



HANDBALL INTERNATIONAL EDUCATION PROJECT

Deliverable 6

D3.2 Coaches Manual

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FIGH – Federazione Italiana Giuoco Handball

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The document "Strategies for Development and Growth" for Olympiacos Youth Handball discusses the multifaceted aspects of developing youth handball programs. It covers the historical evolution of handball and its significance in promoting physical activity among children and young adults. Emphasis is placed on skill development, psychological preparation, and physical conditioning tailored to youth players. The document also explores the importance of inclusivity, diversity, and strategic educational approaches in handball. Key benefits for youth participation in handball include improved physical health, mental well-being, and social connections, with a focus on long-term athlete development through structured training programs and community involvement.





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1. Introduction to Handball

Handball is one of the oldest team sports and has been part of the Summer Olympic Games since 1936. Each team consists of 7 outfield players and 1 goalkeeper, and the game involves high-speed movements aimed at scoring goals. A standard match includes two 30-minute periods with a 10-minute halftime. Handball's popularity has increased, with around 2 million registered players, 25,000 clubs, 202 national federations, and a regular TV audience of 1 billion in 202 countries (Muntianu et al., 2022; Smiatek & Heuer, 2012).

While much of the scientific literature focuses on elite team handball, the development of youth handball is crucial for general health, quality of life, and the foundation for elite performance. Effective strategies for youth development must be tailored to individual countries, respecting cultural and traditional contexts. The overall aim of the current literature is to explore youth handball development from various perspectives, including context, psychological, physiological, and biomechanical factors.

1. History and Evolution of Handball

Handball, a popular indoor team sport, originated in Germany, Scandinavia (Denmark, Sweden, and Norway), and Czechoslovakia in the late 19th century. It quickly spread worldwide, becoming an Olympic sport in 1936 and reintroduced in the 1972 Munich Olympics. Today, there are about 19 million handball players globally. Olympic handball is the most popular version of the sport.

Technological advances have enhanced the observation and analysis of handball, contributing to scientific progress in understanding the game. Researchers have investigated tactical variables in offensive play, aiming to link performance indicators with individual or collective attack tactics. Predicting match outcomes can help managers, coaches, and fans by estimating the probability of future events. However, there is limited literature on handball analytics compared to sports like football and basketball. Factors such as home advantage, player fatigue, and travel distance



significantly influence game outcomes (Ferrari et al., 2022). To address the gap in predictive models, a Statistically Enhanced Learning (SEL) approach has been developed for predicting handball matches (Felice & Ley, 2023).

2. Significance of Handball in Physical Activity

In an era dominated by electronic media, organized sports, including handball, serve as essential physical, social, and health activities for children and young adults (Valerdi et al., 2021). These sports provide enjoyable extracurricular activities that fulfill the need for physical fitness, psychological satisfaction, and social interaction. Based on the Self-Determination Theory, organized sports meet intrinsic psychological needs such as autonomy, competence, and relatedness (Moustakas, 2023).

Regular participation in organized sports is crucial for developing motor competence and associated physical and technical skills. Despite this, many countries report a worrying decline in youth sports participation from primary school through adolescence and into adulthood. This trend highlights a lack of appreciation for the health benefits of physical activities among educational and health policymakers.

Handball, as a team sport, offers rich life experiences and individual development during physical education and sports classes. It encompasses physical capacity expression, effectiveness, autonomy, and emotional exchanges with teammates and opponents. Team sports involve technical and tactical performance in a dynamic environment, fostering cooperation, opposition strategies, and interaction with referees and spectators. For beginners, the focus is not solely on physical or tactical performance but on maintaining a positive psycho-affective state through motivation, goals, commitment, and emotion (Cherif et al., 2012).

3. Objectives and Scope

In youth handball, objectives should focus on the physical and psychological development of children, vocational training, and instilling values related to team



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sports to help them become well-behaved adults (Moustakas, 2022). Youth sports should start at an early age, progressing from basic handball discovery to fostering social integration and responsibility.

The intervention in youth handball should follow a guided and coherent path, considering sociocultural factors that influence a child's engagement in the sport. To address these factors, the introduction to basketball—a sport with similar motor skill requirements—was examined. Three chapters provide a detailed country-by-country analysis of grassroots activities, excluding school handball, which is covered separately. Various games and activities are documented with reference to national and European programs (R. Arias et al., 2021).

4. Overview of Technical and Tactical Approaches

Starting training at an optimal age is essential for injury prevention and improving performance quality in team handball, especially at elite levels (Petrariu & Valentin Leuciuc, 2022). Perceptual-motor learning in sports involves refining motor skills through continuous practice and adjustments, leading to stable motor performance. Handball, part of Germany's comprehensive sports system, features spontaneous collective interactions and unpredictable actions, requiring more than just physical training of specific muscles.

Technical and tactical approaches are vital for understanding and improving collective behavior and sports preparation in handball (Llana et al., 2022). Team sports, characterized by interaction and dynamism, involve unpredictable and complex actions that require quick reactions. Research indicates the need for a structured game program to develop cognitive, physical, and relevant game skills. Emphasizing technical exercises helps create automatic responses in positioning, running, and effective throwing gestures.

