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REVIEW PAPER

Talent Identification in Youth Football: A Systematic Review

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Abstract

Identification of talents in football is one of the most important tasks of coaches in youth football selection. The main focus of this paper was to review the available literature on talent identification in youth football. A systematic review of PubMEd, Medline, ResearchGate and Elsevier databases was performed according to PRISMA guidelines. The following keywords were used: „identification of talents", „football talent", „selection in football", and „management in sport clubs". Of 137 studies initially identified, of which 17 met the inclusion criteria of the review. Mentioned studies were analyzed and discussion was created with the emphasis on 4 segments: 1) analysis of physiological aspects and identification of talents 2) importance of specific contents for identification of talent 3) biological and chronological age as an important aspect of selection of young players 4) multidisciplinary approach to the selection of young players. It is concluded that process of identification of talents needs to be approached multidisciplinary with all contents of physiological and physical assessment and with specific football contents (SSG and TE-TA contents) respectively. Great role in performance on the field has the biological age, on which coaches need to pay attention to when evaluating quality of players.

Keywords: *Selection of footballers, Training, Coaching, Field Test*

Introduction

Identification of talents in football is one of the most important tasks of coaches of youth selections in football and that identification, in terms of chronological age, is very low (Roderick, 2006). One of the reasons why clubs are trying to identify players at such early age is the fear that that selection is done too late. Also there are two reasons: 1) development of a player 2) fear that talented player is selected by other clubs (Sæther, 2014). Earlier philosophy of identification of talents was based on monitoring of genetic predispositions of players, which can be improved by training (Hoare & Warr, 2000). In order to make a selection of players, training teams and teams which work on this issue, use different physiological and specific football indicators, which are used for identification of talented players (Vaeyens et al, 2006). Identification of players demands multidisciplinary approach because growth and development of a player, especially in adolescence, makes process of selection by standard testing of physiological and technical aspects of players, difficult. (Meylan, Cronin, Oliver, & Hughes, 2010). Still, Williams, & Reilly (2010) proved that sport science has an important role in process of identification, monitoring and development of talents of young players and all for the purpose of development of their full potential. Work with athletes of different sports, whose abilities are developed above average, includes 3 procedures, which demand multidisciplinary, scientific and professional approach: detection and recognition of potential, orientation and selection of players, and quality development of players (Trninić, Jelaska, & Papić, 2009).

The term "talent"

Latin term „talentum", originates from Greek word tálanton [τάλαντον], which means balance, weight, amount of money (Hoad, 1993). Different authors define talent in different ways. According to Ommundsen (2009), talent is something you have, something you are, something you can be or something you can develop. There are 2 concepts of observing talent; static and dynamic concept. Static concept observes talent as something internal; which focuses on level of performance in early age, while dynamic concept observes talent together with conative and sociological features (Güllich, 2014). Proper selection of talent in terms

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of player and management of sport organization is considered as one of the key segments for success of organization (Beechler & Woodward, 2009). Different authors link the term „talent" with different terms that can describe its role. Some authors, the term "talent" identify with the term "possibilities" (Gagné, 2000; Silzer & Dowell, 2009), others identify term "talent" with the word "capacity" (Jericó, 2001). Stahl et al. (2007) identify this term with the term "capability", while Ulrich (2007) identifies term "talent" with the term "advantage". Some authors consider talented person: a person with competences (Bethke-Langenegger, 2012; González-Cruz Martínez, Fuentes, & Pardo del Val, 2009). The term "experience" is also related to the term "talent" (Cheese, Thomas, & Craig, 2008), as well as the term „knowledge" (Tansley et al., 2006). Some authors explain the term "talent" through the term „potential" (Tansley et al., 2007), while Stahl et al. (2007) the term „talent" identify with the term „performance". These different approaches to the term "talent" show how complex is the process of identification of talent, but they also prove that criteria for selection of talent cannot be the same for all organizations and sports.

The aim of this paper was to systematically review and organise the literature on significant factors, which affect identification of football talents in young categories, and to determine criteria based on which coaches evaluate whether players have potential or not.

Methods

This paper is designed as overview using PRISMA method (Di Palma, Raiola, & Tafuri, 2016). Data base that are used for this paper are: PubMed, Medline, ResearchGate & Elsevier. When searching papers words that were searched are: identification of talents, football talent, selection in football and management in sport clubs.

