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A Multi-dimensional Dynamic Analysis of Talent Selection Mechanisms in Shanghai U13-U15 Women's Football

Xinyun Huo

College of Physical Education, Hunan Normal University, Changsha, China
huoxinyun0615@163.com

Abstract. This article looks at how we currently identify young female talent for the U13-U15 level in Shanghai using the latest research and policy reports. In this paper, a review method was used to find the literature from 2020-2024. The relevant literature found was 17 papers. According to the results, there are some factors affecting our current selection, like the relative age factor, physical maturity and coach's preference for short term success. Then there are structural biases too. Because we have so few girl's football participation channels, which means less competition and specialization much earlier in the game. And also puberty related changes in body comp and growth tempos will cause short term performances swings so that late maturing players get prematurely deselected. In response to the above problems, this paper puts forward a multidimensional dynamic framework selection and development, including maturity adjustment, repeated test, longitudinal evaluation in terms of Technical(T), Tactical(T), Physical(P), Psychological(P) and Social(S) fields. It changes the evaluation of a player from "now", at this moment, into something that can develop and make progress, giving tangible pointers as to what to be looking for when scouting players.

Keywords: multi-dimensional dynamics, U13-U15 Women's Football, athlete, selection mechanism

1. Introduction

1.1. Policy and practice issues

Recently, youth football development has developed very quickly in many places in China, and the U13-15 women's football program in Shanghai is also progressing rapidly. But the current success of talent identification is a big problem for the future of you women's football programs. Studies now mainly revolve around physical indicators and no investigation has been done on a dynamic maturity adjusted the multidimensional selection model of female youth football. From the perspective of policy, the current standard for choosing talents is unable to take into consideration the characteristics of physical and mental changes in teenage girls. On the other hand, because there is a lack of chances and fixed position, so some players with talent but takes more time to develop will be ignored. This makes it hard for the chosen players to satisfy long term development demands, hurting talent pools and training of the Shanghai Women's football team, making their distance from world top teams wider.

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1.2. Why focus on U13–15 women's football and Shanghai

Shanghai's young ladies' footballers are mostly cultivated via sports school and it is through the selection trials at school level for the prestigious school football tournament. Then from district team to city team so the process of finding and developing U13-15 women's football players with talent is done through many ways. Talent recognition occurs in many different situations, such as school team tryouts, elite tournament games, tryouts for youth teams, and all kinds of training camps. In order to produce results for the competition, coaches force themselves to select players early on, due to a limited number of places available it is very likely that a position would be fixed very soon, and also because of some constraints over school enrolment / registration rules that have to be respected so they end up choosing players. And these institutions all compound the problem.

1.3. Article contribution

This innovative and practical "Multi-dimensional Dynamic" analytical framework is different from traditional static method, it can make a complete evaluation of the athlete on many aspects. It is about more than just the physical stuff, it includes psychological and technical things too. Dynamic assessments can help us see if players change over time, and how well they might grow in the future. Based on selection and cultivation integrated together, it can avoid bias for sure so that the Shanghai women's football team will get some better players. And also it will help this group to get better result on national and even international competitions, thereby Shanghai women's football can develop.

2. Methods

2.1. Search strategy

To obtain all kinds of resources comprehensively, we used a multi-database joint retrieval method including various databases like CNKI,WOS, Scopus, PubMed. In terms of searching for materials, it was used key words such as "tactical selection mechanism of Shanghai U13-U15 Women's Football", "Multi-dimensional dynamic point of view" etc. The period is fixed within 5 years so that the data is timely and new to help me get a deep and full knowledge about research hot spots and development directions. A total of 48 articles were retrieved, after removing 12 duplicate ones, 20 shortlisted from titles and abstracts, 17 articles are ended up with for the final analysis by reading their full texts.

2.2. Inclusion / exclusion criteria

As for the inclusion criteria, it states that the subject has to be women's football player at the age of 13-15, and mainly for young development and talent selection, with more attention paid to studies about women's football. Also, there should be some elements like selecting talent mechanisms, bias, evidence-based indicators and so on. For the exclusion criteria, it is the subject that do not belong to the U13-15 years old or are not engaged in women's football research, and also excludes those with no relation to youth development/talent selection, or lack of discussion on important issues like mechanisms/biases/evidence-based indicators. It is sure the relevancy and validity of it.

