# INTEGRATING MINDFULNESS MEDITATION INTO SPORT THERAPY

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by

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# General Abstract

*This thesis was supervised by Dr. Athanasios (Sakis) Pappous (School of Sport and Exercise Science, University of Kent, UK), Co-supervised by Dr. Dinkar Sharma (School of Psychology, University of Kent, UK).*

Since 1979, once Kabat-Zinn developed Mindfulness Based Stress Reduction (MBSR), gradual changes in the domain of health have been observed. Hence, the flow of mindfulness into numerous fields of scientific research. One of fields which mindfulness meditation (MM) has been integrated into is sport. Many investigations have successfully documented how MM can enhance athletes' performance, as well as improving their negative mood state. Notably, the majority of this research has focused on sport performance. Despite the promising theory, there has been no experimental study regarding the increase in pain tolerance (PT), reduction of perception of pain (PP) and psychological distress for athletes once they have become injured.

The Cold Pressor Test (CPT) had been used to discover the effectiveness of MM regarding physical pain with injured athletes (IA). Additionally, this was conducted in order to understand whether MM could benefit them with their condition. Therefore, a commonly used meditation technique, based on MBSR, had been used as an intervention during the period of recovery with IA. The first study set out to determine the role of MM training in increasing pain tolerance, reducing the perception of pain, mindful attention, reducing anxiety/stress and improving mood state. The experimental data found that PP increased in CPT for IA who received 8 weeks of formal and informal MM training. However, no reductions in CPT were observed in PP. Quantitative findings showed that mindful attention had significantly changed for IA in the intervention group. There was also an improvement in the control group, even though they had not received MM. This is might be due to the physiotherapy treatment that had increased their level of awareness.

MM had also been investigated with therapists (physiotherapists and sport therapists) in the second study, through both formal and self-directed practise. Questionnaire assessments of MM were collected from 29 therapists who were involved in 4 weeks of the MM program

from different countries and methods of practice. It was important to note that the process of data collection was through a website that was developed only for research purposes. There were two research questions that were investigated. The first was Does MM increase therapists' body-awareness and reduce their burnout in the workplace? Additionally, it looked at the positive effect of MM on their personal attitudes after 4 weeks of formal and self-directed practise. The second research question aimed to understand which methods (face-to-face and Skype (FFG) with an instructor or self-directed (SDG), MM program were more effective with therapists. The findings indicated that there was a positive effect of MM in increasing their body-awareness through the MAIA scale, particularly attention-regulation, self-regulation and trusting and BST personal-achievement for therapists in the FFG. As such, the findings found a significant improvement in FFMQ in acting with awareness, the PANAS positive affect and SCBC. As a result of these findings, therapists who practised MM face to face with an instructor obtained more benefits compared to their peers in the SDG.

In previous studies, MM had been investigated through both experimental and quantitative methods. In order to aid further understanding about the effect of MM, a qualitative approach was implemented with both clinical and non-clinical populations through semi structured interviews. Two research questions were examined with both IA and therapists. In the third study, the qualitative study sought to understand and explain what experiences the "injured athletes" had experienced during the eight weeks' formal and self-directed MM program. In the last study of this thesis, the qualitative investigation sought to discover what the therapists' perceptions of the effectiveness of the MM program were.

Taken together, both IA and therapists emphasised that the MM program had positively affected their attitudes after their participation. With regard to IA experiences', MM is a suitable mental training that can be used during the sport rehabilitation process (SRP). On the other side, the therapists stressed that MM is an effective strategy to use in the workplace and at home.

The findings of this thesis provide a better understanding of practising MM in both clinical and non-clinical populations in sport. This is in addition to the variety of methods that were used to assess MM in all the studies. Consequently, this novel work in sport could contribute towards a broad theoretical and practical foundation in future research.

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# List of Abbreviations

| | |
|---|---|
| BST/MBI | Burnout Self-Test, Maslach Burnout Inventory |
| DASS 21 | Depression, Anxiety and Stress Scale |
| FFG | face-to-face group |
| FFMQ | Five Facet Mindfulness Questionnaire |
| IA | injured athletes |
| MAIA | Multidimensional Assessment of Interoceptive Awareness |
| MBSR | Mindfulness Based Stress Reduction |
| ME | mindful exercise |
| MH | mental health |
| MM | mindfulness meditation |
| MMP | mindfulness meditation program |
| PANAS | Positive and Negative Affect Schedule |
| PP | perception of pain |
| PSS | Perceived Stress Scale |
| PT | pain tolerance |
| SCBCS | Santa Clara Brief Compassion Scale |
| SDG | self-directed group |
| SI | sport injuries |
| SPI | sport injury |
| SRP | sport rehabilitation process |
| WHO | World Health Organization |

# Publication Arise From the Thesis

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# CHAPTER ONE

# General Introduction

# General Introduction

## 1.1 What is Mindfulness?

To illustrate mindfulness terminology, in 1881 T.W. Rhys Davids, first translated the term sati in the Pali form or smarti in the Sanskrit form into the English word "mindfulness" (Gethin, 2011). Mindfulness is an English term, which means the same as the words sati and sampana in the Pali language, which means awareness, discernment, retention and circumspection (Shapiro & Carlson, 2009). Mindfulness can be understood from two perspectives, as an Eastern spiritual traditional practise and also in the scientific context in which it is used as a psychological intervention in the West. Historically, and according to Bach and Robinson, mindfulness is a part of meditation practice that derived from the belief system of Eastern spiritual practise, particularly Buddhist traditions. In addition, it is a way of cultivating the consciousness in the present moment (Bach & Robinson, 2017). In the scientific field, mindfulness has been widely applied as an intervention to improve the health benefits for both the clinical and non-clinical populations, such as those of (Kabat-Zinn 2009; Pbert et al., 2012; Reich at al., 2017; Jekauc, Kittler & Schlagheck, 2017). Mindfulness infuses consciousness in the present moment of the mind and body without judgment (Stahl & Goldstein, 2010). It is worth noting that, mindfulness can be applied in both formal and informal practise. Formal practise means that practitioners intentionally organise daily time to practise mindfulness meditation as a sitting mediation, lying down and breathing mediation, standing, using sounds, bodily sensations, or thoughts and emotions. In contrast, informal practise is applied through bringing mindful attention into daily activities, such as exercising, eating or doing household chores at work or at home. In other words, it involves being mindful during any activity that you practise (Stahl & Goldstein, 2010). The most recognised definition of mindfulness is that defined by Kabt-Zinn 'mindfulness means paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally' (2009:4). Our definition is that, mindfulness is the observation of the mind from whatever body-sensations and emotions that might arise, and being in the present moment.

## 1.2 Why Mindfulness?

Kabat-Zinn developed Mindfulness Based Stress Reduction (MBSR) in 1979 at the University of Massachusetts Medical Centre in Worcester, USA, to assist patients with chronic disorders when it seemed that traditional treatments were not noticeably effective for them. MBSR has been extensively applied as a clinical intervention by researchers' on-the-spot of scientific research. In addition, a huge body of literature has been derived from the MBSR program. In particular, Mindfulness-Based Cognitive Therapy (MBCT) by Segal, Williams, and Teasdale (2002). Besides, other mindfulness based programs have been established by Kabat-Zinn (2005) for particular purposes, such as cancer treatment, childbirth, eating disorders, parenting and other interventions (Ergas, 2014). Depending upon Kabat-Zinn's approach, working in mindfulness approaches is being continued by other researchers, who are investigating the effectiveness of mindfulness such as (Pollard et al., 2017; Reich et al. 2017; Levoy, Lazaridou, Brewer & Fulwiler, 2017; & Krzeczkowski, Robb & Good, 2017). Mindfulness has also been integrated into educational approaches for health practitioners. Dobkin & Hassed (2016) stated that mindfulness should be taught in both postgraduate and undergraduate studies as an effective clinical skill. As it turns out from literature, mindfulness meditation is an effective tool to use with both patients and health practitioners. The rational to study the effect of mindfulness was based upon the following four main elements.

1. Mindfulness has been used extensively in scientific research with a high-level of validity and reliability.
2. In this thesis, the mindfulness program was based on Mindfulness Based Stress Reduction (MBSR) that was developed by Kabat-Zinn (1979); thus, it has become the basic research for numerous mindfulness approaches. Indeed, as Kabat-Zinn (2009) stated, mindfulness has increased impacts on other fields such as sports, education, economics, leadership, business, technology, law, government, and politics; in parallel, with it being a new area in medicine, psychology and health care. As a result, this explains why mindfulness has great benefits for our lives.
3. The other reason for using mindfulness in this thesis with both injured athletes and therapists was its flexibility in terms of practise, it can be practised at any time or any place, with a group or individually. In addition, mindfulness is very safe and does not

include any kind of medication that might have side effects on injured athletes or therapists.

4. Indeed, the idea of investigating the influence of mindfulness on injured athletes and therapists grabbed our attention, because to the best of our knowledge, this is the first thesis that has investigated the influence of mindfulness on injured athletes and therapists.

## 1.3 Injured Athletes and Mental Health

Athletes in all fields of sport activities might face the risk of injuries. As such, sports injuries are serious issues that athletes have to pay attention to in order to prevent them occurring and also have the capability to return to their sports after being injured. As Nicholl, Coleman and Williams (1995) estimated, 29 million sports injuries occur each year in the UK. According to Hawkins & Fuller (1999) the proportion of injuries among football players is higher than other sports and professions. They estimated the rate of injuries between professional footballers in four English Leagues to be nearly 1000 times higher than any other occupation. Moreover, Beynnon, Renström, Alosa, Baumhauer & Vacek (2001) reported that more than two million people each year in the USA suffer from ankle ligament injuries, notably, half of them are diagnosed as severe injuries. It is clear from the previous data that, sports injuries have a very high rate of risk between athletes. As Bahr & Holme (2003) stated, literature has shown overwhelming benefits that emerge from physical activity, such as health, relaxation, pleasure, competition, socialisation, an improvement in fitness and many other benefits. In addition to that, regular exercise can lead to a reduction in the risk of premature mortality, obesity, heart disease, hypertension and particularly diabetes mellitus. Nevertheless, participation in physical activity might lead to permeant disability as a result of a sports injury. In other words, despite the countless advantages of physical activity, it can expose athletes to the risk of injuries. Schneider, Seither, Tonges & Schmitt (2006) have specified that the side effect of physical activity is injuries.

To shed light on psychological models that relate to sports injuries, there are two types of psychological-adjustment that have been recognised. The first, is the stage model that the author states was inspired by literature concerning grief reactions. The second, which are cognitive appraisal models were realised as stress and coping approaches in research. In the stage models, there are two assumptions of psychological-adjustment. Once athletes

have become injured, they feel that a part of them is missing. This feeling emerges after they have been away from their sports that provide them with a social role, a sense of identity and a specific charisma. The other assumption is that, achieving satisfactory-adjustment of psychological response, is unalterable because injured athletes follow a predictable path. Sport psychologists specify that, prior to achieving an acceptance, the athlete's progress consecutively goes through the stages of anger, depression, denial and bargaining (Brewer & Redmond, 2016).

With regard to the second models, Brewer & Redmond (2016) identified that cognitive appraisal models put forward that athletes' interpretation of their injuries or judgement of their physical state, (besides the context of injury) once it had occurred, played an essential role in determining how they responded emotionally, behaviourally and cognitively. This is instead of a predictable way that athletes respond to their injuries.

In terms of a psychological point of view, injured athletes might experience both physical and psychological consequences after being injured. Walker & Heaney (2013) emphasised that psychological effects on injured athletes can be noticed by anybody who has experience of a sports injury, whether it be athletes, a coach of an athlete or even medical practitioners who are treating injured athletes. As a result, the physical effects may cause psychological changes such as anxiety, depression, isolation, anger and frustration. More specifically, Schinke, Stambulova, Si & Moore (2017) indicated that people who surround athletes, such as teammates, coaches, sport psychologists and medical staff have to be conscious of referring to their evidence-based interventions, cultivating help-strategy behaviours and also the presence of clinical and subclinical mental conditions. As a consequence, these factors will lead injured athletes to cope better and recover from injuries. In relation to the psychological consequences, Reese, Pittsinger & Yang (2012) reported that sport injuries frequently make injured athletes' lives imbalanced and also disrupted. Thus, injured athletes will face health risks and also the inability to achieve their athletic targets.

It is from this perspective, that paying attention to improving the mental health of injured athletes is very necessary. As outlined by Markser (2011) this is because of the massive social, somatic and mental stress that athletes are exposed to. By the same token, a study by De Heredia, Munoz & Artaza (2004) described that the mental response to injury as a subjective estimation of the injury, mood states and adherence has positive effects on sport

recovery. Therefore, and based on these results, the psychological responses of injured athletes can have an effect upon their abilities to handle injuries and also achieve better consequences in the rehabilitation process. Furthermore, Putukian (2016) demonstrated that psychological responses fluctuate among athletes who have been injured, from the moment of occurrence to the post-injury stage, followed by the rehabilitation process and then when athletes return back to their sports. Hence, through psychological responses, the mental health conditions that emerge from injuries such as anxiety, depression, substance use/abuse and eating disorders can be observed. Consistently, Brewer & Redmond (2016) indicated that sport injuries impact upon athletes' behaviour as well as emotion and cognition. Therefore, rehabilitation outcomes can be affected by behavioural responses to sport injuries. It should be noted that, they referred to rehabilitation outcomes in terms of terminology, which includes both biopsychological consequences, such as pain endurance, rate of recovery, strength, joint laxity and range of motion, in addition to sports injury rehabilitation consequences, such as quality of life, preparation to return to sports and functional performance.

It is therefore important, to pay more attention into injured athletes' mental health, despite the sizable body of literature and psychological models that have been developed to support injured athletes to handle their injuries. For example, these pieces of research were developed in the realm of the psychology of sports injuries (Wiese-Bjornstal, Smith, Shaffer & Morrey, 1998; Maddison & Prapavessis, 2005 & Pazit et al., 2017). Mental health was defined in 2003 by the World Health Organization (WHO), as a feeling or a sense of wellbeing that enables an individual to handle their stressful experiences. This is in addition to becoming more productive and fruitful, and also encouraging them to feel better about their affiliation and contribution in a community. From this point on, health is not only the absence of sickness or infirmity, but also a complete context of mental, physical and social wellbeing (WHO, 2003). With respect to injured athletes' mental health, Keilani et al., (2016) mentioned that mental training techniques can provide athletes with an ability to handle sport-associated injuries (SAI), thus they can improve their mental skills and counteract distress. These mental techniques, showed an improvement in both mental recovery and sport performance such as breathing techniques, cognitive interventions, progressive muscle relaxation, imagery/visualization and many others.

Furthermore, the role of social support also has effects on injured athletes in the rehabilitation process. As Rees, Mitchell, Evans & Hardy (2010) emphasised, this social

factor might affect the athletes' capability to cope with distress, through receiving support from their family members, friends, coaches, teammates and also medical practitioners who are treating them. The social factor in the rehabilitation process has been also stressed by Podlog, Heil & Schulte (2014) who stated that socialising and connecting with teammates or training together, a love of the sport, preserving identity and keeping their fitness level high and also reaching personal goals provided support to injured athletes to return back to their sports faster. Importantly, long-term and short-term goals play a significant role in recovering from injuries.

In light of the above, and in addition to the positive impact of physical rehabilitation on those injured, the psychological response also plays a significant role in terms of recovery time. Notably, injured athletes who recover quickly from injury and in both senses, indicated that they had a greater adherence to the rehabilitation process, better mood state and less judging of their injuries (De Heredia et al., 2004).

### 1.3.1 Model of Sport Injury and MBSR

Brewer & Redmond (2016) found that the psychological response around sport injuries includes cognitive appraisal (CA), emotional response (ER) and behavioural response (BR). CA begins with the psychological response to the injury. This can be clearly distinguished by stress and coping responses to an environmental event or situation that determines their behavioural reactions and emotional responses. The form of CA is assumed as a primary appraisal, secondary appraisal and the last stage is reappraisal. An environmental event or situation of SI is appraised by the influence upon the individual's happiness. For instance, "the injury could not have come at a worse time", "An event may be irrelevant" and "I need to have rest anyway". Athletes in the secondary appraisal are thinking about coping with a stressful event. More specifically, athletes will pay attention to what should be done about their injury, whether they should begin a sport rehabilitation process (SRP) and what is required to return back to recovery. The third CP is reappraisal, this can be noticed through 'modifying appraisal' based on a learning process that provides athletes with an understanding of "effective treatment techniques", which leads to changes in their attitudes about their injury. In addition, the sport rehabilitation process is subject to changing athletes' perceptions of injury.

Emotional response (ER) is the second dimension of psychological response that is subject to recovery outcomes. Emotions are considered to be a core psychosocial response to SPI

Brewer & Redmond (2016). It is notable that in the literature, the most attention with regard to psychological outcomes to SPI was the emotional reaction, from the work of Little (1969) to the present time. Moreover, ER was investigated through both qualitative and quantitative methods to assess the effects of sport injury on athletes' emotions and moods. Regarding the use of qualitative methods, to understand athletes' attitudes and emotions after being injured, they should be asked to talk about their own experience in considerable detail. For instance, athletes can describe how their emotions were after injury and how they reacted in the initial phases of the sport rehabilitation process. Furthermore, how they handled the negative emotions that were raised after the injury and also how negative emotions such as anxiety, anger, frustration, disappointment and fear can change to positive attitudes or feeling more positive in comparison to the initial stage of injury after receiving rehabilitation (Brewer & Redmond, 2016). In contrast, to collect information about ER, sport injury researchers used different measurements, such as a Profile of Mood States (POMS) (McNair et al., 1971) or Emotional Responses of Athletes to Injury Questionnaires (RAIQ) (Smith, Scott and Wiese, 1990). POMS and RAIQ are similar to other instruments in that researchers found that injured athletes reported their negative experiences to be similar to athletes who explained their negative emotions in qualitative studies. Similarly, injured athletes might also experience positive emotions after an injury; however, positive emotions are less well documented in the literature (Brewer & Redmond, 2016).

The last dimension that influences recovery outcomes with injured athletes is the behavioural response (BR) (Brewer & Redmond, 2016). The importance of BR is the direct influence on sport rehabilitation outcomes (Brewer, Andersen et al., 2002 & Wiese-Bjornstal et al., 1998). In addition, injured athletes' behaviours are very important at this stage, because they are relevant to adherence to SRP. Another side to this importance is coping behaviour, as athletes try to cope with the injury by preparing cognitive strategies, which encourage successful treatment (Brewer & Redmond, 2016). Literature showed that there are various coping strategies in response to SPI. Brewer & Redmond (2016) mentioned some of those strategies that injured athletes can cope with regarding their injuries (Bianco et al., 1999). They used a variety of strategies by using different methods which include (a) providing a forceful program for their rehabilitation; (b) gaining information about the injury; (c) finding alternative therapies; and strengthening injured athletes' bodies. Another strategy that was used with "Australian Football League" players

for coping with SPI was seeking social support after disengaging from their clubs (Ruddock-Hudson et al., 2014). Another strategy by Wadey, Evans, Hanton and Neil, (2012a; 2012b) that can be used with injured athletes was ‘problem-focused behavioural strategies (e.g., pursing goals) and emotion-focused or avoidant behavioural strategy (e.g., watching TV or going out drinking) to cope with their injuries (Brewer & Redmond, 2016:75).

On the other hand, and to understand whether MBSR is a suitable technique that might support injured athletes in terms of psychological responses to SPI, it is important to address what exactly MBSR could provide for athletes to cope with postinjury emotional responses. In addition, to the above is addressing how athletes can be benefit from MBSR techniques during SRP. MBSR is a treatment for the body and mind that could maintain health and lessen pain and improves mood (Morone et al., 2008). Furthermore, MBSR was not only used with psychological disorders, but MBSR also could be cultivated as a manner for every-day life. Consequently, it contributes to a decrease in discomfort, which usually accompanies psychological conditions and pain for both males and females during meditation practice (Ott et al., 2006). MBSR can positively influence respondents in both mind and body.

With regard to the mind, mindfulness practice can support injured athletes and therapists to overcome the negative self-talk that might come into their mind. This will be through observing these thoughts as an event and to be aware of it and in the end, it will pass. In other words, it is like watching all the thoughts in the mind, and becoming more aware of them, just like watching clouds in the sky come and go. The magnificence of mindfulness is in providing the respondent with the tools to learn how handle negative and distressing thoughts, as mental events and not truths (Stahl & Goldstin, 2010). Another way of letting go of negative thoughts is the habitual style of thinking. Regular mindfulness practice will help practitioners to have a particular style of thinking; this will also encourage them to achieve greater well-being. As Stahl & Goldstin (2010) emphasised, regular thinking patterns increase the level of awareness and consequently provide an opportunity to look differently at your situation and accept your negative self-talk as mental events not truths.

Another benefit of MBSR is coping with negative interpretations. Judging situations and events can have direct and tremendous impacts on your level of well-being (Stahl & Goldstin, 2010). In contrast, judging might also lead to an increased level of suffering. On

this basis, and as mentioned above, injured athletes might have negative judgements about their injuries after being an injured. In addition, injured athletes might feel that a part of them is missing and have many thoughts regarding returning back to their sports and recovery treatment. Therefore, it is important to understand what MBSR can provide in terms of judging such situations to injured athletes. Kabat-Zinn (2018) illustrated that a non-judgmental part of meditation does not mean you should not have any kinds of judgment. Instead, it means that you will observe countless judgments, and gain an awareness that there are all kinds of judgments, such as "dislike, like, desire, aversion, good, bad". Hence, to be non-judgmental is a way to deliberately suspend the judging, and observing of how situations go on.

Both body-awareness and physical pain are two elements that can recognise how MBSR benefits the body. MBSR includes very particular techniques, such as a body scan and breathing meditation that can help injured athletes live in the present moment of his/her body. A body scan is one of the main techniques that can increase body awareness in injured athletes. This is would be through paying attention to all physical sensations that are present: aches, itches, pain, heaviness, lightness, cold, warmth and many others, by observing them without judging or manipulating the body. As a consequence, a body scan will help injured athletes to discover a range of physical feelings and reconnect them with other aspects of life (Stahl & Goldstin, 2010). Another technique that MBSR can provide to injured athletes regarding body awareness is breathing meditation. Paying attention to our breathing is the key to reminding ourselves of the present moment and to be fully awake whatever is happening now. Furthermore, mindfulness will help you to feel your breath purely; this feeling of breath will encourage you to increase your body awareness (Kabat-Zinn, 2009).

With regard to clarifying how MBSR works with physical pain, this can be noticed via three steps in applying MBSR to pain. The first step is observing tension and pain in the body. By practising mindfulness meditation on a daily basis, injured athletes can understand how to cope with their tension and painful areas of the body. MBSR provides an opportunity to reconnect with pain and tension, by distinguishing body sensations from mental sensations and emotions, and then you can learn how to hold the pain and tension in the body and eventually have an ability to cope with it (Stahl & Goldstin, 2010).

The second step that MBSR can provide is working with emotions of physical pain. Mindfulness practice offers techniques to cope with unpleasant emotions that usually arise during physical pain, such as confusion, grief, fear, anxiety, anger and sadness. Paying attention to emotions will allow practitioners to acknowledge them whatever they are without resistance. It is notable that, resistance to hard emotions during physical pain often causes more pain, though learning to let it go and letting be without fighting such emotions will reduce the suffering that emerged from negative emotions. More specifically, instead of resistance and fighting the hard emotions, the individual should observe whatever they feel and let emotions go wherever they go (Stahl & Goldstin, 2010). More understanding about physical pain and emotional reactions will help to acknowledge the differences between pain and suffering. MBSR will help to change the emotional responses to physical pain over time even without changing physical sensations. In other words, the body includes pain receptors, which help to feel pain and often prevent an injury, while emotional reactions are optional. Eventfully, MBSR techniques can provide the ability, with regular practice, to feel pain with less suffering (Stahl & Goldstin, 2010).

Living in the present moment is another step where MBSR can influence physical pain. Through this step, injured athletes can have an ability to live in his/her present moment without being attached to what happened in the past and will happen in the future. In this way, they can deeply observe their physical state and go through it. In this vein, and based on the fact that the "present moment" is the only real life that you have, here and now, and the only time that you can make any changes, mindfulness offers the capability to be fully awake in the present moment and not be concerned with what the future will bring, because nobody is sure that pain and tension will last forever (Stahl & Goldstin, 2010). MBSR teaches practitioners to accept and live with pain one moment, then to create an attitude of "Let's see if I can be with pain in this moment", if pain arises in the next moment, I'll deal with it then" (Stahl & Goldstin, 2010).

