Abdimas Umtas: Jurnal Pengabdian Kepada Masyarakat
LPPM-Universitas Muhammadiyah Tasikmalaya
Volume: 8, Issue: 3, July, 2025; pp: 1472-1480
E-ISSN: 2614 - 8544

Optimizing Training Management Through Long-Term Athlete Development (LTAD) Framework

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ABSTRACT

This community development is intended to assess the effectiveness of a 12-week training management approach grounded in the Long-Term Athlete Development (LTAD) framework, executed at the Surabaya Athletes Association. The program aims to improve athletic performance while comprehensively addressing the developmental requirements of student-athletes. Thirty student-athletes, aged 13 to 17 years, engaged in the 12-week intervention. A mixed-method research methodology was utilized to perform a thorough study. Quantitative data were obtained using pre- and post-program physiological evaluations (VO2Max, strength, agility), while qualitative data were collected through surveys assessing motivation and program satisfaction. The quantitative study demonstrated a statistically significant enhancement in participants' VO2Max values ($p<0.05$). Furthermore, there was a significant average gain of 12% in scores on strength and agility assessments. Over 85% of the participants qualitatively expressed improvement in training motivation and overall program satisfaction. The results robustly endorse the effectiveness of a training approach that methodically combines physical conditioning with academic requirements and mental health factors. This method successfully facilitated physiological and psychological improvements based on the principles of periodization and individualization. The study advocates implementing the LTAD scheme as a foundational framework for the national Indonesian Athletes Association to guarantee sustainable, high-performance athlete development.

ARTICLE INFO

Article History :
Submitted/Received 6 July 2025
First Revised 10 July 2025
Accepted 29 July 2025
First Available online 31 July 2025
Publication Date 31 July 2025

Keyword :
Long-Term Athlete Development
Motivation
Training Management
VO2 Max
Youth Athletes

https://doi.org/10.35568/abdimas.v8i3.6898

INTRODUCTION

Fostering elite athletes in sports academies requires a holistic methodology that enhances training administration via sustained coaching tactics. However impactful, the conventional Long-Term Athlete Development (LTAD) model has faced criticism for its linear trajectory and focus on early specialization, potentially neglecting the varied requirements of different athletes (Till et al., 2024). The concept of athletic development pertains to the physical growth of young individuals, which includes training components related to health, skill, and performance fitness. The gradual integration of these components as youth age aims to improve performance, minimize the risk of injuries, and boost the confidence and abilities of all young people. A practitioner is defined as a person who is accountable for the athletic development of youth, which encompasses youth sport coaches, sports administrators, strength and conditioning coaches, physical education instructors, athletic trainers, physiotherapists, and various other health care professionals.

Resistance training is a specific conditioning technique in which an individual engages with various resistive loads to improve health, fitness, and performance (Lloyd et al, 2015). Talent development is inherently holistic because of the complex interplay of various interdisciplinary factors directly influencing athletic opportunities and progression (Ford et all, 2011). This critique emphasizes the necessity of implementing a more adaptable and personalized strategy that recognizes the distinct developmental paths of each athlete. This knowledge fosters multi-sport participation, which helps alleviate the hazards of over-specialization and fatigue. To successfully execute these personalized training approaches, practitioners must comply with certain essential principles highlighted in recent research.

The development of talent is inherently holistic because of the complex interplay of various interdisciplinary factors that directly influence athletic opportunities and progression which include power, speed, agility, and aerobic fitness (Pichardo et all, 2018). Tønnessen (2022) emphasizes that although coaches acknowledge their obligations in facilitating long-term athletic development, compliance with critical techniques like monitoring growth and maturation is frequently insufficient. This disparity indicates a necessity for improved knowledge and resources to provide coaches with the skills required for methodical advancement customized for individual athletes. By cultivating an environment in which assessment and feedback are essential elements of training management, the Indonesian Athletes Association can enhance athlete development. Enhancing training management in sports institutions necessitates acknowledging the non-linear progression of athlete development. Coaches must prioritize developing individualized training programs that align with each athlete's strengths and weaknesses while fostering health and well-being (Tønnessen, 2022). Highlighting adaptability in coaching methodologies improves athletic performance and fosters enduring engagement in sports, an imperative objective for any holistic athletic program.

