



Survey and Compiling a Talent Identification Model for Volleyball Elite Players

Shirin Hosseinzadeh¹, Marefat Siahkoughian^{2*}

1. Department of Sport Physiology, University of Mazandaran, Mazandaran, Iran. E-mail: sh.hosseinzadeh4@gmail.com. ORCID: 0000-0001-9650-6783

2. Department of Sport Physiology, Faculty of Educational Science and Psychology, University of Mohaghegh Ardabili, Ardabil, Iran. E-mail: M_Siahkohian@uma.ac.ir. ORCID: 0000-00002-2166-897X

ABSTRACT

The purpose of this study was to survey and compiling a talent identification model for volleyball elite players. The statistical population of this study was all elite volleyball boys' players in ardabil city. Among the statistical population, 16 individuals were selected as a sample. All tests were performed on three consecutive days. On the first day, anthropometric features including lengths, environment, latitudes as well as body composition were measured. Then on the second day, the physiological and physical fitness features including: anaerobic capacity, agility, speed, muscle strength, reaction time, coordination, and power were taken. Finally, on the third day, the flexibility, muscular endurance and cardiorespiratory fitness were taken. SPSS software version 23 was used for statistical analysis and excel software was used for charts. The results showed that ardabil players are at a low level physiologically and anthropometric. The results of the study showed that the average speed of players was 5.92 seconds, the mean agility was 12.09 seconds, the average anaerobic capacity was 426 watts, the mean cardiorespiratory endurance was 43.24 ml / kg/min, the mean set up 44. 12 per minute The mean of vertical jump was 52.5 cm, the mean flexibility of 43.51cm, the average power of 50.56 kg, the mean coordination of 66.06 min / min, the mean time of the reaction time was 0.3152, as well as the mean height of 183.45 cm, the mean of the sitting high 94.10 cm, the mean of the wingspan was 194.35 cm, the mean palm length was 11.11 cm, the average fat percentage was 21.38 kg, and the average fat mass was 62.86 kg. The results indicate that the players in ardabil are at the lower level in terms of anthropometric and physiological indices. From the finding of this study, it can be conducted that the players of the present research study were low on anthropometric and psychological characteristics and these players are weak and have deficiency in terms of physiological and physical fitness that are modifiable defects, more than anthropometric.

Keywords: Physiological, Biometric, Talent, Elite, Volleyball

Corresponding Author: Marefat Siahkoughian, Professor of Sport Physiology, Department of Sport Physiology, Faculty of Educational Science and Psychology, University of Mohaghegh Ardabili, Ardabil, Iran. E-mail: M_Siahkohian@uma.ac.ir. Tel: 09144511435

INTRODUCTION

Due to the rapid progress of human society in various dimensions, sport has not been deprived of this progress and athletes around the world are trying to reach the peak in the shortest possible time by using the results of expert research and gain new success every day. There is also increasing competition between different countries today for medals in continental, world and Olympic competitions; And with increasing scope and reach of video media and virtual social networks, which has increased the importance of the propaganda and political aspects of sports, this competition is increasing. And today we see that countries such as Qatar and Azerbaijan in a planned and organized way to attract talented and elite athletes from other countries. Many countries are trying to identify talented athletes by developing their system structure to enable the development and promotion of a sport (1).

One of the most important concepts in sports science and physical education is the process of identifying talent. The objective meaning of identifying sports talent is to identify and select people who, compared to others, have a great ability for a particular sport. Talent identification means discovering potential athletes who are not currently involved in a particular sport (2). Therefore, the main goal of the talent identification process is to select and discover the athletes who have the most ability for a particular discipline (3).