## 1.4 Therapists and Mental Health

Based on the literature, the nature of the therapists' profession includes a high level of stress and burnout. Nathiya, Sasikumar, Jagannath, Thangaraj & Adalarasu (2017) indicated that a therapist's work environment includes different physical movements from positions to postures such as standing, sitting, walking, pushing, lowering, demonstrating, stretching, bending, reaching and lifting. Therefore, this leads to therapists facing both

physical (ascendant and injuries) and also psychological symptoms (stress). In addition to that, they are also exposed to musculoskeletal disorders. Through a qualitative study that has been undertaken by Broom & Williams (1996) it was found that stress is a very serious issue that therapists suffer from during their work. Thus, it has an effect on both their professional performance and also their well-being rate. Moreover, Lindsay, Hanson, Taylor & McBurney (2008) emphasised that stress is one of the workplace dilemmas that can be found in both medical staff and employers. It has also been shown that therapists as a group of health practitioners suffer from stress in their workplace. Another condition that therapists are likely to suffer from is burnout. Maslach, Jackson & Leiter (2006) identified that burnout is a psychological state that can be noticed by the sense of an emotional fatigue, reduction in personal achievement and depersonalisation, which occurs between those who are working with other people.

Recently, burnout became a theme for a range of scientific research in both qualitative and quantitative forms and it lead to low-organisational commitment, job-dissatisfaction and absenteeism (Gupta, Paterson, Lysaght & Von Zweck, 2012). Consistently, professional health staff usually counteract burnout which leads to physical and emotional stress, because of prolonged responses to their workplace dilemmas. Thus, psychological conditions and in particular burnout have many health implications and also effects on their behaviour (Piko, 2006). Schlenz, Guthrie & Dudgeon (1995) reported that therapists experienced a higher level of burnout, particularly emotional exhaustion, which was recognised by physical and psychological tiredness. Furthermore, Śliwiński et al., (2014) specified that medical practitioners such as medical doctors, physiotherapists, nurses, psychologists and social workers are frequently exposed to burnout, according to the nature of their work, as they deal with people who have illnesses and who feel upset and anxious because of their medical condition. Likewise, Pavlakis, Raftopoulos & Theodorou (2010) emphasised that therapists are at risk of burnout, because of their close contact with clients and also because of their significant role in the recovery period.

As such, Fischer et al., (2013) stressed that the potential indication of burnout in physiotherapists is the client's desire for distance or proximity to the therapist, based on the direct and close body contact with them. In turn, the body is the main factor in physiotherapy treatment, more specifically; the body-awareness of each person becomes an object and starting point of the physiotherapy procedure (Jorgensen, 2000). From this view, the decisive factors that affect therapists are interpersonal communication and

contact with clients. As previously noted, therapists work with people who suffer from medical conditions. Therefore, their work requires special predispositions and different skills to cope with patients who have had difficult experiences. It is noteworthy that the contact and interface between individuals, families and groups with therapists is a sort of social-contact that points towards satisfying needs with regard to health and also life (Śliwiński et al., 2014). It is important to note that, as a part of the health care system, physiotherapy plays an effective role in terms of enhancing both wellbeing and health. Similarly, it also has significant effects on the recovery process from physical disorders. Along with this, physiotherapy provides an essential intervention that supports clients to recover from medical conditions and restore body system functions and improve their quality of life. And given that, the therapists' role in the rehabilitation process and health improvement can clearly be understood (Higgs, Refshauge & Ellis 2001).

With respect to this contact, not only does physiotherapy treatment have effects upon injured athletes' recovery, but also psychological components have an impact on their return to play after being injured. To support this view, Herring (2006) stressed that once athletes become injured, there are variety of emotional reactions that arise. The initial responses begin with evaluating their injury implications, how they should cope with their injuries and also thinking of being injured. They also stated that, emotional reactions for injured athletes' include frustration, lack of motivation, sadness, irritation, feeling disengaged, sleep disturbance, feelings of isolation, anger and alterations in appetite. These negative responses become seriously problematic when the process of healing does not improve or even worsens over time. This is could be realised through the depression level of injured athletes'. Thus, understanding emotional responses for injured athletes' might support and resolve their medical condition or it may negatively affect the rehabilitation process.

Interestingly, psychological research in the domain of the sport rehabilitation process (SRP) was abundant. As suggested, various mechanisms and interventions would support injured athletes having a lower rate of injuries and also it would reduce any negative psychological effects after being injured (Brewer, 2010). Sizeable literature has emphasised the positive role of psychological education on the recovery process for injured athletes (Hamson-Utley, Martin & Walters, 2008; Brewer, 2010; Podlog et al., 2014 & Heaney, Rostron, Walker & Green, 2017). Consistently, the main task for therapists and athletic trainers when an athlete is injured, is to assist them in their efforts to return to

sports. Importantly, often the negative emotional responses which arise after being injured leads to a lack of recovery period from injury and rehabilitation adherence. This encourages physician teams to search for different mechanisms in the physiotherapy process. Therefore, a reduction in the recovery period from the sport injury, stimulates an injured athlete to adhere to physiotherapy, reduce the anxiety level and improve self-confidence. This can be achieved through psychological techniques that are provided to them during the SRP (Hamson-Utley et al., 2008). A study by Francis, Andersen & Maley (2000) investigated both motivation and communication between injured athletes and physiotherapists and found that it had positive effects on sport recovery.

Furthermore, through research conducted by Jevon & Johnston (2003), participants reported the quality of the connection between physiotherapists and injured athletes. They revealed that, the capability of physiotherapists to build up confidence in injured athletes, the adherence by the injured athletes to SRP and the productive communication between both are the key factors to a successful treatment.

Other researchers have found that, qualified physiotherapists in the UK who are working in the SRP gained an improvement in their "sport psychology related attitude and referral behaviours" through psychological approaches towards sport injury. This improvement can affect their work as well as the experience of the clients they examine (Heaney, Walker, Green & Rostron, 2017).

As outlined by Arvinen-Barrow, Massey & Hemmings (2014) sports-medicine-professionals (SMPs/physiotherapists and athletic trainers) are required to understand the values of psychological intervention, as it can support injured athletes in both physical and psychological dimensions of the SRP, with regard to the direct contact between SMPs and injured athletes. In order to achieve this, they stated that SMPs should practice psychological skills in their workplace with convenient techniques. As such, it is essential that SMPs understand the principles of self-regulation and whether is effective in the SRP. Similarly, understanding psychosocial principals is a supportive means in the SRP in respect of psychosocial reactions that might occur with injured athletes. Along with other sorts of psychosocial support that can be suitable in the SRP, are determining the goals and asking for social support, which might assist injured athletes' self-regulation. In the meantime, SMPs also can gain benefits in providing psychosocial interventions in SRP.

What is particularly notable in the literature above is that, physiotherapists present a high percentage of stress and burnout caused by their professional practice. Furthermore, psychological approaches play a significant role in SRP.

# CHAPTER TWO

# Literature Review

# Literature Review

## 2.1 Mindfulness Meditation and Sport Injuries

Ruddock-Hudson, O'Halloran & Murphy (2014) concluded that sport injures (SI) include both psychological and physiological effects on athletes. In line with Ruddock-Hudson et al., (2014), Nicholl, Coleman, & Williams, (1995) reported that sports exercise injures are very public health conditions. It is noteworthy, that every year alone in the United Kingdom there are 29.7 million injures between athletes. Leppanen, Aaltonen, Parkkari, Heinonen & Kujala (2014) indicated that there are some negative aspects to this and additionally risks through participating in sporting activities. In particular, this occurs when athletes become injured out of their sports for a considerable period of time, or there is a termination of a player's career as a result of re-occurring severe injuries. Even taking the above into account, physical activity has various health benefits.

Grosman (1997) argued that even though sports equipment has become very high quality, there is still an underestimation of the mechanisms of avoiding severe injuries, as injury is still a part of physical activity. Besides this, the numbers of injured athletes (IA) are higher than before. The reason for that is high intensity training and an increase in the number of respondents in sport activities. As a result, huge numbers of these types of injuries occur for athletes. Reese, Pittsinger & Yang (2012) & Heaney (2006) mentioned that there are many psychological disorders which occur when athletes become injured such as anxiety, depression, decreased self-esteem, loss of identity, anger, isolation, fear, and tension; as a result of this, SI leads to worsening consequences in athletes' health. Additionally, SI leads to an imbalance and discomfort in life for athletes after injury and this physical inability prevents them from obtaining achievements in sport performance. From this perspective, recent evidence (Ford, Eklund & Gordon, 2000; Tracey, 2003; Heaney, 2006; Vergeer, 2006; Reese et al., 2012; Ruddock-Hudson et al., 2014; Tatsumi & Takenouchi, 2014; & Arvinen-Barrow, Massey & Hemmings, 2014) suggested that psychological interventions (PSI) are significant in order to play an effective role in the rehabilitation process with IA; the same can be said for traditional treatments. More specifically, PSI leads to a reduction in negative thoughts and psychological disorders, which occur after sporting injures.

According to Heaney (2006), there are many studies which have been conducted regarding psychological interventions to enhance athletes' attitudes and reduce negative thoughts as a strategy of the injury rehabilitation process (Gordon, Grove & Milios, 1990; Ford & Gordon, 1993; Brewer, Van Raalte, & Linder, 1991; Larson, Starkey, & Zaichkowsky, 1996; Ford & Gordon, 1997; Ford & Gordon, 1998; Francis, Andersen, & Maley, 2000; Hemmings & Povey, 2002). These studies discover significant differences through applying Sport Injury Rehabilitation Personal (SIRP), with positive outcomes concerning psychological aspects with injured athletes. Nevertheless, utilizing psychological interventions seems limited regarding sport injuries. Grosman, (1997) and Dawes & Roach (1997) stated that it is common during and after injury for there to be negative thoughts and experiences for athletes. Therefore, understanding the psychological response is the first step in organising rehabilitation with IA; because emotions stimulate tensions and worries. More specifically, both tensions and worries impede athletes' from achieving their performance and also hinder the injury rehabilitation proses. According to Dawes & Roach (1997) psychological interventions depends on new tendencies in the area of sport injuries rehabilitation process and health care, the mind and the body are working as one system with each other and also play an important role in the etiology and reduction of pain. This was initially reported in the literature review about the role of MM and is being given particular attention in the current moment.

Venkatesh, Raju, Shivani, Tompkins & Meti (1997) reported in their study that practicing meditation in the long-term leads to considerable changes in consciousness. As well as this, the study investigated a significant amendment in self-awareness, arousal and perceptual experience. Stahl & Goldstein, argued that by being in the present moment or living "in-the-body", by paying attention and being conscious of your physical sensations, the body scan becomes a very convenient way to make contact with your body. In that way, a body scan can be an effective technique to reduce physical pain, anxiety and stress. More importantly, it has been reported that mindfulness meditation is beneficial concerning healing those suffering with pain.

## 2.2 Technique of MBSR Work in the Literature Review

### 2.2.1 Validity of MBSR

MBSR is a typical meditation form which was developed by Kabat-Zinn in 1979 at the University of Massachusetts Medical Centre in Worcester; substantially, this program was organized to lessen pain for patients who have chronic pain. Besides, MBSR is used to adapt to medical conditions that can deliver regular meditation practise through self-regulation attitudes to manage both emotions and stress (Nehra, Nehra & Dogra, 2012).

Krasner (2004) demonstrated that until recent times, mindfulness had not been known clearly as a method for health care strategies; however, present empirical studies have shown that MBSR is becoming more common and is growing quickly. Noteworthy, is the Centre for Mindfulness in Medicine, Healthcare, and Society at the University of Massachusetts Medical School, which has shown that the number of clinics, hospitals, and other facilities which are related to MBSR and training are now about 240 throughout the world. Kabat-Zinn (2003) referred to the large amount of research in the area of MBSR and its clinical application during his doctoral thesis and dissertation, which have become important in recent times. The reasons for the importance of MBSR might be that there are many positive aspects of mindfulness treatment in both mind and body. Morone et al., (2008) found that MBSR was a convenient alternative medicine for chronic pain and psychological disorders, such as anxiety, during the application of a MBSR program.

With regard to the validity of MBSR, it can be noticed that MBSR has been used in different domains e.g. pain reduction, such as back pain or cancer treatment and stress management etc.

#### 2.2.1.1 Pain Reduction

Previous research has shown that MM is an effective means for managing and decreasing the intensity of chronic pain (Veehof et al., 2011), reducing nociceptive pain conditions, lower perception of pain (Brown & Jones, 2010) and increasing pain tolerance (Tashani, Burnett & Phillips, 2017). In relation to coping with pain through MM, it not only provides an ability to manage pain, but also allows it to be experienced in a deeply meaningful manner of spiritual and psychological practise (Young, 2011). In addition, acceptance of pain is also another way to handle pain. In this context, de Boer, Steinhagen, Versteegen, Struys & Sanderman (2014) concluded that patients who recorded greater rates of pain-

acceptance had less pain complaints. Another inspired component is that MM practise can increase mindfulness and wellbeing in both clinical (Carmody & Baer, 2008) and non-clinical populations (McConville, McAleer & Hahne, 2017).

Through Kabat-Zinn's (1982) observations and through applying a training course which consisted of 10 weeks in MM, it was clearly shown that there had been an improvement in psychological states with patients. Fundamentally, MBSR includes some techniques such as breathing meditation, body scans, sitting meditation, compassion and loving kindness meditation, which can provide a relaxed state and calmer mind. As a consequence, practitioners, whether patients or health practitioners could reconnect with their mind and body and listen deeply to themselves. Moreover, MBSR techniques can teach practitioners how they can go through different situations in life.

Furthermore, Kabat Zinn indicated that the program reduced the proportion of pain; besides, it developed all levels of chronic pain during practicing MM between 2.5 to 7 months. Morone and colleagues' (2009) emphasised that mindfulness has a high significance in treating people who have chronic pain. The reason for this is that patients could learn the application of mindfulness approaches to separate the cognitive emotional aspects and physical sensations of pain; thus, reducing the proportion of pain. In addition, they found that people who participate in eight weeks of an MBSR program had a proportion in the reduction of pain, compared to the control group, which followed a health education protocol. In this context, Cassidy et al., (2012) found that research showed that MBSR has a direct benefit on patients with chronic pain in the long term; besides, mindfulness practice decreases somatic pain and psychological conditions. They also found that during three months of an MBSR program with patients who had lower back pain (LBP), it was shown that patients suffered reduced depression, less grades of disability and no more pain. Baer (2003) referred to the research which has been done on the influence of MBSR on patients with pain disorders (Kabat-Zinn, 1982; Kabat-Zinn, Lipworth & Burney, 1985; Kabat-Zinn, Lipworth, Burney & Sellers, 1987; Randolph, Caldera, Tacone & Greak, 1999). All of this research collected data about chronic pain with patients who applied MBSR. In addition, the results of these studies showed that there is a significant enhancement in pain grades for patients.

### 2.2.1.2 Stress Management

Research has shown that there is a significant correlation between MBSR and psychological health such as, life satisfaction, adaptive emotion regulation, less negative thoughts, psychopathological symptoms and positive influences in oneself (Keng, Smoski & Robins, 2011). Gilbert & Waltz (2010) emphasised that mindfulness helps a person to control passive feelings and aids the growth of thoughts. In addition, it also helps an individual to engage in a healthy life. Brown & Ryan (2003) stated that mindfulness is a status which involves paying attention to what is happening in the present moment. Mindfulness, to be precise, has an instrumental role to play in reducing negative thoughts. Thus, it is clear to note that MBSR has become more acceptable between people, because it has a positive impact and is simple to practice.

In this vein, mindfulness is very accepting as a kind of medical handling with patients, the onset of mindfulness is based on stress reduction (MBSR) and positive results have been found for depression, psoriasis, pain and biochemical proofs for making the immune system more active (Beach et al., 2013).

## 2.3 Reliability of the MBSR

MBSR ‘is a structured group program that employs mindfulness meditation to alleviate suffering associated with physical, psychosomatic and psychiatric disorders. The program, which is nonreligious and nonesoteric, is based upon a systematic procedure to develop an enhanced awareness of moment-to-moment experience of perceptible mental processes’ (Grossman et al., 2004:35). Hempel and colleaques (2014) compared different meta-analyses of MBSR to demonstrate the health benefits, in particular reviews on depression, chronic illness, mental illness, distress, somatisation and substance use. Notably, they reviewed 109 ‘mindfulness randomised controlled trials, and these reviews proposed differential effects of MBSR, mindfulness based cognitive therapy (MBCT) and other mindfulness-based interventions.The greatest benefits of MBSR were indicated in chronic illness and psychological outcomes compared to the control group. Other mindfulness interventions showed the most beneficial effects for depression. With regard to MBCT, reviews suggested the consistent benefits for mental illness and somatisation. In addition, most of the research with regard to mindfulness is openly available to those who wish to read it.

## 2.4 The Main Limitation of the Current Literature

The main limitation of the current literature is that there were not any investigations that addressed mindfulness practice or the MBSR program to injured athletes and therapists. Therefore, in this thesis, mindfulness meditation (MM) has been provided to both clinical and non-clinical populations in sport. The interpretation of providing it in terms of mental health is particularly associated with the nature of participants' professions as noted earlier. The clinical population in this thesis were injured athletes who had suffered from severe injuries. Consequently, they were away from their sports for among three to sixth months. In relation to a better understanding of mental health with injured athletes, the efficiency of MM practice should be pronounced.

Sport injury (SPI) is alongside physical activity, regardless of the degree of severity of injuries, always presenting the eventuality that all athletes might be exposed to SPI during their career. Hence, it has deleterious consequences on an athlete's career and life. Furthermore, the side effects of SPI not only threaten athletes' careers, but also have a negative impact upon physical and psychological health, occupational aspects and economic factors (Almeida, Olmedilla, Rubio & Palou, 2013). According to Santi & Pietrantion (2013) some SPI have less or no impact upon athlete's careers; however, other SPI can make athletes withdraw from their sports. Likewise, other consequences of SPI are rehabilitation costs and lost time that has an effect on both injured athletes and sport organisation. Markser (2011) stated that mental stress, somatic, social impacts and emotional strains are conditions that professional athletes experience, despite the overwhelming concerns towards athletic achievement. It should also be noted that there is a lack of investigation regarding emotional strains upon athletes. Continually, mental health plays a central role in athletes' progress and performance (Schinke et al., 2017).

Mindfulness based practice, has become an intervention that is used frequently in health care. Particularly, it has been used with patients as a natural way of pain relief, improving psychological conditions such as stress and anxiety, as well as the quality of life and wellness (Hardison & Roll, 2016). Importantly, this prevalence started with the first approach of MBSR that was developed by Kabat-Zinn (1979), for patients who suffered from chronic pain and provided education in managing the effects of anxiety and stress (Hardison & Roll, 2016). The MBSR program can be considered as 'complementary medicine' that can be delivered by medical staff, in particular therapists to patients who

encounter chronic pain. Additionally, the positive effects of MBSR have also been shown in the literature regarding the effectiveness of regular mindfulness practice, to handle both physical and mental health disorders (Hill, McKernan, Wang & Coronado, 2017). Moreover, pervious research in the domain of MM practice and mental health has shown an improvement in mental health indicators with both clinical and non-clinical populations (Lee et al., 2017; Hoge et al., 2017; van Dijk et al., 2017; Van Vliet et al., 2017). On this basis, to improve the mental health of injured athletes, a similar theoretical and practical contextual 8-week MM program has been delivered in this thesis.

A non-clinical population in this thesis who received MM practise were therapists. As mentioned earlier, therapists are at risk of mental distress as a result of their occupation that carries a high level of stress and burnout. Donohoe et al., (1993) emphasised, burnout is a condition that therapists can be exposed to within the rehabilitation process, as they spend massive amounts of their time with their clients. They also stated that burnout can lead to less quality of treatment, side effects on workplace tasks and psychosomatic complaints. This is consistent with previous research that has shown higher emotional exhaustion in therapists (Pustułka-Piwnik, Ryn, Krzywoszański & Stożek, 2014) compared to other medical staff professions (Fischer et al., 2013). Importantly, MBSR has been well-studied in numerous health fields and has become a foundation for other approaches. Shapiro, Brown & Biegel (2007) draw our attention, to the beneficial impact for therapists' mental health by cultivation of the mindfulness program. In other words, the mindfulness program has made significant improvements in decreasing rumination, perceived stress, state and trait anxiety and improvement in self-compassion. As a result, mindfulness would be a positive technique for therapists in daily training. Nevertheless, there is a lack of investigation in mindfulness intervention related to both sport therapists as well as physiotherapists. To shed new light on that, 4 weeks of the MM program were to therapists, with a view to improving the condition of their mental health.

## 2.5 The Main Aims and Questions in this Thesis

Mindfulness has received great attention in sport sciences as well as other scientific domains. Nonetheless and based on the knowledge gained, this thesis is the first attempt to deliberate MBSR with injured athletes as well as therapists (physiotherapists and sport therapists). This thesis consists of four studies. Each study has been implemented with different methods and procedures as well as different objectives.

- The first study aims to use a commonly used meditation technique, based on Mindfulness-Based Stress Reduction (MBSR), as an intervention to be used during the period of recovery with injured athletes. Therefore, the main aim of study 1 was to investigate the role of MM practice in reducing the perception of pain, increasing pain tolerance, mindful attention, reducing anxiety/stress and also in improving an injured athlete's mood.

  In the second study, there were two research questions:

- (1) Does mindfulness increase therapists' body-awareness and reduce their burnout in the workplace? Additionally, it looked at the positive effect of mindfulness on their personal experiences after four weeks of formal and informal practise.
- (2) To explore which method (face-to-face with an instructor or self-directed) in the mindfulness program was the more effective with therapists.

  In the third study, the main research question was:

  What experiences did the "injured athletes" have during the eight weeks formal and self-directed mindfulness meditation program?

  The research question regarding the last study in this thesis was:
  What were the therapists' perceptions of the effectiveness of the mindfulness meditation program?

# CHAPTER THREE

## The Effect of Mindfulness Meditation in Increasing Pain Tolerance in Injured Athletes

# The effect of mindfulness meditation in increasing pain tolerance in injured athletes

**Abstract:**

Injured athletes face both physical and psychological distress after they have become injured. In this study a Mindfulness Meditation Program (MMP) was utilised as an intervention to be used during the period of recovery with injured athletes. **Objective:** The aim of this research was to investigate the role of MMP practice in reducing the perception of pain and anxiety/stress, as well as increasing pain tolerance, mindfulness and mood.

**Methods:** The participants were twenty athletes (male = 14; female = 6; age range = 21-36 years) who had severe injuries which prevented their participation in sport for more than three months. It is notable that, the severity of the injury and the period of recovery was confirmed with physiotherapists before the injured athletes signed the consent form. Prior to their injury participants trained regularly with their University teams and participated in official university championships. Both groups followed their normal physiotherapy treatment, but in addition the intervention group practiced mindfulness meditation for 8 weeks (one 90-minute session/week). A Cold Pressor Test (CPT) was used to assess pain tolerance. In contrast, the perception of pain was measured with a Visual Analog Scale. Other measurements used were the Mindful Attention Awareness Scale (MAAS); Depression Anxiety and Stress Scale (DASS**)** and Profile of Mood States (POMS).

**Results**: Our results demonstrated an increase in pain tolerance for the intervention group and an increase in mindful awareness for injured athletes. Moreover, our findings observed a promising change in positive mood for both groups. Regarding the Stress/Anxiety scores, our findings showed a notable decrease across sessions; however, no significant changes were observed in other main and interaction effects in both groups.

**Conclusion:** Injured athletes can benefit by using mindfulness as a part of the sport rehabilitation process, in particular to increase their pain tolerance and awareness. Further research is required to assess whether increasing pain tolerance could help in the therapeutic process.

**Keywords:** Injured athletes, Mindfulness Meditation, Pain Tolerance, Stress

## 3.1 Introduction

Sport injuries are a considerable public health concern. The impact of the injured athlete extends beyond the individual. Although it may impact on their seasonal and potential career performance, it additionally impacts upon the clubs and organisations for whom they perform. Furthermore, it leads to a greater general burden on the health service. Every year in the United Kingdom there are 29.7 million injuries among athletes (Nicholl et al., 1995). This is in line with (Nicholl et al., 1995 & Leppanen et al., 2014) who indicated that even though there are many health benefits through participating in sport activities, risks are expected. In particular, this occurs when athletes become injured and they are out of their sports for a considerable period of time, or when a termination of a player's career occurs as a result of re-occurring severe injuries. Reese et al., (2012) & Heaney (2006) reported that injuries can affect athletes' mental health by triggering depression and anxiety, decreased self-esteem, loss of identity, anger, isolation, fear, and tension. It is noteworthy, that sport injuries include both psychological and physiological effects on athletes (Ruddock-Hudson et al., 2014). Peterson and Renström (2000) clarified that sports injuries are caused by trauma. They divided sport injuries in terms of different levels of trauma: injuries that are caused by overuse syndromes and traumatic injuries. Overuse syndromes are common among athletes because of the duration of training and high intensity in exercises, whereas traumatic injuries occur because of the impact of a large force often resulting in a high level of pain.

