

## PREPARATION FOR THE YEAR MAIN COMPETITION TEAMS IN BASKETBALL WITH HEARING IMPAIRMENTS WITH INNOVATIVE TECHNOLOGIES

Sobko I.N. The  
Kharkov National Economic University

**Annotation.** *Purpose:* develop and prove experimentally comprehensive training program on the Ukrainian national team basketball with hearing impairment in the annual cycle for the major competitions. *Material:* The study involved 12 basketball hearing impaired 20-25 years old - female players team of Ukraine on basketball. Also analyzed the test results and competitive activity 12 basketball players with hearing impairments - Lithuanian team players. *Results:* We showed the need for a qualitative change in the training process through the development and application of innovative technologies. This allows a greater level of communication between the coach and athletes to intensify training process. Developed and experimentally substantiated comprehensive training program for the Ukrainian national team. In technical training device used light. This increased mobility, agility, activity and intensity workouts. In tactical training improved situational and planned change tactical drawing game using copyright protection of video tutorials with animated illustrations. *Conclusions:* A positive impact of the developed system for basketball training result in major competitions.

**Keywords:** basketball, Invasport, Deflimpiada, software, sound, technique, tactics.

### Introduction

At present, Ukrainian sportsmen with different health problems participate in Para-Olympic and Deaflympic competitions [1, 2, 3, 4]. Their achievements at prestige international competitions facilitate strengthening of Ukraine authority at international sport community and create opportunities for disabled people to adapt in modern society and realize their social demands [8, 9, 13]. One of kinds of sports for disabled is deaflympic sport, where sportsmen with hearing problems compete [15, 19, 21]. Review of scientific publications showed that recent scientific researches reflect different aspects of physical education and sport trainings of people with hearing problems [1, 3, 4, 15, 19, 21]. But problems of training process's organization, formation of sport fitness; problems of competition functioning of sportsmen with hearing problems have not been studied sufficiently yet. These problems are urgent as far as winning of highest sports prizes by disabled sportsmen in conditions of constant increasing of global competition in elite sports – is one of the most preferable possibilities for a country to declare itself at international level. In this connection main task of development of sports for disabled for long period of time is entering in three prize-winners of combined sport teams at Para-Olympic and Deaflympic Games in not official team event. The process of sportsmen's training in deaflympic sports, in particular in basketball, can not be the same as the process of healthy sportsmen's training. In this connection working out of system of basketball players' with hearing problems in annual cycle, has acquired special importance [16, 17, 18, 20, 22, 23, 24]. This problem has not been elucidated sufficiently in recent scientific literature.

The research has been carried out in compliance with “Combined team 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 number 0112U002001) and in compliance with scientific-research work, financed by Ministry of education and science of Ukraine for 2013-2014 and 2014-2015 “Theoretical-methodic principles of application of information, pedagogic and medical-biological technologies for formation of healthy life style”, (state registration number 0113U002003) and “Theoretical-methodic provisioning of formation of personality's healthy life style in conditions of educational establishment in context of European integration”, (state registration number 0114U001781).

### Purpose, tasks of the work, material and methods

*The purpose of the research* is to work out and experimentally prove complex program of Ukrainian basketball team training for sportswomen with hearing problems in annual cycle of preparation for main competition.

*The methods of the research:* theoretical analysis and generalization of special literature, methods of pedagogic testing, which included tests on special physical and technical fitness, method of determination of competition functioning's effectiveness, pedagogic experiment; methods of mathematical statistics.

In the research 12 female basketball players of 20-25 years old age, with hearing problems participated. All of them were members of women combined basketball team of Ukraine. For comparative analysis we analyzed also results of testing and competition functioning of 12 female basketball players with hearing problems – members of combined team of Lithuania.

### Results of the research

In connection with the fact that main competition of the season (autumn 2012 – summer 2013) was 22<sup>nd</sup> Deaflympic Games, we set the following tasks of training program [5, 6, 10, 16, 17]:

1. Determination of ways of combined Ukrainian basketball team's (sportswomen with hearing problems) improvement in process of preparation for 22<sup>nd</sup> summer Deaflympic Games 2013.

2. Working out of up-to-date technology of combined Ukrainian basketball team's (sportswomen with hearing problems) training on the base of advanced scientific and scientific-methodic achievements.

