

## **BODY HEIGHT AS THE DOMINANT FACTOR IN MODERN VOLLEYBALL GAME**

**Predrag Nemeč<sup>1</sup>, Vesna Nemeč<sup>2</sup>, Goran Brezić<sup>3</sup>, Katarina Nejić<sup>4</sup>**

<sup>1</sup>Fakultet za menadžment u sportu, Alfa BK Univerzitet

<sup>2</sup>Fakultet za fizičku kulturu i menadžment u sportu, Univerzitet Singidunum

<sup>3</sup>Treća beogradska gimnazija

<sup>4</sup>Fakultet sporta i fizičkog vaspitanja, Univerzitet u Nišu

### **Abstract**

Observing and analysis of the development of volleyball has shown that the tendency of modern volleyball is increasingly moving towards rationalization of movement in the game, and the ease of winning game points. In addition, it is evident that this tendency is a dominant factor in the form of body height, which results in more frequent wins for the teams that have an average height of players of around 2m in their lineup. Dominance in the body height is not important only for middle blockers, but also for players who have their roles in spiking, digging, blocking, and even those who are in the role of the libero. The expressiveness of the anthropometric variables is also represented in the spike service, which is becoming an increasingly effective means of attack. When the motor skills are adequately developed to be consistent with the level of body height, then a team game is gaining stability and continuity in the achievement of results.

**Key words:** rationalisation of movement, body height, efficiency of attack, deep formation, shallow formation.

### **Introduction**

The truth is that the experts' estimates of volleyball players' future prospects do not depend only on body height, however, they still do play a dominant role in modern volleyball. In fact, a large number of situations in the concept of volleyball play are associated with body height and length measurements of the body extremities. In the analysis of performance success and contributing factors, undisputed importance of anthropometric variables for

quality and creating new opportunities in the future of volleyball is confirmed. Since every time bears some innovations, it is almost certain that this feature will be crucial in the future.

Today's play provides an offset of several processes critical for modernising and improving the game; these processes can be achieved by rationalizing volleyball techniques, optimizing the time spent on training and determining the strategic orientation. In an effort to achieve improvements in the game, more and more training is often erroneously resorted to, which leads to overtraining and rapid "spending" of players. Thus, daily training sessions lasting several hours accelerate deterioration of players, i.e., "spending" of already created resources, and overload leads to faster, more frequent and more severe injuries. On the other hand, to determine the strategic orientation of the team, it is necessary to, first of all, perform laboratory selection of players, because it will show their genetic structure as well as opportunities for further guidance, both individually and as a team. Already in this initial step of creating a team, it can be seen that making a selection is conditioned by body height. Very often players of distinct height get advantage over those who belong to the volleyball "average". The reasons for the trainer's choice in favour of higher players are numerous. The first is that they are "permanently" in the block, they can block standing, due to a greater arms span they can cover a larger space above the net, but also in the field. They do not jump too high in the first pace, they can block it by simply rearing on their toes, which gives them the ability of timely blocking the second pace. Therefore, they do not get tired too quickly, because they use their level and speed generated force in a rational manner (Milošević, 2014). Another reason is the unquestionably greater height reach when spiking, blocking or digging. Further, they spend less time in the air, which gives them an advantage over the lower height players, whose time, due to lack of height, is extended between two actions (e.g., blocking or spiking). And the last reason, they can have an indirect role in the realization of effective attacks by teammates. As such, they represent a constant threat on the net, so they can easily draw attention to themselves and "pull" the block, thus leaving space for other hitters.

According to Kretschmer, there are three main types of the human body. The most desirable and appropriate for the needs of volleyball is the first type - leptosomic. They are characterized by narrow shoulders, long body, long upper and lower extremities, pronounced long fingers and large feet. This type is appropriate for the position in a team where the dominance is present in the subtle performance of volleyball techniques, such as service, spiking, blocking, digging and even in play in the field. Another type – athletic – most often find their place in the libero role, but with the possibility of later switching to the setter position, and even to that of the hitter. Due to the broad shoulders, long torso, short lower extremities, short upper extremities

levers and short hand, players of this type have an extremely low center of gravity, big arms span and the ability to cover a large area. Finally, the "moderate pyknic" is characterized as a type with long legs, short torso, elongated neck, long feet, slightly wider hips, long fingers, length of the forearm and upper arm are proportional to the torso length. As such, this type is mainly found in the position of the middle blocker. Although manifesting low-level jumping pulses, this type has a great hand speed in setting up the block, an excellent assessment in closing the space above the top of the net, good timing of arrival to the place where the opponent will spike, moves easily and quickly from the attack phase (spiking) to the defence stage (blocking) and often become supporting diggers. It is also characterized by an extremely small number of mistakes.

