



Developing an Intensive Football Goalkeeper Training Camp Program for Secondary School Students

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Abstract

Background and Aim: Football goalkeepers in China require specific skills and characteristics to excel in their positions. They need to have good aerobic endurance and anaerobic endurance to perform well in the competition. Overall, a combination of physical endurance, technical skills, and mental fitness is essential for football goalkeepers in China to succeed in the position. Therefore, this research objective was to develop and evaluate an intensive football goalkeeper training camp program for secondary school students. The research provides a valuable framework for designing effective training programs to enhance the performance of young goalkeepers.

Materials and Methods: This research was a mixed-methods research that involved a four-phase process: 1) Literature review and research to gather existing knowledge on training adolescent goalkeepers. 2) Deep interviews with 5 experts to identify key factors for program design. 3) Focus group discussions with 9 experts to develop the training camp program, incorporating technical skills, tactical understanding, physical conditioning, mental fortitude, and recovery strategies. 4) Connoisseurship evaluation by 7 experts to assess the program's suitability and feasibility. Data analysis was computed with the mean and standard deviation.

Results: The results found that: 1) The intensive football goalkeeper training camp program, a 14-day duration training, encompassed a holistic approach to goalkeeper development, progressing from foundational techniques to advanced skills, and integrating tactical awareness, physical conditioning, and mental training. 2) Experts rated the program highly, particularly commending its focus on tactical understanding and well-rounded physical conditioning.

Conclusion: The intensive football goalkeeper training camp program represents a well-structured and evidence-based approach to goalkeeper development. By integrating technical, tactical, physical, and mental training components, it addresses the multifaceted demands of the position.

Keywords: Intensive Training Program; Soccer Goalkeeper; Secondary School Students

Introduction

Football goalkeepers in China require specific skills and characteristics to excel. They need to have good aerobic endurance and anaerobic endurance to perform well in the competition. Endurance training is important for goalkeepers, and aerobic endurance training should be the foundation of the training system (Eirale et al., 2020). The training intensity should be properly controlled, with a heart rate of 150 or more beats per minute during aerobic endurance training. In addition to endurance, goalkeepers also need technical skills such as agility. Response and hand-eye coordination (Geng, J., 2019). These skills are essential for quick saves and responses to goal attacks (Zhang, L., 2019). A combination of physical endurance, technical skills, and mental fitness is essential for football goalkeepers in China to succeed in the position.

Targeted training programs have been the focus of several studies. One study developed a training program for football goalkeepers, which had a positive effect on the development of physical abilities (Al-Nedawy et al, 2022). Another study described the development of a FIFA 11+ shoulder training program specifically aimed at preventing shoulder injuries in football goalkeepers (Ejnisman et al, 2016). In addition, a study of neurofeedback training procedures for goalkeepers was conducted, focusing on improving the ability to read the game (Camille et al, 2020). In handball, the importance of goalkeeper-specific training has been emphasized, with the need to consider physical factors. Technical, cognitive, and tactical aspects (Muñoz, A. et al., 2012). In addition, a study on youth football goalkeepers found that a training program



focused on offensive activities had a statistically significant impact on individual game performance (Peráček et al, 2012). These studies highlight the importance of tailored training programs for goalkeepers that address specific needs and goals. In creating a specific football goalkeeper training program, it is important to consider several factors. First, the program should focus on the development of physical abilities. This includes core strength, balance, and stability (Al-Nedawy et al, 2022). Secondly, the program should include technical and tactical training, focusing on offensive and defensive actions (Ejnisman et al, 2016). It is also important to analyze the different methods used to train goalkeepers and prioritize performance factors such as physical-technical, cognitive, and tactical aspects (Lapresa Ajamil et al, 2018). In addition, injury prevention exercises should be included in the program, specifically targeting the shoulder muscles. Finally, observational analysis can be used to identify effective and ineffective technical and tactical actions, which can inform the design of specific training tasks. By considering these approaches, a comprehensive and effective goalkeeper-specific training program can be developed.

The above led the researchers to develop an intensive training program for goalkeepers for a youth sports camp, to systematically develop athletes and help athletes to their highest potential in Zhengzhou City.

Objectives

1. To study the factors of an intensive football goalkeeper training camp program for secondary school students.
2. To develop an intensive football goalkeeper training camp program for secondary school students.
3. To evaluate the intensive football goalkeeper training camp program for secondary school students.

Literature review

1. Goalkeeper performance

The evolving role of the goalkeeper is more than just a defensive player, recognizing them as a "tactical player" who actively contributes to the team's overall strategic approach. Modern goalkeepers are increasingly involved in the initiation of offensive plays, providing tactical advantages through precise ball distribution, positioning, and decision-making. This shift reflects a more integrated role within the team's tactical framework, where the goalkeeper's ability to read the game, communicate with teammates, and participate in transitions from defense to attack is critical. Their involvement in these strategic elements can influence the tempo of the game and provide additional support to both defensive and offensive phases, making them essential to a team's overall performance (Gutiérrez-Díaz et al., 2019). Goalkeepers require a diverse range of physical attributes to perform effectively in their positions. Unlike outfield players, goalkeepers need to possess a unique combination of strength, agility, flexibility, and reflexes. These physical traits are essential for executing critical movements such as diving, jumping, and making quick lateral shifts to save shots. In addition, goalkeepers must demonstrate excellent hand-eye coordination and explosive power to react rapidly to fast-moving balls. The variety of physical demands placed on goalkeepers highlights the importance of tailored fitness and conditioning programs that address these specific needs, ensuring that they can excel under the high-pressure demands of their role (D'Isanto et al., 2019). The importance of regular performance reviews in the development of goalkeepers, particularly through the use of video analysis and feedback. These tools allow athletes to assess their actions during training sessions and matches objectively, identifying specific strengths and areas for improvement. By reviewing footage, goalkeepers can analyze their positioning, reactions, and decision-making in different game situations, offering a clearer understanding of their performance. Feedback from coaches can further refine this process, providing targeted advice on technique adjustments, tactical awareness, and decision-making. This combination of self-assessment and external guidance promotes continuous improvement and enhances overall goalkeeping performance (Capalbo et al, 2022).

