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Adaptation of the LTAD Model to the FUNdamental Stage in the FUNdamental Judo Training Program for Children Aged 6-9 (Ukemi, Tachiwaza & Newaza FUNdamental Drills)[1]

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ORIGINAL ARTICLE

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Abstract

In the literature, the critical importance of the foundational phase of the Long Term Athlete Development (LTAD) model is to enhance the growth and acquired fundamental movement skills of primary school-aged children and to develop sport-specific skills through structured and unstructured physical activities and multi-sport training. This study highlights the contribution of the basic phase of the LTAD model to the development of children, especially judo coaches. It offers insights into how basic judo training can be structured and evaluated, as well as a structured training programme that supports the development of ABC (Agility, Balance, Coordination) and biomotor abilities inherent in this phase. Using the Formative Research model, the adaptation of the "LTAD Model (Ukemi, Tachiwaza & Newaza Basic Drills) for Judo Basic Training Programme for 6-9 Year Old Children" was examined. PLAYcoach Physical Literacy Score Form (Physical Literacy Follow-up Form) was used for measurements and Physical Literacy Visual Analogue Scale (VAS) was used for evaluation. The progress of the athletes will be monitored using the PlayFun Physical Literacy Observation Form (Physical Literacy Score Form). Descriptive statistics including standard deviation and arithmetic mean will be presented for, gender, age, environment, cognitive domain and motor competence (general motor competence, object control and locomotor, balance) along with PLAYcoach physical literacy scores. Means and standard deviations for participants categorised as meeting and not meeting the criteria can be calculated based on descriptive statistics and physical literacy VAS (PL VAS) domain scores. This study is expected to be a valuable resource for judo coaches and coach education programmes.

Keywords: Secondary School, Play, Fun, Ukemi, Tachiwaza & Newaza Drills

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6-9 Yaş Çocuklar için FUNdamental Judo Eğitim Programında LTAD Modelinin FUNdamental Aşamaya Uyarlanması (Ukemi, Tachiwaza ve Newaza FUNdamental Drilleri)

Öz

Literatürde, Uzun Süreli Sporcu Gelişimi (LTAD) modelinin temel aşamasının kritik önemi, ilkokul çağındaki çocukların büyüme ve kazanılmış temel hareket becerilerini geliştirmek ve yapılandırılmış ve yapılandırılmamış fiziksel aktiviteler ve çoklu spor eğitimi yoluyla spora özgü becerileri geliştirmektir. Bu çalışma, LTAD modelinin temel aşamasının çocukların, özellikle de judo antrenörlerinin gelişimine katkısını vurgulamaktadır. Temel judo eğitiminin nasıl yapılandırılabileceği ve değerlendirilebileceğinin yanı sıra bu aşamanın doğasında bulunan ABC (Çeviklik, Denge, Koordinasyon) ve biyomotor yeteneklerin gelişimini destekleyen yapılandırılmış bir eğitim programına ilişkin içgörüler sunmaktadır. Biçimlendirici Araştırma modeli kullanılarak, '6-9 Yaş Çocuklarda Judo Temel Eğitim Programı için LTAD Modeli (Ukemi, Tachiwaza & Newaza Temel Drilleri)' uyarlaması incelenmiştir. Ölçümler için PLAYcoach Fiziksel Okuryazarlık Puan Formu (Fiziksel Okuryazarlık Takip Formu) ve değerlendirme için Fiziksel Okuryazarlık Görsel Analog Ölçeği (VAS) kullanılmıştır. Sporcuların gelişimi PlayFun Fiziksel Okuryazarlık Gözlem Formu (Fiziksel Okuryazarlık Puan Formu) kullanılarak izlenecektir. Standart sapma ve aritmetik ortalama dahil olmak üzere tanımlayıcı istatistikler, PLAYcoach fiziksel okuryazarlık puanlarıyla birlikte yaş, cinsiyet, bilişsel alan, çevre ve motor yeterlilik (genel motor yeterlilik, denge, nesne kontrolü ve lokomotor) için sunulacaktır. Kriterleri karşılayan ve karşılamayan olarak kategorize edilen katılımcılar için ortalama ve standart sapmalar, tanımlayıcı istatistikler ve fiziksel okuryazarlık VAS (PL VAS) alan puanları temel alınarak hesaplanabilir. Bu çalışmanın judo antrenörleri ve antrenör eğitim programları için değerli bir kaynak olması beklenmektedir.

Anahtar kelimeler: Ortaokul, Oyun, Eğlence, Ukemi, Tachiwaza & Newaza Alıştırmaları

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Introduction

Judo is a sport that requires a high skill level. Specific qualities expected to be achieved in this sport include the improvement of analytical functions, ability to quickly identify, and ability to act and make decisions under constantly changing competitive conditions. Additionally, under complex game conditions, athletes' decisions depend on their ability to perceive external stimuli. Quick thinking and interpretation skills assist the opponent in achieving successful tactical behavior or team success (Bompa, 2007; Brosse and Matsumoto, 1999).

