

Goal setting in sport injury rehabilitation: a systematic review

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Abstract:

Goal setting is an essential component of any modern approach to rehabilitation. It provides a framework through which rehabilitation professionals and their patients can work together to improve the physical autonomy of the client and their psychological well-being, generating an important reference for rehabilitation achievements, and fosters both the effort and perseverance of the athletes. The aim of this paper is review and analyse the investigations that have employed goal setting in the framework of sports injuries rehabilitation. A systematic review was conducted, within the PsycINFO, SPORTDiscus, CINAHL Complete, MEDLINE, Academic Search, EMBASE, Dialnet, ISI Web of Knowledge and Science Direct databases. Ten studies have analysed the effect of goal setting during the rehabilitation process, or have used the technique in conjunction with other intervention procedures. Significant effects on rehabilitation were confirmed. The main findings confirm a faster recovery because of goal setting, psychological discomfort reduction and increased motivation, mood improvements, greater focus and effort of athlete in treatment, and performance improvements with challenging goals. It also resulted in a greater treatment adherence, greater adherence to rehabilitation sessions and compliance with homework, high scores on self-satisfaction and self-efficacy, and a very high percentage of athletes who achieve their self-selected functional goals. It is concluded that goal setting is shown as an intervention strategy and technique with important benefits at a psychological and physical level, and is positively valued by athletes, coaches and physiotherapists. It is necessary to implement techniques and programs that address the cognitive and behavioral aspects of the injured, and that motivate and focus their efforts to full recovery.

Keywords: Goal setting; Sports injuries; Physiotherapy; Physical therapy; Rehabilitation.

Introduction

Goal setting (GS) is an essential and key characteristic of modern rehabilitation (Dekker et al., 2020). It provides a framework through which rehabilitation professionals and their patients can work together to improve the physical autonomy of the client and their psychological well-being, and GS generates an important reference for rehabilitation achievements, and fosters both the effort and perseverance of athletes (Brewer & Redmond, 2017).

GS has been tested in various clinical contexts, such as the treatment of patients with neurological problems, psychiatric or behavioral disorders, cardiovascular, respiratory, endocrine and/or dietary disorders, and in patients with musculoskeletal problems, among others, and there is ample evidence in favour of its efficacy as part of treatment (Levack et al., 2006). In sport, GS determines an enhancement in motivation and commitment, and provides a direction in order to optimize the recovery (Santi & Pietrantonio, 2013).

The goal concept is the central component of a multitude of psychological theories, and it helps explain why individuals differ in terms of choice, direction, persistence and intensity of their behavior, regardless of their abilities and knowledge (Austin & Vancouver, 1996). The goal is an aspiration, purpose or result that the individual plans or intends to achieve. The beneficial effect of GS on task performance is one of the strongest findings in the psychological literature, as up to ninety percent of studies have shown positive effects in whole or in part (Locke et al., 1981).

In rehabilitation context, GS requires building a repertoire of personal behavioural patterns to be achieved during the recovery process, and has powerful effects on the athlete's basic behavioural responses after injury, especially adherence and compliance to rehabilitation (Brewer, 2009).

Treatment using goals is mainly used as a motivational device designed to give patients a sense of purpose about the duration of their treatment program (Payton et al., 1998). By generating personal standards of achievement in rehabilitation activities, it is postulated to provide guidance to the rehabilitation efforts of the athlete, improve persistence in rehabilitation and facilitate the development of new rehabilitation strategies (Brewer & Cornelius, 2003; Locke & Latham, 1990), and can provide a sense of achievement that is motivating and generating confidence (Fisher et al., 1993; Weiss & Troxel, 1986). Also, Locke and Latham (2002) suggest

that the goals have an energizing function because through participation in the process of setting goals increases performance and persistence to achieve specific goals.

In rehabilitation, the use of GS is usually aimed at four main objectives (Levack et al., 2006): improve patient outcomes, improve their autonomy, evaluate results, and to meet contractual, legislative or professionals requirements. Different authors affirm its usefulness and support its use (Gilbourne & Taylor, 1998; Playford et al., 2009), arguing that helps athletes to specify the aims and purposes of their rehabilitation in a positive way, increasing the base of their intrapersonal and interpersonal skills, and can provide significant increases in motivation, autonomy, and influence their ability to cope rehabilitation demands. In addition, it has a key and decisive role in the adherence of athlete to treatment program (Brewer & Redmond, 2017).

Starting from the particular characteristics of sport, and the specific differences with the rehabilitation processes in other areas, the objective of this study is to review and analyse the research that has explore the effect of goal setting in sport injury rehabilitation.

