



ISSN: 2456-0057

IJPNE 2021; 6(1): 17-22

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www.journalofsports.com

Received: 13-11-2020

Accepted: 15-12-2020

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Psychological interventions applied with football goalkeepers: A scoping review

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Abstract

Positionally, the football goalkeeper is a unique player who can use their hands within a specific area of the field. Playing as the last line of the defense, one miss by the goalkeeper can result in a score for the opponents. Consequently, this is a role where the player is considered as being under constant pressure. This scoping review examined research literature focused on the application of psychological skills by football goalkeepers. The databases searched were SPORTDiscus with full text (Ebsco), PsycARTICLES (Ebsco), Scopus and Web science. From all databases, 178 articles were found. After exclusion criteria were applied, 9 papers were selected for this review. It was identified that most of the research was focused on situations related to the penalty kick. In summary, this included, the benefits of the use of video, the role of verbal cues and practice, skilled athletes being able to anticipate events based on postural cues and perceptual home training being useful even for skilled keepers. However, even though, clear recommendations are made about the positives of applying psychological skills to reduce anxiety, improve self-confidence and enhance skill acquisition, this scoping review found only one study where techniques were applied; albeit without improvement detected. Based on the positive outcomes of the implementation of psychological skills in other sports it is considered that football goalkeepers may benefit from psychological techniques applied specifically to their position.

Keywords: goalkeeper, football, psychological skills, imagery, arousal control

Introduction

Football is the most popular sport in the world (Taghizadeh, 2016) ^[19]. A football goalkeeper is a unique player who, within a specific area of the field, can use their hands (Memmert *et al.*, 2013) ^[11]. The main attribute of this player is to not concede goals (White *et al.*, 2018) ^[24]. The defensive actions of the goalkeeper include catching a shot, dealing with the high cross, deflecting, positioning the goal area and punching and saving in one on one situations. This player is also present in offensive actions, such as distributions and to also kick the ball within any number of actions that are performed repeatedly in games and practice (Ziv & Lidor, 2011) ^[25].

The goalkeeper could be considered as an isolated position with their training being different from the other players (Villemain & Hauw, 2014) ^[21]. Further to this, the role provides the last line of defense, consequently, a miss can result in a score for the opposition along with the experiencing of high pressure. In addition, fear of failure and poor decision making is stated as reducing self-confidence and attentional focus and thus causal to impaired performance for goalkeepers (Villemain & Hauw, 2014) ^[21]. Phrases found such as “one mistake can cost the team success” (West, 2018, p. 1220) ^[23]; or “goalkeeper is a hard position to play as you become scrutinized from all angles, and keepers are often blamed for losses” (Kristiansen *et al.*, 2011, p. 295) ^[9], highlight how this is experienced as pressure.

Villemain and Hauw (2014) ^[21], studied the crucial moments for goalkeepers in a game, and affirm that mental training strategies, such as the management of anxiety and stress, arousal control and the application of specific psychological skills have all been shown to improve goalkeeper competitive performance. However, the basis for this statement is found with hockey goaltenders and penalty situations where pre and post intervention assessments were not applied. Additionally, West (2018) ^[23] recommends that focus, self-confidence, and

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motivation should be present in entire games and whilst training. Finally, professional goalkeeper coaches mention that decision-making skills and mental skills such as courage, hard work, resilience, reliability and professionalism are the main attributes for high-level professional goalkeepers (Otte *et al.*, 2019) ^[14]. Therefore, we sought to identify and describe the extent, range and nature of research investigating the application of psychological skills with football goalkeepers. We used a scoping review methodology to provide a broad overview of the state of the evidence and to determine the feasibility and value of undertaking a full systematic review.

Materials and methods

This review applied the five stage scoping review process as recommended by Arksey and O'Malley (2005) ^[2]. The following research question was formulated: "What is known about the use and effects of psychological skills with football goalkeepers?" The searched included the following databases: SPORTDiscus with full text (Ebsco), PsycARTICLES (Ebsco), Scopus and Web science of all databases.