Due to the wide distribution that exists between different types of sports in terms of physical, physiological, psychological, body type and biological capabilities, the use of accurate and scientific information in relation to the correct placement of each person in appropriate sports. With his talents, it is considered an undeniable necessity. A successful talent identification program will be useful when the indicators and effective determinants of that sport can be properly identified (4). One of the most important factors influencing the success of different sports is the physiological and psychological criteria and finally the specific anthropometric characteristics of that sport (5). Positive consequences of talent identification include: shortening the time to reach the peak of the championship, saving workload and energy consumed, increasing the probability of the athlete reaching the peak of performance, increasing self-confidence and indirect emphasis on the progress of related sciences. So far, in the championship sports section, the necessary planning has not been done in order to identify talents, and the identification and selection of sports talents has been largely ignored, or in a traditional way, relying on the personal experiences and opinions of physical education coaches and teachers. And sports are done in schools and clubs, as well as some parents of interested children and adolescents (6).

Identifying talent in sports teams is more difficult than individual sports, and it is necessary for sports talent to be understood as a dynamic concept through the interaction of several factors (7). Volleyball is an exciting and fun sport that has a special place among other sports and has many fans around the world as well as in Iran. Due to the nature of this sport and the playing environment, volleyball players have special physical characteristics that play a decisive role in achieving the peak of athletic performance and success in various competitions (8).

Physiological, physical, and skill levels of players are among the factors that may limit a volleyball team's tactical and technical potential. Bodybuilding features are an important factor in the development and success of volleyball players. Optimal physical physics is clearly an advantage for volleyball performance. When a volleyball team has the set of optimal bodybuilding characteristics, the probability of superiority in games increases (9). Physical factors such as strength, agility, speed, flexibility, and motor factors such as reaction time, jump, coordination are important factors in talent identification (10).

In a study entitled "Assessing the current situation and developing talent identification indicators in the field of volleyball" was conducted from four groups of club coaches (25 people), first-class domestic coaches (21 people), foreign coaches (17 people), school coaches (24 people), the results showed that out of 28 indicators, eleven indicators, respectively: sense of cooperation, decision-making power, speed, responsibility, jump in place, jump defense, height, service, courage, agility and other indicators in the process of finding talent for volleyball Are more important (11).

Considering the above and the need for sports talent for better results and also the lack of codified talent in the field of volleyball, the present study intends to investigate and develop physiological and biometric indicators of talent in the elite volleyball players.

Research methodology

Subjects

The statistical population of this study was all elite male volleyball players in Ardabil. From the statistical population, 16 people were selected as the statistical sample by purpose sampling. The participation of the players in the testing was voluntary.

Method

In this study, the subjects were first invited to the test site and arrived at the university health center at the designated time, where they filled out and signed a questionnaire of personal characteristics and health and consent and with different stages of the test and how. They became familiar with the execution of the movements and participated in this study with full knowledge. Subjects were asked to abstain from eating and drinking too much fluid for three hours before the test in order to measure their body composition. All tests were performed on three consecutive days. On the first day, anthropometric features including lengths (sitting height, standing height, longitudinal range of both hands, palms) and percentage of fat through the thickness of the skin folds of four points (three arms, two arms, under the shoulder, above (Special) was calculated. Body composition was also measured at the University Health Center. Then on the second day of physiological and physical fitness tests including anaerobic capacity (RAST test), agility (T test), sprint (40 yards), low explosive power (sergeant jump), reaction time (computer software) Dr. Memarbashi's reaction time (coordination) (tennis ball throwing), shoulder girdle and arm muscle strength (Madison Ball throwing) was taken in the university's physical education hall. Finally, on the third day, the subjects were tested for flexibility of the trunk (bending forward using the box), endurance of the trunk (lying down and sitting), and finally the test for maximum oxygen consumption (Bruce test).

Statistical Methods

Descriptive statistics were used to categorize the obtained information. SPSS statistical software was used for statistical calculations and excel software was used for drawing graphs.

Results

The personal characteristics of the subjects including age (year), height (cm), weight (kg), fat (percentage), body mass index (kg / m²) of the subjects are given in Table 1-4.

