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Original Article

An early investigation to optimize the implementation of long term athlete development in Indonesia

RISKY SYAHPUTRA[1*], TOMOLIYUS[2], FX. SUGIYANTO[3], LUCY PRATAMA PUTRI[4], AFDAL ADE HENDRAYANA[5], ATRADINAL[6], SYAHRIAL BAKHTIAR[7], JOHAN PION[8]
[1.2.3]Sport Coaching Education Department, Universitas Negeri Yogyakarta, INDONESIA
[1.5.6.7]Physical Education Department, Universitas Negeri Padang, INDONESIA
[4]Health and Recreation Department, Universitas Negeri Padang, INDONESIA
[8]Talent Identification and Development Department, HAN University of Applied Sciences, NETHERLAND

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Abstract:
Long-term athlete development is a big challenge that Indonesia must face as a country with abundant human resource potential. Even so, Indonesia's current sports achievements have yet to show significant progress. In order to increase sports achievement, researchers assume that all supporting aspects must work together to create a good coaching climate. One of them is having many trainers with qualified knowledge spread throughout Indonesia to nurture young athletes to become champions in the future. This study aimed to see the extent of knowledge of sports trainers in Indonesia regarding the long-term development of athletes. The sample of this study was 308 trainers throughout Indonesia who were divided into 4 groups (227 district/city levels, 43 provincial levels, 35 national levels and 3 international levels). The data came from an online survey and was analyzed using descriptive statistics to determine participant demographics, distribution of answers, mean, standard deviation, and crosstabulation. Data were analyzed using SPSS version 26. The results of the study showed that the lack of coach knowledge related to long-term coaching to create elite athletes. This result revealed that Indonesia's sporting achievements were still low, so it could have performed better at regional and international sporting events. It is hoped that future research will provide an illustration for stakeholders about the extent of competence possessed by sports coaches in Indonesia and find solutions to the phenomena that occur. So, the coaches can adjust training programs based on long-term athlete development principles.
Keywords*:* **Coach, knowledge, lead, athlete development**

Introduction

Raising the world's elite athletes is multidimensional and more complex, takes time, and needs to be thoroughly understood by practitioners and experts in the field of sports (Martindale, Collins, & Daubney, 2005). In order to support this, long-term athlete development is a pivotal model to implement. In the last few decades, experts developed long-term development models designed to improve athlete performance (Baker, Côté, & Abernethy, 2003). For instance, LTAD Model (Balyi & Hamilton, 2004), the Sports Participation Development Model (Côté, Baker, & Abernethy, 2007), and the Road to Excellence (Ericsson, Krampe, & Tesch-Römer, 1993), the Environment Model for the Development of Athletic Talent (Henriksen, Stambulova, & Roessler, 2010) and Munich Model (Baker, Schorer, & Watti, 2018).

The backbone of LTAD is built on the physiological principles of growth, development, and skill acquisition (Ford et al., 2011). LTAD is a belief-based sports participation development model that, due to the unique demands of each sport and the wide differences in the development profile of individual athletes. Long-Term Athlete Development describes how to systematically develop sports excellence and increase athlete participation on a Regional to National scale. LTAD is implemented through a sports approach that combines skills and long-term planning with understanding aspects of human growth and development.

By studying LTAD, it is hoped that trainers, academics, and practitioners will have insights to improve the achievement, performance, and growth of athletes. Black and Holt (2009), who investigated coaches' and parents' perceptions of implementing an LTAD-based alpine ski program, found that the model helps coaches update their knowledge, use consistent language, and plan training sessions. LTAD adoption and successful implementation depend on trainers' involvement in their specific coaching environment. Trainers are those who apply the LTAD principles on the pitch.

According to Rogers' (2003) theory, they are agents of change in relation to the proposed innovation, namely LTAD. Therefore, it is important to understand how they perceive LTAD and what motivates them to adopt or reject it.

