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Exploratory Factor Analysis on the Talent Development Environment Questionnaire (TDEQ-5) for Basketball in Indonesia

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Authors' Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

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Abstract

Objectives. This study aimed to adapt and measure the level of validity and reliability of the Talent Development Environment Questionnaire (TDEQ-5) for basketball in Indonesia.

Materials and methods. A quantitative approach was employed, using the Exploratory Factor Analysis (EFA) method and Cronbach's Alpha test to determine the reliability of the instrument. The sample comprised 420 basketball athletes (212 men, 208 women) from the Developmental Basketball League, distributed across eight provinces, which were divided into nine major cities in Indonesia. The characteristics of the sample (mean ± SD) were as follows: aged 15 to 18 (17.8 ± 7.2 years old), training experience was 4 to 8 years (5.3 ± 8.9 years), and participating in competitions experience twice to four times a year. The analysis of this study is based on each factor: Long-term development (LTD), Alignment of expectations (AOE), Communication (COM), Holistic quality preparation (HQP), and Social network (SN).

Results. The results showed that KMO-MSA was $p > 0.5$, and Bartlett's Test of Sphericity was $p < 0.05$. Furthermore, Anti-image Correlation, Communalities, and Pattern Matrix Test also exhibited $p > 0.5$. The Cronbach's Alpha value was found to be 0.924.

Conclusions. These findings indicate that the TDEQ-5 is a reliable and valid tool for assessing the talent development environment of basketball athletes, especially in Indonesia. However, further development of this instrument is recommended to be adapted to the sports culture in Indonesia and to ensure a more comprehensive and scientific evaluation of talent coaching in basketball.

Keywords: sports talent, talent coaching, athlete coaching, basketball.

Introduction

The talent development of basketball athletes in Indonesia is an important element in improving both national and international achievements. In recent years, Indonesia has seen an increasing interest in basketball, both among young players and the basketball community in general (Indrayana & Hasibuan, 2021 & Rubiyatno et al., 2022). Nevertheless, to be able to compete at a global level, a structured and supportive talent development system is needed. Therefore, it is important to understand and optimize the talent development environment, which involves various aspects such as support from coach competence, quality of service, and also motivation and commitment of athletes (Juita et al., 2024). Based on previous studies, an easy measurement tool has been found and has a fairly high level of reliability, namely the Talent Development Environment Questionnaire (TDEQ-5) (Alfermann et al., 2023).

The Talent Development Environment Questionnaire (TDEQ-5) is a tool that has been proven effective in various countries in measuring the talent development environment. Several studies have also shown that TDEQ-5 has been used on 538 young athletes in China, (Li et al., 2018), analyzing the perceptions of 92 junior-elite U-19 soccer players about the talent development environment in Norway (Gangsø et al., 2021), as well as evaluating the impact of the talent development environment on team cohesion in water polo in South Africa (Madi et al., 2023). The results of those studies highlight that a good and conducive development environment can have a major effect on the career path of

athletes in the future. This instrument is also able to evaluate important dimensions such as social support, training structure, and development opportunities described in a study of 146 student golf athletes in Malaysia (Manaf et al., 2022). However, until now, there has been no study to adapt or validate TDEQ-5 in various types of sports in Indonesia, especially Basketball. Given cultural, social, and language differences, it is important to make adaptations so that this instrument can provide accurate and relevant results for the Indonesian basketball community (Deviandri et al., 2023).

Adapting TDEQ-5 to sports in Indonesia not only serves to accurately measure the talent development environment but also to provide deeper insights to coaches and sports organizations about factors that can be optimized (Thomas et al., 2020). Then, adapting the Talent Development Environment Questionnaire (TDEQ-5) for basketball talent development research in Indonesia is also very important for several reasons. According to the results of the research that has been found, questionnaire adaptation research can ensure cultural relevance that accurately reflects the local context and is well understood by athletes, coaches, and sports organizations (Gledhill & Harwood, 2019, Apollaro et al., 2022, & Henriksen & Stambulova, 2023), especially in Indonesia. By adjusting the language and context, the validity and reliability of the data collected will increase, so it provides more precise insight into the talent development environment in Indonesia. In addition, the results of this study allow researchers to identify the specific strengths and challenges faced by local athletes, so that talent development policies and programs can be structured more effectively (Gesbert et al., 2021). Adapted tools also facilitate better communication between researchers, coaches, and athletes, thus supporting targeted training strategies to improve the competitiveness of Indonesian basketball athletes (Megicks et al., 2022).