Many studies have emphasized the contribution of judo to children's motor, social, and cognitive development (Tegner, 1974; Menzer, 1985). It is also an important tool in children's development. In particular, the European and World Judo Federations are conducting many projects worldwide. The primary objective of these projects is to contribute to children's physical and mental development. For this purpose, the two FUNdamental principles of judo, "Seiryoku Zenyo: The FUNdamental spirit of judo" is used for physical development and "Jita Kyoei: mutual prosperity" for mental development (Kano and Murata, 2005). Therefore when these two core principles are not effectively integrated into pedagogically structured FUNdamental Judo training programs, such programs fail to contribute to the holistic development of children (Physical Literacy Observation for Youth, 2023; Kodokan, 2023).

Judo, defined as a combat sport in the literature by sports scientists, demands high levels of physical (Seiryoku Zenyo: The FUNdamental spirit of judo) and mental skills (Jita Kyoei: mutual prosperity) (Kano and Murata, 2005). Judo requires not only physical development and fitness but also development in terms of psychological maturity. The philosophy of judo offers important education from various perspectives, such as an individual's avoidance of aggression and harmony with society (Balyi et al., 2013; Matsumoto, 2004). Furthermore, judo is considered a late specialization sport (LTAD) in sports literature (International Judo Federation, 2023; Sterkowicz-Przybycień et al., 2014). Therefore, judo training programs for children aged 6-9, which are part of FUNdamental judo training, are supported by the LTAD FUNdamental program to effectively manage this foundational process that is considered crucial for children's future development. Since it supports the development of children within the process management LTAD FUNdamental training program, and thanks to the critical role of this developmental process, it has become an engaging and attention-grabbing field of study for sports scientists (Balyi et al., 2013; Matsumoto, 2004; Physical Literacy Observation for Youth, 2023; Kodokan, 2023)

The International Judo Federation introduces children to judo through the "Judo in Schools Project" worldwide and implements a pedagogical exercise program aimed at improving the mental

and physical health of children aged between 4 and 9 years through FUNdamental judo training (International Judo Federation, 2023; Sterkowicz-Przybycień et al., 2014). This practice includes applications that support the FUNdamental stage of the LTAD model. The FUNdamental stage of the Long-Term Athlete Development model is a critical period in which children acquire FUNdamental skills that shape their sports careers. During this stage, it is important for athletes to teach and enhance FUNdamental movements and technical skills to develop and enhance basic movement and technical skills. Basic physical attributes, coordination, and sport-specific FUNdamental techniques were implemented at this stage. It is important to emphasize that the LTAD FUNdamental stage encourages athletes to engage in sports using a nonspecialized approach (Balyi et al., 1995; 2013).

In the literature review, it can be seen that prominent approaches to youth athlete development include the Development Model of Sports Participation (DMSP) (Côté, 1999), the 'LTAD' model proposed by Lloyd and Oliver (2012) and popularized by Balyi et al. (1995; 2013), and the Youth Physical Development (YPD) model (Açıkada and Hazır, 2016; Pichardo et al., 2018). Each of these models serves as a reference for children's development based on chronological age and/or maturation and offers a unique perspective.

In this study, a resource that includes the FUNdamental stage of the Long-Term Athlete Development (LTAD) model popularized by Balyi et al. (1995; 2013), its adaptation to the FUNdamental judo training program, and implementation examples, was created. Furthermore, in this study, considering the basic principles of the DMSP and YPD models, the 'FUNdamental Training Stage of Judo LTAD Model in Structured FUNdamental Judo Training Program was developed. The present study aimed to serve as a reference source for coaches, experts, athletes, and those interested in the subject.

Methods

Methodology of the Study

The Formative Research model, which is a design-based research type, was utilized in the methodology of the study. The purpose of this model is to improve teaching systems and designs (Kuzu et al., 2011; Reigeluth and Frick, 1999).

Developed Design

This study is based on the 'Sport Participation Development Model (DMSP)' (Côté, 1999), the 'Youth Physical Development Model (YPD),' and the Long Term Athlete Development (LTAD) model's 'FUNdamental Stage (6-9 Boys/Girls)' basic principles (Açıkada and Hazır, 2016; Pichardo et al., 2018). A training program design, encompassing the adaptation of a structured judo basic

training program to the fundamental stage (Ukemi, Tachiwaza, & Newaza basic drills), was developed according to the three fundamental principles provided here (Physical Literacy Observation for Youth, 2023; Kodokan, 2023).