The practice of long-term athlete development has been recommended for the past two decades. The development of an athlete is likened to an art where the coach is involved in a complex orchestration of

Corresponding Author: RISKY SYAHPUTRA, E-mail: riskysyahputra.2022@student.uny.ac.id

planning, training execution, and competition (Nash, Sproule, & Horton, 2011). In sports, athletes spend much time with their coaches and peers, which has an impact on their development, both inside and outside of sports (Čaprić et al., 2023). The connection between a coach and an athlete is crucial in determining an athlete's experience and output since coaches manage, plan, instruct, and counsel athletes regarding the teams they compete for (Čaprić et al., 2023).

However, research exploring the knowledge and skills required by practitioners to optimize the long-term development of athletes is still limited, especially in Indonesia. Therefore, while long-term athlete development is recognized as a guiding principle for youth development, no studies have explored the demographics and knowledge of practitioners responsible for implementing and delivering long-term athletic development programs to young people. In this context, 'practitioner'.

In the sports context, coaches and PE teachers are expected to have knowledge related to the development and improvement of sports achievements in children. The synergy between coaches and PE teachers is expected to be able to create a positive environment and have a positive impact on children's achievements (Davies, 1996; Emeagwali, 2009; Epstein, 2009; Weinburg & Gould, 2015). Parents who have insight regarding the development of sports achievement will be wiser in encouraging their children to achieve peak performance. Finding the right place to practice, fulfilling facilities and infrastructure, and providing motivation (Arthur-Banning et al. 2009) to continue to pursue the sport they enjoy.

In developing the potential of athletes, coaches have a very important role in guiding athletes to achieve peak performance (Beaudoin et al., 2015) in various aspects such as psychology, motor skills, and social skills. Coaches who have broad insight into the development of achievements will certainly provide many advantages for the athletes they train.

This is even though the teacher’s implementation of education plays an important role. The teacher's role in learning is a key factor for student development (Muarifin, 2022). Physical activity and sports are important tools for students' comprehensive development because they foster the improvement of capabilities such as self-esteem, personal autonomy, and social relations. The knowledge trainers possess can be obtained through formal education or the various pieces of training attended (Cassidy & Rossi, 2006) coupled with the interactions between trainers and other trainers (Cushion, 2011).

Identification and development of talent is an essential pillar of the success of current national sports associations in several countries (de Bosscher, Bingham, Shibli, Bottenburg, & Knop, 2009) to find talented young athletes capable of achieving world achievements (Vaeyens, Lenoir, Williams, & Philippaerts, 2008). This is what has made the TID program a top priority over the past decades in many countries (Pion et al, 2015). Talent identification programs should be implemented to provide opportunities based on existing sports, particularly in priority sports.

This research aimed to evaluate the demographics (sport, coaching level, profession, region of origin, and length of coaching experience) and knowledge of the practitioners responsible for implementing long-term athlete development. Such information will be critical to understanding the extent of knowledge needed to optimize long-term athlete development strategies, including supporting practitioners responsible for delivering and implementing long-term athlete development programs, which should be explored in future applied research.

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Material & methods

Participants

This descriptive research involved 308 samples from 28 provinces in Indonesia consisting of teachers, coaches and sports observers. Participants involved in this research were trainers with a variety of coaching experiences of around 1 or more than 5 years. Apart from the length of training time, the trainers involved in this research consisted of trainers from district/city level to international level.

Procedure/Stages of the research/test trial/Measurement/Instruments

This study employed a questionnaire with 10 LTAD-related items that LTAD specialists had previously approved. Participants completed the survey by providing their name, email address, home address, training level, and training duration.

Data collection and Statistical analysis

Data was collected using a Google form with 10 questions about long-term coaching in Indonesia. Each question consisted of 4 to 5 answer choices that researchers can choose according to their beliefs. The data were analyzed using SPSS to calculate the distribution of research data and create crosstabs.

