

An innovative method of managing the training process of qualified basketball players with hearing impairment

IRINA SOBKO

Semen Kuznets Kharkiv National University of Economics, Ukraine

Published online: December 26, 2015

(Accepted for publication October 10, 2015)

DOI:10.7752/jpes.2015.04097

Abstract:

The aim: to justify the use of an innovative method of controlling the training process of the qualified basketball players with hearing impairment. Materials: there were 24 qualified basketball players, aged 20-25, with hearing problems, involved in the study. Results: We created an innovative way of managing the training process for basketball players with hearing impairment. We managed it by using light signals, where a series of commands and instructions regarding the different exercises used in the training process. They were given by changing the colour of lights outside the playing area. We have succeeded to establish that use of the method of controlling the training process of basketball players with hearing impairment has positive effect on physical, technical preparedness and the competitive activities of sportsmen. Conclusion: The developed method of managing the training process of sportsmen with hearing impairment improves physical and technical preparedness, competitive activity of basketball players with hearing impairment.

Keywords: basketball, hearing impairment, training process, management, innovation.

Introduction

Sport is an important factor for rehabilitation and social adaptation of people with health deviations. Active participation in sports activities restores mental balance of people with hearing impairment. Adequate communication during the trainings and competitions contributes to the faster rates of humans' adaptation to the modern life conditions [13, 15, 15]. Participation in sports competitions and training demand much from human body and functioning of all its systems (Arnold P., 1995) [12].

It is possible to name such directions in the field of disabled sports, as: sports traumatology, biomechanics, classification system of sportsmen-invalids, psychology and sociology of sport, development of specialized wheelchairs, impact of training load on the body of sportsmen with disabilities [16, 23]. However, it should be noted that the problems of training of sportsmen with hearing impairment and methodical features of their training are not enough studied by scientific experts. Y.M. Vihl'jaev (2007) [1] studied the problem of increasing the effectiveness of training and competitive activity of swimmers with hearing impairment. M.V. Gabov (2010) [2] revealed the issues of social adaptation of highly skilled fighters who took part in the Deaflympic games. A.N. Kadochkin (2011) [4] showed the effectiveness of joint trainings of physically healthy judo sportsmen and sportsmen with hearing impairment. V.V. Murav'ev-Andreychuk (2013) [5] considered the means and methods of training of snowboarders with hearing problems and pedagogical control of physical preparedness in the annual cycle. O.A. Zavorotna (2008) [3] developed the program for development of coordination abilities of basketball players of 13-14 years old with hearing impairment. D.K. Ammons [11] mentioned that the training of sportsmen with hearing impairment requires from the coach great pedagogical tact, attention, skillful use of success evaluation and strict individual approach. So, P. Kurková (2011) [22] indicates that the sports training of people with hearing impairment requires the systematic correction of the physical condition, moves in the process of improving of sports technique, physical qualities and the load, on the basis of which form the adaptive and compensatory mechanisms.

As we know, the process of sports training is a complex dynamic system, where the management plays an important role. Controlling of the training process is a system of influence on a sportsman with the help of transferring him from the original level of sports preparedness to any other given level in order to achieve sports results [9]. Scientists widely considered the management issues of general and special physical fitness of healthy and qualified sportsmen [29]. However, there is a problem of development and selection of the system of impact on sportsmen with hearing impairment. It requires creative cooperation of trainers, scientists and medical professionals in order to create continuous improvement and scientifically based system of sports training.