Furthermore, sport injuries lead to an imbalance and discomfort in life for athletes after injury and this physical inability prevents them from obtaining achievements in sporting performance (Reese et al., 2012). From this perspective, the recent evidence (Ford et al., 2000; Tracey, 2003; Heaney, 2006; Vergeer, 2006; Reese et al., 2012; Ruddock-Hudson et al., 2014; Tatsumi & Takenouchi, 2014; Arvinen-Barrow et al., 2014) suggests that psychological interventions are important for athletes to play an effective role in the rehabilitation process when they are injured. Particularly, psychological interventions can lead to a reduction in negative thoughts and moods. Heaney (2006) revealed that there are many studies which have been undertaken using psychological interventions to enhance athletes' attitudes and reduce negative thoughts as a strategy of the injury rehabilitation process (Ford & Gordon, 1998; Francis et al., 2000; Hemmings & Povey, 2002). Crossman (1997) and Dawes & Roach (1997) stated that it is common during and after injury that

athletes have negative thoughts and experiences. Therefore, understanding the psychological response is the first step in organising rehabilitation with injured athletes, because emotions stimulate tensions and worries (Crossman, 1997). In other words, both tension and worries impede athletes' achieving their optimum performance and hinder the injury rehabilitation process. As stated by Dawes & Roach (1997) the psychological response is influenced by the new tendency in the area of the sport injuries rehabilitation process and health care, the mind and the body are working as one system with each other and play an important role in the etiology and reduction of pain. In support, Ivarsson et al., (2013) also emphasised that in recent years the theoretical concepts, empirical studies, and applied knowledge in the psychology of injury are widely used as part of the rehabilitation process with injured athletes.

Furthermore, sport injuries can affect injured athletes' teammates, coaches and family members. Therefore, their social support can have a positive effect on athletes and help them to return back to their sports (Crossman, 1997). With regard to the social factor in sport rehabilitation, Rees et al., (2010) emphasised that receiving support from family, medical staff, coaches and friends can enable athletes to cope with the psychological distress. In this vein, Podlog et al., (2014) stressed that the duration of the sport rehabilitation process could be shorter with injured athletes if they continue to connect and socialise with teammates, keep their fitness level high, have a love of sports and reach their personal goals. Calvert (2015) also stressed that utilising psychological interventions with athletes is useful in the rehabilitation process. The reason is that the athletes' beliefs, emotions and thoughts have an effect on how their body responds after injury. More specifically, there is an interaction between body and mind and this interaction can be utilised for two purposes. The first is to support injured athletes in the rehabilitation process. The second is that, injured athletes become more confident in avoiding the risk of injuries (Calvert, 2015).

With respect to the role of mindfulness meditation (MM) in current research, Arvinen-Barrow & Walker (2013) mentioned that as a part of sport injury rehabilitation, mindfulness can be an effective instrument to achieve a relaxed state of body and mind. Moreover, it can enable an individual to gain more awareness and acceptance about their situation as an injured athlete (Arvinen-Barrow & Walker, 2013). Besides, it might be suitable to turn their attention to psychotherapy treatment, seeking to confirm the correct course of action for rehabilitation (Arvinen-Barrow & Walker, 2013). Venkatesh et al.,

(1997) have reported that practicing meditation in the long-term leads to considerable changes in awareness. Moreover, the study has investigated significant changes in self-awareness, arousal and perceptual experience. Stahl & Goldstein (2010) emphasised being in the present moment or living in the body by paying attention and being conscious of your physical sensations. Therefore, a "body scan" is a very convenient mode to make contact with your mind and body. In such a way, the body scan can be an effective technique to reduce physical pain, anxiety and stress. More importantly, it has been reported that mindfulness meditation is beneficial concerning healing those suffering from pain. In addition, Ivarsson (2015) has referred to elite football players who undertook psychological interventions, which were based on attention and they were able to diminish sports injuries. Besides, he has recommended daily mindfulness exercises to lessen the risk of injuries.

Therefore, this study aims to use a commonly-used meditation technique, based on Mindfulness-Based Stress Reduction (MBSR), as an intervention to use during the period of a recovery with injured athletes. The aim of this research was to investigate the role of a Mindfulness Meditation Program (MMP) in reducing the perception of pain and anxiety/stress and increasing pain tolerance and mindfulness. Additionally, the aim was to increase the positive mood and decrease the negative mood in injured athletes.

Our hypothesis was that practising regular mindfulness will increase pain tolerance, and awareness, in injured athletes. Furthermore, it will reduce the perception of pain and decrease negative mood in their daily lives.

## 3.2 Methods

### 3.2.1 Procedure

Ethical approval for the study was obtained from the Ethics Committee, School of Sport & Exercise Sciences. All participants gave informed consent prior to starting the study. All participants saw the participant's information sheet (PIS), then they signed the consent form to join this study. PIS contained information regarding the procedure involved in this study, such as the purpose of the study, what kind of population can take part, whether there were any benefits and risks involved in taking part, confidential issues and contact details.

In week zero (week_0) and nine (week_9) of the study, all participants completed the cold pressor test (CPT). From week 1-8 participants in the intervention group completed 3 questionnaires (MAAS, DASS and POMS) before and after each formal meditation session. Injured athletes in the control group who did not receive MMP were also asked to complete the CPT in week zero and week nine. Regarding the quantitative measurements, they filled out all questionnaires before starting their clinic session and at the end of the treatment.

The intervention in this study was based on the original version of the MBSR which was developed by Kabat-Zinn 1979 at the University of Massachusetts Medical Centre in Worcester (Kabat-Zinn, 2009). Notably, MBSR consists of 8 weeks of coursework about 2.5 hours per week in group session. In this study the procedure was modified due to the nature of the patients' state who suffered from severe injuries. Hence, doing meditation for 2.5 hours was not medically reasonable. The reason behind that was that physically injured athletes were not capable of practising meditation for that duration, as they had pain and maintaining a stable body posture for a long time was problematic. (See Table 3.2).

Likewise, gathering all injured athletes' in a group session and at the same time was not possible because of their physiotherapy treatments and their availability. Therefore, individual sessions were run with each patient.

All participants in the study followed their normal physiotherapy treatment. The participants came to a specific room which was adapted to run the mindfulness practice in a noiseless and unobtrusive space at the School of Sport and Exercise Science, University of Kent.

Participants started each session by completing three types of questionnaires that lasted about 15 minutes. Then they spent 10 to 15 minutes of mindful check-in and sharing ideas about mindfulness meditation. Afterwards, 30 minutes of meditation (mindful breathing, body scan meditation and sitting meditation) and the same questionnaires were completed at the end of the session following sharing an idea about meditation and their body sensations. Consequently, participants spent about 90 minutes in each session with the first author.

In addition, each participant was given a CD guide of meditation practice to listen to and practice with at home for between 20 to 30 minutes per day. In this study the CD of the

"mindfulness based stress reduction workbook" by Stahl & Goldstein (2010) was offered to injured athletes and at the end of the MMP they were returned back to the researchers.

It is important to note that, many researchers have followed different levels of practice of MBSR in their research such as Mackenzie et al., (2006) and Bergen-Cico et al., (2013). It should also be noted that, injured athletes in both groups received physiotherapy treatment according to their particular injury.

### 3.2.2 Participants

A total of 20 "injured athletes" who were all university students were recruited through the use of flyers, emails and word of mouth. Flyers were put in different university locations such as academic departments, clinics, student unions and exercise facilities. In addition, emails were sent to all students through the students' support officer in the School of Sport and Exercises Sciences. Finally, participants were also recruited through word of mouth and asking therapists to refer injured athletes.

Regarding the inclusion criteria, participants trained regularly with their teams in university and prior to injury, they had participated in an official university championship. However, they were not elite athletes. All participants must have been away from their sports due to injury for more than 3 months. Notably, the final sample included participants who were involved in various kinds of sports as well as typology of injury.

Participants who self-reported having diabetes (Type I or II), haemophilia, Reynaud's syndrome, fainting, seizures, any recent cuts to the hand and cardiovascular disorder were excluded from the study. Half the participants were randomly allocated to the control group and half to the intervention group. To ensure that there was a number of participants in each group; pairs of participants as they arrived at the laboratory were assigned randomly by a third person (blind to the aims of the study) to one of the two groups. Four participants dropped out of the study, two dropped out after signing the consent form and another two after starting the MMP, and were replaced. Demographic information for each participant that completed the study is presented in (Table 3.1). The two groups did not differ in age, $t$ (18) = 0.083, $P$ = 0.935, (m intervention=28.9 years, $s$ =6.21; m control=28.7, $s$ =4.47) or gender, $\chi 2$= 0.952, $P$ = 0.329. All participants received physiotherapy treatment in a sports therapy clinic**,** when they had been away from their sports for 3-6 months.

**Table 3.1: Demographic details for each participant in each of the groups in terms of Age, Gender, clinical characteristics of the injury and sporting activities. Anterior cruciate ligament (ACL). The labels used in the typology of injury were labels given by the injured athlete. These injuries either occurred during participation in the sport or during training.**

| **Intervention Group** | | | | | |
|---|---|---|---|---|---|
| **Age** | **Gender** | **Typology of Injury** | **Physical Activity** | **Side of Injury** | **Side of Body Tested for CPT** |
| 36 | Male | Ankle injury | Tennis | Right Ankle | Right Hand |
| 36 | Male | Wrist injury | Kickboxing | Right Wrist | Left Hand |
| 34 | Male | Knee injury | Bodybuilding | Right Knee | Right Hand |
| 32 | Female | Hips Injury | Running | Left Side | Right Hand |
| 32 | Male | Low Back pain | Running | Low Back pain | Right Hand |
| 31 | Male | Shoulder injury | Football | Left Shoulder | Right Hand |
| 24 | Male | Shin injury | Basketball | Right Side | Right Hand |
| 22 | Male | Collateral-Ligament | Basketball | Right Knee | Right Hand |
| 21 | Male | Knee ACL | Running | Right Knee | Right Hand |
| 21 | Female | Knee ACL | Basketball | Right Knee | Right Hand |
| **Control Group** | | | | | |
| 36 | Male | Knee (ACL) | Football | Right Knee | Right Hand |
| 33 | Male | Low Back pain | Kickboxing | Low Back Pain | Right Hand |
| 31 | Male | Arm injury | Running | Left Arm | Right Hand |
| 31 | Female | Knee injury | Cyclist | Right Knee | Right Hand |
| 30 | Male | Peroneal tendon subluxation | Cyclist | Left Side | Right Hand |
| 29 | Male | Shoulder injury | Bodybuilding | Left Side | Right Hand |
| 26 | Female | Elbow injury | Basketball | Left Elbow | Right Hand |
| 26 | Male | Ankle | Cyclist | Right Ankle | Right Hand |
| 24 | Female | Knee (ACL) | Running | Right Knee | Right Hand |
| 21 | Female | Big Toe/ Proximal phalanx | Running | Left Side Toe | Right Hand |

*The two groups did not differ in age, t (18) =.083, P =.935, (m intervention=28.9 years, s =6.21; m control=28.7, s =4.47) or gender, $\chi 2$=.952, P =.329.*

**Table 3.2: Mindfulness Meditation Program (MMP) that was used in this study with injured athletes in the intervention group**

| Weeks | Formal meditation practice (90) minutes | Informal Mediation practice (20) minutes |
|---|---|---|
| Week 0 | - Participant information sheet<br>- Consent forms<br>- Cold Pressor Test (CPT) | Participants given the CD guide of MBSR program to practice at home. |
| Week 1 - Week 8 | - Participants were asked to complete 3 questionnaires (MAAS, DASS and POMS), approx.15 minutes.<br>- 10 to 15 minutes of mindful check-in and sharing ideas about mindfulness meditation practice.<br>- 30 minutes formal meditation practice with researcher. The formal session included these meditation skills (sitting/lay down meditation, mindful breathing and body scan meditation).<br>- Participants were asked to complete 3 questionnaires (MAAS, DASS and POMS) for the second time at the end of the meditation session.<br>- 10 to 15 minutes of mindful check-in and sharing ideas about mindfulness meditation practice.<br>- Participants attended the lab on the same day each week. | -20 minutes daily meditation practice. The CD guide of MBSR program includes (sitting/lay down meditation, mindful breathing, body scan meditation, mindful eating, mindful walking meditation, meditation for anxiety and stress, mindful lying yoga, mindful standing yoga and loving kindness meditation.<br>- Participants were free to choose which skills, they will apply or listen to it. |
| Week 9 | Participants repeated the Cold Pressor Test (CPT) at the end of the MMP. | |

### 3.2.3 Cold Pressor Test (CPT)

As per previous studies, injured athletes started the CPT test by sitting down and submerging one hand (participants choose their preferred hand) in a bucket of cold water between 0-2°C for a maximum of 8 minutes (Angius et al., 2015). They were instructed to

put their hand in the ice bucket and keep it in for as long as possible and for a maximum of 8 minutes. All participants placed their hand in the ice bucket so that the whole hand was submerged up to the level of the wrist.

The pain tolerance measure was described as the time between submersion and removal of the hand from the cold water. CPT is appropriate for this research as it is safe, time efficient and a reliable method that is widely utilised to measure pain (Mitchell et al., 2004, Wirch et al., 2006 & Angius et al., 2015).

### 3.2.4 Visual Analog Scale (VAS)

Injured athletes made a mark on a 10 cm straight line anchored with the labels *no pain* and *most pain* at each end to indicate the degree of pain experienced when removing their hand from the water in the CPT. VAS is a popular and reliable assessment tool for measuring pain (Johnson, 2005).

### 3.2.5 Mindful Attention Awareness Scale (MAAS), Brown & Ryan (2003)

This is a 15- item questionnaire that measures the frequency of mindful states in everyday life, using general and situation-specific statements. Responses are given on a six-point scale, from 1 *almost always* to 6 *almost never* with higher scores representing greater mindfulness. The objective of using the MAAS scale is to obtain the level of the participants' mindful awareness across the eight weeks of the study.

### 3.2.6 Depression Anxiety and Stress Scale (DASS), Lovibond & Lovibond (1995)

The DASS was used to assess the level of anxiety and stress during the eight weeks of the study. The DASS scale contains 42 items, which consists of three subscales to evaluate depression, anxiety and stress. Only the anxiety and stress section of the scale were administered with participants reporting which symptoms they were currently experiencing. The anxiety scale comprises four factors: skeletal muscle effects, the subjective experience of the effect of anxiety, situational anxiety and autonomic arousal. In contrast, the stress scale assesses nervous arousal, irritability/being over-reactive and impatient, being upset/agitated and having difficulty relaxing. The rating scale is divided

between 0 *did not apply to me at all* to 3 *applied to me very much, or most of the time* (Lovibond & Lovibond, 1995).

### 3.2.7 Profile of Mood States (POMS), Terry, Lane & Fogarty (2003)

Injured athletes completed the POMS prior and post each session during the 8 weeks of the MBSR program. The participants answered the POMS according to how they felt at the present time and they chose from a rating scale of 0 *not at all* to 4 *extremely* (Terry et al., 2003).

## 3.3 Statistics Analysis

All data were calculated as means and Std. Error to assess the pre and post meditation practice in each week and for both intervention and control groups.

Pain perception scores from the VAS and pain tolerance were analysed using a 2-way Mixed analysis of variance, with Group (intervention, control) as the between subjects factor and Time (week_0, week_9) as the within subject factor. Scores from each of the questionnaires (MAAS, DASS and POMS) were analysed using a 3 Factorial Mixed analysis of variance with Group (intervention, control) as the between subjects factor and Time (weeks 1 to 8) and Session (pre, post) as the within subject factors. (See Tables 3.3 and 3.4).

## 3.4 Results

### 3.4.1 Analysis of Pain Perception

This showed no significant main or interaction effects (all *F's* < 0.36, *P's* > 0.18, partial eta squared (PES) <0.1, (See Figure 3.1).

### 3.4.2 Analysis of Pain Tolerance

This showed a significant main effect of Time, $F$ (1, 18) =12.21, $P$ = 0.003, PSE=.4 but no main effect of Group $F$ (1, 18) =2.29, $P$ = 0.148. However, there was a Time x Group interaction, $F$ (1, 18) =13.12, $P$ = 0.002, PES= 0.422. Figure (3.2) indicates increases were only in the intervention group. Further analysis showed no significant difference between the two groups at week_0, ($t$ (18) = 0.006, $P$ = 0.9), but a significant difference at week_9 ($t$ (18) =2.66, $P$ = 0.016). (See Figure 3.2).

**Figure 3.1: Showing the Time x Group interaction for pain perception**

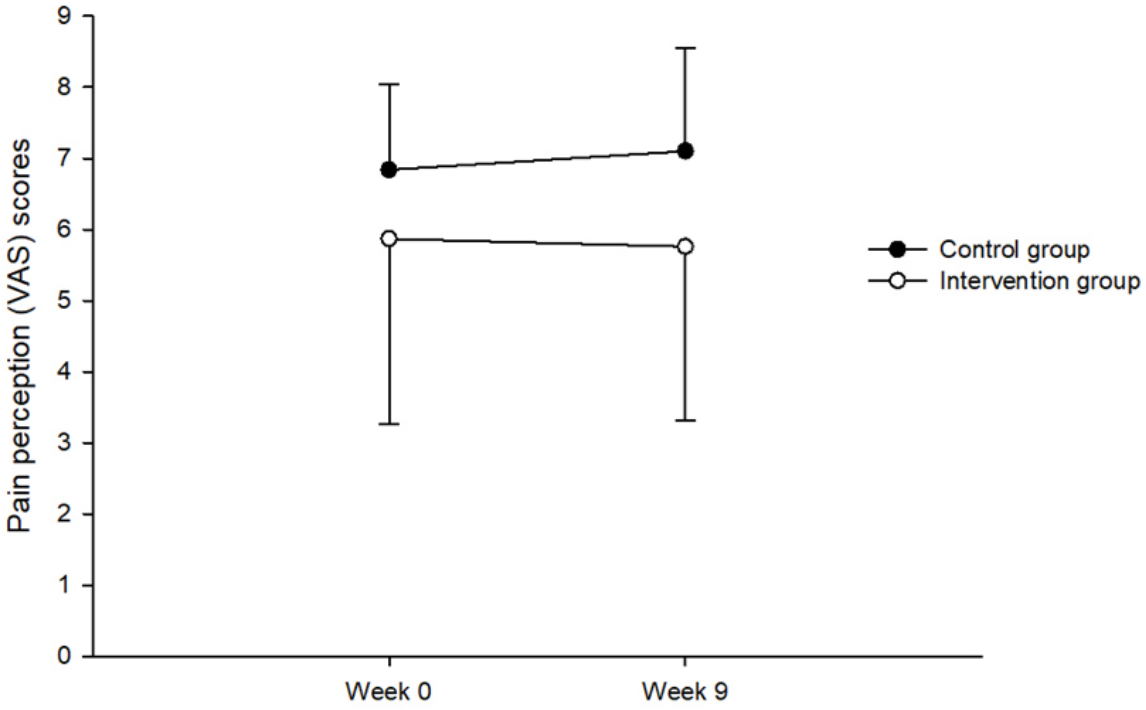
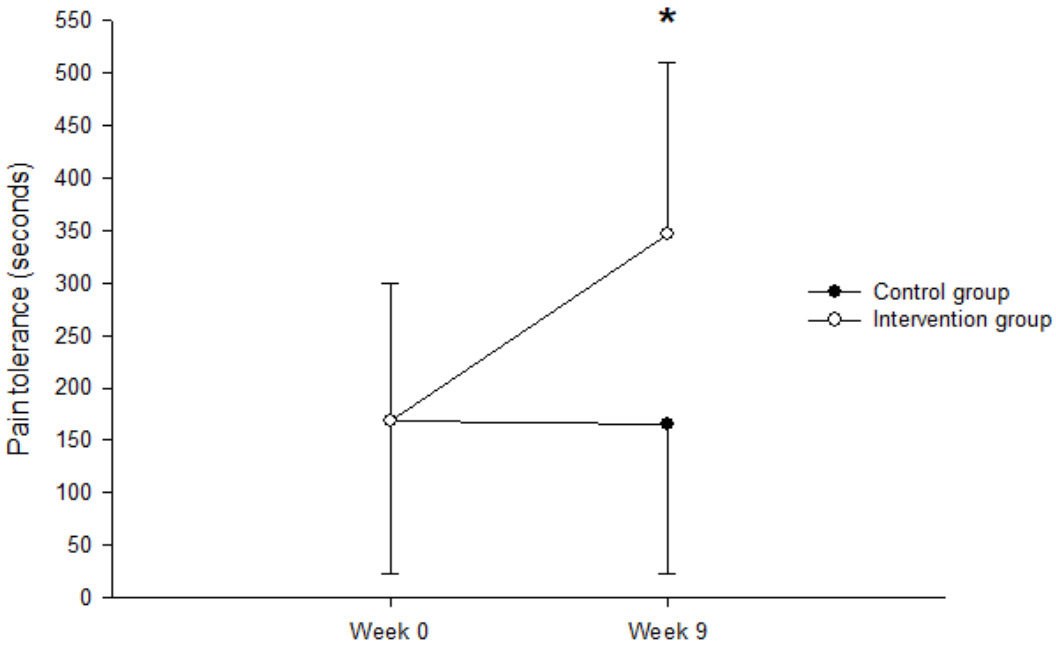



**Figure 3.2: Showing the Time x Group interaction for pain tolerance**



### 3.4.3 MAAS

The MAAS scores increased over the two Sessions, $F$ (1, 18) =16.45, $P$ = 0.001, PSE=.478 and over the 8 weeks, $F$ (7,126) = 6.45, $P$ < 0.001, PSE=.264. There was also a main effect of Group, $F$ (1, 18) =5.34, $P$ = 0.033, PSE=.229), indicating higher MAAS scores for the intervention group (m =68.79, $s$ =3.52) than the control group (m =57.29, $s$ =3.52). There was a greater change in MAAS scores across the Session for the intervention group (pre =66.16, post =71.41) than for the control group (pre =56.36, post =58.21), the Group $x$ Session interaction, $F$ (1, 18) =3.77, $P$ = 0.034 (one-tailed), PSE=.173 was significant.

### 3.4.4 POMS

These results indicated that there were general changes in mood across Session and Time for depression, tension, fatigue and confusion scores. All other main and interaction effects were not significant ($P$ > 0.06). The main effects of Session and Time are illustrated in Tables 3.3 and 3.4 respectively for each measure of mood.

### 3.4.5 DASS

Anxiety scores indicated a notable decrease in anxiety across Session, $F$ (1, 18) =8.80, $P$ = 0.008, PSE=0.328 see table 3. All other main and interaction effects were not significant ($P$ > 0.2).

Stress scores indicated a decrease across Session, $F$ (1, 18) =16.04, $P$ = 0.001, PSE= 0.471 and Time $F$ (7,126) =3.59, $P$ = 0.001, (See Table 3.3 and 3.4). All other main and interaction effects were not significant ($P$ > 0.06).

