

THE CONCEPT OF INDIVIDUAL APPROACH IN SPORT

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Annotation. *Purpose:* prove the concept of individual approach to sports training. Develop a common scheme ways individualization process of training athletes. *Material:* the study involved 149 athletes: 38 volleyball players and 111 players. Was carried out comprehensive testing athletes for 33 pedagogical, psycho-physiological, biochemical parameters. Also conducted an analysis of indicators of competitive activity. *Results:* we propose the following areas of the individualization process of preparation of athletes: 1 - systematization of mathematical indicators of preparedness and condition of the athlete in a single point in time; 2 - regression analysis of the dynamics of individual game performance athletes; 3 - the use of universal methods of individualization of various aspects of the training process. It is established that the individual characteristics of players in basketball and volleyball are connected not only with the anthropometric data, but also depend on the physiological and psychophysiological indicators. In this aspect there is provided use of cluster and factor analysis for the construction of individual training programs for players. It was found that the dynamics of the gaming performance is described by quadratic, cubic and sinusoidal functions. In the case of sinusoidal oscillation period of regression models in girls is 25-30 days, 31-38 days in boys. This allows to determine the most preferred times of increasing and reducing the efficiency of competitive. *Conclusions:* the concept of individual approach in sport involves the separation of a wide range of indicators leading factors in the individual structure of athletes, in the analysis and prediction of individual dynamics of competitive performance, to develop universal methods of individualization with the activation of awareness of various aspects of the training process.

Keywords: concept, individualization, sports, prognosis, preparedness.

Introduction

Sports always have been being a concentrated model of life in all its variety. In sports there are situations, when a person is at extreme of his (her) potentials, but overcomes him (her) self and reaches his aim. Sportsman shall be able to quickly and correctly take decisions against the background of maximal or close to maximal physical loads and physiological shifts in organism. In sports it is necessary to subordinate everything to achieving of purpose (to “construct” own life and even destiny) [13, 16, 17, 19].

Principle of individualization is one of main principles of sportsmen’s training. Individual approach implies selection of necessary training means and methods, suitable for certain sportsman. It is a necessary condition for achievement of desired high result [22, 27, 30, 33, 36, 37, 38]. This problem is important for all stages of sport training. For example at stage of sport selection [2] it is necessary to determine what kind of sport a child should practice. At stages of initial training [36, 37, 38], of sport perfection [5, 7, 11, 12, 18, 24], and, especially, at stage of highest sportsmanship [20, 21, 23, 26] construction of individual training programs for sportsmen is especially required. There is no “universal” sportsman, for whom standard training programs would be ideal. May be one sportsman shall make accent on power exercises or some other physical quality, other – sportsman should perfect technique; the third needs better understanding of strategy and tactics [1, 14, 15]. With consideration all these factors determination of how to train exactly for this sportsman and what direction to choose in training process is rather a difficult task.

The same picture is often observed in other spheres of life activity: every person always meets a problem of choice of own way, suitable and the only correct exactly for him.

In sports exists a problem: what is better to train? In other spheres of life – the problem is the same – what profession to choose? If this choice has been made, it is necessary to choose way of further functioning. Decisions are taken about what features (physical and mental) shall be trained and what skills shall be perfected. It is also necessary to determine what shall be accentuated: improvement of “delaying” qualities or perfection of leading ones. If both these aspects are considered then proportions and quantitative characteristics of required loads are determined.

Thus, problem of individual approach in sports expands far behind of sport frames and is spread on all spheres of human life. It includes: learning, choice of kind of functioning and method of self perfection in it. It is also choice of specificities of following of any life direction and in general any choice in life.

That is why working out of algorithms for determination of sportsmen's individual features with specifying of individual structure and dynamic of different indicators' development or factors of fitness is important not only for sports but also for other spheres of human life functioning.

The research has been fulfilled in compliance with:

- “Combined plan of scientific research works in sphere of physical culture and sports for 2011-2015” by topic 2.4 “Theoretical methodic principles of individualization in physical education and sports” (state registration № 0112U002001);
- Scientific research works of Ministry of education and science of Ukraine for 2013-2014 and for 2014-2015 “Theoretical-methodic principles of application of informational, pedagogic and medical-biological technologies for formation of healthy life style” (state registration № 0113U002003);
- “Theoretical-methodic provisioning of healthy life style's formation in conditions of educational establishment in context of European integration” (state registration № 0114U001781).

Purpose, tasks of the work, material and methods

The purpose of the work is to ground conception of individual approach in sport training.

The tasks of the work:

1. Analyze existing opinions concerning nature of individuality and its manifestation in sport functioning.
2. To formulate and ground conception of individual approach in sports.