Mental toughness is described as an athlete's ability to consistently perform at high levels despite challenges, pressure, or adversity. It encompasses attributes such as resilience, confidence, focus, and the ability to remain composed under stress. Studies show that mentally tough athletes are better equipped to handle setbacks, maintain concentration, and regulate emotions during competitions, which can give them a competitive edge. This psychological trait allows athletes to push through fatigue, recover from errors, and stay committed to their goals, even in the face of difficulties, making it a key determinant of success in sports (Gucciardi et al., 2015). Visualization and mental rehearsal techniques are effective in enhancing athletic performance, particularly under pressure. These techniques involve athletes mentally simulating the execution of tasks, such as specific movements or game scenarios, without physical engagement. For goalkeepers or athletes in high-pressure positions, visualization can reduce anxiety, build confidence, and improve focus by mentally preparing them for critical moments. By repeatedly imagining success in various situations, athletes become more familiar with the actions and responses needed in real-time competitions. This mental preparation enables them to cope better with the unique challenges of their positions, such as high-stakes decision-making, thus enhancing their performance during actual events (Liew et al, 2019).

2. Intensive training program

Training programs for soccer goalkeepers are crucial for enhancing their performance and reducing injury risks. The unique demands of the goalkeeper position require specialized training approaches that focus on technical skills, physical abilities, and mental preparedness. Goalkeeper training should focus on developing decision-making skills, athleticism, mentality, and technical skills (Otte et al, 2020; Struzik, A., 2020).

The importance of training scenarios that closely simulate real game situations, such as 1v1 challenges and set pieces, in developing tactical expertise. These scenarios expose athletes to diverse game contexts, allowing them to experience and adapt to varying tactical demands. By replicating the pressure and decision-making environments encountered in actual matches, players can improve their situational awareness, decision-making skills, and ability to execute strategies under stress. Repeated exposure to these scenarios enhances players' ability to anticipate opponents' movements, make quick tactical decisions, and refine their overall game intelligence, ultimately contributing to a higher level of performance (Williams & Hodges, 2005).

Integrating various training modalities, such as plyometrics, strength training, and interval training, is crucial for developing the physiological adaptations required for optimal athletic performance. Plyometric exercises improve explosive power and reaction time, which are essential for quick, dynamic movements like jumping and sprinting. Strength training enhances muscle endurance, force production, and overall stability, supporting athletes in maintaining high performance over extended periods. Interval training, which alternates between high-intensity and low-intensity efforts, improves cardiovascular endurance and recovery ability, allowing athletes to sustain their energy and responsiveness throughout the competition. By combining these modalities, athletes can target specific performance needs, ensuring a more comprehensive approach to physical conditioning (Reilly et al., 2000).

Motor learning involves the gradual acquisition and refinement of motor skills, which is essential for achieving optimal performance. Motor learning is not an immediate process; rather, it unfolds over time as individuals practice and adjust their movements based on feedback. The learning process consists of several stages, starting with cognitive understanding, progressing to associative practice, and culminating in the autonomous execution of skills. Consistent practice, combined with feedback from both internal and external sources, helps learners fine-tune their motor abilities, ultimately leading to better coordination, efficiency, and precision in movement. The concept highlights the importance of continuous practice and adaptation in mastering physical skills (Schmidt and Lee, 2019). The importance of skill specificity in motor learning highlights how incorporating diverse drills and exercises that target specific techniques, such as catching, diving, and dribbling, can enhance the development of particular motor skills. According to the principle of skill specificity, the best way to improve a specific skill is to practice that skill in conditions that closely resemble those in which it will be used. Learners can achieve more effective and efficient

performance by focusing on drills that isolate and refine each technique. This approach ensures that motor patterns are precisely aligned with the demands of the sport or activity, facilitating better skill retention and transfer to real-world scenarios. Skill specificity is crucial for developing expertise, as it encourages learners to adapt their motor responses to the unique requirements of each task (Magill, 2017).

The critical role of rest and recovery in athletic performance and adaptation. Recovery allows the body to repair and strengthen itself between training sessions, facilitating the physiological and psychological adaptations necessary for improved performance. Without adequate rest, athletes may experience fatigue, decreased performance, and a higher risk of injury. Kellmann highlighted that recovery is not just about physical rest but also involves mental recuperation, as excessive physical and cognitive demands can lead to overtraining syndrome or burnout. Proper recovery strategies, including sleep, hydration, nutrition, and relaxation techniques, are essential to optimize training outcomes and ensure long-term athletic success (Kellmann, 2010).

Conceptual Framework

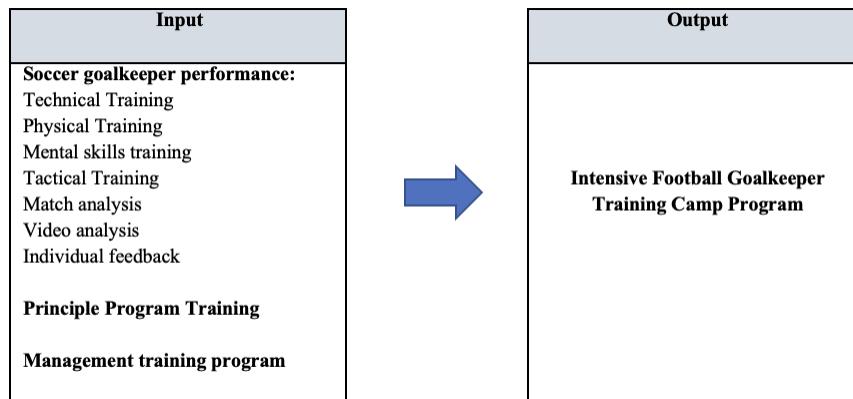


Figure 1 Conceptual Framework

Methodology

Research Tools

In this research, the following tools were used to conduct the research: (1) Semi semi-structured Questionnaire for experts' deep interviews; (2) a Questionnaire for a focus group; (3) a Questionnaire for connoisseurship.