**Table 3.3: Mean, standard errors for the main effect of session for the POMS, MAAS and DASS questionnaires for the intervention group and control group**

| Dependent Variables | | Group | | | | | |
|---|---|---|---|---|---|---|---|
| | | Intervention Group | | | Control Group | | |
| | | Pre | post | P | pre | post | p |
| **POMS:** | Mean | 2.26 | 0.90 | 0.01 | 3.25 | 2.53 | 0.027 |
| **depression-dejection** | Std. Error | 0.64 | 0.38 | | 0.68 | 0.40 | |
| **POMS:** | Mean | 3.03 | 1.76 | 0.008 | 4.85 | 3.39 | 0.012 |
| **tension-anxiety** | Std. Error | 0.71 | 0.53 | | 0.74 | 0.56 | |
| **POMS:** | Mean | 1.84 | 1.21 | 0.35 | 3.65 | 3.24 | 0.207 |
| **anger-hostility** | Std. Error | 0.74 | 0.59 | | 0.78 | 0.63 | |
| **POMS:** | Mean | 5.83 | 6.26 | 0.48 | 7.10 | 7.04 | 0.62 |
| **vigour-activity** | Std. Error | 1.04 | 1.11 | | 1.10 | 1.17 | |
| **POMS:** | Mean | 4.39 | 2.70 | 0.01 | 3.08 | 2.28 | 0.24 |
| **fatigue-inertia** | Std. Error | 0.70 | 0.58 | | 0.74 | 0.61 | |
| **POMS:** | Mean | 2.89 | 1.48 | 0.00 | 2.60 | 2.03 | 0.452 |
| **confusion-bewilderment** | Std. Error | 0.60 | 0.37 | | 0.63 | 0.39 | |
| **MAAS** | Mean | 66.16 | 71.41 | 0.012 | 56.36 | 58.21 | 0.008 |
| | Std. Error | 3.52 | 3.62 | | 3.52 | 3.62 | |
| **DAS-Anxiety** | Mean | 6.29 | 4.73 | 0.06 | 6.06 | 5.01 | 0.06 |
| | Std. Error | 1.42 | 1.15 | | 1.42 | 1.15 | |
| **DAS-Stress** | Mean | 8.31 | 5.13 | 0.01 | 11.61 | 10.35 | 0.043 |
| | Std. Error | 1.60 | 1.57 | | 1.60 | 1.57 | |

**Table 3.4: Mean and standard errors for the main effect of Time for the POMS, MAAS and DASS questionnaires for the intervention and control group**

| Group | | | Time | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | p |
| **Intervention** | **POMS:** | Mean | 2.15 | 2.75 | 0.95 | 1.95 | 1.55 | 1.40 | 1.25 | 0.65 | 0.023 |
| | **depression-dejection** | Std. Error | 0.85 | 0.89 | 0.54 | 0.65 | 0.51 | 0.71 | 0.56 | 0.52 | |
| | **POMS:** | Mean | 3.65 | 4.20 | 1.35 | 2.20 | 2.20 | 3.10 | 1.10 | 1.35 | 0.003 |
| | **tension-anxiety** | Std. Error | 1.02 | 0.91 | 0.56 | 0.69 | 0.75 | 0.98 | 0.64 | 0.72 | |
| | **POMS:** | Mean | 1.85 | 2.75 | 1.50 | 1.60 | 1.45 | 0.95 | 1.10 | 1.00 | 0.179 |
| | **anger-hostility** | Std. Error | 0.84 | 1.10 | 0.64 | 0.73 | 0.53 | 0.69 | 0.74 | 0.70 | |
| | **POMS:** | Mean | 6.40 | 6.10 | 6.60 | 5.85 | 5.40 | 6.00 | 6.30 | 5.70 | 0.881 |
| | **vigour-activity** | Std. Error | 0.94 | 1.03 | 1.28 | 1.19 | 0.92 | 1.23 | 1.31 | 1.41 | |
| | **POMS:** | Mean | 6.10 | 5.90 | 2.85 | 4.50 | 2.85 | 2.35 | 1.65 | 2.15 | <.001 |
| | **fatigue-inertia** | Std. Error | 0.97 | 1.06 | 0.59 | 1.05 | 0.67 | 0.71 | 0.60 | 0.64 | |
| | **POMS:** | Mean | 2.95 | 3.35 | 1.60 | 2.50 | 2.70 | 1.95 | 1.30 | 1.10 | 0.03 |
| | **confusion-bewilderment** | Std. Error | 0.79 | 0.75 | 0.41 | 0.55 | 0.65 | 0.62 | 0.43 | 0.41 | |
| **Control** | **POMS:** | Mean | 4.56 | 3.28 | 2.94 | 2.39 | 2.39 | 2.94 | 2.50 | 2.11 | 0.12 |
| | **depression-dejection** | Std. Error | 0.89 | 0.93 | 0.57 | 0.68 | 0.54 | 0.75 | 0.59 | 0.55 | |
| | **POMS:** | Mean | 5.61 | 5.17 | 3.89 | 3.11 | 3.28 | 4.56 | 3.89 | 3.44 | 0.005 |
| | **tension-anxiety** | Std. Error | 1.08 | 0.96 | 0.59 | 0.73 | 0.79 | 1.03 | 0.68 | 0.76 | |
| | **POMS:** | Mean | 4.39 | 4.17 | 2.83 | 2.72 | 2.78 | 4.22 | 3.44 | 3.00 | 0.171 |
| | **anger-hostility** | Std. Error | 0.89 | 1.16 | 0.67 | 0.76 | 0.56 | 0.72 | 0.78 | 0.73 | |
| | **POMS:** | Mean | 7.33 | 7.17 | 6.67 | 7.39 | 6.94 | 6.83 | 7.00 | 7.22 | 0.787 |
| | **vigour-activity** | Std. Error | 0.99 | 1.09 | 1.35 | 1.25 | 0.97 | 1.29 | 1.38 | 1.49 | |
| | **POMS:** | Mean | 4.11 | 3.28 | 2.11 | 2.50 | 2.67 | 2.17 | 2.33 | 2.28 | 0.014 |
| | **fatigue-inertia** | Std. Error | 1.02 | 1.12 | 0.62 | 1.11 | 0.70 | 0.75 | 0.63 | 0.68 | |
| | **POMS:** | Mean | 4.17 | 2.94 | 2.56 | 1.50 | 2.22 | 2.11 | 1.67 | 1.33 | <.001 |
| | **confusion-bewilderment** | Std. Error | 0.83 | 0.79 | 0.44 | 0.58 | 0.68 | 0.66 | 0.45 | 0.43 | |
| **Intervention** | **MAAS** | Mean | 62.75 | 65.35 | 69.60 | 69.40 | 70.55 | 68.40 | 71.05 | 73.20 | 0.004 |
| | | Std. Error | 3.64 | 3.93 | 3.74 | 4.01 | 3.75 | 4.15 | 4.30 | 4.37 | |
| **Control** | **MAAS** | Mean | 53.05 | 50.95 | 55.80 | 59.55 | 56.25 | 57.60 | 61.35 | 63.75 | 0.002 |
| | | Std. Error | 3.64 | 3.93 | 3.74 | 4.01 | 3.75 | 4.15 | 4.30 | 4.37 | |
| **Intervention** | **DAS-Anxiety** | Mean | 5.80 | 6.15 | 5.70 | 7.70 | 5.30 | 4.70 | 4.85 | 3.85 | 0.624 |
| | | Std. Error | 1.33 | 1.23 | 1.72 | 1.90 | 1.74 | 2.09 | 1.47 | 1.01 | |
| **Control** | **DAS-Anxiety** | Mean | 6.60 | 7.00 | 5.00 | 4.10 | 5.40 | 5.60 | 5.35 | 5.25 | 0.142 |
| | | Std. Error | 1.33 | 1.23 | 1.72 | 1.90 | 1.74 | 2.09 | 1.47 | 1.01 | |
| **Intervention** | **DAS-Stress** | Mean | 7.650 | 7.950 | 8.250 | 8.550 | 6.750 | 5.550 | 5.550 | 3.500 | 0.04 |
| | | Std. Error | 1.786 | 2.081 | 1.955 | 2.062 | 1.464 | 1.810 | 2.053 | 1.780 | |
| **Control** | **DAS-Stress** | Mean | 11.400 | 14.000 | 12.400 | 8.900 | 12.250 | 10.950 | 8.800 | 9.150 | 0.02 |
| | | Std. Error | 1.786 | 2.081 | 1.955 | 2.062 | 1.464 | 1.810 | 2.053 | 1.780 | |

## 3.5 Discussion

The objective of this study was to investigate whether MMP has any effect on reducing pain and improving mental health for injured athletes during an 8-week program. The results showed that there was an increase in pain tolerance and therefore less sensitivity to pain in the intervention group. Based on these results, mindfulness practice might provide injured athletes with effective skills to cope with their physical pain and look at their situation in a different way, which might encourage positive responses. It was also observed that injured athletes who had taken part in the intervention group gained beneficially from MMP as an additional tool during the sport rehabilitation process. Self-regulation practice could improve pain management through an attitude that emerged from MMP. In other words, regular mindfulness practice becomes a habitual style of thinking and then injured athletes can have the ability to cope with their situation in a different way with mindfulness training. Consequently, pain tolerance has been increased in injured athletes' who received MMP compared to their peers in the control group. To support this view, Kabat-Zinn stated that 'keeping particular attitudes in mind is actually part of the training itself, a way of directing and channelling your energies so that practitioners can be most effectively brought to bear in the work of growing and healing' (2013:21).

This supports previous research, which has found that people who participate in eight weeks of a mindfulness meditation program have a significant reduction in their pain, compared to the control group that had followed a health education protocol (Morone et al., 2009). Additionally, Nehra et al., (2012) and Lykins & Baer (2009) indicated the self-regulation benefits of MBSR on pain management and well-being. Essentially, Baer (2003) referred to the research which has been conducted on the influence of MBSR on patients with pain disorders. It included four studies which were the same as those of (Kabat-Zinn et al., 1985; Kabat-Zinn et al., 1987 & Radolph et al., 1999). All of this research collected data about chronic pain with patients who applied MBSR. In addition, the results of these studies showed that there was a significant enhancement in pain grades for patients. Furthermore, Zeidan et al., (2010) mentioned that three days of a brief mindfulness intervention is effective in diminishing pain and increasing psychological status. Our results highlight that MMP can be used in a group of injured athletes to increase pain tolerance.

However, the VAS scores in perception of pain showed that there was no difference between the intervention group and control group in both pre and post program. Based on the instructions of CPT, injured athletes in both groups could take their hands out of water when they experience pain. This might predicate their similar level of perception of pain.

The MAAS results showed that mindful awareness was higher immediately after 90 minutes of MMP. This change was significant in the intervention group than the control group. In other words, participants in the intervention group were able to understand how to pay attention and live in the present moment and increase their level of body awareness without criticizing their self through specific instructions which they received from MMP. That could be the main reason for the higher scores of MAAS in the intervention group.

It was also observed that mindful awareness increased across the 8 weeks. As this happened for both groups, this is probably due to both groups receiving physiotherapy treatment. It is clear that physiotherapy depends upon touch to treat patients; therefore, our expectation was that it would lead to an improvement in their mindful awareness, possibly due to the focus of attention to a particular part of the body, after 8 weeks of treatment. The MAAS results in this study support previous research, which has shown an increase in mindfulness skills over time with cancer patients (Brown & Ryan, 2003). Correspondingly, the athletes who contributed to research by Goodman et al., (2014) were taken from 26 colleges and a number of experimental groups were 8 athletes, whereas; the control group consisted of 13 male athletes from sport teams. As a result, there were significant results in the experimental group, with greater attention to their goals with mindful exercise than student athletes from the control group. Another possible explanation for our findings is that by practicing mindfulness meditation on a regular basis, basses injured athletes improved their emotion regulation. To support this interpretation, Siegel (2008) stated that mindfulness application lead to combatting emotional dysfunction, a reduction in negative attitudes, a capability to regulate emotion and an improvement in patterns of thinking. Moreover, a study by Azulay & Mott (2016) found encouraging findings in relation to mindfulness meditation practice with a mixed brain injury. They also observed that awareness had increased in patients with a stroke condition, as they were more mindful about their disability at the end of the treatment. They explained their findings as a consequence of regular meditation which provides patients with the capability to manage their pain and physical injury.

However, a control group that did not receive physiotherapy treatment would be required to distinguish it from any natural increase in mindfulness with time. In the control group, having an injury could have directed their attention to the injury, which might have been sustained throughout the 8 weeks. Alternatively, it could be that the injury increased worry or rumination of the consequences of the injury. Then, as the injury heals over time, this decreases and therefore could increase mindfulness awareness.

With regard to the mood changes, a consistent pattern emerged over Time and over Session. We found a general decrease in mood for depression-dejection, tension-anxiety, fatigue-inertia and confusion-bewilderment. There were no significant changes for anger-hostility or vigour-activity. As these main effects did not interact with the group, this suggests no additional benefit from the MMP. It is important to note that there was mood decrease in the control group. This could be due to the physiotherapy though, again, a control group (without physiotherapy) would be needed to answer this question. It could be that as the injury improves over time (either due to physiotherapy or not) mood decreases. The lack of any change for tension-anxiety and for vigour-activity may be because injured athletes were not engaged with their physical activities; therefore, they did not feel active enough during those 8 weeks.

In relation to stress and anxiety scores, the results showed a notable decrease across sessions, however; no significant changes were observed in the other main interaction effects, although, a sizable body of literature found a positive influence of MBSR in reducing anxiety and stress (Ott et al., 2006; Pradhan et al., 2007; Keng et al., 2011). A potential explanation for this might be the injured athlete's state of mind at the time of completing the DASS questionnaires. Furthermore, the last therapeutic process might also have an effect on injured athletes' scores.

According to the results of this study, injured athletes can benefit from using mindfulness meditation as a part of the sport rehabilitation process to increase their pain tolerance and the level of mindful awareness.

### 3.5.1 Implications

The main aim of this study was to explore the usefulness of a Mindfulness Meditation Programme in a sport injury rehabilitation context. This study offers evidence that including an MMP component in the traditional sport injury rehabilitation process can help

athletes increase their pain tolerance. This is important for a speedy recovery from injury, as research (Pen and Fisher, 1994) suggests that the ability of an injured athlete to support pain is related to how quickly the athlete recovers from the injury. Taken into account the significant mental nature of pain, mindfulness can become an essential part in the therapeutical toolkit of rehabilitation professionals. Indeed, in view of the results of this study a it is suggested that there is considerable scope for including some formal mindfulness components in in the professional training of sports injury rehabilitation professionals. In addition, the benefits of MMP in increasing pain tolerance may well extend beyond the sport specify context of injury, in helping also people who suffer from chronic pain as well and further research is needed in this regard.

### 3.5.2 Limitations of this Study

1. In this study the procedure was modified due to the nature of the patients' state who had suffered from severe injuries. Therefore, individual sessions were run with each patient.

2. The duration of the meditation sessions in this study was 90 minutes, because it was modified to be convenient for injured athletes. While the original MBSR program was about 170 minutes per week.

3. The gender and the typology of sports injuries were another limitation of this study that should be taken into consideration in future research.

4. Voluntary participants, who wanted to participate in mindfulness training, as they might have heard about the positivity of practicing it.

5. Another limitation was that, injured athletes were treated by different therapists in clinical sport therapy at the School of Sport and Exercise Sciences.

6. Another potential limitation to this study was the assessment of informal practice. Injured athletes were asked to complete numerous requirements during the program, thus affecting their participation in this study.

7. A few participants dropped out of the intervention group, whilst nobody dropped out of the control group. This is might be because injured athletes had a prior experience of mindfulness practice. Another possible reason might be that, injured athletes believed that MBSR techniques might interfere with their belief systems.

8. An additional active control group and placebo group could be beneficial in future research.

## 3.6 Recomondations

There were some recommendations that emerged from the findings of this study. The findings of this study have a number of important implications for future practice, which might support researchers who are working in mindfulness and sport.

1. Further experimental investigations are needed, to discover the effect of mindfulness practice on the participant's injury related to pain and in addition to CPT. This will provide further understanding of the effectiveness of MMP in terms of pain.

2. Starting with a brief form of mindfulness practise and increasing the duration of time steadily, it would help practitioners to adapt to the program more easily, particularly, if the practitioners are beginners.

3. Practising MM in groups could bring better experiences for participants in terms of sharing their ideas with others and further, they might be motivated by each other.

4. Generally, long term studies need high motivation and interest to keep practising until the end of the program. Therefore, it can be recommended that offering incentives to practitioners might keep their motivation at the same level as at the beginning of the program, especially if there were many requirements that they were asked to practise during the program.

# CHAPTER FOUR

# Perceptions of Injured Athletes about Their Participation in a Mindfulness Meditation Program: A Qualitative Study

# Perceptions of injured athletes about their participation in a Mindfulness Meditation Program: A qualitative Study

**Abstract:**

**Objective:** The main objective of this study was to offer a qualitative explorative insight into the perceived experience of participating in a mindfulness meditation program for injured athletes (MMP).

**Methods:** In this study, a Semi Structured Interview (SSI) was conducted with each injured athlete who participated in the previous study as described in chapters three and four. A thematic analysis (Braun and Clarke, 2008) was applied to explore the themes which emerged from injured athletes' experiences after 8 weeks of participation in a MMP. A thematic analysis is 'a method for identifying, analysing, and reporting patterns (themes) within data. It minimally organises and describes your data set in (rich) detail (Braun and Clarke, 2008:6)

**Results:** Five themes emerged from injured athletes' attitudes towards MMP: 1) Reconnecting with the body, 2) Reconnecting with the mind, 3) Passivity of MMP as an opposed to the athletic praxis, 4) Group versus self-guided MMP, 5) Acceptance of pain. These different themes are presented and discussed below.

**Conclusion:** In addition to the quantitative sections of this thesis, this particular qualitative exploratory investigation was based on injured athletes' experiences in this study, MMP can benefit them during SRP. As such, their attitudes would promote scientific understanding about the effectiveness of MMP as a clinical intervention. It should also be noted that, more investigation is required to find out about the role of mindfulness meditation in terms of therapeutic aspects with injured athletes.

## 4.1 Introduction

Injured athletes might experience both physical and psychological consequences after being injured. Walker & Heaney (2013) emphasised that psychological effects on injured athletes can be noticed by anybody who had experience of a sports injury, whether it be athletes, a coach of an athlete or even medical practitioners who are treating injured athletes. As a result, the physical effects may cause psychological changes such as anxiety, depression, isolation, anger and frustration. More specifically, Schinkea, Stambulova, Si & Moore (2017) indicated that people who surround athletes, such as teammates, coaches, sport psychologists and medical staff had to be conscious of referring to their evidence-based interventions, cultivating help-strategy behaviours and also the presence of clinical and subclinical mental conditions. As a consequence, these factors will lead injured athletes to cope better and recover from injuries. In relation to the psychological consequences, Reese, Pittsinger & Yang (2012) referred that sport injuries frequently make injured athletes' lives imbalanced and also disrupted. Thus, injured athletes will face health risks and also the inability to achieve their athletic targets.

It is from this perspective, that paying attention to improving the mental health of injured athletes is very necessary. As outlined by Markser (2011), this is because of the massive social, somatic and mental stress that athletes are exposed to. By the same token, a study by De Heredia, Alzate, Munoz & Artaza (2004) described that the mental response to injury as a subjective estimation of the injury, mood states and adherence had positive effects on sport recovery. Therefore, and based on these results, the psychological responses of injured athletes can have an effect upon their abilities to handle injuries and also achieve better consequences in the rehabilitation process. Furthermore, Putukian (2016) demonstrated that psychological responses fluctuate among athletes who have been injured, from the moment of occurrence to the post-injury stage, then the rehabilitation process and then when athletes return back to their sports. Hence, through psychological responses, the mental health conditions that emerge from injuries such as anxiety, depression, substance use/abuse and eating disorders can be observed.

This research was provided via a knowledge transfer of 8 weeks of a mindfulness meditation program (MMP) based on the original Mindfulness Based Stress Reduction (MBSR) version which was developed by Kabat-Zinn in 1979 in the University of Massachusetts Medical Center (Kabat-Zinn, 2013). Being able to identify and categorise

the characteristics of a better meditation practice is crucial to improving the experience of practitioners. In other words, in order to assess MM with different kinds of methodology, participants were provided with the opportunity to explain and discuss their expertise, thoughts and experiences after 8 weeks of the MMP in both formal and self-directed practice. The positive outcome of this study was the overarching benefit to researchers, which will expectantly be the ability to help achieve higher levels of practicing MM in future. This will help to deal with the problems that might be faced during meditation and also to become more familiar with the MMP as a clinical intervention that can be used with both "injured athletes and therapists". This study was an attempt to find out what the experiences of injured athletes was in relation to MMP.

By collecting some exploratory qualitative data, our intention was to get to know what the perception of injured athletes' and therapists was after participating in an 8 week MM intervention. This chapter focuses on athletes while the next chapter focuses on therapists.

In this vein, Fitzpatrick, Simpson & Smith (2010) indicated that qualitative assessments are a suitable means of realising the acceptability of intervention. Moreover, Fitzpatrick et al., (2010) mentioned a qualitative study by Abercrombie, Zamora & Korn (2007) to evaluate the acceptability of MBSR with women of different ethnic backgrounds who had a low income. In addition, Cohen-Katz, Wiley, Capuano, Baker, Kimmel & Shapiro (2005) employed qualitative materials to evaluate the effect of MBSR as a long term intervention on nurse's stress and burnout; notably, the qualitative analyses improved their understanding of the effectiveness of MBSR and also the future direction of MBSR research. According to research that had been done by Mackenzie, Carlson, Munoz & Speca (2007) with cancer patients, it was revealed that MBSR in quantitative methods can reduce stress, change mood and improve the quality of life. On the other hand, subjective effects were not clearly observed. Therefore, they collected data from qualitative methods using a semi-structured interview and a focus group to evaluate their experiences after the participants had received 8 weeks of MBSR.

The main objective of this research was to find out what the experiences of injured athletes were in relation to the mindfulness meditation program (MMP). The research question was concerned with what experiences the "injured athletes" had had during the eight weeks' formal and self-directed MMP.

## 4.2 Methods

### 4.2.1 Procedure

This study was approved by the Ethics Committee at the School of Sport & Exercise Sciences, University of Kent.

To inform the participants about the researcher of this study, they were given a participant's information sheet (PIS). This sheet explained that they had the right to withdraw at any stage of the program, and this was explained clearly to the participants. In addition, all the information they needed about the study procedure was available in PIS. This was followed by informed consent to sign prior to conducting an interview with the participants. The participants were invited to attend a face to face interview and the duration of the interview was 30 minutes. Additionally, each injured athlete had to respond to five questions during the interview. The interview was led by the primary researcher in order to ask questions and take notes. The interview was conducted individually with each participant in a safe and quiet location, at a suitable location and time for all participants. The interview took place in the School of Sport and Exercise Sciences. Once the research was completed, all the research participants were sent a digital copy of the research and all were acknowledged for their assistance in the study.

### 4.2.2 Participants

In this study, only the participants who had taken part in the intervention groups in the previous study that had received ethics approval from the School of Sport and Exercise Sciences (SSES) were invited to be part of this study. Thus, to participate in this study, the participants needed to be "injured athletes" who had received 8 weeks of MMP. Six injured athletes were randomly selected to be involved in this study after they had received the MMP. The participants were both female and male. Notably, five male and one female (injured athletes) completed the semi-structured interview in this study.

Demographic data is presented in (Table 4.1). The participants' demographic and qualification characteristics were: (M injured athletes = 28.0 years, SD = 6.63). The researcher contacted injured athletes and invited them to take part in this study. The initial contact was made by email and then additionally by telephone calls. It is noteworthy that no participants dropped out of the study after signing the informed consent forms.

**Table 4.1: Participants' demographic, qualification, physical activity and occupation characteristics for injured athletes**

| Participants number | Age | Gender | Physical Activity | Kind of injury |
|---|---|---|---|---|
| 1 | 25 | Male | Basketball | Shin injury |
| 2 | 22 | Male | Running | Knee injury |
| 3 | 23 | Male | Basketball | Collateral-ligament |
| 4 | 33 | Male | Running | Low back pain |
| 5 | 37 | Male | Kickboxing | Wrist injury |
| 6 | 30 | Female | Running | Hips injury |

## 4.3 Data Analysis

Injured athletes' opinions after participating in an 8 weeks MMP were analysed using a Thematic Analysis (Braun and Clarke, 2008). Semi-structured interviews (SSI) were carried out with injured athletes to obtain detailed and comprehensive information about their experiences in participating in the MM in both formal and self-practice mode. The purpose of this qualitative study was to learn from the participants, to get to know the way that they experienced MMP, the meanings they perceived from it, and how they interpreted their experience. In order to discover and explore the perceptions of our participants and in order to acknowledge the complexity of their interpretations, an inductive approach was privileged without any pre-establishment of any previous assumptions or hypothesis on the belief of the researcher (Gale et al. 2013). The inductive approach served to triangulate and add another perspective to the data that had been collected from the pervious quantitative studies as presented in the previous chapter. The transcribed interview data was coded using first-cycle processes as suggested by Saldana (2016). All interview transcripts were analysed using in vivo coding. The interviewees' quotes were highlighted for and descriptively coded for a generation of broad themes. The initial codes were then categorised into key topic areas and analysed at a later stage in depth. The coding and categorisation of the data was complemented by analytic memorising, which helped record emergent thoughts and themes about the data during and after analysis (Saldana, 2016).

The further elaborated analytic memos were then analysed and contrasted with the generated themes to further scrutinize the data. The initial findings produced by the PhD student were then passed to their PhD supervisors for a second level of analysis, who verified them and checked for coherence and for identifiable distinctions between the different themes. Any disagreements between the initial codes were discussed until a consensus was obtained and this facilitated further development of the data analysis (Saldana, 2016).

The interview data were recorded using an audio tape recorder to allow for transcription and analysis of data at the end of the study. The data were transcribed and then coded openly. At the end of this process, five themes were identified.

## 4.4 Results

### 4.4.1 Reconnecting with the Body

Among the different transcripts of the interview data, a recurring theme that emerged in our analysis was related to the feeling of gaining control and of 'reconnection with the body' that mindfulness provided to them. This first theme refers to the sensation of control and body-awareness that the MMP offered to our participants. According to participant 4:

> 'I think injured athletes become aware of their bodies and focus on it, they can follow their recovery time better and also feel more aware of their injury. I think it is good as a complementary tool plus physical therapy to support athletes in how they can manage their feelings during the rehabilitation process and this should be taken into account as well' (Participant 4).

This reconnection with the body helped the injured athletes in our sample to identify the specific location of the pain into our participants' bodies. In the words of participant number 5:

> 'I could think better during the meditation, what is my problem and where is the pain and also I could determine where exactly the pain was in my body' (Participant 5).

