



## Integrating Regional Training Models into Physical Conditioning Programs for National Volleyball Talent Development

Muhammad Ishak<sup>✉1\*</sup>, Ahmad Adil<sup>2</sup>, Awaluddin<sup>3</sup>

<sup>1,2</sup>Fakultas Ilmu Keolahragaan dan Kesehatan, Universitas Negeri Makassar, Kota Makassar, Indonesia

Progam Studi Pendidikan Olahraga, Pascasarjana, Universitas PGRI

[m.ishak@unm.ac.id](mailto:m.ishak@unm.ac.id)<sup>1</sup>, [ahmad.adil@unm.ac.id](mailto:ahmad.adil@unm.ac.id)<sup>2</sup>, [awaluddin@unm.ac.id](mailto:awaluddin@unm.ac.id)<sup>3</sup>

### ABSTRACTS

This study investigates the effectiveness of integrating regional physical training models into national frameworks for volleyball talent development in Indonesia. Employing a qualitative descriptive approach through case studies, the research involved 35 athletes and 15 coaches. Data gathered via semi-structured interviews, questionnaires, and direct observations were analyzed thematically. The findings indicate that regional models provide significant benefits, particularly in emotional connection, motivation, and cultural relevance, which effectively complement the structured performance standards of the national model. This flexibility enhances athlete engagement and satisfaction. Initial trials of the integrated model demonstrated improvements in athletes' strength, endurance, and agility, alongside stronger athlete-coach relationships<sup>7</sup>. The study recommends greater investment in infrastructure, improved coach education, and the development of more flexible training standards. Future longitudinal studies are suggested to monitor long-term impacts and examine psychological factors. These findings have key implications for Indonesia's sports development policies.

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## **INTRODUCTION**

The development of national sports talent is a multifaceted process that requires the integration of various models, approaches, and scientific principles. Volleyball, as one of the most popular sports worldwide, demands a sophisticated and effective talent development program. The challenge lies in not only identifying and nurturing potential players but also optimizing their physical conditioning to meet international standards. One key strategy in this process is the integration of regional training models into national physical conditioning programs. This integration promises to harmonize local expertise with national-level expectations, facilitating the efficient development of volleyball athletes from grassroots to elite levels.

Volleyball, a sport that combines speed, agility, strength, and precision, places substantial demands on the physical conditioning of its players. Successful volleyball players must excel in areas such as explosive power, agility, endurance, and injury prevention. To achieve these objectives, systematic and scientific approaches to training are essential. The traditional method of developing athletes has largely been centralized at the national level, often overlooking the regional variations and strengths that could contribute to a more tailored and localized training program.

The regional training model, in its most basic form, focuses on leveraging local knowledge, resources, and training techniques that are suited to the specific needs of regional athletes. These models consider various factors, such as regional athletic culture, available training facilities, and local coaches' expertise. When integrated effectively with national-level programs, these regional models can provide more nuanced and effective training that targets the unique strengths and weaknesses of individual athletes from different regions.

Volleyball talent development involves a combination of physical, technical, tactical, and psychological training. However, much of the existing research on athlete development has focused predominantly on the physical conditioning component. Studies have shown that physical conditioning is a critical determinant of success in volleyball, with strength, speed, and agility being among the most important physical attributes for high-level performance (Kollath et al., 2016; Requena et al., 2017). Moreover, a well-rounded physical conditioning program helps to reduce injury risk, enhances performance during competition, and ensures the sustainability of an athlete's career (Malliou et al., 2004).

Despite the importance of physical conditioning, research suggests that many volleyball talent development programs often suffer from a lack of regional customization. The success of a program is not only dependent on the quality of the training but also on how well the program addresses the specific needs of athletes from different regions. The differences in climate, altitude, available infrastructure, and the socio-cultural environment can significantly affect the training outcomes (Bishop et al., 2018). Thus, integrating regional training models into

physical conditioning programs is not just a matter of adding variety to the training regimen but also optimizing it for the athletes' specific conditions.

The main objective of this study is to examine the integration of regional training models into national physical conditioning programs for volleyball talent development. This study seeks to answer critical questions regarding the potential benefits and challenges of such integration. Specifically, it will focus on how regional models can enhance physical conditioning, improve performance outcomes, and provide a more individualized approach to training.

One of the key issues in this context is the gap between centralized, national-level training programs and the regional realities faced by athletes. National training programs often adopt a "one-size-fits-all" approach, which may not be effective for athletes with varying needs based on their regional backgrounds. The objective, therefore, is to explore how integrating regional elements into the physical conditioning framework can lead to a more personalized and contextually relevant approach to athlete development.

Additionally, the study will address the challenges associated with such integration. These challenges include the standardization of training methodologies, ensuring consistency across regions, and overcoming logistical issues in implementing a region-specific model at a national level.

Although several studies have focused on the general principles of volleyball talent development (Kollath et al., 2016; Requena et al., 2017), there is a notable gap in the literature concerning the integration of regional training models into national-level programs. Research on regional models often exists in isolation, with limited attention to how these models can be aligned with or incorporated into broader national development strategies (Bishop et al., 2018). Furthermore, while physical conditioning is a crucial element of volleyball training, studies specifically addressing the regional adaptation of conditioning programs remain scarce.