3. Increasing of effectiveness of interaction and responsibility for results of combined work of managers, coaches, specialists and maintenance services in preparation for competition functioning of combined Ukrainian basketball team (sportswomen with hearing problems).

4. Creation of conditions for effective scientific-methodic, medical and medical-biological provisioning of combined Ukrainian basketball team (sportswomen with hearing problems).

5. Satisfaction of demand of combined Ukrainian basketball team (sportswomen with hearing problems) in high quality training on modern sport bases.

6. Provisioning of combined Ukrainian basketball team (sportswomen with hearing problems) with high quality equipment, facilities and apparatuses.

We solved directly first two tasks, the rest tasks were in competence of basketball federation of sportsmen with hearing problems.

For working out of complex training program, we, first of all, analyzed competition results of advanced world women basketball teams (sportswomen with hearing problems) at international competitions up to 2013.

As it is known, modern basketball, both of healthy sportsmen and sportsmen with hearing problems, is based, in its development, on the following [11, 12, 16, 17, 25]:

- full fledged rising of sportsmanship;
- the highest level of physical condition;
- flexible, variable tactic compositions.

With it we can observe constant trend to increasing of quickness in game situations with priority of quick breakthrough and early attack and, at the same time, “simplification” of tactic schemas of game and shortening of time for their realization. Teams are equipped with modern technique of handling ball; they show high motion activity in game without ball; they have variable techniques and effective operative thinking, high level of will and psychological stability. Especially it should be noted that players have increased physical condition and show universal characteristics in game roles. From one deaflympic games to one notice a trend to increasing of countries-participators and quantity of sportsmen. The quantity of teams, pretending to compete with leaders of world basketball also increases.

In table 1 we give comparative characteristic of results of leading women world teams (sportsmen with hearing problems) at Deaflympic Games in Italy (July 2001); Deaflympic Games in Australia (January 2005); at Deaflympic Games in Taiwan (September 2009); at European championship in Italy (September 2011); at Championship of Europe in Turkey (June-July 2012).

As we can see in the table combined Ukrainian basketball team’s (sportswomen with hearing problems) had not won prize places before 2011, but after World championship 2011, where it won 3<sup>rd</sup> place, it reduced sport results and took 4<sup>th</sup> place at European championship 2012. Relatively successful and stable are combined teams of USA, Lithuania, Sweden. Recent years, basketball in Greece has started to show progress.

Table 1

*Comparative characteristic of leading basketball teams’ results (sportswomen with hearing problems) at international competitions*

Country	Deaflympic Games 2001	Deaflympic Games 2005	Deaflympic Games 2009	World championship 2011	European championship 2012
Ukraine	6	4	5	3	4
USA	1	1	1	-	-
Sweden	2	2	3	1	1
Lithuania	3	3	2	2	2
Greece	5	5	4	4	3
Russia	-	-	6	6	5
Italy	-	-	8	7	7
Byelorussia	4	-	7	5	6
Japan	-	8	9	8	-

Balance of forces in basketball in period of preparation to 22<sup>nd</sup> summer Deaflympic Games 2013 witnesses that women combined teams of USA, Lithuania, Sweden, Ukraine and Greece are leaders of world basketball (see table 1).

The highest steady results in women’s basketball were achieved by combined team of USA – multiple champion of Deaflympic Games. Women team of USA is a winner of three Deaflympic Games - 2001, 2005, 2009; it has the highest team indicators and the strongest players of different game roles. Steady progress has been shown, recent years, by combined team of Sweden, which took first places at world and European championships. The closest challenger of Ukrainian team is combined team of Lithuania; it plays better than Ukrainian combined team, having won

second places at world championship 2011 and at European championship 2012. In Italy (world championship) our sportswomen were defeated by Lithuanian in first game by 9 scores, in the second by 2 scores; in Turkey (European championship) they lost 30 scores.

Also we should note the progress of combined team of Greece, which, at world championship defeated Ukrainian team by 10 scores in first game and lost 6 scores in second game, having taken 4<sup>th</sup> place; but at European championship it defeated Ukrainian team twice: by 10 and 18 scores. This team is a promising one and has rather trained reserve.

The listed above teams are the most probable adversaries of Ukrainian combined team in fight for places in next deaflympic competition. It was assumed that at Deaflympic Games in Bulgaria medals would be probably won by teams of USA, Sweden, Lithuania and Ukraine (see table 2). Basing on analysis of teams' – main adversaries level – the task of Ukrainian combined team will be to enter the three strongest teams and ascend from fourth place in rating to the third one.