The terms researched were: ("goalkeeper*" OR "goal keeper*" OR "goalie*") AND (mindfulness OR "mental strateg*" OR "mental training" OR psycholog* OR "psychological strateg*" OR imagery OR "arousal control" OR relaxation OR "self-talk" OR "goal setting" OR visualization OR "cognitive self-talk") AND (soccer OR football).

The following inclusion criteria were applied if the research: a) was published in English in a peer-reviewed academic journals; b) specifically identified the use of psychological skills with football goalkeepers; c) included primary research, such that the design was cross-sectional or longitudinal, was an interventional methodology, an experiment with pre-post measures and a non-psychological skills comparison, a review; d) included any age group or gender.

Research studies were excluded based on the following criteria: a) being focused only on the emotional feeling of the players, without application of psychological skills; b) participants were goalkeepers from sports other than football; c) studies about the 11-m penalty kick before a review published in 2012 by Lidor, Ziv, & Gershon.

The review found 80 papers in SPORT Discuss, 3 in Psyc ARTICLES (Ebsco), 61 in Scopus, and 34 in Web Science. Information included was the author, year, location, design, sample size and characteristics, exposure or intervention characteristics, comparator or control characteristics, outcome measures and key findings. The selected research articles were reviewed, collated and analysed. Outcomes and concluding information were summarised.

Results

In total, 124 articles were identified after removing duplicates. Based on the above exclusion criteria, and after a full reading of the 17 remaining studies, 9 research articles met our inclusion criteria and were included in the review (see Figure 1). The findings for each outcome are presented in Table 1.

Discussion

The present review aimed to identify the application of psychological skills with football goalkeepers. Most of the research was focused on penalty kick situations. The penalty kick is a free kick at the goal from the penalty spot, which only the goalkeeper is allowed to defend it. The penalty "is considered to be one of the most challenging tasks the

goalkeeper has to face (Lidor *et al.*, 2012, p. 375) ^[10].

With a focus on the penalty, the majority of psychological skills applied within the research reviewed, were conducted in controlled laboratory environments via the use of videos with occlusion (Causar *et al.*, 2017; Causar & Williams, 2015; Peiyong & Inomata, 2012; Shafizadeh & Platt, 2012; Wang *et al.*, 2019) ^[4, 5, 15, 18, 22]. There was one study in the field (Dicks *et al.*, 2016) ^[6], one with home training (Murgia *et al.*, 2014) ^[13] and finally one review about the psychological preparation of goalkeepers for the penalty kick. Studies using psychological interventions such as imagery, self-talk, relaxation, and performance routines were not found in the research about penalty kick situations. However, it is stated by Lidor *et al.* (2012) ^[10] that these psychological skills can be useful.

In addition, it is important to note that the penalty is not a common situation in football because the game includes more than just the penalty situation (Avugos *et al.*, 2019) ^[3]. Finally, the penalty situation is the moment where the goalkeeper is not expected to save the goal, and this is due to the difficulty of the task. In this moment, it is expected that the penalty taker does not make a mistake, such as a missed goal. Therefore, the goalkeeper is described as being under less pressure in this situation (West, 2018) ^[23].

Nevertheless, within the articles about the penalty kick, there are important effects as a consequence of application of psychological skills. It was established that the use of video can benefit both experienced and novice goalkeepers (Causar *et al.*, 2017; Causar & Williams, 2015; Peiyong & Inomata, 2012; Shafizadeh & Platt, 2012; Wang *et al.*, 2019) ^[4, 5, 15, 18, 22]. Verbal cues along with practice will improve the anticipation of novice goalkeepers (Shafizadeh & Platt, 2012) ^[18].

Additionally, skilled athletes are better able to anticipate upcoming events based on postural cues (Causar & Williams, 2015) ^[5]. Perceptual home training is a useful model of training even for skilled goalkeepers (Murgia *et al.*, 2014) ^[13]. Waiting for as long a period as is possible to dive in the right direction, deception strategies, such as gaze behavior and more space for one side can influence the penalty takers (Lidor *et al.*, 2012) ^[10]. Knowledge focused on penalty kick situations is important, mainly because the shooter has the advantage, thus any increase in the goalkeeper level of defense is relevant.

