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# The Effect of Mindfulness and Meditation in Sports Performance

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The Effect of Mindfulness and Meditation in Sports Performance

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A Synthesis Project

Presented to the

Department of Kinesiology, Sport Studies, and Physical Education

The College at Brockport

State University of New York

In Partial Fulfillment

of the Requirements for the Degree

Master of Science in Education

(Athletic Administration)

By

Christopher Heckman

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**THE COLLEGE AT BROCKPORT**

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**Department of Kinesiology, Sport Studies, and Physical Education**

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**Chairperson Approval**

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## **Abstract**

Sports performance has been a hot topic in the past few decades and many studies have been done on factors that effect sports performance. Everything from diet to training methods has been studied. Perhaps one of the most important aspects of sports performance is the athlete's ability to train the mind to put themselves in the best situation to compete. This can come in many different forms. Mindfulness and meditation are the main focus. Many different theories have been studied. It is important to train the mind just as you would train the body. Using mindfulness techniques have been shown to increase athletic ability and focus. This review of literature will examine at how mindfulness techniques have been used to increase performance and the athletes ability to cope with inner and external stimuli to increase the competitive edge.

Keywords: Sports performance, mindfulness, meditation, psychology

## **Chapter 1**

### **Introduction**

Mindfulness meditation has been around for thousands of years and originated in Asia. The idea of using meditation and other mindfulness techniques to cope with your environment and improve focus, has been practiced since the ancient days. Many spiritual people have used this practice to increase awareness of their self and the world around them. Breath control was also used as a way to connect with the earth's electromagnetic field, spiritual encounters, and even healing (Edwards, et al., 2013). However, during the Century of Lights (1800's), there began a division between religion and science. This led to scientists researching the physiological changes that happen during meditation and less on the theory of faith. Within the last few hundreds years there has been a more secular shift in mindfulness and through science, these religious practices have become more modern and science based. (Neves-Pereira, Carvalho and Aspesi, 2017) There have been studies in various sports about the effect of using these mindfulness practices to enhance specific skills and overall perception of oneself in the sport (Baltzell et al., (2014); (Sappington & Longshore, 2014); (Burns, 2016); (Ford et al., 2016); (Hasker, 2010). These factors may all lead to increased performance through different physiological and mental benefits.

Through various forms of mindfulness and mind training there have been significant impacts on the way athletes are able to perform. Each sport is very specific, meaning one mindfulness practice may not work across all mediums. Mindfulness involves the participant to

center themselves and the thoughts in their head. It allows the individual to focus on the present moment and not worry about outside factors that may be in their head. (Scott-Hamilton, Schutte and Brown, 2016)

Mindfulness has become relevant in sport because the practices teaches present moment regulation that is crucial to athletic performance. Previous mind training has had a focus on suppressing and stopping negative thoughts. These tactics have been shown to not be as effective as mindfulness interventions. These methods were goal setting, imagery, mental rehearsal, arousal control, self-talk, and pre-competitive routines (Hasker, 2010). This is because instead of forcing the individual to stop thinking negatively, mindfulness training allows the individual to be non-judgmental. This has a positive influence because the focus is no longer on the negative. (Gardner & Moore, 2004) This could be a huge step in athletics because mental attitude is an enormous factor in sports performance and coach-ability. Focusing on the positives and all the things within the control of the team and athletes may improve the way they and the team function as a whole during practice and performances. A athlete can then learn how to cope and accept the difficult things that come up during sports (Gardner & Moore, 2004). This may help clear their head and allow them to better focus attention on their body and the things that matter, rather than the negative things happening during their intense training load and competition.

This is also true in the military. There are many similarities of athletes and active military. During service and training, the military is put through taxing situations that test both the body and the mind. The military also have many cases of negative emotional and mental

disorders that need to be dealt with or it can mentally cripple soldiers and decrease productivity (Stanley, Schaldach, Kiyonaga, Kiyonaga & Jha, 2011) Being able to think mindfully and have better control over their thoughts and body may benefit the active military as well. The active military may be compared to athletes and many similarities can be studied.

Highly skilled sports including soccer and other team sports and endurance sports such as cycling and running may see a large benefit because most of the time the athlete is in their head focusing on the task at hand (Baltzell, Caraballo, Chipman and Hayden, 2014) . With increased mindfulness tendencies the mind will not focus on the pain or negative feelings involved in the competition and may exhibit increased sports performance. A regular mindfulness practice may also increase the likelihood of an athlete to reach a flow state in which they are in “the zone” and have increased performance,

Reviewing the current literature about various uses of mindfulness techniques and how specific adaptations happen in sport, suggests there is a connection between mindfulness training and sports performance. There are no large scale or long term studies currently available, but the current studies address many modalities and many seem to point to an effect on athletic performance and athlete attitude.