All papers designed to determine different aspects of talent identification in football (specific football aspect, anthropological aspect, psychological aspect, philosophy of the clubs, scientific aspect) were considered as a relevant for this Systematic review. Few criteria influenced acceptance of papers for further analysis: (1) papers had to be published between 2009 and 2019, older papers weren't considered (date criterion), (2) papers had to be written in English language (language criterion), (3) papers focused only on youth players were used for analysis (participants criterion), (4) papers had to be focused on talent identification in football (exposure to interest criterion), (5) papers had to be original researchs (type of publication criteria), (6) articles that didn't meet inclusion criteria's were excluded from further analysis (exclusion criteria).

Results

Scheme 1 shows the detailed process of creating systematic review. After using key-words in databases 137 publications were found. All duplicates were removed (n=26), so 111 papers were screened for title and date criteria. In this phase 42 papers were excluded. Total of 34 papers were excluded in next phase for not meeting exposure to interest criteria. After reading 35 whole papers, 18 of them were excluded for not meeting deeper type of publication criteria and language criteria.

Table 1. Overview of papers with basic information which are taken in consideration during analysis of results

N	Title	Year	Authors	Magazines
1	Talent Identification in Soccer: The Role of Maturity Status on Physical, Physiological and Technical Characteristics	2010	Meylan et al.	International Journal of Sports Science and Coaching
2	Positioning and deciding: key factors for talent development in soccer	2011	Kannekens et al.	Scandinavian Journal of Medicine and Science in Sport
3	Talent identification in youth soccer	2012	Unnithan et al.	Journal of Sports Science
4	Match analysis of U9 and U10 English premier league academy soccer players using a global positioning system: relevance for talent identification and development.	2015	Goto et al.	The Journal of Strength & Conditioning Research
5	Psychometric properties of the motor diagnostics in the German football talent identification and development programme	2015	Höner et al..	Journal of Sports Science
6	The evaluation of small-sided games as a talent identification tool in highly trained pre-pubertal soccer players.	2016	Fenner et al.	Journal of Sports Medicine
7	Talent identification and selection in elite youth football: An Australian context	2016	O'Connor et al.	European Journal of Sports Science
8	Multivariate analyses of individual variation in soccer skill as a tool for talent identification and development: utilizing evolutionary theory in sports science.	2016	Willson et al.	Journal of Sports Science
9	Discriminating talent-identified junior Australian football players using a video decision-making task.	2016	Woods et al.	Journal of Sports Science
10	Two-year changes in anthropometric and motor ability values as talent identification indexes in youth soccer players.	2016	Hirose & Seki	Journal of Science and Medicine in Sport
11	Talent identification and recruitment in youth soccer: Recruiter's perceptions of the key attributes for player recruitment	2017	Larkin & O'Connor	PLoS ONE 12(4): e0175716. https://doi.org/10.1371/journal.pone.0175716

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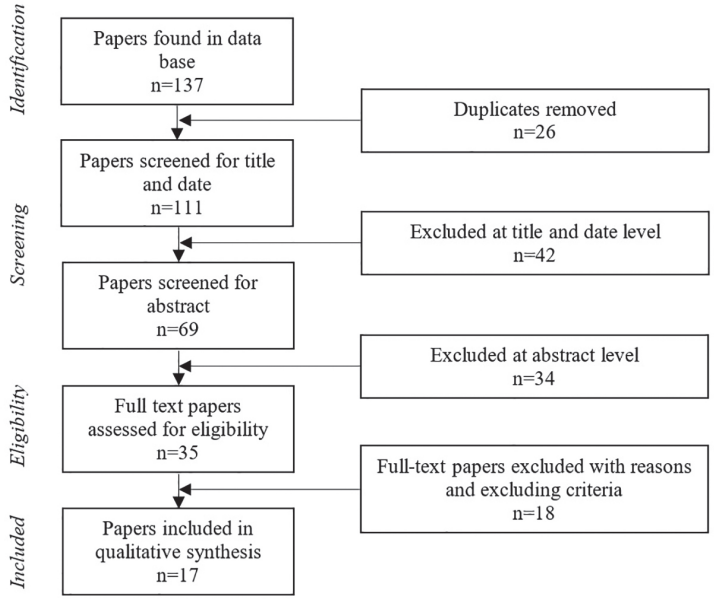
N	Title	Year	Authors	Magazines
12	Progression in youth soccer: selection and identification in youth soccer players aged 13-15 years.	2017	Bidaurrazaga-Letona et al	The Journal of Strength & Conditioning Research
13	A multidimensional approach to talent identification and selection in high-level youth Australian Football players	2017	Tribolet et al	Journal of Sports Science
14	Talent identification in soccer: Physiological Aspect	2018	Dodd & Newans	Journal of Science & Medicine in Sport
15	Seasonal Body Composition Variation Amongst Elite European Professional Soccer Players: An Approach of Talent Identification	2018	Owen et al.	Journal of Human Kinetics
16	Methodological Issues in Soccer Talent Identification Research	2019	Berkamp et al.	Sports Medicine
17	Assessing the validity of a video-based decision-making assessment for talent identification in youth soccer.	2019	Bennet et al.	Journal of Science and Medicine in Sport