Material & methods

Search Strategy

An exploratory search was conducted in PsycINFO, SPORTDiscus, CINAHL Complete, MEDLINE, Academic Search, EMBASE, Dialnet, ISI Web of Knowledge and Science Direct databases, produced from February to April 2021. The search terms used were: goal-setting &: sport injuries; rehabilitation; physiotherapy; physical therapy; athletic therapy. Additionally, the search is deepened through a general review of specialized scientific publications, specifically dissertations and doctoral theses. No limitations were established regarding the studies language, gender or sport modality of the population, nor restrictions regarding the temporary period of publication.

Study Eligibility Criteria

Studies that met several criteria were selected: a) intervention using GS; b) interventions that integrate GS together with other procedures or techniques; c) application in injured athletes; d) empirical studies that provide complete and detailed study information. Once the empirical and methodological quality of each study has been verified, the most relevant data for the purpose of this review are extracted.

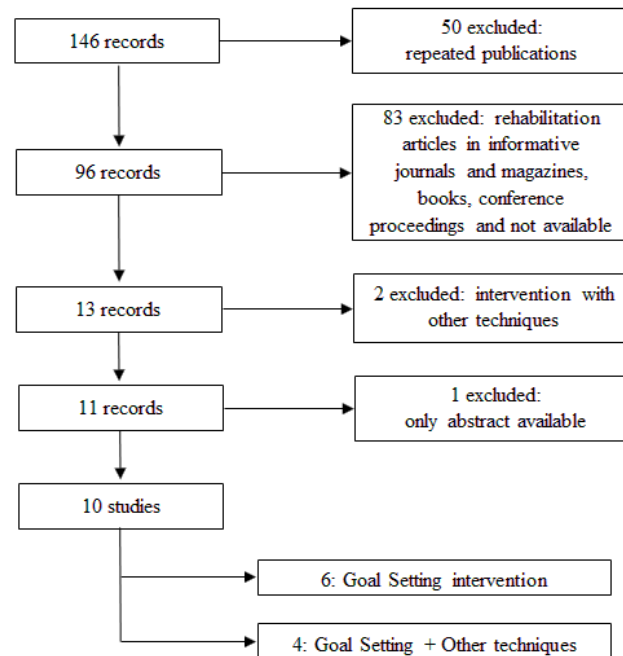


Figure 1. Flow diagram of study selection procedure.

Publication Selection

When entering the search terms, a total of 146 results were obtained (Figure 1). Immediately the search engine eliminates 50 results, as they are repeated publications, and were reduced to 96 results. Next, the previous ones were analysed in detail, resulting in 83 more exclusions. These publications were no empirical papers, articles in scientific journals rehabilitation and informative magazines, books on sports injuries, conference proceedings, and items not available. Two publications were subsequently excluded because they were studies with interventions that use other techniques. One more result is excluded, which while dealing with GS in rehabilitation, only presents abstract and not the complete study design. Finally, the search yielded ten studies that empirically apply GS in sport injury treatment.

Results

The results showed that the highest number of papers were published in *Journal of Sport Rehabilitation* ($n = 4$), followed by *Sport Psychologist* ($n = 2$) and *Research Quarterly for Exercise and Sport* ($n = 2$). Regarding authors, 54.16% of the studies were conducted by US authors, 25% by Greek authors, 12.5% by British authors, and by authors from Canada and Sweden (4.16% each). By country, four publications are from the United States, three from the United Kingdom, two from Greece, and one each from Sweden and Canada.

The samples were very diverse and heterogeneous. The mean age of the participants was 24.35 years, with a range between 14 and 48 years. 46.8% of the participants in the studies were female, while 53.2% were male. Regarding the sports practised, most of the studies analysed competitive-level athletes, but there are studies whose participants were university students, university and recreational athletes.

The main characteristics and conclusions of the ten selected studies are set out below, and summarised in Table 1.

The Ievleva and Orlick (1991) study confirmed that patients who set goals, especially daily goals, recorded a faster recovery. The results showed correlation between goal setting and slow recovery, fast-recovering athletes set goals more regularly, and that the approach of daily or short-term goals (versus long-term), it was related to faster athlete recovery.

In a study by Theodorakis et al. (1996) a sample of 92 female university athletes was studied. Results indicated that athletes who set goals with higher challenges and more difficult, improved their performance and obtained higher scores in self-satisfaction and self-efficacy. In a subsequent investigation by Theodorakis et al. (1997), the experimental group had to set specific performance goals, receiving immediate information after execution. The control group did not set any goals. Results include significant improvements of the experimental group in muscular performance, and a greater satisfaction with their performance in those athletes who set goals.

