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The Impact of Mindfulness Training on Competitive Athletic Performance

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Abstract

The impact of mindfulness training on athletic performance is an area of growing interest for researchers, sport psychologists, and athletes. The aims of the current literature review are to compare the performance benefits of mindfulness training to those of the more traditional psychological skills training (PST) and to examine the relationship between mindfulness and the construct of flow. The reviewed literature shows that mindfulness training may help athletes to improve both subjective and objective measurements of performance, their ability to practice mindfulness techniques, and their performance in game situations. Comparatively, athletes practicing PST showed improvements in practicing PST techniques, in subjectively measured performance, and in practice situations, but research is limited in showing improvements of objective performance and in-game performance situations. Further, several studies have shown a relationship between mindfulness techniques and the ability to achieve flow in athletic competition. Such evidence suggests that mindfulness training may be more effective than other training techniques in improving athletic performance.

Keywords: flow, mindfulness training, PST

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The Impact of Mindfulness Training on Competitive Athletic Performance

The potential impact of the mind on athletic performance has become a subject of great interest among researchers (Cook & Fletcher, 2017; Kornspan, 2012; Tod, Hutter, & Eubank, 2017). Because of this fairly recent increase in interest, sport psychology, or the study of the impact of the mind on sport performance, is still a relatively young field of study (Cook & Fletcher, 2017; Gardner & Moore, 2007; Goodman, Kashdan, Mallard, & Schumann, 2014). Even so, researchers and psychologists are developing promising psychological techniques to enable athletes to perform at their maximum potential. One of these promising techniques is known as mindfulness training (Birrer, Röthlin, & Morgan, 2012; Gardner & Moore, 2007).

Mindfulness is a construct that has grown out of Eastern meditation techniques and is just now beginning to be embraced by the Western medical world for its perceived positive impact on well-being (Bernier et al., 2009; Gardner & Moore, 2012). As mindfulness grows in popularity in medical circles, more and more sport psychologists have started applying its tenets to the realms of competition. Mindfulness, as a construct, can be summarized as the ability to turn one's full focus to the current moment (Bernier et al., 2009; Gardner & Moore, 2012). In the process of mindfulness, attention is given to physical stimuli as well as to visual and acoustic cues (Bernier, Thienot, Codron, & Fournier, 2009; Gardner & Moore, 2012; Goodman et al., 2014; Röthlin, Birrer, Horvath, & grosse Holtforth, 2016). Thoughts are allowed to flow in and out of the mind without being judged as "good thoughts" or "bad thoughts," which limits the ability of a thought to produce an emotional reaction in the thinker (Bernier et al., 2009; Röthlin et al., 2016).

The most common methods and ideologies of sport psychology are centered on principles of psychological skills training (PST). Psychological skills training involves a consistent and

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systematic effort to control one's thoughts and emotions (Weinberg & Gould, 2015). Röhlin et al. (2016) suggest that PST consists of four main tenets. The first tenet is the use of visualization or imagery, which involves the recollection or deliberate imagining of an athletic event by an athlete in an effort to prepare necessary mental and physical responses. The second tenet is positive self-talk, which is used to combat negative thinking. The third is goal setting, which generally means making a plan in order to accomplish a certain end. The fourth is arousal regulation, which uses techniques such as relaxation to enable athletes to calm themselves down when too aroused. Gaining control over one's thoughts and emotions seems to be the main goal of PST in sport psychology. Mindfulness training (MT), on the other hand, takes a different approach.

A mindful approach to competition places comparatively less focus on things such as imagery and self-talk (Bernier et al., 2009; Gardner & Moore, 2012; Goodman et al., 2014, Röhlin et al., 2016). The goal of mindfulness is not to take control of one's thoughts and emotions. Rather, athletes center their efforts on engaging in the moment and allowing their thoughts and emotions to flow through their mind without judgment (Gardner & Moore, 2017). They shift their focus from internal processes, such as thoughts and emotions, to external processes, like catching a pass or playing defense. To understand the differences between PST and mindfulness training, it may be helpful to imagine the cognitive processes of a fielder in baseball when a ball is hit towards him or her. In preparing to field the ball, a fielder trained in PST may begin to think to him or herself, "I can do this. I am ready for this. I will pick up the ball cleanly and make a good throw to first to get the runner out." The player will seek to block negative thoughts and control emotions. By contrast, an athlete trained in mindfulness will be more focused on visual and acoustic cues and will strive to keep a clear mind. The mindful

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athlete may watch the pitch and listen for the crack of the bat, notice his or her own body movements as he or she approaches and fields the ball, then notice his or her grip on the ball before throwing it to first base. The athlete does all of this while maintaining a calm and clear mind.