Population and Sample

Participants: Contributors to the creation of the Intensive Football Goalkeeper Training Camp Program for Secondary School Students. Specialists who are 21 football coaches and sports scientists were randomly obtained Snowball method, which is divided into three groups:

1. Five experts were interviewed to determine the composition of the exercise. Intensive football goalkeeper training camp course for secondary school students
2. Nine experts in a focus group to provide information on the creation of the intensive football goalkeeper training camp program for secondary school students.
3. Seven experts to assess suitability and practicality. Intensive Standard Football Goalkeeper Training Camp Program for Secondary School Students.

Data Collection

1. To explore the data factors of training, which include document analysis and interviews with 5 experts.
2. To draft an Intensive Football Goalkeeper Training Camp Program for secondary school students, by conducting a focus group with 9 experts that consisted of a goalkeeper coach and sports screencasts.

3. To evaluate the Intensive Football Goalkeeper Training Camp Program for Secondary School Students by Connoisseurship, with 7 experts conducting to examination of the efficiency and appropriateness of the training program. (Such as the table below)

Step	Method	tools	Result
To study about a factors of Intensive Football goalkeeper Training Camp Program for Secondary School Students	1.Document analysis 2.Interview 5 experts	Semi construct questionnaire	Data factor of training
To draft a Intensive Football goalkeeper Training Camp Program for Secondary School Students	Focus group, 9 experts Goalkeepers Coach and sport sciences	Questionnaire	a Intensive Football goalkeeper Training Camp Program for Secondary School Students
To evaluate Intensive Football goalkeeper Training Camp Program for Secondary School Students	Connoisseurship By 7 experts	Questionnaire	Intensive Football goalkeeper Training Camp Program That a good quality

Data Analysis

The data was prepared and analyzed with statistical package computer programs to compute the mean and standard deviation.

Research Process

Step 1: To study factors of the Intensive Football Goalkeeper Training Camp Program for Secondary School Students.

Method: Document analysis of 5 experts' deep interviews for factors of training for the football Goalkeeper Training Camp.

Step 2: Draft an Intensive Football Goalkeeper Training Camp Program for Secondary School Students.

Method: Focus group, 9 expert goalkeeper coaches and sports scientists to conduct an Intensive Football goalkeeper Training Camp Program for Secondary School Students.

Step 3: To evaluate suitable and appropriate.

Method: Connoisseurship, 7 experts to evaluate a suitable and appropriate intensive football goalkeeper training camp program for secondary school students.

Results

Part 1: Factors used in the standard football goalkeeper training Program for secondary school students.

The results of in-depth interviews with 5 experts expressing their opinions on the factors and components used in standard football goalkeeper training that were used for developing student groups at the secondary level showed that all 5 experts had the same opinion on important factors and elements. These elements should be used in developing a standard training program for football goalkeepers in secondary school students, as shown in the following study results.

Table 1 The results of in-depth interviews factor training for goalkeeper training summary

Factors of training	Elements	Expert opinions				
		Exp 1	Exp 2	Exp 3	Exp 4	Exp 5
Cognitive skill	1. Attention (Observation surrounding area)	✓	✓	✓	✓	✓
	2. Focus/Awareness	✓	✓	✓	✓	✓
	3. Distractibility	✓	✓	✓	✓	✓
	4. Decision making	✓	✓	✓	✓	✓
Mentality skills	1. Concentration, discipline	✓	✓	✓	✓	✓
	2. Self-control	✓	✓	✓	✓	✓
	3. Self-confident	✓	✓	✓	✓	✓
	4. Resistance to stress	✓	✓	✓	✓	✓
	5. Aggressiveness	✓	✓	✓	✓	✓
	6. Risk taking	✓	✓	✓	✓	✓
	7. Psychological stamina achievement	✓	✓	✓	✓	✓
	8. Competitiveness	✓	✓	✓	✓	✓
	9. Playing for team	✓	✓	✓	✓	✓
	10. High motivation	✓	✓	✓	✓	✓
	11. Drive for improvement	✓	✓	✓	✓	✓
Goalkeeper technique or goalkeeper Tactics	Goal defending: Ball into GK body					
	1. Infront catching (w technique)	✓	✓	✓	✓	✓
	2. Cup technique	✓	✓	✓	✓	✓
	3. Scoop technique	✓	✓	✓	✓	✓
	4. High ball catching	✓	✓	✓	✓	✓
	Ball next to body					
	1. Low ball push off	✓	✓	✓	✓	✓
	2. Collapsing save	✓	✓	✓	✓	✓
	3. High ball push off					