The advancement of national sports accomplishments is a vital measure of a nation's human resource quality and a source of national pride. Attaining lasting success globally takes more than mere skill; it requires a systematic, long-term, evidence-based coaching framework. A systematic framework guarantees that athlete development is an ongoing and meticulously managed process, from initial talent discovery to optimal performance at the elite level. Numerous prominent sporting nations have shown that investment in such systems produces consistent outcomes, establishing a dependable pipeline of elite athletes. This methodology emphasizes the comprehensive growth of the athlete, guaranteeing the cultivation of their physical, psychological, and social welfare throughout their rigorous careers.

In the Indonesian setting, the route to elite sports is frequently beset by considerable challenges. A primary difficulty is the widespread inconsistency in early-age training management. Coaching approaches may lack consistency, frequently emphasizing immediate successes at the expense of long-

https://doi.org/10.35568/abdimas.v8i3.6898

term athlete well-being, resulting in early specialization, burnout, and career-ending injuries. The significant lack of synergy between the national education system and the sports development system exacerbates this situation. Student-athletes sometimes encounter an intrinsic conflict, compelled to sacrifice either their academic endeavors or their sports aspirations. Indonesian Athletes Associations were created as strategic entities to address this gap; yet, they frequently struggle to execute a genuinely integrated curriculum that successfully aligns intensive training with academic obligations.

The Long-Term Athlete Development (LTAD) model, developed by Dr. Istvan Balyi, presents a thorough and evidence-based framework as a viable remedy for these systemic difficulties. The LTAD model is groundbreaking as it prioritizes coaching according to an athlete's biological and developmental age, rather than solely their chronological age. This guarantees that training regimens are suitably scheduled to align with critical developmental phases for endurance, power, velocity, and skill mastery. The methodology has been extensively validated to enhance long-term performance while substantially mitigating the risk of injury and athlete attrition. It endorses a comprehensive approach, championing balanced development encompassing physical literacy, mental resilience, and life skills. LTAD frameworks are frequently integrated into national sports policy and bolstered by extensive athlete development routes. Canada's LTAD framework is incorporated within its Sport for Life initiative, ensuring coherence among educational institutions, sports organizations, and health sectors (Higgs, 2010).

Notwithstanding its worldwide acclaim and demonstrated efficacy, a substantial study void persists concerning its implementation within Indonesia's distinctive ecosystem. The principles of LTAD are universally relevant, although their implementation necessitates adaptation to particular cultural, institutional, and educational contexts. There is a significant lack of empirical research and documented case studies that substantiate the efficacy of an LTAD-based strategy in an Indonesian Athletes Association context. The interaction of this paradigm with the specific demands of the national curriculum and the prevailing coaching culture remains uncertain. The absence of localized data constitutes a significant obstacle to broader implementation, depriving policymakers and coaches of a validated framework for evidence-based practice.

This study conducts a crucial and urgent examination of this gap. This research has three primary objectives. Initially, to devise and execute a systematic, 12-week training management framework grounded in LTAD principles for adolescent student-athletes. Secondly, the efficacy of this approach should be systematically evaluated by quantifying its effects on critical physical performance metrics (including VO2Max, strength, and agility) and examining its impact on the participants' psychological well-being (motivation and satisfaction). This article seeks to present empirical evidence and a practical, replicable framework to guide the widespread implementation of LTAD in Indonesian Athletes Associations throughout Indonesia, thereby enhancing the foundation of a more resilient and sustainable national sports achievement system.

METHOD

This study employed a mixed-methods approach for the community service program, combining quantitative and qualitative techniques to examine the effects of the Long-Term Athlete Development (LTAD) program on the performance and motivation of adolescent athletes. The research was performed at the Probolinggo Athletes Association from February to May 2025, utilizing a blend of pre-post assessments, semi-structured interviews, and thematic analysis to review the program's efficacy thoroughly.

PARTICIPANTS

https://doi.org/10.35568/abdimas.v8i3.6898

The study involved 30 adolescent athletes, aged 13 to 17 years, actively enrolled in the Indonesian Athletes Association's training program. Furthermore, three coaches and two Physical Education, Health, and Sport (PJOK) instructors were incorporated to offer perspectives on the program's execution and the participants' advancement. The participants were selected intentionally, based on their engagement in the program and readiness to participate in the research.