5. Key Benefits of Handball for Young People





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Sport participation, including handball, provides numerous benefits for individuals and society, such as enhanced physical health, mental well-being, and social connections (Davis & Knoester, 2020). These benefits include improved aerobic and musculoskeletal health, better emotional and cognitive functioning, and opportunities to build relationships and social networks. Sport also aligns with the five key outcomes promoted by the United Nations Inter-Agency Task Force on Sport for Development and Peace (UNIATF): health, education, gender equality and social inclusion, peace, and life skills development.

Community sports programs can significantly contribute to youth development and social change, especially during times of social, political, cultural, and environmental transition. The infrastructure of sport for development must evolve to consider the diversity and complexity of participants' lives, avoiding unintended consequences and resource imbalances that favor privileged groups. While sports generally enhance physical, psychological, cognitive, and social capacities, they can also worsen disparities and inequalities. Effective program planning should incorporate the culture and context of the youth being served, using indigenous knowledge and socio-cultural practices. This approach ensures that youth are co-designers of research and interventions, which will better support their rights, needs, and interests.

6. Structure of Handball Programs

Handball programs are large and complex, allowing teams to compete under UEFA and IHF auspices. National federations often include youth and junior leagues at various levels, but their structures are typically loose, leaving local programs for children and youth largely independent. These local programs are initiated and supervised by community-driven initiatives or advised efforts aimed at improving youth situations and reaching marginalized groups. Some have developed their own structures, relying on non-governmental institutions or local sociocultural and sports organizations, to evolve into comprehensive education, talent development, and sport support programs.



7. Current Trends

Interdisciplinary methods from statistical physics have been applied to sports league data to predict match results, particularly in soccer. This study aims to introduce a new prediction model for team handball, using general and team-specific fitness parameters to predict the remaining 2013/2014 Bundesliga handball season. The model achieved a 65.91% accuracy rate, improving by 0.82% over a previous model using fitness data from the second half of the 2012/2013 season. Traditional sports studies often focus on home advantage and match result prediction, primarily in soccer. Despite handball's global popularity, comprehensive statistical predictions are rare. However, high-quality data from the German Handball

Bundesliga indicate that such methods could effectively estimate handball results, comparing them to soccer outcomes.

8. Challenges in Promoting Handball

Promoting handball faces unique challenges due to its significant societal role and its ties to youth culture and emotions. This section examines three key aspects of managing handball within a complex society: promoting inclusivity through diversity management and equitable access; using handball as a tool for intercultural dialogue and interaction; and fostering social cohesion to enhance social participation and integration (Moustakas, 2022; 2023). Sport educators need to understand the social structures of their target groups to design appropriate programs, improving their competencies in this area (Nery et al., 2023). New initiatives for children and youth should encourage independent use of free time and view sport as a means for self-development. Organic community growth through shared experiences can lead to a robust, self-sustaining sport community that embraces challenges and creates future opportunities.

9. Importance of a Strategic Educational Approach

Developing youth handball requires a strategic educational approach, involving school programs that offer opportunities for participation during and outside school hours, thus strengthening its presence among pupils. This initiative includes diverse partners from social, political, sports, and commercial sectors, supported by growing national interest and encouragement from the Ministry of Culture. The goal is to increase youth participation by enhancing coach education and sports pedagogy for teachers and coaches, aiming for significant growth in programs like DAI and VIB (Moustakas, 2022).

The evaluation of these programs focused on their social, developmental, and strategic impacts, examining the underlying values and methodologies. DAI and VIB have positively influenced learners' self-awareness, social roles, friendships, and relationships. However, despite their enthusiasm, learners are not fully integrated into the handball community compared to ethnically Danish players. In the VIB class, sports-based friendships have promoted integration, aligning with different integration models: segmentation, assimilation, and pluralism (R. Arias et al., 2021).

10. Summary and Key Takeaways

Recent research has begun to address the incidence and awareness of youth handball injuries, particularly concussions, but has not fully developed prevention interventions for at-risk groups (Sturesson et al., 2024). Concussions are common in dynamic sports with frequent player collisions, including handball. General preventive measures, such as raising awareness among coaches and participants, have been suggested alongside technical

measures specific to handball, given the high incidence of concussions and their impact on adolescents' developing brains (Moesch et al., 2022).

Despite increasing popularity, handball is not expected to surpass other sports in overall popularity across Europe. Norway leads in global handball success, and Croatia

is strong in the sport despite its greater success in football. The Croatian women's handball team is generally considered weaker than the men's team. A clinical kinesiology study in 2018 involving 100 students from Zagreb's Cvitan Baranović Elementary School highlighted the sport's role in physical education. Croatia's national children's defensive handball tournaments, held for many years, are among Europe's most attended defensive handball events.

2. Fundamentals of Handball Skills Development

Handball skill development involves multiple physical and psychological components. Joint mobility is typically measured using goniometers. Players with strong visual and oculomotor coordination respond more effectively to stimuli, with decision-making and reaction time being crucial for success (Muntianu et al., 2022). Training methods now address both physical and psychological aspects, with an emphasis on explosive lower limb force, which can be enhanced through plyometric training. Performance improvements are often assessed using 30-second jump tests to measure leg power (García-Sánchez et al., 2023).

Running velocity, a key factor in handball, varies with players' physical characteristics. Research by Jaric and Markovic on 20 elite male handball players found that 40–55 meter sprints and shooting velocities significantly predict running speed. Their study highlighted the importance of assessing physical and physiological traits to predict top players' biological capacities.