SCHEME 1. Elaboration of selection of papers by PRISMA methodology

Table 1 presents basic information about selected research papers. Only title, year of publication, authors and Journals were presented here. From here, it is obvious that papers were published in different scientific magazines, primary directed toward research in sport, which are placed in index data base. Six of them were performed in Australia, 4 in United Kingdom, 2 in Netherlands and 1 in New Zealand, Germany, Japan, Spain and France. Analysis of table 2 shows that papers had different goals and that they included different segments which are significant for this paper.

Table 2. List of papers with aims and conclusions of papers

N	Authors	Aim	Conclusion
1	Meylan et al.	The aim of this paper was to create an overview on identification of talents in football, using physiological and technical tests, and to sum issues related to this process	Standard tests cannot be criterion for identification of talents because period of growth and development of young players largely affect results of tests.
2	Kannekens et al.	The aim of this study was to determine in what measure tactical knowledge affects quality and identification of talented players.	Decision-on the field and tactical knowledge are tools which influence the performance and therefore have great impact on process of identification of young player, especially midfielders.
3	Unnithan et al.	The aim of this paper was to evaluate traditional approach to identification of talents in youth football and to present newer method of identification in football.	Games on a small court can be very useful tool for identification of talents. Also, players who have better technical performance are more successful in games in smaller space.

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N	Authors	Aim	Conclusion
4	Goto et al.	The aim of this study was to examine profile of activities of match among elite footballers U9 and U10 and to determine whether there are differences between players which were held later by their clubs.	Players of U9 and U10 cover over 4000m per game and players who are kept in Academy cover bigger distance and in smaller speed.
5	Höner et al.	The aim of this study was to examine reliability, differential stability and validity of motor diagnostics which is conducted in whole Germany by German program for identification and development of talent and gives referential values for standardized interpretation of results of diagnostics.	Diagnostics showed satisfying factor validity with acceptable loadings on two empirical factors speed and technical skills. Results and technical skill of leading and juggling is highly different in players of different performances and therefore showed the highest criterion for validity.
6	Fenner et al.	The aim of this study was to examine physiological and technical features of pre-puberty players during multiple games in a small space (SSG) and to establish whether SSG can be used as a tool for identification of talents.	Results showed great correlation between the best players and success in SSG, perhaps because of higher rating of players, who cover bigger distance and great speed. Therefore, SSG can be used for identification of more talented footballers in pre-puberty period.
7	O'Connor et al.	The aim of this study was to identify perceptive-cognitive skills and variables of history of players, which differentiate defense and non-defense players in elite youth football (i.e. football program)	Efficiency of discriminative function is shown in 93.7% of players, which are correctly qualified, where 4 variables include 57.6% of variance. Discriminative model can give better understanding of factors that influence the selection and identification of elite model of young talents.
8	Willson et al.	The aim of this study was development of overall protocol for qualification of specific football skills, which could significantly improve identification and development of talents.	This study established simple, but overall methodology for evaluation of footballer's performance of skills, which enables coaches to quickly assess relative abilities of their players, identify perspective young players, and work on elimination of deficit of skills in players.
9	Woods et al.	The aim of this paper is to question whether the task of making decisions by viewing videos can discriminate young Australian football players, who are identified as talents, as oppose to the ones who are not identified in such manner.	This paper proved that making decisions while watching video clips fully differentiates elite (talented) players from players who are not identified in that manner, in selection U18.
10	Hirose & Seki	The aim of this study was to examine 2-year changes in antropometric variables and motor skills in elite footballers and to identify potential indexes of identification of talents.	Due to change of minimal rang in speed of sprint, in normal conditions of football game, linear speed of sprint has potential to be useful index for identification of young footballers. On the other hand, muscle strength and ability of COD can be changed during the growth, which suggests that these parameters are not useful for index of identification of talents.
11	Larkin & O'Connor	The aim of this paper was to understand abilities, which are considered to be important by coaches of young players and staff for recruitment, for identification skills of young footballers on entrance on the level of representative football in Australia, using modified Delphi method	Indicated skills and qualities are not significant in process of identification of talents, including physiological antropomertic, sociologic and several psychological attributes. It suggests that recruits of talents apply holistic multidisciplinary approach of identification of talents, with current results, which potentially give evidence at the beginning, which indicate that recruits need to consider numerous attributes during the identification of young players.
12	Bidaurrazaga-Letona et al.	The aim of this paper was to determine factors that are important for identification and selection of young footballers	Identification or promotion of players by coaches depends on indicators, which depend on the age. This paper proved that program for identification of talents is more the process of selection rather than process of promotion; selection and identification are posterior and not priority.