Evans, Hardy and Flemming (2000) implemented a five-week GS program, applied to seriously injured rugby players in rehabilitation process. In the course of program they decided to integrate other intervention techniques with athletes: social support, imagery training, verbal persuasion and training simulation. The program showed how the use of flexible short-term and long-term goals, focused on both process and performance, are favorable in increasing athlete's self-efficacy and motivation. Specifically, process goals facilitated concentration of athletes on specific characteristics of a given task, while performance goals provided specific goals and structure for the overall rehabilitation set.

Johnson's study (2000) seeks to test the effect of psychological skills training with competitive athletes with long-term injuries. Results concluded that the experimental group reached higher levels of general mood, both in the middle of the process and at the end of the rehabilitation. In addition they, had a greater perception of feeling prepared for a rapid return to competition than the group control. However, GS is not considered as a promoter of changes assuming its contribution alone, separated from other techniques.

Scherzer et al. (2001) examined the relationship between the use of psychological skills and adherence to rehabilitation in 54 athletes undergoing intervention for reconstruction of anterior cruciate ligament. GS was significantly related to adherence to rehabilitation sessions, fulfillment of tasks at home and higher scores of treatment professionals regarding such adherence. They also concluded that through the goals the athletes remained focused on completing the prescribed tasks and the rehabilitation protocol as a means to achieve those goals.

Evans and Hardy (2002a) investigated the effect of a five-week GS program on 77 athletes. The results show how the group trained in formulating goals obtained significant differences with respect to other groups in terms of greater self-efficacy and adherence to rehabilitation program. In a subsequent study, Evans and Hardy (2002b) conducted a qualitative study. Through semi-structured interviews they concluded the importance of different individual variables and the interaction of athlete and situational variables, especially support of the physiotherapist, coach and club, inability to train, weight gain, slow progress, and the importance of long-term results goals. They proposed as possible mechanisms of observed effects, the effects of GS, self-attributions effectiveness, control perceptions, and attention.

McGrath (2005) studied the consequences of implementing a goal program on self-confidence, satisfaction and adherence to rehabilitation, in injured university athletes. The results confirmed a positive effect of the program, contributing to help increase motivation throughout the rehabilitation process, an increase in adherence, keep athlete focused on intervention process and increase the effort during physiotherapy sessions. The athletes considered that the goals contributed to a positives changes in their confidence post-intervention, the use of GS increased their motivation and/or effort, and that the goals gave them something to strive for during each rehabilitation session. Most athletes felt that the long-term goals helped the most with motivation, while the short-term goals provided direction, as well as increased effort.

In last study, Sohlberg and Ledbetter (2016) analysed 24 athletes who suffered sports-related concussion, and whose symptoms after the concussion persisted for at least 2 months with a detrimental effect on school performance. Four treatment approaches were established, and all athletes participated in a personalized GS process, to establish domains of functional goals that they wanted to address as a result of participating in cognitive rehabilitation. Functional rehabilitation goals were facilitated by clinicians. As a result, eighty-three percent (22 of the 24 athletes) achieved the functional goals they had selected.