Physical fitness	Space defending: 1. Dealing with crossing situation: catching, punching Cutback situation: push off high/low	✓	✓	✓	✓	✓
	1 v 1 situation: 1. Hand foot/reaction	✓	✓	✓	✓	✓
	2. Attack the ball	✓	✓	✓	✓	✓
	3. Long leg blocking	✓	✓	✓	✓	✓
	4. Short leg blocking	✓	✓	✓	✓	✓
	Offensive situation: 1. Rolling technique	✓	✓	✓	✓	✓
	2. Throwing technique	✓	✓	✓	✓	✓
	3. Goal kick/ long ball technique	✓	✓	✓	✓	✓
	4. Side volley technique	✓	✓	✓	✓	✓
	5. Build up or back pass	✓	✓	✓	✓	✓
Physical fitness	Endurance 1. Long duration endurance, Speed endurance, strength endurance and strength/speed endurance	✓	✓	✓	✓	✓
	Strength					
	1. Strengthening the abdominal muscles	✓	✓	✓	✓	✓
	2. Strengthening the back muscles	✓	✓	✓	✓	✓
	3. Strengthening the upper body	✓	✓	✓	✓	✓
	4. Strengthening the lower body	✓	✓	✓	✓	✓
Physical fitness	5. Core stability (Stabilization)	✓	✓	✓	✓	✓

	Speed 1. Speed of perception, anticipation and decision, 2. Reaction speed. 3. Speed of maneuvers (speed of action) 4. Speed strength 5. Speed endurance	√	√	√	√	√
	Coordination 1. With or without a ball, 2. With or without equipment.	√	√	√	√	√
	<i>Coordination factors:</i> 1. Differentiation 2. Balance 3. Orientation 4. Rhythm 5. Reaction	√	√	√	√	√
	Suppleness 1. articular mobility: this concerns the joints and the intervertebral discs,	√	√	√	√	√
	2. stretching capacity: concerns the muscles, tendons, ligaments and articular capsules.	√	√	√	√	√
	Movement pattern or basic movement					
	1. Walking 2. Running 3. Sprinting 4. Jumping 5. Side step 6. Crossover step 7. Diagonal move 8. Change direction	√	√	√	√	√

Table 1 shows the study of important factors and elements used in developing a football goalkeeper standard training program. Program for secondary school students. From 5 experts, the results of the study found that important factors in training consist of 4 main factors: Cognitive skills, Mentality skills, Goalkeeper technique or goalkeeper Tactics, and Physical fitness. For each factor, experts have determined the sub-components of each factor.

Table 2 A 14-day goalkeeper training draft, incorporating the training factors from various levels of expertise.

Factor Training	Expert comments (Exp 1/2/3/4/5)
Day 1-2: Foundation & Assessment	
Goal defending: Ball into GK body (Catching techniques, Collapsing save)	Exp 1: Start with basic techniques, emphasizing proper footwork and hand positioning. Assess current skill level.
Space defending: Dealing with crossing situations	Exp 2: Introduce different crossing scenarios, focusing on decision-making (catch vs. punch).
Physical fitness: Endurance, Strength, Speed, Coordination	Exp 3: Conduct baseline fitness tests to tailor subsequent training. Prioritize dynamic warm-ups and injury prevention.
Day 3-4: Technical Refinement	
Goal defending: Ball next to body (Low/High ball push-offs)	Exp 4: Progress to more challenging saves, incorporating dives and reactions.
1 v 1 situations: Hand-foot coordination, Attacking the ball	Exp 5: Simulate realistic 1 v 1 scenarios, emphasizing quick decision-making and bravery.
Physical fitness: Core stability, Suppleness	Exp 1: Introduce core exercises and dynamic stretching routines to enhance stability and flexibility.
Day 5-6: Tactical Awareness & Distribution	
Space defending: Cutback situations	Exp 2: Train reactions to cutbacks, focusing on positioning and angles.
Offensive situations: Rolling/Throwing techniques, Goal kicks	Exp 3: Develop accurate distribution skills, both short and long-range.
Movement patterns: Footwork drills, Change of direction	Exp 4: Enhance agility and footwork specific to goalkeeping movements.
Day 7: Active Recovery & Mental Skills	
Low-intensity activities: Yoga, Swimming, Video analysis	Exp 5: Focus on recovery and mental preparation. Analyze previous training sessions.
Day 8-9: Advanced Techniques & Game Scenarios	
1 v 1 situations: Long/Short leg blocking	Exp 1: Refine advanced shot-stopping techniques, including leg saves.
Offensive situations: Side volley, Build-up play	Exp 2: Integrate goalkeepers into team build-up play and counter-attacks.
Physical fitness: Speed endurance, Strength/Speed endurance	Exp 3: Implement high-intensity drills to improve speed and power.

Factor Training	Expert comments (Exp 1/2/3/4/5)
Day 10-11: Pressure Training & Decision Making	
Small-sided games, High-pressure drills	Exp 4: Simulate match situations with increased pressure and decision-making demands.
Mental skills: Concentration, Self-confidence, Stress resistance	Exp 5: Incorporate visualization techniques and mental exercises to enhance focus and composure.
Day 12-13: Tactical Integration & Set Pieces	
Full team training, Defending set pieces	Exp 1: Integrate goalkeepers into full team training, focusing on communication and organization.
Offensive situations: Goal kicks under pressure	Exp 2: Train goal kicks under pressure, emphasizing accuracy and decision-making.
Day 14: Match Simulation & Evaluation	
Friendly match or Scrimmage, Performance review	Exp 3: Assess performance in a match-like environment. Provide feedback and set goals for future development.

Part 2: Draft of football goalkeeper standard training program for secondary school students with 9 expert focus groups.

The focus group discussion was held with 9 experts to participate in the analysis. Criticize and express opinions together in developing a football goalkeeper standard training program. Program for secondary school students. What factors should be used to develop the skills of students who play football in the position of goalkeeper? This is the result of a small group discussion. Experts have agreed in the same direction and have determined the factors and elements of training for students, as the following details.