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2.3. Literature analysis method

I obtained the literature after which I sought out materials between 2020-2025 and then used thematic induction to examine the main content and perspective of the discovered literature in different database with regard to topics such as talent selection mechanism like relative age effects and maturation bias. And at last totally 17 articles were contained. Through using a framework based synthesis method; content from each of these study were synthesizes into a multidimensional dynamic analytic framework which allows me to see insights/inconsistencies/ gapes etc in order to have a better and more thorough understanding about the current state (of talent selection mechanism) for Shanghai U13-15 women football teams. An easy quality has been down with checking with respect to the chosen paper according their research plan, samples number and legitimacy in terms of indicators, then removed some that do not have realistic data or insufficient explanation about methods.

2.4. Analytical framework development

By summing up all the themes in literature included, with focus on information over 5-dimension technology, tactics, body, psychology, society. The 5-dimensional frame was then extracted from analysis and combination.

3. Evidence review: from static screening to multidimensional dynamic identification

3.1. "Selection-cultivation integration" and long-term development logic

In terms of past studies have also found in the youth football training in other countries, the selection and training of young people is an important guarantee. It's an effective approach to address problems encountered in the development of football and ensure that it develops healthily. "One dimensional static selection approach" era is slowly vanishing and what is fast emerging is the "Multi dimensional dynamic selection approach" [1]. And in the prior literature stated that during this talent selection process one must always be full of energy and concentration, and use any past experience with selection to find talented individuals for Chinese football [2]. Earlier studies also pointed out that we need to constantly pay attention to the development change at every stage and make staged evaluations on it [3].

Young coaches, talents scout also need to pay close attention to the development trajectory of the athlete, keep track of his physical maturity, psychological growth, as well as technical proficiency at every step [4]. Hatem & Ikram used the method of looking back in time to adjust training programs, setting new goals. Such as like the youth who can't grow up quickly but has strong technical abilities, he should be given lots of opportunities and places for him [5].

Towards globalisation: By means of using such an "assessment framework" that has become multi-dimensional and is ongoing gives a better method regarding long-term thinking about a youth football players program.

3.2. Multidimensional portrait (technology-tactics-body-mind-society) and dynamic tracking concept

The Scholar put forth an idea which is multidimensional profile comprising technical, tactical, physical, psychological and social parts creating a full 3 dimensional picture of athletes. Dynamic tracking: Dynamic is to continuously track the athlete as it changes over [6]. Matuica & Perek have

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created a scientific evaluation system for continuous examination, evaluation and identification of different athlete's ability in time for the adjustment of their programme [7].

In this proposal, I have used some modern technological tools like sports monitoring device, psychological assessment tool to get better information about the condition of athletes. Thus, guaranteeing that the women football talent we have selected and nurtured can develop in the long run.

With regards to U13-15 Women's Football, this is even more so because of changes that happen during puberty as well as limited opportunities for women playing football. Thus it is important to comprehensively assess the physical and mental changes so as to correctly identify and choose suitable candidates for women's football.

4. Evidence review: key characteristics of U13-15 women's football

4.1. Adolescence/PHV and performance fluctuations caused by body composition changes

Existing literature contended that girls aged 13-15 are in a critical period of adolescence. After puberty begins, many big bodily changes start happening to girls. Their bodies get fatter, muscles act differently, and it's hard for some people to move around sometimes [8]. The expert said at this stage, mental development and cognitive growth occurs quickly so teenagers become more aware of their appearance, bodies and pressure from the society. External evaluation and the body's self-awareness have a great effect on the mind. And also for female football players from age 13-15, training load should be taken into account [9]. It is known from experts that physical growth in this stage greatly raises the probability of injury caused by training, especially anterior cruciate ligament (ACL) knee injuries [10]. Researchers suggested that coaches, etc., should create personal training schedules according to the physiological situation and growing rule of adolescents, otherwise, there would be problems resulting from over training [11].

Therefore, during the selection process of female football player with age group 13-15 years, we have to consider adaptability, malleability and potential development of the athlete along with other present level of their speed and strength. Only by doing so can we really choose the best women football players, and create a good foundation for the future development of women's football.

4.2. Psychosocial sensitivity and participation retention

Yamashita & Kubo think that women football players aged 13-15 are very sensitive about psychosocial things. In their own assessment as well, if it doesn't turn out for the match, they can be very discouraged. Body image: changes in body shape and composition leads to more concern and worry over how they look which decreases their self-confidence [12]. The scholar also said the pressure of peers and parent shouldn't be ignored, as well as competition with peers and parents having too high expectation will create stress for kids while engaging in football, which impacts retention. Therefore, it is necessary to do psychological counseling in talent selection and training, and provide an easygoing atmosphere [13].

4.3. Training load and injury risk (especially knee/anterior cruciate ligament) constraints on player selection and development

Female athletes aged 13-15 are going through puberty and experiencing major physical changes it has been noted. So, training load and the possibility of getting hurt have become big limits for picking and growing players [14]. In that period their physical condition is still not stable yet, so

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intense training will cause an injury, mostly ACL knee. Therefore we must also consider the physical endurance and recuperation ability of talents when choosing them.

