

A HOLISZTIKUS EDZÉSMÓDSZER HATÁSA AZ EGYÉNI LABDAKEZELÉSI KÉPESSÉGEK FEJLŐDÉSÉRE UTÁNPÓTLÁSKORÚ LABDARÚGÓKNÁL

HOLISTIC TRAINING AND BALL CONTROL DEVELOPMENT IN YOUTH FOOTBALL

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Összefoglalás

A holisztikus edzés, amely egyetlen edzésen belül integrálja a technikai, taktikai, fizikai és mentális összetevőket, a játékosfejlesztés egyik leghatékonyabb módszerének tekinthető. A vizsgálatban 15 utánpótláskorú labdarúgó vett részt. A technikai képességeket szlalom labdavezetési tesztekkel (jobb lábbal, bal lábbal, illetve mindkét láb használatával), valamint az első érintés minőségének értékelésével mértük. Az eredmények valamennyi vizsgált területen szignifikáns javulást mutattak: a szlalomidők csökkentek, valamint nőtt a sikeres átadások száma. Az eredmények arra utalnak, hogy a holisztikus edzésmódszer fejleszti a technikai végrehajtás minőségét, a döntéshozatali képességet és a szituációfelismerést, ezáltal elősegítve a mérkőzészerű körülményekhez való gyorsabb alkalmazkodást.

Abstract

Holistic training, which integrates technical, tactical, physical, and mental components within a single session, appears to be the most effective method for player development. In this study, 15 youth football players participated. Technical skills were assessed using slalom dribbling tests (right foot, left foot, and both feet) and the quality of the first touch. The results showed significant improvements across all measured areas, with faster slalom times and a higher number of successful passes. These findings suggest that holistic training enhances technical proficiency, decision-making, and situational awareness, facilitating faster adaptation to match-like conditions.

1. Introduction

In the development of child and youth athletes, the enjoyment of movement and the formation of a positive emotional attachment to sports participation play a crucial role. Young athletes develop

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most effectively when the sporting experience is enjoyable, diverse, and challenging, while simultaneously supporting harmonious physical, psychological, and social development. Regular physical activity not only serves as a foundation for a healthy lifestyle but also enhances self-confidence, fosters perseverance and concentration, develops social skills, and enables children to experience the joy of cooperation, effort, and success [1,2,3,4,5, 6,7, 8,9,10].

Several studies examining the effectiveness of training methods have emphasized that the holistic training approach represents one of the most effective, scientifically grounded, and integrated methods in modern football training, enhancing player development. But what exactly is this method? Holistic training is defined as an approach in which all three primary training domains—technical, tactical, and physical—are simultaneously addressed within a single training session. Some international literature [11,12,13] refers to this type of training as holistic, whereas in Hungary it is more commonly termed complex development, encompassing technical, tactical, physical, and mental components.

Why is this integrated approach essential? In football, the physical, technical, and tactical demands occur simultaneously during matches; therefore, isolated training modalities are suboptimal for performance enhancement. The holistic (or complex) training method is a training philosophy in which the three main components of football—technical, tactical, and physical—along with a fourth component, the psychological or mental factors, are developed in an integrated, non-segregated manner. Key elements of this approach include the simultaneous development of technique, tactics, physical capacity, and cognition, through game-related exercises, continuous decision-making, and learning in context (i.e., game-based learning).

Developmental tools can include small-sided games, game-based drills, functional tasks, and position-specific games. The main advantage of holistic training is that players develop physically and technically in environments that closely resemble competitive situations, resulting in more effective adaptation compared to isolated conditioning or technical training [11, 12]. According to Bangsbo [11], holistic/complex training facilitates faster development and superior game-specific performance in both youth and adult football players. Furthermore, the holistic approach is effective even in younger age groups (6–13 years), helping children develop not only technically but also in terms of game intelligence and mental preparedness [14].

This type of training provides a more comprehensive understanding of players' capabilities, while also allowing for the optimization of interactions among the physical, technical, and tactical components [12]. Mental and decision-making skills are further enhanced when physical load is combined with technical and tactical tasks in realistic game situations [12,15]. During holistic exercises, cognitive and decision-making abilities develop because players must continuously apply their knowledge, which improves situational awareness and tactical intelligence. With such preparation, players experience loads similar to competitive environments, enabling easier transfer of learned skills to match situations.

Holistic or complex training, which simultaneously integrates technical, tactical, physical, and mental components, offers advantages on multiple levels. Physically, it results in greater adaptation in endurance, speed, and explosiveness [16]. Technical skills—such as ball control, passing, and shooting—develop more rapidly, particularly in game-specific situations [17]. Tactically, decision-making, situational awareness, and game intelligence improve, especially under stressful or competitive conditions when strategies are applied during training [18]. Mentally, concentration, decision-making speed, and motivation increase due to the integration of targeted psychological components in training tasks, such as stressors and attention exercises [18, 19]. Consequently, performance during matches adapts more rapidly and efficiently to real game situations, and players are better able to transfer the skills learned in training to competitive scenarios [18].