Participants

In this study, a structured education system was designed for the holistic development of children aged 6-9 (girls and boys) receiving basic judo training (Kuzu et al., 2011; Reigeluth and Frick, 1999). Holistic development is an educational and developmental approach that aims to support all aspects of an individual (physical, mental, emotional, social, and spiritual) (Miller, 2007). When applied to the field of sports, this approach focuses not only on the athlete's performance but also on their quality of life, character development, learning process, and social adaptation.

In line with the planned design of this study, children aged 6–9 years were targeted as participants in the developed educational programme. The sample training programmes provided should be used as a training environment in educational facilities (DOJO) where basic judo training is provided.

Measurement & Evaluation in the Design

In the developed design (adaptation of structured judo basic training program to the fundamental stage (Ukemi, Tachiwaza & Newaza basic drills) measurement will be conducted using the 'PLAYcoach Physical Literacy Score Form (Physical Literacy Tracking Sheet),' while evaluation will be performed using the 'Physical Literacy Visual Analog Scale (VAS)' tools. Athletes' development will be monitored using the PlayFun Physical Literacy Observation Form (Physical Literacy Score Sheet) (Play Tools, 2023).

The PlayFun Physical Literacy Observation Scoring Form (Physical Literacy Score Sheet)

*Pl*ayFun athletes' fundamental movement skills were assessed through 18 exercises, each evaluated on a 5-point Likert scale as follows: 'Poor = 0, Fair = 1, Good = 2, Very good = 3, Excellent = 4'. The subtotals were obtained for each exercise section. These subtotals were summed and divided into 18 subtotals. The resulting average provides the PLAYfun Physical Literacy Score (Table 1).

The PLAYcoach Physical Literacy Score Form (Physical Literacy Tracking Sheet); utilizes a 5-point Likert scale, where 'Poor = 0, Fair = 1, Good = 2, Very good = 3, Excellent = 4'. To obtain the subtotal of the scale, section score totals are summed and then multiplied by 1.25 to obtain the PLAYcoach Physical Literacy Score. Coaches use a scoring sheet to determine a child's physical literacy score and record the progress of their skills. Additionally, coaches assessed their athletes and used this form to track progress by monitoring development (Table 2).

The Physical Literacy Visual Analog Scale (VAS) (Figure 1); It is a measurement technique conducted through observation. In this technique, the extent of physical literacy is conceptualized and developed by imagining and scoring a child with physical literacy in all fundamental movement skills within the scope of physical literacy. Based on the VAS score example provided for the trained child, a marking was placed on the line between two anchors, representing not physically literate' and perfect physical literacy. This mark was placed at approximately 70 mm to indicate approximately 70% perfect physical literacy. On this scale, high physical literacy represents a maximum of 100 points (Hayes and Patterson, 1921; Pastor-Cisneros et al., 2021; Play Tools, 2023).

Figure 1. PlayCoach VAS (PLAY stands for Physical Literacy Assessment for Youth, 2023)

Descriptive Statistics

After the study is implemented, it is recommended that the PLAYcoach physical literacy scores obtained, including descriptive statistics such as standard deviation and arithmetic mean, be evaluated in conjunction with age, gender, cognitive domain, environment, and motor skills (general motor skills, balance, object control, and locomotion). The means and standard deviations, descriptive statistics, and physical literacy VAS (PL - VAS) domain scores can also be calculated separately for participants who meet and do not meet the criteria. Additionally, differences between genders can be determined using the SPSS statistical programme (Belanger et al., 2018; Caldwell et al., 2021; Liu and Chen, 2021).

Findings

Table 1

PLAYFun Physical Literacy Observation; Adaptation of structured judo basic training program to the fundamental stage. Physical Literacy Scoring Sheet.

Running (Judo Educational Games)	**Score**
1.Carrying the uke with a 5m Ippon-seoinage. The winner is the one who carries the uke in the shortest time	2
2. Carrying the uke with a 5m Koshi-guruma. The winner is the one who carries the uke in the shortest time	3
3.Carrying the uke with a 5m O-goshi. The winner is the one who carries the uke in the shortest time	1
Total	**6**
Locomotor	
4. Circular ukemi forward by rolling with a plates ball	1
5.Circular ukemi in front of the bear walk	2
6.Walking backwards Tai-sabaki Uchikomi	3
7.Walking backwards O-soto-Otoshi Uchikomi	4