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N	Authors	Aim	Conclusion
13	Tribolet et al.	The aim of this paper was to examine differences in age of young players on high level and to examine features that influence the selection in development program on high level.	Significant differences in results of age groups, emphasizing that Academies on high level need to strive to additional selection in age over 15. Apart from this, it seems that players who were favoring for the selection in Academy on high level, matured earlier. .
14	Dodd & Newans	The aim of this study was to examine physiological profile of footballer in modern age and testing and process of identification of talents should match with that data.	Using battery for physiological testing enables teams to monitor progress of their players during their development age. This enables coaches to consistently identify strength and weaknesses of players and enables players, who mature later, to be considered as potential, still.
15	Owen et al.	The aim of this study was to examine season changes in body composition in elite European footballers and to identify key position differences.	There are big variances in profiles of body composition among professional European footballers.
16	Berkamp et al.	The aim of this paper was to determine advantages and limitations of methodology, validity and utility of current research about identification of football talents.	Four methodological problems are relevant for researching identification of talents 1) operationalisation of criterion variables (efficiency which is anticipated) as a level of efficiency; 2) focusing on isolated indicators of efficiency as predictors of football performances; 3) results of limitations of volume on predictive validity of predictors, which are used in identification of talent; and 4) effect of the basic level on usefulness of procedures of identification of talent
17	Bennet et al.	The aim of this study was to examine constructive and discriminatory validity of video-based assessment of decision for identification of talents in youth football.	Coaches and athletes would be careful when interpreting data from practical, video-based evaluations in making decisions. Currently, there is limited evidence, which confirms efficiency of these evaluations for identification of talents.

Discussion

Analysis of papers which were subjected to inclusive and exclusive criteria (17 papers) showed that there is no general consensus about the term "talent", especially about procedures of identification of talent, which is confirmed in earlier studies in overview (Gallardo-Gallardo, Dries, & González-Cruz, 2013).

Analysis of Physiological Aspects of Identification of Talents

Physiology is a segment of medicine, which is essential in sport, because effects of training are most commonly performed on physiological aspects of a man. Therefore, all segments of physiology of athletes are constantly researched, due to which different forms of testing, which will enable easier assessment of athlete's condition. Papers which write about identification of talents in football, suggest that each Academy or youth program constantly monitor different motor and physical parameters of players (Dodd & Newans, 2018). Also, programs of identification of talents need to contain batteries of tests, which are based on physical and physiological abilities of elite footballers, in order to constantly monitor their development (Dodd & Newans, 2018). However, standard procedures of testing cannot be criterion for process of identification of talents (Meylan et al., 2010; Larkin & O'Connor, 2017), and they need to be enriched with TE-TA contents and contents of making decisions (Kannekens, Elferink-Gemser, & Visscher, 2011). Since football is a team game, making decisions and collaboration of team mates based on performance of opponents, is very important psychological aspect of players, such as: emotion intelligence, motivation and making decisions (Murr, Feichtinger, Larkin, O 'Connor, & Höner, 2018). Linear speed is one of the most important skills in football and therefore it is very significant in process of identification of talent (Hirose & Saki, 2016). Also, it is not possible to determine whether young footballer is a potential, based on antropomatric measures of body composition, which doesn't obstruct their performance on the field and playing football on high level (Owen et al., 2018). This attaches to the fact that mass and volume are segments of anthropometry, which is lowly genetic indigenous and can be affected by training.

Importance of Specific Contents for Identification of Talents

Since the center of football game are football actions, which are performed in offense, defense and transition, with ball or without it, and each football action includes 4 time-space components, which can never be repeated 2 times, in a same way: time, space, direction and speed (Verheijen, 2014), it shows significance of integral training in football, and choice of contents, respectively, which are specific in football game, in order to influence making decisions and speed of thinking.