Also, information about the problem of training sportsmen with hearing impairment shows that during the training process trainers use common methodological approaches developed for healthy sportsmen [6, 14, 26, 28]. Today many scientific studies deal with the training and competitive activity of high qualified basketball players. The modern system of training of woman's basketball teams in order to achieve high results uses a lot of

new tools and techniques that enhance the workability of sportsmen. R.A. Sushko (2009) [7] developed a method for predicting the level of sportsmanship of skilled basketball players. The study was based on the studying of fluctuation indicators of the level of their workability and moving possibilities at different stages of ovarian-menstrual cycle. L.G. Shahlina (2012) [8] reviewed the specifics of the functional adaptation of the organisms of skilled sportsmen to considerable physical activities. She also studied the biological characteristics of the women's body according to biorhythmology. Z. Kozina, I. Sobko, T. Bazulyk, O. Ryepko, O. Lachno, A. Ilinskaya (2015) [19] developed a theoretical concept of individualization of training process of basketball players. They identified the major factors in the individual structure of sportsmen's preparedness analyzed the rules and prediction of individual dynamics of the competitive impact of and developed the universal method of individualization of training process.

We must note that there are a number of innovations to improve the training process of healthy sportsmen in the modern theory and practice of sports training [26]. Z.L. Kozina, S.S. Iermakov, T.A. Bazulyk and E.V. Voloshina (2012) [20] described the effectiveness of the innovative technology of aqua fitness with some basketball elements. The scientists also based the methods of individual use of innovative technologies. They are the use of psycho-regulatory training with video accompaniment, multimedia technologies, which include combining of different visual means of communication – animation and video technology.

Therefore, the issues of differentiation means and methods of sports training in real condition of studying process of sportsmen with hearing impairment gain topicality. We can suppose that the development of innovative ways to manage the training process will be effective for basketball players with hearing impairment. It also let to improve the quality of communication between coach and sportsmen, as well as speed up and optimize the perception of information by sportsmen.

Materials and methods

The aim – to prove the use of an innovative method of managing the training process of the qualified basketball players with hearing impairment.

Methods of research: theoretical analysis of literary data, methods of pedagogical testing, pedagogical experiment, methods of mathematical statistics.

There are 24 qualified basketball players, aged 20-25, who took part in this research. 12 basketball players with hearing impairment from Ukrainian national team were in the experimental group, 12 equal competitors were in control one. The research was being carried out during 9 months, when the sportsmen of Ukrainian woman's team were preparing to Deaflympic games (6-13 August 2013) in Sophia.

Results

Managing of healthy sportsmen, to give instructions and correct mistakes during different exercises is not difficult for any coach. On trainings of deaf sportsmen, coach spends much time to explain exercises and tactical actions. They must go to him for information, to understand explanation and return to the pitch for the work. This reduces the motive density and efficiency of the training process.

In this regard, we have developed a method of controlling the training process of basketball players with hearing impairment. This allows the coach to give instructions to individual sportsmen and team in general, to monitor the correct performance of commands, to help in improvement of techniques and skills. We set multicolour LED lightings on two basketball posts under the boards at eye-level of sportsmen outside the basketball sports ground. The coach, using the remote control, sent commands using the colour signals. We used three colours (red, blue, green). Depending on what colour lights, basketball players performed a particular action. Light signals were used to improve the technical elements and group and team interactions. Use of lights during the training requires theoretical study of code light signals to perform a variety of technical exercises and tactical schemes. Before the start of training, we provided basketball players with cards with tables, with the help of which they learn a colour coding (Table. 1). Furthermore, we hung a poster with the same information in the gym.

Table 1. Exemplary means of technical training of skilled basketball players with hearing impairment using light coding signals

Technical training			
Colour	Passes	Throws	Notes
Red	Long passes (20-22 m) with one hand on place.	3 points	In pairs, in threes.
Red (flashing)	Long passes (20-22 m) after dribbling with one hand.	3 points after dribbling	In pairs.
Blue	Medium (10-15 m) passes with two hands.	2 points	In pairs, in threes.
Blue (flashing)	Medium (10-15 m) passes after dribbling with one or two hands.	2 points after dribbling	In pairs.
Green	Short (1-3 m) passes with one or two hands.	Penalty throws	In pairs, in threes.
Green (flashing)	Short (1-3 m) passes in jump with one or two hands.	Throws after the double step	In pairs, in threes.