### **Statement of the Problem**

A review of the literature demonstrates that mindfulness techniques that have been adapted to sport and military training can lead to increased performance during stressful

situations. Identifying and synthesizing the literature on this topic can assist those who work with these individuals to incorporate these techniques into their training protocols to foster optimal performance.

### **Purpose**

The purpose of this synthesis project is to review the literature on mindfulness practices in athletics and its effect on sports performance.

### **Research Questions**

1. What are the benefits of mindfulness training as it relates to stress and performance.
2. What sports would benefit from mindfulness training?
3. Does Mindfulness training affect the athletes outlook and attitude?

### **Operational Definitions**

- Mindfulness- A mental mode characterized by attention to present-moment experience without conceptual elaboration or emotional reactivity (Rooks et al. 2017)
- Meditation-is the practice of turning your attention to a single point of reference. It can involve focusing on the breath, on bodily sensations, or on a word or phrase known as a mantra. In other words, meditation means turning your attention away from distracting thoughts and focusing on the present moment.(Meditation. (n.d.). Retrieved April 06, 2018, from <https://www.psychologytoday.com/basics/meditation>)
- Flow State- consists of a feeling of enhanced physical and psychological functioning, a sense of freedom stemming from absence of negative thought and self-conscious evaluation (Scott-Hamilton et al. 2016)

- Mental Toughness- the capacity to sustain one's attention on the task-at-hand, in the service of protecting against distraction and its performance and emotional costs. (Rooks et al. 2017)

### **Delimitations**

1. Population is high level athletes and military
2. Population is 149 male and 20 female. In addition 65 subjects did not denote gender
3. Participants are involved in the following sports: cycling, soccer, golf, football, swimming, and the United States Marines.
4. There are different techniques of mindfulness studied

## Chapter 2

### The Methods

The purpose of this chapter is to describe the methods used during the collection of data involved in mindfulness training and its effect on sports performance and behavior. The studies collected for this synthesis were located using multiple database searches through the College at Brockport Drake Library. The databases used were through EBSCO host.

During the search for mindfulness there were 12,000 articles initially found. Continuing the search, the keywords used were: Mindfulness, Meditation, History, Sports Performance, and Athletics. These key words were combined to narrow the articles down to 1,300. Refining my search to full text only, scholarly-peer reviewed, and journal article. This left 85 articles that met the criteria. After reviewing through the 85 articles, 10 that were based around an athletic population or were supporting results that involved human performance through mindfulness. Criteria for selection included peer reviewed, full text access, and focus on mindfulness and athletic performance. To insure that the information retrieved was current and relevant, all the articles were published between 2004 and 2016.

Three articles were found by going to a researchers website and downloading the articles directly from the reference section of the website. The website was (<http://www.amishi.com/lab/>) who is an Associate Professor of Psychology at the University of Miami. Her articles were accessed through her lab website. Additional sources were selected as part of the literature review provided context about the topic, background information and supplemental information to complete the review. All sources are cited in the reference section of this paper.

The sources are from the following journals, Cognitive and Behavioral Practice, Journal of Clinical Sport Psychology, Applied Psychology: Health and Well Being, African Journal for

Physical, Health Education, Recreation, and Dance, Biofeedback, The International Journal of Health, and Wellness, and Society. Other research was ascertained from book chapters and theses to provide additional information on the topic

Included in this critical mass there were 268 participants. This included 20 female athletes, 149 male athletes, 65 athletes not assigned a gender, and 34 male military men. All athletes were from a large variety of sports and different levels of competition. A large majority of the critical mass were collegiate athletes in Division III through Division I programs. From this mass there were 7 Division I soccer male athletes, a 22 year old Division I golfer, 100 Division I football athletes, 2 males and 4 female national level swimmers for the United Kingdom, 5 female and 42 male cyclists from Australia, 34 male military men with a mean age 30, and 65 athletes of various sports. There are other case studies looked at from various individuals as well.