Results

Table 1. Training Level and Train Lenght

Training Level (%)		Train Length (%)	
International	3 (1%)	< 1 years	52 (16,9%)
National	35 (11%)	1 years	24 (7,8%)
Province	43 (14%)	> 1 years	71 (23,1%)
Regional/City	227 (73%)	> 5 years	161 (52,3%)

Table 2. Participant Demographics

Province (%)					
West Sumatera	141 (45,9%)	West Kalimantan	4 (1,3%)	East Java	1 (0,3%)
South Sulawesi	39 (12,7%)	North Sumatera	4 (1,3%)	Riau Islands	1 (0,3%)
Riau	21 (6,8%)	Banten	3 (1,0%)	West Papua	1 (0,3%)
South Sumatera	14 (4,6%)	DI Yogyakarta	3 (1,0%)	South Papua	1 (0,3%)
Maluku	12 (3,9%)	Bali	3 (1,0%)	Bengkulu	1 (0,3%)
East Kalimantan	12 (3,9%)	Central Kalimantan	3 (1,0%)	D.I Aceh	1 (0,3%)
Jambi	11 (3,6%)	Lampung	2 (0,7%)	North Maluku	1 (0,3%)
North Kalimantan	10 (3,3%)	DKI Jakarta	2 (0,7%)	West Sulawesi	1 (0,3%)
Bangka Belitung Islands	6 (2,0%)	West Java	2 (0,7%)		
Southeast Sulawesi	5 (1,6%)	Central Java	2 (0,7%)		

The research was conducted on 308 participants consisting of 28 provinces and dominated by West Sumatra, with a total of 141 participants or around 45.9%. The researcher divided the participants into groups with a crosstab based on the level and length of training for each question item. The following are the answers given by the participants.

Table 3. Training_Level * LTAD_Concept Crosstabulation

		LTAD Concept				
		Very unfamiliar	Do not know	Know	Very familiar	Total
Training_ Level	International	0	0	1	2	3
	National	0	1	24	10	35
	Province	1	5	25	12	43
	Regional	6	54	142	25	227
Total		7	60	192	49	308

Based on the question the researchers asked: "Are you familiar with the concept of long-term athlete development?", out of 308 sample people divided into 4 groups who participated in this survey showed different answers from each group. In the group of trainers/practitioners at the District/City level, with 227 participants, only 25 stated that they were very familiar with this concept. Meanwhile, out of 43 participants in the Province group, only 12 participants said they were very familiar. For the national level, only 10 participants said they were very familiar with this concept out of a total of 35 participants. In the international level group of 3 participants, both stated that they were very familiar with the LTAD concept.

Table 4. Training Level * Development Model

		LTAD Concept				
		Very unfamiliar	Do not know	Know	Very familiar	Total
Training_ Level	International	0	0	1	2	3
	National	0	1	24	10	35
	Province	1	5	25	12	43
	Regional	6	54	142	25	227
Total		7	60	192	49	308

The histogram above shows the development model used by participants in the coaching process for their coached athletes. In the Regency/City group, more than half of the participants (50.66%) used the LTAD concept. Likewise, participants in the Provincial group (58.14%) and the National group (48.57%) stated that LTAD was also chosen as a model for the development of athlete development. As for international trainers, some used FTEM and LTAD. The number of respondents who did not use any coaching model was also quite large, at 13.64% of the total respondents.

Table 5. Training Level * Development in Indonesia

		Development_in_Indonesia				
		Very bad	Bad	Good	Very good	Total
Training_Level	International	0	3	0	0	3
	National	5	6	20	4	35
	Province	2	10	26	5	43
	Regional	4	61	144	18	227
Total		11	80	190	27	308

The next question was about how to implement long-term athlete development in Indonesia. There were 144 participants (63.44%) from the Regency/City group stating that the guidance carried out in Indonesia was good. As many as 26 participants (60%) in the Province group stated that it was good. Out of a total of 35 participants who joined the National group, 20 participants (57.14%) stated that the long-term coaching carried out in Indonesia was good. However, participants in the international level group stated that the long-term athlete development implemented in Indonesia was still poor.

Table 6. Training Level * Age Specialization

		Spesialization_Age				
		16-18	13-15	10-12	8-10	Total
Training_Level	International	0	0	1	2	3
	National	6	15	5	9	35
	Province	8	15	10	10	43
	Regional	20	81	55	71	227
Total		34	111	71	92	308

Then, participants were asked about the most appropriate age to carry out specific and intensive training in one sport (specialization) for the athletes they coached. The Regency/City participant group answered the most at the age of 13-15 years, with nearly 81 participants. In the Province group, the majority of participants agreed that early specialization could be carried out at the age of 13-15 years. For the National group, the participants' answers were balanced, between those stating the ages of 8-10 years and 13-15 years. In the international level group, some say 8-10 years old, and some say 10-12 years old.