The methods of the research: theoretical analysis of literature sources, physiological, psycho-physiological, bio-chemical, pedagogic methods of research, pedagogic experiment, methods of mathematical statistic.

In our research 149 sportsmen participated; among them – 54 players of men combined basketball team (Kharkov), 12 players of men basketball team of Ukrainian super league “Politechnik”, 23 female basketball players of Ukrainian first league team, 22 players of women basketball team of KhNPI, named after G.S. Skovoroda, 38 volleyball players of supreme league of Ukraine.

Results of the research

Individual approach in sports covers wide range of problems: from sport selection at all stages of training to determination of individual programs of sportsmen's training. At the same time individual approach in sports is a reflection of every personality's individuality, which determined human choice of kinds of functioning and way of life in general.

That is why individual distinctive features of people have caused interest of scientists since ancient time. View on nature of individual features reflected cultural, religious and world vision ideas of people.

For example in India individual features of a person were explained by stronger activity of one chakra in comparison with other (<http://chakrachka.ru/chakr/test.htm>). Chakras in Indian philosophy are energetic formations in biological field of a person, the so called points of energy concentration; they are centers of consciousness, of physical and psycho physical regulation. In opinion of Hindu people every person has seven chakras. But not all of them are equally active (<http://priroda.inc.ru/biopole/biopole89.html>). Most frequently one of three lower chakra, which determine health, social relations, self assurance, mental stability and so on, is the most active. Relatively more rare are cases of higher chakras' activity, which are responsible for spirituality, creativity, supreme manifestations of consciousness. May be there is certain practical sense in this theory. That is why with appearing of adequate methods of registration of human energetic centers, researchers of human individuality will receive effective tool for diagnostic of human individual features.

Besides, in Vedic they use concept “Atman is Brahman” for revealing of nature of individuality [3, 4, 10, 35], i.e. individuality, personality *(atman) is a reflection of certain Absolute Consciousness (analogue to Holy Spirit or “Father” in Christianity). Atman is the essence of individual soul. Atman originated from Brahman (God emanatory), who “inspired” Atman in every person. That is why according to pantheistic Vedic conception Atman seeks his Source; when it find the Source, Atman will combine with Him and disappear in Him. Such principles have also subjective character and, consequently, subjective diagnostic. However, with presence of methods of objective diagnostic of Atman's relation to Absolute “Brahman”, mankind will receive additional tool of determination of individuality's features. It is important for all spheres of life, including sports.

There are other ancient opinions of nature of human individuality. For example, Christian religion says about three planes: spirit, soul and physical body [31]. Exactly Spirit determines individuality and way of life of a person; hat is why main task of a person is to understand his mission and take decisions as adequate to his mission as possible.

If there are analogues to these conceptions in modern science has still been unknown. However, determination of ways for maximal realization of human individuality (in sport functioning) is an urgent task.

Opinions about nature of individuality have long history in science. In European scientific tradition, which originated from antique time, there exist different theories of individuality [41, 43, 45, 46, 48], the most wide spread of which are: theory of tempers, individual distinctions by type of thinking, perception of information and so on [13, 39, 40, 42, 44, 47].

Sport is one of the brightest manifestations of individuality. At present time there have been worked out conceptions of individualization in different kinds of sports and physical culture (outdoor games, martial arts, track and field events and etc.) [9, 17, 25, 28, 29, 32, 34]. However, nowadays especially urgent is working out of single conception of individualization in sports.

Many authors dealt with problem of sportsmen training's individualization [6, 9, 13, 36, 37, 43], but nearly all the accentuated only one certain indicator or group of indicators (potentials of nervous system, level of physical condition, specificities of somatic type and etc). These authors actually did not consider individual structure of a personality as system, combining different aspects (indicators of individuality). These indicators have certain links between each other and form certain structural units. In a number of works [13, 16, 17, 19] we presented algorithm of determination of individual abilities of sportsmen in game kind of sports according to their complex factorial structure of fitness and dynamic of separate indicators' progressing as well as sport result in general. In this work we generalized received earlier data in order to modify system of sportsmen training's individualization, training of sportsmen in game kinds of sports in conception of individualization in sports.

For working out of scientific-methodic principles of sportsmen training's individualization it is necessary to base on methodological principles of scientific research. The following principles can be named from them [13, 16, 17, 18, 19]:

1. Systemic approach combines physiological, psycho-physiological, psychological structures and functions in connections with external world;
2. Laws of information's development and its connection with time. That is why progressing of a person obeys to general laws of informational exchange and connection of information with time.
3. Usage of mathematical simulation for determination of individual features of sportsmen.
4. Usage of fundamental sciences for determination of sportsmen's individual features..