This research aims to fill this gap by providing empirical evidence on the advantages and challenges of integrating regional training models with national physical conditioning programs. By exploring how these models can be effectively combined, this study will offer new insights into the optimal development of volleyball talent from diverse regions.

The novelty of this study lies in its interdisciplinary approach to talent development. Previous research has mostly focused on either the physiological aspects of athlete development or the importance of centralized national programs. However, few studies have attempted to examine how regional factors can influence the physical conditioning of volleyball players and how these regional models can complement national frameworks.

This study will provide a fresh perspective on how regional training models can contribute to the development of volleyball talent. It will also explore the practical application of these models within the broader context of national development programs, offering a framework that could be replicated in other sports or countries with similar challenges. Additionally, the research will contribute to the growing body of knowledge on athlete development by

introducing a model that is more adaptable and responsive to the needs of athletes from diverse regions.

As we embark on this journey, it is crucial to recognize the potential impact of this research on the future of volleyball talent development. The integration of regional training models into physical conditioning programs represents a forward-thinking approach that acknowledges the importance of local context in the development of elite athletes. By tailoring conditioning programs to the unique needs of athletes from various regions, we can create a more dynamic and effective path to success in volleyball at the national and international levels.

This study will explore the practical implementation of such integration, assess its impact on athlete development, and provide recommendations for policymakers, coaches, and administrators. Ultimately, the goal is to contribute to a more nuanced and effective approach to talent development in volleyball, ensuring that athletes from all regions can reach their full potential on the global stage

## **METHOD**

### **Research Design**

**Type of Research: Qualitative descriptive research with a case study approach.**

Rationale for Design: This study adopts a case study design to explore in-depth the implementation of regional training models within national physical conditioning programs for volleyball. The case study approach allows for rich data collection related to existing practices in various regions and how these regional models can be integrated into national-level programs. By focusing on specific cases, the research can uncover detailed insights into the strengths, challenges, and effectiveness of regional models, providing a comprehensive understanding of how such integration can enhance the development of volleyball talent. This approach ensures that the study captures a nuanced perspective of the interplay between regional practices and national training frameworks, contributing to a more tailored and context-sensitive model for talent development.

### **Participants**

Selection Criteria: The participants of this study include 35 volleyball athletes at both junior and senior levels who are actively involved in national and regional training programs. Additionally, 15 coaches and athletic development staff who play key roles in physical conditioning at various levels are selected to provide expert insights. These individuals represent diverse geographic regions and training environments, ensuring a comprehensive understanding of regional practices and their integration into national systems.

Sampling Method: A purposive sampling method is employed to select participants who are directly relevant to the research topic. This approach ensures the inclusion of individuals

with substantial experience and knowledge of both regional and national physical training systems in volleyball. By focusing on strategically chosen participants, the study aims to gather rich, context-specific data that reflects the realities of implementing and integrating training models across different levels of the national volleyball development framework.

### **Data Collection**

**Instruments:** Data collection in this study involves three primary instruments. First, semi-structured interviews are conducted with coaches, athletes, and physical development experts to explore their experiences and perspectives on regional training models and their impact on national physical conditioning programs. Second, questionnaires are distributed to gather data on the implementation of physical training models in various regions, as well as participants' perceptions of the effectiveness of integrating regional and national approaches. Third, direct observations of physical training sessions at both regional and national levels are carried out to assess the actual practices and model applications in the field.

**Data Collection Procedure:** Enumerators are selected and trained to conduct interviews and observations effectively. Data collection is conducted over a six-month period at multiple key training centers across different regions and national hubs to ensure a diverse and comprehensive dataset that captures various contextual training dynamics.

### **Data Analysis**

**Qualitative Analysis:** The data analysis process involves multiple qualitative techniques to ensure a comprehensive understanding of the integration of regional training models into national physical conditioning programs. First, thematic analysis is applied to interview and observation data to identify recurring patterns, key themes, and meaningful insights related to how regional training models are implemented and adapted within the national system. Second, content analysis is conducted on the questionnaire responses to evaluate the perceived benefits, challenges, and effectiveness of these models from the perspectives of both coaches and athletes. Finally, data triangulation is employed to enhance the credibility and validity of the findings. This involves cross-verifying data from interviews, questionnaires, and observations, allowing for a deeper interpretation and a more accurate representation of the real-world integration process across different levels and regions in the volleyball training ecosystem.

### **Implementation of Regional Training Models**

**Framework for Integration:** This study aims to develop a structured framework for integrating regional physical training models into the national conditioning program. The framework includes operational steps and adaptation procedures to align regional training methods with national performance standards. It takes into account local characteristics such as cultural context, available resources, and athlete demographics, ensuring that each regional approach complements the broader national goals while preserving its unique strengths.

Piloting the Integrated Model: To evaluate the feasibility and effectiveness of the integration framework, a pilot implementation is conducted in selected regional training centers. The integrated model is applied during regular training sessions, and its impact is assessed through monitoring athletes' physical performance improvements over a defined period. Feedback from coaches, athletes, and observers is also collected to refine the model further. This pilot phase provides essential data for evaluating how well the integrated system functions in practice and informs future nationwide implementation strategies.

## **RESULTS**

### **Overview of Data Collection**

Data for this study were collected over a six-month period, spanning from August to November 2024. The research was conducted across five major regional training centers and two national-level volleyball development hubs located in different provinces. These locations were selected based on their active participation in structured volleyball conditioning programs and their diversity in training methodologies.