When team positions are successfully assigned based on longitudinal characteristics, but also on mental and physical abilities, it is much easier to begin creating team orientation and the process of teamisation (team creation). Given the need to monitor modern volleyball trends, it is increasingly evident that the current team compositions, as well as the so-called "deep formations", is a thing of the past. Although it is sometimes difficult to give up the standard concepts and established habits, it is undeniable that the top volleyball game is changing and is taking on new forms. One of future efforts should be a painless transition to the so-called "shallow formation" (Tomić, 2000), which, due to its innovativeness and increased speed of play is slowly finding its place in some top teams, which further contributes to an increased efficiency and attractiveness of play. It is expected that upcoming talents will bring certain innovation during an unconscious adaptation to new standards of modern volleyball, thereby aiding that this formation obtains a deserved place. Its application can help in that dominance in height could play a crucial role in modernizing the old volleyball templates.

### **Characteristics of length measurements of volleyball players and their function in competing**

A large number of studies on volleyball players in recent years have been conducted in areas of longitudinal dimensionality, in order to establish what are the predispositions that bring success in the competition. In fact, if we observe the position of the middle blocker, it is clear that in the men's competition, the players usually chosen are over two meters tall and very mobile, in order to get to areas where they predict the ball will be sent by the setter. In addition, the middle blocker must be characterized by a great sense of space, as well as capable of closing the space above the net's upper edge at the net in line with the movement of outside blockers. In the case of the

middle blocker with extreme body height and big arms span, deficiencies are often expressed in the speed when it comes to reaching outside blockers and adequate merger before the jump. Due to their natural clumsiness, it is necessary to work on coordination in training in order to reduce it, but it is also important to make use of their advantage over the other players at blocking a penalty or double penalty, and even "pipe". Such players are often said to be constantly in a position to block, because in some situations it is enough to "rear" on the toes or just jump a little (as blocking during fast actions) in order to perform a successful block, for which others need to fulfill the previously mentioned requirements. When it comes to dimensions of middle blocker's extremities, the rule that the size of the hand is in proportion to body size has proved to be the best.

Unlike the middle blocker, the size of the hand in the extreme hitter should be proportionally smaller in comparison with the size of the body, because the muscle innervation and peripheral hand speed is often crucial in the final outcome of the results when spiking. However, although it is known that good hitters have a smaller hand compared to others, it does not mean that players with bigger hands are not good hitters. The adopted technique was proved to be a much more important factor, as well as the use of the intellect in competition. Besides, the experience factor that comes with years of playing and acquiring knowledge, be it on their own or other's examples, should not be forgotten.

Another fact perceived in major competitions should be added to this analysis: there is no team that has achieved high placement whose setter was not in the category of players with a body height of about two meters. In the past setters were short and highly explosive, however, they made up for the lack in height performing high vertical jumps. Today, it is increasingly common that the setter is extremely high, which gives him the opportunity to surprise and personally manifest the innovative play which is hard for opponent to predict, and therefore reacts to it more slowly and with greater difficulty. In addition, this type of setter reaches the "spilt" balls more easily, and becomes a conductor in blocking, due to a very good sense of space he has. Observed from the position of the server, each player, including the setter, has the opportunity to learn several types of service, amongst which is a spike service, which in some shorter setters impaired his effectiveness in the past.