## Chapter 3

### Review of Literature

The purpose of this chapter is to review the literature on the effects of mindfulness and meditation on sports performance. During this study 12 peer-reviewed articles were reviewed to form this synthesis. The information was broken down into sections that allow the information to be compared and contrasted. The sections are as follows: Sports Performance, Mental Attitude, and Flow State. Breaking the topic down into these sections allows one to look at the different adaptations that occur from a mindfulness and meditation practice and how they affect different populations of athletes. The articles that were used were with various types of athletes and skill levels. There were also different mindfulness practices used, however they have many similarities and all have the common goal of creating a better mindset for the athlete and to attempt to increase sports performance.

#### *Mental Attitude*

Baltzell et al., (2014) used a six week, 12 session mindfulness meditation program (MMTS). Seven athletes from a division I women's soccer team were interviewed following the completion of the MMTS program. All of the athletes interviewed (n=7) stated that following the program there was a shift in their relationship with emotions, both on and off the field. One athlete stated, "I think I am able to focus the excitement or anxiety towards my play instead of getting too pumped up and then trying to do too much at the beginning of the game... (like) devoting myself to win a ball that I probably can't get to because I am over excited." (p. 229) Another athlete said, "towards the end of the game... (when I was) becoming fatigued and everything, instead of saying that I'm tired and having my body sort of break down, I mentally push through it and work up the field for an attack, or get back and defend" (Baltzell et al., 2014,

p. 229). All of the athletes saw the benefit of the MMTS practice and attributed it towards their positive shift mental shift on the field. Six out of the seven athletes experienced a shift in their attitude during practice as well. Many of the participants began seeing the benefits and taking advantage of the opportunity and saw the mental side of the game improve. Ford, Wyckoff, and Sherlin, (2016) found that “Mindfulness has been reported to decrease perfectionism, thought disruption, and performance anxiety while decreasing the likelihood of being overwhelmed with emotions” (p. 154).

Burns, (2016) studied ten basketball players, where five players would meditate regularly and five did not. An observer that played basketball and meditated conducted loose conversation with the other participants over the phone or skype. The questions were geared towards finding reasons to meditate and reason to not meditate. Among the reasons to meditate, a large reason was gaining self knowledge. The players that mediated proclaimed that sitting down and freeing your mind helped them discover who they really are and see things in a different light. The players also stated that they were able to feel less stress, worry, social insecurity, feelings of fear and anger (Burns, 2016). The reality of an athlete is that there is enormous pressure on the individual and team. To be able to reduce these negative factors and have a shift in mental attitude towards the game and others around them, makes meditation a valuable tool.

Similar findings were established by Scott-Hamilton et al., (2016). The study consisted of Australian cyclists that did not have any prior mindfulness training, were club level athletes, and older than sixteen years. Baseline pre-interventions measures were given before the eight week intervention commenced. Forty seven cyclists participated in the study with five (n=5) being female and forty two (n=42) male riders. Twenty riders were in the control group and the remaining were put through the eight week mindfulness practice. The experimental group were

put through mindfulness workshops, mindfulness-integrated cognitive behavior therapy program material, and mindful spin-bike sessions. At the end of the intervention, all participants were given a post-test survey. During this study, the experimental cyclists were not any less anxious than the control group, but did show improvements in mental attitude. The mindfulness group showed lower frequency of pessimistic attributes. These findings did not reach significance, however they do show similarities to (Burns, 2016).

Stanley et al., (2011) studied a group of thirty four United States Marine reservists that were put through a program tailored to the stresses of the military. This intervention was called, mindfulness-based Mind Fitness Training (MMFT). MMFT was developed to prepare these men for deployment in Iraq. Many of the the MMFT exercises were programed based on rank and were mostly in a group setting. The thought behind doing group exercises, was to create unit cohesion and social support. The groups were broken into two, seventeen man units that were consistent throughout the 8 week program. A separate detachment of 21 male participants from the same parent unit were examined as the Marine Comparison group (MC). This group did not receive the same MMFT training as part of their pre-deployment training. The participants were then tested on separate laptops, where they completed self-reported questions based on stress, mindfulness, outlook, etc. Stanley et al., found that the higher groups with the mindfulness intervention had increased mindfulness scores from pre to post evaluation. The other groups with less mindfulness training saw a decrease in mindfulness test scores, most likely due to the stressed put upon them during this time. The findings of this study showed great promise in military personnel and could be very similar to athletes. There are a lot of similarities between athletes and the military. The stresses and physical demand of training can be compared and their

overall performance when it comes to game day or preparedness of deployment may also be compared.