Table 7. Training Level * Multilateral Concept

		Multilateral_Concept				
		Very unfamiliar	Do not know	Know	Very familiar	Total
Training_Level	International	0	0	3	0	3
	National	0	8	21	6	35
	Province	0	12	22	9	43
	Regional	6	89	127	5	227
Total		6	109	173	20	308

Questions regarding the concept of multilateral development put forward by the researchers showed that 89 participants (39.21%) in the districts/cities needed to be more familiar with this concept, and there were 127 (55.95%) participants who said they were familiar. The Provincial (51.16%), National (60%) and International (100%) groups stated they were familiar with the concept of multilateral development. Although many of the participants stated that they were familiar with this system, the answers they answered in this question item were in contrast to those in the previous item because these two questions are related.

Table 8. Training Level * The importance of TID

		The_importance_of_TID				
		Very unnecessary	No need	Need	Necessary	Total
Training_Level	International	0	0	0	3	3
	National	0	0	13	22	35
	Province	0	0	5	38	43
	Regional	1	1	54	171	227
Total		1	1	72	234	308

Based on a survey regarding: "Is talent identification needed or not?", participants at the Regency/City level (75.77%), Provincial (88.37%), National (62.86%), and International (100%) stated that it was very necessary to do.

Table 9. Training Level * The way to find talent

		The_way_to_find_talent				
		Experience/track record	Competition champion	Observation	Test and evaluation	Total
Traning_Level	International	0	0	1	2	3
	National	3	0	8	24	35
	Province	5	2	16	20	43
	Regional	11	13	90	113	227
Total		19	15	115	159	308

Researchers also asked questions related to the way participants looked for talented athletes aged <12 years. Most district/city participants stated that they found talented athletes through a series of tests and evaluations (49.78%), and the rest (36.65 %) through observation. Most provincial group participants (46.51) stated through observation. While the National (68.57%) and International (66.67%) groups said they found talented athletes aged <12 years through a series of tests and evaluations. The answers given by participants in the Regency/City and Province groups were found to be contrary to the answers they gave in item number 6, which asked whether talent identification needed to be done.

Table 10. Training Level * Athlete Election

		Athlete Election				
		Not sure	Sure	Certain	Very confident	Total
Training_Level	International	0	0	1	2	3
	National	0	1	25	9	35
	Province	0	2	24	17	43
	Regional	1	9	159	58	227
Total		1	12	209	86	308

The histogram above provides information related to participants' confidence level in the athletes they have chosen. District/City group participants (70.04%), Provincial group (55.81%), and National group (71.43%) stated that they were confident in the athletes they had chosen. Meanwhile, the international group (66.67%) said they were very confident in their chosen athletes.

Table 11. Training Level * Knowledge Instrument

		Knowledge_Instruments				
		Very unfamiliar	Do not know	Know	Very familiar	Total
Training_Level	International	0	1	1	1	3
	National	0	5	24	6	35
	Province	0	9	27	7	43
	Regional	4	70	132	21	227
Total		4	85	184	35	308

In the question item: "Are you familiar with the instrument test (talent detection) that can find sports matching the potential abilities of the child?". District/City group participants (30.84%) said they not familiar by (58.15%) said they were familiar with instrument tests that can find sports matching the potential abilities of children. Provincial (62.79%) and National (68.57%) group participants also stated that they were familiar with the instruments used. For the international group, those who stated they were familiar and very familiar with the instruments could find sports matching the potential abilities of the children.

Table 12. Training Level * Desire Execution Test

		Desire_Execution_Test			
		Don want	want	Really want	Total
Training_Level	International	0	0	3	3
	National	0	22	13	35
	Province	0	17	26	43
	Regional	2	105	120	227
Total		2	144	162	308

The last question was: "If this talent detection test instrument existed, would you like to carry it out?" get a good response from each group of participants. The Regency/City group (52.86%) stated that they really want and want (46.26%), and the Province group participants said they really want (60.47%) and want (39.53%) for this instrument to be implemented. National group participants stated that they really want (37.14%) and want (62.86%) for this instrument to be implemented. Likewise, the international group of participants stated they really want (66.67%) and want (33.33%).