To determine the effectiveness of the applied method of managing the training process, we compared the Ukrainian women's national team with hearing impairment with an equal opponent. The team was engaged in the same amount of time at a standard training program without the help of lamps.

The proposed new way of managing the training process helped to increase mobility, intensity and workability of trainings of the Ukrainian team. Comparative analysis of physical preparedness of basketball players of control and experimental groups after the experiment indicates positive results for the benefit of our team (Fig. 1), after the results of the tests "speed technic, s", (in 2.09 s, $p < 0.01$), "speed of protection movements" (in 1.55 s, $p < 0.05$)

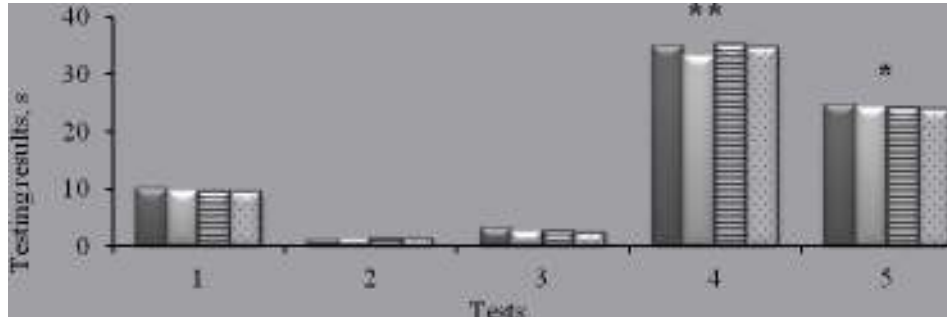


Fig. 1. Changes of the results of special physical preparedness of experimental (n=12) and control group (n=12) after the experiment

– experimental group before the experiment;
 – experimental group after the experiment;
 – control group after the experiment;
 – control group before the experiment;

* - differences between the control and experimental groups after the experiment are significant if $p < 0.05$;
 ** - differences between the control and experimental groups after the experiment are significant if $p < 0.01$;
 1 - shuttle running 2x28 m, s;
 2 - running 6 m, s;
 3 - running 20 m, s;
 4 - "speed technics", s;
 5 - "speed protection movements", s

Comparative analysis of the technical readiness of basketball players of these two groups also showed high results after the experiment (Fig. 2). Our team made according the test results: "3-point throws, the number of hits from 21" (in 1.25 times, $p < 0.05$) "special endurance, the number of throws during 5 minutes" (in 4.92 times, $p < 0.01$), "medium throws, the number of hits from 40" (in 2.33 times, $p < 0.05$).

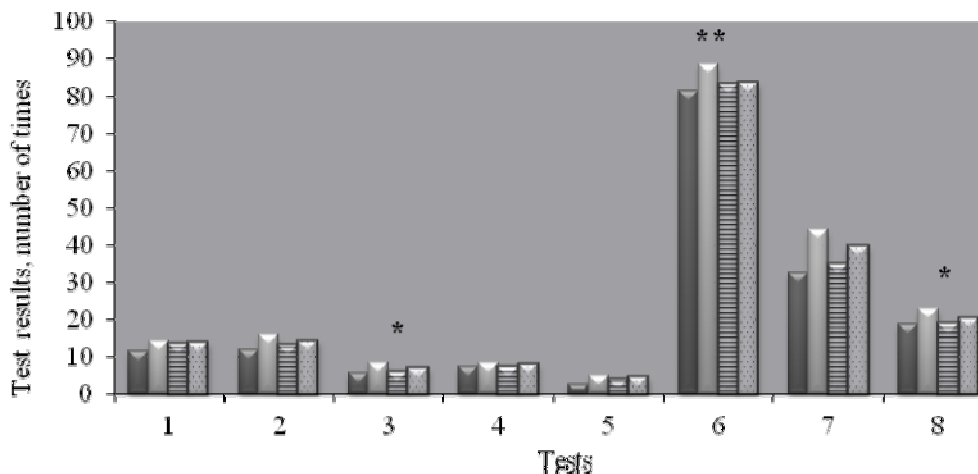


Fig. 2. Changes of the results of technical preparedness of experimental (n=12) and control group (n=12) after the experiment