Training for young handball players should focus on the specific motion mechanics of sporting events to develop versatile motor skills. Speed, especially in 40-meter sprints, is a critical performance indicator. There are significant correlations between sprint times and agility, as well as between 40-meter sprints and 20-meter acceleration. Training methods that evolve in specificity can improve motivation, strength endurance, speed, and coordination in handball shooting, enhancing overall skills.



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1. Basic Techniques and Movements in Handball

Handball practice should focus on a variety of game forms, starting with basic bounce actions like dribbling and movement with the ball, and extending to specific individual skills such as running, passing, receiving, blocking, and defensive actions (Felice & Ley, 2023). Players must master ball handling and running towards the goal (Cherif et al., 2012).

For juniors aged 6-10, training should emphasize fundamental movements, pre-handball activities, and recreational forms like minihandball, streetball, and school-related ball games.

As they progress, youths work on offensive and defensive techniques, as well as game tactics. They can follow either a competitive or sports health path.

Advanced players need to develop precise handball localization accuracy (Ageberg et al., 2022). This involves exercises where players target specific areas by throwing balls. Polish literature methods and surveys are used to evaluate these skills. Conditioning training aims to optimize handball localization skills without significant differences among tested players. Training programs should include exercises for ambidexterity (left/right hand and leg) to enhance motor skills for talented and young athletes.

2. Skill Progression for Youth Players

An interview-based study developed strength and conditioning training based on the LTAD model for youth handball, resulting in a training workbook for adolescents with a handball license (Krüger et al., 2015; Ageberg et al., 2022). This workbook includes exercise explanations, integrated strength and conditioning exercises, and circuit training for youth handball players, aiming to standardize training at school and club levels. It covers training variations for male and female athletes up to the A-Youth (16/17 years) and B-Youth (14/15 years) categories.

A three-month intervention study confirmed the workbook's positive impact on handball-specific strength and conditioning knowledge, though it proved unsuitable





for untrained children and adolescents (Cherif et al., 2012). To retain young athletes and enhance the number of licensed youth players, a comprehensive talent promotion strategy is necessary. This strategy should include age-appropriate training programs, multilateral athletic development, acquisition of sport-specific skills and knowledge, and fostering intrinsic motivation (Moustakas, 2022).

Specific training systems for youth handball, including talent schools, need restructuring. Strength and conditioning equipment should be developed and tested, and talent level programs from basic to advanced stages should be implemented in clubs and handball schools (Güllich, 2016). New training and instructional practices, integrated into LTAD model handbooks for coaches, players, and teachers, should be created. These practices should be intensively applied during handball classes, particularly in sport-interested schools, to offer significant long-term prospects. A handball-focused curriculum should be implemented, especially during the tournament phase, to ensure comprehensive skill development (Güllich and Krüger, 2015; Krüger et al., 2015; Güllich, 2016).

3. Importance of Individual Skill Development in Team Sports

European policy debates emphasize prioritizing junior sports, recognizing the need for a comprehensive socio-educational environment involving families, communities, schools, sports clubs, public institutions, and media. The European Union invests 100 million euros

annually in youth sports to support these initiatives (Moustakas, 2022; Smiatek & Heuer, 2012).

Team sports like handball are highly attractive to children and adolescents, offering fun and active integration. Handball's popularity has grown, especially among girls, with many starting in primary school. Training should focus on maximizing ball contact and developing technical skills from an early age. Systematic skill development is crucial during the middle and basic levels of handball training, leading to comprehensive education for young athletes.





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While team games like handball have a collective nature, individual skill development is essential for effective gameplay and achieving team success. Proper development of technical skills in handball requires advanced and consistent training, highlighting the importance of individual preparation in contributing to the team's overall performance.

4. Training Methods and Drills for Skill Enhancement

This chapter emphasizes the need for developing strategies to enhance individual skills and improve players' game-reading abilities in handball. It provides a comprehensive review of methods aimed at advancing the development of youth players, including tailored handball-specific training services. These services encompass fitness training, physiotherapy, match analysis, and sport psychology (García-Sánchez et al., 2023; Ageberg et al., 2022).

The goal is to inspire national-level strategies and programs to foster a strong cohort of promising Polish handball players (Farzinnejad et al., 2023). By employing standard training methods alongside result-driven exercises and support services, the chapter aims to ensure more youth handball players develop into talented athletes.

3. Psychological Aspects in Youth Handball

Research on the psychological aspects of youth handball development is limited, yet factors like motivation, self-confidence, persistence, and teamwork are crucial for success in competitions (Teshome et al., 2022). Cherkowski et al. highlight that athletic success relies not only on physical skills but also on mental attributes such as concentration and determination. Slovenian Handball Federation President Jelko Dobovšek emphasizes that mental preparation and desire are essential for athletes, asserting that while physical and technical skills can be developed early, psychological qualities enhance their effectiveness in competition (Jakšić et al., 2022).



Mismanagement of psychological aspects within youth handball is a significant reason for underperformance in international competitions and declining participation in academies. Promoting positive individuals through physical activities is vital, particularly within clubs and federations involved in performance sports like handball (Moustakas, 2023). Furthermore, effective policies and social initiatives in handball academies can foster sociocultural changes, enhance social integration, and promote intercultural dialogue through positive community representation.