8.Walking backwards İppon-seoinage Uchikomi		4
	Total	**14**
Object Control-Upper Body [19]		
9. Seoi-nage (Oyo-Renshu)		3
10. Ippon-seoi-nage (Oyo-Renshu)		3
11. Kesa-gatame (Oyo-Renshu)		3
12. Kuzure-kesa-gatame (Oyo-Renshu)		4
	Total	**13**
Object Control-Lower Body		
13. De-ashi-harai (Oyo-Renshu)		3
14. Hiza-guruma (Oyo-Renshu)		3
	Total	**6**
Balance, Stability & Body Control		
15. Seoi-nage and O-soto-otoshi combination (Oyo-Renshu)		3
16. O-goshi and Harai-goshi combination (Oyo-Renshu)		2
17. Sasae-tsurikomi-ashi and Uchi-mata (Oyo-Renshu)		3
18. Ko-soto-gake and O-soto-otoshi combination (Oyo-Renshu)		3
	Total	**11**
PLAYFun Physical Literacy Score		
Running (Judo Educational Games)		6
Locomotor		14
Object Control-Upper Body		13
Object Control-Lower Body		6
Balance, Stability & Body Control		11
Add up the section totals to obtain the Subtotal	**Subtotal**	**50**
Divide the subtotal by 18 to obtain the PLAYfun Physical Literacy Score	**Total**	**2,78**

Not: Use the following scale: Example of evaluation according to 5-point Likert scale ‘‘Poor = 0 Fair = 1 Good = 2 Very good = 3 Excellent = 4’’ and divide the subtotal by 18 to obtain the PLAYfun Physical Literacy Score (Play Tools, 2023).

In the adaptation of the structured judo basic training program to the fundamental stage, Table 1 (PLAYFun Physical Literacy Observation Structured judo basic training program adaptation to the fundamental stage, Physical Literacy Scoring Sheet) was used to track the development of athletes. All the sub-sections in Table 1 were scored on a 5-point Likert scale. Scoring was performed for the 18 sections listed in table. The total sub-scores obtained are divided by 18 to obtain the 'PLAYFun Physical Literacy Score' (This score is important for tracking the athlete's progress. The scores provided in this table are given as an example for evaluating an athlete). Monitoring an athlete's development will contribute to reviewing the program if necessary and making necessary adjustments and interventions in a timely manner.

Table 2

PLAYcoach Physical Literacy Observation; Adaptation of structured judo basic training program to the fundamental stage (Physical Literacy Tracking Sheet).

Running (Cognitive Domain / Judo Educational Games)	**Score**
1.Confidence in participating in educational games and physical activities (core strength training) During judo training.	2
2. Motivation for participating in educational games and physical activities (core strength training) during judo training	3
3. Understanding the basic judo vocabulary and movement terms	2
Total	**7**

Environment			
4a. Able to participate in the judo training sporthall (DOJO)			4
4b. Able to participate in outdoor areas including athletics field, swimming pool, judo training programs on the beach			2
4c. Able to participate in basic judo training in water			3
4d. Able to participate on training in cold weather conditions			4
4f. Able to participate in training in hot weather conditions			4
5. Awareness of the environment and teammates			4
		Total	**21**
General Motor Competence			
6. Developing different judo movement skills			4
7. Ability to select classify appropriate judo technical skills according to the training materials used			3
		Total	**7**
Balance			
8. Basic movements for Judo Sports: 4 main directions of imbalance			3
9. Dynamic balance (Oyo-Renshu practice of Tachi-waza techniques by imbalance the balance in four main directions)			2
10. Coordination: Use of static and dynamic balance together (paired judo technique work in movement. For example Yakusekugıyeku and Oyo-Renshu)			3
		Total	**8**
Object Control (body, Rope, plates ball, gymnastic ball, judogi)			
11. Ability to use hands to throw (kake), catch (kumikata) and carry (uchikomi) a partner (uke)			3
12.Ability to use the feet to move the partner (Uke) (Ashi-waza Judo Techniques)			4
13. Ability to judo training use left and right sides equally			2
		Total	**9**
Locomotor			
14. Hajime/Matte (start/Stop)			3
15. Running (Walking backwards Judo basic technicals uchikomi)			3
16. Ability (Speed uchikomi and judo educational games with judo technicals)			4
		Total	**10**
PLAYcoach Physical Literacy Score			
Cognitive Domain			7
Environment			21
Motor Competence	**General Motor Competence**		7
	Balance		8
	Object Control		9
	Locomotor		10
Add up the section totals to obtain the Subtotal		**Subtotal**	**62**
Multiply the subtotal by 1.25 to obtain the PLAYcoach Physical Literacy Score		**Total**	**77,5**

Not: Use the following scale: Example of evaluation according to 5-point Likert scale ‘‘Poor = 0 Fair = 1 Good = 2 Very good = 3 Excellent = 4’’ and divide the subtotal by 18 to obtain the PLAYfun Physical Literacy Score (Play Tools, 2023).

In the adaptation of the structured judo basic training program to the fundamental stage, Table 2 (PLAYcoach Physical Literacy Observation; Adaptation of structured judo basic training program to the fundamental stage, Physical Literacy Tracking Sheet) was used to evaluate athletes' physical literacy from the coach's perspective.