This research showed the low knowledge possessed by sports coaches regarding coaching in Indonesia. One of them is the question regarding the most appropriate age to carry out specific and intensive training in one

sport (specialization) for the athletes being coached. Ironically, even international-level sports coaches answer that sports specialization can be done at the age of 8-10 years and 10-12 years, even though the correct answer is 13 years of age for each method of long-term coaching. More than half of the participants also stated that they were "familiar" with the multilateral concept, but the answers they gave showed inconsistencies between one question and another if they were already "familiar" with the multilateral concept.

Out of 308 participants, 266 participants (86.36%) stated that they had used the long-term coaching model for the athletes they coached, such as LTAD, ADM, FTEM or DMSP. This answer was also inconsistent with other questions that ask how participants search for children's talents because 37.33% of participants stated that they made observations to find sports talent in children. This gave us information that all this time, coaches have only heard the term long-term coaching without knowing more deeply about what and how long-term coaching takes place. Participants did not understand the definition of talent and talent identification in athletes. Researchers assumed that low reading literacy contributes to this condition occurring in the sports trainers who are the sample in this study. Of course, such a phenomenon illustrated that coaches' insights and knowledge about long-term athlete development are interrelated with Indonesia's sporting achievements at the Olympics, which have yet to be able to occupy the top 10 positions

Discussion

All the world's elite coaches agree that talent is what makes an athlete stand out from the crowd. Coaches describe talented athletes as someone who has "natural potential" and a willingness to be coached. Talent is a dynamic component because an athlete can "become" talented. It is believed by many coaches that talent (as seen today) is something that everyone can see. However, it is different from those who are identified as having potential that can be developed in the future (Prieto et al., 2020). Because athletes who are obtained through the identification stage are individuals who will become "athletes at the right time". Athletes whose talents are still not "seen" are caused by different levels of maturity time that differ from one individual to another. Those with the same biological age will not necessarily have maturity at the same age because maturity is not based on biological age but on a person's physiological abilities.

In implementing LTAD, there are stages regarding the implementation of sports coaching. Do you know and understand these stages? "We've heard the term LTAD, but we don't know exactly the stages and implementation of LTAD itself."

Prioritizing the development process in every practice or match is the principle of training at a young age rather than seeking victory and prioritizing it. Do you know this, and how does it apply in the field?"We know this, but it becomes a dilemma when it is implemented. Parents tend to get involved and want their children to become champions as a manifestation of the success of the training process that children undergo. If it continues to be implemented, it will impact the continuity of the club. The determining factor for parents choosing a club to place their child in is the club's track record. The more champions the club scores, the more fans it will have. Providing such an understanding is the most challenging thing to do, given the low reading literacy of parents."

Fundamental Motor Skills, Multilateral Development, Maturity Status and Early Specialization are terms in the LTAD concept and its application in identifying children's talents!"We know and are quite familiar with this term. We also know what control objects are, locomotor and non-locomotor. However, we never evaluate the basic movement abilities of the children we train because we also never know whether or not there are instruments that can be used. However, for other terms, we have never heard of them before and have insight into them."

Do you know that there is a test for talent detection and identification? Tests that can help parents to place their children in the right sports *according* to their ability criteria? "We have never heard of that type of test. It's just that we are no strangers to the term talent scouting. Is it the same? But in talent scouting, children are directly tested in certain sports that they are already involved in". "We have heard of talent scouting, but we feel this instrument is inappropriate to use. It is due to the participants who are tested being tho who joined in certain sports. Even though a child gets a high score on the test, in the end, it is the CHAMPION that is used as a benchmark for talent.

Nearly 80% of the medalists were produced through the talent identification stage (Herzog, 1987); this result confirms that the LTAD carried out by experts so far is on the right track. Talent identification is a program designed to identify young athletes who have *extraordinary* potential to be successful at the elite level and selected to continue in talent promotion programs (Vaeyens et al., 2009). In sports professionals, identifying talent in the scope of junior athletes is something that needs to be done (Reily et al., 2000) because countries and clubs that succeed in identifying and training talented young athletes as early as possible have a great chance of success in sports competitions in the future (Baker et al., 2020).