Recent studies have suggested a broader range of positive results in the performance of those who take a mindful approach into competition as compared to those using the traditional PST model (Bernier et al., 2009; Gardner & Moore, 2017). Some studies have suggested that athletes who are trained in mindfulness are better able to achieve a state of flow in their competitive events (Aherne, Moran, & Lonsdale, 2011; Cathcart, McGregor, & Groundwater, 2014). Flow is a construct that has been loosely defined as the state of being completely absorbed in the current task (Csikszentmihalyi, 1997) and is almost always reported with improved performance (Aherne, Moran, & Lonsdale, 2011). Athletes often experience flow in their best performances and refer to it as “being in the zone.” This is another appropriate characterization of flow. The understanding of which methods and practices lead to a greater frequency of flow experiences is the goal and desire of all serious athletes and sport psychologists (Kimiecik & Stein, 1992).

Although common psychological training techniques like PST can contribute to the successful performance of athletes, mindfulness training is a technique that could provide a comparatively greater benefit to athletes because of its ability to help athletes better achieve a state of flow and thus improve their overall performance. The present literature review will (a) examine the constructs of PST and mindfulness training and compare the differences between the two and (b) examine the relationship between mindfulness training and the construct of flow.

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Psychological Skills Training and Mindfulness

The comparison of psychological skills training and mindfulness training is an area of growing interest in sport psychological research (Birrer, Röthlin, & Morgan, 2012; Goodman et al., 2014; Röthlin et al., 2016). PST is more firmly established and more widely accepted than mindfulness training, mainly because it has been studied for a longer period of time (Birrer, Röthlin, & Morgan, 2012; Kabat-Zinn, 2003). Much about mindfulness training has yet to be learned, but mindfulness training techniques have already shown promise in their ability to help athletes improve performance (Birrer, Röthlin, & Morgan, 2012; Gardner & Moore, 2007). The following sections will describe and compare the current literature regarding the implementation, effectiveness, and limits of the two constructs.

Implementation, Effectiveness, and Limits of Psychological Skills Training

PST has been defined as the use of cognitive and behavioral strategies to improve psychological functioning and overall performance (McCrory, Cobley, & Marchant, 2013), and has proven effective in a variety of areas as a way to develop and strengthen skills necessary to overcome both common human challenges and unique individual struggles (McCrory, Cobley, & Marchant, 2013; O'Donohue, Ferguson, & Pasquale, 2003).

The core principles of PST are goal setting, imagery, self-talk, and arousal regulation (Röthlin et al., 2016). Different researchers and sport psychologists occasionally add to this list or omit one or more of these strategies in administering training, but generally, these four strategies are consistent across the discipline (Horn, Gilbert, Gilbert, & Lewis, 2011; McCrory, Cobley, & Marchant, 2013; Patrick & Hrycaiko, 1998; Thelwell & Maynard, 2003). Goal setting is typically implemented by inviting the client to determine his or her desired outcomes in competition and in training. The client and the practitioner can then categorize goals by date of

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expected completion (long-term or short-term) and by whether the goal is outcome oriented or task oriented (Patrick & Hrycaiko, 1998; Thelwell & Maynard, 2003). Imagery is presented as the creation of vivid mental scenarios that show the client succeeding in his or her athletic event. Sport psychologists commonly teach that the ability to create these scenes will improve with time and practice (McCrory, Cobley, & Marchant, 2013; Patrick & Hrycaiko, 1998). Self-talk is taught as the stopping and rejecting of negative thoughts and the deliberate proliferation of positive and encouraging ones (McCrory, Cobley, & Marchant, 2013; Patrick & Hrycaiko, 1998). A common way that arousal regulation can be achieved is through relaxation techniques, which vary in their implementation more than the previous three strategies. However, common relaxation themes include controlled breathing and the use of Progressive Muscle Relaxation (PMR), a process in which large muscle groups are individually targeted and deliberately relaxed (Patrick & Hrycaiko, 1998; Thelwell & Greenlees, 2001).

The impact of PST on athletic performance has been and continues to be studied in depth by a wide range of researchers. The most common improvement in performance found in the reviewed literature was lowered average times reported in timed events, such as distance running or triathlon (Patrick & Hrycaiko, 1998; Thelwell & Greenlees, 2001). Other typical improvements found were increased ability and consistency of athletes to implement PST strategies in their performance (Horn et al., 2011; Patrick & Hrycaiko, 1998, Thelwell & Greenlees, 2001; Thelwell & Maynard, 2003). While PST has shown some positive benefits in performance, its efficacy in all sports and performance conditions has come under question (Gardner & Moore, 2007).