Another of our participants highlighted that this increased body-awareness helped them achieve a sense of reconnection with their body:

> ‘Physically I was really aware of my body; I did not feel any pain or anything. I could do things that before I could not, 8 weeks of made me feel very connected with my body’ (participant 2).

### 4.4.2 Reconnecting with the Mind

Sport injuries generate a period of absence from the sport arenas and this is mentally very demanding for the injured athlete. However according to our data, injured athletes can find in the practice of MMP a very good mechanism to cope with the injury, in their journey to full recovery.

> ‘I think mindfulness could be very effective method for injured athletes especially to handle with the negative mood that you feel it when you become injured and being away from your sport for a while’ (participant 6).

Indeed, all injured athletes in this study reported that 8 weeks of MMP encouraged them to feel an improvement in their psychological state. Thanks to their participation in the programme they felt less anxious and more positive in their thinking. Participants 1 and 2 described their feeling that meditation practise helped them to become more relaxed, happier, less stressed, have less negative thoughts and gain a better feeling. One of our participants stated that his experience was related to the theme above as follows:

> ‘Mentally, I was really emotionally able to experience basically what kind of emotion I had, so if I was feeling like sad I just switched my mood and just did not think about it. I was not so angry and was really calm and felt very joyful’ (Participant 2).

The feeling of calmness and relaxation as a result of mindfulness practise was something that was mentioned by several of our participants:

> ‘Overall, after doing an hour of meditation it is just a bit easier to do something after it. I would say that initial meditation gives you a relaxed feeling and more attention, if there is negative feeling I can push it away or I can ignore it and focus on something I need to focus on. I would say, definitely psychologically it was an improvement, and it definitely helped me out’ (Participant 3).

### 4.4.3 Passivity of MMP as an Opposed to the Athletic Praxis/ Challenges When Practising MMP/

For the totality of our sample, MMP was a new experience and every new practise entails its own difficulties and challenges. Participant 4 stated that:

> 'It was frustrating to begin with MM because its new skills and difficult skills to learn because you spent all day thinking and you have to switch-off. You will see yourself struggle in the first couple weeks but by the end you will do it easily'.

The most common obstacle that our participants faced during the MMP had to do with the passive character or MMP. This is especially true for our participants who as athletes, are used to having to be exposed to activities that require a high level of action and movement.

> 'Sport is a very active thing and mindfulness is not very active, its more about acceptance. In sport, the focus is on fixing the problem and dealing with problems, while mindfulness rather teaches just accept it and move on' (Participants 1).

Participant number 3's words reflect the need to incorporate more diverse methods of meditation to avoid monotony and have a break from routine.

> 'In formal sessions it was just a sitting meditation, body scan, mindful breathing, so it was just the same things or the same practise every week, so I think variety of meditation during the formal sessions would make MM better' (Participant 3).

Lastly, one of our participants suggested that a shorter duration of mindfulness practice would facilitate a smoother initiation to the program, while the full program seems difficult for them to adhere to because of the long duration.

> 'Omm, it might be better to start with short time like 10 minutes, because for me being in the proses for nearly 90 minutes its quite long time and sometimes it becomes like you force yourself to finish it' (Participant 6).

### 4.4.4 Group Versus Self-Guided MMP

Another question that we indented to shed some light upon had to do with the delivery of the MMP. Nowadays there is a plethora of self-guided modes of delivery, while there are

other courses which still privilege the face-to-face delivery of the programmes. As has been described in other parts of this thesis, our methodological design included both self-guided practise and a face-to-face modality. Overall it seems that most of our participants expressed a preference for a face-to-face mode of delivery of the programme. Notably, participant 1 mentioned that the interaction with other participants in a group workshop setting would help participants get through the obstacles of the first difficult initiation stage:

> '… I think, group workshops would be interesting because you will meet many people and especially at the start when you are learning the skill, because you can compare it to other people. For instance, how you are doing and your feelings towards other people because is frustrating at the start and I think many people might stop because they struggle with it but if you see other people are struggling and you know you are all together, that might sometimes really help' (Participant 1).

Participant number 6 also highlighted that for new starters it would be beneficial:

> 'Providing a guided meditation in formal session. Or meditation with guide especially to people with no prior experience' (participant 6).

### 4.4.5 Acceptance of Pain

In terms of pain aspects, injured athletes who were involved in this study have attributed their practise in MMP to clearly changing their attitudes towards pain. A number of injured athletes were focused on how MMP helped them to accept their physical state after they got injured and also improve their pain sensitivity.

> 'I can run for longer and at the same time I feel tired but I was still able to push through it. It might be that MM did make me think differently about the pain, that is, it is actually not the end of the world if you have pain, so pain is there but I did not really worry about it' (Participant 4).

Another participant also mentioned the concept of 'acceptance' of pain and how the MMP helped in that regard:

> '…it was helpful a lot in terms of just acceptance that hey, that is ok that happens' (Participant 1).

This notion of 'acceptance' of pain was indeed present in several of the responses that we received from the participants. Participant number 2 was very illustrative in their description of how the MMM, by focusing and not distracting the sensation of pain, was of help to finally 'get through it' and 'let go'.

> 'Slightly, I was more aware of the pain, I could think about it, it was not just reflex I can just feel it as a pain and I thought about whether to accept it or not. My perception of pain like changed, before it was just pain I did not really think about the pain, when I just found it I tried to avoid it but after MM I was able to connect with the pain and go through it, I just let it go' (Participant 2).

In the same line participant 5 also mentioned that:

> 'As a result, you can control your muscles with your mind through positive thinking and ignore pain in your body' (Participants 5).

In conclusion, overall all injured athletes' who were interviewed expressed positive comments after their participation in the 8 weeks of the MM program. However, they also stated that, as it was a new skill for them to learn, they also faced some difficulties especially during the early phase of the program. From the interview data, it came apparent that group meditation in a face-to-face mode would enhance feelings of empathy among participants and also stimulate some peer support which would help overcome the difficulties of new starters. In addition, the participants mentioned that MM supported them in accepting their new situation as an injured athlete and promoted a feeling of "let go" without judging their physical state.

## 4.5 Discussion

In this study a qualitative approach was employed by applying a thematic analysis to explore the perceptions and opinions of injured athletes who received 8 weeks of the MM program. Notably, five injured athletes were randomly selected and invited to attend a 30-minute interview to assess their personal lived experiences. Five themes were identified from our thematic analysis: (1) Reconnecting with the body, 2) Reconnecting with the mind, 3) Passivity of MMP as opposed to the athletic praxis, 4) Group versus self-guided MMP, 5) Acceptance of pain.

Injured athletes reported that MMP was a new skill for them to learn and they faced difficulties in going through the initial stage of the program. It is worth mentioning that the injured athletes who took part in our studies were beginners in this kind of meditation and had not any previous experience. Therefore, to learn and be familiarised with new skills, it is indeed a difficult task, as the MMP requires some perseverance and a series of repetitions. Kornfield (2005) stressed that the cultivation of any new skills requires three components: systematic training, patience and perseverance.

Thinking about the particularities of our sample, it is of relevance to take into consideration that the everyday pattern of sport activities is characterised by dynamic, active, explosive and fast actions and that this is antithetic to the passive and sedentary nature of a classic MMP, as highlighted by some of our participants. Consistently, injured athletes emphasised that self-practise with formal sessions during the 8 weeks enabled them to perform better and also feel more connected with their bodies.

Overall our participants regarded MM as a beneficial method to help them reconnect with their bodies and be more aware of their injuries and to accept them. This is in line with other studies that found out that MMP is a suitable treatment to use as a clinical intervention (Arefnasab, Babamahmoodi, Babamahmoodi, Noorbala, Alipour & Panahi 2016; Ali, Weiss, Dutton, McKee, Jones & Kashikar-Zuck et al., 2017; Zhang, Zhou, Feng, Fan, Zeng & Wei 2017; Reich, Lengacher, Alinat, Kip, Paterson & Ramesar, 2017).

Injured athletes also offered some valuable insight into what method of delivery is more suitable for inexperienced participants such as them. These attitudes might be a "light guide" for practitioners and researchers in future programs which target clinical populations. Injured athletes reported that instead of running meditation sessions for an individual, workshops might have a better effect in terms of comparing one person's state to others and sharing an idea with them. Fundamentally, the original MBSR was developed and practised in a group (Kabat-Zinn, 1982). However, to the contrary in this study, meditation sessions were run individually instead of meditation with a group. The reason behind this was that the physical state of injured athletes, which made the gathering of injured athletes in one time and place not possible. In addition to the MM, they had had physiotherapy treatment and also their own personal tasks to do. Furthermore, other injured athletes reported that self-directed practise should have included a diary to write in instead of only the practise, because it would help to understand one's progress as a beginner in

mindfulness meditation. The reason for the self-directed practise without having homework to write down was to avoid an extra task that might have affected their participation.

There were perceptible interpretations from injured athletes regarding the perception of pain and pain tolerance after 8 weeks of the MMP. Noticeably, injured athletes reported that after a period of regular meditation, their pain sensitivity improved and their body sensations changed after MM. Further, the pain tolerance increased and they felt more endurance even though they had had fatigue. Interestingly, the understanding of these perceptions, which emerged after their participation in this study, was that MMP has actual positive effects on injured athletes. In other words, they followed and applied the daily practise in both formal and informal meditation. Therefore, meditation sessions supported them during the rehabilitation process. This is in line with Kingston, Chadwick, Meron & Skinner (2007), who found that pain tolerance significantly improved with asymptomatic students. Consistently, Zeidan, Gordon, Merchant & Goolkasian (2010) verified that a brief form of mindfulness meditation was effective in reducing pain and anxiety. Other injured athletes emphasised the beneficial aspects to the psychological consequences of pain. They indicated that after being injured there were many negative thoughts that had come to their minds regarding parallel physical pain such as frustration, negative moods and anger. Therefore, MBSR was very useful in terms of managing feelings and having a clearer mind. However, there was nothing noticeable in terms of physical pain. Worth mentioning is that Brown and Jones found in their research with patients who had chronic pain that there was an improvement in mental health and better management of pain, while clinically no reductions in pain rating had been found (Brown & Jones, 2013).

The last theme related to the injured athletes' attitudes about MMP *mood state* (theme 5). All injured athletes reported that MMP positively affected their psychological state during the rehabilitation process. This is even though they were faced with difficulties in practicing meditation for a long time. Further, it was a suitable means of managing their negative moods and also it helped them in with their daily tasks over time. In fact, it was expected that MM would support injured athletes during their recovery time, because they meditate regularly to cultivate awareness and this helped them to achieve wellbeing and the ability to manage their psychological state. In this sense, Kabat-Zinn (2009) stated that to develop a greater wellbeing and emotional balance, individuals need to keep up the awareness moment by moment and disengage themselves with strong thoughts and beliefs.

Moreover, this is consistent with the findings from other research (Carmody & Baer, 2008; Nyklíček & Kuijpers, 2008; Hoffman, Ersser, Hopkinson, Nicholls, Harrington & Thomas, 2012; Nejati, Esfahani, Rahmani, Afrookhteh & Hoveida, 2016) which discovered the positive impact of MBSR on improving wellbeing and the quality of life within different clinical populations.

In spite of the exploratory nature of this study, it should be noted that the findings revealed a considerable positive perception regarding their participation in the MMP. Further qualitative studies could enhance our knowledge and scientific understanding about what it is that makes MM have such a positive perceived effect on injured athletes' acceptance of pain and how this can be incorporated into a holistic approach during the sport rehabilitation process.

## 4.6 Recommendation

It will be important to explore the potential use of other qualitative approaches, such as focus group to understand therapists' experiences in addition to semi structured interviews (STI). The reason behind that is that therapists can share their ideas about the program with colleagues and thus gain more accurate information.

# CHAPTER FIVE

## The Effect of Mindfulness Meditation on Therapists' Body-Awareness and Burnout in Different Forms of Practice

# The Effect of Mindfulness Meditation on Therapists' Body-Awareness and Burnout in Different Forms of Practice

**Abstract:**

**Objectives**: The main aim of this study was to explore whether mindfulness increases therapists' (physiotherapists and sport therapists) body-awareness and if it can have an effect on reducing their burnout in the workplace. Additionally, it was intended to gather evidence about which of the methods of delivery of the mindfulness meditation programmes (MMP) (face-to-face groups with an instructor (FFGs) and self-directed group (SDG)) were more effective with therapists.

**Methods**: Online tools such as the creation of a website, as well as skype and online surveys were used with participants as part of the methodology. Seven measurements were used to assess the effect of mindfulness meditation on therapists after 4 weeks of formal and informal practise.

**Results**: Our results showed that attention regulation, self-regulation and trusting in FFGs had a significant improvement in pre and post meditation practise. Findings showed significant differences between groups for the FFGs. Particularly, our findings indicated a clear improvement in acting with awareness, a positive effect of mindfulness, emotional awareness and a reduction in burnout. However, no changes were observed in stress.

**Conclusion**: This study offers evidence that mindfulness meditation benefited therapists in terms of improving their body-awareness and by reducing their level of burnout in the workplace. The benefits of the mindfulness programme were more significant when delivered in a face-to-face programme rather than in a self-directed way.

Key words: Physiotherapists, sport therapists, mindfulness, meditation, body-awareness, burnout

## 5.1 Introduction

Mindfulness is a way of being in the present moment and observing whatever thoughts and body sensations that might arise into the mind without judgment (Stahl & Goldstein, 2010). The cultivation of mindfulness includes concentrating on the present time, described by openness, acceptance, nosiness and non-judgmental awareness. In this regard, there are three techniques to improve the body awareness, the first is called a body scan which includes scanning the full body from head to feet, and attention is paid at the current time by using both breath awareness and relaxation. Sitting meditation is the second technique that includes mindful-attention through breath meditation and non-judgmental awareness of the thoughts that constantly comes up to the mind. The third techniques is hatha yoga, which involves concentrating on training the breath and extension exercises to enhance relaxation in the musculoskeletal system (Chiesa & Serretti, 2011).

La Forge (2005) pointed out that the mindfulness training involves five components. The first component is Meditative/Contemplative, which contains non-judgment during performance, focusing on the current moment and guiding attention to the present targets. The second component is Proprioceptive-Awareness, during mindfulness training the muscular activity is confined to between a low to moderate range, besides; concentrating on the muscles, which contribute to movement. The third component is Breath-Centering. The process of breathing includes various techniques which are a main characteristic within mindful training. The next component is Anatomic Alignment, which means anatomical aspects of the body such as the pelvis, spine and trunk. Noteworthy, is the self-discipline involved with the style of the movements and spine alignment which apply to different forms of Mind-Body exercise. The last component is Energy-Centric. Mindfulness training consist of many kinds of positive energy such as, lively, flow of inner energy and more awareness of the physical activities.

The objective behind mindful training is to notice the feelings inside the body during movements. At the same time, through mindful exercise, it is possible to understand ourselves and our experiences in addition to knowing the patterns which help us see how to behave in certain situations (Silverton, 2012). Mills & Allen (2000) concluded that mindful exercise contains the process of improving the moment-to-moment awareness within the movements, situations and breathing. In addition, this improvement in awareness is concerned with whether the movements are integrated into the mind or whether there is a

disconnect between the "mind and body", whether the process of breathing is deep or shallow and also whether movement situations are aligned or misaligned. In relation to mindfulness interventions, Lykins & Baer (2009) stated the fact that there are many mechanisms which teach mindful exercise and are applied in the health field, (Relapse Prevention for Substance Abuse Marlatt & Donovan, 2005; Acceptance Commitment Therapy (ACT) Hayes et al., 1999; Mindfulness-Based Cognitive Therapy (MBCT) Segal et al., 2002 and Mindfulness-Based Stress Reduction Kabat-Zinn, 1982). A technique that has proven to be effective in developing the participants' awareness is the "body scan" technique once awareness has been achieved movements become more graceful and comfortable, and participants become aware of any muscular tension or cohesion in their movements, as participants developed a deeper understanding of the self-worth of their own body (Mills & Allen, 2000).

### 5.1.1Therapists and Work-Related Stress

Different studies from across the globe have gathered evidence that the physiotherapists work conditions put them in high risk and high levels of stress and anxiety and musculoskeletal problems. In an international study in which the participants were therapists from 35 different countries Klappa et al., (2015), the majority of therapists reported experiencing extreme fatigue (66%). In the same study, the international sample of participants mentioned experiencing a series of psychological symptoms such as increased irritability, increased isolation, and sadness or hopelessness and also work-related issues were mentioned such as increased difficulty with colleagues and decreased productivity. These results were also echoed by another survey-based study Gh et al., (2009) conducted in a sample of 243 Iranian physiotherapists, observed that more than a half of the participants of their survey had job related musculoskeletal problems and that 58.2% of them perceived that their job was a source of stress. It seems that workplace stress in the therapeutic profession is common across cultures. In the United Kingdom, the Chartered Society of Physiotherapy (CSP) conducted a survey in which 37% of its members reported having unacceptably high stress levels. Moreover, a quarter of their physiotherapists who took part in the CSP survey stated that the workplace stress has been detrimental to their health (CSP, 2017).

Another problematic symptom of the physiotherapists' work conditions that has attracted the attention from scholars is compassion fatigue (CF). Compassion fatigue has been

characterized as the gradual lessening of compassion and the overall negativity experienced by caregivers who are frequently exposed and work with people who have experienced traumatic stress and/or suffering (Stamm, 2010). The therapists who in Klapa et al., (2015) study showed symptoms of CF, reported 'having difficulty demonstrating compassion to their patients while facing the stresses of productivity and other job strains' (Klapa et al., 2015: 136). Gh et al., (2009) also stated that physiotherapists may be susceptible to chronic fatigue syndrome because they are frequently exposed to work closely with clients who have chronic problems. CF strongly associates with burnout syndrome in physiotherapists. In real one-fifth of physiotherapists presented high levels of burnout signs and work-related symptoms of stress.

Overall, there is a plethora of studies evidencing that demands placed on the therapists can potentially lead to heightened levels of stress and burnout (Ogiwara & Hisano, 2002; Tragea et al., 2012 and Pustulka-Piwnik et al., 2014). Maslach and Jackson (1996) clarified that burnout as a psychological condition includes three elements of negative experiences which can be noticed through a reduction in personal achievement, increase in depersonalisation and a high level of emotional fatigue.

Therapists are conscious of the stress symptoms related to their work conditions and that they are at risk of burnout. In the phenomenological enquiry led by Klapa et al., (2015) therapists mentioned the employment of several strategies, such as physical activity and their participation hobbies in their spare time to alleviate the symptoms and achieve a healthier life-work balance Klapa et al., (2015). However mindfulness training was not listed among the different copying strategies employed by therapists to reduce their workplace related stress. In the section that follows evidence form the literature is summarized in order to highlight how mindfulness training can help reduce psychological distress Klapa et al., (2015).

### 5.1.2 Why Mindfulness Practise can be of Benefit to Therapists

Notably, and related to the context of this study, the effect of mindfulness training in reducing workplace stress has started to been identified and scholarly evidence has been gathering over the course of the past decade. Landsman-Dijkstra, van Wijck and Groothoff, (2006) employed a 3-day residential body awareness program (BAP) directed to people with chronic aspecific psychosomatic symptoms (CAPS) in order to help them cope with their daily workload. The methodological design (pre-post) of that study enabled

the authors to gather evidence that BAP can leads to long-term effects in copying with psychosomatic symptoms. A year after the 3-day program, participants had modified their behaviour a way that helped dealing better with their daily worked and coping with stress and psychosomatic symptoms.

The above results have been echoed by another study by Shapiro et al., (2005) who observed that healthcare-professionals who received 8 weeks of meditation practice recorded less stress and a greater level of compassion compared to their peers in the control group. In addition, both negative emotions and burnout had decreased. In a similar vein, Schenström, Ronnberg and Bodlund, (2006) discovered that mindfulness and wellbeing were increased in a mixture of healthcare-professionals after participating in a mindfulness program. Additionally, the stress level had decreased both at home and at the workplace.

Therefore, and in light of the above, mindfulness could be a convenient skill that can support therapists in terms of improving their body-awareness, reducing burnout syndromes and achieve compassion and a better mood state.

In our present study, the focus was in exploring the following two research questions:

- Does mindfulness increase therapists' body-awareness and reduce their burnout in the workplace?

- Which of the delivery method of the mindfulness mediation program (face-to-face with an instructor or self-directed) was more effective with therapists?

## 5.2 Methods

### 5.2.1 Procedure

This study has been approved by the School of Sport and Exercise Sciences, Ethics Committee. Three pilot tests were conducted to test the design of this study. Prior to the data collection, all the assessment tools that were used in the present study were transferred to the online version. The first pilot test was to design one of these questionnaires giving two ways to answer. The purpose of that was to understand which way would be easier to handle the data collection. The first design, which included three questions to be completed, then enabled the participants to skip to other questions. The second design,

included one question to complete, and then the participants could skip to the next question. Notably, ten postgraduate students completed both designs of the questionnaire via PC and mobile. As a result, the first design was chosen by the participants who took part in this study, because they emphasised that it was easier and quicker. Five postgraduate students were involved in the second pilot test to identify the length of time taken for all the questionnaires that were used in the present study. The last pilot test was done with three therapists entering a website which was created to handle all the data collection in this study. The participants read and completed consent forms and all the questionnaires. Additionally, the primary researcher was sitting next to them and noting down any observations that he/she might have had to do, or any other points that were not understood.

The study lasted 4 weeks in total and all the information regarding the structure of the study was given to the participants during that period. It should be noted that, mindfulness practise (MP) in this study was based on the Mindfulness Based Stress Reduction that was developed by Kabat-Zinn in 1979 at the University of Massachusetts Medical Centre in Worcester, USA (See Table 5. 2). Importantly, the original MBSR had been offered for 8 weeks with 2.30 minutes of formal and informal practice. In this study, the MMP had been modified into 4 weeks to be convenient for therapists in terms of time and study procedure. The reason behind that was that therapists in the SDG came from different countries. As such, therapists in both groups had limited availability to participate in 8 weeks MMP. Furthermore, there were many requirements that the therapists were asked to complete, therefore asking more might have affected their participation.

The baseline measures (questionnaires) were taken before and after four weeks. Once they complete the questionnaires they started training and practising mindfulness. It should be noted that, in this study MMP was used with 2 different groups. The first group was the therapists, who trained in mindfulness face to face (FFGs) with the researcher. Each week involved one session lasting 60 to 90 minutes. Further, each participant was given one CD from the MBSR program to listen to and practice at home for about 20 minutes per day. Some of the therapists in the face to face group practiced mindfulness via skype that was led by the researcher and lasted 60 to 90 minutes.

The second group were self-directed (SDG) participants who applied the MMP by themselves, using a CD that was provided to them. The outcomes were collected via an on-line survey. It is noteworthy that all questionnaires were completed on-line at two different

times. The first time was when the participants filled in all the questionnaires at the beginning of the four weeks. The last time was when the participants filled in questionnaires after they had done the mindfulness program. Notably, therapists in SDG obtained the guides from the CD of MBSR. In other words, the CD consists of instructions that meditators need during meditation practice. Additionally, as mentioned above, all therapists received further information in the consent form regarding the study procedure and mediation procedure before their participation in this study.

### 5.2.2 Participants

A total of 29 therapists were involved in this study (See Table 5.1). The participants were able to take part in the present study in various locations throughout the world.The researcher contacted the therapists and asked them to take part in this study. Furthermore, the investigators contacted the Chartered Society of Physiotherapists (CSP). A request for potential participants and the contact details of the researcher were posted in the CSP forum for Skype and an online survey. Therapists in the Medway were also contacted for the face to face group. The graduate sports therapists were contacted though the School of Exercise and Sports Sciences' Facebook page. The participants were allocated to either group A face to face and face to face through Skype (FFGs) or the group B Self-directed (SDG) group. UK therapists were allocated to the FFGs but the non-UK therapists were allocated to the SDG. It should be also noted that, therapists in the intervention group were given formal mindfulness meditation practice with the primary researcher for 60-90 minutes per week. In addition they were asked to continue to practice 20-30 minutes of informal mindfulness meditation training through listening to a CD of the "mindfulness based stress reduction workbook" by (Stahl & Goldstein, 2010). Regarding to the self-directed group SDG, the therapists only practised 20-30 minutes of informal mindfulness meditation training on their own. The details of differences in terms of applying MMP, completing the quantitative measurements and time were presented in (Table 5.2).

### 5.2.3 Website, Skype and Online Survey

In this study, internet-based technologies such as websites, skype conference calls and online surveys were used with participants as part of the methodology. The website**: http://mindfullnessmeditationresearch.weebly.com/** was created exclusively for the purpose of the study and to make the study procedure and data collection easier. Moreover,

it was also created to avoid some technical issues that might have an effect on the study process, such as wasting time, not receiving data properly, losing data and having contact difficulties. Further, a Skype interview was utilised with a group of participants to practice MMP for 60 to 90 minutes per week.