The training program plan for days 1-4

Goalkeeper training session plan								
Training information		Duration:		Pitch:				
Date:	Time:	Duration:		Pitch:				
Head Coach:		Assist coach:						
Main topic:	GD : Basic technique	Minor topic:		Push off low/high				
GK name:		Injuries GK:		Age:				
Session organization								
Equipment:	Cone 1 set	Marker	Pole 20	Balls 2	Goals	Air body/Dummy		
Special equipment:								
Exercise plan								
1. Warm up		Time total:						
1.1 Brain-activation	Duration: 6 min	1.2 Pre-activation		Duration: 15 min				
Neuro tracker training	6 min	Injuries prevention training		5 min				
		Mobility/activation training		5 min				
		Coordination&basic movement training		5 min				
1.3 Technical	Duration: 15 min							
Methodology:	Isolation	Cognitive /		Combination	Situative			
Focal point:		Passing & first touch combination with long ball						
Exercise		Process		Coaching point				
		1. Passer pass ball to GK in goal and GK make a first touch with 2 touch. 2. GK pass ball th another position and move to another position for receiving the ball. 3. After GK receiving the ball form player in position 3. GK have to make a chip ball to player in far a way position.		1. Passing technique. 2. First touch and receiving technique. 3. Open body&scanning 4. Chip and long ball technique				
2. Introduction		Time total:		20 min				
Methodology:	Isolation	Cognitive /		Combination	Situative			
Focal point:		Passing & first touch combination with pressure and basic technique.						
2.1 Exercise 1	Duration: 10	Process		Coaching point				
		1. GK in each position try to pass ball to another GK. 2. GK tries to pass the ball without being intercept by the opponent.		1. Passing technique. 2. First touch and receiving technique. 3. Open body&scanning				
2.2 Exercise 2	Duration: 20	Process		Coaching point				
		1. GK make a save from player form player position 1. 2. After catch the ball from player in position 1, GK try to pass ball with rolling technique to player in position 2. 3. GK make save shooting for player in position 2. 4. After GK make a save from position to GK need to move to position 3 and make a save with push off low.		1. Situation awareness. 2. Start position. 3. Set position. 4. Goal defending technique: 4.1 Basic technique - Ball Infront catching - Cup technique - Scoop technique - Push off low/high				
3. Main part		Time total:		40 min				
Methodology:	Isolation	Cognitive /		Combination	Situative			
Focal point:								
3.1 Complex part 1 (exercise 1)	Duration:	Process		Coaching point				
		1. GK make a save with push off low from position 1. 2. After GK make a save and stand up player position 1 will pass the ball to another player in each positon (Position: 2, 3, 4) 3. GK try to move to another position to make a save		1. Situation awareness. 2. Start position. 3. Set position. 4. Goal defending technique: 4.1 Basic technique - Ball Infront catching - Cup technique - Scoop technique - Push off low/high				
3.2 Complex part 2 (exercise 2)	Duration:	Process		Coaching point				
4. Team (or special part)		Time total:		20 min				
Methodology:	Situative	Complex		Real game				
Focal point:		Goal defending in 2 v 2 situation						
4.1 Exercise		Process		Coaching point				
		1. Team competition 2 v 2 + 2 GK 2. Team A and B try to play and make a score 3. change GK every 3 minutes.		1. Communication with teammate. 2. Situation awareness. 3. Start position. 4. Set position. 5. Get involved with the game				
5. Cool down		Time total:		30 min				

The training program plan for days 5-7

Goalkeeper training session plan					
Training information					
Date :	Time :	Duration :	Pitch :		
Head Coach:		Assistant coach:			
Main topic:	GD : Basic technique	Minor topic:	Push off low&high		
GK name:		Injuries GK:			
Age:					
Session organization					
Equipment:	Cone	1 set	Marker	Pole	20 Balls
Special equipment:					
Exercise plan					
1. Warm up			Time total		
1.1 Brain-activation	Duration:	6 min	1.2 Pre-activation	Duration:	15 min
Neuro-tracker training		6 min	Injuries prevention training		5 min
			Mobility/activation training		5 min
			Coordination&basic movement training		5 min
1.3 Technical	Duration:	15 min			
Methodology:	Isolation		Cognitive	/	Combination
Focal point:	Passing & first touch with pressure (1 or 2 opponent)				
Exercise			Process	Coaching point	
			1. GK play with 2 touches and pass the ball with teammate(s) position 2. GK try to pass the ball avoid the opponent. Duration: 3 rounds per each GK and change. Variation: 1. GK try to play with 1 touch and pass the ball with teammate(s) position 2. GK distribution with hand after catch the ball	1. Passing technique. 2. First touch and receiving technique. 3. Open body & Scoring 4. Chip and long ball technique	
2. Introduction				Time total	
Methodology:	Isolation		Cognitive	/	Combination
Focal point:	Situative				
2.1 Exercise 1	Duration:	10	Process	Coaching point	
			1. GK train push off technique series: - start from sitting, kneeling, one leg and stand up position	1. Push off low or high technique. 2. Quality of push off technique.	
2.2 Exercise 2	Duration:	20	Process	Coaching point	
			1. GK start to use foot technique to pass the ball to the coach 2. After that GK move to back side and catch 3 balls from coach. 3. and GK go to cut back position and make save with push off low technique.	1. GK movement pattern/ footwork. 2. Basic technique. 3. 1. Push off low or high technique.	
3. Main part				Time total	
Methodology:	Isolation		Cognitive	/	Combination
Focal point:	Situative				
3.1 Complex part 1 (exercise 1)	Duration:		Push off in 3 position	Coaching point	
			1. GK catch the ball with basic push off 3 balls (Kneel position) in position 1 2. and GK catch the ball with basic push off 3 balls (Standing position) in position2 3. and GK catch free ball in position 3 Duration: 7 ball per each GK and change.	1. Basic positioning 2. Push off technique 3. Goal defending positioning 4. Positioning timing.	
3.2 Complex part 2 (exercise 2)	Duration:		Process	Coaching point	
4. Team (or special part)				Time total	
Methodology:	Situative		Complex	/	Real game
Focal point:	Goal defending in 2 v 2 situation				
4.1 Exercise			Process	Coaching point	
			1. Team competition 2 v 2 + 2 GK 2. Team A and B: try to play and make a score 3. change GK every 5 minutes.	1. Communication with teammate. 2. Situation awareness. 3. Start position. 4. Set position. 5. Get involved with the game	
5. Cool down				Time total	
				30	