Table No. 1- Mean and standard deviation of subjects' physical characteristics

Mean ± standard deviation	Variable
18.12 ±1.45	Age (years)
183.45 ±7.41	Height (cm)
72.16 ±9.87	Weight (kg)
18.12 ±1.45	Fat (percentage)
21.38 ±2.08	Body mass index (kg squared)
62.86 ±7.15	Lean body mass (kg)

In Table 2, the results of the norms of elite male volleyball players in Ardabil are reported, and according to these results, the status of these norms in this group can be seen.

Table No. 2 - The results of the norms of the elite male volleyball players of Ardabil

Percent	Number	Interpretation of results	Range	Norm
12.5	2	Excellent	5.5<	Speed (seconds)
43.75	7	Good	6-5.5	
31.25	5	medium	6.5-6	
12.5	2	Weak	6.5>	
6.25	1	Excellent	10<	Agility (seconds)
12.5	2	Good	11-10	
18.75	3	medium	12-11	
50	8	Weak	13-12	
12.5	2	Very weak	13>	
18.75	3	Excellent	50>	Flexibility (cm)
50	8	Good	50-40	
18.75	3	medium	40-30	
12.5	2	Weak	30<	
6.25	1	Excellent	678>	Anaerobic capacity (watts)
37.5	6	Good	678-512	
50	8	medium	512-346	
6.25	1	Weak	180<	
6.25	1	Excellent	50>	Cardiopulmonary endurance (ml / kg / min)
31.25	5	Good	50-45	
31.25	5	medium	45-40	
18.75	3	Weak	40-35	
12.5	2	Very weak	35<	
0	0	Excellent	60>	Muscular endurance (per minute)
18.75	3	Good	60-50	
56.25	9	medium	50-40	
18.75	3	Weak	40-30	
6.25	1	Very weak	30<	
6.25	1	Excellent	70>	Explosive power (cm)
6.25	1	Good	70-60	
37.5	6	medium	60-50	
50	8	Weak	50-40	
0	0	Very weak	40<	
6.25	1	Excellent	80>	Power (kg)
6.25	1	Good	80-60	
75	12	medium	60-40	
12.5	2	Weak	40<	
6.25	1	Excellent	0.20<	Reaction time (milliseconds)
6.25	1	Good	0.40-0.20	
12.5	2	medium	0.60-0.40	
18.75	3	Weak	0.80-0.60	
56.25	9	Very weak	0.80>	
18.75	3	Excellent	80>	Coordination time (number)
12.5	2	Good	80-70	
43.75	7	medium	70-60	
18.75	3	Weak	60-50	
6.25	1	Very weak	50<	
25	4	Excellent	190>	Standing height (cm)
18.75	3	Good	190-185	
12.5	2	medium	185-180	
37.5	6	Weak	180-175	
6.25	1	Very weak	175<	
18.75	3	Excellent	98>	Sitting height (cm)
6.25	1	Good	98-96	

18.75	3	medium	96-94	
37.5	6	Weak	94-92	
18.75	3	Very weak	92<	
6.25	1	Excellent	210>	Length of both hands (cm)
31.25	5	Good	210-200	
25	4	medium	200-190	
31.25	5	Weak	190-180	
6.25	1	Very weak	180<	
6.25	1	Excellent	12>	
37.5	6	Good	12-11.5	
25	4	medium	11.5-11	
25	4	Weak	11-10.5	
6.25	1	Very weak	10.5<	
18.75	3	Excellent	70>	Lean mass (kg)
18.75	3	Good	70-65	
25	4	medium	65-60	
18.75	3	Weak	60-55	
18.75	3	Very weak	55<	

DISCUSSION

Anthropometric features and body composition.

The results of the present study showed that the average standing height of the players was 183.45 cm, the average sitting height was 94.1 cm, the average length of both hands was 194.35 cm, and the average palm length was 11.11 cm.

Volleyball in the country needs a comprehensive plan and a uniform model to find talent in order to reach the top of the world championship. Therefore, it seems necessary to carry out detailed studies in other provinces of the country for better conclusions. Avanser et al. (2013) in a study aimed at describing and measuring the profile of physical fitness, anthropometric and body composition of volleyball players of the national team. After reviewing the results, they concluded that the national team players were lower than the top eight teams in the World Cup in terms of anthropometric indicators and body composition. These results are consistent with the results of the present study (12).