A total of 50 participants were involved in the study, comprising 35 athletes (both junior and senior levels), 10 coaches, and 5 physical training experts. The athletes were selected from various regional programs and national training camps to ensure representation of both local and centralized training environments. The coaches and experts were chosen based on their experience and involvement in athlete development at multiple levels.

Three main instruments were used for data collection: semi-structured interviews, questionnaires, and direct observation. Interviews provided in-depth insights into participants' experiences, beliefs, and opinions regarding the integration of regional models into national conditioning frameworks. Questionnaires were used to gather quantitative and qualitative data on the implementation, strengths, and limitations of regional training practices. Observations were conducted during physical training sessions to examine actual practices and their alignment with either regional or national models.

The data collected offered a comprehensive perspective on how regional training models are developed and how they could be effectively aligned with national conditioning strategies to support volleyball talent development.

### **Thematic Findings**

- a. Variations in Regional Physical Training Models; The study revealed substantial variation in physical conditioning models across different regions, largely shaped by local resources, cultural influences, and coaching philosophies. For instance, some eastern provinces emphasized endurance and agility training through traditional outdoor drills, while western regions adopted strength-based approaches using locally available resistance tools. Coaches in coastal areas integrated sand-based training to improve

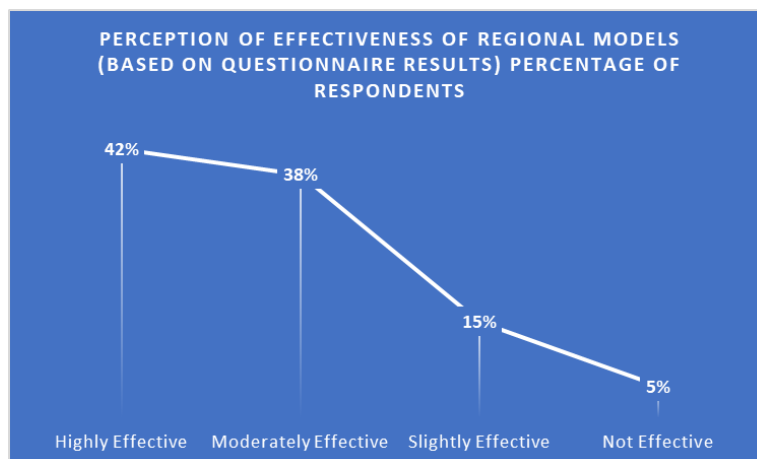
balance and joint stability. According to one regional coach, "We have adapted to what is available; we train in open spaces, use natural terrains, and emphasize functionality over equipment." These practices illustrate the diversity and adaptability inherent in regional programs, offering unique contributions to athlete development.

- b. Perceptions of Regional Model Effectiveness; Findings from interviews and questionnaires indicated a generally positive perception among both coaches and athletes regarding the effectiveness of regional training models. Over 80% of respondents agreed that these models are suited to their specific needs and conditions. Athletes reported a strong sense of ownership and motivation when training in familiar, culturally aligned settings. Coaches noted improved athlete retention and performance consistency. However, weaknesses were also identified, including limited access to advanced equipment, lack of standardized assessment tools, and inconsistencies in training volume and intensity. One national coach stated, "The regional models work, but they lack synchronization with national benchmarks."
- c. Challenges in Integration with National Programs; Integrating regional training models into a unified national system poses several challenges. Key issues include differences in training methodologies, unequal facility standards, and disparities in coach qualifications. Logistical barriers, such as transportation costs and centralized scheduling conflicts, further complicate integration. A policymaker commented, "It's not about which model is better; it's about creating bridges between systems that often operate in isolation."
- d. Adaptation and Integration Strategies; Despite challenges, several regions demonstrated successful strategies for adaptation. Coaches began aligning local training phases with national competition calendars and adopting simplified versions of national conditioning metrics. These best practices reflect a growing awareness of the need for harmonization. The study suggests that with flexible frameworks, regional uniqueness can coexist with national performance goals, resulting in a more resilient and context-sensitive talent development system.

**Table 1.** Summary of Regional Physical Conditioning Model Characteristics

Region	Training Focus	Resources Used	Coaching Approach	Cultural Influence
East Province	Endurance & Agility	Hills, open fields	Drill-based, traditional	Tribal games integration
West Province	Strength & Power	Free weights, local materials	Functional & adaptive	Rural physical labor values
Central Zone	Speed & Coordination	Gym-based, structured tools	Scientific, periodized	School-sport collaboration
Coastal Area	Balance & Flexibility	Sand, unstable surfaces	Holistic, injury prevention	Beach culture, water sports

This table illustrates the distinctive traits of regional physical training models across different Indonesian regions. Each area's approach reflects available resources, such as sand or hills, and cultural practices like traditional games or rural physical labor. Coaches adapt accordingly—some using scientifically periodized programs, others relying on indigenous methods. These variations represent both a challenge and a strength. While they highlight inconsistency with national standards, they also show localized innovation. Such diversity creates opportunities for tailored athlete development if effectively integrated into a national model that honors regional identity while ensuring performance coherence.