In order to raise the impact of the implementation, teachers and trainers acquire skills and knowledge about long-term coaching (Beaudoin et al., (2015). Trainers have a desire to find talent as soon as possible so they can include athletes in long-term coaching programs. To develop their talents (Abbott & Collins 2002). Traditionally, coaches know and already have an overview of the combinations of factors that can identify the ideal athlete candidate. Coaches believe they will recognize talent in athletes when they see it. However, they

cannot explain exactly what factors are taken into consideration because one trainer with another trainer has different criteria (Christensen, 2009) based on experience. Therefore, in order to get talented athletes who can be included in the process of long-term construction, the "coach observation" factor should no longer be used because, with the application of the right talent identification method, the coach can get the desired athlete criteria quickly, precisely and reduce costs and time that must be spent on long term construction(Houlihan & Green, 2008).

One of the coaching concepts that is widely used by countries in the world to produce talented athlete candidates is long-term construction developed by Balyi, which we know as LTAD (Dowling & Washington, 2021). The development of an athlete is likened to an art where coaches are involved in complex orchestration of planning, executing training, and competition (Nash, Sproule, & Horton, 2011). This means that the coach's role is very important in the long-term development of athletes.

Besides clubs, schools are the right place to coach and develop talents in children (Rhodes et al., 2008) because children spend much time at school with their teachers and friends for quite a long time. PE plays a vital role in the identification and development of sports talent in students (Lovell et al., 2018) because PE contains key elements of the talent detection process (Fernández & Méndez, 2012). In the 1950s, PE was included in the school curriculum as the main content (Kirk & Gorely, 2000) and was considered a place to nurture prospective athletes who would compete in the Olympics (Hargreaves in Prieto-Ayuso et al., 2020).

Research conducted by several experts states that talent requires an optimal environment to develop (Pion, 2017). A PE teacher should have insight into how and what instruments they can use to discover children's talents.

The findings from this study indicated that coaches seem to identify with athletes based on their own abilities and desires as coaches, not on their abilities.

This is because the term "present talent" is understood by some of the participants in this study and is used as a benchmark in deciding which child to choose. Ideally, the decisions and judgments the trainer makes are formed from the trainer's interactions with their environment to influence their perceptions, actions, and cognition (Araújo et al., 2015). Trainers are an integral part of talent identification (TID), but they have a poor understanding of "making the right decision at the right time" (Lyle & Vergeer, 2013).

Conclusions

The purpose of this article was to explore the extent of the knowledge and application of practitioners, coaches and teachers of physical education in Indonesia towards the concept of long-term athlete development. The researcher felt that this research needed to be done because since Indonesia's participation in the most prestigious international multi-events, such as Olympics, Indonesia's achievements have remained the same and instead tend to decrease. Then, the world has recognized long-term athlete development for the last two decades. Top athletes only immediately became top athletes. There must be a relatively lengthy process that delivers the potential of these athletes to become world-class athletes. Coaches in teachers' clubs at schools and practitioners play an important role in forming and developing athletes. Therefore, I want to find out how far the knowledge and insight of sports practitioners in Indonesia are.

By using the mixed method approach, it found that 1) sports practitioners know the concept of long-term coaching, 2) LTAD development concept model is the most widely recognized by sports practitioners in Indonesia, 3) The exciting findings were the length of training experience does not have a difference in knowledge There were significant differences regarding the contents of the LTAD concept itself, 4) There were many coaches who think that the process of fostering long-term athlete development in Indonesia is currently not good, 5) More sports practitioners only knew of LTAD concept or other concepts, but did not know what the exact contents of LTAD concept itself, 6) The fact that 100 per cent of participants agreed that talent identification needs to be done as part of the long-term athlete development process, 7) Even though Indonesia's human resources are abundant, the fact is that only 2.1% (DBON) has the participation rate of children in sports. The talent detection program was an approach taken to find sports that are suitable for a child's potential. Quite a lot of people knew about this talent detection, 71.10%, and only 28.89% did not know yet. This was a surprising result, considering that talent detection was something new in Indonesia as a first step to building LTAD. If this was implemented in Indonesia 100% of participants would agree to be implemented

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Conflict of interest

There is no conflict of interest in writing this research article.

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