– experimental group before the experiment;
 – experimental group after the experiment;
 – control group after the experiment;
 – control group before the experiment;

* - differences between the control and experimental groups after the experiment are significant if $p < 0.05$;

** - differences between the control and experimental groups after the experiment are significant if $p < 0.01$;

- 1 - 2-point throws, the number of hits from 21;
- 2 - penalty throws, the number of hits from 21;
- 3 - 3-point throws, the number of hits from 21;
- 4 - medium throws, the number of throws during 40 seconds;
- 5 - medium throws, the number of hits during 40 seconds;
- 6 - "special endurance", the number of throws during 5 minutes;
- 7 - "special endurance", the number of hits during 5 minutes;
- 8 - medium throws, the number of hits from 40;

To confirm the effectiveness of our control method applied in the training process of basketball players with hearing impairment, we compared the results of competitive activity of the Ukrainian team with a stable and equal team at the top world competitions.

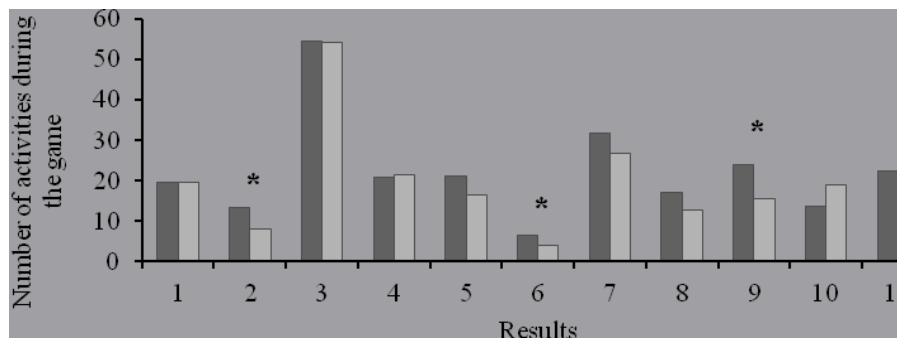


Fig. 3. Changes in competitive activity of the experimental ($n = 12$) and control group ($n = 12$) at the XXII Summer Deaflympics because of use of the innovative method of controlling the training process:

* - $p < 0.01$; ■ - experimental group; □ - control group

- 1 - penalty throws, the number during the game;
- 2 - penalty throws, the number of hits during the game;
- 3 - 2-point throws, the number during the game;
- 4 - 2-point throws, the number of hits during the game;
- 5 - 3-point throws, the number during the game;
- 6 - 3-point throws, the number of hits during the game;
- 7 - defensive rebounds, the number during the game;
- 8 - offensive rebounds, the number during the game;
- 9 - turnover, the number during the game;
- 10 - fouls, the number during the game;
- 11 - mistakes, the number during the game;

Ukrainian team performed significantly more hits from the foul line (in 5.33 times, $p < 0.01$), from 3-points line (in 2.33 times, $p < 0.01$) than the control group of sportsmen. They increased the number of turnovers (in 8.33 times, $p < 0.01$).

Thus, at the XXII Summer Deaflympics Ukrainian national team won the silver medals for the first time. This is primarily due to the increased intensity of the trainings by reducing stoppings, which the trainer made to explain the tasks and controlling the process.

Discussion

Many authors were interested in the problem of optimization of the training process of sportsmen with hearing impairment. For example, I.E. Yankevich [11] proposed the technique of sports training for football players with hearing impairment on the stage of profound specialization. It must contribute to the improvement of the training process and enhance sports results. She made a compilation of video clips of games of the leading football teams for teaching the attack and defense tactics. In addition, coaches and sportsmen together must make regular analysis of these videos.