Therefore, this study aimed to adapt and measure the validity and reliability of the Talent Development Environment Questionnaire (TDEQ-5) for basketball in Indonesia. The exploratory Factor Analysis (EFA) method was employed because it provided important initial validation to ensure that TDEQ-5 could be measured consistently in the local context, especially in Basketball in Indonesia (Martindale et al., 2010 & Apollaro et al., 2022). Additionally, the researcher also added a reliability test to measure the internal consistency of the TDEQ-5 items within each identified factor. It is expected that the results of this study will significantly contribute to basketball sports coaching in Indonesia, ensuring that talented athletes receive the support they need to achieve their full potential.

Materials and Methods

Study Participants

The research population consisted of high school students who participated in the Developmental Basketball League (DBL) competition held in eight provinces spread across nine major cities in Indonesia. Sample selection was conducted using purposive sampling, where the selected sample was basketball players who qualified for the DBL Final round. Thus, there were 36 high school basketball teams (18 men's teams and 18 women's teams). Data collection was carried out one day before the start of the final basketball match. Based on the collected sample player data, the total number of players as samples was 420 players (212 male players and 208 female players). The sample characteristics (mean ± SD) were age ranging from 15 to 18 years old (17.8 ± 7.2 years), player training level of 4 to 8 years (5.3 ± 8.9 years), and participating experience in competition of 2 to 4 times in a year.

Study Organizations

This study employed a quantitative method, and the Exploratory Factor Analysis (EFA) approach was used to test the level of validity and reliability. The EFA testing method helped to understand the factor structure of instruments that have not been adapted before and to allow the identification of new factors that may arise due to differences in understanding (Yong & Pearce, 2013). For the results of this study to produce a reliable questionnaire tool, the researcher added an unstructured interview method. The purpose of the unstructured interview method was to analyze responses or comments to be evaluated in the research results (Susiono et al., 2024; Wedi et al., 2024).

This study has four stages. The first stage was to analyze the problems that occur in the basketball environment in Indonesia and review some scientific literature. In the first stage, the first problem identified was that many basketball communities in Indonesia arose from school-age children (Adiansyah et al., 2021; Ningsih et al., 2022; Santoso et al., 2022; Yuliandra et al., 2023; Nurhabibah et al., 2023; Sastra, 2023). The second problem was the lack of talent coaching support on basketball, which caused many players in the basketball community to have skills that go unnoticed. The second stage was the preparation of scientific articles and the search for measuring tools. The results of the second stage were the Talent Development Environment Questionnaire (TDEQ-5) as a measuring tool to be studied in this study. After TDEQ-5 was found, it was then translated into Indonesian based on recommendations of Banville et al., (2000). First, two Indonesian researchers who are bilingual experts in sports science and sports psychology translated the questionnaire. Second, after the TDEQ-5 was translated, it was then discussed by the researchers to produce a single version, conceptually with the original questionnaire and easy to understand. Third, the evaluation of questionnaires was conducted by English experts, sports coaching lecturers, as well as some basketball coaches with a minimum License B. The third stage was data collection, which was carried out in August-November 2024. Data collection was carried out in the Developmental Basketball League (DBL) competition. DBL is an inter-school basketball competition held annually in each province in Indonesia (Rahmaniar & Dewi, 2018; Dikky et al., 2020). The DBL competition is an official competition under the Indonesian Basketball Federation (PERBASI). The fourth stage was the preparation of scientific paper reports, reporting the results of this study by publishing scientific papers through journals. This study has been approved with research permit number B/1516/UN34.16/PT.01.04/2024.

Measurement

At the measurement tool stage, this sub-method section continued from the second stage of this study. The Talent

Development Environment Questionnaire (TDEQ-5) was adopted from research by Martindale et al., (2010), and then it was developed further by Li et al., (2015). Thus, TDEQ-5 produced 25 items in 5 factors, namely 1) Long-term development (LTD), 2) Alignment of expectations (AOE), 3) Communication (COM), 4) Holistic quality preparation (HQP), 5) Social network (SN). After the TDEQ-5 was successfully translated into Indonesian, it was then evaluated in a Focus Group Discussion (FGD) involving English language experts, sports coaching lecturers, and several basketball coaches, with a minimum of License B. The results of the evaluation are stated in the table below.