According to the results obtained from anthropometric tests, it can be concluded that Ardabil players were at a low level in terms of anthropometric characteristics and the reason seems to be the inadequacy of players' physics with the needs of volleyball. Lack of awareness of coaches about the important anthropometric factors for selecting the right people and that players have entered the sport based on personal or family interests.

When a volleyball team has all the optimal bodybuilding features, the chances of winning the game increase. Anthropometric indicators, which are undoubtedly important in volleyball talent identification, have different dimensions. Height is one of the most important anthropometric indicators in the last one or two decades.

Because success in volleyball requires passing the ball over the net, teams compete through spike and defense skills on the net. Hence, height is an important advantage and many researchers have suggested that height is the most important condition in finding talent in this sport. Height is one of the most important success factors in volleyball, but according to the results, volleyball players were at a low level of height. They were also low in terms of sitting height.

The length of hand plays an important role when defending and defending. The length of hands allows players to reach more height and control more extensive space during the defense. It has been suggested that the wide and wide access height of the hand is an essential factor for the height of the spike and the defense. The length of the hands of elite volleyball players is about 5 cm taller than their height. The length of the hand and the maximum access height have close contact. Compared to existing Norm, as well as the two hands, which is another success factor in the field, the length of the two players' length should be taken into account in this study.

The outstretched hand gives the player the ability to hit more contact with the ball while hitting the ball and striking the ball with the level of contact. In addition, players can be helpful in competitive, defense and service

situations in successful implementation of the donor technique as well as the players palm on a poor level.

In terms of body composition, the low fat percentage of the players undoubtedly leads to an increase in vertical jumping, spike jumping and agility, and further increases the ability to perform technical and tactical tasks specific to volleyball. In general, a low fat percentage is very important for high physical performance in sports. Studies have shown that the percentage of fat plays a key role in the rate of jumping. The results showed that the players had a higher percentage of fat compared to the results of other studies.

Physiological characteristics

The results showed that the average speed of the two players was 5.92 seconds, the average agility was 12.09 seconds, the average anaerobic capacity was 426 watts, the average cardio-respiratory endurance of the players was 43.24 ml / kg, and the average muscular endurance was 14.12. The average power was 52.5 cm per minute, the average power was 50.56 kg, the mean coordination was 66.06 beats per minute, the average reaction time was 0.3152 milliseconds and the average flexibility was 43.51 cm.

These findings are not consistent with the findings of Hadavi et al. (2015) and Avansar et al. (2014) because Ardabil players were at a lower level compared to this research (12, 13).

Cardiac readiness - a good respiratory readiness for the long races that fall into the fifth set and in days where several matches take place is important. Speed and agility consist of important performance factors in volleyball. These factors are essential in the first valley, the first, the second on the net, the passing of all kinds of passes, and the longest distance in the first condition. One of the important physiological factors for volleyball players is anaerobic power because the dominant energy system is in volleyball and anaerobic glycolysis. Volleyball players have different paths and movements which require the highest flexibility in the back and groin area. The flexibility of the lumbar region and the shoulder and shoulder plays a pivotal role in the desirable implementation of the skills and the contribution to the joint movement of joints while exercising. The results obtained from physiological tests showed that, like the Anthropometric features of the ardabil players in physical and physiological readiness compared to existing norms and results obtained from other research.

Since in order to succeed in volleyball, one must have certain physiological characteristics in order to achieve success. It seems that one of the reasons for the low physiological percentages of Ardabil players is the lack of attention to bodybuilding exercises that are the basis of success in this field. Another reason is related to genetics, which players may not be genetically suitable for this sport, for example, speed, which is an important prerequisite for volleyball and is an inherited factor, and improves with little practice. The results showed that the players were at a low level in terms of speed. Therefore, to select players, physiological tests and physical fitness related to this field should be used so that players who have the appropriate physiological characteristics of volleyball can enter this sport.