### *Sports Performance*

Mindfulness training has been tested with athletes in the past and has shown promising effects. Mardon, Richards, and Martindale, (2016) found that in college swimmers, the coaches and team (6 participants) found it to be very useful. On a 10 point scale, 0 being not at all beneficial and 10 being extremely beneficial, two found it to be an eight and two rated the training to be a seven. The last two participants said the training rated a six. The coach also included that the mindfulness training program exceeded his expectations. The intervention was from a CD so the mindfulness training was standardized and consistent. The participants went through 8 weeks of 4 exercises that lasted between 10-30 minutes. These techniques included focus on breath, body and breath, standing yoga, and body scanning.

The results also found that four participants improved their attention efficiency over the eight week intervention. The study also looked at performance times in the athletes during the intervention period. Four of the participants saw improved performance times in their primary racing events. The average improvement was 1.5%. Participants two and four both had improvements in performance time, but did not report any improvement in self reported mindfulness (Mardon et al, 2016). This could be due to the participants thinking the improvements came through other variables or that the mindfulness training had little effect on the way they went about attempting to make the improvements. Overall this study showed that mindfulness did have a positive effect on most of the participants. For many of the participants attention improved as well as times. Improvement in attention makes sense because mindfulness helps participants focus on the present and what is happening to them at that very moment. The

improvement in performance time would need to be further studied to see if the increased attention during practice and competition had a positive impact or if it was just increased conditioning.

Hasker (2010) discussed how using the Mindfulness-Acceptance-Commitment (MAC) approach positively impact athletic performance. The theory is that there is no need to control or change these negative internal states, Through acceptance based strategies and mindfulness, athletes can increase task-focused attention and that increase will improve the overall performance. The approach lets the athlete realize that their thoughts are not reality. They are just passing thoughts and do not affect the way things really are. The MAC approach is similar to other mindfulness techniques because there is a focus on present- moment awareness and task-focused attention. Within the study, the MAC group did not see increases in athletic performance through self-rating. The Mindfulness Training group did however, see an increase in self rated athletic performance. Both groups demonstrated an increase in ability to engage in experimental acceptance and had greater ability to be non-reactive to inner experience. The MAC group did not experience significant improvement in flow, but the MT group did see increase in flow. These finding were in contrast to previous studies however. The MT group saw improvements in challenge-skill balance, action-awareness, clear goals, unambiguous feedback, concentration, sense of control, loss of self-consciousness, and autoletic experience (Hasker, 2010). Traditional mindfulness training seems to be a more stable intervention for creating a improvements in variables that will improve overall performance. This is also supported by Ford, Wyckoff, and Sherlin, (2016), in which they state, “Mindfulness-based practices with athletes have suggested that these interventions can have benefits for sports performance.” (p. 255)

*Flow State*

A large part of mindfulness and sport performance is due to being in a flow state. The flow state has been something many athletes have sought after since the beginning of sport. The state involves the athlete to be in complete sync with their body and the present things happening around them. “In flow , everything is optimal. Mind and body are in harmony, negative thinking and self-doubts are absent, and functioning is enhanced” (Hanin, 2000, p.141). The flow state can feel like autopilot to the athlete. Where they are competing and don’t really have vivid memories or are not putting in a large perceived effort. The opposite may also be true however, the athlete is not in autopilot, the athlete is hyper aware and so in touch with themselves that they have this out of body experience. This flow state comes from an unforced sense of focus. Mindfulness helps build this focus and may be able to help the athlete reach this state faster and with more ease due to the nature of mindfulness and being in the now. Scott-Hamilton, Schutte, and Brown, (2016) stated that, “results suggest that mindfulness based interventions tailored to specific athletic pursuits can be effective in facilitating flow experiences. Much of the research promotes the theory that mindfulness can catalyse the flow state” (p. 85). Mindfulness training has many benefits including increased flow state, decreased sport anxiety, and pessimism among cyclists (Scott-Hamilton et al, 2016). This is important because endurance sports have a larger chance of seeing flow states. This is because endurance athletes are exposed to longer bouts of physical and mental sensations of discomfort. Rooks et al., (2017) supported this showing that during intensive pre season football practices, mindfulness helped decrease the likelihood in loss of attention over long periods of time.