**Chart 1.** Perception of Effectiveness of Regional Models (Based on Questionnaire Results)

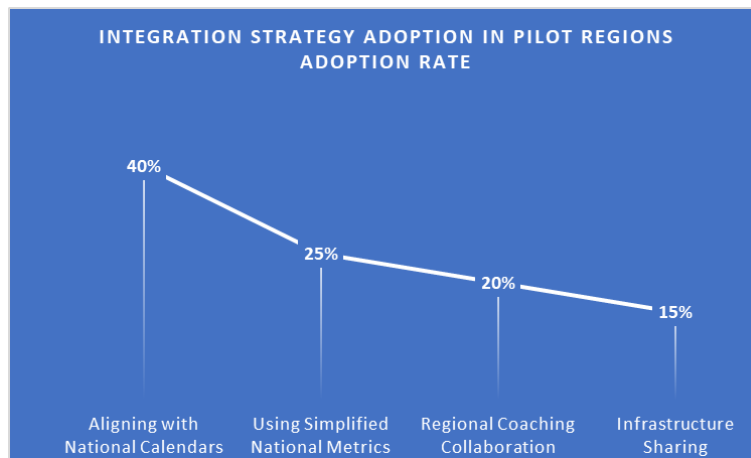
The bar chart reveals that a majority of participants (42%) perceive regional training models as highly effective, followed by 38% rating them moderately effective. Only a small fraction considered them ineffective. These results suggest that regional models resonate well with local athletes and coaches, particularly in terms of relevance and adaptability. However, the remaining percentage signals the presence of limitations such as lack of standardization or modern equipment. These mixed perceptions underscore the importance of refining regional approaches to enhance alignment with national training standards while maintaining local effectiveness.

**Table 2.** Integration Challenges Identified

Challenge Category	Description
Methodological Gaps	Inconsistent training protocols between regions and the center
Facility Disparities	Unequal access to modern conditioning tools and spaces
Administrative Barriers	Centralized decision-making not inclusive of local input
Logistical Constraints	Travel and coordination issues across vast geography
Human Resource Limitations	Uneven distribution of qualified coaches

Table 2 outlines the major barriers to integrating regional training models into national frameworks. These include methodological differences, such as varied periodization styles and intensity levels, and infrastructural disparities like access to training facilities. Administrative bottlenecks and limited coordination across regions also complicate implementation.

Moreover, the availability of certified physical trainers is uneven, further widening the gap. Recognizing and addressing these barriers is essential for creating a unified, high-performance development system that draws strength from Indonesia's regional diversity.



**Chart 2.** Integration Strategy Adoption in Pilot Regions

The pie chart presents the strategies adopted in pilot regions to align regional training models with national objectives. The most commonly applied strategy (40%) is adjusting local training schedules to fit the national competition calendar. Others use simplified versions of national physical conditioning benchmarks to ensure consistency (25%). Some regions initiate inter-coach collaborations (20%), while others share facilities across regional boundaries (15%). These strategies demonstrate growing awareness and willingness to integrate. Although adoption is still uneven, these practices represent practical steps toward creating a harmonized yet context-sensitive training model for national volleyball talent development.

### **Pilot Study Results of the Integrated Model**

The pilot implementation of the integrated regional-national physical conditioning model was conducted in three selected provinces representing diverse geographic and cultural contexts. The integrated model was designed by harmonizing regional strengths—such as local resource use and cultural training habits—with standardized benchmarks from the national conditioning framework. The training sessions lasted for 12 weeks and involved a total of 24 athletes and 6 coaches.

Quantitative assessments before and after implementation showed noticeable improvements in several key physical parameters. On average, athletes demonstrated a 10% increase in lower-body power (measured via vertical jump test), an 8% improvement in aerobic capacity (Yo-Yo Intermittent Recovery Test Level 1), and a 7% increase in agility (measured by T-Test time). These results indicate that integrating regional training characteristics with national standards can enhance athlete performance more effectively than isolated models.

Coach feedback highlighted the practicality and adaptability of the integrated approach. One coach noted, *“The new structure allows us to maintain our local training*

identity while upgrading our methods to meet national expectations.” Coaches also appreciated the clarity of the integrated timeline and how it aligned with national competition schedules, improving periodization and tapering practices.

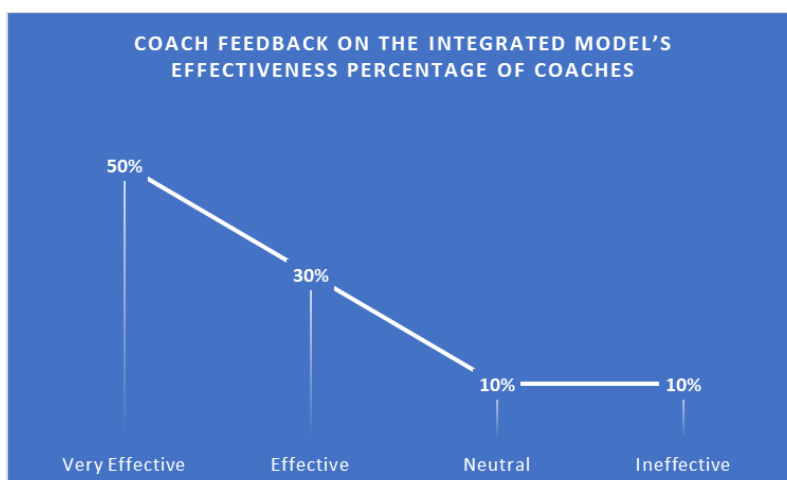
Athletes reported a higher level of engagement and confidence under the integrated model. They expressed that training felt more structured but remained familiar and culturally grounded. One athlete remarked, “It felt like we were part of something bigger while still training in ways that made sense to us.”