Surprisingly, there was only one study (Munroe-Chandler & Hall, 2004) ^[12] where imagery was applied as an intervention with goalkeepers. However, the study was executed within a short period of time, with small sample size and blended with defenders. The hypothesis that there would be an improvement in the perceived collective efficacy of the athletes in training and competition after an imagery intervention, was not achieved.

Therefore, to date, there is a paucity of research on the application of psychological skill interventions such as self-talk, relaxation, imagery and pre-performance routines. It is important to highlight, that research conducted in the laboratory using a joystick or movement watching videos to predict the side and high of the ball may not necessarily reflect the ecological focus of the field. Second Lidor *et al.* (2012) ^[10], limitations exist as these investigations do not reflect the atmosphere of the game.

Importantly, in sports other than football, research has been able to show that following the application of psychological skills, players showed reductions in anxiety (Kanniyan, 2015) ^[8], increased self-confidence (Heydari *et al.*, 2018) ^[7] and

skill acquisition (Abraham *et al.*, 2017) ^[1]. In Ice hockey particularly, the use of self-talk with goaltenders was able to demonstrate positive results (Rogerson & Hrycaiko, 2002) ^[17]. These athletes achieved enhanced performance in league games. In addition, both players and their respective coaches viewed the intervention as a positive,

Implications for future research

There is opportunity to investigate all aspects of football goalkeeping. Future research could focus on the use of imagery for both technical and tactical skill execution. West

(2018) ^[23] states that imagery to improve the techniques of the goalkeeper, is an underused method. The study conducted by Ribeiro *et al.* (2015) ^[16] found an extensive use of imagery by goalkeepers, however without professional supervising, the effectiveness and the technique were questionable. Thus, the introduction of the correct use of imagery, conducted simultaneously with football skills and drills, could be considered. Vealey and Greenleaf (2010) ^[20] recommend that an imagery intervention should be continuous and systematic in order to accomplish performance enhancement.

Table 1: Studies on the use of psychological interventions with football goalkeepers

Author	Sample	Aim	Intervention	Findings
Munroe-Chandler & Hall (2004) ^[12]	Female soccer players, 10-12 years old, n= 15, 8 of them are defense and goalkeeper	To implement a motivational imagery intervention to determine if the technique would enhance their collective efficacy	Imagery intervention	<ul style="list-style-type: none"> Between defender and goalkeeper, the study indicated no significant change in collective efficacy after the imagery intervention
Lidor, Ziv & Gershon (2012) ^[10]	Review, 18 studies	To review papers about psychological preparation of goalkeepers for the penalty kick in soccer	Gaze behavior, deception strategies, tactical behaviors, and on-field performances	<ul style="list-style-type: none"> The use of penalty situations' video clips during psychology programs for keepers can improve their familiarity with penalty kick act Wait a longer period as possible to dive in the right direction during a penalty kick Use of the deception strategies, such as gaze behavior, and more space for one side can influence the penalty takers Consider individual differences among goalkeepers
Shafizadeh & Platt (2012) ^[18]	Male and novice goalkeepers from junior teams, n= 28, divided into experimental and control groups	To investigate the effectiveness of applying the verbal cueing technique in the penalty kick situation	Two groups, the experimental group received cues about the position of foot that do not kick, and hip position. Control group did not receive cues	<ul style="list-style-type: none"> In the experimental group the verbal's cues improved the novice goalkeeper's ability to anticipate the direction of a penalty kick
Peiyong & Inomata (2012) ^[15]	Male university students, n= 24, divided into experienced and inexperienced goalkeepers	The use of pre-impact cues to anticipate the direction of the ball, and whether the response-initiation time or penalty kicker's method and direction of kicking influence experienced and inexperienced goalkeeper's response accuracy in goal saves in soccer penalty kicks	Video recorded with occlusion made by the researchers	<ul style="list-style-type: none"> Neither the experimental group nor the inexperienced group could successfully make use of pre-impact cues to anticipate the direction of the ball when they initiated their responses before the moment of football contact The goalkeeper group had a considerably quickly response-initiation time when compared to the field players group Goalkeepers tend to apply a technique where the velocity of the reaction is crucial

Table 1: Studies on the use of psychological interventions with football goalkeepers (Cont.)