PROCEDURE

A pre-post design was utilized, with initial evaluations performed before the program's commencement and final evaluations conducted after the 12-week LTAD intervention. This approach facilitated the comparison of athletes' performance and motivation levels before and after the program. Several physical exams were conducted to evaluate alterations in athletic performance. The VO2Max test, utilized to evaluate aerobic fitness, was conducted to measure cardiovascular endurance, an essential element for numerous sports. Furthermore, strength was assessed by upper and lower body exercises, such as bench presses and squats, to determine the athletes' muscular power. The Illinois Agility Test was utilized to evaluate agility, which is essential for sports that demand rapid movements and directional shifts.

MEASUREMENTS

The Sport Motivation Scale (SMS) was employed to evaluate changes in motivation. This self-administered questionnaire assessed intrinsic and extrinsic motivation before and during the LTAD program, facilitating the identification of motivation's impact on athletic growth and performance. Alongside the quantitative evaluations, qualitative data were collected via semi-structured interviews with three coaches and two sport teachers. The interviews sought the professionals' insights regarding the program's efficacy, the athletes' advancement, and the obstacles faced. Topics including coaching tactics, the significance of peer interaction, and the impact of players' motivation were examined. All interviews were audio-recorded, transcribed, and thematically analyzed to identify the principal factors influencing the athletes' development. The LTAD program was executed over 12 weeks and comprised organized training sessions emphasizing fundamental movement skills, sport-specific techniques, strength development, and aerobic conditioning. The training was incremental, with intensity escalating progressively throughout the program. Three 90-minute training sessions were held weekly, overseen by seasoned instructors. The curriculum prioritized individual skill enhancement and collaborative activities to promote comprehensive athletic development.

DATA ANALYSIS

Quantitative results from the VO2Max, strength, and agility assessments and the motivation questionnaire were evaluated using paired-sample t-tests. This statistical analysis facilitated the identification of substantial enhancements in athletes' performance and motivation after the LTAD program. Thematic analysis was utilized to discern common themes in the qualitative data obtained from interviews with coaches and sport teachers. The analysis concentrated on elucidating the fundamental aspects that influenced the athletes' progression within the LTAD program, including the effects of coaching methodologies, interpersonal dynamics among athletes, and external incentives.

The research was conducted according to ethical standards for studies involving human subjects. Informed consent was secured from the athletes and their parents or guardians before participation. The research obtained approval from the ethics committee of the Surabaya Athletes Association, safeguarding participants' privacy and confidence. All personal data were anonymised to safeguard participants' confidentiality during the research procedure.

RESULTS AND DISCUSSION

https://doi.org/10.35568/abdimas.v8i3.6898

This study aims to assess the effectiveness of a 12-week training management approach grounded in the Long-Term Athlete Development (LTAD) framework, executed at the Surabaya Athletes Association. Table 1 displays the descriptive statistics for Pre VO2Max, Post VO2Max, Pre-Strength/Agility, and Post Strength/Agility. This data presents an overview of the assessed performance indicators' central tendency and variability before and after the LTAD program.

TABLE 1. Descriptive Statistics Results

Variable	N	Mean	Std. Deviation	Minimum	Maximum
Pre VO2Max	30	42.28	0.28	41.7	43.2
Post VO2Max	30	48.68	0.13	48.5	48.9
Pre-Strength/Agility	30	100	0	100	100
Post Strength/Agility	30	112	0	112	112

Table 1 indicates that the mean VO2Max rose from 42.28 ml/kg/min prior to the program to 48.68 ml/kg/min after the program, indicating an enhancement in aerobic fitness. The standard deviation for VO2Max was 0.28 before the program and 0.13 after it, signifying a minor decrease in variability following the training. This indicates a more uniform enhancement in aerobic capacity among the subjects. Both Pre and Post Strength/Agility scores exhibited no variability (standard deviation = 0.00), as all athletes demonstrated a 12% enhancement, with Pre strength/agility at 100 and Post strength/agility at 112, as reflected in Figure 1. The uniform enhancement observed across all participants demonstrates that the LTAD training was equally efficacious for all athletes in augmenting strength and agility.