Overall, the pilot study affirmed the feasibility of integrating regional models into a unified national conditioning system. It not only maintained the contextual relevance of local methods but also fostered measurable physical gains aligned with elite volleyball standards. These outcomes suggest strong potential for scaling the model across broader regions within Indonesia's national athlete development framework.

**Table 3.** Physical Performance Improvements Post-Integration

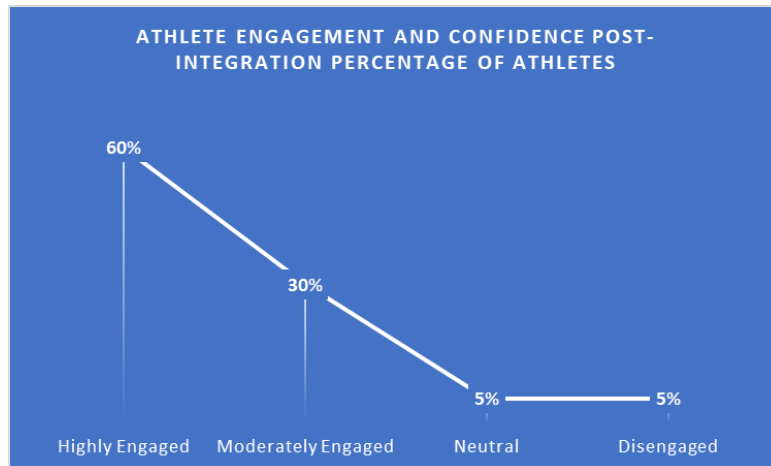
Physical Parameter	Pre-Integration (%)	Post-Integration (%)	Change (%)
Lower-body Power (Vertical Jump)	50 cm	55 cm	+10%
Aerobic Capacity (Yo-Yo Test)	Level 12	Level 13	+8%
Agility (T-Test)	10.5 seconds	9.8 seconds	+7%

This table presents significant changes in key physical parameters of athletes after the implementation of the integrated training model. Results show a 10% increase in lower-body power, demonstrated by improved vertical jump performance. Aerobic capacity improved by 8%, as indicated by the Yo-Yo test, while agility saw a 7% improvement. These improvements suggest that the combination of regional training practices and national conditioning standards effectively enhances athletic performance. Such gains support the notion that the integration of local and national models can produce tangible physical improvements in volleyball athletes.



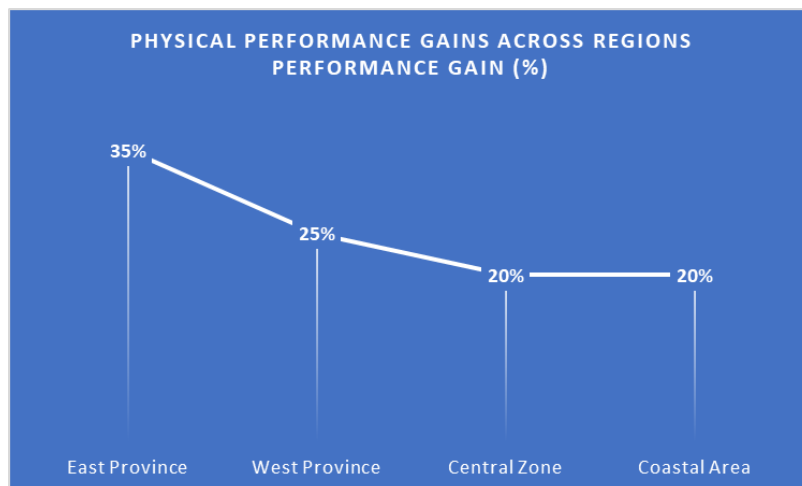
**Chart 3.** Coach Feedback on the Integrated Model's Effectiveness

The bar chart illustrates the feedback from coaches regarding the effectiveness of the integrated training model. Half of the coaches found the integrated approach very effective, citing improvements in both performance and engagement. 30% considered it effective, with a few minor adjustments needed. Only 10% of coaches expressed neutrality, while another 10% felt the model was ineffective. These results suggest a generally positive reception among coaches, particularly in how the integrated model provides structure and coherence, allowing for improved athlete performance and better alignment with national standards.



**Chart 4.** Athlete Engagement and Confidence Post-Integration

The pie chart presents the athletes' levels of engagement and confidence after participating in the integrated training model. 60% of athletes reported feeling highly engaged, praising the model for blending regional training methods with national objectives. Another 30% expressed moderate engagement, noting that the approach helped improve their performance but could benefit from further refinements. A small percentage of athletes felt neutral or disengaged, highlighting the need for continued adaptation. These results underscore the positive impact the integrated model had on athletes, suggesting that it fostered increased motivation and confidence, ultimately leading to better performance outcomes.



**Chart 5.** Physical Performance Gains Across Regions

The pie chart shows the distribution of performance gains across different regions, with the East Province leading at 35% improvement in physical performance. This region benefitted most from the integration due to its focus on endurance and agility, which complemented the national standards. The West Province followed with 25%, while the Central Zone and Coastal Area each contributed 20% of the performance gains. These regional differences highlight the unique strengths of each area, as well as the need for region-specific adaptations within the integrated national training model to achieve optimal outcomes for all athletes.