Another hole in current literature is the lack of data taken from situations where athletes are competing in in-game situations, as opposed to data taken from practice situations. One

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would assume that athletes desire for practicing PST would be to improve their performance in both practice and in-game situations. Studies have reported improvements in objective measures of performance with PST but mainly in practice situations (Patrick & Hrycaiko, 1998; Thelwell & Greenlees, 2001). Studies that incorporated data taken from higher-pressure game situations showed improvement only in subjective measures like comfort or self-efficacy, while objective measures, like batting average or completion percentage, showed no significant change (Horn et al., 2011; Thelwell & Maynard, 2003). For PST to be considered more effective, it should yield consistent objective results in competitive situations (Birrer & Morgan, 2010).

Implementation, Effectiveness, and Limits of Mindfulness Training

Mindfulness is the practice of focusing one's attention on current physical sensations, thoughts, feelings, and audible and visual stimuli in an accepting manner without judging, reacting to, or elaborating on said sensations, thoughts, or feelings (Bernier et al., 2009; Gardner & Moore, 2012; Goodman et al., 2014, Röthlin et al., 2016). Mindfulness in athletic competition is a developing field of study. The earliest reviewed article came from Wolanin (2005) and discussed the efficacy of a mindfulness-based intervention in enhancing the performance of various collegiate athletes, while the majority of related articles have come from the past decade. Because of this, the characteristics of mindfulness are not yet as well defined as those of PST, but one can still identify common threads running through mindfulness-based treatments (Gardner & Moore, 2012; Kabat-Zinn, 2003). The first, and one of the most prevalent characteristics of mindfulness-based approaches is the idea of acceptance. In contrast to PST, mindfulness training places a strong emphasis on nonjudgmental awareness and acceptance, meaning that athletes do not view their individual internal states as good, bad, right, or wrong, but rather accept these states as they are (Bernier et al., 2009; Gardner & Moore, 2012; Goodman

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et al., 2014; Röthlin et al., 2016). Internal processes, such as thoughts or emotions, are considered passing events rather than concrete realities (Bernier, Thienot, Codron, & Fournier, 2009; Gardner & Moore, 2012; Röthlin et al., 2016). The second common emphasis in mindfulness training is a focus on task-relevant cues or stimuli. This second emphasis relies somewhat upon the first. It stems from the idea that if attention is centered less upon internal processes, it can be centered more upon relevant external cues (Gardner & Moore, 2012; Röthlin et al., 2016). The third common emphasis in mindfulness training is the maintaining of a personal, values-driven commitment to one's athletic endeavor. This means that athletes find fulfillment in their individual events that goes beyond simply winning a match or scoring the most baskets (Gardner & Moore, 2012).

As is to be expected from such a young field, the body of literature treating the relationship between mindfulness and improved athletic performance is relatively small; nevertheless, the existing studies give reason to believe that mindfulness training in sport psychology is a promising field of study (Gooding & Gardner, 2009; Gross et al., 2018; Perry et al., 2017; Pineau et al., 2014; Wolanin, 2005). As was the case with many PST studies improving PST capacity (Horn et al., 2011; Patrick & Hrycaiko, 1998, Thelwell & Greenlees, 2001; Thelwell & Maynard, 2003), those engaged in mindfulness training studies improved their abilities to achieve a state of mindfulness. This led to improved self-esteem, more positive responses to negative emotion, and greater tolerance of undesirable internal experiences (Goodman et al., 2014; Pineau et al., 2014). Two studies showed significant improvement in subjectively measured athletic performance (Goodman et al., 2014; Wolanin, 2005), while two more showed significant improvement in objectively measured performance (Gooding & Gardner, 2009; Perry et al., 2017), with a third showing objective improvement that failed to

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reach statistical significance (Gross et al., 2018). These last three studies that showed objectively measured improvement in performance highlight the scarcity of these types of studies in PST literature.

Current holes in mindfulness training literature are similar to those in PST literature. Although some studies have shown significant objective improvement in competitive settings (Gooding & Gardner, 2009; Perry et al., 2017), much still remains to be studied in this area. A greater focus on objective data may call greater attention to this field of study from those in the discipline. The sports that are studied also vary widely from study to study (Gooding & Gardner, 2009; Pineau et al., 2014; Perry et al., 2017; Wolanin, 2005). Because different sports pose different challenges and require unique adjustments, researchers may want to focus research on one or two sports at a time. Mindfulness training techniques have been studied in a wide variety of participants (Thelwell & Maynard, 2003; Aherne, Moran, & Lonsdale, 2011; Bernier et al., 2009; Cathcart, McGregor, & Groundwater, 2014; Wolanin, 2005). Different skill levels may benefit more or less from mindfulness training. Future researchers could investigate whether or not the impact of mindfulness training varies with the skill level of the athletes receiving the training.