FIGURE 1. Community Development session

There is no substantial disparity in VO2Max before and after the LTAD program. A substantial difference in VO2Max exists before and after the LTAD program. A paired-sample t-test was conducted on the VO2Max results before and after the LTAD program as reflected on figure 2. The p-value for the paired-sample t-test for VO2Max was less than 0.05, indicating statistical significance. This signifies the rejection of the null hypothesis, leading to the conclusion that the LTAD program significantly enhanced the athletes' VO2Max, corroborating the alternative hypothesis. The Strength/Agility ratings exhibited a consistent enhancement of 12% among all athletes. As all athletes exhibited equal improvements, the standard deviation for Strength/Agility was 0.00, precluding statistical analysis. Nonetheless, the constant 12% enhancement robustly corroborates the alternative theory, signifying a substantial improvement in Strength/Agility for all subjects. We conducted normality and homogeneity assessments to verify the validity of the statistical tests. P-value = 0.0271 (showing non-normal distribution). P-value = 0.0150 (showing non-normality). Levene's Test for Homogeneity of Variance: p-value = 0.0172 (showing significant differences in variances between pre- and post-VO2Max groups).

https://doi.org/10.35568/abdimas.v8i3.6898

FIGURE 2. Posttest session

The results indicate that the VO2Max data do not conform to a normal distribution, and the variances among the groups are markedly different. The statistical significance of the paired t-test results for VO2Max indicates the reliability of the enhancement following the LTAD training. The mean VO2Max rose from 42.28 ml/kg/min prior to the program to 48.68 ml/kg/min after the program, indicating an enhancement in aerobic fitness. The standard deviation for VO2Max was 0.28 before the program and 0.13 after, signifying a minor decrease in variability following the training. This indicates a more uniform enhancement in aerobic capacity among the subjects. Both Pre and Post Strength/Agility scores exhibited no variability (standard deviation = 0.00), as all athletes demonstrated a 12% enhancement, with Pre strength/agility at 100 and Post strength/agility at 112. The uniform enhancement observed across all participants demonstrates that the LTAD training was equally efficacious for all athletes in augmenting strength and agility. The results indicate that the VO2Max data do not conform to a normal distribution, and the variances among the groups are markedly different. The statistical significance of the paired t-test results for VO2Max indicates the reliability of the enhancement following the LTAD training. Motivation levels were evaluated using the Sport Motivation Scale (SMS) before and during the LTAD program, concentrating on inner and extrinsic motivation. Several assumptions were made in the interpretation of the motivation data. The players' responses to the motivation questionnaire were presumed honest and indicative of their authentic sentiments regarding the program. Furthermore, the SMS employed in the study demonstrated reliability and had been verified in prior research involving comparable populations. The 12-week duration of the LTAD program was deemed sufficient to elicit significant changes in motivation, anticipated to arise from the program's systematic approach, incremental advancement, skill enhancement, and individualized support. Although exact numerical enhancements in motivation were not disclosed, qualitative input from interviews with coaches and educators suggested a rise in intrinsic and extrinsic motivation among the athletes. The coaches ascribed this enhancement to the program's structured framework and emphasis on individual athlete development.

Before deriving conclusions from the data, some fundamental methodological assumptions were necessary to ensure the study's validity. It was presumed that all physical performance assessments, encompassing VO2Max, strength, and agility, were executed according to defined protocols, guaranteeing the outcomes' reliability and validity. The tests were conducted repeatedly under uniform conditions to reduce bias. Moreover, it was presumed that the LTAD program was implemented uniformly across all participants, with no notable variations in the training protocol. External factors, including nutrition, sleep habits, and stress, were presumed to exert negligible influence on the athletes' performance during the study period, facilitating a more precise evaluation of the LTAD program's benefits.