1. Mental Preparation and Focus

The emotional and cognitive preparation of handball players for daily life, competitions, and training is essential due to the psychological demands of the sport (Jukic et al., 2021). Psychological aspects shape sports training by helping athletes develop persistence, manage frustration, and respond to various events (Muntianu et al., 2022). Sports psychology focuses on the mental well-being of athletes, fostering a constructive collaboration that is both positive and ongoing.

From a technical-tactical perspective, players must be aware of game dynamics and their performance, utilizing space-time awareness for decision-making. Skills such as understanding the rules and effective communication are vital. The psychomotor domain combines performance with critical factors like timing, sensory information, and resilience. Overcoming challenges and maintaining determination are crucial during training (J. Pulido et al., 2017).

While there is no guaranteed training method for mental readiness, athletes must adapt to competition-related stressors, including nervousness and emotional responses. Sport psychology aims to enhance mental preparation for competitions, integrating performance with personal and social aspects. Research explores whether mental practice can improve actual handball performance, specifically looking at the impact of correctly visualizing actions like penalty throws. The study considers the biomechanical and temporal complexities of real movements, suggesting that effective mental preparation may vary based on intervention protocols.

2. Building Confidence and Resilience

To enhance performance among young athletes, effective psychological strategies, such as fostering positive motivational environments and promoting life skills, are essential (J. Pulido et al., 2017). Confidence and resilience are critical psychological factors; resilience helps athletes recover from setbacks and manage stress (H. McManama O'Brien et al., 2021). Coaches play a vital role in boosting athletes' confidence and creating a supportive atmosphere that enables them to cope with pressure and change.

Professional athletes and young players must develop resilience and self-control in competitive settings, often requiring support from experts to manage stress and acquire coping skills. Psychological skill training is key to fostering self-confidence and resilience in athletes.

This study identifies strategies for promoting psychological development in primary school children through literature review, focusing on aspects such as strengthening confidence, nurturing resilience, providing positive support, and enhancing emotional management. These strategies include fostering enjoyment, teaching emotional expression, and promoting recovery (Moustakas, 2023).

3. Team Cohesion and Communication

In U18 youth handball teams, effective communication and team cohesion significantly enhance performance. Communication is crucial for mutual mental support, resolving misunderstandings, and fostering teamwork during practices and games. Misunderstandings and poor communication can harm interpersonal relationships and overall performance (Moustakas, 2022). As athletes train and compete together, their social skills improve, which is vital for team dynamics.

Team cohesion refers to how well members cooperate and work together, providing a foundation for learning the sport and developing life skills. High team cohesion boosts



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motivation, group performance, and a sense of belonging among players (Lara-Bercial & McKenna, 2022). Strengthening teamwork is essential during this developmental stage to aid athletes' adaptation to the sport.

4. Handling Performance Pressure and Stress

Psychological intervention programs can help youth handball players adapt to the pressures of competition, improving their performance (Olmedilla et al., 2019). In youth handball, athletes face complex situations requiring quick decisions and emotional regulation under stress. Key stressors include environmental factors (like crowd noise), social pressures (such as expectations from parents and coaches), and self-imposed pressures (like fear of failure) (J. McBurnie et al., 2021).

High mental pressure can impair athletes' performance by reducing their ability to process information and control their responses. Young athletes, who often lack developed psychological resilience and emotional regulation, are particularly vulnerable to these stresses. Therefore, implementing mental toughness programs is crucial to enhance their psychological skills and improve overall performance.

4. Physical Conditioning for Youth Handball Players

Handball is a demanding team sport that requires significant muscular strength, power, and high-intensity performance, alongside balance control (Hammami et al., 2021). Success in

handball relies on various physiological factors, including muscle strength, endurance, upper body strength, running ability, jumping ability, reflexes, agility, and speed (Cherif et al., 2012). As competition levels rise, players must exhibit superior motor and physiological qualities to succeed.

Youth handball players face a high volume of activity, with elite teams playing 60-65 matches per season, including additional games for training and friendly matches, leading to increased injury risk. Therefore, contemporary injury prevention strategies





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emphasize understanding the kinetics and kinematics of essential game skills (Ageberg et al., 2022).

1. Components of Physical Fitness in Handball

Handball is a dynamic team sport involving specific movements like sprinting, jumping, rapid direction changes, and body contact, all of which occur intermittently during matches. Training focuses on developing both aerobic and anaerobic endurance to accommodate these varying intensity actions. Players also need high upper body strength for effective ball throwing and overall conditioning throughout the game.

Research shows that higher-level players demonstrate less variability in sprinting and jumping performance compared to less experienced athletes. Left-handed players benefit from better coordination in both dominant and non-dominant movements due to the high-intensity nature of the sport.

As children and adolescents compete on smaller playing fields, it's essential to provide broader game education and develop unique physical abilities specific to handball. Age-specific programs should focus on enhancing tactical understanding, endurance, speed, power, agility, and coordination. The bio-banding model, which considers physical maturity rather than just chronological age, offers an alternative to traditional youth development, addressing fairness in participation.

2. Age-Appropriate Strength and Conditioning Programs

Effective preparation for elite youth handball is linked to proper physical development and well-being. This review emphasizes the importance of long-term athlete development (LTAD) and biological maturation as key factors in training young athletes. It outlines principles for creating strength and conditioning programs tailored to different age groups, focusing on maximizing benefits while minimizing risks.