Upon examining Table 2, it is evident that six sub-components are provided, and scoring is conducted on a 5-point Likert scale. The scoring system is provided in table. These scores are provided as sample figures for athletes. Upon review of Table 2, it can be observed that a score of 77.5 points is obtained from the PLAYcoach Physical Literacy Observation: adaptation of structured judo basic training program to the fundamental stage (Physical Literacy Tracking Sheet). Coaches

use this score to determine a child's physical literacy score and record the progress of skills. Furthermore, when the obtained score of 77.5 points from Table 2 is placed on the Physical Literacy Visual Analog Scale (VAS) (Figure 1), it can be interpreted that the default athlete (judoka) has good physical literacy and is progressing towards the boundary of excellence, indicating that the improved design in the study positively contributes to athletes' (judokas) development.

Result

Adaptation of the FUNdamental Training Stage of Judo LTAD Model in Structured FUNdamental Judo Training Program; Developed by Balyi et al., the main objective of the long-term athlete development (LTAD) model is to provide a structured training process tailored to the individual needs of athletes with training process management for elite athletes to win medals in the Olympics (Balyi, 1990; 2001; Balyi and Hamilton, 2004; Balyi et al., 2013). Therefore, it is a training process that is easy for coaches to implement because it is easy to understand process management, even though its implementation can be challenging (McKeown and Ball, 2013). As the core component of this model, FUNdamental lays the physiological infrastructure of judo sports and establishes the foundation of a strong structure for athletes' future judo career. As a critical stage in which athletes acquire FUNdamental judo skills and sport values, this stage is considered crucial for the child's social, intellectual, and cognitive development.

In judo sports, the 'Judo LTAD; Adaptation of FUNdamental Judo Training Program' is a structured and unstructured training program for children that is based on fun, enjoyment, and play. This training program incorporates a training program improving the children's ABC (Agility-Balance-Coordination) skills (Balyi and Hamilton, 2004; Sterkowicz-Przybycień et al., 2014) and enhancing the FUNdamental biomotor skills such as agility, speed, balance, and coordination, which play a crucial role in competition performance in elite athlete development (Demiral, 2011; 2018), as well as complex and intricate athletics skills (Bompa and Haff, 2009; 33; Sport Frameworks, 2023).

Furthermore, judo is founded on values such as discipline, respect, patience, and perseverance. These values contribute to the character development of athletes and aim to make the sport beneficial not only in the arena but also in other areas of their lives (Kano, 2013). These mental skills, 'Jita Kyoei: mutual prosperity', are systematically incorporated into the 'Judo LTAD FUNdamental Training Program' and the ethical values of judo are emphasized within the 'Judo LTAD FUNdamental Training' process. This method helps children transfer these skills into their lives as learned behaviors.

The 'Judo LTAD FUNdamental Training Program' spans a 5-year training for children aged between 4 and 9 years in their pathway to become an elite athlete. As emphasized in scientific studies reporting that a minimum of 10 years (or 10,000 hours) of FUNdamental training is required to become an elite athlete (Balyi, 1990; 2001; McKeown and Ball, 2013; Bloom, 1985; Ericson and Charness, 1994; Ericson et al., 1993), the 'Judo LTAD FUNdamental Training Program' has become an important phase for children aged between 4 and 9 years. Below is an example of 'Judo LTAD Model Fundamentals Stage of Adaptation in Judo Basic Education Program Structured' provided in Table 3. Coaches can structure this according to the fundamental principles provided above for the athletes or groups they train.

Table 3

Structured Judo LTAD FUNdamental Training Program's Stage of Maturation and Late Childhood (McIver et al., 2013)

Stage of maturation	Late childhood
Chronological Age and Developmental Level	Male 6-10 years and Female 6-10 years
Progression	This stage is important for learning FUNdamental movement skills such as balance, agility, running, sprinting, coordination, jumping, throwing and catching, strength with own body weight, learning to work with others, other sports (swimming, handball, athletics, etc.).
Judo specific skills	Introduction to throwing and catching skills in its many aspects, emphasising the versatility of movements. Introduction and development of falling skills. Introduction to basic floor work using simple movements for Osaekomi, evasion and combinations. Transfer of basic knowledge from throwing, using simple teaching methods of movement.
Specific skills	Agilty, Balance and Coordination, biomotor and motor skills to be developed (with family and school support).
Volume and intensity of training	High-volume and low-intensity
Number and length of sessions per week	2-3 Week of judo (45-60 mins), 4–6 sessions of physical activity
Type/amount of competition	Fun events and Judo festivals
Number of gradings (per year)	2–3 non-competitive junior gradings
Training venues	Preschool, School, and Club
Coaches	Level 2 assisted by Level 1

Adaptation of the FUNdamental Stage of Judo LTAD Model in Structured FUNdamental Judo Training Program; Evaluation; Judo LTAD – FUNdamental Training Process was implemented as a structured program incorporating the adaptation of all FUNdamental movement skills (general motor skill development) for boys aged 6-9 years and girls aged 6-8 years (Balyi, 2001; Balyi and Hamilton, 2004).