Statistical Analysis

The data analysis in this study utilized Exploratory Factor Analysis (EFA) to assess the validity of the instrument. In the EFA analysis, the analysis stage was divided into five parts, namely: Kaiser Meyer Olkin Measure Of Sampling Adequacy (KMO-MSA), Bartlett's Test of Sphericity, Anti-image Matrices, Communalities test, and Pattern Matrix Test. The significance level used for EFA analysis based on Bartlett's Test of Sphericity is $p < 0.05$, while the other four parts were >0.5 (Yong & Pearce, 2013). Then, reliability testing used Cronbach's Alpha with a significance value of > 0.7 (Amirrudin et al., 2020). The scale used was 1-5;

Table 1. The Translated Talent Development Environment Questionnaire (TDEQ-5) in English-Indonesian

Long-term development (LTD)	
LTD1	My training is specifically designed to help me develop effectively in the long term. Pelatihan saya dirancang khusus untuk membantu saya berkembang secara efektif dalam jangka panjang.
LTD2	My coach emphasizes that what I do in training and competition is far more important than winning. Pelatih saya menekankan bahwa apa yang saya lakukan dalam latihan dan kompetisi jauh lebih penting daripada menang.
LTD3	I spend most of my time developing skills and attributes that my coach tells me I will need if I am to compete successfully at the top/professional level. Saya menghabiskan sebagian besar waktu saya untuk mengembangkan keterampilan dan kualitas yang menurut pelatih saya akan saya perlukan jika saya ingin bersaing dengan sukses di tingkat atas/profesional.
LTD4	My coach allows me to learn through making my own mistakes. Pelatih saya memperbolehkan saya belajar dengan membuat kesalahan sendiri.
LTD5	I would be given good opportunities even if I experienced a dip in performance. Saya akan diberi kesempatan bagus meskipun saya mengalami penurunan performa.
Alignment of expectations (AOE)	
AOE1	My coach takes time to talk to my parents about me and what I am trying to achieve. Pelatih saya meluangkan waktu untuk berbicara kepada orang tua saya tentang saya dan apa yang ingin saya capai.
AOE2	The advice my parents give me fits well with the advice I get from my coaches. Saran yang diberikan orang tua saya sesuai dengan saran yang saya dapatkan dari pelatih saya.
AOE3	My progress and personal performance is reviewed regularly on an individual basis. Kemajuan dan performa saya secara berkala ditinjau secara individual.
AOE4	I am involved in most decisions about my sport development. Saya terlibat dalam sebagian besar keputusan tentang pengembangan olahraga saya.
AOE5	I regularly set goals with my coach that are specific to my individual development. Saya secara teratur menetapkan tujuan dengan pelatih saya yang khusus untuk pengembangan individu saya.
Communication (COM)	
COM1	My coach and I regularly talk about things I need to do to progress to the top level in my sport (e.g., training ethos, competition performances, physically, mentally, technically, tactically). Pelatih saya dan saya, secara teratur berbicara tentang hal-hal yang perlu saya lakukan untuk maju ke tingkat teratas dalam olahraga saya (misalnya, etos pelatihan, performa kompetisi, fisik, mental, teknik, taktik).
COM2	My coach and I talk about what current and/or past world-class performers did to be successful. Pelatih saya dan saya, berbicara tentang apa saja yang dilakukan para pemain kelas dunia saat ini dan/atau di masa lalu mereka untuk meraih kesuksesan.
COM3	My coach and I often try to identify what my next big test will be before it happens. Pelatih saya dan saya, kerap kali mencoba mengidentifikasi apa ujian besar saya berikutnya sebelum hal itu terjadi.
COM4	My coach explains how my training and competition program work together to help me develop. Pelatih saya, menjelaskan bagaimana program pelatihan dan kompetisi saya bekerja sama untuk membantu saya berkembang.