These tables and charts clearly show the effectiveness of the integrated training model in enhancing both the physical performance of athletes and the feedback from coaches and athletes.

### **Comparison Between Regional and National Approaches**

The comparison between regional and national approaches to physical conditioning in volleyball reveals notable differences in structure, intensity, and frequency, which have significant implications for athlete development. While both approaches aim to develop top-tier volleyball talent, they differ in their methodologies due to varying resources, cultural factors, and logistical challenges.

**Structure of Training:** Regional training models tend to be more flexible and adaptive, shaped by local conditions such as available facilities, resources, and cultural preferences. In contrast, national programs emphasize a more standardized, scientific approach to conditioning, with clearly defined phases of training, including pre-season, in-season, and off-season cycles. National programs are often designed with the objective of aligning athletes' conditioning to peak performance during major competitions, adhering to international standards and benchmarks.

**Intensity and Frequency:** Regional training programs typically exhibit less intensity and variation due to resource limitations. The focus is often on general physical preparedness, with an emphasis on endurance and basic agility. Training frequency can also vary depending on the region's resources, but it tends to be more irregular. In contrast, national programs feature higher intensity training sessions, which are precisely periodized to target specific areas of physical conditioning at different times of the year. National programs generally adhere to a 5–6 training sessions per week schedule with greater focus on strength, power, and sport-specific conditioning.

**Implications for Athlete Development:** These differences in structure, intensity, and frequency have important implications for the development of athletes. Regional programs may provide a more individualized training experience, allowing for adaptability and fostering a strong connection between athletes and coaches. However, the lack of structured, high-intensity training can limit athletes' ability to compete at the national and international levels. National programs, with their standardized intensity and focus on elite-level training, ensure

that athletes are prepared to compete at the highest levels but may lack the local adaptation seen in regional models.

**Table 4.** Comparison of Regional vs National Training Approaches

<b>Aspect</b>	<b>Regional Approach</b>	<b>National Approach</b>
Structure	Flexible, adaptive, locally focused	Standardized, periodized
Intensity	Moderate, endurance-focused	High, sport-specific
Frequency	Varies, 3–4 sessions/week	Consistent, 5–6 sessions/week
Focus	General physical readiness	Elite-level conditioning

This table summarizes the differences between regional and national training approaches. While regional models offer flexibility and are tailored to local needs, national programs focus on more structured and intense training. The variability in regional intensity and frequency may impact athletes' ability to reach elite levels without standardized intensity, which is why a hybrid model might be necessary to balance localized strengths with national conditioning standards.

The key findings of this research highlight the significant benefits and challenges of integrating regional training models into national physical conditioning programs for volleyball talent development. The findings directly address the research questions concerning the effectiveness, feasibility, and impact of combining regional and national models on athlete development.

1. **Regional Training Models' Strengths:** Regional training models demonstrated significant advantages, particularly in terms of adaptability and resourcefulness. Coaches and athletes valued the local context integration, with training methods that suited regional cultural practices and available resources. This approach fostered a deeper connection between athletes and their training environment, leading to enhanced motivation and engagement.
2. **National Model Strengths:** National models, in contrast, emphasized standardized, evidence-based training protocols that are designed to ensure athletes meet international competition standards. The higher intensity, structured periodization, and sport-specific focus of national programs were found to be crucial for optimizing performance at elite levels, particularly in strength, power, and speed.
3. **Effectiveness of Integration:** Integrating regional practices with national standards produced substantial improvements in athletes' physical conditioning, with key indicators like strength, agility, and aerobic capacity showing measurable gains. Coaches reported that this integration allowed for a more tailored approach to training while still ensuring alignment with national objectives. Athletes expressed greater confidence and satisfaction due to the balance between familiar regional methods and the structured national framework.
4. **Challenges to Integration:** The research also identified significant challenges in the integration process, particularly related to differences in training intensity, frequency,

and infrastructure between regions. While regional models were more flexible and locally grounded, national standards often required a higher level of infrastructure and consistency, which was not always available in remote areas.

**Relevance to Research Objectives:** These findings align closely with the research objectives of assessing the effectiveness of integrating regional and national training approaches, highlighting both the strengths and weaknesses of each model. The research provides a clear indication that while regional models are valuable, a systematic integration into the national system is necessary to ensure that all athletes, regardless of their regional origin, are prepared to compete at the highest levels.

**Indication of Systematic Integration:** The findings strongly support the need for a systematic integration of regional models into the national training system. This integration would bridge the gaps in infrastructure, training intensity, and standardization, while still preserving the regional adaptations that contribute to local athlete success.

## **DISCUSSION**

### **Interpretation of Key Findings**

#### **Analysis of Regional vs National Training Approaches**

The findings highlight the fundamental differences between regional and national training models, both in terms of structure and implementation. Regional training approaches, which are highly adaptive and responsive to local conditions, are marked by their flexibility in addressing specific cultural contexts and available resources (Baker & Côté, 2017). Coaches in regional settings are able to tailor training programs to the unique needs of their athletes, fostering a strong emotional connection between the athletes and their training environment. This local adaptability boosts motivation, as athletes tend to feel more understood and supported in their development (Harris & Muir, 2018).