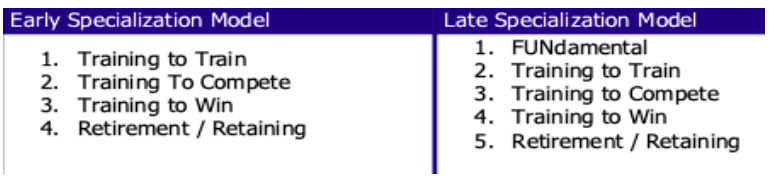

Figure 2. LTAD Specialization Model (Balyi, 2001)

Given that the FUNdamental stage of the long-term athlete development model (LTAD) is a critical phase in which athletes develop their foundational skills and abilities, learn the FUNdamental of the sport, and have a versatile sports experience, evaluating children's development using appropriate criteria is also equally important. Throughout the structured Judo LTAD FUNdamental Education Program, children's performance and progress should be assessed on a regular basis. While these assessments allow coaches and experts to identify children's strengths and areas that should be improved, they also lay the foundation for children to potentially become elite athletes in the future (Bompa and Haff, 2009; International Judo Federation, 2023; Malina et al., 2004; Martindale, 2009). The 'Structured Judo LTAD FUNdamental Training Program' presented here covers the age range of 6-9 years for males and 6-8 years for females. This age range is also included as a performance assessment tool for children because it is within the scope of physical literacy assessment (Lyod et al., 2015). Within the scope of physical literacy (commonly called movement competency) (Balyi et al., 2013; Whitehead, 2001), it is aimed at improving FUNdamental movement skills, movement competency) (Pichardo et al., 2018), and FUNdamental biomotor skills such as agility, speed, and coordination, along with sporting skills, from early childhood and early adolescence (Arslan and Bayraktar, 2020; Temürçi et al., 2020). The program focuses on children's physical capacities, FUNdamental movement skills, Agility, Balance, Coordination (ABC) (Demiral et al., 2022), and overall development. Participation in as many sports as possible was encouraged. Fun games are used to enhance the speed, strength, and endurance. The Structured Judo LTAD (Long-Term Athlete Development) FUNdamental Training Program includes locomotor movements such as walking, running, jumping/leaping (horizontal and vertical), hopping, sliding sideways, skipping, vaulting, chasing, climbing (Gallahue et al., 2012), non-locomotor (stability) movements such as body control skills, slipping, balancing, bending, twisting, swinging, pushing, and pulling (Balyi et al., 2013); manipulative skills such as rolling or throwing from below, throwing over the shoulder, catching, striking with equipment or tools, and kicking an object (ball), as well as combined movements in which all or some locomotor, non-locomotor, manipulative, and/or stability movements are used (Mengütay, 2005). In addition, the development of ABCs is supported by the use of educational games (Demiral, 2011; Malina et al., 2004). In this training program, PLAYFun (Table 1) can be used to track the athletes' development, PLAYcoach (Table 2) can be utilized for measurements within the athletes, and VAS (Figure 1) can be employed for evaluation.

Within the Structured Judo LTAD FUNdamental Training Program, children should engage in activities that support basic strength development, including static and dynamic uchikomis (repetitive technical exercises) in four main directions using their body weight, ukemis performed

using Pilates bouncing balls, and exercises with stability and Swiss balls. Moreover, by teaching the FUNdamental rules, values, and game ethics of judo to children within the scope of the program, forms addressing their use by children in practice should be examined (Demiral, 2018). Moreover, speed, strength, and endurance development are accelerated by using fun-structured games that enhance judo's technical skills (Demiral, 2011; International Judo Federation, 2023).

During the LTAD FUNdamental stage, the 'critical period of speed development' occurs between the ages of six and eight for girls and between the ages of seven and nine for boys. Therefore, by using structured judo technical and educational games, linear, lateral, and multidirectional speeds should be improved, repetition durations should be between 5 and 10 s, and training volume should be low. This is often referred to as the 'agility, quickness, and change of direction window (Balyi and Hamilton, 2004; Sport Frameworks, 2023; Van Kooten, 2016). The Structured Judo LTAD FUNdamental Training Program is part of the physical literacy framework in the literature (Balyi and Hamilton, 2004). Physical literacy is defined as the development and competency of FUNdamental movement skills and basic sports skills that enable a child to move confidently while learning a wide variety of physical activities and rhythmic sports skills (Ford et al., 2011; Higgs et al., 2008). Therefore, a well-structured Judo LTAD FUNdamental Training Program can be used as an evaluation criterion (Canadian Sport for Life, 2005). The example judo physical literacy tracking chart was adapted according to the Structured Judo LTAD Fundamental Training Program and provided through PLAYcoach (Physical Literacy Observation for Youth).