In contrast, isolated or traditional training focuses on individual components separately. Physical development is limited to specific loads, while technical skills are practiced in isolation, independent of game situations [16]. Tactical development is also more constrained due to fewer realistic, match-like scenarios during training sessions [20]. Mentally, traditional training less effectively supports long-term improvements in concentration or motivation, as it does not incorporate challenges requiring attentional control or stress management [18, 19, 21]. While such training may help players react to ball recovery situations (“pressing after loss”) and apply tactical principles relevant in competitive contexts, the authors emphasize that integrating psychological

components (stress, mental challenges) into training does not require separate, isolated exercises, but can be embedded within core tactical drills. The effectiveness of isolated training in match situations is lower, and players may struggle to adapt the practiced elements to the dynamics of real competition.

2. Method

2.1. Research method

Although a football match inherently integrates technical, tactical, physical, and mental components, and individual skills do not appear in isolation, researchers often adopt an isolated approach when examining these components, and we have done the same in this study. In our research, sport-specific motor tests were conducted; however, in the present paper, we focus specifically on technical tests and individual ball-handling skills, highlighting those that are particularly relevant to performance outcomes.

To assess individual ball-handling technical abilities, three measurement tests were employed, evaluating the use of the lower limbs separately and in combination (right foot, left foot, and both feet dribbling). The quality of the first touch was also examined using a passing-receiving technical element. The parameters investigated were as follows: 1) Slalom dribbling with the right foot, 2) Slalom dribbling with the left foot, 3) Slalom dribbling with both feet, and 4) Passing-receiving over a rebound board.

The assessment was conducted on two separate occasions. Each test was performed twice by the players, in accordance with recommendations from the literature [22]. For statistical analysis, the mean execution time of each trial was considered. The layout of the field required for the exercises was pre-designed based on literature recommendations, and all necessary equipment was prepared in advance. The following equipment was used for the measurements: cones, balls, rebound board, OXA Starter+ infrared timing system, and a laptop for data recording and entry.

2.2. Assessment of technical skills – TDS Footballdribbling – Slalom Dribbling Test

To assess the players' technical skills, the slalom dribbling method was employed. This test is also suitable for evaluating football-specific coordination [23]. Six cones were required to mark the field, which were placed in a straight line at uniform intervals of 80 centimeters (see Figure 1).

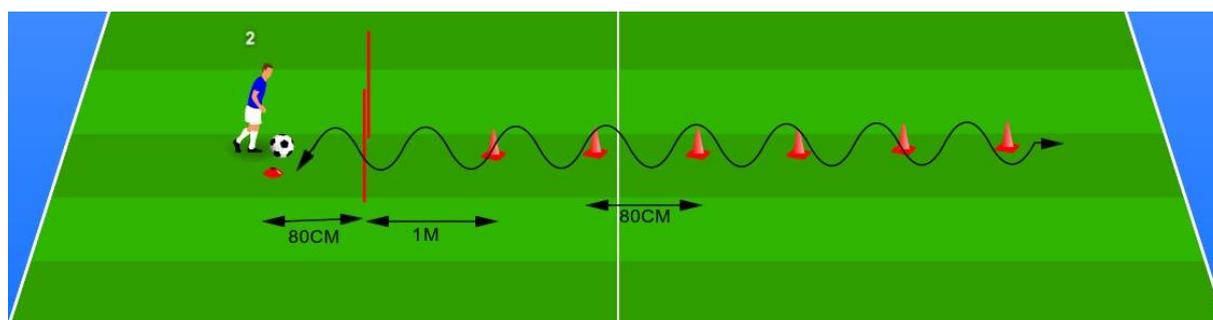


Figure 1: Layout of the field used for the assessment of technical skills

Three tests were employed to assess technical skills. In the first exercise, the task was performed with the dominant foot (Exercise 1), in the second exercise with the non-dominant foot (Exercise 2), and in the third execution with both feet (Exercise 3). The results were recorded in seconds using the OXA Starter+ infrared timing system. The photocell gate was positioned 80 centimeters from the starting point and 1 meter from the first cone (see Figure 1). Players had to dribble through the cones in a slalom pattern, passing through the timing gate, perform a full turn at the last cone, and return to the starting point using the same slalom dribbling pattern. For right-footed dribbling, the first cone was passed on the left side to allow the player to perform the turn with the inside of the right foot at the last cone. For left-footed dribbling, the procedure was mirrored. This setup ensures that the turn is executed using the inside of the foot, which allows the fastest execution. This test is referred to as the TDS Football Dribbling – Slalom Dribbling Test.