Table 2

*Prospects of achievements of strongest world teams in women's basketball (sportswomen with hearing problems) at 22<sup>nd</sup> Deaflympic Games, 2013 (by data of world championship 2011 and European championship 2012)*

Teams	Preliminary prognostication of results of Deaflympic Games						
	1	2	3	4	5	6	7
Leader	USA	Sweden	Lithuania	Ukraine	Greece	Russia	Byelorussia
Probable adversary	Sweden	Lithuania	Ukraine	Greece	Russia	Byelorussia	

Thus, analysis of modern women's basketball (sportswomen with hearing problems) showed sharpening of fight for highest sport places, increasing of motivation and prestige of highest sport achievements.

Basing on analysis of the data, obtained in process of construction of training process for female basketball players with hearing problems for future competitions we made conclusion about qualitative change of training process at the cost of working out and application of innovative technologies, which would permit to raise communication level between coach and sportswomen and, thus, to intensify training process.

In power training, influence on speed- power and functional fitness were of the first priority.

In technical training main accent was made on perfection of techniques of ball handling and accuracy of throws, especially 3-scores, in extreme conditions. We used new means of control of training process for increasing of mobility, activity and intensity of trainings with the help of light devices that was innovative technology of our program [15].

In training of tactics we paid attention to increasing of specific weight of active forms of game both in defense and in attack with application of visibility's method in mastering of tactic interactions and tactic schemas, basing on specificity of every certain adversary; besides it was necessary to perfect situational and planned changes of tactic picture of game in defense with the help of author's video-aid with animations that also was innovative technologies in training of female basketball players with hearing problems [15].

Application of innovative technologies was the main novelty of our training program for female basketball players with hearing problems.

*Stages of training of women combined basketball team of Ukraine (sportswomen with hearing problems) for 22<sup>nd</sup> Deaflympic Games 2013 in Bulgaria.*

At 1<sup>st</sup> stage (August, September, October 2012) the task was improvement of functional state and physical fitness of female basketball players as the basis for further specialized technical-tactic and competition trainings. In training camp all main means were used, including competition exercises, oriented on group and team interactions. At this stage we developed individual plans of tactic trainings, considering individual tactic and physical fitness for players of different game roles. Also we implemented modern, scientifically grounded innovative technologies in training process.

For 2<sup>nd</sup> stage (November 2012 – April 2013) wave-like increasing of loads with comparatively high variety of differently oriented loads was characteristic; we created conditions for further qualitative improvement of special workability with certain reducing of loads for general physical fitness. We improved individual sportsmanship of players of different game roles, checked coordination in game of different game links, team tactic in defense and attack in extreme conditions. In order to control fitness of combined team's players in competition conditions we increased scope of competition loads in control matches with strong adversary.

Final, 3<sup>rd</sup>, stage (May, June 2013) – was the stage of direct preparation for Deaflympic Games in Bulgaria. This cycle is devoted to complex perfection of all sides of players' and team's fitness as well as achievement of sport form's peak for strategically important matches of Deaflympic tournament.

Independent on stage character of training we systemically increased role of special physical fitness, improved technical-tactic sportsmanship of players, intensified training process, individualized trainings, including psychological one; ensured reliability and stability of female basketball players in conditions more complex than competition ones. All

these were oriented on facilitating basketball players' optimal sport form at summer Deaflympic Games and on achievement of planned sport results.

*Training and competition loads of sportswomen with hearing problems – members of combined team of Ukraine in basketball in annual cycle 2012-2013*

With building of annual cycle [16, 17] we envisaged 2 macro-cycles (see table 3), from which the first macro-cycle implied mainly complex training and participation in Ukrainian championship among women teams of Supreme basketball league, season 2012-2013. Preparatory period included training camp of functional and physical orientation in Kharkovskaya region, Balakleya and finished by 1-3 matches with adversary of not high fitness. Special-preparatory period was of technical - tactic orientation with application of innovative technologies [7, 15]. Competition period included tactic and game orientations: we fulfilled perfection of different sides of fitness, realized direct preparation for participation in competitions. Transitive period was directed to recreation of physical and psychic potential of sportswomen, preparation for the next macro-cycle.