The review highlights the need for creativity and diversity in exercises, particularly during pre-pubertal, pubertal, and post-pubertal stages, as physiological changes can





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affect performance. It calls for collaboration among parents and clubs to foster optimal development in young players.

While resistance and plyometric training have shown positive effects on youth fitness, there is a gap in literature regarding specific strength and conditioning exercises that enhance handball performance. The authors encourage trainers to incorporate specialized handball tasks into their programs to improve players' on-court effectiveness.

3. Injury Prevention Strategies and Rehabilitation

Recent reports highlight the importance of prioritizing athlete welfare in the development of young handball talents. Injury prevention is a major concern, particularly within frameworks like the Personal Development of Emerging Elite Youth Athletes (PRODEEM). Effective training load management is essential in multi-year talent development models, allowing athletes to rest and adapt, which can help prevent injuries.

The integration of physical education in schools and a focus on fundamental training practices are vital for nurturing talent. Coaches must balance performance demands with athlete well-being, often needing to make tough decisions to safeguard young athletes. As issues like abuse in sports gain attention, proper coach education becomes increasingly critical to ensure a supportive environment for young players.

4. Nutrition and Hydration Guidelines for Young Athletes

Maintaining fluid balance is essential for young athletes, as dehydration can lead to early fatigue and negatively impact performance. Young athletes are particularly vulnerable to dehydration due to their cognitive and physical immaturity, especially during demanding summer matches. Unlike adult players, who may have better hydration practices, young athletes often lack awareness of hydration's importance.



To promote optimal performance, young athletes should adhere to specific guidelines: drink 1.5–2 liters of water daily, especially in hot conditions; hydrate within the first five minutes post-activity; replenish any weight loss due to exercise within two hours; consume salty foods for recovery; and follow individualized nutritional plans. Additionally, it is crucial for young athletes to ensure adequate intake of iron and calcium to prevent deficiencies, while avoiding smoking and limiting alcohol consumption until after age 18.

5. Coaching and Leadership

Youth handball development organizations aim to promote physical health, well-being, and core values like sportsmanship, respect, and cooperation, often focusing on marginalized groups. These programs emphasize social relations and fair play while de-emphasizing competition. Effective coaching and leadership styles are crucial for fostering player development.

For children aged 8 and older, structured sports activities (4 to 7% of their weekly activity) enhance emotional competence, autonomy, and generosity. Activities should cater to children's needs for autonomy and social connection, although overly individualistic environments may hinder personal development and inclusiveness.

Regular early training in handball (before age 8) may not significantly benefit long-term outcomes, suggesting that specialization at a young age might not be ideal.

Ultimately, enjoyment and fun in sports are vital for developing competence and positive values, indicating that methodologies in coaching should prioritize these aspects alongside traditional goals.

1. Role of the Coach in Player Development

Coaches play a crucial role in the development of handball players by focusing on their physical, technical, tactical, and strategic qualities. Effective player development requires creating individualized strategies, emphasizing cognitive aspects, and refining



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tactics related to game scenarios. Coaches may prioritize different elements, such as player positioning, teamwork, or athletic preparation, including strength and agility.

Training should simulate game conditions, fostering creativity and decision-making under time and space constraints. Coaches are also responsible for planning and conducting practices, and they should engage with both players and parents to enhance the overall development process.

The coach's influence is significant, especially in youth teams where they often fulfill dual roles, such as a parent-coach dynamic. It's essential for coaches to understand each player's unique skills and potential, assessing qualities like ball handling, imagination, and defensive abilities. By creating an environment conducive to commitment and growth, coaches can maximize player development in handball.

2. Effective Communication and Motivation Techniques

To foster positive development in young handball players, effective communication and motivation are essential. A study aimed to create the Coach Performance Scale (CPS) to assess coaches' behaviors in supporting players' basic psychological needs. Involving 263 young athletes with an average age of 15.83, the research highlighted that younger players benefit significantly from supportive coaching across various aspects of athlete interaction.

Additionally, Intergroup Contact Theory (ICT) suggests that structured interactions among group members can enhance tolerance and social cohesion, provided there is equal status and shared goals. This theory emphasizes the role of group activities in building community and sportsmanship, which is vital for the development of handball talent. Overall, active participation in sports is crucial for fostering skills and maintaining engagement in youth handball.

3. Building Leadership Skills in Young Athletes





Sport organizations serving children and youth have a crucial role in teaching leadership skills, particularly within democratic structures. A study evaluated the effectiveness of the Goal-Directed Leadership Development Program (G-D LED) on young handball players. Results showed that the program successfully enhanced

skills in communication and group processes, but was less effective in developing interpersonal skills. The findings underscore the importance of assessing various leadership development strategies and their outcomes. It is not sufficient to assume that improvements in knowledge or attitudes will naturally lead to aspiring leaders. The study suggests that coaching should focus more on enhancing athletes' psychological resources rather than solely on their physical abilities.

4. Ethical and Safe Coaching Practices

Regular league play is seen as essential for transitioning youth to adult sports, offering critical playing opportunities that aid in player retention. A survey revealed that over 90% of junior members and their parents view these opportunities as vital, while concerns about winning emerged as a significant factor in player dissatisfaction, especially as they age. Coaches are encouraged to adopt a developmental philosophy rather than a winning-centric approach, unless coaching at a high-performance level.