Psychological Skills Training Compared to Mindfulness Training

Clearly, many similarities exist between the results of PST and mindfulness training studies. Both types of training improved the ability of the subjects to better practice the techniques they were trained in (Goodman et al., 2014; Horn et al., 2011; Patrick & Hrycaiko, 1998; Pineau et al., 2014; Thelwell & Greenlees, 2001; Thelwell & Maynard, 2003) and both led to significant improvement in subjectively measured areas of performance (Goodman et al., 2014; Horn et al., 2011; Thelwell & Maynard, 2003; Wolanin, 2005). However, two compelling

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areas of difference are improvement in objectively measured performance and improvement in competition settings. Few PST studies showed significant findings in these two areas, while considering the short time mindfulness studies have been performed, they have shown comparatively more significant results in these areas (Gooding & Gardner, 2009; Perry et al., 2017). R othlin and colleagues (2016) are the first researcher to have proposed a randomized controlled trial study to compare the effects of PST and mindfulness training on functional athletic performance in competition in the same study. More studies, such as the one proposed by R othlin et al. (2016), that directly compare these two constructs in specific situations may further our knowledge of their comparative benefits in areas of objective performance, subjective performance, and competitive performance.

Mindfulness and Flow

One more promising area of study is the connection of mindfulness training to the construct of flow. Flow is a mental state characterized by one's complete mental absorption into a present task (Aherne, Moran, & Lonsdale, 2011; Bakker, Oerlemans, Demerouti, Slot, & Ali, 2011; Bernier et al., 2009; Cathcart, McGregor, & Groundwater, 2014; Csikszentmihalyi, 2000; Jackson & Marsh, 1996; Kee & Wang, 2008; Perry et al., 2017; Pineau et al., 2014).

Csikszentmihalyi (2000) describes nine essential areas that contribute to a state of flow: (a) challenge-skill balance, which means that one's perceived skills are adequate to overcome perceived challenges; (b) action-awareness merging, which is described as losing awareness of one's self as being separate from the actions that one is performing; (c) clear goals; (d) unambiguous feedback; (e) concentration on the task at hand; (f) sense of control; (g) loss of self-consciousness; (h) transformation of time; and (i) autotelic, or intrinsically rewarding, experience. Flow is a state that is highly coveted by virtually all athletes because of its capacity

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to increase overall enjoyment of competition and to positively impact athletic performance (Bakker et al., 2011; Jackson & Marsh, 1996). While flow is not experienced solely in athletic endeavors (Jackson & Marsh, 1996; Perry et al., 2017), its relationship with athletic performance and mindfulness is relevant to the current literature review.

Recent studies have started to show a positive correlation between flow and mindfulness (Aherne, Moran, & Lonsdale, 2011; Bernier et al., 2009; Cathcart, McGregor, & Groundwater, 2014; Csikszentmihalyi, 2000; Kee & Wang, 2008; Perry et al., 2017; Pineau et al., 2014). With flow being considered the ideal competitive state (Jackson & Marsh, 1996), increasing the frequency and quality of flow experiences could help improve competitive athletic performance. Studies performed by Kee (2008), Cathcart (2014), and Pineau et al. (2014) have each shown a link between mindfulness and flow; however, mindfulness training was not an integral part of these studies. Rather, mindfulness was viewed as a trait instead of a skill that can be taught and learned. Approaching mindfulness as a trait allows less room for the potential improvement of one's capacity to use mindfulness techniques. Aherne (2011) and Bernier et al. (2009) on the other hand, incorporated mindfulness training into their studies. Their data showed that those who received mindfulness training were able to experience greater flow in their respective events. This suggests that mindfulness can indeed be taught, learned, and help improve flow. Further research needs to be done, but such findings can greatly impact the future of sport psychology by allowing athletes more frequent opportunities to experience the ideal mental state for competition.

Conclusion

While further study is necessary, the current research suggests that mindfulness training offers comparatively greater benefits to athletes than does PST by helping athletes to achieve a

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state of flow and improve performance in objective measures and in competitive settings.

Mindfulness training is a potentially powerful new technique in the world of sport psychology that has proven effective in helping athletes to improve their competitive athletic performance. It is a practice in its infancy that differs in both application and outcome from traditional sport psychology practices such as PST, and much has yet to be learned regarding its implementation. Nevertheless, current research shows that mindfulness training could make vital contributions to help athletes improve subjectively measured and in-game performance, both of which are areas that appear to have limited support from more traditional PST studies (Aherne, Moran, & Lonsdale, 2011; Bernier et al., 2009; Cathcart, McGregor, & Groundwater, 2014; Csikszentmihalyi, 2000; Gooding & Gardner, 2009; Kee & Wang, 2008; Perry et al., 2017; Pineau et al., 2014). Continued studies involving competition settings and objective measurements will further validate the use of mindfulness as common practice among practitioners and athletes. Practitioners and athletes may want to begin considering how they might incorporate mindfulness training into their services and training routines as a way to improve competitive athletic performance.

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