Table 1. Summary of studies and results

Study	Participants	Objective	Techniques and measures	Results
Ievleva & Orlick (1991)	32 injured athletes	Prove if athletes who recovered faster demonstrated higher levels of psychosocial factors	Survey to assess use of psychological skills during rehabilitation. Recovery time log	GS regular and short-term is associated with more faster recovery
Theodorakis et al. (1996)	Female university athletes (32 injured, 29 healthy; 30 control group)	Examine GS effect, and differences in personal GS, SE, SS, and performance between injured and healthy subjects	Knee extension specific task trials. GS use. SE and SS measures	High and challenging goals increased performance, SE and SS. GS was affected by skill level and, in turn, had a direct effect on performance
Theodorakis et al. (1997)	Injured physical education university students (20 experimental group; 17 control group)	GS effect on performance, anxiety, SE and SS	Program in which experimental group performs GS and receives feedback. Measurement of knee extension, ability, SE, SS and anxiety	GS improves SS because of better muscle performance and performance
Evans, Hardy & Flemming (2000)	3 seriously injured athletes	Employ the action research process in a longitudinal psychological rehabilitation intervention	5 weeks GS program. Consulting with athletes and final interviews	Short and long term goals increase SE and motivation
Johnson (2000)	58 injured athletes (14 in experimental group)	Analyse the effectiveness of short-term psychological interventions in competitive athletes with long-term injuries	Psychological skills training (GS skills, stress management and cognitive control, and relaxation/guided imagery)	Combined effect of the group of techniques on mood and increased perception of rapid return to competition
Scherzer et al. (2001)	54 athletes in rehabilitation after anterior cruciate ligament reconstruction	Examine the relationship between self-reported use of psychological skills and rehabilitation adherence	GS, imagery and positive self-talk. Four adherence measures and the Sports Injury Survey	GS is significantly related to session adherence and homework accomplishment
Evans & Hardy (2002a)	77 injured athletes in three groups (GS intervention, social support control, and control)	Examined the effects of a 5-week goal-setting intervention	GS, social support, SE and treatment effectiveness Measures: adherence to rehabilitation, SE, and psychological responses to the injury	Significant differences of GS group educated: greater SE, rehabilitation adherence and reorganization, and lower dispiritedness
Evans & Hardy (2002b)	9 injured athletes (3 from each group of previous study)	Improve interpretability and meaning of findings from the previous study	Qualitative study through semistructured interviews	Athletes confirmed the effect of GS as one of the mechanisms responsible for the positive effects observed
McGrath (2005)	6 injured NCAA student-athletes	Investigates the effects of a formal GS program on SC, SS and rehabilitation adherence	Effect of a GS program. Weekly measures of confidence and rehabilitation adherence. Measures of satisfaction before and after intervention.	Increased motivation, SC, focus and effort in sessions
Sohlberg & Ledbetter (2016)	24 athletes who suffered sports-related concussion	Examine a variety of cognitive rehabilitation treatment options	Four treatment approaches. All clients participated in a goal selection process. Principles of scale of achievement of objectives and motivational interviews.	83% of athletes achieved functional goals they had selected

Abbreviations: GS= Goal Setting; SE= Self-Efficacy; SS= Self-Satisfaction; SC= Self-Confidence

Discussion & Conclusions

Based on the different empirical studies, the GS in rehabilitation demonstrates its positive effect in different directions. The main findings confirm a faster recovery because of GS (Ievleva & Orlick, 1991), psychological discomfort reduction and increased motivation (Evans & Hardy, 2002a, 2002b; McGrath, 2005), mood improvements (Johnson, 2000), greater focus and effort of athlete in treatment (Scherzer, 2001; McGrath, 2005), and performance improvements with challenging goals (Theodorakis et al., 1996, 1997). It also resulted in a greater treatment adherence (Evans et al., 2000; Scherzer et al., 2001) greater adherence to rehabilitation sessions and compliance with homework (Scherzer et al., 2001), high scores on self-satisfaction and self-efficacy (Theodorakis et al., 1996, 1997; Evans et al., 2000), and a very high percentage of athletes who achieve their self-selected functional goals (Sohlberg & Ledbetter, 2016). All these results confirm what has been suggested by different authors in terms of the powerful effect of the establishment of qualitative goals oriented to the task for the benefit of the rehabilitation process of injured athletes (Brewer, 2009; Brewer & Redmond, 2017; Gilbourne & Taylor, 1998; Gilbourne et al., 1996; Penpraze & Mutrie, 1999).

From these results and conclusions, it is clear that the GS should be considered as a significant tool to work with injured athletes, a fundamental strategy and technique of special value in treatment. According to Arvinen-Barrow et al. (2014) the setting of physical, psychological, performance, and lifestyle goals can be planned to complement each other, and become a natural part of the integral approach to the rehabilitation process. In addition, GS has been proposed for its positive effect on psychosocial and physical healing, facilitating increased effort levels, persistence and commitment, promoting rehabilitation adherence, and positively affecting athlete emotional responses, all facilitating an optimal return to sport (Arvinen-Barrow & Hemmings, 2013).

Different studies highlight the importance of GS, given to this technique and its use by the main involved in the process, the athletes, in addition to people who are usually by their side in recovery work: physiotherapists and coaches. Athletes immersed in rehabilitation processes claim to know GS importance (Arvinen-Barrow et al., 2014; Brewer et al., 1994). Athletes believe that GS can be a natural part of their daily routine, which does not imply an overwhelming time commitment, and offers a greater chance of seeing themselves as active participants in defining their goals (Brewer et al., 1994). They emphasize their flexibility, since there was reformulation of objectives during the process, due to the setbacks and obstacles that arose. However, athletes consider that GS is not usually systematic, and is often dictated by the medical team, rather than a mutual planning between athlete and team (Arvinen-Barrow et al., 2014).