We believe that in the future the tendency of coaches should be to find young players with the mentioned body height and with a pronounced sense of defensive play. As such, a very young player, should be coached for the role of a defender, or even a libero, but with parallel training for the role of the hitter, so eventually, with maturing and acquiring playing maturity he will become the main carrier of the play in attack. By then he would already have

acquired some knowledge of the defensive play, then in critical situations can take on the responsibility of the defence organization and increase its efficiency. In addition, knowledge of playing in defense will give him a different perspective that will help innovative solutions during matchplay and achieving a more efficient attack. (Tomić, Nemeč, 2012)

Based on body height it is possible to build tactical attack variants applied in a variety of different team compositions and playing systems. The best proof in practice that this feature is a dominant factor in modern volleyball is reflected in the application of team composition 3 + 2 + 1 + libero (3 middle blockers + 2 hitter-receivers + 1 setter +1 libero) (Nemeč, 2005.). The superiority at the net leads to the possibility of increasing the diversity of actions, both in attack and in defense, which aims to develop new ideas and creative solutions during the volleyball match play.

### **Types of attacks in modern volleyball “deep formation“attack**

Today it is a common belief that for a good attack to be organised, it is extremely important to achieve a successful service receiving. At the beginning of jumping service an emphasis on this element of volleyball play has become evident. Every team strives to have at least two specialists in service receiving. They are usually positioned diagonally, so that in each rotation, one of them is in the area of defense. However, as one player is insufficient to protect the space when receiving the service, then the other one at the net joins the zone of defense to help. His retreat leads to the retreat of the defense zone players. This creates a "deep formation" whose main characteristic is setting up a large number of players near the court endline.

The player from the attack zone that is receiving the service or is just preparing to receive it, exerts a long run up in the attack, the most appropriate and most effective for a "third pace" attack type. Given the fact that the role of these two attackers - specialist for service reception is very exhausting, they tire fast and their attack success is reduced, which is further aggravated by the fact that their movement due to the long run up is easily noticeable and therefore easier to block by the opposing team. Therefore, it is worth noting and remembering that "long run-up with spiking is burdened with a number of deficiencies" (Tomić & Jerry's, 2012), which places the "deep formation" in an untenable position and is somewhat outdated in the current, extremely fast volleyball.

## **“Shallow formation“attack**

Nevertheless, "deep formation" can have its advantages when treated as a possible option, not as the basic model of attack, because in certain situations it brings an element of surprise and changes in the rhythm of play. Opposite to it is the possibility of organizing the attack with a "shallow formation", which represents a new way of looking at the organization of the attack, in part self-imposed due to increased speed of volleyball matchplay.

The main characteristic of the "shallow formation" is the ability of a large number of players to play the role of the setter, giving the opportunity to increase possibilities in the realization of attacks, as well as the reduction of predictability evident in the "deep formation". In relation to the team composition this represents the 3:3, 2:4 relations, and in most favourable case 0:6. A transitional form of the "shallow formation" is a team composition along the 3:3 principle, but significantly stronger and more stable is the 2:4 one. In this formation tactical variants with specialists in the team attack are developed, positions become the main orientation, and so become the hitting power of the specialist attackers (Nemec, 2016) and the construction of high-level technical execution of the two specialist setters and the two other setters. Players are arranged according to individual abilities, with two spiker specialists diagonally arranged, with a level of cooperation with nearest teammate becoming most important.

Unlike the "deep formation", the service in this formation is received only by defenders, usually two of them. Here, we should not neglect the possibility of service reception with three or more players, but in the "shallow formation" this is not treated as a system solution, rather as a possible option, particularly in crisis situations, which implies mainly a critical service reception. (Tomić, Nemec, 2012)

Generally taken, the basic characteristic of the "shallow formation" is a higher level of technique of all players in all elements of play, especially in lifting and receiving the service. This tendency is imposed as a condition of organizing the attack with the mentioned type of formation, slowly ending any exclusive specialization of players for certain roles and creating their versatility. However, although the "shallow formation" aims to create this kind of dual possibilities, care must be taken that some players do not get continuously assigned the roles that are not intended for them, i.e., in those elements in which they do not show a high level of technique. Today, cases in which hitters are "playing" lifters – specialists are dominant, and in some instances they even try lifting the specials, for which the adopted techniques and a certain level of virtuosity are essential, but are not gained with simple observation of teammates during the execution or a random try during the match. In this sense, the "shallow formation" offers great opportunities for a

large number of attack variants of the whole team, whereas a small number of those applied by individuals, which significantly improves the quality of the whole team and safety performance.