Table 1 (continued)

Holistic quality preparation (HQP)	
HQP1	My coach rarely talks to me about my well-being. Pelatih saya jarang berbicara kepada saya tentang kesejahteraan/kondisi saya.
HQP2	My coach doesn't appear to be that interested in my life outside of sport. Pelatih saya tampaknya tidak begitu tertarik dengan kehidupan saya di luar olahraga.
HQP3	My coach rarely takes the time to talk to other coaches who work with me. Pelatih saya jarang meluangkan waktu untuk berbicara dengan pelatih lain yang juga melatih saya.
HQP4	I don't get much help to develop my mental toughness in sport effectively. Saya jarang sekali mendapat dukungan untuk mengembangkan mentalitas saya dalam olahraga secara efektif.
HQP5	I am rarely encouraged to plan for how I would deal with things that might go wrong. Saya jarang didorong untuk merencanakan bagaimana menghadapi situasi yang mungkin tidak berjalan sesuai rencana.
HQP6	The guidelines in my sport regarding what I need to do to progress are not very clear. Pedoman yang mengatur langkah-langkah untuk berkembang dalam olahraga saya kurang brgitu jelas.
HQP7	I am not taught that much about how to balance training, competing, and recovery. Saya tidak banyak diajarkan tentang bagaimana cara menyeimbangkan latihan, kompetisi, dan pemulihan.
Social network (SN)	
SN1	Currently, I have access to a variety of different types of professionals to help my sports development (e.g., physiotherapist, sport psychologist, strength trainer, nutritionist, lifestyle advisor). Saat ini, saya memiliki akses ke berbagai jenis profesional untuk membantu pengembangan olahraga saya (seperti fisioterapis, psikolog olahraga, pelatih fisik, ahli gizi, dan konsultan gaya hidup).
SN2	I can pop in to see my coach or other support staff whenever I need to (e.g., physiotherapist, psychologist, strength trainer, nutritionist, lifestyle advisor). Saya dapat berkonsultasi dengan pelatih atau staf pendukung lainnya (seperti fisioterapis, psikolog olahraga, pelatih fisik, ahli gizi, dan konsultan gaya hidup) kapan saja.
SN3	My coaches talk regularly to the other people who support me in my sport about what I am trying to achieve (e.g., physiotherapist, sport psychologist, nutritionist, strength and conditioning coach, lifestyle advisor). Pelatih saya secara rutin berkomunikasi dengan para profesional yang mendukung saya (seperti fisioterapis, psikolog olahraga, ahli gizi, pelatih kekuatan dan kondisi, dan konsultan gaya hidup) mengenai tujuan-tujuan yang ingin saya capai.
SN4	Those who help me in my sport seem to be on the same wavelength as each other when it comes to what is best for me (e.g., coaches, physiotherapists, sport psychologists, strength trainers, nutritionists, lifestyle advisors). Para profesional yang membantu saya dalam olahraga tampaknya memiliki kesamaan visi tentang apa yang terbaik bagi saya (seperti fisioterapis, psikolog olahraga, pelatih fisik, ahli gizi, dan konsultan gaya hidup).

1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), and 5 (strongly agree). The testing of Exploratory Factor Analysis (EFA) and Cronbach's Alpha used SPSS 26.

Results

The following are the results of the validity test in the first stage after data analysis using Exploratory Factor Analysis (EFA). The first stage of EFA analysis is by analyzing the value of the Kaiser Meyer Olkin Measure Of Sampling Adequacy (KMO-MSA) in Table 2.

Based on the results of Table 2, the value of the Kaiser Meyer Olkin Measure Of Sampling Adequacy (KMO-MSA) shows 0.852. This KMO-MSA value is greater than $p > 0.50$, then the significance value of Bartlett's Test of Sphericity is $p < 0.05$, so the analysis can be continued.

After the KMO-MSA is known to be 0.852, the next analysis is by looking at the value criteria in the Anti-image Matrices in Table 3.

Table 2. KMO-MSA Results

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.852
Bartlett's Test of Sphericity	Approx. Chi-Square	1828.096
	df	10
	Sig.	0.000

Based on the results in Table 3, the focus is on the Anti-image Correlation values, denoted by 'a'. The values for factors LTD, AOE, COM, HQP, and SN are 0.857, 0.864, 0.943, 0.811, and 0.813, respectively. All of these values are greater than $p > 0.50$. Therefore, these five factors meet the criteria for Measures of Sampling Adequacy (MSA) as indicated by the Anti-image Correlation values.

The next step involves analyzing the Communalities test values, based on the values in the Extraction section. The results of the Communalities test are shown in Table 4 below.