Regarding physiotherapists, GS is valued as one of fundamental psychological strategies and techniques in rehabilitation (Annear et al., 2019; Arvinen-Barrow et al., 2010; Francis et al., 2000; Hamson-Utley et al., 2008; Ninedek & Kolt, 2000), and whose employment differentiates those athletes who face their injuries more successfully (Ninedek & Kolt, 2000). In the early stages of the rehabilitation process, its use is considered a way to manage and counteract the occurrence of reactions of fear and apprehension (McVeigh & Pack, 2015). Physiotherapists show good knowledge regarding the use of GS, understanding of different goal levels, and considering it an rehabilitation integral part (Arvinen-Barrow et al., 2010). Physiotherapists also consider the use of short-term and realistic goals as one of the most used and effective strategies to cope psychologically with the injury (Lafferty et al., 2008; Ninedek & Kolt, 2000), besides being seen as a useful strategy to improve adherence and motivation (Niven, 2007), speed recovery (Hamson-Utley et al., 2008), and as a means to monitor progress, a marker of recovery stage and athlete proper functioning (Lafferty et al., 2008; Niven, 2007). Moreover, setting unrealistic goals is considered a characteristic of athletes who cope less well with the injury (Arvinen-Barrow et al., 2007; Hemmings & Povey, 2002), and sometimes procedure is usually unidirectional and unplanned, since during initial evaluation, general and long-term recovery goals were very discussed with athlete, but the short-term goals seemed to be very controlled by physiotherapists (Arvinen-Barrow et al., 2010).

Finally, coaches value the GS as a characteristic that distinguishes athletes who face the injury better, as well as concentration in short-term goals as a facilitating technique to cope with injury (Fisher et al., 1993; Wiese et al., 1987). They also consider GS as the most important of all the strategies used to facilitate the reintegration of their athletes into sports, a fundamental and intuitive strategy to facilitate the return transition (process, progression and achievement) (Podlog & Dionigi, 2010). Setting realistic goals was seen as the second best strategy valued by coaches after using a positive and sincere style of communication, to help athlete with his injury (Wiese et al., 1987), and one of the three best psychosocial strategies in injury recovery, along with keeping athlete involved in team and creating a wide variety of rehabilitation exercises (Clement et al., 2013). Coaches also agree that setting short and long-term goals during recovery was useful to give hope to athletes, allowing them to see their progress in short term, gain confidence in their ability and be motivated to set and achieve new goals, which in ultimately facilitated his return to sport (Podlog & Dionigi, 2010).

Practical application and conclusions

Goal setting is shown as a fundamental strategy and technique, with special value in sport injury rehabilitation. Despite studies heterogeneity, application of GS reports benefits on psychological athlete sphere, cognitively and emotionally, with improvements in mood, motivation, focus, self-satisfaction and self-efficacy, and at behavioral level, with greater adherence to treatment and improvements in performance.

Psychological factors have demonstrated their great importance in sport injury rehabilitation (Brewer, 2010; Goddard et al., 2020), and a wide range of psychological techniques and interventions have demonstrated their effectiveness, and among them GS provides obvious benefits (Berengüí & Pelegrín, 2018). Assumed as the most effective technique for increasing motivation, its promotion becomes a skill that also allows improvements in other psychological variables such as attention or self-confidence, as well as providing advances in the physical results of the process, as a consequence mainly of greater adherence to prescribed program. Identification and establishment of appropriate goals should be one of basic skills that characterise treatment professionals (Berengüí et al., 2013).

Regarding the limitations of present study, we must point out limited number of publications and great heterogeneity of studies, with a great variety of sports disciplines and subjects analyses, diversity of experimental designs, techniques used and evaluation instruments in research.

Future research may investigate GS in samples of greater number of athletes and multiple sport disciplines. At the same time, homogeneity must be achieved through the design of precise investigations, analysing athletes with similar injuries, competition level, and age ranges. More studies are also needed that relate GS to different physical and psychological variables.

We consider interdisciplinary work to be important when working with injured athletes. Rehabilitation professionals (e.g. physiotherapists, doctors and psychologists, fundamentally) must achieve an appropriate knowledge of athlete course in their recovery, and promote their skills when identifying signs that indicate a bad psychological adjustment of athlete to injury and promote adherence to treatment. Similarly, collaborative work between the patient and the rehabilitation professional should be encouraged, focusing objectives on their needs and preferences, in a structured environment to support and assess the goals (Cameron et al., 2018).

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