It is proved that games in small spaces (SSG) have direct effect on physical performances of players, which are developed in situational conditions (Martin-Garcia et al., 2019; Giménez & Gomez, 2019). From the aspect of identification of talent, small games are rarely used during the process of selection, because there is no standardized and objective way of assessment of player's potential, through small games, yet. Still, analyzed studies prove that SSG can be very relevant indicator, which can determine whether player has potential or not and to be professional football player or not (Woods, Raynor, Bruce, & McDonald, 2016; Fenner, Iga, & Unnithan, 2016; Unnithan, White, Georgiou, Iga, & Drust, 2012), despite that their movement structure and physiological parameters do not respond fully to the game 11v11 (Giménez & Go-

mez, 2019). Technical aspect of football game is one of the most important and presents fundament of work with young players (>12 y). Although isolated technique, as such, is not fully identical to actions on the field during the games (SSG or matches), it is very important part of training process, especially in this age of a player. Technical performance of a player is not situational way of assessment of talent in young players but it is very important element of football game, which is developed in young age of players. Therefore, technical performance in combination with speed of making decisions and performances of football actions needs to be part of the process of identification and selection of young talents (Höner, Votteler, Schmid, Schultz, & Roth, 2015).

Biological and Chronological Age as an Important Aspect of Selection of Young Players

Although selection of young footballers is formed based on age, this is not a guarantee that players have equal physical and physiological abilities, due to the differences in biological age (BA). Biological and chronological age is not usually in accordance and need to be constantly monitored by coach, because they can be useful tool in explaining different specific-football phenomenon (Carvalho et al., 2019). Therefore, coaches need to monitor players and based on all analyzed segments, which include analysis of chronological and biological age, make decisions. Knowledge of biological age needs to be a very important variable in a process of selection of players (Meylan et al., 2010; Bidaurrazaga-Letona, Lekue, Amado, & Gil, 2017). It is very important to mention that if SSG is used as a test for identification of abilities and talent, respectively, one needs to have in mind that players, who play against each other, need to have similar biological and chronological age, because there is a big difference in football performances of players of a different age (Tribolet, Bennett, Watsford, M. & Fransen, 2017). Also, coaches need to be relieved of achieving results, which is not a measure of palyer's talent. Therefore, coaches need to be very careful with their choice of work philosophy, because it cannot be based on subjective thinking but on objective scientific facts. Coaches need to know that they, with their decisions, affect the complete process of development of young player, and that the work with young footballers is hard-working process of selection and their personal promotion (Bidaurrazaga-Letona et al., 2017). Studies proved that coaches, not considering the facts, favor physical dominant players, who bring them results. (Tribolet et al., 2017).

Multidisciplinary Approach of Selection of Young Players

In process of selection young players, it is very important to include all segments, which are directly related to the process of development of players. This doesn't mean that only one aspect of player is analysed, in order to determine whether he has potential or not, but to make a selection by consensus of different experts from different scientific disciplines. Results of physiological testing and football performance are insufficient to assess whether a player has a potential or not (Larkin & O'Connor, 2017). Coaches need to have overall and multidisciplinary approach to the selection of players, which will help in objective and real assessment of qualities of young players (Willson et al., 2016; Larkin & O'Connor, 2017; Bidaurrazaga-Letona et al., 2017). Also, video-analysis in football take an important role in selection of talents, therefore it is necessary to ask a question whether making decisions by watching videos is suitable tool for quality decisions for young players. Some researchers proved that this is a very useful and objective tool in process of selection of young players (Woods et al., 2016), but some pioneer steps are taken in that area, therefore one needs to be careful when using video analysis for assessment of quality of making decisions, especially when it comes to the selection of players (Bennet et al., 2019).

Conclusion

Process of identification of talented players at young age is very complex. There is no general rule in process of identification of talent and that area is still subject of research. This study proves that physiological tests are important part of process of selection of young players, but they cannot be measure of potential of players. Also, it is very important that all segments of football actions need to be close to conditions of the game, and that process of selection needs to be done with physiological testing and conditions of the game, through SSG and technical-tactical performance on the field. Coaches need to be aware of sensitivity of work with young categories and cannot allow that results come first. Based on earlier ways of selection, coaches need to be able to objectively observe players and to make decisions about their future, thinking about biological age of players. When testing young players, physiologically and physically, tests of genetic highly arranged abilities need to be emphasized, because they are tools for determining physical potential of players.

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Conflict of Interest
The authors declare that there are no conflicts of interest.

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