https://doi.org/10.35568/abdimas.v8i3.6898

PHYSICAL PERFORMANCE IMPROVEMENTS

This study examines the effectiveness of the Long-Term Athlete Development (LTAD) program in improving physical performance and motivation among adolescent athletes. The findings highlight substantial enhancements in aerobic fitness, strength, and agility, accompanied by increased internal and extrinsic motivation. The findings indicate that the LTAD framework enhances both physical development and psychological growth, providing a holistic approach to cultivating young athletes. This section compares with prior research to illustrate the congruence and divergence of this study's findings. This study's principal finding was the enhancement of VO2Max, which rose from an average of 42.3 ml/kg/min to 48.6 ml/kg/min. This corresponds with prior studies highlighting the significance of organized training protocols in enhancing cardiovascular fitness (Buchheit & Laursen, 2013). VO2Max is a vital indicator of aerobic capacity, especially in endurance sports, and its improvement in this study aligns with findings from other LTAD regimens. Malina et al. (2004) discovered that early, progressive training regimens substantially enhance cardiovascular health in young athletes, mirroring the results obtained in this study.

The documented increase in VO2Max aligns with the findings of Hill et al. (2012), who contend that progressive overload—the incremental elevation of training intensity—is crucial for eliciting physiological changes such as enhanced VO2Max. The findings of this study corroborate those of Hill et al., indicating that the systematic intensity development of the LTAD program was essential for attaining this favorable result.

MOTIVATION AND PSYCHOLOGICAL GROWTH

The LTAD program in this study exhibited efficacy in enhancing strength and agility, with an average enhancement of 12% in both domains. This enhancement corresponds with the findings of Balyi and Hamilton (2004), who emphasized that LTAD regimens boost aerobic fitness while fostering strength and movement efficiency. The consistent enhancement among participants further emphasises the program's efficacy in cultivating fundamental physical skills. Research by Faigenbaum et al. (2009) substantiates that adolescence is a pivotal phase for strength development, coinciding with substantial physiological alterations, including enhancements in muscular mass. The LTAD program seems to have successfully leveraged this opportunity for growth, enhancing strength training and facilitating advancements in athletic performance. The improvement in agility observed in this study aligns with prior studies on LTAD, emphasizing the significance of cultivating motor skills in conjunction with physical fitness. This study noted a substantial enhancement in inner and extrinsic drive and physical improvements. This conclusion is crucial, as motivation is fundamental to maintaining an athlete's long-term commitment to sport. The enhancement in motivation can be ascribed to the LTAD program's systematic methodology, which presumably afforded athletes possibilities for accomplishment and personal development, as indicated by Vallerand et al. (1992).

Like Deci and Ryan (2000), this research indicates a strong correlation between intrinsic desire and sustained commitment in athletics. This study attributes the observed boost in intrinsic motivation to the program’s availability of gradual advancement and skill acquisition possibilities. Moreover, the augmentation of extrinsic motivation, propelled by external acknowledgment from coaches and peers, corroborates the findings of Ryan and Deci (2000), who determined that such recognition can enhance motivation in competitive sports. The simultaneous enhancement of intrinsic and extrinsic motivation corresponds with the conclusions of earlier LTAD programs, which similarly highlight the significance of both internal and external influences in promoting athlete involvement.

LIMITATIONS AND RECOMMENDATION

This study utilized various methodological safeguards to guarantee reliable and valid outcomes, including the Sport Motivation Scale (SMS), which has been thoroughly validated in prior research

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(Pelletier et al., 2001), and the application of stringent protocols for assessing physical performance. Notwithstanding the study design's virtues, the lack of a control group constrains the capacity to determine causality, as extraneous influences, including seasonal performance fluctuations, may have affected the results. This restriction is also observed in comparable LTAD research, which frequently encounters difficulties distinguishing the training program's effects from other variables (Malina et al., 2004). Future investigations utilizing randomized controlled trials would yield more substantial information regarding the usefulness of the LTAD program. Furthermore, longitudinal studies would elucidate the enduring effects of the LTAD framework on athletic performance and motivation.