It is quite natural that account and registration of different indicators is rather a difficult task. These indicators reflect level of different systems' functioning in their interconnection and dynamic of changes. However, its solution corresponds to requirements of modern sports, which implies systemic approach to solution of any questions and corresponds to principles of complex scientific research.

On the base of generalization of literature data, own experiments and fulfilled theoretical analytical work we worked out general schema of individualization of sportsmen's training [13, 17].

The first direction of these series of researches implies creation of algorithm of mathematical systemizing and processing of wide spectrum of indicators, reflecting separate sides of fitness and sportsman's condition as a system. Such approach regards sportsman's condition at certain period of time. We assume determination of group (team) and individual structure of sportsmen's fitness. On the basis of found leading and delaying factors in individual structure of fitness in respect to general structure of sportsmen's fitness we construct training process. It implies to accentuate development of leading (60-80% of total means) and delaying factors (20-40% of means)[13, 17].

The second approach to scientific provisioning of training process is connected with analysis of factors, which condition individual dynamic of sportsmen's game efficiency. This approach implies construction of regression models of competition effectiveness's dynamic and application of these models for prognosis of competition results and management of training process.

The third direction of the researches in this field is connected with development of universal methods, which permit to individualize different aspects of training process. This direction implies that there are also universal methods of training. They initially contain systemic approach: they influence on all organism in the whole and are suitable for sportsmen of different qualification, age, anthropometrical data. These methods indirectly lead organism to individually optimal mode of functioning and create conditions for realization of correct for certain man actions.

Such methods can include regulation of physical load's intensity by subjective sensations, method of autogenic and mental control trainings, natural means of workability's rehabilitation [13, 17]. Besides, they can be exercises, built of movements by power lines of human electro magnetic field.

It should be noted that improvement of organization of such self organized system (as sportsman or team) can be realized in interaction with higher organized system. For example combined training with more qualified sportsman

or observation over his technical tactic actions. For this purpose, video records of world level sportsmen's performances can also serve. Observation over movements of qualifies master creates favorable background in consciousness for manifestation of own individual potentials.

Besides, using of autogenic training with concentration of natural images facilitates improvement of human organism's functioning and increasing of all systems' and organs' effectiveness. Also we can include improvement of separate techniques, increasing of quickness of operative thinking. Such influence of natural images is connected with the fact that they are reflection of higher organized system (nature) in comparison with individual [18, 19].

Thus, basing on the above said we can conclude that there are universal methods of individualization of sportsmen's training. These methods are all methods, oriented on connection with more organized system. In respect to human being more organized systems are: nature; cosmos; elite sportsmen.

Working out of theoretical methodic principles of sportsmen training's individualization expands range of training principles. In particular, principle of individualization progresses in system. Such system contains: theoretical conception and ways of its realization; complex of algorithms and methods, which permit to quickly and effectively determine individual features of sportsmen, prognosticate competition result and develop individually adequate training programs.

With the help of worked out conception we applied modern analytical apparatus to field of sportsmen training's individualization; it implies using of wide complex of research methods, effective generalization of received data, determination of leading factors in sportsmen's fitness, construction of individual regularities of competition efficiency's dynamic, working out of universal programs of training's individualization.

Algorithms of worked out theoretical conception were successfully applied in different sport games [13, 17, 19-22], Judo [23], sport orientation [32], that proves effectiveness of worked out principles.

Results of realization of the worked out conception of sportsmen training's individualization in different kinds of sports are as follows: our research showed effectiveness of practical realization of worked out principles of training's individualization in different kinds of sports. Effectiveness of this conception's application was shown in men basketball team (1st grade players) [13], in women basketball team of Supreme league of Ukraine "BK-KhAI" [20] in women basketball team (players of 1st and 2nd grade) [19], in women volleyball team of Supreme league "Kharkovchanka" [17, 19, 21, 22].

We have determined [13, 19], that individual characteristics of basketball players and their specializations are not always connected with purely anthropometrical data. They also depend on a number of other physiological and psycho-physiological factors, which are confidently different for different specializations. Cluster and factorial analysis permitted to work out individual programs of training of highest grade basketball players. Constuction of training process by these programs showed its effectiveness in results of pedagogic experiments.

Regressive analysis of individual regularities of competition functioning shows that individual competition functioning can be described by different non-linear functions with rather high confidence [19, 20].