### 5.2.4 Burnout Self-Test, (BST) Maslach Burnout Inventory (MBI), Maslach & Jackson, (1996)

The MBI is comprised of 22 items, each divided into three sections. The MBI rating is between *0 (never)* to 6 *(every day).* With regard to the Cornbach's alpha for each subscale, the figures were 0.90 for Burnout, 0.79 for Depersonalisation and 0.71 for Personal Achievement (Maslach & Jackson, 1996). Furthermore, Loera, Converso & Viotti (2014) emphasised that MBI is extensively used to assess burnout, by using three subscales: personal accomplishment, depersonalisation and emotional personal. In this study MBI was utilised with therapists to discover their attitudes and feelings pre and post the MBSR program. Essentially, each subscale has a particular score to measure MBI/BST. For instance, a low-level of burnout starts with total scores of 17 or less, moderate burnout is between the total of 18 to 29, and a high-level of burnout with a total of 30 or more. Depersonalisation scores measure low-burnout from 5 or less, moderate-burnout from 6-11, and high-burnout from 12 or more. Regarding personal achievement scores, a high level of burnout is a total of 33 or less. Whereas, moderate burnout is from 33-39 and more than 40 indicates a high level of burnout (Maslach & Jackson, 1996).

### 5.2.5 Multidimensional Assessment of Interoceptive Awareness (MAIA), Mehling, Price, Daubenmier, Acree, Bartmess & Stewart (2012)

MAIA was developed by Mehling et al., (2012) at the University of California, San Francisco. This instrument included 32 items to measure eight notions of interoceptive awareness which are noticing, not-distracting, worrying, emotional awareness, attention regulation, body listening, trusting and self-regulation. This scale includes some reverse-score items particularly on not-distracting and worrying subscales. Afterward, total scores are calculated for each subscale. The Cornbach's alpha for MAIA subscales is: 0.69 for Noticing, 0.66 for Not-Distracting, 0.67 for Not-Worrying, 0.87 for Attention-Regulation, 0.82 for Emotional-Awareness, 0.83 for Self-Regulation, 0.82 for Body- Listening and 0.79 for Trusting Mehling et al., (2012).The rating scale is divided between 0 *(never)* to 5

*(always).* Mehling et al. (2012) indicated that an interoceptive awareness is a state of conscious perception of internal body sensations, which can be sensed through physiological conditions such as respiration, heartbeat, satiety and autonomic nervous system sensations. Furthermore, this instrument is much related with mindfulness meditation and it has been commonly used in assessing body sensations.

### 5.2.6 Five Facet Mindfulness Questionnaire (FFMQ), Baer, Smith, Hopkins, Krietemeyer & Toney (2006)

The initial FFMQ was developed by Baer et al., (2006) this instrument included 39 items that measured five components, such as non-judging (NJ) of inner experience eight items, non-reactivity to inner experience (NR) eight items, acting with awareness (AA) eight items, describing (DS) eight items and observing (OB) eight items. The FFMQ scale rating is from 1: "*never or very rarely true"* to 5: "*very often or always true"*. The Cornbach's alpha for all subscales were 0.81 for Observing, 0.87 for Describing, 0.83 for Acting with Awareness, 0.83 for Non-Judging and 0.75 for the Non-Reactivity (Bohlmeijer, Klooster, Fledderus, Veehof & Baer, 2011). Additional to the previous scale, FFMQs also have reverse score items, describing (R) and then summing all items to achieve the total scores of FFMQ **(**Baer et al., 2006). In the current study, a short form of the FFMQ was utilised, which was developed by (Bohlmeijer et al., 2011).

### 5.2.7 Santa Clara Brief Compassion Scale (SCBCS), Hwang, Plante & Lackey (2008)

The original version of the Compassionate Love Scale consisted of 21 items (Sprecher & Fehr's, 2005). The updated version of the SCBCS was developed by (Hawang et al., 2008). In addition, it included five items and the purpose of the SCBCS was to assess compassion and it is associated with prosocial behaviours. The higher the score, the greater the compassion, and the scale is divided into seven points from "*not at all true of me"* to "*very true of me".* The Cornbach's alpha for the SCBCS is 0.90 (Sprecher & Fehr's, 2005). Hawang et al., (2008) emphasised that to investigate the effectiveness of any educational strategies, the SCBCS is an ideal tool to assess compassion between respondents. Besides, the SCBCS is short and therefore the process of scoring and analysing becomes easier. A study by Plante and Mejia (2016) indicated that SCBCS is an appropriate and valid scale to

measure self-reported compassion. This was done through different psychometric tests and the collection of data from 6,763 responses.

### 5.2.8 The Positive and Negative Affect Schedule (PANAS), Watson & Clark and Tellegen (1988)

The PANAS is designed as a valid and reliable instrument to evaluate both negative and positive moods, through 20 words (10 negative and 10 positive) that express different emotions for respondents. Each word is given a rating between 1= *very slightly or not at all* to 5 = *extremely*. The participants selected the numbers according to how he/she felt in the present moment (Watson et al., 1988). Positive or negative scores ranged between (10-50) with higher scores indicting higher rates of positive or negative affect. The Cornbach's alpha for the positive scale is ranged between 0.86 to 0.90 and the negative scale from 0.84 to 0.87 (Watson et al., 1988). Therefore, PANAS was a convenient means to use in the present study to distinguish the emotional state for therapists. In addition, Schmukle, Egloff & Burns (2002) stressed that PANAS is the most common instrument that is used in numerous studies regarding health complaints, perceived stress and social activities (Watson & Pennebaker, 1989; Watson, Clark, McIntyre, & Hamaker, 1992; Watson, Clark & Carey, 1988; Burger & Caldwell, 2000; Becona, Vasquez, Fuentes & Lorenzo, 1998).

### 5.2.9 Perceived Stress Scale (PSS), Cohen & Williamson (1988)

PSS is widely applied as a psychological means to measure the perception of stress. Therefore, the PSS is a convenient scale to investigate the present level of stress. Additionally, through this instrument, it is possible to understand both thoughts and feelings for respondents during the last month. After reverse coding, some items and then all the items are summed to obtain the total PSS scores. Furthermore, the Cornbach's alpha for PSS 10 items is 0.78 (Cohen & Williamson, 1988). Cohen and Williamson (1988) and Andreou et al., (2011) mentioned that to measure the perception of stress, there are three common instruments which are Impact of Event Scale IES, Stress Appraisal Measure SAM and the Perceived Stress Scale PSS. Notably, PSS is the most popular instrument that is used in particular studies such as stress management strategies, assessing the stressfulness of events and physical and psychiatric diseases.

### 5.2.10 The Depression, Anxiety and Stress Scale (DASS 21), Lovibond & Lovibond (1995)

The original version of DASS Lovibond & Lovibond (1995) comprised 42 items measuring 3 scales of depression, anxiety and stress and each scale contained 14 items. In contrast, DASS 21 Lovibond & Lovibond (1995) is developed from the original DASS and each subscale has 7 items; notably, DASS 21 has high validity and reliability. The Cornbach's alpha for all DASS 21 subscales are 0.91 for Depression, 0.81 for Anxiety and 0.89 for Stress. The rating scale is scored between 0 *(never)* to 3 *(almost always).* DASS 21 scores have five levels of severity for each subscale which are normal, mild, moderate, severe and extremely severe Lovibond & Lovibond (1995).

Further, DASS 21 requires less time to complete compared to the DASS; therefore, it will be more acceptable for participants in two dimensions. The first are participants who have busy schedules and the second participants with a limited focus (Crawford et al., 2009). In this study the DASS 21 was utilised with therapists.

**Table 5.1: Demographic information and details of each therapist in terms of Age, Gender, Qualifications and Country**

| Face to Face and Skype Group | | | |
|---|---|---|---|
| **Age** | **Gender** | **Field** | **Country** |
| 35 | Male | Sport therapist | United Kingdom |
| 34 | Female | Physiotherapist | United Kingdom |
| 32 | Male | Physiotherapist | United Kingdom |
| 27 | Female | Physiotherapist | United Kingdom |
| 25 | Male | Sport therapist | United Kingdom |
| 24 | Male | Sport therapist | United Kingdom |
| 23 | Male | Sport therapist | United Kingdom |
| 23 | Female | Sport therapist | United Kingdom |
| 23 | Female | Sport therapist | United Kingdom |
| 22 | Male | Sport therapist | United Kingdom |
| 36 | M | Physiotherapist | Kurdistan/Iraq |
| 35 | F | Sport therapist | Thailand |
| 35 | F | Physiotherapist | India |
| 34 | M | Physiotherapist | Brazil |
| 33 | M | Physiotherapist | Brazil |

| | | | |
|---|---|---|---|
| 25 | F | Physiotherapist | Lithuania |
| **Self-Directed Group** | | | |
| 45 | F | Physiotherapist | India |
| 40 | M | Physiotherapist | Kurdistan/Iraq |
| 38 | F | Physiotherapist | India |
| 36 | M | Physiotherapist | Kurdistan/Iraq |
| 35 | M | Physiotherapist | Italy |
| 35 | M | Physiotherapist | Brazil |
| 35 | F | Sport therapist | Brazil |
| 35 | M | Sport therapist | India |
| 32 | M | Physiotherapist | Brazil |
| 32 | F | Physiotherapist | Kurdistan/Iraq |
| 27 | M | Physiotherapist | Thailand |
| 27 | M | Physiotherapist | India |
| 25 | F | Physiotherapist | Brazil |

**Table 5.2: Mindfulness Meditation Program (MMP) that was used in this study with therapists, and all sessions were led by the primary researchers. While, the therapists in the SDG applied MMP by themselves via a meditation practice CD.**

| Weeks | Formal mindfulness meditation practice (60-90) minutes (face to face and skype groups). | Informal mindfulness meditation practise with daily (20) minutes of informal training (self-directed group). |
|---|---|---|
| Week 0 | - Participant's information sheet<br>- Consent form<br>Participants were asked to complete 7 questionnaires (MAIA, BST, FFMQ, PANAS, SCBCS, PSS and DASS21) through the website, created exclusively for the purpose of the study and to make the data collection easier. In addition to avoiding some technical issues that might affect study protocol. (http://mindfullnessmeditationresearch.weebly.com)<br>16 therapists took part in this group. Further demographic information in Table (1).<br>Each participant had one formal session | - Participant's information sheet<br>- Consent form<br>Participants were asked to complete 7 questionnaires (MAIA, BST, FFMQ, PANAS, SCBCS, PSS and DASS21) through the website, created exclusively for the purpose of the study and to make the data collection easier. In addition to avoiding some technical issues that might affect study protocol. (http://mindfullnessmeditationresearch.weebly.com)<br>13 therapists took part in this group. Further demographic information in Table (1).<br>Participants only applied mindfulness meditation by themselves, with CD guides |

| | | |
|---|---|---|
| | per week which lasted for 60-90 minutes.<br>In addition to 20 minutes informal practise at home.<br>None of the participants withdrew from this group.<br>Therapists in the intervention group were applied formal mindfulness meditation practice with a primary researcher for 60-90 minutes a week.<br>Daily 20-30 minutes of informal mindfulness meditation training through a CD at home. | for only 20 minutes per day.<br>Only 7 participants withdraw from this group, after they singed informed consent without any explanation.<br><br>Therapists in the Self-directed group SDG, only practised 20-30 minutes of informal mindfulness meditation training by themselves. |
| Week 1 to Week 4 | The formal session protocol.<br>- 10 to 15 minutes mindful check-in and sharing ideas about mindfulness meditation practice.<br>- 35 minutes formal meditation practice. The formal session included these meditation skills (sitting or lay down meditation, mindful breathing and body-scan meditation).<br>- 10 to 15 minutes mindful check-in and sharing ideas about mindfulness meditation practice. As well as this, sharing attitude that emerged from the session. | The informal session protocol.<br>20 minutes of daily mindfulness meditation through the CD guide. The CD of MBSR included these skills (sitting/laying down meditation, mindful breathing, body-scan meditation, mindful walking meditation, mindful eating, meditation for anxiety and stress, mindful lying yoga, mindful standing yoga and loving kindness meditation). |
| Week 5 | Participants were asked for the second time to complete 7 questionnaires (MAIA, BST, FFMQ, PANAS, SCBCS, PSS and DASS21) through the website below: (http://mindfullnessmeditationresearch.weebly.com/) | Participants were asked for the second time to complete 7 questionnaires (MAIA, BST, FFMQ, PANAS, SCBCS, PSS and DASS21) through the website below: (http://mindfullnessmeditationresearch.weebly.com/) |

*This table explains 4 weeks of formal and informal sessions with therapists (physiotherapists and sport therapists) in both face to face & skype groups and a self-directed group. MMP has been delivered in different methods and procedures to understand the changes between FFGs and SDG in pre and post MMP.*

## 5.3 Results

The data were analysed based on either parametric (e.g. t-test) if data conformed to a normal distribution, or non-parametric statistics were reported, e.g. a z-score using a Wilcoxon signed ranked test, or a Mann Whitney U Test.

### 5.3.1 Multidimensional Assessment of Interceptive Awareness (MAIA)

The total findings of the MAIA showed that there were no significant differences in pre and post meditation scores for the SDG (z=-0.54, p=0.59). Furthermore, pre and post meditation scores in the face to face group were significant (z=-2.80, p=0.05).

In addition, the results showed significant differences between the groups in mean difference scores (u=2.50 p=0.034).

The focus will be on three subscales which were significantly improved after MMP. (See Table 5.3, 5.4 and 5.5).

#### 5.3.1.1 Attention Regulation (AR)

Regarding the AR subscale our findings indicate that FFGs had significant differences in mean scores, pre MMP scores (17.50±5.017) and post MMP scores (25.20±4.392), t(9)= -4.478, p=0.002. On the other hand, there were no changes in the pre mean scores for SDG (17.75±9.179) and post MMP scores (15.67±10.693), p = 0.235.

#### 5.3.1.2 Self-Regulation (SR)

The data showed that there were improvements in the mean scores of FFGs, pre MMP scores (9.60±3.806) and post MMP scores (14.80±2.044), t(9)=-5.600, p<0.001. Whereas, there were no changes in the mean scores differences in SDG, pre MMP scores (12.50±3.512) and post MMP scores (12.00±8.185), t(2)=1.677, p=0652.

#### 5.3.1.3 Trusting

As such, the findings showed that there were clear improvements in the mean scores for FFGs, pre MMP scores (9.20±3.360) and post MMP scores (11.80±2.860), t(9)=-4.628, p=0.001. While, no changes were found in SDG pre MMP scores (10.00±3.916) and post MMP scores (9.67±4.163), t(2)= 0.311, p=0.785.

#### 5.3.1.4 Body-Listening (BL)

The findings indicated that there were no significant differences between groups. However, there was an improvement in the mean scores in pre (4.50±3.10) and post (8.70±3.26) meditation for FFG, and no changed were found in pre (7.00±2.94) and post (6.33±4.50) meditation practise for the SDG. In addition, there were significant changes for FFG t(9)= -4.466, p= 0,002, compare to the SDG t(2)= 0.625, p= 0.596.

#### 5.3.1.5 Emotional Awareness (EA)

In relation to the EA, data showed that FFG has significantly improved in the mean scores in pre (14.80±3.76) and post (18.90±2.92) meditation practise. However, no improvement was observed in pre (13.25±6.29) and post (13.00±5.56) MMP. The data also showed that there were statistical changes for the FFG t(9)= -3.374, p= 0.008, compare to the SDG t(2)= -2.000, p= 0.184.

#### 5.3.1.6 Not-Worrying (NW)

Our findings revealed that there were no differences have been observed between pre (7.60±3.20) and post (8.50±3.27) meditation for FFG and similarly pre (5.75±2.21) and post (7.00±3.00) mediation practise for SDG. As such, no significant changes were observed for FFG t(9)= -1.784, p= 0.108 and SDG t(2)= 0.866, p= 0.478.

#### 5.3.1.7 Not-Distracting (ND)

The results observed that there were no significant improvement in the mean scores for FFG in the pre (7.30±3.88) and post (7.30±2.45) meditation program. As well as this, no significant enhancement were found for the SDG in pre (7.75±4.78) and post (7.33±4.041) MMP. Furthermore, no significant changes were observed for FFG t(9)=0.000, p= 1.000, and SDG t(2)= -1.147, p= 0.370.

### 5.3.1.8 Noticing

Data showed that noticing did not change in the mean scores for FFG in pre (11.50±4.197) and post (14.80±4.31) meditation program and also for the SDG in pre (13.25±2.87) and post (12.33±5.85) MMP. Further, there were no significant changes shown between FFG t(9)= -2.039, p= 0.086, and SDG t(2)= -1.516, p= 0.158.

**Table 5.3: Analysis for the face to face meditation group comparing pre with post meditation for a Multidimensional Assessment of Interceptive Awareness (MAIA).**

| Outcome Variable | Pre Meditation | Post Meditation | Statistical analyses values (t/z, p) |
|---|---|---|---|
| Total scores of Multidimensional Assessment of Interceptive Awareness (MAIA). | 82 ± 21.69 | 110 ± 11.96 | z = - 2.803, p = 0.005 |
| Attention Regulation (MAIA) | 17.50 ± 5.01 | 25.20 ± 4.39 | t(9) = - 4.478, p = 0.002 |
| Self-Regulation (MAIA) | 9.60 ± 3.80 | 14.80 ± 2.04 | t(9) = - 5.600, p = 0.000 |
| Trusting (MAIA) | 9.20 ± 3.36 | 11.80 ± 2.86 | t(9) = - 4.628, p = 0.001 |
| Body-Listening (MAIA) | 4.50 ± 3.10 | 8.70 ± 3.26 | t(9) = - 4.466, p = 0.002 |
| Emotional Awareness (MAIA) | 14.80 ± 3.76 | 18.90 ± 2.92 | t(9) = - 3.374, p = 0.008 |
| Not-Worrying (MAIA) | 7.60 ± 3.204 | 8.50 ± 3.274 | t(9) = - 1.784, p = 0.108 |
| Not-Distracting (MAIA) | 7.30 ± 3.88 | 7.30 ± 2.45 | t(9) = 0.000, p = 1.000 |
| Noticing (MAIA) | 11.50 ± 4.19 | 14.80 ± 4.31 | t(9) = - 2.039, p = 086 |

**Table 5.4: Analysis for the self-directed meditation group comparing pre with post meditation for Multidimensional Assessment of Interceptive Awareness (MAIA)**

| Outcome Variable | Pre Meditation | Post Meditation | Statistical analyses values (t/z, p) |
|---|---|---|---|
| Total scores of Multidimensional Assessment of Interceptive Awareness (MAIA). | 87.25 ± 17.84 | 83.33 ± 31.89 | z = - 0.535 p = 0.593 |
| Attention Regulation (MAIA) | 17.75 ± 9.17 | 15.67 ± 10.69 | t(2) = 1.677, p = 0.235 |
| Self-Regulation (MAIA) | 12.50 ± 3.51 | 12.00 ± 8.18 | t(2) = 0.524, p = 0.652 |
| Trusting (MAIA) | 10.00 ± 3.91 | 9.67 ± 4.16 | t(2) = 0.311, p = 0.785 |
| Body-Listening (MAIA) | 7.00 ± 2.94 | 6.33 ± 4.509 | t(2) = 0.625, p = 0.596 |
| Emotional Awareness (MAIA) | 13.25 ± 6.29 | 13.00 ± 5.56 | t(2) = - 2.000, p = 0.184 |
| Not-Worrying (MAIA) | 5.75 ± 2.21 | 7.00 ± 3.00 | t(2) = - 0.866, p = 0.478 |
| Not-Distracting (MAIA) | 7.75 ± 4.78 | 7.33 ± 4.04 | t(2)= -1.147, p = 0.370 |
| Noticing (MAIA) | 13.25 ± 2.87 | 12.33 ± 5.85 | t(2) = - 1.516, p = 0.158 |

**Table 5.5: Analysis comparing change scores (pre – post meditation) for the two groups face to face and self-directed for Multidimensional Assessment of Interceptive Awareness (MAIA)**

| Outcome Variable | Post Meditation (FFG) | Post Meditation (SDG) | Statistical analyses values (t/u, p) P Value |
|---|---|---|---|
| Total scores of Multidimensional Assessment of Interceptive Awareness (MAIA). | 28 ± 14 | -6.66 ± 22.12 | p = 0.034, u =2.500 |
| Attention Regulation (MAIA) | 7.700 ± 5.43 | -5.33 ± 5.50 | p = 0.004, t(11) = - 3.633 |
| Self-Regulation (MAIA) | 5.20 ± 2.93 | -1.66 ± 5.50 | p = 0.013, t(11) = - 2.0942 |
| Trusting (MAIA) | 2.60 ± 1.77 | -1.00 ± 5.56 | p = 0.083, t(11) = - 1.908 |
| Body-Listening (MAIA) | 4.20 ± 2.97 | -1.66 ± 4.61 | p = 0.022, t(11) = - 2.673 |
| Emotional Awareness (MAIA) | 4.10 ± 3.84 | 1.33 ± 1.15 | p = 0.256, t(11) = - 1.197 |
| Not-Worrying (MAIA) | 0.90 ± 1.59 | 1.00 ± 2.00 | p = 0.929, t(11) = 0.091 |
| Not-Distracting (MAIA) | 0.00 ± 4.05 | 1.66 ± 2.51 | p = 0.521, t(11) = 0.662 |
| Noticing (MAIA) | 3.30 ± 4.59 | -1.00 ± 2.64 | p = 0.158, t(11) = - 1.516 |

*Data are presented as mean ± SD, and statistical analysis. A Mann-Whitney U Test (T test) was used to compare the mean difference scores between the face to face (FTFG), and self-directed groups (SDG).*

### 5.3.2 Burnout Self-Test and the Maslach Burnout Inventory (BST/MBI)

#### 5.3.2.1 Burnout

Burnout/BST scores showed that the FFGs had remarkable differences in the mean scores, pre meditation scores (9.60±6.7) and post meditation scores (13.20±10.94), t(9)=-2.17, p=0.058. However, data revealed that there were no significant differences in the mean scores for the SDG in pre (13±3.61) and post (14.33±10.01) MMP, t(2)=-0.359, p=0.754.

Moreover, there were no notable changes observed between groups in their mean difference SDG (1.33±6.42) and FFGs scores (3.6±5.25), t(11)=0.628, p=0.628.

However there was no significant difference found in SDG. The change in score was calculated between the pre and post meditation scores and compared between groups. However, no difference was found.

#### 5.3.2.2 Depersonalisation

Data showed that there were no differences in the pre meditation depersonalisation/BST scores (17.75±10.05) and post meditation scores (14±3.61) for the self-directed group (z=-0.54, p=0.59). Likewise, depersonalisation /BST scores in the face to face group were not significantly different in the pre meditation (9.50±7.76) and post meditation scores (6.40±5.50) and (z=-1.72, p=0.09).

In addition, the result revealed that there were no significant differences found in the mean change scores between SDG (1±4.58) and FFGs (-3.1±6.15), in the mean difference (4.53± 5.66) scores (u=13, P=0.733).

#### 5.3.2.3 Personal Achievement

The Wilcoxon signed – Rank test indicated that there was no significant difference in pre and post meditation scores for the self-directed group (z=-0.82, p=0.41).
However, there were clear differences in the pre and post meditation scores in the face to face group (z=-2.30, p=0.021).

Notably, there was no significant difference between the FFGs and SDG in the mean difference scores (u=13, p=0.733). (See Table 5.6, 5.7 and 5.8).

**Table 5.6: Analysis for the face to face meditation group comparing pre with post meditation for Burnout Self-Test and the Maslach Burnout Inventory (BST/MBI)**

| Outcome Variable | | Pre Meditation | Post Meditation | Statistical analyses values (t/z, p) |
|---|---|---|---|---|
| Burnout Self-Test and the Maslach Burnout Inventory (BST/MBI) | Burnout | 9.60 ± 6.753 | 13.20±10.94 | t = - 2.167, p =0.058 |
| | Depersonalisation | 9.50 ± 7.76 | 6.40 ± 5.50 | z = - 1.722, p =0.085 |
| | Personal Achievement | 34.90 ± 11.05 | 39.20 ± 8.60 | z = - 2.30, p = 0.021 |

**Table 5.7: Analysis for the self-directed meditation group comparing pre with post meditation for Burnout Self-Test and the Maslach Burnout Inventory (BST/MBI)**

| Outcome Variable | | Pre Meditation | Post Meditation | Statistical analyses values (t/z, p) |
|---|---|---|---|---|
| Burnout Self-Test and the Maslach Burnout Inventory (BST/MBI) | Burnout | 13 ± 3.61 | 14.33 ± 10.01 | t = -0.359 p = 0.754 |
| | Depersonalisation | 17.75 ± 10.05 | 14 ± 3.61 | z = -0.535, p = 0.593 |
| | Personal Achievement | 27 ± 10.06 | 33 ± 13 | z = -0.816 p = 0.414 |

**Table 5.8: Analysis comparing change score (pre – post meditation) for the two groups face to face and self-directed for Burnout Self-Test and the Maslach Burnout Inventory (BST/MBI)**

| Outcome Variable | | Post Meditation (FFG) | Post Meditation (SDG) | Statistical analyses values (t/u, p) P Value |
|---|---|---|---|---|
| Burnout Self-Test and the Maslach Burnout Inventory (BST/MBI) | Burnout | 3.6 ± 5.25 | 1.33 ± 6.42 | p = 0.618, t(11) = 0.628 |
| | Depersonalisation | 3.1 ± 6.15 | 1 ± 4.58 | p = 0.733, u=13 |
| | Personal Achievement | 4.30 ± 4.83 | 5.33 ± 9.29 | p = 0.733, u=13, |

*Data are presented as mean ± SD, and statistical analysis. A Mann-Whitney U Test (T test) was used to compare the mean difference scores between the face to face (FTFG), and self-directed groups (SDG).*

### 5.3.3 Five Faced Mindfulness Questionnaire: short form (FFMQ-SF)

Total scores for FFMQ showed that there were no significant differences in pre and post meditation scores for SDG (z=-1.07, p=0.28) and pre and post meditation scores in FFGs (z=-1.17, p=0.24).