2.3. Assessment of First Touch Quality Using the Passing-Receiving Technical Element

The quality of the first touch is determined by several factors, including ball speed, direction, reception angle, and passing accuracy. For this exercise, a rebound board and a cone were used. The cone was placed 2 meters from the rebound board, and the player positioned themselves half a meter to the side of the cone and 2.5 meters from the board (see Figure 2). The half-meter offset from the cone ensured that the reception could be successfully executed in both directions.

The exercise began with a pass onto the rebound board, after which the returning ball had to be received on the opposite side of the cone with minimal touches and proper quality of contact. Subsequently, the ball had to be passed back to the board with the foot farther from the cone. This sequence was performed continuously for a set duration of 30 seconds, back and forth. The number of successful passes completed within the allotted time was recorded.

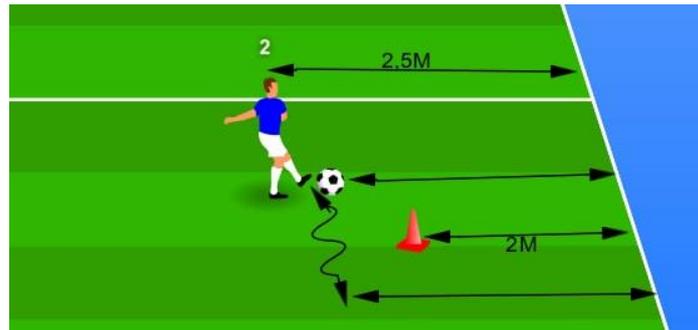


Figure 2: Protocol for the assessment of the first touch

2.4. Sample

The study involved 15 participants, all of them were registered players for youth teams. Most of them started playing football at the age of 3-4, so they have been playing football for an average of 5 years. The average age of the participants is 11.67 years (SD = 0.900), which shows a homogeneous sample, as the range between the minimum and maximum ages is narrow (10-13 years).

2.5. Statistical analysis

Basic statistics and correlation analyses were conducted. For the measured variables, the mean and standard deviation were calculated. Following a normality test, since the sample was not normally distributed, the Wilcoxon test was applied, and Spearman's rank correlation coefficient was used to calculate correlations. A significance level of $p \leq 0.05$ was adopted for correlation analyses. In the tables, significant correlations corresponding to $p \leq 0.05$ are indicated with an asterisk. Data analysis was performed using SPSS version 27.

2.6. Training Structure

Holistic training methods were applied during the sessions, meaning that technical, tactical, skill, and capacity development occurred simultaneously. The sessions were conducted in individual and small-group formats, with multiple coaches working with the athletes, including both sport-specific specialists and athletic trainers. Work was organized by group according to skill level. Two groups, each consisting of 2–4 players, alternated: one group performed sport-specific exercises while the other participated in running drills and running technique training.

The training followed the principle of progression, moving from simpler technical elements to more complex and integrated tasks. Each session began with a warm-up, which was also divided into two parts. The first part focused on mastering simple, isolated technical exercises without resistance, aligned with the session's objectives. In the second part, players performed exercises with added resistance, which did not necessarily involve direct duels but could include competitive situations, enforcing dynamic execution without verbal instruction.

Following the warm-up, sessions consisted of three main blocks (Objective 1, Objective 2, Objective 3), each lasting 10–12 minutes. The design of the training method started from Objective 3, representing the target to be achieved by the end of the session, which was then deconstructed into the preceding blocks. It is essential to define the technical and tactical objectives first, as these must be reflected in all exercises.

As the participants were under 14 years of age, training focused on general technical and individual skill development rather than position-specific training. The aim was to implement match-specific, technically oriented training based on the technical elements most frequently occurring during matches. This approach optimally adapts to match load and performance. Developing adaptability is a key objective, as match play alternates between ball-related and non-ball technical elements. In a 90-minute match, a player typically has possession of the ball for only 2–3 minutes; therefore, it is crucial to train the body to execute fine motor ball-handling techniques under pressure and elevated heart rate. This makes the training match-specific, and preparation for such situations is essential.

The technical elements addressed in training included ball-related and non-ball exercises (passing-receiving, dribbling, shooting, stop-start, turning, ball control, changes of direction, heading, tackling, positioning). Within a single session, it is recommended to focus on 1–2 technical elements, reinforced across 1–2 weekly sessions. Training sessions generally lasted 90 minutes, with approximately 60 minutes of active training and the remaining time for rest.

3. Results

The results indicate that the players' technical skills, as measured by the TDS Football Dribbling – Slalom Dribbling tests and the passing-receiving assessment, improved significantly between the two measurement time points (see Table 1 and 2.). Specifically, for right-foot slalom dribbling, the mean completion time decreased from 9.95 seconds at baseline to 8.56 seconds post-intervention, representing a statistically significant improvement ($p = 0.009$). Similarly, left-foot slalom dribbling performance improved from 10.50 seconds to 9.37 seconds ($p = 0.005$), and two-footed dribbling showed the greatest improvement, decreasing from 9.68 seconds to 8.49 seconds ($p = 0.001$).

