

## Optimizing Performance Training with A Long-Term Athlete Development Approach to Handball Coaches

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### ABSTRACT

Upgrading the competency of existing trainers has not been implemented well and still seems minimal without using sports science studies and approaches. Setting standards and implementing certification of training and upgrading programs is an important element in developing quality handball coaches. Research Objectives to improve the skills of handball coaches, especially those related to the long-term athlete development approach (LTAD). This study was a group pretest-posttest design—45 participants consisting of 12 athletes and 33 physical education teachers. Participants' demographics and outcomes were summarized using descriptive statistics. Pre and post-tests in each group were assessed using paired t-tests. There was a significant increase in the knowledge and skill of handball, knowledge of the training program, and LTAD. This research concludes that coaches can use a long-term athlete development approach to improve handball athletes' skills.

**Keywords:** Handball; LTAD; training, Coaches

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## INTRODUCTION

In general, sport can be interpreted as a physical (World Health Organization, 2020) and spiritual connection of activity between muscles (Miller & Hamilton, 2016), nerves, and joints, which consists of a struggle against natural elements, other people, or oneself (Bompa & Buzzichelli, 2015; Rohman, 2018)." The National Sports System Law (UU SKN) Number 11 of 2022 (Undang-Undang Republik Indonesia, 2022) is the legal basis that regulates the development of the sports sector which so far has only been held by statutory regulations under the law, is partial, or has not regulated all aspects of national sports as a whole, and does not yet reflect an orderly legal system in the sports sector (Syamsudin et al., 2023). The national sports system is a whole sports subsystem interconnected in a planned, integrated, and sustainable manner to achieve national sports goals (Dlis, 2021; Ford et al., 2011a). The subsystems in question include, among others, sports actors, sports organisations (Andrefson et al., 2023), sports funds, sports infrastructure and facilities, community participation, and sports support, including science, technology, information, and the sports industry (Demiral, 2018; Varghese et al., 2022).



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As a manifestation of the implementation of the legal instruments mentioned above, the national sports building is organised into a sports system architecture that essentially carries out sports training and development, starting with the stages of sports introduction, monitoring, and scouting, as well as talent development and improving performance (Andrefson et al., 2023; Varghese et al., 2022). These stages are directed at promoting and cultivating sports and improving sports achievements at regional, national, and international levels (Ford et al., 2011a). These stages involve elements of families, associations, educational units, and sports organisations in society (Gleason et al., 2023), both at regional and central levels. By these stages, all sports spaces can synergise with each other to form a flexible and comprehensive national sports system (Muhlisin et al., 2022). This system involves three pillars: educational, achievement, and recreational sports. The implementation of the SKN Law in Central Java was then realised in Central Java Regional Regulation (PERDA) no. 4 of 2015 and Central Java Governor's Regulation (PERGUB) no. 4 of 2018 (Muhlisin et al., 2022).

The main focus of this service is on the sports pillar of achievement in the sport of Handball, where the government, through the Ministry of Youth and Sports (Ministry of Sports Youth) together with KONI (Indonesian National Sports Committee) and parent sports (Sports) have carried out the introduction, breeding to massing, and screening of athletes talented and ready to excel (Muhlisin et al., 2022). Handball is an attractive and interactive sport that requires its players' excellent abilities and skills (Manchado et al., 2018). Every player must be able to make decisions quickly and correctly at every opportunity/opportunity in the game (Hidayat et al., 2023). Handball games are very fast and faster than basketball, futsal, or other team events (Mr.K. et al., 2020). So apart from the skill requirements of each player, excellent physical abilities are also required. This makes Handball develop more quickly and is in demand by various groups of society (Carlsson, 2021; Muhlisin et al., 2022).

The development of Handball in Indonesia has increased quite rapidly (Muhlisin et al., 2022) and is increasingly in demand among various groups (Basiran et al., 2020). The inclusion of sports in West Java PON and the many national and regional championships in various regions have increasingly popularised the sport of Handball in society. The development of Handball has now spread to various circles of society, both the general public and students (Ford et al., 2011b).

Currently, the parent organisation for Handball in Central Java has 21 parent branch organisations (districts/cities) that actively develop Handball. Since its founding in 2014, the Provincial Management of the Indonesian Handball Association (ABTI) of Central Java Province has trained over 1,000 athletes across 20 districts/cities in Central Java. This resource needs to be developed properly through a training system, one of which is increasing human resources for trainers in each region. Therefore, this research aims to optimise the increase in athlete performance using a long-term athlete development approach.

## **METHOD**

The method uses the Long Term Athlete Development approach with one group pre-test – post-test design. Participants physical education teachers and handball athletes in Kendal Regency, totalling 45 participants consisting of 12 athletes and 33 physical education teachers on 21-23 July 2023. All participants took the test with 21 questions

on knowledge and skill aspects of Long-term Athlete Development. After being given training for three meetings with a duration of 360 minutes per session regarding long-term athletes in handball sports, a post-test was carried out.