This recommendation pointed out that when training, one needs to be scientifically planned is the training load, gradually increases its intensity, and strengthens injury prevention work, such as doing targeted warm-up exercises, stretching and strengthening exercises, etc., to promote the healthy development of talents and improve the success rate of talent selection and cultivation.

5. Mechanism trap

5.1. Relative Age Effect (RAE) × maturity bias × coach preference

U13-15 Women's Football is looking at talent from the point of view of relative age and when they are physically mature. And there are some evidences show the older and more precocious girl have better physical condition at the beginning of development, it matches coach's goal oriented requirement for quick results. As a result, these girls tend to get more playing chances, training time and attention [15]. They thought it might create a "rich get richer" situation that top athletes would continue to be very strong, but not as many people would have competition against late developers and those born later in the year [16].

It was recommended that because of the niche nature of women's football as well as the unique timing of the competition there will be problems. Such as too early to restrict the development of some posts, which would be bad for athletes' future.

5.2. The resource tilt and the chain of the matthew effect: the cycle of appearance, training, attention and selection

Like playing times and training, then attention and selections leading to something with the Matthew effect chain, which means it won't be even. It is generally recognized by scholars that players who have more playing time, training time will develop their abilities faster and get more notice which puts them at an advantage in selection [10]. Oppositely speaking, the ones without the chances cannot show what they are capable of even if they have it.

In the end, it shrinks the recruiting pool and also a huge amount of promising late bloomers will never be found. It will not only affect the comprehensive development and long-term development of the Shanghai U13-15 Women's Football Team, but also hinder the general improvement of women's football level.

5.3. Amplifier of "more scarcity of opportunity/earlier fixed position" in the context of women's football

When it comes to women's football, the lack of chances along with early position selections creates even more selection bias. Experts said this was hard because there were few chances for good players to show off what they can do when everyone's place is already decided at first [17].

And it's not just hard for the late developer player to get over, it can prevent coaches from finding all kinds of talent as well. Then, it leads to decline in the quality of talent selection which restrains the width and depth of women's football development and finally hampers the long-term development as well as overall improvement of Shanghais U13-15 Women`s Football Team.

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6. Framework analysis

6.1. Dimensions and metrics

Framework is made up of ideas taken from the read material and not a completely new empirical model. It is mainly divided into: technical, tactical, physical, psychological and social. Maturity Adjustment is made by changing the evaluation standard according to the change of body structure due to adolescence. Process-oriented indicators emphasize changes in the performance of athletes over time like skills being developed at various stages of development. By means of these dimension, and indicators, we would be able to find promising women's football talent better.

6.2. Dynamic principle

Strata can also be made according to various types of athletes for different training. Adjusting the weight of each stage depending on the characteristics of different age groups and deciding how important each part is. Frequency of re-evaluation is reasonable so that it can timely monitor the changes of athlete's progress. Track the development trajectory: document growth process, forecast potential path to make sure of more proper match between talents and their own situation.

6.3. Mechanism diagnostic table

Bias comes from the relative age effect, maturity bias and so on. Some people get a lot of chances, and other hopeful players are missed. Risks are: A drop in the quality of talent selection, limitation to the development of talent. To solve it, we need a multi-dimensional dynamic correction of the maturity indicator, do proper stratification and dynamic follow-up, adjust the choice at the right time, so that the talent selection is both comprehensive and rigorous.

7. The enlightenment and suggestions for Shanghai

For Shanghai's U13-15 girls' football team, improving the method by which they select talent could also include incorporating other aspects of development potential and how well they can adapt in order to match more naturally how young people develop. Maturity is stratified scientifically according to stages of puberty and then different training takes place. And we should have a data driven decision making using big data analytical process to track player's performance. As for integrating sports and education, we can also cooperate with schools to make sure that their academic performance is guaranteed, as far as healthcare is concerned, there is a professional medical team to monitor the physical status of athletes at any time, avoid injuries and diseases, protect the cultivation of talents in female football.

8. Conclusion and limitations

Studied the multi-dimensional dynamic analysis system and put forward advice for the selection mechanism of talents by Shanghai, but there are some limitations. It's mainly according to the existing literature, without sufficient empirical research to prove the results obtained, so it may be less universal. The future should conduct field research and do a lot of follow-up study work to collect more primary data, continue to improve the multidimensional dynamic system, enrich the indicators and dynamism rules, give more scientific and accurate direction to the talent selection of U13-15 female football in Shanghai and other places.

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