Non-linear regression analysis showed that dynamic of game efficiency is described by, square, cube and sinusoid functions. Period of oscillations of female basketball players is 25-30 days (periods of physical and emotional bio-rhythms, period of ovarian –menstrual cycles) the same of male basketball players equals to 31-038 days (periods of intellectual and intuitive bio-rhythms). The most accurate regressive models of competition functioning's effectiveness are sinusoidal regressive models. They permit to determine rather exactly time, when competition efficiency can rise or fall. [19, 21].

As an example of determination of individual dynamic of competition functioning we can supply the received by us regularity. It is described by cubic function. The tested players of women basketball team of first league dependence of game functioning's effectiveness on time interval of game obeys to square ($y = b_0 + b_1x + b_2x^2$) or cubic ($y = b_0 + b_1x + b_2x^2 + b_3x^3$) functions.

For example, this dependence of player X-t is described by cubic equation of regression (see fig.4), which looks like as follows (see fig.1):

$$S_+ = 12,87 + 0,085T - 0,002T^2 + (5,618 E-06)T^3 \quad (1)$$

Where S_+ -quantity of "positive" scores.

T – time interval, i.e. nember of day from the first analyzed game.

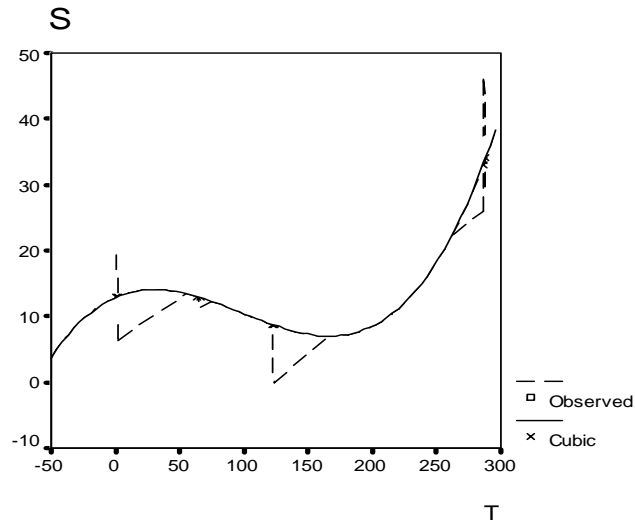


Fig.1. Cubic regression of iterconnection of “positive” scores’ quantity, gained in game (S) and time interval of game (T) of player X-t (Observed- values, which were observed), Cubic- value of cubic function).

Table 1

Results of regression analysis of “positive” scores’ quantity, gained in game (S) and time interval (T) of player X-t

The set variable	F criterion	Significance	b0	b1	b2	b3
t CUB	3.47	0.01	12.87	0.09	-0.002	5.618 E-06

Individual regularities of competition functioning’s dynamic obey general laws of self-organizing systems’ development. One of aspects of such regularities is oscillating processes. Dynamic of competition functioning depends on structure of sportsmen’s fitness, leading and delaying factors. Besides, individual regularities of competition functioning’s dynamic are determined by a number of factors, which can be divided conventionally into internal and external. These groups of factors are interconnected. With it internal factors, with their sufficient development, can block negative influence of external factors. Main factor of influence on dynamic of competition functioning is level of different kinds of fitness. May be there are also non-specific factors, which condition exactly laws of peaks and falls in sportsmen’s competition functioning.

The conducted research showed that there are also universal methods of training, which initially contain systemic approach: influence on all organism in general and are suitable for sportsmen of different qualification, age, constitution. These methods directly lead organism to individually optimal mode of functioning and create conditions for realization of correct for certain person in certain situation actions.

Building of training process, basing on individual features of every sportsman, considering their individual structure of fitness rendered positive influence on level of players’ special physical and technical fitness [19], on effectiveness of their competition functioning [19, 20].

Experimental group players (female basketball players of high class) demonstrated increasing of game effectiveness in comparison with prognosis by sinusoidal and cubic functions, which were determined before experiment [13, 19, 20].

Besides, we registered confident increase of game actions’ effectiveness of separate players and all experimental group. In control group such picture was not registered. Coefficient of variations of games actions’ effectiveness reduced in experimental group. It witnesses about increasing of reliability of players’ competition functioning [13, 19].