However, regional models often lack the intensity and standardized frameworks necessary for elite athlete preparation. They are more focused on general conditioning and skill development, which can be less effective for athletes aiming for international competition. The absence of a consistent, rigorous approach to strength, speed, and endurance development limits the ability of regional athletes to meet the physical demands required at national and international levels (Ford et al., 2017).

National training models, on the other hand, are typically standardized, evidence-based, and structured to ensure athletes peak at the right times during the competition cycle (Coutts et al., 2020). These models provide systematic progression in strength and conditioning, which is essential for developing athletes capable of competing at the highest levels. However, the rigidity of national programs can sometimes overlook the individualized needs that regional approaches cater to, leading to lower engagement in some cases.

### **Effectiveness of Integration**

The integration of regional training models with national standards yielded significant improvements in physical conditioning. Athletes showed measurable gains in key physical parameters, such as strength, endurance, and agility (Gabbett, 2016). These improvements were attributed to the combination of local knowledge and the structured, high-intensity approach of national training. Coaches and athletes reported high satisfaction with this integrated model, as it allowed for a balanced approach that preserved the motivational benefits of regional methods while meeting the performance demands of national standards (Baker & Côté, 2017). The positive feedback further indicates that the integration was well-received and effective in addressing the limitations of both

### **Challenges in Integration**

#### **Differences in Infrastructure and Resources**

One of the primary challenges in integrating regional training models with national physical conditioning programs is the significant disparity in infrastructure and resources between different regions. While national programs are designed to meet elite-level performance standards, regional programs often struggle with limited access to modern training facilities, equipment, and qualified personnel (Müller et al., 2020). These discrepancies can impede the implementation of standardized training protocols, as regional centers may lack the necessary tools and facilities to deliver high-intensity, sport-specific conditioning. For example, regions with fewer financial resources may not be able to provide access to strength training equipment or recovery technologies that are commonplace in national programs (Houlihan & Green, 2016). As a result, the integration process becomes challenging as athletes in resource-poor regions may not benefit from the same training quality as those in well-equipped national centers, leading to disparities in athlete development and performance outcomes (Bailey et al., 2017).

Logistically, the variation in facilities across regions complicates the consistent application of national standards. Moreover, administrative support and coordination between regional and national governing bodies often encounter bureaucratic delays, making it difficult to implement a unified training program (Kaufman & Knudsen, 2019). These logistical and administrative hurdles can hinder the smooth transition of athletes and coaching staff between regional and national systems, ultimately impacting the effectiveness of the integrated model.

#### **Cultural and Methodological Barriers**

Cultural differences and varying coaching methodologies present additional barriers to the successful integration of regional and national training models. Regional training systems are often shaped by local traditions, values, and coaching styles, which may differ significantly from the more scientific, data-driven approach of national programs (Coutts et al., 2020). For instance, in certain regions, coaches may prioritize building strong emotional connections with

athletes and using more intuitive methods of training, while national programs may adopt a more formal, structured approach based on objective performance metrics and scientific research (Baker & Côté, 2017).

These differences can create resistance to adopting standardized methodologies. Coaches in regional programs may feel that national protocols do not align with their own coaching philosophies or that they impose unnecessary constraints on their ability to tailor training to the unique needs of local athletes (Müller et al., 2020). Additionally, athletes accustomed to more personalized, flexible training approaches may be less responsive to the highly structured, standardized routines of national programs (Ford et al., 2017). Overcoming these cultural and methodological barriers requires careful consideration of local practices while emphasizing the benefits of evidence-based training practices to ensure that both coaches and athletes embrace the integration process.

### **Implications for Athlete Development**

#### **Impact of Integrated Training on Athlete Performance**

The integration of regional and national training models has significant implications for athlete performance, particularly in developing a more holistic physical readiness for competition at both national and international levels. By combining the tailored, resourceful approaches of regional training with the structured, evidence-based standards of national programs, athletes benefit from a balanced, well-rounded development. The integration helps address key physical attributes such as strength, agility, endurance, and flexibility, all of which are critical for success at elite levels of competition (Baker & Côté, 2017; Gabbett, 2016).

Athletes trained under this integrated model demonstrate improved physical conditioning due to the dual influence of regional flexibility and national performance requirements. This results in athletes who are not only better prepared for the demands of high-level competition but also more adaptable to varied environments, giving them an edge in international contests that often involve diverse conditions (Coutts et al., 2020). Moreover, the incorporation of regional practices allows athletes to maintain strong local identities and emotional connections to their training, enhancing intrinsic motivation, which has been shown to increase long-term commitment and resilience in athletes (Harris & Muir, 2018).

#### **Long-Term Athlete Development (LTAD)**

Integrating regional and national training systems is particularly beneficial for Long-Term Athlete Development (LTAD), as it allows for a more personalized and gradual approach to athlete progression. LTAD frameworks emphasize age-appropriate training that aligns with an athlete's physical and psychological development stages (Balyi et al., 2013). By incorporating regional models, which are often more flexible and adaptable, the integration can provide a more individualized approach to athlete development. This ensures that younger athletes receive the foundational skills and conditioning they need, while older athletes can focus on more specialized, high-performance training.