The training program plan for days 8-11

Goalkeeper training session plan					
Training information					
Date :	Time :	Duration :	Pitch :		
Head Coach :		Assist coach :			
Main topic :	GD : Basic technique	Minor topic :	Push off low/high		
GK name :		Injuries GK:		Age :	
Session organization					
Equipment :	Cone	1 set	Marker	Pole	20 Balls
Special equipment :				2 Goals	Air body/Dummy
Exercise plan					
1. Warm up				Time total	
1.1 Brain-activation	Duration: 6 min	1.2 Pre-activation	Duration: 15 min		
Neuro tracker training	6 min	Injuries prevention training	5 min		
		Mobility/activation training	5 min		
		Coordination&basic movement training	5 min		
1.3 Technical	Duration: 15 min				
Methodology :	Isolation	Cognitive	/	Combination	Situative
Focal point :	Passing & first touch with pressure (1 or 2 opponent)				
Exercise	Process	Coaching point			
	1. GK play with 2 touches and pass the ball with teammate(3 position) 2. GK try to pass the ball avoid the opponent. Duration : 3 rounds per each GK and change. Variation: 1. GK try to play with 1 touch and pass the ball with teammate(3 positions) 2. GK distribution with hand after catch the ball	1. Passing technique. 2. First touch and receiving technique. 3. Open body&carrying 4. Chip and long ball technique			
2. Introduction		Time total	20 min		
Methodology :	Isolation	Cognitive	/	Combination	Situative
Focal point :	basic technique and push off. Combination with basic 1 v 1				
2.1 Exercise 1	Duration: 15	Process	Coaching point		
	1. GK catch the ball with basic push off 3 balls (Knee position) in position 1, 2, and 3. and GK catch the ball with basic push off 3 balls (Standing position) in position 3. Duration : 7 ball per each GK and change. Variation: 1. GK try to catch ball with basic positioning	1. Basic positioning 2. Push off technique 3. Goal defending positioning 4. Positioning timing			
2.2 Exercise 2	Duration: 20	Process	Coaching point		
	1. GK catch the ball in front with basic technique. 2. after that return the ball to teammate and catch the ball from coach with push off low 3. and last thing recovery line and make 1v1 with Blocking or attacking ball technique. Duration : 2 sides per each GK and change. Variation: 1. GK try to catch ball with basic positioning	1. Basic positioning 2. Push off technique 3. Goal defending positioning 4. Positioning timing 5. 1v1 technique			
3. Main part		Time total	40 min		
Methodology :	Isolation	Cognitive	/	Combination	Situative
Focal point :	Push off H/L Combination with 1 v 1: attack the ball				
3.1 Complex part 1 (exercise 1)	Duration:	Process	Coaching point		
	1. GK catch the ball from the side (opponent dribbling fake move and shoot). 2. after that return to basic position, and catch the ball with combination play in center area from coach 3. and last thing recovery line and make 1v1 with Blocking or attacking ball technique. Duration : 2 sides per each GK and change.	1. Basic positioning 2. Push off technique 3. Goal defending positioning 4. Positioning timing 5. 1v1 technique			
3.2 Complex part 2 (exercise 2)	Duration:	Process	Coaching point		
4. Team (or special part)		Time total	20 min		
Methodology :	/	Situative	Complex	Real game	
Focal point :	Goal defending in 2 v 2 situation				
4.1 Exercise		Process	Coaching point		
	1. Team competition 2 v 2 + 2 GK. 2. Team A and B try to play and make a score. 3. change GK every 3 minutes.	1. Communication with teammate. 2. Situation awareness. 3. Start position. 4. Set position. 5. Get involved with the game.			
5. Cool down		Time total	30 min		

The training program plan for days 11-14

Goalkeeper training session plan				
Training information				
Date :	Time :	Duration :	Pitch :	
Head Coach:	Assist coach :			
Main topic :	GD : Basic technique	Minor topic	Push off low&high	
GK name :		Injuries GK:		Age :
Session organization				
Equipment :	Cone 1 set	Marker	Pole 20	Balls 2 Goals 1 body/Dummy
Special equipment :				
Exercise plan				
1. Warm up			Time total	
1.1 Brain-activation	Duration: 6 min	1.2 Pre-activation	Duration: 15 min	
Neuro tracker training	6 min	Injuries prevention training	5 min	
		Mobility/activation training	5 min	
		Coordination&basic movement training	5 min	
1.3 Technical	Duration: 15 min			
Methodology :	Isolation	Cognitive / Combination		Situative
Focal point :	Passing & first touch with pressure (1 or 2 opponent)			
Exercise	Process	Coaching point		
	1. GK play with 2 touches and pass the ball with teammate(3 position) 2. GK try to pass the ball avoid the opponent. Duration : 3 rounds per each GK and change. Variation: 1. GK try to	1. Passing technique. 2. First touch and receiving technique. 3. Open body&Scanning 4. Chip and long ball technique		
2. Introduction		Time total	20 min	
Methodology :	Isolation	Cognitive / Combination		Situative
Focal point :	basic technique and push off. Combination with basic 1 v 1			
2.1 Exercise 1	Duration 15	Process	Coaching point	
	1. GK catch three balls from coach and teammate including 1.1 Infront ball: - W technique - Cup technique - Scoop technique 1.2 Next to the body: - Low ball push off	1. Basic positioning 2. Push off technique 3. High ball catching technique		
2.2 Exercise 2	Duration 20	Process	Coaching point	
3. Main part		Time total	40 min	
Methodology :	Isolation	Cognitive	Combination /	Situative
Focal point :	Push off H/L Combination with 1 v 1: attack the ball			
3.1 Complex part 1 (exercise 1)	Duration:	Process	Coaching point	
	1. GK catch crossing balls from coach and teammate. 2. After catching ball and make a distribution.	1. Basic positioning for dealing with crossing. 2. Space defending position.		
3.2 Complex part 2 (exercise 2)	Duration:	Process	Coaching point	
	1. GK will receiving the passing ball from coach and make a first touch. 2. GK try to make a long ball kicking to another teammate.	1. Scanning the free space 2. Body open 3. Long ball kicking technique 4. Chip ball technique		
4. Team (or special part)		Time total	20 min	
Methodology :	Situative	Complex	Real game	
Focal point :	Goal defending in 2 v 2 situation			
4.1 Exercise	Process	Coaching point		
5. Cool down		Time total	30 min	