Scott-Hamilton et al., used a sport specific mindfulness approach to the training they gave the cyclist athletes. Part of the mindfulness training was done on the bike to mimic sport specific sensations that they may find. The participants practiced mindfulness during a spin on

their bike. This allowed the athletes to practice mindfulness as they experienced discomfort physically and the emotions that come with feeling discomfort. The participants with the mindfulness training did not test less anxious at post-test, but they were less pessimistic at post-test than any of the other wait list participants. This shows that depending on the sport and type of mindfulness practice, there may be a different effect. Practicing mindfulness on a daily bases may prove to have benefits to the athletes' attention, performance, and attitude. However, it may be beneficial to further look into how mindfulness could be incorporated into training protocol to be more sports specific.

### *Summary*

Mindfulness benefits can be seen in sports performance in varying ways. The previous studies show the how practicing mindfulness and meditation affect mental attitude, sports performance, and increase in flow state. Although different techniques were used many athletes saw benefits. These benefits include increased time of attention, better mind body connection, ability to overcome pessimistic thoughts, improvement in race times, and ability to better control emotions.

## Chapter 4

### Discussion and Recommendation for Future Research

This synthesis examined research articles to determine the effect of mindfulness training and its impact on sports performance. The intent of this synthesis project was to answer the following questions:

- What are the benefits of mindfulness training as it relates to stress and performance.
- What sports would benefit from mindfulness training?
- Does Mindfulness training affect the athletes outlook and attitude?

When examining the benefits of mindfulness training as it relates to stress and performance it was demonstrated that mindfulness practices have decreased stress, opened the mind, and created a more spiritual presence in the past. Modern society and science has taken these practices and created a more secular and scientific approach to mindfulness. Looking at a performance perspective, athletics could benefit from increased mindfulness training. The literature shows a trend that athletes have a great demand not only on their bodies, but their minds as well. A lot of focus in training athletes is based on their body. For example conditioning, nutrition, body composition, etc. Creating a solid mental platform can help athletes reach for higher potential and take away some of the mental pressure involved in their performance. Having a mindfulness practice in place will help athletes create a better understanding of themselves and the training. The literature demonstrated that athletes felt they were better equipped to focus on the task at hand and make better judgment calls because their mind was focused and trained to deal with the stressors given to them. Athletes would also

benefit because mindfulness as been shown to improve athletes ability to deal with failure and to stay focused on the task at hand. Lastly, it is hard to determine exactly if mindfulness causes an increase in performance, but swimmers saw an increase in their performance times. Is this simply due to the training effect or due to the mindfulness practice? It is hard to isolate the reason, but the swimmers did agree that they saw benefits of attitude and their feeling in the water.

In terms of sports that would benefit from mindfulness training, this question is difficult to answer. Based on the most current literature it is hard to say which sports would directly benefit from this training. It is clear that athletes gain many benefits as stated above, but which sports would benefit the most is unclear. Highly skilled sports and sports with high levels of endurance would benefit by the fact that they are able to focus on the task at hand and forget about negative feeling. More research would be needed to find a more substantial answer.

Finally, regarding the impact of mindfulness training on athletes outlook and attitude researchers found that soccer players expressed how they felt better prepared for their competition. One athlete felt that she was able to better deal with anxiety and other emotional reactions that come during competition. Athletes are also able to better prepare themselves for negative thought and outcomes. They had better reactions to these negative stimuli and could keep their focus on performing at the highest level. There is a common theme that many athletes see a shift in their mental attitude which could lead to better performance, learning, and possibly prevent burnout.

### *Recommendations for Future Research*

The following present recommendations for future research in the area of mindfulness training and its impact on athletic performance.

1. It is recommended that more extensive studies be done because it is still only an emerging field of study within the last 20 years.
2. Future research should also determine how mindfulness can be presented specifically for individual sports.
3. More large scale studies will help see larger trends and eliminate any speculation.

### **Summary**

This synthesis shared the information found on mindfulness training and how it can be used in an athletic setting. The research focused on the how mindfulness affects athletes of different sports and abilities. The effects can be a little different across mediums. However, there are many benefits to adding mindfulness practice into athlete's training regimen.

Developing athlete specific mindfulness will not only open up a new pillar in mental training, but could also bring forth new theories on sports psychology. Using this knowledge can help increase self awareness, mental attitude, increase likelihood of reaching flow state, and increase sport specific performance. Although there is some research found, it is recommended that more extensive studies be done because it is still only an emerging field of study within the last 20 years.