Author	Sample	Aim	Intervention	Findings
Murgia et al. (2014) ^[13]	Male, young and skilled goalkeepers, n= 42, divided into three training groups: experimental, placebo and control	To test the effectiveness of a perceptual training concerning the anticipatory skills of soccer goalkeepers	The experimental group practiced with an interactive home-training protocol with the addition of both positive and negative feedback. The placebo group viewed television footage of penalty kick shoot-outs. Finally, the control group did not receive any treatment	<ul style="list-style-type: none"> The effectiveness of the home-training protocol demonstrated significant accuracy. The same group enhanced the capacity to predict the penalty kick direction Perceptual home training can be effective also for skilled goalkeepers and learners
Causser & Williams (2015) ^[5]	Male soccer goalkeepers, n= 24, divided into skilled and less skilled soccer goalkeepers	To identify skills-based differences in susceptibility to disguise key information from hip region	A film based temporal occlusion approach was used in skilled and less skilled soccer goalkeepers to anticipate penalty kick outcomes under three occlusion conditions and under three uniform manipulation conditions	<ul style="list-style-type: none"> Skilled athletes are better able to anticipate upcoming events based on postural cues Skilled athletes are also more susceptible to deceptive information, compared to less-skilled athletes Uniform design can influence anticipation judgments
Dicks,	Male with at least 3	To examine whether a	One-player training group (OP):	<ul style="list-style-type: none"> Following training, goalkeepers

Pocock, Thelwell & Van der Kamp (2017)	years of soccer playing experience, n= 18	novel on-field training intervention improves the anticipation performance of novice soccer goalkeepers for deceptive and not deceptive penalty kicks	faced “traditional” practice, with one penalty taker running up to execute the kicks. Three -player training group (TP): The TP group faced three players running-up to execute the kick. The other two players stopped their run-up approximately 1.2m from the ball	<ul style="list-style-type: none"> in the three players group accomplished above probability levels for both delusion and no delusion trials When confronting no deception shots, goalkeepers in the three players group made significantly more saves in comparison with one player Goalkeepers in the three players group did not make more saves than one player in delusion cases
Causar, Smeeton & Williams (2017)	Male soccer goalkeepers, n= 24, divided into skilled and less skilled soccer goalkeepers	To determine the role of the hip region in making anticipation judgments in the penalty kick	A film based spatial and temporal occlusion approach was used in skilled and less skilled soccer goalkeepers to remove information from all other regions other than the hips throughout the kick	<ul style="list-style-type: none"> The skilled group achieved best performance than the less-skilled group Participants performed better in the full body when compared to the situation where only the hip region was related Tardy temporal occlusion situation was correlated with improved performance both in the accurate response and correct direction examinations, but not for exact height
Wang, Ji & Zhou (2019)	Male soccer goalkeepers, n= 50, divided into experts and novices	To examine whether no kinematic prior cues would influence the anticipatory judgment of penalty kicks	In the cue-anticipation task, congruency was manipulated, congruent or incongruent. Both behavioral performance and event-related potential activity elicited by cues and kicks were compared between expert goalkeepers and novices	<ul style="list-style-type: none"> Action anticipation performance was improved in the congruent condition and was reduced in the incongruent condition Experient goalkeepers outperformed beginners both when the prior cue provided no directional information (neutral condition) and when it provided directional information incongruent, but not congruent, with the following kick