Part 3: To evaluate the appropriateness of the football goalkeeper standard training program. Program for secondary school students with 7 experts in connoisseurship.

Evaluate the feasibility and suitability of a standard football goalkeeping training plan. Program for secondary school students. From drafting an intensive goalkeeper training program for secondary school students based on expert opinions, jointly evaluate the appropriateness and feasibility of the training program. By judging the average score of 3.51 - 5.00, the average score is calculated to compare with the set criteria (Boonchom Srisa-ard, 2011: 121) as follows: Average score 4.51 - 5.00, 3.51 - 4.50, 2.51 - 3.50, 1.51 - 2.50, and 1.00 - 1.50 Interpretation, most appropriate, very appropriate, moderately appropriate, slightly appropriate, c- and least appropriate by considering the training plan. The details are as follows.

Table 3 Mean of expert opinions, jointly evaluate the appropriateness and feasibility of the training program.

List items evaluated	Opinions	
	M+SD	Criteria
Part 1 General Principles		
1. Specificity: To what extent does the training program address the specific demands of the goalkeeper position (e.g., agility, reflexes, diving)?	4.14±0.38	very appropriate
2. Progression: The program demonstrate a gradual increase in training intensity or complexity over time?	3.86±1.07	very appropriate
3. Are there clear progressions in skill development or physical conditioning?	3.43±0.78	moderately appropriate
4. Overload: Does the program incorporate sufficient challenges to stimulate adaptation and improvement?	3.71±0.76	very appropriate
5. Are there opportunities for goalkeepers to push their limits safely?	4.29±0.76	very appropriate
6. Individualization: Does the program to the individual needs and skill levels of different goalkeepers?	3.86±0.90	very appropriate
7. Are there provisions for modifying exercises or drills based on individual abilities?	4.00±0.58	very appropriate
8. Variation: Does the program offer enough variety to maintain engagement and prevent plateaus?	3.71±0.76	very appropriate
9. Are different training methods and drills utilized to target various aspects of goalkeeping?	3.86±0.69	very appropriate
10. Recovery: Does the program adequately emphasize rest and recovery to optimize performance and prevent overtraining?	3.86±0.38	very appropriate
11. Are there scheduled rest days or active recovery sessions incorporated?	3.71±0.76	very appropriate
Part 2 Program-Specific		
1. Warm-up and Cool-down: How appropriate are the warm-up and cool-down routines for goalkeepers?	4.14±0.69	very appropriate
2. Do they adequately prepare the body for training and facilitate recovery?	4.14±0.69	very appropriate
3. Technical Skill Development: How effectively does the program address the development of essential goalkeeping techniques (e.g., catching, diving, footwork, distribution)?	3.86±0.69	very appropriate
4. Are the drills and exercises challenging and relevant?	3.57±0.53	very appropriate
5. Tactical Awareness: Does the program incorporate training elements to enhance goalkeepers' tactical understanding of the game (e.g., positioning, decision-making, communication)?	4.29±0.48	very appropriate
6. Physical Conditioning: How well-rounded is the physical conditioning component of the program?	3.71±0.49	very appropriate
7. Does it address strength, power, agility, flexibility, and endurance in a balanced manner?	4.43±0.53	very appropriate
8. Mental Preparation: Does the program include any strategies or exercises to develop the mental aspects of goalkeeping (e.g., focus, confidence, resilience)?	3.86±0.69	very appropriate
9. Goalkeeper-Specific Considerations: Are there any unique considerations for training secondary school goalkeepers that the program addresses or could further incorporate?	4.00±0.58	very appropriate
10. Overall Program Effectiveness: Based on your expertise, how effective do you believe this training program would be in developing the skills and abilities of secondary school goalkeepers?	4.00±0.82	very appropriate

Table 3 showed that:

1. General Principles

1. The training program is seen as effectively addressing the specific needs of goalkeepers (Specificity, $M = 4.14\pm0.38$).

2. While there's agreement on the importance of progression, there's less certainty about the clarity of skill development and conditioning progressions (Progression, $M = 3.86\pm1.07$; Clear progressions, $M = 3.43\pm0.78$).

3. The program is perceived to offer sufficient challenges for improvement, with opportunities for goalkeepers to push their limits (Overload, $M = 3.71\pm0.76$; Opportunities to push limits, $M = 4.29\pm0.76$).

4. The program is viewed favorably in terms of individualization, with provisions for adapting exercises to different abilities (Individualization, $M = 3.86\pm0.90$; Provisions for modifications, $M = 4.00\pm0.58$).

5. There's some uncertainty about the variety in the program, although different training methods are utilized (Variation, $M = 3.71 \pm 0.76$; Different training methods, $M = 3.86 \pm 0.69$).

