*. As a result of the analysis, the main factors of physical development and specific performance of 18-year-old handball players were revealed and identified.

Key words: *handball, adolescents, physical development, specific performance, factors.*

10. Giannakou, I., Chanev, S., Mplahava, M. (2019). Συγκριτική αναλγση της φυσικής κατασταςης των ελιτ ελληνιδων γυναικων της χειροσφαιρισης πογ παιζογν σε διαφορετικες θεσεις. (Comparative analysis of the physical fitness of the elite Greek female handball players, playing in different positions). // 27th International Congress of Physical Education and Sport, Proceedings, Komotini, ISSN: 2585-2884, pp. 341-344.

Abstract

Handball is an aerobic-anaerobic sport with variable intensity and high requirements for the level of physical training of athletes. The main playing positions on the court are determined by the location of the handball players on the field during the game in attack (left wing, left distributor, link, right distributor, right wing and pivot) or defense (players are counted from the periphery to the center of the field). Each position has its own specifics. **The purpose** of this study is to compare the physical fitness of elite Greek handball players playing in different positions. **The contingent** of the study is 101 elite Greek handball players, playing in the 1st division. To solve the purpose of the research, sport-pedagogical testing of the athletes from different playing positions was performed. The test battery includes nine tests (sprint 20 m, long jump, triple jump, vertical rebounds from the place and after three steps, throwing a dense ball, abdominal presses, shuttle running 10 x 15 m and forward inclination depth). In the mathematical and statistical processing of the results are applied: *descriptive statistics ANOVA, analysis of variance*, with the calculation of the so-called Tukey`s Honestly Significant Difference (HSD), which allows to determine the statistically significant differences between the results of individual game posts and *the Cohen coefficient* - for the size of the effect. Significant statistical differences between the groups were found in terms of the next indicators: 20 m sprint, long jump, vertical rebound both from a place and with strengthening and shuttle running (10 x 15 m). The results of the study show that the elite Greek handball players, playing in different playing positions, differ mainly in terms of speed and dynamic strength abilities, followed by specific abilities for speed endurance.

Key words: *handball, playing position, elite Greek handball players.*

11. Chanev, S. (2020). A study on the mental readiness of 17-19-year-old handball players. // Personality, Motivation, Sport, Volume 24, NSA PRESS, Sofia, ISSN 2682-9495, pp. 73-83.

Abstract

The aim of the study is to optimize the psychological training of 17-19-year-old adolescent handball players by revealing the age dynamics of some psychological abilities and qualities. **The subject** of research is handball in adolescents. **The object** of study is some psychological abilities and qualities of 17-19-year-old handball players.

The contingent of the study is 115 handball players aged between 17 and 19 from 10 teams participating in the state championship for juniors under 19, divided into 3 age groups: 17-year-olds - 39 players, 18- and 19-year-olds - 38 competitors each. To solve the purpose and tasks of the research, *a review study and theoretical analysis of the specialized literature* are applied, as well as an *ascertaining psychological experiment*. The applied ascertaining psychological experiment allows some psychological abilities and qualities in the age aspect to be established. For this purpose, appropriate test methods have been applied: *coordination-motor test*, *black-red table* (modified version of Schulte's method) and *short-term memory test*.

Key words: *handball, adolescents, mental fitness, age dynamics*

12. Chanev, S., Mladenov, N. (2021). Assessment of the signs of physical capacity of 18-year-old students from Lom. // NSA Yearbook, Volume 1, NSA Press, Sofia, ISSN: 2682-9908, pp. 31-43.

Abstract

The **research aims** to optimize the learning process in physical education and sports of students in the eleventh grade of PG "N. Gerov" (Lom), through control and assessment of their physical capacity. The **subject** of the research is the physical capacity of adolescents. The **object** of research is the signs of physical capacity in students of XI grade of PG "N. Gerov" (Lom). A **contingent** of the research is a total of 36 students (25 girls and 11 boys) from the XI grade of PG "N. Gerov" (Lom), exercising a uniform motor activity during regular physical education and sports activities. To solve the purpose and tasks of the research, *a survey study and analysis of the specialized literature sources and sports-pedagogical testing* were used. The attached test battery is borrowed from the System for assessing the physical capacity of students from I to XII grade, developed by the staff of NSA "V. Levski", under the general editorship of Prof. O. Miladinov (Miladinov, O. et al., 2019) and includes a total of 5 indicators that allow to determine the level of physical capacity of students in the studied age group. The results of the research are subjected to **mathematical and statistical processing** through *variation analysis* and *sigma method of evaluation*. The results of the research allowed to outline both the strengths and weaknesses in the preparation of XI grade students and to take the necessary measures to improve the learning process in physical education and sports.

Key words: *students, physical capacity, assessment*