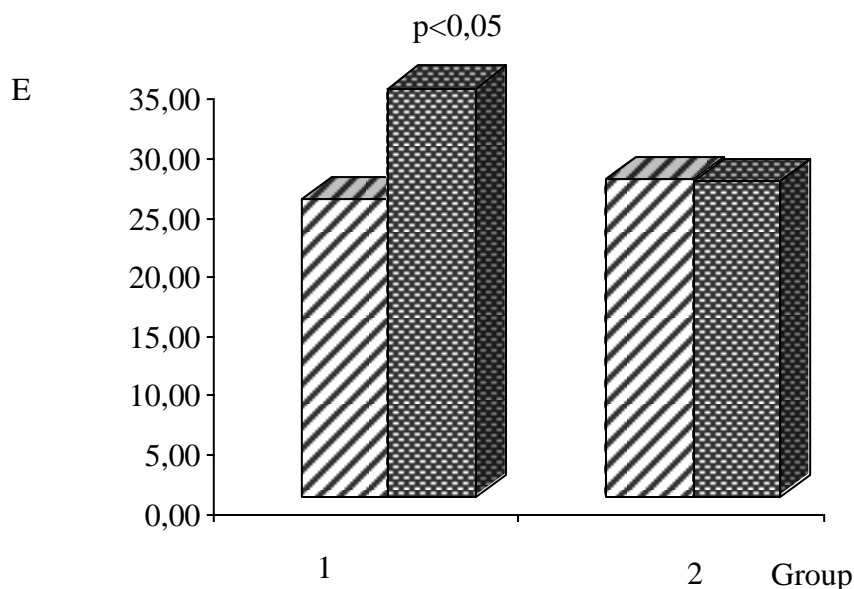




Fig.2. Individual effectiveness of games actions in experimental and control groups before and after experiment (quantity of games before experiment - 10, after experiment - 10):

* - $p < 0,05$;  - before experiment;  - after experiment; E – effectiveness of competition actions, conv.un. 1 – experimental group; 2 – control group

Discussion

Analysis of literature and our own results showed that this work is the first, meaning development of theoretical-methodic principles of individualization of sportsmen's training. With it authors touch on working out of certain parameters of individualization of sportsmen's training and do not regard process of individual training from the point of view of system; analysis of wide complex of fitness's [7, 11, 12, 24, 25]. Before the present research individualization of sportsmen's training was regarded as specific problem [26, 27, 36], without creation of theoretical conception, principles, algorithms, apparatus of indicators' analysis, methods of research and certain methodic of optimization of training process. From this point of view our research is a novelty and is significant not only for theory and practice of sport training but also for other sciences (pedagogic, psychology, physiology and so on). That is why this work is a novelty, in which principle of individualization transforms in system with own structure, algorithm and mathematical apparatus.

Analysis of literature data [3, 4, 7, 30, 31] showed that problem of individual distinctions has long history and comes far behind the frames of single science (including theory and methodic of physical education and sports. From this point of view our work is an extension and addition of existing knowledge about individual nature of human being.

The most widely this problem is presented in psychology and psycho physiology [7, 42, 44, 45, 46]. Classic conceptions of individuality either reduce temper to different features of lower level of individuality or define temper as coming from higher planes of individuality – plane of personality. In our opinion our research permits to coincide these two approaches, add them with physiological parameters of individual distinctions, regard them in the light of certain manifestations in fulfilled actions.

Authors [42, 46, 48] regard problem of individual distinctions purely basing on psychological distinctions. They do not touch problem of individualization and analysis of a person as a system, which combine complex of different indicators. That is why, from this points of view our work is a novelty. We offer algorithm of construction of individual models of sportsmen's complex fitness. The models permit to assess individual distinctions in general, combining all measured indicators in single system.

Conclusions:

1. Analysis of literature witnesses about long history of determination of human individual features. This problem comes out of sports. It has natural, cultural, religious roots. We have shown interconnection of human individual features and his way of life with individual approach to sport practice.

2. We worked out conception of individual approach in sports. It implies marking out of leading factors in individual structure of sportsmen's fitness. One more aspect of this conception is analysis of regularities and prognosis of individual dynamic of competition efficiency. Working out of universal methodic of training's individualization is an

important parameter of the conception; the methodic imply activation of understanding of different aspects of training process.

2. We determined that application of system of individual approach in sports rendered positive influence on indicators of special physical and technical fitness and competition effectiveness.

In the future we offer to practically realize the worked out system of individualization of training process in different kinds of sports in domestic and foreign teams of high class.

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Cite this article as: Kozina Zh.L., Prusik Krzysztof, Prusik Katarzyna. The concept of individual approach in sport. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2015, no.3, pp. 28-37. <http://dx.doi.org/10.15561/18189172.2015.0305>

The electronic version of this article is the complete one and can be found online at: <http://www.sportpedagogy.org.ua/html/arhive-e.html>

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Received: 17.01.2015

Accepted: 21.02.2015; Published: 23.02.2015