Table 3. Anti-image Matrices Results

		LTD	AOE	COM	HQP	SN
Anti-image Covariance	LTD	0.273	-0.138	-0.057	-0.065	0.009
	AOE	-0.138	0.267	-0.081	-0.012	-0.043
	COM	-0.057	-0.081	0.441	-0.016	-0.049
	HQP	-0.065	-0.012	-0.016	0.197	-0.139
	SN	0.009	-0.043	-0.049	-0.139	0.215
Anti-image Correlation	LTD	0.857a	-0.511	-0.163	-0.278	0.038
	AOE	-0.511	0.864a	-0.236	-0.053	-0.178
	COM	-0.163	-0.236	0.943a	-0.054	-0.160
	HQP	-0.278	-0.053	-0.054	0.811a	-0.677
	SN	0.038	-0.178	-0.160	-0.677	0.813[a]

a. Measures of Sampling Adequacy (MSA)

Table 4. Communalities Test Results

Communalities		
Item	**Initial**	**Extraction**
LTD	1.000	0.798
AOE	1.000	0.810
COM	1.000	0.689
HQP	1.000	0.830
SN	1.000	0.809

Based on Table 4, the extraction values for factors LTD, AOE, COM, HQP, and SN are 0.798, 0.810, 0.689, 0.839, and 0.809, respectively. These extraction values are all greater than p>0.50, indicating a strong relationship between the variables and the factors.

Following the Communalities test, the next step is the Pattern Matrix test, which produces the component matrix (Table 5).

Table 5. Component Matrix Results

Item	Component
	1
LTD	.893
AOE	.900
COM	.830
HQP	.911
SN	.900

Based on Table 5, the values for factors LTD, AOE, COM, HQP, and SN are 0.893, 0.900, 0.830, 0.911, and 0.900, respectively. All five factors show values greater than p > 0.50 (sample size = 420), and the pattern from the matrix test also indicates that TDEQ-5 is divided into one component. Therefore, TDEQ-5 is proven to be valid as each test item is closely attached to a single instrument.

After conducting the validity test using Exploratory Factor Analysis (EFA), to ensure that the TDEQ-5 instrument has a high level of reliability, a reliability test was conducted. This reliability test uses Cronbach's Alpha values (Table 6).

Based on the results from Table 6, the Cronbach's Alpha value is 0.924, which is greater than 0.7. Additionally, the five factors, LTD, AOE, COM, HQP, and SN, also show reliability values greater than 0.7. Therefore, the Talent Development Environment Questionnaire (TDEQ-5) demonstrates high reliability.

Table 6. Reliability Test Results

Test	Item	Results
Cronbach's Alpha	All Item	0.924
Cronbach's Alpha if Item Deleted	LTD	0.901
	AOE	0.901
	COM	0.924
	HQP	0.906
	SN	0.898

Discussion

This research demonstrates that the Talent Development Environment Questionnaire (TDEQ-5) is a suitable and valid tool when using the Exploratory Factor Analysis (EFA) method. The analysis of the LTD factor proved valid for basketball in Indonesia, indicating that a supportive environment for long-term development is highly relevant in this context. Based on research in Burundi, an ideal talent development environment includes providing sports facilities for young athletes, prioritizing the development of competencies in all sports personnel, and developing youth training centers (Hatungimana & Oladipo, 2023). Moreover, coaches play a crucial role in talent development, as indicated by several LTD items. Competent and qualified basketball coaches should possess qualities such as motivation competency, game-strategy competency, character building, and technique competency (Juita et al., 2024). Furthermore, research by Wijayanti et al. (2024) suggests that qualified coaches should possess mental skills, coaching style, character building, nutrition knowledge, and coaching science. Therefore, coaches play a primary role in the context of talent development in basketball. Organizing age-group basketball tournaments or inter-school competitions is also a method for developing talent (Kalén et al., 2021), as players will continually strive to explore basketball skills that can then be used to evaluate coaches. The LTD factor

approach ensures that athletes not only achieve short-term peak performance but also develop sustainable careers. This is essential given the need to nurture talent continuously to contribute at the national and international levels.

The analysis of the AOE factor as a valid factor underscores the importance of alignment in vision and expectations among coaches, athletes, and other stakeholders in Indonesian basketball. Alignment among coaches, athletes, and stakeholders is crucial for team sports like football, basketball, volleyball, and handball, as it is necessary to achieve desired results for all parties (Van Meervelt et al., 2023). Alignment also creates consistency, such as the support and advice received by athletes, reducing confusion and improving athlete performance and self-confidence (Latief et al., 2024; Mandan et al., 2024). This alignment ensures that everyone is working towards a common goal, minimizing conflict, and increasing the efficiency of training programs. This coordinated approach is believed to enhance athlete satisfaction and motivation in the long term. Another advantage of good alignment between coaches and athletes is that training programs can be designed more efficiently and measurably, allowing athletes to focus on achieving success without distractions (Yi et al., 2021). Additionally, customizing training programs based on individual needs becomes easier, maximizing the potential of each basketball player.