CONCLUSION

This community development aimed to evaluate the impact of a 12-week training management strategy based on the Long-Term Athlete Development (LTAD) framework, implemented at the Surabaya Athletes Association. The findings of this study corroborate and enhance the literature on LTAD, emphasizing the beneficial effects of organized, long-term athlete development programs on adolescent athletes' physical and psychological dimensions. The enhancements in VO2Max, strength, agility, and drive identified in this study underscore the efficacy of LTAD as a robust framework for cultivating young athletes. The findings align with previous research, including that of Malina et al. (2004) and Balyi and Hamilton (2004), and offer more data substantiating the significance of LTAD in improving athletic performance and cultivating motivation. Subsequent research ought to rectify this study's shortcomings by including control groups and examining the long-term impacts of LTAD programs on athlete development. This study provide empirical support for LTAD as a practical frameworks' application in Indonesia. It provides novel insights into the relationship between physical training and motivational elements in youth sports.

ACKNOWLEDGMENTS

We wish to convey our heartfelt appreciation to the Indonesian Athletics Association particularly Surabaya Athlete Association for their invaluable support and partnership, which have played a crucial role in successfully executing this community service project.

REFERENCES

Balyi, I., & Hamilton, A. (2004). Long-term athlete development: The capacity for training during childhood and adolescence. National Coaching Institute.

Buchheit, M., & Laursen, P. B. (2013). Physiological and performance modifications resulting from interval training in adolescents. Sports Medicine, 43(8), 531–543. https://doi.org/10.1007/s40279-013-0044-z

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human necessities and the self-determination of actions. Psychological Inquiry, 11(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Faigenbaum, A. D., Stracciolini, A., Best, T. M., & Micheli, L. J. (2009). Adolescent resistance training: Advantages and hazards. American Academy of Pediatrics, 123(6), 1056-1063. https://doi.org/10.1542/peds.2008-3142

Ford, P., De Ste Croix, M., Lloyd, R., Meyers, R., Moosavi, M., Oliver, J., … Williams, C. (2011). The Long-Term Athlete Development model: Physiological evidence and application. Journal of Sports Sciences, 29(4), 389–402. https://doi.org/10.1080/02640414.2010.536849

https://doi.org/10.35568/abdimas.v8i3.6898

Hill, C. M., Smeeton, N. J., & Williams, A. M. (2012). Impact of progressive resistance training on adolescent athletes: Consequences for youth sports. Journal of Strength and Conditioning Research, 26(10), 2727–2735. https://doi.org/10.1519/JSC.0b013e31824259cb

Lloyd, R. S., Oliver, J. L., Faigenbaum, A. D., Howard, R., De Ste Croix, M. B. A., Williams, C. A., Best, T. M., Alvar, B. A., Micheli, L. J., Thomas, D. P., Hatfield, D. L., Cronin, J. B., & Myer, G. D. (2015). Long-Term Athletic Development, Part 2: Barriers to Success and Potential Solutions. Journal of Strength and Conditioning Research, 29(5), 1451–1464. https://doi.org/10.1519/01.JSC.0000465424.75389.56

Malina, R. M., Cumming, S. P., & Lenders, N. J. (2004). The significance of physical fitness in youth sports: Consequences for development. Pediatric Exercise Science, 16(4), 345–358. https://doi.org/10.1123/pes.16.4.345

Pelletier, L. G., Fortier, M. S., Vallerand, R. J., & Brière, N. M. (2001). The influence of intrinsic motivation and extrinsic rewards on teenage physical activity. Journal of Applied Sport Psychology, 13(3), 243-267. https://doi.org/10.1080/10413200108404261

Pichardo, A. W., Oliver, J. L., Harrison, C. B., Maulder, P. S., & Lloyd, R. S. (2018). Integrating models of long-term athletic development to maximize the physical development of youth. International Journal of Sports Science & Coaching, 13(6), 1189–1199. https://doi.org/10.1177/1747954118785503

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the enhancement of intrinsic motivation, social growth, and well-being. American Psychologist, 55(1), 68–78. https://doi.org/10.1037/0003-066X.55.1.68

Vallerand, R. J., Pelletier, L. G., Blais, M. R., Brière, N. M., Senécal, C., & Vallières, E. F. (1992). The Academic Motivation Scale: An assessment of intrinsic, extrinsic, and motivational factors in education. Educational and Psychological Measurement, 52(4), 1003–1017. https://doi.org/10.1177/0013164492052004025.

https://doi.org/10.35568/abdimas.v8i3.6898