Adaptation of Judo LTAD Model FUNdamental Stage in Structured FUNdamental Judo Training Program; Sharing Information; The evaluation results of data such as the Judo Physical Literacy tracking chart (example), the Judo Physical Literacy Skill Assessment table (example), and the assessment table structured according to the FUNdamental judo training program (example) can be used as an effective method for monitoring and observing a child's development when shared with the child, coach, teacher, expert, and family. When providing feedback, it should include answers to the questions of why, how, why, when, and where.

Table 4

Judo LTAD Model Fundamentals Stage of Adaptation in Structured Judo Basic Education Program; Sharing Information with the Children (Sample Implementation)

Why	Providing feedback is important to improve children's perception and demonstration of the skill.
How	Visual: the coach shows the child what to do. Verbal; the coach explains to the child what to do. Kinesthetic; the coach guides the child's body for the duration of the movement.
What	Information about observations of movement skills
When	As soon as possible after the demonstration of the movement skill
Where	In a Judo hall (Dojo) or in a different area

Providing feedback to children contributes to the educational and transparent nature of assessments. Owing to individual differences, sharing information using methods such as verbal, visual, auditory, and kinesthetic would be effective. Providing feedback during practice guides the child to perform these skills effectively and competently. Positive feedback during the feedback process encourages the child and enhances their skill development (Table 4; FUNdamental movement skills).

Tablo 5

Judo LTAD Model Fundamentals Stage Of Adaptation In Judo Basic Education Program Structured; Sharing Information with the School & Judo Club (Sample Implementation)

Why	To follow the development of children's skills and outcomes over time
How	Recording the individual profiles of the children and the judo class
What	General assessment in children: development of motor skills.
When	Weekly, monthly, and annually
Where	At School & Judo Club

Information Sharing with Schools and Judo Clubs, integrating judo team information in a format that will enable schools and clubs to map children's training levels, will be an indicator of successful schools and judo clubs (Table 5; FUNdamental movement skills).

Tablo 6

Judo LTAD Model Fundamentals Stage of Adaptation in Judo Basic Education Program Structured; Sharing Information with the Coach (Sample Implementation)

Why	It is important to provide different perspectives in order for the expected movement skill performances of children to reach the desired gains.
How	Rubrics, Learning Stories and FMS Observation Records
What	Information about the target group
When	After the observation is done, additional information can be made if deemed necessary.
Where	Judo Club

Working with different teachers (physical education, classroom teachers, other experts, etc.) will support the coach. Observations by different individuals and the feedback provided can be used by the coach to accelerate a child's development. In this way, it will contribute to the qualitative and quantitative structuring of the educational content and the efficient use of time for the coach, as it will help children establish connections between concepts, skills, and attitudes, and transfer and transform what they learn in different environments with different teachers (Table 6; FUNdamental movement skills).

Tablo 7

Judo LTAD Model Fundamentals Stage of Adaptation in Judo Basic Education Program Structured: Sample Implementation (McIver et al., 2013)

Week1	**Duration**	**Intensity**	
Training 1 Monday	60min	High volume and low intensity	10 minutes of warm-up with educational games (cartwheels with a ball, carriage with resistance bands, jump rope with hoops) 30 minutes of FUNdamental judo training in Tachi-waza (Ukemi, Taisabaki, Osotogari, De-Ashi-Barai) 10 minutes of ABC exercises with the athlete's bodyweight 5 minutes of educational games (prisoner's base with music, jump-to-lap game) 5 minutes of stretching
Training 2 Wednesday	60min	High volume and High intensity	10 minutes of warm-up with educational games (sprint games with a gymnastic bouncing ball) 30 minutes of Ne-waza FUNdamental judo training (circular Ukemis left-right with a gymnastic bouncing ball, Ne-waza leg-lock drills, balance disruption in Ne-Waza the high bridge position, 4 X 1-minute Ne-waza Randori) 10 minutes of educational games (best rope climbing, best long jump with both feet, longest one-legged balance competition with eyes closed) 10 minutes of stretching
Training 3 Friday	60min	High volume and low intensity	10 minutes of warm-up with educational games (balance disruption in four main directions with a Judo belt) 30 minutes of Tachi-waza FUNdamental judo training (Ukemis with a gymnastic ball, dynamic Taisabaki, Osotogari, Ippon-seonage) 10 minutes of ABC exercises with body weight 10 minutes of educational games (rope pulling "Tug of War game", climbing high, etc.) 5 minutes of stretching

The sample structured practice programme based on the LTAD model given in Table 7 can be restructured by the coaches according to the developmental characteristics of the study groups.