It is noteworthy that, there was no significant difference between the groups in the mean difference scores (u=12 p=0.610).

#### 5.3.3.1 Acting with Awareness (AA)

Our findings showed that AA was significantly improved after MMP. The data revealed the mean scores in pre MMP scores for FFGs (8.30±2.497) and post (6.60±1.955), t(9)=3.431, p=008. However, the changes have not been observed in SDG in pre MMP scores (9.20±1.789) and post MMP (9.33±2.082), t(2)-5.555, p=0.635. Furthermore, the findings indicated that there were significant differences between groups t(11)=2.098, p=0.945.

#### 5.3.3.2 Describing

Findings indicated that there was a slight improvement in the mean scores for the FFG in pre (17.26±2.65) and post (18.40±2.22) MMP. In contrast, the pre mean scores for the SDG were (16.00±4.00) and post were (17.67±2.08).

Besides, our data showed that there were almost significant changes for the FFG t(9)= -2.167, p= 0.058 compared to the SDG t(2)= 0.655, p= 0.580.

#### 5.3.3.3 Not-Judging (NG)

The results showed that there was no improvement in the mean scores for the FFG in pre (14.70±3.40) and post (15.60±3.34) MMP, and in the pre mean scores for the SDG (12.20±2.16) and post (13.33±1.15) MMP.
Moreover, no significant changes were found in FFG t(9)= -1.22, p= 0.25 and also in the SDG t(2)= 0.000, p= 1.000.

#### 5.3.3.4 Not-Reactivity (NR)

Regarding the NR, our findings showed that there was a clear improvement in the mean scores for the FFGs in pre (14.50±0.82) and post (16.10±0.98) MMP, compared to the SDG in pre (16.33±1.66) and post (16.33±1.66) and post (16.33±0.67) MMP.

Further, the data showed that no significant differences were observed in FFGs z= -1.902, P= 0.057 compared to SDG z= 0.000, p= 1.000.

#### 5.3.3.5 Observing

Concerning the last subscale in FFMQ, the results showed no significant improvement in the mean scores for the FFG in pre (11.10±2.07) and post (11.40±2.63) MMP, similarly, in the mean scores for the SDG in pre (8.20±1.92) and post (11.00±2.64) MMP.

In addition, no significant differences were observed in FFG t(9)0.394, p= 0.703 and also SDG t(2)-2.000, p= 0.184. (See Table 5.9, 5.10 and 5.11).

**Table 5.9: Analysis for the face to face meditation group comparing pre with post meditation for Five Faced Mindfulness Questionnaire: short form (FFMQ-SF)**

| Outcome Variable | Pre Meditation | Post Meditation | Statistical analyses values (t/z, p) |
|---|---|---|---|
| Total scores of Five Faced Mindfulness questionnaire: short form (FFMQ-SF) | 65.8 ± 5.73 | 68.10 ± 6.08 | z = - 1.17, p = 0.241 |
| Acting with Awareness (FFMQ-SF) | 8.30 ± 2.49 | 6.60 ± 1.95 | t(9) = 3.431, p = 0.008 |
| Non-Judging (FFMQ-SF) | 14.70 ± 3.40 | 15.60 ± 3.34 | t(9) = - 1.221, p = 0.235 |
| Non-Reactivity (FFMQ-SF) | 14.50 ± 0.82 | 16.10 ± 0.98 | z = - 1.902, p = 0.057 |
| Describing (FFMQ-SF) | 17.26 ± 2.658 | 18.40 ± 2.22 | t(9)= - 2.167, p = 0.058 |
| Observing (FFMQ-SF) | 11.10 ± 2.07 | 11.40 ± 2.63 | t(9) = - 0.394, p = 0.703 |

**Table 5.10: Analysis for the self-directed meditation group comparing pre with post meditation for Five Faced Mindfulness Questionnaire: short form (FFMQ-SF)**

| Outcome Variable | Pre Meditation | Post Meditation | Statistical analyses values (t/z, p) |
|---|---|---|---|
| Total scores of Five Faced Mindfulness questionnaire: short form (FFMQ-SF) | 60.80 ± 10.91 | 67.66 ± 0.57 | z = - 1.069 p = 0.285 |
| Acting with Awareness (FFMQ-SF) | 9.20 ± 1.78 | 9.33 ± 2.08 | t(2) = - 0.555, p = 0.635 |
| Non-Judging (FFMQ-SF) | 12.20 ± 2.16 | 13.33 ± 1.15 | t(2) = 0.000, p = 1.000 |
| Non-Reactivity (FFMQ-SF) | 16.33 ± 1.66 | 16.33 ± 0.66 | z = 0.000, p = 1.000 |
| Describing (FFMQ-SF) | 16.00 ± 4.00 | 17.67 ± 2.08 | t(2) = - 0.655, p = 0.580 |
| Observing (FFMQ-SF) | 8.20 ± 1.92 | 11.00 ± 2.64 | t(2) = - 2.000, p = 0.184 |

**Table 5.11: Analysis comparing change score (pre – post meditation) for the two groups face to face and self-directed for Five Faced Mindfulness Questionnaire: short form (FFMQ-SF)**

| Outcome Variable | Post Meditation (FFG) | Post Meditation (SDG) | Statistical analyses values (t/u, p) P Value |
|---|---|---|---|
| Total scores of Five Faced Mindfulness questionnaire: short form (FFMQ-SF) | 2.3 ± 5.45 | 3.66 ± 6.02 | p = 0.692, u=12 |
| Acting with Awareness (FFMQ-SF) | -1.70 ± 1. 56 | 0.66 ± 2.08 | p = 2.150, t(11) = 0.055 |
| Non-Judging (FFMQ-SF) | 0.90 ± 2.33 | 0.00 ± 1.00 | p = 0.538, t(11) = - 0.636 |
| Non-Reactivity (FFMQ-SF) | 1.80 ± 1.12 | 3.33 ± 1.76 | p = 0.551, u = 11.500 |
| Describing (FFMQ-SF) | 1.20 ± 1.75 | 1.00 ± 2.64 | p = 0.879, t(11) = - 0.156 |
| Observing (FFMQ-SF) | 0.30 ± 2.40 | 2.00 ± 1.73 | p = 0.285, t(11) = 1.124 |

*Data are presented as mean ± SD, and statistical analysis. A Mann-Whitney U Test (T test) was used to compare the mean difference scores between the face to face (FTFG), and self-directed groups (SDG).*

### 5.3.4 Santa Clara Brief Compassion Scale (SCBCS)

The scores found the FFGs had a significant difference in mean score SCBC pre meditation 23.50±5.359 and a post meditation score of 27.60±4.03, t(9)= -2.527, p=0.032. However, there was no significant difference found in the SDG pre mediation scores (25±6.03) and post (21±9.53), t(2)=0.327, p=0.775.

The changes in score were calculated between the pre and post meditation scores and compared between groups. Nevertheless, no notable differences were found.

### 5.3.5 Perceived Stress Scale (PSS)

PSS results showed that there were no significant differences in both pre and post meditation scores for the SDG (z=-1.604, p=0.11). Likewise, almost significant changes were found in pre and post meditation scores in the FFGs (z=-1.89, p=0.058).
Furthermore, no changes were found between the groups in the mean difference scores (u=10, p=0.39). (See Table 5.12, 5.13 and 5.14).

**Table 5.12: Analysis for the face to face meditation group comparing pre with post meditation for the Santa Clara Brief Compassion Scale (SCBC) and the Perceived Stress Scale (PSS)**

| Outcome Variable | Pre Meditation | Post Meditation | Statistical analyses values (t/z, p) |
|---|---|---|---|
| Santa Clara Brief Compassion Scale (SCBC) | 23.5 ± 5.359 | 27.6 ± 4.03 | t = - 2.527, p = 0.032 |
| Perceived Stress Scale (PSS) | 17.70 ± 7.67 | 13.30 ± 3.91 | z = - 1.89, p = 0.058 |

**Table 5.13: Analysis for the self-directed meditation group comparing pre with post meditation for the Santa Clara Brief Compassion Scale (SCBC) and the Perceived Stress Scale (PSS)**

| Outcome Variable | Pre Meditation | Post Meditation | Statistical analyses values (t/z, p) |
|---|---|---|---|
| Santa Clara Brief Compassion Scale (SCBC) | 22 ±7.55 | 21±9.53 | t = 0.327 p = 0.775 |
| Perceived Stress Scale (PSS) | 24.75 ± 7.50 | 15.33 ± 1.15 | z = - 1.604 p = 0.109 |

**Table 5.14: Analysis comparing the change score (pre – post meditation) for the two groups of face to face and self-directed for the Santa Clara Brief Compassion Scale (SCBC) and the Perceived Stress Scale (PSS)**

| Outcome Variable | Pre Meditation (FFG) | Post Meditation (SDG) | Statistical analyses values (t/z, p) |
|---|---|---|---|
| Santa Clara Brief Compassion Scale (SCBC) | 4.1 ± 5.13 | -1 ± 5.29 | p = 0.025, t(11) = - 1.835 |
| Perceived Stress Scale (PSS) | -4.4 ± 6.76 | -6 ± 4.35 | p = 0.396, u = 10.00 |

*Data are presented as mean ± SD, and statistical analysis. A Mann-Whitney U Test (T test) was used to compare the mean difference scores between the face to face (FTFG), and self-directed groups (SDG).*

### 5.3.6 The Depression, Anxiety and Stress Scale (DASS 21)

Total results in DASS 21, indicated that there were no significant differences in the SDG in the mean scores of DASS 21. Pre meditation scores were (36.00±22.54) and post meditation scores were 20.67±5.03, t(2)=1.482., p=0.277.

Results showed that there were no significant differences in the mean scores of DASS 21 found in the FFGs. Data revealed that pre meditation scores were (30.00±14.36) post meditation scores were (21.00±13.67), t(9) =1.853, p=0.093.

Besides, there were no differences observed between groups in their mean differences SDG (-15.33±17.9) and FFGs (-9±15.35), t(11) =0.607, p=0.649.

#### 5.3.6.1 Depression

The data indicated that there was a clear improvement in the mean scores for FFG in pre (10.80±6.512) and post (7.00±4.89) MMP, and also the mean scores for SDG in pre (14.75±9.21) and post (8.00±2.64) MMP.
However, no significant differences were found in the FFG t(9)= 1.507, p= 0.166, and SDG t(2)= 1.257, p= 0.336.

#### 5.3.6.2 Anxiety

Similarity, our data showed that there was an improvement in the mean scores for the FFG and SDG in pre and post MMP. Nevertheless, no significant changes were found between groups, FFG t(9)= 2.604, p= 0.029 and SDG t(2)= 1.125, p= 0.377.

#### 5.3.6.3 Stress

The mean scores for stress showed that there was an improvement for the FFG in pre (8.10±1.37) and post (6.00±1.542) MMP, and also for the SDG in both pre (12.67±3.66) and post (5.33±0.33) MMP. See Figure (4.24). However, the findings indicated that no significant changes between FFG z= -1.181, p= 0.238 and SDG z= -1. 1.604, p= 0.109 were present. (See Table 5.15, 5.16 and 5.17).

**Table 5.15: Analysis for the face to face meditation group comparing pre with post meditation for the Depression, Anxiety and Stress Scale (DASS 21)**

| Outcome Variable | Pre Meditation | Post Meditation | Statistical analyses values (t/z, p) |
|---|---|---|---|
| Total scores of Depression, Anxiety and Stress Scale (DASS 21) | 30.00 ± 14.36 | 21.00 ± 13.67 | t = 1.853, p = 0.097 |
| Depression (DASS 21) | 10.80 ± 6.51 | 7.00 ± 4.89 | t(9)= 1.507, p = 0.166 |
| Anxiety (DASS 21) | 10.80 ± 6.51 | 7.00 ± 4.89 | t(9)= 2.604, p = 0.029 |
| Stress (DASS 21) | 8.10±1.37 | 6.00±1.542 | z= - 1.181, p = 0.238 |

**Table 5.16: Analysis for the self-directed meditation group comparing pre with post meditation for the Depression, Anxiety and Stress Scale (DASS 21)**

| Outcome Variable | Pre Meditation | Post Meditation | Statistical analyses values (t/z, p) |
|---|---|---|---|
| Total scores of Depression, Anxiety and Stress Scale (DASS 21) | 36.00 ± 22.54 | 20.67 ± 5.03 | t = 1.482 p = 0.277 |
| Depression (DASS 21) | 14.75 ± 9.21 | 8.00 ± 2.64 | t(2)= 1.257, p = 0.336 |
| Anxiety (DASS 21) | 14.75 ± 9.21 | 8.00 ± 2.64 | t(2) = 1.125, p = 0.377 |
| Stress (DASS 21) | 12.67±3.66 | 5.33±0.33 | z= - 1.604, p = 0.109 |

**Table 5.17: Analysis comparing change score (pre – post meditation) for the two groups face to face and self-directed for the Depression, Anxiety and Stress Scale (DASS 21)**

| Outcome Variable | Post Meditation (FFG) | Post Meditation (SDG) | Statistical analyses values (t/u, p) P Value |
|---|---|---|---|
| Total scores of Depression, Anxiety and Stress Scale (DASS 21) | 3.6 ± 5.25 | 1.33 ± 6.42 | p = - 0.554, t(11) = 0.619 |
| Depression (DASS 21) | -3.80 ± 4.61 | -3.33 ± 5.13 | p = 0.883, t(11) = 0.150 |
| Anxiety (DASS 21) | -3.80 ± 4.61 | -3.33 ± 5.13 | p = 0.883, t(11) = 0.150 |
| Stress (DASS 21) | -2.10±1.54 | -7.33±3.84 | p = 0.049, u = -1.966 |

*Data are presented as mean ± SD, and statistical analysis. A Mann-Whitney U Test (T test) was used to compare the mean difference scores between the face to face (FTFG), and self-directed groups (SDG).*

### 5.3.7 The Positive and Negative Affect Schedule (PANAS)

Total PANAS scores, showed that there was no significant difference in pre and post meditation scores for the SDG (z=-0.54, p=0.593). However, in the FFGs, data showed changes in pre and post meditation scores (z=-2.72, p=0.005).

Additionally, the U test showed that there were significant differences between the groups in the mean difference scores (u=3, p=0.042).

#### 5.3.7.1 Positive Affect (PA)

The positive affect scores showed that there was a difference in the mean scores of FFGs in pre MMP scores (31.30±8.056) and post MMP scores (39.70±2.830), t (9) =-3.763, p= 0.004. On the other hand, no changes were found in SDG in pre MMP scores (33.25±6.076) and post MMP scores (33.00±12.124), t(2)=0.346, p=0.762.

Additionally, the findings showed that PA had significantly changed between groups in this study t (9) =-3.763, p= 0.004.

#### 5.3.7.2 Negative Affect (NA)

The NA scores were showed an improvement in the means scores for the FFG in pre (20.20±7.19) and post (16.90±5.97) MMP, as well as for the mean scores for SDG in pre (28.00±10.03) and post (22.00±5.00) phases.

This is even though, no significant changes were observed in both FFG t(9)= 1.406, p= 0.193 and SDG t(2)= 0.459, p= 0691. (See Table 5.18, 5.19 and 5.20).

**Table 5.18: Analysis for the face to face meditation group comparing pre with post meditation for Total scores of the Positive and Negative Affect Schedule (PANAS)**

| Outcome Variable | Pre Meditation | Post Meditation | Statistical analyses values (t/z, p) |
|---|---|---|---|
| Total scores of the Positive and Negative Affect Schedule (PANAS) | 31.30 ± 8.06 | 39.70 ± 2.83 | z = - 2.80, p = 0.005 |
| Positive Affect of (PANAS) | 31.30 ± 8.05 | 39.70 ± 2.83 | t(9) = - 3.763, p = 0.004. |
| Negative Affect of (PANAS) | 20.20 ± 7.19 | 16.90 ± 5.97 | t(9) = 1.406, p = 0.193 |

**Table 5.19: Analysis for the self-directed meditation group comparing pre with post meditation for Total scores of the Positive and Negative Affect Schedule (PANAS)**

| Outcome Variable | Pre Meditation | Post Meditation | Statistical analyses values (t/z, p) |
|---|---|---|---|
| Total scores of the Positive and Negative Affect Schedule (PANAS) | 33.25 ± 6.08 | 33±12.12 | z = - 0.535 p = 0.593 |
| Positive Affect of (PANAS) | 33.25 ± 6.07 | 33.00 ± 12.12 | t(2) = 0.346, p = 0.762 |
| Negative Affect of (PANAS) | 28.00 ± 10.03 | 22.00 ± 5.00 | t(2)= 0.459, p = 0.691 |

**Table 5.20: Analysis comparing change score (pre – post meditation) for the two groups face to face and self-directed for Total scores of the Positive and Negative Affect Schedule (PANAS)**

| Outcome Variable | Pre Meditation (FFG) | Post Meditation (SDG) | Statistical analyses values (t/z, p) |
|---|---|---|---|
| Total scores of the Positive and Negative Affect Schedule (PANAS) | 8.40 ± 7.06 | -1± 5 | p = 0.042, u = 3.000 |
| Positive Affect of (PANAS) | 8.40 ± 7.05 | -1.00 ± 5.00 | p = 0.057, t(11) = - 2.121 |
| Negative Affect of (PANAS) | -3.30 ± 7.42 | -1.33 ± 5.03 | p = 0.680, t(11) = 0.424 |

*Data are presented as mean ± SD, and statistical analysis. A Mann-Whitney U Test (T test) was used to compare the mean difference scores between the face to face (FTFG), and self-directed groups (SDG).*

## 5.4 Discussion

The first aim of this study was to investigate whether mindfulness has an ability to increase therapists' body-awareness and reduce burnout at their workplace, besides looking at the positive effects of MM on their personal experiences after four weeks of formal and informal practise. The second aim was to understand the efficacy of each method in terms of an applied MMP and whether it was effective in a group of therapists. The novel findings in this study were that, MM has positively affected therapists, in particular in the FFGs. More specifically, variables which positively changes in the FFGs were attention-regulation, self-regulation, trusting, acting with awareness, positive affect, compassion and personal-achievement. In other words, therapists obtained beneficial results from mindfulness as a result of their regular practise in both formal and informal practise. In general, therapists' body-awareness increased after they received a brief form of MMP. Body-awareness was assessed through MAIA and FFMQ scales. Notably, in the FFGs "almost significant" changes were found in other variables (depersonalisation, burnout); however, there were no statistical changes in some of the remaining scales that had been included (depression, anxiety, stress, non-judging, non-reactivity, describing and observing).

However, no significant differences were found in the SDGs in all variables that are mentioned above. An explanation that emerges from statistical results can be estimated via

two main reasons. The first, is that mindfulness meditation practice mainly involves changes in attitude and attention, whereas physiotherapy depends on physical movements. The second, posits that therapists in the SDG applied mindfulness by themselves and they obtained guidance only through a CD. In addition to that, regular MM might have also affected therapists. Nevertheless, there was no potential expectation that might have affected therapists parallel to the MM during the period of the program. To further illuminate the effects of MMP, each measurement that is used with therapists individually will be explained in the sections that follow.

### 5.4.1 Body-Awareness

The results observed that there were significant changes in mean difference scores between groups and for the FFDs. Our perspective behind these results was that therapists cultivated greater attention-regulation, self-regulation and trusting after MP. The advantage might have occurred because the therapists received further guidelines regarding mindfulness training. This was specifically, during the formal session of the MMP that they practised with the primary researcher. Consistent with Kabat-Zinn (2009) it was stated that the word "practise" did not explain the competition level or performance, it simply demonstrated a cultivation of mindfulness. In other words, the core of mindfulness is being present in the moment and not achieving better performance. Along with other researchers, Maloney, Lawlor, Schonert-Reichl & Whitehead (2016) emphasised that through mindfulness practise moment to moment, it is possible to cultivate a greater awareness of emotions and body sensations, by accepting them as they occur without changing or judging the experiences. Other findings by Tsur, Berkovitz & Ginzburg (2016) indicated that mindfulness can lead to a greater body awareness. Additionally, a study by Jain, Shapiro, Swanick, Roesch, Mills & Bell (2007) stated that through a brief form of MM practise and a somatic relaxation training, there was an improvement in positive mood and less distress compared to the control group.

### 5.4.2 Mindfulness

The finding indicated that there were significant changes in the mean differences scores between groups for the FFGs. The most important finding was that there was an improvement in acting with awareness, in the FFGs compared to the SDG. To illustrate that, therapists in the FFGs practised ninety minutes of the MM per week and in addition

they were supposed to practise twenty minutes per day. According to Kabat-Zinn (2009) practising mindfulness every day is the most important point to remember. Nevertheless, the findings showed no significant differences observed in pre and post mindfulness for both groups. It can be appraised that the reason for that is FFMQ is a trait scale not a state scale that might influence therapists' scores.

### 5.4.3 Burnout (Depersonalisation, Personal Achievement, Burnout)

Expectedly, results showed that there were significant differences in the mean scores between pre and post mindfulness for the FFGs. Therapists in this group gained a reduction in their burnout level. In turn, this explained the effectiveness of MMP on therapists. These findings also coincided with other research that mentioned the effects of MBSR in reducing burnout and improving well-being in a healthy population (Cohen-Katz, Wiley, Capuano, Baker, Kimmel & Shapiro, 2005; Gold, Smith, Hopper, Herne, Tansey & Hulland, 2010; and Goodman & Schorling, 2012). On the other hand, no significant changes were found in the SDG in the pre and post MMP. Similarly, there were no significant changes between the groups in their means scores. It is noteworthy that, the burnout level reduced in the FFGs compared to the SDG. The potential reason might emerge from the fact that the FFGs attended one 60-90 minute formal session with a primary investigator. Moreover, there was an opportunity to share an idea prior and post all sessions.

The second subscale regarding burnout of the self-test is depersonalisation. Findings revealed that there were significant differences in the FFGs in the pre and post MMP. As noted above, and in addition to the informal MP, therapists attended a formal session each week. Therefore, it can be realised that there were reductions in the depersonalisation level with therapists in the FFGs. The outcomes were consistent with a study by Cohen-Katz et al., (2005) that found depersonalisation and emotional exhaustion had significantly changed in nurses after 8 weeks of the MBSR program. On the contrary, no significant differences in the SDG were observed. As well, no significant differences were found between groups in their means scores.

Therapists who took part in the SDG were from other countries with different time schedules that might have affected their level of depersonalisation. In addition, therapists in the SDG practised meditation by themselves. Therefore, they carried on the MMP by themselves without additional guides or sharing an idea with the primary researcher before

and after sessions as therapists did in FFGs. Another possibility is that therapists may experience memories of past unpleasant events during the MP. These thoughts often subside as a result of doing the exercises repeatedly and with practice, allowing thoughts to become less intrusive over time. Furthermore, the therapists might have felt that MMP interfered with their belief systems, which affected their depersonalisation state.

The final subscale to assess the BST scale is personal-achievement. Maslach & Jackson (1996) revealed that in order to determine personal-achievement as a component of burnout, it can be noticed that there was a negative judging and having feelings of not being capable of changing the situation. This can lead to distressing feelings despite spending effort. As a result, individuals will be in doubt as to whether they have an ability to achieve their objectives.

Our findings indicated that personal-achievement increased in the FFGs. As data showed, there were significant changes in pre and post MMP. The possible explanation was that therapists had less negative self-efficacy toward themselves and they believed in their abilities after they had received four weeks of MMP. The scores in the SDGs showed that personal-achievement had no significant differences in pre and post MP. As such, there were significant differences found between groups in their means differences scores.

### 5.4.4 Positive and Negative Affect of MMP

The results observed that there were significant changes in the pre and post mindfulness programs in the FFGs. More specifically, the evidence in this study regarding PANAS, showed that there was a clear positive change in the FFGs regrading to “positive subscale” after they practised MMP. The expectation was that because of the daily practice of mindfulness, the FFGs would have clear changes in positive affect. This assumption was based on therapists in the particular period of MMP not practising any other program aligned with MMP.