These findings suggest that the holistic training program effectively enhanced both dominant and non-dominant foot control, as well as bilateral dribbling skills, which are crucial for performance in match-like situations. The reduction in execution time across all dribbling tests demonstrates not only improved technical proficiency but also increased agility, coordination, and decision-making under dynamic conditions.

The results of the passing-receiving test further support these findings, indicating that the quality of the first touch, ball control, and precision in receiving and redirecting the ball improved following the intervention. These improvements reflect the integrated effect of the holistic training approach, in which technical, tactical, physical, and cognitive components are developed simultaneously, allowing players to apply their skills more effectively in both isolated drills and game-like contexts.

Overall, the significant reductions in completion times across all slalom dribbling tests highlight the efficacy of the training intervention in promoting measurable, game-relevant technical development. This supports previous findings in the literature suggesting that integrated, holistic training methods yield faster and more transferable improvements in young football players' technical abilities (Bangsbo, 1994; Putra et al., 2023; Atradinal et al., 2025).

Table 1: Changes in TDS Football Dribbling – Slalom Dribbling Test Results Between the Two Measurement Time Points

Slalom Dribbling Test	Measurement	Mean Sec	Asymp. Sig. (2-Tailed)
Slalom dribbling performed with the right foot	Baseline measurement	9,95	
	Post-intervention measurement	8,56	0,009**
Slalom dribbling performed with the left foot	Baseline measurement	10,50	
	Post-intervention measurement	9,37	0,005**
Slalom dribbling performed with both feet	Baseline measurement	9,68	
	Post-intervention measurement	8,49	0,001***

Wilcoxon test * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$
source: own editing

The results of the first touch quality assessment, measured using the passing-receiving technical element test, showed a significant improvement between the two measurement time points (see Table 2). At baseline, the mean number of successful passes completed within the test duration was 14.94, whereas following the intervention, this increased to 18.77 passes, representing a highly significant improvement ($p < 0.001$).

This increase indicates that the holistic training program not only enhanced technical execution but also improved players' cognitive and perceptual abilities, including decision-making and anticipation during ball reception. The improved first touch quality suggests that players were better able to control and redirect the ball efficiently, which is critical in dynamic match situations.

The observed improvements align with the results of the slalom dribbling tests, demonstrating that the integrated development of technical, tactical, physical, and mental components within the training program leads to measurable and transferable enhancements in game-relevant skills. These findings support previous research emphasizing the effectiveness of holistic or complex training approaches for accelerating skill acquisition and improving performance in youth football [11,16,18].

Table 2: Changes in First Touch Quality Assessment – Passing-Receiving Technical Element Test Results Between the Two Measurement Time Points

	Measurement	Mean number of shots	Asymp. Sig. (2-tailed)
Passing-Receiving	Baseline measurement	14,941 db	
	Post-intervention measurement	18,765 db	0,000***

Wilcoxon test * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$
source: own editing

4. Conclusions

The results of this study clearly demonstrate that a holistic training approach provides significant advantages in the development of technical skills in youth football players. The slalom dribbling tests (right foot, left foot, and both feet) and the assessment of first touch quality showed significant improvements between the two measurement points. Performance in right-, left-, and two-footed slalom dribbling became faster and more accurate, while the number of successful passes in the first touch test increased substantially, indicating that players were able to control and direct the ball more effectively during the exercises [16].

These findings highlight that holistic training, which integrates technical, tactical, and physical components, allows players to execute faster and more precise ball control under match-like load conditions. The program is particularly effective for developing two-footed technical skills, which are crucial during matches, as players must continuously handle and control the ball in varying situations.

Overall, the study supports the effectiveness of holistic training as a method for improving the technical abilities of youth football players, particularly in ball control, passing, and dribbling. The reduction in slalom dribbling times and the increase in successful passes indicate that players are capable of transferring skills learned in training to match-like situations, contributing to the development of game-specific performance [11,16].

5. Summary

This study investigated the effects of a holistic training program on the technical skills of youth football players. Fifteen young athletes participated in the intervention, and their technical abilities were assessed using slalom dribbling tests (right foot, left foot, and both feet) and a first touch quality test. The results showed significant improvements across all tests, including faster dribbling times and an increased number of successful passes. These findings suggest that holistic training, which integrates technical, tactical, and physical components within a single session, is effective in enhancing football-specific skills and enabling players to better transfer training outcomes to match situations.

However, the study has some limitations. The sample size was relatively small, and only technical aspects were measured, without assessing tactical, cognitive, or psychological development. Future research could include larger samples and consider additional performance components to provide a more comprehensive evaluation of holistic training effects.

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