6. The program's emphasis on rest and recovery is generally well-received, but there are questions about the inclusion of scheduled rest days or active recovery (Recovery, $M = 3.86 \pm 0.38$; Scheduled rest/recovery, $M = 3.71 \pm 0.76$).

2. Program-Specific

1. The warm-up and cool-down routines are considered appropriate and effective (Warm-up/Cool-down appropriateness, $M = 4.14 \pm 0.69$; Preparation and recovery effectiveness, $M = 4.14 \pm 0.69$).

2. While the program addresses essential goalkeeping techniques, there's room for improvement in the challenge and relevance of drills (Technical Skill Development, $M = 3.86 \pm 0.69$; Drill challenge and relevance, $M = 3.57 \pm 0.53$).

3. The program's focus on tactical awareness is highly regarded (Tactical Awareness, $M = 4.29 \pm 0.48$).

4. The physical conditioning component is seen as well-rounded and balanced (Physical Conditioning, $M = 3.71 \pm 0.49$; Strength, power, agility, etc., $M = 4.43 \pm 0.53$).

5. The program's attention to mental preparation is acknowledged, but there might be opportunities for further development in this area (Mental Preparation, $M = 3.86 \pm 0.69$).

6. The program is perceived to address the unique considerations of training secondary school goalkeepers (Goalkeeper-Specific Considerations, $M = 4.00 \pm 0.58$).

7. Overall, the program is expected to be effective in developing the skills and abilities of secondary school goalkeepers (Overall Program Effectiveness, $M = 4.00 \pm 0.82$).

Conclusion

The intensive 14-day training program encompasses a holistic approach to goalkeeper development, incorporating: 1) Technical Skills: Progression from foundational techniques (catching, diving) to advanced skills (leg saves, side volleys). 2) Tactical Understanding: Decision-making in crossing situations, 1v1 scenarios, and set pieces, plus integration into team play. 3) Physical Conditioning: Balanced focus on endurance, strength, speed, agility, flexibility, and core stability. 4) Mental Fortitude: Stress resistance, concentration, and self-confidence enhancement through visualization and mental exercises. 5) Recovery and Evaluation: Scheduled active recovery and performance analysis for continuous improvement. Experts rated the program highly, deeming it "very appropriate" for developing secondary school goalkeepers. They particularly commended the focus on tactical awareness and well-rounded physical conditioning.

Discussion

This study found that the intensive football goalkeeper training program exemplifies a multifaceted approach to goalkeeper development, aligning with contemporary sports science principles that strategically integrate various training factors to optimize performance outcomes, catering to the unique demands of the goalkeeper position. The principle of training theory and the many reports that support each factor are as follows:

The technical skill development factor in the program's emphasis on technical skill progression, starting from foundational techniques and culminating in advanced skills, reflects a deliberate and systematic approach to learning. This aligns with the concept of motor learning, where gradual skill acquisition and refinement are crucial for optimal performance (Schmidt & Lee, 2019). The incorporation of diverse drills and exercises targeting specific techniques, such as catching, diving, and distribution, promotes skill specificity, a key principle in motor learning (Magill, 2017).

Tactical awareness in the program's focus on tactical awareness, encompassing decision-making, positioning, and communication, underscores the cognitive demands of goalkeeping. This aligns with the recognition of the goalkeeper as a "tactical player" who actively contributes to the team's strategic approach (Gutiérrez-Díaz et al., 2019). Training scenarios that simulate game situations, such as 1v1s and set pieces,



foster the development of tactical expertise through experience and exposure to diverse game contexts (Williams & Hedges, 2005).

Physical conditioning in this program, the well-rounded physical conditioning component addressing strength, power, agility, flexibility, and endurance, reflects a comprehensive approach to athletic development. This aligns with the understanding that goalkeepers require a diverse range of physical attributes to excel in their positions (D'Isanto et al., 2019). The integration of various training modalities, such as plyometrics, strength training, and interval training, targets specific physiological adaptations necessary for optimal performance (Reilly et al., 2000).

Mental Fortitude: This approach addresses the psychological demands of goalkeeping by including tactics to improve mental qualities such as attention, confidence, and resilience. This is consistent with the expanding body of studies demonstrating the relevance of mental toughness in athletic performance (Gucciardi et al., 2015). Visualization and mental rehearsal techniques can help you perform better under pressure and cope with the position's unique obstacles (Liew et al., 2019).

Recovery and Evaluation Active recuperation and performance analysis are included in this program, demonstrating a dedication to athlete well-being and continual progress. This is consistent with the knowledge that enough rest and recovery are required for effective adaptation and performance (Kellmann, 2010). Regular performance review, including video analysis and feedback, helps goalkeepers discover their strengths, flaws, and areas for improvement (Capalbo et al, 2022).

Recommendation

Recommendation for this research

1. **Elevate Technical Challenges:** While the program effectively covers essential techniques, the experts suggest increasing the complexity and relevance of drills. This could involve introducing more game-realistic scenarios, varying the intensity and tempo of exercises, and incorporating decision-making elements into technical training.

2. **Expand Mental Skills Training:** Although mental preparation is included, the experts see potential for further development in this area. This could involve incorporating more specific strategies for enhancing focus, confidence, and resilience, such as mindfulness practices, self-talk techniques, and goal-setting exercises.

Recommendation for further research

1. **Longitudinal Study:** Conduct a longitudinal study to track the long-term impact of the training program on goalkeepers' development. This would provide valuable data on the program's efficacy in fostering sustained improvement over time.

2. **Comparative Analysis:** Implement a comparative study involving a control group to assess the specific benefits of the intensive training program compared to standard training methods. This would help quantify the program's unique contributions to goalkeeper development.

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