Other than that, the speed of winning points (dominant even in the short run up for the spike typical of this formation) that will also increase the efficiency of play, but will also give particular advantage to taller players, is already widely present in modern volleyball. Thus, the attack is accelerated without increasing the speed of movement of either the players' movement or the ball. Consequently, the "width of attack" is less prominent and there is more variability and flexibility and/or individual ability and intuitiveness. It is in this way that a significant specific expression of each player is gained, including departing from templates and a greater range of innovative solutions. Any departure from the template reduces the predictability giving the possibility of surprise, which makes it difficult to the rival to succeed in defence. In short, the "shallow formation" inclines towards the up to now unusual, and sometimes even illogical realization of ideas. For this reason, the "shallow formation" is moving in the direction of natural progress and development tendencies in volleyball, primarily on the level and manner of the matchplay and will bring a range of innovative, creative solutions as well as unpredictability, making the game additionally interesting and fluent.

## **Conclusion**

The aim of this study was to briefly present the main characteristics of and explain the term "shallow formation". Since it is a formation that is yet to come, and is yet to be developed, it is unnecessary to further elaborate on its templating and its creation. On the contrary, full freedom of access should be allowed because the only way to get a new perspective on the volleyball game and devising of innovative approaches in the organization of attack. It should be noted that the entire "system" will not be built in one place, as it never has been the case. It has always represented a mosaic into which details from various parts of the volleyball world were installed.

It is necessary that methods should be developed to include new, more attractive situations and actions into the strategic orientation in order to attract all volleyball lovers. Of course, one is bound to be faced with fierce resistance to the new direction in the development of volleyball. For innovation to be accepted, one must first understand it to the tiniest details, and such details are very important in setting the idea. The current national team coach Nikola Grbic, however, has a sense of unusual, non-template team leadership. Of course there is plenty of space for the innovative

rationalization of the game if the body height is properly used and implemented through phases that are mentioned in this article.

## Literature

1. Milenko B. Milosevic, Eleonora D. Dzoljic, Milos M. Milosevic, Morteza Jourkesh, & David.G. Behm. (2014). The Analysis of Muscle Force Development with Trained and Elite Athletes. *Physiology*, 24(1-81):5-12.
2. Milosevic, B.M., Nemec, M.P., Zivotic, R.D., Milosevic, M.M., & Rajovic, D.R. (2014a). Force distribution model of motor units of leg extensor muscles. *Journal of Sports Sciences*, 2(3):195-199.
3. Milošević, B.M., Milosevic, M.M., Nemec, M.P., Zivotic, R.D. & Radjo, II. (2014b). A new approach to development of human maximal muscular force. *Journal of Exercise Physiologyonline*, 17(5):70-80.
4. Milošević, B.M., Nemec, V., Yourkesh, M., Nemec, P., Milošević, M.M., & Behm, GD. (2016 u štampi). Determination of capacity and rules of the variability of maximum force using nonlinear mathematical models: a case study. *International Journal of Sport Studies*.
5. Nemec MP., Milosevic MM., Nemec JV. & Milosevic, BM. (2016). Production and development of muscle force in elite male volleyball players' spike, *Sport Science* 9, Suppl 2: 32-40, Print ISSN: 1840-3662,
6. Nemec, P., (2005). *Mogućnosti nove kompozicije tima 3+2+1+(L) u odbojci*, I Međunarodna konferencija „Menadžment u sportu“, Beograd,
7. Nemec, P. (2002). *Odbojka i oko nje*, Beograd: SIA.
8. Nemec, P. (1989). *Odbojka – fizis i motorika*, Beograd: SIA.
9. Tomić, D. (2000). *Odbojka – napad plitkom formacijom*, Beograd: Sportska akademija.
10. Tomić, D. (1989). *Odbojka budućnosti*, Beograd: SIA.
11. Tomić, D. (1984). *Trening dizača u odbojci*, Beograd: Institut za unapređenje organizacije rada i stručno usavršavanje kadrova.
12. Tomić, D., Nemec, P. (2012). *Odbojka u teoriji i praksi*, Beograd: SIA.
13. Tomić, D., Nemec, P. (1989). *Teorija odbojkaške prakse*, Beograd: SIA.