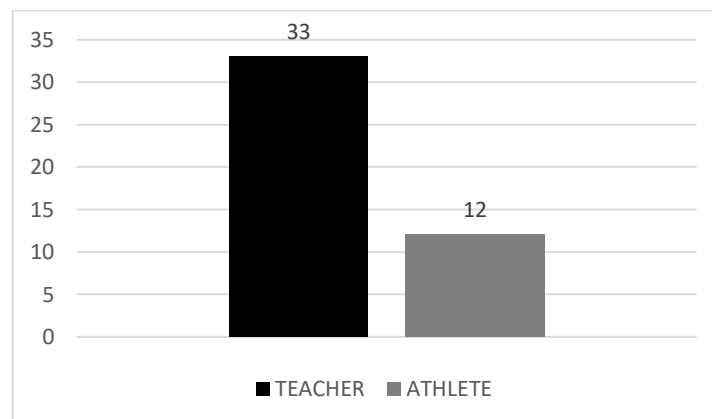
In preparing the schedule and program materials, it is adjusted to the handball training curriculum, where each material is inserted with "Long Term Athlete Development" material to increase knowledge and practical aspects. This is done using pre-test, post-test, and observation to determine the level of achievement theoretically (knowledge) and practically. The pre-test and post-test use test instruments for knowledge of handball and understanding of Long-Term Athlete Development via Google form.

Achievement of the knowledge aspect is known through the initial test (Pre-test) and final test (Post-test) using the form test instrument with 21 questions. There are six questions about handball, seven about training methods, and eight about LTAD.

Participants' demographics and outcomes were summarized using descriptive statistics. Pre- and post-tests were assessed in each group using paired t-tests. Analyzes were conducted using the IBM SPSS Statistics for Macintosh, Version 27.0. Armonk, NY: IBM Corp, with a significance level of 0.05.

## RESULTS

There were 45 participants, consisting of 33 teachers and 12 handball athletes. Participants generally have the characteristics of physical education teachers who have a basic understanding of learning and training methods but do not understand handball beforehand. In contrast, on the other hand, athlete participants have the opposite understanding, namely a better understanding of handball rules and the basics of playing well. There were 45 participants, consisting of 33 teachers and 12 handball athletes. Participants generally have the characteristics of physical education teachers who have a basic understanding of learning and training methods but do not understand handball beforehand. In contrast, on the other hand, athlete participants have the opposite understanding, namely a better understanding of handball rules and the basics of playing well.



**Figure 1.** Participants in Handball Training using the Long-Term Athlete Development (LTAD) Approach

Skill achievement is divided into two aspects: the basic technical ability aspect and the ability to develop training programs based on long-term athlete development. The second aspect was obtained from observations for basic technical aspects and for aspects of the ability to prepare programs using questions about preparing training programs. The following are the achievements from the knowledge and skills aspect in Table 1.

**Table 1.** Completeness of Handball Knowledge Aspects

No	Parameter	Time	Participant N = 45		p
			Mean	SD	
1	Knowledge of Handball	Pre	10.60	4.938	.000
		Post	20.84	2.923	
2	Training Methods	Pre	11.96	4.977	.000
		Post	26.16	2.345	
3	LTAD Knowledge	Pre	19.69	2.999	.000
		Post	29.29	2.332	
4	Basic Handball Techniques	Pre	2.47	.815	.000
		Post	3.58	.583	
5	LTAD Training Program	Pre	2.84	.562	.000
		Post	3.96	.475	

Source: research data, 2023

## DISCUSSION

From this research, the results can be seen that there is an increase in knowledge about handball in which the subjects were tested before and after the research,  $p < 0.05$ . This aligns with increased learning knowledge, especially perceptual and cognitive knowledge in handball (Magnaguagno et al., 2023). Learning cognitive knowledge is crucial for exploring a sport (Williams & Jackson, 2019). In terms of knowledge, many things must be learned, including response and the ability to capture visual information that comes from movement (Smeeton et al., 2019). This knowledge will have a good effect in capturing information, especially in handball (Magnaguagno et al., 2023).

This study also explains the increase in knowledge of making training methods before and after  $p < 0.05$ . This is in line with learning. One of the achievements of teaching sports teams in schools is that learning a game cannot be understood without important practice (Zerai & Zerai, 2017). So, training is needed for exercises with this training approach (Debanne & Laffaye, 2013). An exercise is verbal and practical (Zerai & Zerai, 2017). Factors that influence training methods include improving the quality of training for trainers and practitioners by developing measurement methods and special tests from scientific studies (Wagner et al., 2014).

Apart from knowledge and basic training methods in handball, this research also shows an increase in LTAD knowledge and application in creating LTAD training programs. This aligns with the research (Bjørndal & Ronglan, 2020). In handball, there is basic knowledge and approach before specializing in the sport. LTAD needs a sustainable approach and program (Manchado et al., 2018). This LTAD approach also influences changes in behaviour and skills (Jeffreys, 2019). In this LTAD method, trainers can portion training programs according to age, gender, and physical condition

(Bjørndal & Ronglan, 2020). Good athlete development is planned, systematic, progressive, and appropriate to their development (Balyi et al., 2013).

Furthermore, this research also produced significant changes in practising basic handball techniques and implementing how to create an LTAD training program for handball. This is in line with information about training that is not only verbal but can also provide examples of the basic techniques that have been taught (Zerai & Zerai, 2017). Trainers can provide information through direct responses and examples even when providing training programs (Debanne & Laffaye, 2013). Coaches can actively visualize by training imagery and distinguishing the characteristics of athletes so they do not give the wrong program (Corrado et al., 2019). This is done partly as part of training for a long-term program not to create haphazard athletes but quality athletes (Balyi et al., 2013). In training, coaches also create implicit-explicit programs to see progress in handball athletes (Ribeiro et al., 2023). If the coach has implemented this, he can create outstanding athletes (Balyi et al., 2013).

## CONCLUSION

This research concludes that there is an increase in knowledge about handball, the LTAD training program, basic handball skills, and the creation of the LTAD program to increase the performance of athletes in handball. It is hoped that further research can increase training time, especially in subjects for athletes/teachers/participants or other specialities.

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## CONFLICT OF INTEREST

The authors have no conflicts of interest associated with the material presented in this paper.

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