There is also well-known way of training a sportsman's reaction. In such way, we can control and monitor of the training process according with the training program [21]. However, using this method of training of sportsman's reaction, there is dependence of this reaction on the visual perception of recorded video training. In addition, some use video recording electronic devices to assess the training process, review the recorded stages of the training process and visually establish the effectiveness of training reaction athlete. Therefore, in the control of the reaction there is a need of training in the accurate determination of reaction time athlete that will provide quantitative and qualitative determination of the effectiveness of sportsman's reaction. That is why by controlling the reactions training, we should use special equipment for monitoring and calculating these

reactions. It allows define the effectiveness of training process quantitatively and qualitatively. The main drawback of this method is that it can be used to check the sportsman' reaction, but it is impossible to control the training process. That is, we can not give certain commands and wait for their accurate making, especially when we say about the concerted actions of the whole team [18, 24, 26].

In such way, we have proposed the method of controlling the training process of basketball players with hearing impairment. Where the coach, using the remote control, gives series of commands and instructions by colour signals of the lamps based outside the playing area. Their correct execution is checked visually. Our method is also appropriate for the training of sportsmen with hearing impairment in other team sports, such as handball, volleyball, football, beach and mini-football.

Conclusions

1. We created an innovative way of managing the training process for basketball players with hearing impairment. We managed it by using light signals, where a series of commands and instructions regarding the different exercises used in the training process of sportsmen.

2. Usage of the method of controlling the training process of basketball players with hearing impairment has positive effect on physical, technical preparedness and the competitive activities of sportsmen.

References

- Vihlyayev Y.M. (2007). Leader- simulator for deaf and blind swimmers. *Pedagogics, Psychology and Health and Biological Problems of Physical Training and Sport*. - Kharkiv: HOVNOKU-HDADM. – N 11. - S. 18-21.
- Gabov M.V., Valeev R.Z., Martem'yanov Y.G. (2010). Social adaptation of highly skilled fighters, taking part in the Deaf-and-Dumb Olympic games. *Theory and Practice of Physical Training*. - N 1. - S. 29-31.
- Zavorotna O.A. (2008). Correction of coordination possibilities of basketball players with hearing impairment. *Pedagogics, Psychology, Health and Biological Problems of Physical Training and Sport*. - Kharkiv: HOVNOKU-HDADM, - N 4. - S. 35-38.
- Kadochkin A.N. (2011). The effectiveness of joint trainings of physically healthy judo sportsmen and sportsmen with hearing impairment. *Theory and Practice of Physical Training*. – N 8. - S. 86-88.
- Murav'ev-Andreychuk V.V. (2013). Means and methods of training snowboarders with hearing disabilities and pedagogical control of physical preparedness in the annual cycle. *Adaptive Physical Training*. - 2 (54). - S. 12-14.
- Platonov V.N. (1997). *The general theory of sportsmen' training in Olympic sports*. K.: Olympic Books, 584 pp.
- Sushko R.O. (2009). Prediction of the level of physical mastering of skilled basketball players. *Theory and Methodology of Physical Training and Sport*. - Kiev. - № 3. - S. 87-91.
- Shahlina L.G. (2012). Features of the functional adaptation of organism of high skilled sportsmen to great physical loads. *Sports Medicine. Scientifically-theoretical magazine for scientists, sports medicine experts, coaches*. - Kiev: "Olimpic Literature", - № 1 - S. 114-118.
- Shynkaruk O.A. (2013). *Theory and methodology of sportsmen' training: management, control, selection, modelling and predicting in Olympic sport*. Manual. – K. – 136 p.
- Yankevich I.E. Increasing of operational preparedness to sports training. *Science and Education. Scientific journal*. - Odessa, 2012. - № 2. - S. 121-123.
- Ammons D.K. (1984). American Athletic Association for the Deaf. *Journal of Physical Education, Recreation & Dance*. Volume 55, Issue 2, February, pages 36-37.
- Arnold P. (1995). Word comprehension by hearing impaired and hearing children. *Journal: Educational Research*. Volume 37, Issue 2, June, pages 185-191.
- Arsic R., Slavnic S., Kovacevic J. (2012). Sports Activities as a Factor in Socialization of Deaf Students. *Journal of Physical Education and Sport*, 12 (1), Art 1, pp. 3–8.
- Gaetano A., Gaetano R. (2014). Global vision to understand the game situations in modern basketball. *Journal of Physical Education and Sport*, 14 (4), Art 75, pp. 493-496.
- Graib A.A., Qablan S.A., Aldmour H.A. (2012). Effect of some personal attributes-anxiety and tension on the level of performance of basketball aiming skills for deaf players in Jordan. *European Scientific Journal* Vol. 8, № 6, pp. 45-49.
- Groff D.G. Influence of adapter sport on quality of life: Perceptions of sportsmen with Cerebral Palsy. *Disability and Rehabilitation*, 2009, vol.31 (4), pp. 318-326.
- Harris K. (2008). Deaf International Basketball. International Committee of Sports for the Deaf 12-14, www.dibf.org/
- HongXia M. (2010). Effects of different sports events on the physical self of deaf college students. *Journal of Physical Education*. Vol. 17 No. 6 pp. 55-59.
- Kozina Zhanneta, Sobko Irina, Bazulyk Tatyana, Ryepko Olena, Lachno Olena, Ilintskaya Anna. (2015). The applying of the concept of individualization in sport. *Journal of Physical Education and Sport*, 15 (2), Art 27, pp. 172-177. <http://dx.doi.org/10.7752/jpes.2015.02027>