The research highlights a gap between the stated values of coaches and their actual practices, as some prioritize victory over player development. Ethical coaching is crucial for fostering a sustainable environment for young athletes, characterized by respect for players' autonomy and the commitment to prevent injuries and mistreatment. Safe coaching practices should focus on player-centered approaches, promoting a positive social environment grounded in clear ethical standards.

Additionally, the prevalence of injuries in elite handball is linked to unnecessary contact and inconsistencies in rules across federations. Societal pressures, such as media and financial influences, contribute to a more aggressive style of play, shifting focus away from relational aspects of the sport.



6. Inclusivity and Diversity

The growth and sustainability of youth handball programs globally rely on strategic planning to enhance inclusivity and diversity. Organizations must proactively address issues of historical exclusion affecting various sociocultural groups, including those based on gender, religion, body type, and sexual orientation. A multilevel framework is essential to challenge and change these long-standing barriers.

Sociocultural assessments are crucial for evaluating inclusivity within handball governance and operations, ensuring diverse populations, including parents and youth from different backgrounds, have opportunities to influence programming. It's vital to recognize and address ingrained biases and discrimination, promoting a comprehensive approach to teaching sports in diverse communities.

Professional development focused on inclusion and diversity should be prioritized at all levels, utilizing data to identify gaps in leadership representation. Strategies like systematic advertising, inclusive branding, and awareness campaigns can enhance participation and retention of diverse youth in handball. Engaging young people in open discussions and community events can further promote inclusivity and foster a welcoming environment within the sport.

1. Promoting Gender Equality in Handball

Women have historically faced exclusion from opportunities in sports compared to men, but recent trends indicate a rise in women's participation, including in handball, which has been linked to social inclusion and community engagement. Despite this increase, young women remain underrepresented, and power dynamics in sports often favor men.

Feminist discourse highlights these inequalities, noting that women's sporting careers tend to be less appealing due to systemic barriers. Changing these entrenched practices, which often prioritize male involvement, presents a significant challenge.



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Initiatives like the Female Coaches Initiative (FCI) are crucial for boosting female representation in handball. FCI promotes women's involvement through various efforts, including awareness campaigns and the organization of joint men's and women's tournaments. By fostering greater participation and support for women and young women in handball, these initiatives aim to enrich the sport with diverse perspectives and contribute to gender equality.

2. Creating Opportunities for Players with Disabilities

This project focuses on Asymmetric Handball, which embodies mixed-abled game design principles to enhance inclusion for people with disabilities. By integrating concepts like Sense of Community, Universal Design, and Ludic Design, the project aims to create engaging activities that foster cooperation and appreciation among diverse players.

Through a one-hour session of Asymmetric Handball, participants will experience and evaluate the game, leading to the development of new variants that align with defined inclusivity goals. While mixed-abled teams can promote social engagement and trust, there is still a notable lack of willingness among some players to include

individuals with disabilities, highlighting the need for greater societal awareness regarding ableism and accessibility.

The initiative emphasizes the importance of continuous dialogue and collaboration with both disabled and non-disabled players to foster understanding and create meaningful opportunities for all.

3. Cultural Sensitivity and Awareness in Handball Programs

Cultural sensitivity involves recognizing, accepting, and appreciating diverse cultures, enabling effective interaction with individuals from various backgrounds. In the context of handball, sports can either serve the interests of the dominant culture or facilitate the integration of migrants. Young people, in particular, view sports like





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handball as a valuable means for cultural exchange, fostering team spirit and mutual appreciation within multicultural teams.

Handball offers a framework for culturally sensitive programs in schools and clubs, supported by government and aid organizations. Coaches and players are encouraged to learn about each other's cultural perspectives, enhancing understanding through interactive activities. This approach aims to assist new migrants in integrating into their new environments while maintaining connections to their cultural heritage.

Engaging in playful sports activities serves as a powerful platform for cultural transfer, contributing to identity formation and promoting acceptance of cultural diversity. The integration of different cultural memories within handball can help shape a more inclusive environment, emphasizing the importance of intercultural collaboration among sports federations and educational institutions as effective integration platforms.

7. Technology and Innovation in Youth Handball

Video analysis is an essential coaching tool that enhances performance by allowing coaches to review footage instead of relying solely on notes or memory, which can lead to oversights. In professional football, players utilize video analysis collaboratively to evaluate both their own and their teammates' performances. Coaches benefit from selecting instructive video content, supported by video analysts, to effectively manage team meetings and training sessions. This technology is used to identify and correct technical and tactical errors, optimize conditioning, and enhance skills.

In contrast to team sports, individual sports like chess often rely on memory for match analysis. Nevertheless, many professional sports teams are increasingly using video and multimedia in their pre-match briefings, with comprehensive analysis of player performances contributing to decision-making processes. The integration of

video data, often stored in online databases, allows for in-depth exploration and assessment, although challenges regarding the reliability of third-party data persist.

Overall, the effective use of technology in performance analysis represents a





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significant advancement in youth handball coaching, providing new insights and operational strategies.

1. Wearable Technology for Performance Monitoring

Wearable technology plays a significant role in sports by monitoring kinematics and kinetics to enhance performance. In handball, characterized by dynamic and explosive movements, this technology informs coaches about athletes' physical capabilities and appropriate training loads. By adopting a data-informed approach, coaches can adapt management practices to better meet the specific demands of handball.