## Appendix A- Article Grid

### Synthesis Article Grid

<b>Authors (Year)</b>	<b>Purpose</b>	<b>Participants</b>	<b>Methods &amp; Procedures</b>	<b>Analysis</b>	<b>Findings</b>
Baltzell, A., Caraballo, N., Chipman, K., & Hayden, L. (2014)	Explored relationship between soccer players and a 6 week MMTS program	7 female Division I soccer players	A MMTS mindfulness program consisted of 12, 30 minute sessions. Also practiced 5-10 minutes at each practice session. The program consisted of focus on breath and labeling emotions.	Interviews were given after the protocol. They were then coded.	Participants were more focused on preparing for games, increased control of emotions, improved focus.
Edwards, S., Sherwood, P., Naidoo, N., Geils, C., Van Heerden, K., Thwala, J., & ... Edwards, D. (2013)	To explore and investigate a single session of breathe meditation	4 men and 4 women with mean age of 45	20 minute meditation with a post written interview about their experience.	Wilber AQAL model, which involved qualitative and quantitative data and analysis of bio indicators	Breathing becomes a conscious process, feeling of bliss, mind may wander further into meditation, and breath slows automatically
Ford, N. L., Wyckoff, S. N., & Sherlin, L. H. (2016)	To explore literature on techniques and a case study to offer steps on implementing the mindfulness techniques	22 year old Division I golfer	mindfulness, CBT, and neurofeedback for 3 week intervention	Interviews	Mindfulness during sport allow an athlete to decrease anxiety. It allows the athlete to be present. Can be generalized outside of sport.
Gardner, F. L., & Moore, Z. E. (2004)	Exploring the Mindfulness-Acceptance-Commitment-Based approach to athletics	N/A	N/A	N/A	Having an accepting approach to mindfulness allows athletes to focus on the positive and have a better attitude
Hasker, Sarah M. (2010)	To investigate the Mindfulness-Acceptance-Commitment strategy	19 collegiate athletes of various sports	7 week mindfulness protocol	analysis of variance	groups did not significantly differ in performance, but the MAC

Rooks, J., Morrison, A. B., Goolsarran, M., Rogers, S. L., & Jha, A. P. (2017)	Investigate the impact of short-form mindfulness training (MT) vs. Relaxation training (RT) on attention and emotional wellbeing in college football players	100 College football players	mindfulness training vs, relaxation training,	t tests, regressions, and structural equation modeling	group had increased mindfulness characteristics MT showed protection from decline in sustained attention, MT and RT protected against decline in well-being
Jekauc, D. , Kittler, C. and Schlagheck, M. (2017)	To study mindfulness as a type of psychological training for athletes	46 athletes randomized	Berlin Mindfulness-based Training for Athletes (BATL) was tested and compared to a classical sport psychological intervention	analysis of covariance	the intervention group significantly improved mindfulness as a trait compared to the control group
Hanin, N. L. (2000). (Book) Chapter 6	To explore emotions in sport and what their effect is	N/A	N/A	N/A	Flow in sport is crucial. It takes focus away from outside factors and focuses the athlete on internal factors
Mardon, N., Richards, H., & Martindale, A. (2016).	Investigate the impact of mindfulness training on attention and performance in swimmers	2 males, 4 female national level swimmers for UK	Paper and pencil mindfulness test, Mindfulness CD program with breath, body, and yoga	Coding and graphing of test scores and observations were made.	Improvement in attention, self evaluated performance criteria ratings, and performance times
Sappington, R., & Longshore, K. (2015).	To review and evaluate the efficacy of mindfulness interventions	N/A	N/A	Various analysis	mindfulness-based interventions show promise as being effective in improving performance and associated characteristics
Scott-	Investigate	5 female and	pre and post test	ANACOVA	mindfulness

Hamilton, J., Schutte, N. S., & Brown, R. F. (2016)	whether mindfulness training increases athletes' mindfulness and flow state experience and decrease anxiety	42 male cyclists from Australia	questionnaires with home meditation, weekly workshops, and stationary spinning sessions	of pre-test and post test results after the mindfulness intervention.	training tailored to specific athletic pursuits can be effective in facilitating flow experience.
Stanley, E. A., Schaldach, J. M., Kiyonaga, A., Jga, A. P (2011)	To investigate if specific mindfulness training during pre-deployment training will increase mindfulness and decrease stress.	34 male military men, mean age 30	Computer based test on mindfulness, stress, etc.	multiple regression with Practice Time as dependent variable with multiple test scores. Along with qualitative analysis of questions.	The groups with more time practiced had an increase in mindfulness. Stress was not affected much by the training however.

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