- Kozina Z.L., Iermakov S.S. (2015) Analysis of students' nervous system's typological properties, in aspect of response to extreme situation, with the help of multi-dimensional analysis. *Physical education of students 2015*; 3: 10-19. <http://dx.doi.org/10.15561/20755279.2015.0302>
- Kozina Zhanneta, Prusik Krzysztof, Prusik Katarzyna. (2015). The concept of individual approach in sport. *Pedagogics, psychology, medical-biological problems of physical training and sports*. N 3, pp.28-37. <http://dx.doi.org/10.15561/18189172.2015.0305>
- Kurková P. (2011). Factors impacting participation of European elite deaf sportsmen in sport. *Journal of Sports Sciences Volume 29*, Issue 6, March, pages 607-618.
- Kostopoulos N., Bekris E., Apostolidis N., Kavroulakis E., Kostopoulos P. (2012). The effect of a balance and proprioception training program on amateur basketball players' passing skills. *Journal of Physical Education and Sport*, 12(3), Art 47, pp.316-323.
- Laferrier J.Z. (2012). Technology to improve sports performance in wheelchair sports. *Journal: Sports Technology*, Volume 5, Issue 1-2, February, pages 4-19.
- Martinez M. (2000). *Deaf student makes the cut on college basketball team*. Community college week. Cox Matthews and Associates, № 16, P. 59-68.
- Moistsrapishvili K.M., Egoyan E., Mirtskhulavaetal M.B. (2005). Biomechanical Analysis of Certain Sport Movements by Means of Video-Computer Modelling. *Bulletin of the Georgian Academy of Sciences*, vol. 172. N 3. – P. 543-545.
- Ross G.M. (1999). Innovative Information Technology and Its Impact on Recreation and Sport Programming. *Journal of Physical Education, Recreation & Dance*, Volume 70, Issue 9, November, pages 26-30.
- Sasa J., Milivoje K., Zoran P., Branko G., Radivoj M. (2011). Influence of anthropometric characteristics on speed abilities of 14 years old elite male basketball players. *Journal of Physical Education and Sport*, 11(2), Art 34, pp. 221-225.
- Tyshchenko V., Popovich O. (2015). Control of general and special physical preparedness by qualified handballers. *Journal of Physical Education and Sport*, 15 (2), Art 43, pp. 287-290.