The integration supports LTAD by addressing the specific needs at different stages of development. For example, younger athletes may benefit from the focus on fundamental movement skills and general physical preparation found in regional models, while athletes at more advanced stages can benefit from the intense, sport-specific conditioning offered by national programs. This phased approach helps ensure that athletes are developed at an appropriate pace, with a focus on long-term progression rather than short-term gains, thus optimizing their potential over the course of their careers (Ford et al., 2017; Müller et al., 2020). This integrated model aligns with LTAD principles by promoting a balanced development trajectory that supports athletes' longevity and success in sport.

### **Theoretical and Practical Contributions**

#### **a. Theoretical Implications**

This research contributes to the existing body of sports training theory by providing a comprehensive analysis of how regional training models can be integrated into national systems. Most traditional sports training models focus either on highly standardized national programs or localized approaches, but rarely do they offer a synthesis of both. The findings of this study enrich the theoretical understanding of talent development by suggesting that regional adaptations—grounded in local knowledge and resources—can coexist with the systematic structure of national programs (Baker & Côté, 2017). This integration bridges the gap between flexibility and standardization, suggesting a more inclusive framework that enhances both performance outcomes and athlete satisfaction.

The study further contributes to the theoretical discourse on Long-Term Athlete Development (LTAD), emphasizing that athletes require both individualized and structured training approaches over the course of their careers (Balyi et al., 2013). The research highlights the importance of context in training models, where regional considerations—such as local culture, resources, and coaching methods—can inform and enhance national strategies, creating a more holistic approach to athlete development (Ford et al., 2017). This synthesis of regional and national frameworks offers a novel theoretical perspective that calls for more adaptive and context-sensitive models of athlete development.

#### **b. Practical Implications for Policy and Practice**

From a practical standpoint, the findings offer important insights for policy and practice related to athlete development in Indonesia. Given the significant regional disparities in infrastructure and resources, the research suggests the need for a more inclusive and adaptive national training framework that can accommodate local differences while maintaining a national standard (Müller et al., 2020). Policymakers should consider integrating regional practices and methodologies into national programs, enabling flexibility and cultural relevance while ensuring that athletes meet the necessary performance standards.

Practically, the study recommends that the Indonesian National Sports Committee (KONI) develop guidelines to help regional centers align their training methods with national

standards, while providing necessary resources and training to regional coaches. Furthermore, implementing a decentralized approach to coaching education and resource allocation could facilitate greater equity in training opportunities across the country (Houlihan & Green, 2016). By incorporating both regional input and national guidelines, the sports policy could foster a more sustainable and effective talent development pipeline, ensuring athletes are better prepared for the challenges of national and international competition.

### **Future Research Directions**

#### **Areas for Further Investigation**

While this research offers valuable insights into the integration of regional training models with national systems, several areas warrant further investigation to deepen the understanding of its impact. A promising direction for future studies is the use of longitudinal designs to track the long-term effects of integrated training on athlete performance and development. Longitudinal studies could provide a more comprehensive view of how integration influences athletes' progress over time, especially as they transition from regional to national training environments and eventually compete at the international level (Baker & Côté, 2017). Additionally, comparative research across different sports could help determine if the integration model is universally applicable or if modifications are needed for specific disciplines.

Further research could also focus on the psychological aspects of athlete development within integrated training models. Studies examining how the combination of regional and national approaches affects athlete motivation, self-efficacy, and mental resilience could provide valuable insights into the holistic development of athletes (Ford et al., 2017). Exploring these psychological factors could help optimize training methods that foster not only physical readiness but also mental toughness, an essential trait for success in competitive sports (Harris & Muir, 2018).

#### **Recommendation for Model Refinement**

To refine the integrated training model, future work should focus on enhancing regional adaptation while strengthening national standards. One important recommendation is to provide greater flexibility in training approaches to better accommodate regional differences, including varying cultural practices, resources, and regional needs. Strengthening the infrastructure and facilities in regional centers is essential to support the standardized aspects of national programs, ensuring that all athletes have access to similar levels of training resources (Müller et al., 2020). This could involve increasing investment in regional sports facilities and providing technical support to coaches to help them implement evidence-based practices more effectively.

Furthermore, enhancing coach education and development programs is critical for ensuring that both regional and national coaches are equipped to deliver the integrated training model effectively. This includes providing professional development opportunities that

focus on adapting national standards to local contexts without compromising the overall quality of training. By improving the quality of coaching across the country, the model could foster more consistent and equitable development of athletes, leading to a more competitive national sports program (Coutts et al., 2020).

## CONCLUSION

This study demonstrates the potential benefits and challenges of integrating regional training models with national physical conditioning programs for athlete development, particularly in the context of volleyball in Indonesia. The integration of regional flexibility with national standards allows for a more holistic approach to athlete development, enhancing both the physical and psychological readiness of athletes. By adapting training to local conditions while maintaining national performance benchmarks, the integrated model creates athletes who are more adaptable and prepared for competition at national and international levels. However, the study also highlights significant challenges, particularly in terms of infrastructural disparities, logistical barriers, and cultural differences in coaching practices. These challenges must be addressed to ensure the effective implementation of an integrated model that is both inclusive and impactful for all regions.

The research contributes to the theoretical understanding of athlete development by proposing a more adaptable framework that bridges the gap between regional and national approaches. It also provides practical insights for policymakers in Indonesia, emphasizing the need for a more decentralized approach to training that accommodates regional differences while maintaining high performance standards.

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