Wearable devices capture crucial data, such as acceleration and posture, which can affect emotional, muscular, and skeletal responses during training and competition. This information is valuable for monitoring young players throughout their development stages. Integrated dashboards from various wearable technologies facilitate comprehensive analysis of individual players, allowing for comparisons with environmental factors. Consequently, coaches can track team progress and refine strategies to achieve shared goals effectively.

2. Virtual Training Platforms and Simulation Tools

Small-sided games (SSG) are an effective training alternative to traditional methods, offering similar physical performance benefits while enhancing player motivation and enjoyment. Research indicates that SSG training positively impacts agility, countermovement jumps (CMJ), and short sprints (5, 10, and 20 meters) in elite young female handball players.

Studies suggest that SSG may lead to greater improvements in explosive abilities compared to high-intensity interval training, despite the latter being a standard in elite athlete training. SSG is seen as more engaging and beneficial for maintaining training intensity through competitive activities.





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There is a gap in research comparing SSG with simulated official matches (SIM), particularly regarding female handball players. Previous studies have been limited in scope, often involving small groups, which hinders precise measurement of strength improvements. Future research should focus on the impact of SSG versus SIM on physical performance using a larger sample size of young female players to provide more robust insights.

8. Collaborative Partnerships for Sustainable Handball Programs

Collaboration among organizations is a key strategy for enhancing social cohesion in sport-for-development and peace initiatives. A study in Lyon, France, identified various partnership types, including evangelical, associational, and sport-for-social-cohesion partnerships, each serving different missions.

Youth handball programs face challenges in development both domestically and internationally, as highlighted by literature reviews. Strategic partnerships are seen as vital for the sustainability of these programs. Research involving collaboration directors from top-ranking girls' handball clubs in Belgium revealed that successful program implementation relies on diverse partnerships. While there are variations in partnership strategies between domestic and international initiatives, 90% of directors are focused on cultivating external collaborations with schools and clubs to foster growth in youth handball.

1. Engaging Schools and Educational Institutions

The development of youth talent in handball relies heavily on effective coaching methodologies, which should be shaped through close collaboration with coaches. An experimental program involving workshops promotes the exchange of ideas among coaches, leading to improved coaching practices. Focus group interviews with coaches emphasize the importance of transparent coaching methodologies and the need to address any biases to foster youth development.

Partnerships with schools and educational institutions are essential for sustainable handball initiatives, as schools often serve as the foundation for successful sports





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programs. They provide children with access to sports and extracurricular activities, significantly impacting academic success and personal development. Research indicates that daily physical activity through sports clubs enhances children's learning and socialization.

Extracurricular sports can also play a critical role in supporting at-risk youth, making schools and local clubs vital for delivering comprehensive developmental experiences beyond just sports.

2. Community Engagement and Grassroots Initiatives

Bühler and colleagues highlight the importance of partnerships and networking in enhancing youth sports programs. They propose a multidisciplinary model aimed at developing a comprehensive sports program that fosters competencies, lifestyles, and career opportunities for young athletes. This initiative, rooted in the Swiss regional youth sports framework, underscores the significance of informal sports settings in promoting lifelong participation and preventing youth from dropping out of sports.

To achieve sustainable results, it is essential to engage both local and international students and to establish partnerships with stakeholders such as sports and medical professionals. Aligning the interests and operations of youth coaches and organization leaders is crucial for building effective community partnerships characterized by trust, loyalty, and commitment, ultimately enhancing resources and collaboration.

3. Sponsorship and Funding Strategies for Youth Handball

Youth handball players often face barriers to participation in private coaching and development programs due to associated costs (Abarghoueinejad et al., 2021). Parental involvement is crucial for sustaining the financial and operational aspects of these programs (Geidne et al., 2013). The viability of youth handball academies is enhanced when national policies support youth sports development (Moustakas, 2022).





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Sponsorship opportunities vary by location and are essential for funding at various organizational levels, including clubs and school teams. Strategic partnerships can help handball teams manage resources effectively. Clubs should engage with their local communities to foster goodwill, and securing sponsorship can further bolster available resources, including facilities and expertise.

Research should guide policy-making for handball academies, emphasizing the importance of nurturing talent and educating the public about the challenges of private sports programs. The European Union is actively promoting collaborative initiatives among member states to establish new handball programs, aiming to train elite players across generations.

4. Case Studies and Best Practices in Youth Handball Development

Over the past two decades, research has examined factors influencing the success of youth handball programs across various countries. This chapter aims to identify best practices and successful models in youth handball development, drawing on the rich European handball tradition. It seeks to highlight prerequisites for effective youth sports programs and how these are implemented in different nations.

The significance of advancing handball extends beyond competitive success, as clubs play a crucial role in personal development and social responsibility. Initiatives like "Winning Matters in Handball" and "Talent Development Programs" are essential, but the impact of sports on individual growth and community engagement is equally vital.

Additionally, young athletes often face challenges in balancing sports careers with personal life, which can lead to burnout. To address this, there is a need for systematic mental skill training programs developed collaboratively, focusing on self-determined motivation and mental skill requirements to support athletes effectively.

5. Successful Youth Handball Programs Around the World





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The International Handball Federation (IHF) aims to build sustainable foundations for member national federations, contributing to the global growth of handball. Currently, 41 European, 30 Asian, 36 African, 5 American, and 6 Oceania countries participate in the sport. This expansion has spurred interest in talent identification and development within handball, which involves a complex system influenced by historical, geographical, economic, sociocultural, and political factors.