In second macro-cycle training process became more specific; it stipulated targeted training for Deaflympic games. Scope of training loads became maximal alongside with full-fledged recreation and direct preparation for main competitions. Preparatory period started in Lvovskaya region, on sport base "Tysovets", where integral training of sportswomen was ensured. Then, in Alushta city, control and pre-competition meso-cycle of preparatory period took place and they were oriented on creation of optimal sport form of basketball players, who had hearing problems. Besides, several control matches were conducted. Then they had 2-3 days for recreation. Competition period is direct participation in 22<sup>nd</sup> summer Deaflympic Games on August 4<sup>th</sup>-10<sup>th</sup>, 2013, in Sophia (Bulgaria).

Application of training program for basketball players with hearing problems in annual cycle rendered positive influence on indicators of physical and technical fitness, on competition functioning and results of main competitions. Experimental group basketball players (combined team of Ukraine) experiment resulted in confident improvement of tests "Skipping rope jumps for 1 minute, q-ty of times" (from 136.08 to 149.83 times,  $p < 0.01$ ), "High jump from the spot, cm" (from 30.83 cm to 35.75 cm,  $p < 0.05$ ), "Pressing ups in lying position for 30 seconds, q-ty of times" (from 28.17 to 33.67 times,  $p < 0.01$ ), "Rising of torso from lying position for 30 seconds, q-ty of times" (from 26.17 to 34.17 times,  $p < 0.001$ ), "Jumps for quickness for 20 sec., q-ty of times" (from 27.92 to 32.00 times,  $p < 0.05$ ), "20 meters run, sec."; also improved indicators of tests "Speed technique, sec." (from 35.00 sec. to 33.17 sec.,  $p < 0.05$ ), "Penalty throws, q-ty of hits from 21 throws" (from 11.42 to 14.17 times,  $p < 0.05$ ), "3 scores throws, q-ty of hits from 21" (from 5.58 to 8.33 times,  $p < 0.01$ ), "2 scores throws, q-ty of hits from 21" (from 12.08 to 15.92 times,  $p < 0.001$ ), "Middle distance throws, q-ty of throws for 40 sec." (from 7.33 to 8.42 times,  $p < 0.01$ ), "Middle distance throws, q-ty of hits for 40 sec." (from 2.67 to 4.92 times,  $p < 0.001$ ), "Special endurance, q-ty of throws for 5 minutes" (from 81.5 to 88.5 times,  $p < 0.01$ ), "Special endurance, q-ty of hits for 5 minutes" (from 32.42 to 44.17 times,  $p < 0.001$ ), "Middle distance throws, q-ty of hits for 40 sec." (from 18.92 to 23 times,  $p < 0.01$ ). In control group (Lithuanian sportswomen) the same changes were less expressed and in most cases not confident.

Application of our worked out training program for female basketball players with hearing problems in annual cycle resulted in improvement of indicators of competition functioning. Experimental group members (combined team of Ukraine) fulfilled confidently more throws and hits from long distance than members of control group (combined team of Lithuania), who, before experiment, had equal indicators with members of combined team of Ukraine and in some cases even better. Also such indicators as "picking ups at own backboard, quantity of times during game" and "picking ups at adversary backboard, quantity of times during game", quantity of interceptions, improved; quantity of fouls of Ukrainian sportswomen's reduced.

We also detected positive influence of the worked out training program for female basketball players with hearing problems in annual cycle with application of innovative technologies on result in main competition. At 22<sup>nd</sup> summer Deaflympic Games sportswomen of experimental group (combined team of Ukraine) showed confidently higher results than combined team of Lithuania (control group) by all indicators except the last and, accordingly, won gold and silver, moving aside combined team of Lithuania (which earlier was ahead of combined team of Ukraine) to the third place. It should be noted that as per preliminary prognosis combined team of Ukraine should take forth place in rating of leading teams of the world and the task was to take the third place. However, application of complex training program permitted for female basketball players to significantly improve results and take second place at Deaflympic Games.

We think that this success was conditioned, mainly, by introducing of innovative technologies in program, which implied application of light device for control of team during training and by application of video-aid on game tactic with animations of tactic combinations, developed especially for this team. Improvement of intensity was reached owing to new system of communication between coach and sportswomen. The offered by us new means of training process's control helped to increase mobility, intensity and motor density of trainings of Ukrainian combined team, increase speed and effectiveness of perceiving of information about tactic interactions and to optimize training process.