Conclusion

There are many studies in the literature that explain the identification and development of talent (Gallahue et al., 2012; Mangütay, 2005; International Judo Federation, 2023; Özbar, 2017; Ropret and Jevtić, 2019), such as the Foundation, Talent, Elite, Mastery (FTEM) model phase (Gulbin et al., 2013), the Development Model of Sport Participation (DMSP) (Côté et al., 2007; Côté et al., 2009), the Career Transition Model (CTM) (Lavalle, 2000; Stambulova, 1994), and Long-term Athlete Development (LTAD) (Balyi, 2001). In this study, an example of this application is provided for the Judo LTAD Model at the FUNdamental Stage of Adaptation in the FUNdamental Judo Training Program. The program is discussed within a comprehensive framework that includes its structuring, evaluation, and feedback and is supported by the literature. Furthermore, an example design of the implementation of the Judo LTAD Model Fundamentals Stage of Adaptation in a Structured Judo Basic Education Program was developed and presented. The development of the designed framework has been comprehensively approached, covering its structuring, evaluation, and feedback, and is supported by the literature. The Judo LTAD Model FUNdamental Stage of Adaptation in the FUNdamental Judo Training Program aims to ensure that athletes acquire

FUNdamental judo skills and learn the values of the sport. Furthermore, it underscores the importance of athletes with versatile sports experience during this period and engaging in sports with a focus on fun. The Judo LTAD Model FUNdamental Stage of Adaptation in the FUNdamental Judo Training Program is presented as a structure that encourages children to engage in sports with an approach that does not focus on specialization and has a multidimensional experience. During this stage, a fun- and participation-oriented approach was adopted, and athletes were encouraged to love the sport and participate regularly in training sessions. Coaches should create an environment in which children can be free and establish an enjoyable learning atmosphere that encourages them. Since agility, balance, coordination, and speed as the foundation of movement are as important as running, rotating, kicking, throwing, and catching the ball, their importance is emphasized in physical training programs. Creating environments in which children have opportunities to express their creativity and where they can engage in activities with minimal direction is emphasized for the biomotor, social, intellectual, and cognitive development of children. The Adaptation of Judo LTAD Model FUNdamental Stage in the Structured FUNdamental Judo Training Program suggests that athletes should engage in training sessions to 2-3 times a week, lasting 60 minutes each time, with the training content consisting of Ne-Waza, Tachi-Waza, and uchikomi. Warm-up and cool-down exercises within the training session can be conducted using educational games. It is thought that the 'Adaptation of Judo LTAD Model FUNdamental Stage in the Structured FUNdamental Judo Training Program' will help coaches with the correct implementation of LTAD programs and guide them in the program. In addition, this study will be a valuable resource for judo coaches and coach training programs.

When reviewing the literature, it is emphasised that in judo training methodology, the activities included in the training programme must be adapted to the abilities and psychomotor needs of children and be age-appropriate. The training programme and content applied to children aged 6-9 years are found to be parallel to our study.

In the study by Krustolovic and colleagues (2010), children with an average age of six practised judo three times a week for 45 minutes, while in the study by Djordjevic and colleagues (2021), boys with an average age of six participated in 60-minute judo training sessions three times a week. In Shuba and Shuba's (2021) study, children aged 7–9 participated in judo training three to four times a week, with each session lasting approximately 60–90 minutes. It is emphasised that these programmes include multifaceted exercise sets that incorporate strength, speed, coordination, and flexibility, and that the technical intensity is gradually increased, which has a significant impact on the development of children's motor skills.

Ericsson and colleagues (1993) emphasise 10,000 hours of deliberate practice to achieve elite performance in their Theory of Deliberate Practice (TODP) (Simenko, 2022). According to this theory, a child who begins judo training at the age of 6-9 will reach this number in an average of 25 years by participating in training sessions three times a week (936 hours in 4 years) during the first 3-4 years of their sporting life, and then 4-5 times a week, each lasting 90 to 120 minutes (416 hours in 1 year). According to the Canadian Long-Term Athlete Development Model (LTAD), training sessions for judokas under the age of 11 should be 2-3 times a week for 60-90 minutes.

In conclusion, this study provides valuable insights into the adaptation of the Long Term Athlete Development (LTAD) model's fundamental stage to the judo basic education program for children aged 6-9 years. By utilizing structured research methodologies and incorporating tools, such as the PLAYcoach Physical Literacy Score Form and the Physical Literacy Visual Analog Scale, this study offers a comprehensive framework for assessing and enhancing children's physical literacy and sport-specific skills. These findings are expected to be beneficial for judo coaches and coaching programs and contribute to the development and evaluation of effective training programs for young athletes.

Ethics Committee Approval Information

Ethics committee: Trakya University Ethics Committee for Research in Social and Human Sciences

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Authors' Contribution Statement

The processes related to the method, findings, discussion, and conclusion sections of the study were carried out by the first author, while the processes related to the introduction section were carried out by the second author.

Conflict of Interest Statement

The authors declare that there is no conflict of interest related to this research.

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