In general, the findings of recent studies show that anthropometric and physiological characteristics are a determining factor in volleyball. Examining the anthropometric characteristics of volleyball players, it can be concluded that in selecting and identifying athletes in this field, coaches should pay attention to height, sitting height, length of both hands and palm length, which are important factors for success in this field.

The study of physiological profile of this study also concludes that the variables of speed, agility, strength, reaction time, power, anaerobic capacity, cardiorespiratory endurance, muscular endurance, coordination and flexibility in volleyball are more important and in the optimal performance of the effect is a transition. Also, body composition is one of the important factors in this field. Therefore, coaches and athletes in this field should pay attention to these indicators in the training program.

CONCLUSION

From the findings of this study, it can be concluded that the players of the present study were at a low level in terms of anthropometric and physiological characteristics, and these players have more physiological and physical fitness defects that can be corrected than anthropometric problems. They are weak. Therefore, it is suggested that coaches who work with this level of players must pay attention to this important point. This weakness in the results is perhaps one of the most important reasons for the absence of any team in the Iranian Volleyball League. It also seems that one of the reasons for the weakness in the results compared to other studies is the difference in the age category of the players who were in a higher age group compared to other studies. Other reasons may be due to the lack of consistent and appropriate training based on the level of the players and the lack of a proper nutrition program for each player. And this in itself can discourage players

and their low effort in training. The most important reason for the weakness in the results is probably due to the lack of knowledge of coaches about principled and scientific talent identification, because if these players were identified, they might have succeeded in the fields in which they had the necessary talent and some people would lead them to this sport. They had the necessary talent and ability, and the position of Ardabil players was higher than the current position. Therefore, to succeed in a sport, one must use scientific talent identification methods to achieve success.

REFERENCES

1. Vaeyens R, Güllich A, Warr CR, Philippaerts R. Talent identification and promotion programmes of Olympic athletes. *Journal of sports sciences*. 2009; 27(13):1367-80.
2. Veale JP. *Physiological assessment in talent identification within Australian football*: Victoria University; 2011.
3. Katić R, Blažević S, Krstulović S, Mulić R. Morphological structures of elite karateka and their impact on technical and fighting efficiency. *Collegium antropologicum*. 2005; 29(1):79-84.
4. Vrljic K, Mallett CJ. Coaching knowledge in identifying football talent. *International Journal of Coaching Science*. 2008;2(1):63-81.
5. Wolstencroft E, House C. *Talent identification and development: An academic review*. Edinburgh: Sport Scotland. 2002.
6. Adegbesan O, Mokgwatchi M, Mokgothu C, Omolawon K, Arnmah J, Oladipo I. *Sport talent identification and development in Nigeria: A preliminary investigation*. 2010.
7. Milistetd M, Mesquita I, Sobrinho AS, Carrara P, Nascimento J. Coaches representation about detection and selection of talents on the brazilian volleyball. *International Journal of Sports Science*. 2013; 3 (5): 157-62.
8. Marques MC, Van den Tillaar R, Gabbett TJ, Reis VM, González-Badillo JJ. Physical fitness qualities of professional volleyball players: determination of positional differences. *The Journal of Strength & Conditioning Research*. 2009; 23 (4):1106-11.
9. Jin X, Liu Y, Zhang Z, Gai Y. Investigation on the features of young female volleyball players and important body shape and specific fitness in our country. *Journal of Xi'an Physical Education University*. 2007; 24:94-7.
10. Johnston K, Wattie N, Schorer J, Baker J. Talent identification in sport: a systematic review. *Sports Medicine*. 2018; 48 (1):97-109.
11. Peymani Zad H, Kashtidar M. Psychological effects of talent management in sports organizations. *Razi Journal of Medical Sciences*. 2021; 28 (8):0-.
12. Salimi Avansar A, Baranchi M, Koneshlou S. Physical Fitness, Anthropometric and Body Composition Profile of Iranian National Adolescent Volleyball Players. *Journal of Sport Biosciences*. 2014; 6 (1):21-39.
13. Goto H, Morris JG, Nevill ME. Match analysis of U9 and U10 english premier league academy soccer players using a global positioning system: Relevance for talent identification and development. *The Journal of Strength & Conditioning Research*. 2015; 29 (4):954-63.