The analysis of the COM factor emphasizes that clear and effective communication is a key component of the basketball environment in Indonesia. Good and harmonious communication between coaches and athletes, especially at the beginning of an athlete's career, is essential, such as having common and realistic goals, suppressing ego, and avoiding bringing problems into the work environment (Karafil & Ulaş, 2023). Furthermore, the involvement of parents with coaches also plays an important role in aligning perceptions about the future for young athletes (Yabe et al., 2021; Mandan et al., 2024). Good communication allows for the exchange of important information and helps build strong relationships between coaches, athletes, and support teams. This plays a vital role in helping athletes understand instructions, receive feedback, and improve their performance. Moreover, the main benefit of good communication among basketball players is to improve teamwork and make it more solid, such as sharing experiences about specific skills among players (Da Silva et al., 2022; Wibowo et al., 2024). Previous research also explains that good communication can lead to creativity in the game, maintain resilience in athletes, cultivate a cooperative spirit, and reduce anxiety (Callaghan et al., 2018; Higgins, 2022, & Luo, 2023). Thus, good communication will influence the level of success for both athletes and coaches.

The analysis of the valid HQP factor highlights the importance of a comprehensive and quality preparation approach in developing basketball athletes in Indonesia. Holistic preparation ensures that athletes receive training that covers physical, mental, and emotional aspects, which is crucial in the early development of a basketball player's career (Rodríguez-Cayetano et al., 2023). Holistic training in basketball teams includes improving technical skills such as dribbling, shooting, passing, as well as effective game strategy and teamwork (de Almeida et al., 2024). In addition, a holistic approach to team sports training also involves education such as nutrition and recovery methods, ensuring that athletes get the right intake for energy and adequate recovery to prevent injuries (Boumosleh et al., 2021; Esen et al., 2022). Thus, holistically prepared athletes tend to have better endurance, a lower risk of injury, and a higher ability to adapt to various on-court situations. Another advantage of a long-term and systematic holistic preparation method is that athletes gain mental well-being. Athletes feel well-cared for and have a sense of satisfaction as athletes, which will eventually impact their motivation to achieve (Lima et al., 2020; Juita et al., 2024). All of these methods support a longer and more successful career in basketball. This perspective supports the development of athletes who are not only ready in technical skills but also in facing the challenges of competition.

The analysis of the SN factor in the TDEQ-5 shows that social support or social networks play an important role in supporting the development of basketball players in Indonesia. Social support from family, friends, and the community has a positive impact on athletes' motivation and well-being. Family support can be in the form of material support and moral support, such as providing training equipment and always trying to be present at every practice session or competition (Mandan et al., 2024; Imtihansyah et al., 2024). Support from friends or the community can be in the form of encouragement before or after a match, joint training, and easy access, such as borrowing a basketball court for practice (Haggar & Giles, 2022; Simons & Bird, 2023). In addition, coaches who have extensive relationships also influence the talent development environment for basketball players. The manifestation of this relationship is bringing in nutritionists, physical therapists, sports psychologists, weight training instructors, and even helping athletes find schools for their academic future (Peng et al., 2020, Krommidas et al., 2022; Sridana et al., 2024). Thus, strong social support can be a source of important moral and informational support in an athlete's career. Moreover, social networks also function as an integral support system, helping basketball athletes develop their talents more effectively and sustainably (Benito-Colio et al., 2022).

The reliability analysis results also show that all factors in the TDEQ-5 have high Cronbach's alpha values. These results indicate that the instrument is consistent in measuring the talent development environment in Indonesian basketball. High reliability gives confidence that the evaluations produced by the TDEQ-5 instrument can be trusted and used as a basis for improving talent development training strategies in basketball (Thomas et al., 2020). It is crucial to ensure that the development of training programs is based on accurate and reliable data through this measurement tool. In addition, the results of the TDEQ-5 testing also provide an easy and credible solution for evaluating talent development systems in Indonesian basketball. Other research suggests that, in addition to measuring physical skills, techniques, and anthropometry in athletes, talent in athletes should be evaluated scientifically (Susanto et al., 2023; Vianna et al., 2024).