A successful youth development program is characterized by long-term commitment, strong grassroots support, significant youth participation, and developmentally appropriate coaching. Research indicates that 80% of effective programs focus on educational outcomes, 88% are linked to organizations that engage a large youth demographic, and 90% are community-operated with ties to high-level competitions.

Norway serves as a prime example, with its Handball Federation promoting youth development through school programs, summer and winter camps, and inclusive club memberships. An athletic year rule in Norway limits competitive events for young athletes to prevent burnout and injuries, highlighting the importance of sustainable engagement in sports. Studies show that athletes who compete less frequently at high levels maintain longer careers than those who compete more often. This approach underscores the need for thoughtful design in youth sports programs to balance competition and long-term athlete well-being.

6. Innovations in Talent Identification and Development

The 6th EHF Scientific Conference emphasizes the need for effective athlete training and talent potential maximization in handball. The study aims to assess current challenges in talent selection, highlight recommended diagnostic tests, and propose a systematic approach for integrating experimental and empirical research into talent identification processes.

Utilizing data analysis offers new avenues for understanding individual and population performance, particularly in team sports like handball, where teamwork is crucial. Future advancements could involve combining data from heart rate monitors, GPS



sensors, and other performance metrics across different player demographics. For instance, soccer research suggests the development of position-specific models based on similar player data. Such comprehensive studies can significantly impact decisions regarding player promotions within clubs, shaping the trajectory of young athletes' careers.

7. Impact of Long-Term Athlete Development Models

Long-Term Athlete Development (LTAD) models aim to enhance athletic performance while considering the natural growth and maturation of young athletes. This chapter reviews research relevant to educating children and adolescents in handball, highlighting the need for sport-specific adaptations to generic LTAD frameworks.

The review serves as a guideline for both future practices in sports science and research, focusing on critical areas such as game-based technical and tactical skills, physical and psychological performance, and strategies for talent development. Key findings emphasize the importance of gameplay activity, broad motor competence, and supportive sociocultural environments.

While youth sports systems should promote overall health and well-being, early talent identification and development are crucial, especially in sports like handball that often rely on tournament assessments for talent recruitment between ages 12 and 14. The chapter advocates for prioritizing technical training and varied practice activities to maintain motivation and participation throughout different developmental stages.

9. Future Directions and Emerging Trends in Youth Handball

The overview identifies key trends influencing long-term player development in youth handball, emphasizing the importance of deliberate practice and competitive play for fostering expert performance. However, challenges such as reduced training durations, increased costs, and geographical barriers are hindering skill acquisition and transferability among young athletes.



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Current practice environments are often constrained by these factors, potentially leading to decreased physical literacy and lower retention rates in the sport. As youth players express a desire for greater diversification in their sporting activities, there's a growing recognition that early specialization may not necessarily enhance future performance or lifelong engagement in sports.

The findings suggest that promoting diverse skill pathways can support long-term athlete development and foster healthier lifelong physical activity habits. Additionally, strong relationships between coaches, parents, and peers are vital in shaping a positive training environment. The chapter advocates for a re-evaluation of early sport commitments, encouraging broader experiences in youth sports to enhance overall well-being and performance trajectories.

1. Globalization of Handball and International Youth Competitions

The globalization of sports, particularly handball, has significant economic and social implications, capturing the attention of policymakers and researchers. This paper explores the impacts of globalization on youth team handball, highlighting both challenges and opportunities in developing and developed countries.

Key issues include player and coach mobility, adaptation to global trends, and the competition among governing bodies, which affect youth sports management. Historically, handball originated in northern Europe as a recreational activity, and its recent globalization has led to increased international youth competitions, allowing young players to represent their nations at higher levels.

As a result, the number of international youth tournaments has surged, facilitating participation even among schoolchildren, a development previously rare. The growing presence of global talents necessitates long-term strategies for their development, while also addressing emerging social concerns like loneliness and asocial behaviors in established societies.





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2. Integration of E-Sports and Virtual Handball Platforms

E-sports has significantly boosted interest among young athletes globally, with around 1.2 billion people playing video games, many of which are sports variants. Sports federations are increasingly promoting e-sports as a result. Handball, known for its speed and coordination demands, can leverage digital platforms to enhance skills through interactive video games, allowing players to practice at home.

The integration of e-sport channels through websites and broadcasts can increase the visibility of handball, attracting a larger audience and fostering mass followership. Additionally, technology has been used to assess training loads and biophysiological profiles in sports sciences, suggesting that similar advancements could soon be applied to virtual handball games, further promoting fitness and organized training workshops.

3. Sustainable Development Goals and Handball for Social Change

Investing in youth is essential for achieving the 17 Sustainable Development Goals (SDGs) outlined in the 2030 Agenda, particularly those related to democracy, equality, and justice. Digital platforms have transformed youth political participation, enabling new forms of advocacy alongside traditional methods, facilitating engagement with international policies like the SDGs through youth-led digital diplomacy.

Handball's global popularity positions it well to align with these goals through the International Handball Federation's (IHF) mission and strategies, while respecting cultural diversity. The UN emphasizes that resilient societies require quality education, decent work, and active participation in decision-making processes. While sports do not contribute equally to all SDGs, major team sports, including handball, can positively influence multiple goals, highlighting their role in fostering societal health and promoting transformative values for a better future.





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