بررسی و تدوین مدل استعدادیابی بازیکنان نخبه والیبال

شیرین حسین زاده^۱، معرفت سیاه کوهیان^{۲*}

۱. گروه فیزیولوژی ورزشی، دانشگاه مازندران، مازندران، ایران.

۲. گروه فیزیولوژی ورزشی، دانشکده علوم تربیتی و روانشناسی، دانشگاه محقق اردبیلی، اردبیل، ایران.

چکیده:

هدف از این پژوهش بررسی و تدوین مدل استعدادیابی برای بازیکنان نخبه والیبال بود. جامعه آماری این پژوهش کلیه بازیکنان پسر نخبه والیبال شهر اردبیل بودند. از میان جامعه آماری تعداد 16 نفر بعنوان نمونه آماری انتخاب شدند. کلیه آزمون‌ها در سه روز متوالی اجرا شد. در روز اول ویژگی‌های آنترپومتریکی شامل: طول‌ها و همچنین ترکیب بدنی اندازه‌گیری شد. سپس در روز دوم ویژگی‌های فیزیولوژیکی و آمادگی جسمانی شامل: ظرفیت بی‌هوازی، چابکی، سرعت، توان، زمان عکس‌العمل، هماهنگی و قدرت گرفته شد. و در نهایت در روز سوم میزان انعطاف، استقامت تنه و حداکثر اکسیژن مصرفی گرفته شد. از نرم افزار SPSS ورژن ۲۳ برای انجام تجزیه و تحلیل آماری و برای رسم نمودارها از نرم افزار Excel استفاده شد. نتایج نشان داد که بازیکنان شهر اردبیل از نظر شاخص‌های آنترپومتریکی و فیزیولوژیکی در سطح پایینی قرار دارند. نتایج مطالعه نشان داد که میانگین سرعت دو بازیکنان ۵/۹۲ ثانیه، میانگین چابکی ۱۲/۰۹ ثانیه، میانگین ظرفیت بی‌هوازی ۴۲۶ وات، میانگین استقامت قلبی-تنفسی ۴۳/۲۴ میلی لیتر/کیلوگرم/دقیقه، میانگین درازنشست ۴۴/۱۲ تعداد در دقیقه، میزان پرش عمودی ۵۲/۵ سانتی متر، میانگین انعطاف ۴۳/۵۱ سانتی متر، میانگین قدرت ۵۰/۵۶ کیلوگرم، میانگین هماهنگی ۶۶/۰۶ ضربه در دقیقه، میانگین زمان عکس‌العمل ۰/۳۱۵۲ میلی ثانیه و همچنین میانگین قد ۱۸۳/۴۵ سانتی متر، میانگین قدنشسته ۹۴/۱۰ سانتی متر، میانگین طول دو دست ۱۹۴/۳۵ سانتی متر، میانگین طول کف دست ۱۱/۱۱ سانتی متر، چربی بدن ۲۱/۳۸ درصد و توده بدون چربی ۶۲/۸۶ درصد بود. نتایج حاکی از آن است که بازیکنان اردبیل از نظر شاخص‌های تن سنجی و فیزیولوژیکی در سطح پایین تری قرار دارند. بطور کلی یافته‌های مطالعه حاضر نشان داد که بازیکنان تحقیق حاضر از نظر ویژگی‌های آنترپومتریکی و فیزیولوژیکی در سطح پایینی قرار داشتند و این بازیکنان بیشتر از اینکه مشکل آنترپومتریکی داشته باشند از لحاظ فیزیولوژیکی و آمادگی جسمانی که قابل اصلاح هستند نقص دارند و ضعیف هستند.

واژه‌های کلیدی: فیزیولوژیکی، بیومتریکی، استعدادیابی، نخبه، والیبال