The limitations of this study are that when young basketball players provide statements, there are shortcomings such as assessments of basketball organizations and the quality of services such as schools or clubs. Players also believe that organizations have a strong influence on

basketball development in Indonesia, such as through athlete selection or organizing competitions to form layered local teams according to age categories. In addition, the schools that the players attend also need to be assessed regarding how schools support their basketball players in developing basketball skills to become professional athletes. Future research is expected to develop the Talent Development Environment Questionnaire (TDEQ-5) instrument more deeply following Indonesian sports culture, with more detailed analytical methods.

Conclusion

This study concludes that factors such as Long-term Development (LTD), Alignment of Expectations (AOE), Communication (COM), Holistic Quality Preparation (HQP), and Social Network (SN) are proven to be relevant and play a significant role in supporting the development and growth of basketball athletes, especially in Indonesia. The LTD factor emphasizes the importance of an environment that supports the growth of a sustainable career, while the AOE factor shows that the alignment of expectations between coaches, athletes, and related parties increases the efficiency and motivation of training. The COM factor highlights the role of clear communication in building strong relationships and improving athlete performance, while HQP ensures comprehensive and quality athlete preparation, covering physical, mental, and emotional aspects. Support from social networks (SN) is proven to boost motivation and well-being by providing the necessary moral and material support. The high reliability of the TDEQ-5, with a high Cronbach's Alpha value, indicates that the instrument is consistent and reliable, providing a strong foundation for improving talent development training strategies in Indonesian basketball. However, this study also identifies limitations regarding the assessment of the influence of organizations and the quality of services from schools or clubs. Therefore, further development of this instrument is recommended, adapted to the sports culture in Indonesia, to ensure a more comprehensive and scientific evaluation of talent development in basketball.

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Conflict of Interest

The authors has no conflict of interest.

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Дослідницький факторний аналіз використання опитувальника щодо визначення середовища розвитку обдарованості (TDEQ-5) у баскетболі в Індонезії

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Авторський вклад: A – дизайн дослідження; B – збір даних; C – статаналіз; D – підготовка рукопису; E – збір коштів

Реферат. Стаття: 10 с., 6 табл., 59 джерел.

Мета дослідження. Метою цього дослідження було адаптувати та оцінити рівень валідності та надійності використання опитувальника щодо визначення середовища розвитку обдарованості (TDEQ-5) у баскетболі в Індонезії.

Матеріали та методи. Для визначення надійності інструменту застосовано кількісний підхід із використанням методу дослідницького факторного аналізу (ДФА) та коефіцієнта альфа Кронбаха. Вибірка складалася із 420 баскетболістів (212 чоловіків, 208 жінок) з Баскетбольної Ліги Розвитку, учасників якої було розподілено за вісьмома провінціями, розділеними на дев'ять великих міст Індонезії. Характеристики вибірки (середнє ± СВ) включали наступні показники: вік від 15 до 18 років (17,8 ± 7,2 року), досвід тренувань — від 4 до 8 років (5,3 ± 8,9 року), досвід участі в змаганнях — від двох до чотирьох разів на рік. Проведений аналіз дослідження ґрунтується на кожному із представлених факторів: Довгостроковий розвиток (ДР), узгодженість очікувань (УО), комунікація (КОМ), холістична якісна підготовка (ХЯП) та соціальна мережа (СМ).

Результати. Результати показали, що критерій адекватності вибірки Кайзера-Мейєра-Олкіна становить $p > 0,5$, а критерій сферичності Бартлетта — $p < 0,05$. Крім того, кореляція антиміджів, спільності та критерій матриці патернів також мали показник $p > 0,5$. Значення коефіцієнта альфа Кронбаха становило 0,924.

Висновки. Отримані дані свідчать про надійність та валідність використання TDEQ-5 щодо оцінки середовища розвитку обдарованості баскетбольних спортсменів, що особливо актуально для Індонезії. Однак рекомендується подальший розвиток зазначеного інструменту з метою його адаптації до спортивної культури Індонезії та забезпечення більш комплексної і наукової оцінки тренерської роботи з талановитими спортсменами у баскетболі.

Ключові слова: спортивний талант, тренерська робота з обдарованими спортсменами, баскетбол.

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