Table 3

*Plan – schema of training of women combined team of Ukraine (basketball players with hearing problems) for Deaflympic Games 2013*

Macrocycles	1 <sup>st</sup> macro-cycle										2 <sup>nd</sup> macro-cycle					
	Preparatory			Competition							Transitive	Preparatory			Again Preparatory	Transitive
Mesocycles	I	B	CP	PC, C	C	C	C	C	C	C	P	I	B	CP, PC	C	P
Months	August 2012	September 2012	October 2012	November 2012	December 2012	January 2013	February 2013	March 2013	April 2013	May 2013	June 2013	July 2013	August 2013			
Training camp	Kharkovskaya region, Balakleya											Lvovskaya region, base "Tysoverts"	Alushta			
Quantity of trainings	54	38	40	18	19	21	20	19	4	8	13	4	46	35	2	8
Quantity of control games	-	1	2	6	8	6	8	8	2	-	-	-	-	-	12	-
Correlation of loads (%):																
- physical	45	35*	20*	25*	25*	25*	25*	25*	30*	20*	20*	25	30	20	-	
- technical	25	30*	33*	27*	25*	25*	25*	25*	30*	35*	35*	35	28	30	-	
- tactic	20**	25**	32**	28**	30**	30**	30**	30**	30**	45**	45**	35**	32**	30**	-	
- game	10	10	15	20	20	20	20	20	10	-	-	5	10	20	100	
Kinds of control	-	Ph,TF	-	Tact.F	CF	CF	CF	CF	CF	CF	Ph,TF			Tact.F	CF	

Notes: I – involving meso-cycle; B – basic meso-cycle; CP- control-preparatory meso-cycle; PC – pre-competition meso-cycle; C – competition meso-cycle;

\*- application of LED lighter; \*\*- application of video-aid on tactic;  
Ph,TF – physical, technical fitness; Tact. F – tactical fitness; CF – competition fitness.

### Conclusions:

1. Preliminary analysis of competition functioning of combined team of Ukraine (female basketball players with hearing problems) permitted to make conclusion about demand in qualitative change of training process at the cost of working out and application of innovative technologies, facilitating improvement of communication between coach and sportswomen and, thus, intensify training process.

2. We have worked out and experimentally proved complex program of training of combined team of Ukraine (female basketball players with hearing problems) in annual cycle for main competitions with application of innovative technologies. In technical training main accent was made on perfection of ball handling techniques and high accuracy of throws, especially 3 scores' ones in extreme conditions. We also used new means of training process's control for improvement of mobility, activity and tension of trainings with the help of light devices, which were innovative technology of our program. In tactic trainings we paid attention to increasing of specific weight of active game's forms both in defense and in attacks with the help of method of visibility when mastering tactic interactions and tactic schemas, basing on specificity of every certain adversary. Besides, we perfected situational and planned changes of game's tactic picture in defense with application of author's video-aid with animations that also was innovative technology in training of female basketball players with hearing problems.

3. Application of worked out program in training of female basketball players with hearing problems in annual cycle resulted in improvement of competition functioning's indicators. Basketball players of experimental group (combined team of Ukraine) fulfilled confidently more throws and hits from long distance than members of control group (Combined team of Lithuania), who, before experiment had equal with combined team of Ukraine indicators and in some cases even better. Such indicators as "pick ups at own backboard, quantity per game" and "pick ups at adversary's backboard, quantity per game", quantity of interceptions, improved; quantity of Ukrainian team's fouls decreased. So we detected positive influence of worked out training system in training of female basketball players with hearing problems in annual cycle with application of innovative technologies on results of main competitions.

The prospects of further researches imply development of new technologies for disabled sportsmen, analysis of innovative technologies' influence on competition efficiency, functional potentials, special and physical fitness of disabled sportsmen- representative of other sport games.

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**Information about the author:**

**Sobko I. N.:** ORCID: 0000-0002-4920-9775; sobko.kh@mail.ru; Kharkov National Economic University; Lenina boulevard 9a, 61001, Kharkov, Ukraine.

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**Cite this article as:** Sobko I.N. The preparation for the year main competition teams in basketball with hearing impairments with innovative technologies. *Physical education of students*, 2014, vol.5, pp. 30-37. doi:10.15561/20755279.2014.0506

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Received: 25.06.2014  
Published: 30.06.2014