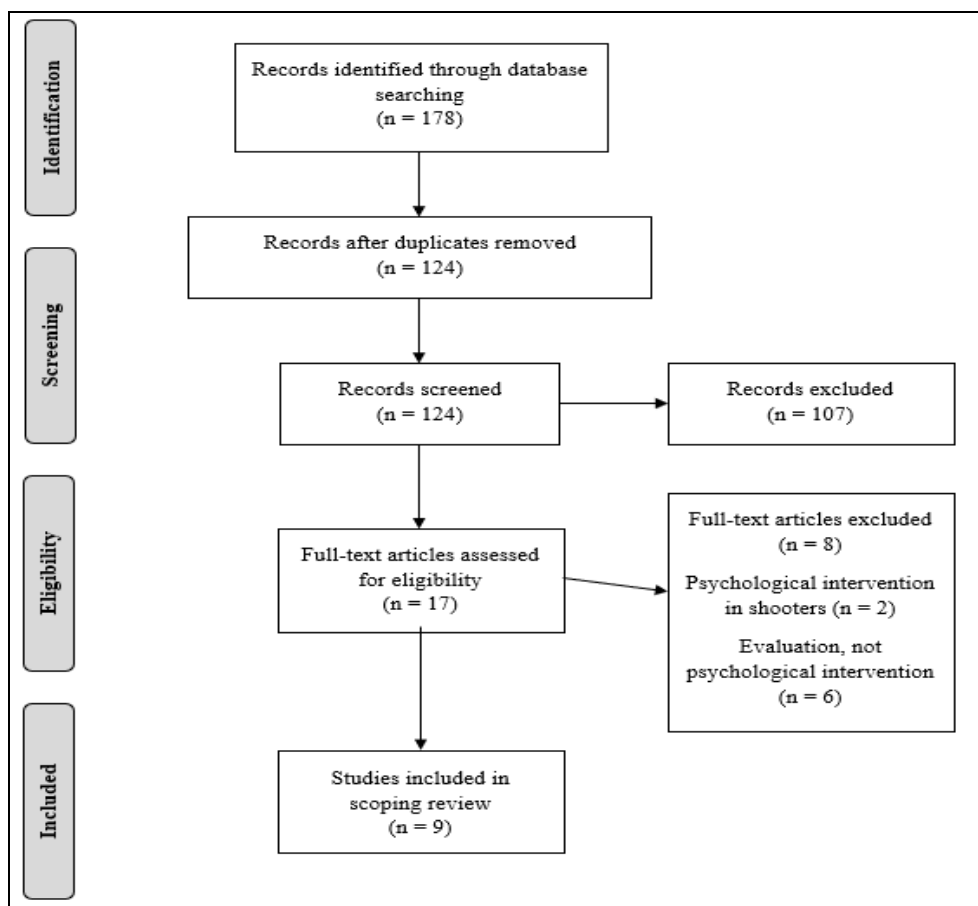


Fig 1: Flowchart of the study selection process.

Conclusion

The goalkeeper is a specific position, crucial for the football team. Due to its main task in the game and being the last line of defense, it usually plays under pressure and an error can result in a goal for the opponent. This pressure can generate anxiety levels and low self-confidence, impairing game performance. There is useful knowledge in the research literature on the penalty kick situation and various psychological skills such as home training and video occlusion, yet the application of imagery, relaxation, self-talk or arousal control were not found at this time. In the entire game, only one study was found with imagery application as a psychological skill applied to the hypothesis of increasing collective efficacy, which was not achieved. On the other hand, in research to verify the use of imagery by goalkeepers, a wide use of this technique by athletes has been identified, but without proper guidance, so the effectiveness is questioned. Studies using self-talk, performance routines or relaxation were not found. Thus, it is concluded that there is limited knowledge about the use of psychological skills with football goalkeepers. This presents an area for research that could potentially improve the sporting experience of these athletes.

Acknowledges

The authors want to acknowledge the contributions from Carlie Nekrasov, Librarian, Southern Cross University, Lismore, NSW, Australia.

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