Likewise, data has also discovered that there were significant differences in the means differences scores between groups for the FFGs. Constant with what was stated above, Brockman, Ciarrochi, Parker & Kashdan (2017) indicated that daily mindfulness practise is related to greater positive effects and less negative effects in supporting the value of MP. Another finding by Chambers, Lo & Allen (2008) supports the effectiveness of a daily

training of mindfulness in reducing depressive symptoms and also an enhancement of cognitive function.

On the other side, the findings in this study have shown no significant differences in the pre and post MMP for the SDG. Our interpretation is that, the rate of informal MP that therapists in the SDG trained in was not enough to improve their positive affect scores.

### 5.4.5 Compassion

Data showed that the compassion for the FFGs had significantly changed after they had participated in the MMP. This is explained by the fact that therapists followed and practiced mindfulness at a regular time during their participation. In addition, mindfulness helped therapists to increase their compassion, after gaining daily benefits from mindfulness. The reason for that is that compassion and loving-kindness are a part of the program. In other words, the CD of MBSR has a guide to improve and educate those skills, and also the possibility of integrating compassion in their daily tasks during their work as therapists. Thus, there were advantages in the level of compassion between the pre and post MMP. Strikingly, this supports other evidence regarding the effects of MMP in increasing compassion, (Kuyken, Watkins, Holden, White, Taylor & Byford et al., 2010; Neff & Germer, 2013; Condon, Desbordes, Miller & DeSteno 2013).

In contrast, there were no significant differences in the SDG, although changes have been calculated between pre and post MMP. Our explanation is that therapists in the SDG might have not had a daily basis for practicing MM like their peers in the FFGs. This in turn, might have had an effect on their level of compassion.

### 5.4.6 Perceived Stress

Despite of the huge amount of research that has been done on MBSR, there is numerous evidence that reports the effectiveness of MBSR in reducing stress with a healthy population Weinstein, Brown & Ryan, 2009; Erogul, Singer, McIntyre & Stefanov 2014; Sallon, Yaffe, & Bdolah-Abram, 2017; McConville, McAleer & Hahne, 2017). In addition, with the positive effect of MBSR, a lot of research has been done with the clinical population in reducing stress symptoms (Carlson, Ursuliak, Goodey, Angen & Speca, 2001; Minor, Carlson, Mackenzie, Zernicke & Jones, 2006; Reich, Lengacher, Alinat, Kip & Paterson, 2017). However, our findings displayed that there were no significant differences

found in the pre and post MMP for both groups. At the same time, no significant changes were found in the means differences between the groups. This might be because of the level of stress in each group at the beginning of the program. Besides, mindfulness is a new skill with no prior experience and the nature of the practice is a very calm technique that might have affected their stress levels. Another prediction is that, therapists' applied mindfulness through the CD guides, particularly in the SDG. Therefore, the CD might have oriented them to pay more attention to focusing on reducing stress levels through a technological tool.

### 5.4.7 Depression, Anxiety and Stress

Our findings showed that there were no significant differences found in both FFGs as well as the SDG in the pre and post mindfulness practise. Further, there were no significant changes between groups in the means differences scores. Even though a sizable body of literature has shown that MM practise has a positive influence on therapists in decreasing their level of depression such those of Serpa, Taylor & Tillisch (2014) and Greeson, Smoski, Suarez, Brantley, Ekblad & Lynch et al., (2015) whose findings showed that depressive symptoms had significantly reduced in 79 veterans and 322 adults respectively. Moreover, Allexandre, Bernstein, Walker, Hunter, Roizen & Morledge (2016) and Ivtzan, Young, Martman, Jeffrey, Lomas, Hart et al., (2016) found through an online intervention that mindfulness had positive effects in improving wellbeing and also workplace stress. Moreover, a study by Goldin & Gross (2010) found that the MBSR program had had positive effects in reducing anxiety, depression and improved self-esteem in people with a social anxiety disorder. Originally MBSR was a clinical approach that included regular MM practise. Emotion management and stress reduction are the core objectives in MBSR (Bishop, 2002). Related to the findings in this study, it can be predicated that therapists might have had the same mind state once they had been asked to fill up the DASS scale in both terms of the program.

In view of these findings and perceptions, therapists in the FFGs gained benefits from MP to improve their body-awareness and also higher scores in personal achievement, as a subscale of the BST. Importantly, the results of this study have also unveiled that, the FFGs were better than the SDG as a method of delivery of the mindfulness program.

Overall, the present study focused on the potential role of mindfulness training and body awareness in therapist self-care and burnout prevention. Another noteworthy, further lines of inquiry could focus on whether mindfulness training could provide skills that might also help therapists better meet the needs of their clients. Indeed, Arvinen-Barrow et al., (2010) stated that 'increasing physiotherapist's awareness of the different techniques available and the ways in which psychological interventions can be successfully integrated into physiotherapy process would be beneficial' [67, p.65]. Along the same line, Hemmings and Povey (2002) indicated that future direction of physiotherapy rehabilitation needs more emphasis on increasing the level of knowledge about using psychological interventions in physiotherapy rehabilitation.

This was echoed by Shapiro and Carlson (1998) who have suggested that therapists through mindfulness training could improve the therapeutic outcomes by cultivating self-compassion, accepting attention, self-attunement, empathy and the ability of emotion regulation. Hopefully the results of our study will inspire the above mentioned lines of inquire that could more insight on how mindfulness can be of the benefit for both the caregivers and care receivers.

### 5.4.8 Strengths and Limitations of this Study

- To the best of our knowledge, this is the first study that has used internet-based technology (websites, skype calls and online surveys) as a part of its methodology to assess MMP with therapists.
- Therapists were able to be involved in this study from anywhere in the world thanks to the website that was created especially for the purposes of this study.
- In this study different psychological variables have been assessed with therapists such as body-awareness, mindfulness, positive and negative affect of MMP, compassion, burnout, and stress. This allowed obtaining a more holistic approach to understand various aspects regarding mindfulness and therapists' experiences.
- Each therapist who wanted to form part of the study had to engage with the research for a period of nearly two months. Therefore, the researchers encountered some issues with recruitment and commitment of the participants as it was difficult for many therapists to commit for that length of time.
- Another potential limitation of the current study was that mindfulness meditation sessions were carried out individually with therapists in the FFGs. There are two

reasons for that. The first, is that it was not possible for therapists in the FFGs to attend at the same time because of their busy work and complications in terms of coordination of their diary. Secondly, there was the issue of the time zone difference between therapists who practised through the skype method located in countries with different time zones. This made a group skype call not being a feasible option.

- There was not any control mechanism in place to verify the engagement of therapists in the self-directed group to the tasks of listening to the CD or to confirm objectively their active commitment in the mindfulness meditation.

## 5.5 Recommendations

- Our results indicated that a mindfulness programme is more effective when practising with a mindfulness instructor rather than alone, especially when the participant has with no prior experience in participating in mindfulness programme.
- Further research will have to be conducted in order to determine the effect of practicing for a short duration of time, in particular 5 to 10 minutes pre and post treatment process. This is in addition to the formal and self-directed practice.
- More research in this field could include into the mindfulness programme sessions of stretching exercises or yoga movements and explore if this adds into gaining more body-awareness and less feeling of burnout.

# CHAPTER SIX

## A Qualitative Investigation of the Effectiveness of a Mindfulness Meditation Program on Therapists (Physiotherapists and Sport Therapists)

# A Qualitative Investigation of the Effectiveness of a Mindfulness Meditation Program on Therapists (Physiotherapists and Sport Therapists)


## Abstract

**Objective:** The main aim of this study was to explore the perceptions of therapists (physiotherapists and sport therapists) regarding their participation in the mindfulness meditation programme (MMP).

**Methods:** Semi Structured Interviews (STI) were conducted with all therapists who had been involved in the second study of this thesis. The data collected were analysed by implementing a Thematic Analysis which enabled us to evaluate therapists' attitudes after their participation in 4 weeks of a formal and informal Mindfulness Meditation Program (MMP).

**Results:** Based on STI with therapists, four themes emerged from their experiences after participating in the MMP 1): Stress reduction, 2) Increased attentiveness, 3) MM's effects on therapists' professional practise, 4) Difficulties in practising MM. The first two themes referred to the perceived benefits of their participation in the programme, while the third one focused on how MMP can help them with some particular characteristics of their job. The fourth theme grouped the responses of the participants, in which they highlighted any difficulties with the MMP and any suggestions they had regarding it.

**Conclusion**: According to therapists' experiences toward MMP, meditation practice can support therapists as a coping strategy to deal with stress and thereby increase their attention. Additionally, it can help them to deal with the challenges of their professional practise.

## 6.1 Introduction

Following a similar procedure as the one discussed in chapter 5 which focused on the perceptions of the injured athletes in regard to their participation in their programme, we also designed and conducted a study to explore the opinions and perceptions of the therapists who also participated in our study. Indeed, the nature of the therapists' profession includes a high level of stress and burnout. Nathiya, Sasikumar, Jagannath, Thangaraj & Adalarasu (2017) indicated that a therapist's work environment entails the use of different physical movements ranging from positions which require a low somatic demand such as standing, sitting and walking to positions that require a higher level of energy such as pushing, lowering, stretching, bending, reaching and lifting. Therefore, this leads to therapists being at risk of both musculoskeletal injuries and also of their being exposed to high levels of stress symptoms. Broom & Williams (1996) in their qualitative study found that work-related stress is a very common condition which therapists suffer from and this affects both their professional performance and also their well-being. In another study Lindsay, Hanson, Taylor & McBurney (2008) also emphasised that stress is one of the more frequent workplace symptoms that staff employed in the medical professions suffer from.

After stress, burnout is the second psychological constraint that has received more scholar attention when it comes to the medical professions' work-related symptoms. Maslach, Jackson & Leiter (2006) defined burnout is a psychological state that can be noticed by the sense of an emotional fatigue, reduction in personal achievement and depersonalisation which occurs on those whose jobs entails working with clinical populations.

Burnout has indeed become a subject that has attracted a wide range of scientific research conducted using both qualitative and quantitative approaches focusing on burnouts' effect on low-organisational commitment and job-dissatisfaction (Gupta, Paterson, Lysaght & Von Zweck, 2012).

Thus, psychological conditions and in particular burnout have many health implications and also effects on therapists behaviour (Piko, 2006). Schlenz, Guthrie & Dudgeon (1995) reported that therapists experienced a higher level of burnout, particularly emotional exhaustion, which was recognised by physical and psychological energy. Further, Śliwiński et al., (2014) specified that medical practitioners such as medical doctors and

physiotherapists were frequently exposed to experienced burnout, according to the nature of their work, as they deal with people who suffer from illnesses and who frequently present high levels of anxiety because of their medical condition. Likewise, Pavlakis, Raftopoulos & Theodorou (2010) emphasised that therapists are at risk of burnout, similar to other medical practitioners, because of their close contact with clients and also their significant role in the recovery period.

As such, Fischer, Mitsche, Endler, Mesenholl-Strehler, Lothaller & Roth (2013) stressed that the potential indication of burnout in physiotherapists is the client's desire for less or more closeness and distance, based on the direct and close body contact with them. From this view, the decisive factors that affect therapists were interpersonal communication and contact with clients. As previously noted, the therapists were working with people who suffer from medical conditions. Therefore, their work requires special predispositions and different skills to cope with patients who have had difficult experiences. It is noteworthy that, the contact and interface between individuals, families and groups with therapists is a sort of social-contact that points towards satisfying needs with regard to health and also life (Śliwiński et al., 2014). It is important to note that, as a part of the health care system, physiotherapy plays an effective role in terms of enhancing both wellbeing and health. Similarly, it also has significant effects on the recovery process from physical disorders. Along with this, physiotherapy provides an essential intervention that supports clients to recover from medical conditions and restore body system functions and improve their quality of life. And given that, it can clearly realise the therapists' role in the recovery period and health improvement (Higgs, Refshauge & Ellis, 2001).

Thus, the main aim of this research was to explore therapists' perceptions of their participation in the programme in terms of identifying any potential benefits and highlighting areas of improvement.

## 6.2 Methods

### 6.2.1. Procedure

This study was approved by the Ethics Committee at the School of Sport & Exercise Sciences, University of Kent.

The procedure for this study was the same as the previous study. The therapists received participant's information sheet (PIS), which included all information about the study procedure. In addition, the therapists who were decided to take part in this study signed an informed consent to conduct 30 minutes of SSI. It should also be noted that, the interview was conducted individually with each therapist, in a convenient location in the School of Sport and Exercise Sciences.

### 6.2.2 Participants

Physiotherapists and sport therapists took part in this study (M therapists= 32.13, SD= 8.10). Demographic data is presented in Table (6.1). This study was similar to the rest of the studies in this thesis and it received ethics approval from the School of Sport and Exercise Sciences (SSES). Eight participants were invited to have a 30 minute semi-structured interview with the primary researcher, offering their insights into their participation in the 4 weeks of MMP.Therapists demographic and qualification characteristics.

**Table 6.1: Participants' demographic, qualification, occupation characteristics for therapists (physiotherapists and sport therapists)**

| Participants number | Age | Gender | Qualification | Occupation |
|---|---|---|---|---|
| 1 | 37 | Female | Physiotherapist | Postgraduate student |
| 2 | 26 | Female | Physiotherapist | Postgraduate student |
| 3 | 24 | Female | Sport therapist | Sessional lecturer in a sports therapy clinic |
| 4 | 48 | Male | Sport therapist | Sessional lecturer in a sports therapy clinic |
| 5 | 26 | Male | Sport therapist | Postgraduate student |
| 6 | 36 | Female | Physiotherapist | Lecture at a department of physical therapy |
| 7 | 27 | Male | Physiotherapist | Lecture at a department of physical therapy |
| 8 | 35 | Male | Physiotherapist | Sessional lecture in a sports therapy clinic |

## 6.3 Data Analysis

To observe attitudes after 4 weeks of MMP, a Thematic Analysis (Braun and Clarke, 2008) was applied in the previous study follwing the same inductive approach and methodologoical process as it was described on page 62 and 63 of chapter four. SSI was carried out with all therapists to understand their attitudes after mindfulness meditation practice. All the interviews were recorded by using an audio tape recorder to transcript and analyse the participants' experiences after their participation in MMP.

## 6.4 Results

The interview data collected in this study, after being analysed thematically, they were grouped into four main themes: 1) Stress reduction, 2). Increased attentiveness, 3) MM's effects on therapists' professional practise, 4) Difficulties in practising.

The first two of them, as their name suggests, discussed the different benefits as mentioned by our therapists. The third one focused on how MMP could help therapists cope better with the characteristics and particularities of their job, while in the fourth one, our participants highlighted some difficulties that they faced and they offered some suggestions for improvement.

### 6.4.1 Stress Reduction

When asked about the perceived benefits that MMP had brought to them, most of the therapists that had taken in our study indicated that MMP helped them cope better with stress. One of our participants' words were very illustrative of this theme:

> 'I felt that my stress levels were reduced because I have a lot of stress in my life and I have not practised anything like that before, so it was an opportunity to try it and I liked it. I think it was a good experience. Basically after that when I get stressed or I feel annoyed, I try to calm down and breathe, to think for a little bit and that makes me to relax and look at the situation from different angles (Participant 2).

Another participant echoed the relaxing effect that MMP had on them:

> ‘I found MM really useful just to take some time during the day to be relaxed and focus on my thoughts, and sort of refresh’ (Participant 3).

Indeed, relaxedness and calmness were the most frequently reported effects that therapists mentioned as a benefit from their enrolment in MMP:

> ‘I think you can look at everything from a different side and also MM is easy to cope with stress or any situation that makes you very angry or upset’ (Participant 2).

### 6.4.2 Increased Attentiveness

Another frequent benefit that the therapists in our sample mentioned was an improvement in focus and concentration.

> ‘After the program I felt that I could concentrate longer than before, especially; in my daily task …In the past I could not concentre on any particular task for a long time, for example when I read a book or paper I was not able to focus for more than 20 minutes. After I participated in this study, it helped me to concentrate for about one hour, it was amazing because it was really helped me to focus on my work so that’s why I appreciate meditation’ (Participant 2).

This increased attentiveness and awareness can be particularly beneficial for therapists whose everyday work entails a detailed a fine observation of patients in order to accurately identify and assess injuries. For this reason, Participant 6 stated that the use of MM for other therapists could be recommended:

> ‘If they are able to take the time to improve their body awareness or general awareness, they will be able to make decisions more effectively. In that time when you are able to think clearly you can make better decisions, if you continually making decision as a reaction, then sometimes you might not, so I will recommend on that basis to take some time out to be more aware of themselves and of what they need to do, where they are and this might inform them better’ (Participant 6).

Participant 4 also stated that MMP would help therapists in terms of decision making with clients:

> '…the more grounded I am and the more aware of everything, the more clear I am in terms of my decision making. So this is important for therapists to make the right decision for clients' (Participant 4).

### 6.4.3 MM's Effects on Therapists' Professional Practise

As mentioned in the literature review of this thesis, many studies have highlighted the constraints and demands in the everyday professional practise of therapists. It is worth mentioning that the physiotherapists in our study were able to identify some particular benefits that MMP had on them in relation to some specific characteristics of their job.

> 'When you are doing a lot of massage like I do, and you might have pro posture and not realise it, so you know how to sense the different areas of pain points of the body. Besides, you know where the aching is coming from and you just take some time out to relax, so it reduces the physical fatigue as well as the sort of emotional and stress of the day if you have difficult clients. Also, you are more used to focusing on different points of your body and you get better at pin pointing where it is' (Participant 3).

Another benefit that was associated with the particular characteristics of physiotherapists' work was an increased feeling of being in control and of patience.

Participant 7 stated that after MMP, he felt kinder towards clients and then had more of a feeling of calmness.

> 'Mindfulness makes me kind and more concentrated. As physical therapists are working very hard and respectively in the clinics, this becomes frustrating and you are less patient. But after the program, I was more patient and kind and if you have patience, you can think more clearly. This has helped me to understand and handle my clients better' (Participant 7).

Participant number 2 provided some more in depth feedback about the improvement in terms of feelings of control and patience, as she described how MMP has helped her to handle better the stress that entailed working with hyperactive children.

> 'When I participated in this program I was working with kids between 5 to 10 years who have some hyperactivity issues, some postures and who had issues. We had several sessions a week with them. Notably, it is very difficult to work

with hyperactive kids, because you will lose your temper a lot but after MMP I could cope with them better, it was easier for me to handle all the situations regarding their hyperactivity. Yes, I felt more confident and more concentrated' (Participant B2).

### 6.4.4 Difficulties in Practising MM

#### 6.4.4.1 Sleepiness

When we asked our participants to comment on any difficulties that they faced during the MMP, the most common theme that emerged was a feeling of sleepiness. Indeed, both MM and sleep involve a pause from physical and mental activity and the transition from one state to another can be difficult to avoid, for especially for beginners:

> 'I think to begin with it was difficult for me to learn the technique I could not familiarise myself with being able to switch everything off and focus without becoming tired, it was a battle between being tired and sort of fully asleep, but then I began to realise how to learn how to use the technique properly' (Participant 4).

From the transcribed comments below it becomes apparent that sleepiness is very present in the initial stage of beginning to learn how to perform MM. However, once a participant perseveres as they progress into the MM practise, it seems that sleepiness goes away and is replaced with awareness and relaxation.

> 'My initial reaction was that I felt sleepy but after that I came out of that with mindfulness meditation practise, I felt a lot more focused and relaxed because all of the past memories around me just became clear. And I think I was more efficient and I did not feel distracted' (Participant 3).

Another participant emphasised the difficulties that a beginner has to face when starting to practise MM and the feelings of awkwardness that this initiation phase entails:

> 'Sessions were a bit strange to start with it, I had never done any form of meditation before and it was quite strange to get into that zone' (Participants 3).

Participant 4 echoed the shared similar perception about the difficulties in the beginning but also stated that after getting accustomed to them, they felt eager to continue the program:

> ‘But also balancing it you don’t sort of think forcibly, this being mindful and being relaxed and then crossing the line and actually feeling and actually focusing and meditating took a few sessions to get used to it. Yes, once I got used to it during the sessions I actually looked forward to coming to the sessions, (Participants B4).

### 6.4.4.2 Duration of the Programme

Another difficulty that was stated by our participants had to do with the duration of the MMP. One of our participants argued that long meditation practise might be not convenient for therapists, suggesting that a short meditation would be more appropriate.

> ‘The longer meditation might be not so good if you are a therapist in the clinic and you have got back to back appointments, it is not realistic to sort out and sit down, but the short meditation definitely in between clients or in the lunch break, you can use it by focusing on your breathing, body scanning and staying mindful, I think it would be very useful’ (Participant 3).

This issue with the duration of the programme emerged again when we asked the therapists who were involved in this study to report to us any suggestions about how to improve MM:

> ‘I think it would be better to start MM with 15 minutes meditation rather than one hour or more especially for beginners, because it is difficult to start with for a long time. When I did meditation the first time, I moved my body the whole the time, I was not sure if I could meditate during that time or not, therefore I think a short time could be more helpful’ (Participant 1).

> ‘I think the main issue was the program starting with one hour, and for the beginners one hour is a very long time to meditate and to focus. I think it should start with 20 minutes and then increase it, because at first it is difficult to stay focused for a long time, especially if you have just started practising meditation. But the self-practise was very good and helped me’ (Participant 2).

‘I think if there are more formal sessions with less time it might be suitable for more therapists to practise MM’ (Participant 4).

## 6.5 Discussion

Related to the first theme ‘Stress reduction’, therapists reported that MMP affected them positively, as they felt more relaxed and calm after practising it. They clarified that MMP had helped them in numerous ways in their daily work life tasks. Precisely, the regular meditation and self-directed practise assisted therapists to become less stressed. According to our qualitative data, therapists are quite frequently therapists are exposed to clients who are stressed and nervous and they pass on to them these negatives sensations. According to the words of one of the therapists that we interviewed, clients sometimes they have an attitude of “treat me I want to return to my normal life” which causes extra pressure on the therapists. However, after participating in the MMP, most of our participants reported that after practising mindfulness it was easier to let go of that kind of negative attitude and also to focus on their current tasks.

These experiences reported were in line with findings from other studies which report that MM has had a positive impact upon reducing stress, anxiety and rumination and by improving self-compassion and positive affect (Shapiro, Brown & Biegel, 2007). Mackenzie, Poulin & Seidman-Carlson (2006) argued that MBSR has a positive effect on improving burnout and stress indications, satisfaction and relaxation in staff who work in a medical environment. Our study comes is also in line with the results of an older study carried out by Shapiro, Schwartz & Bonner (1998) with premedical and medical students who indicated that MBSR had a positive influence in the reduction of anxiety, stress and depression.

Indeed, there is increasing evidence that as meditation becomes a habit, there are improvements in emotion regulation that come with it (Tang, Tang, Tang & Lewis-Peacock, 2017). Overall, it seems that MMP can be an important coping tool in reducing stress Nevertheless, the mechanism on how mindfulness meditation affects the large-scale brain is still unclear (Davidson et al., 2003).

With regard to the second theme of increased attentiveness, the therapists explained that their participation in the programme helped them concentrate for longer, feel less distracted and feel more focused after they had received 8 weeks of regular meditation.

They indicated that both formal sessions and also the CD guides encouraged them to relax their mind state, concentrate for longer and clear their thoughts. It is also noticeable that, MMP helped them to cultivate a better awareness in their daily tasks. Some of the therapists emphasised that MM was beneficial in terms of perceptions of body awareness and in terms of handling distressed work life situations. As a result of increasing their feelings of body awareness, the therapists stressed that this helped them to make effective and accurate decisions in their daily tasks of diagnosis and assessments. Our interview data that contributed in the establishment of this theme, are in line with the results of other studies that have gathered evidence of the positive impact that an MBSR program can have in improving body awareness, attention and concentration (Campbell, Labelle, Bacon, Faris & Carlson, 2012; Kabat-Zinn, 2013).

Regarding the third theme MM's effects on therapists' professional practise, the therapists reported that their participation in the programme helped them cope with some particular aspects of their everyday work activities. As clarified by the therapists, they gained benefits in terms of increasing patience and compassion with their clients. Another therapist revealed that there are some situations where therapists might lose their temper in work and as a result, that affects their daily performance. After participating in the MM, they felt better equipped to handle stressful situations and gain more calmness. Another point made by therapists was that gaining awareness would support them in making the right decision for their patients and also reduce the physical fatigue that results after long hours of practising massage sessions. Interestingly, these attitudes from therapists illustrated that MMP is a suitable means of improving the therapists' performance during the treatment process. Besides, MM has reduced their stress and they achieved a longer period of concentration in the treatment. Our qualitative data supports previous research indicating that MBSR has a significant impact on improving performance in the work environment when dealing with different types of clinical population (Cohen-Katz et al., 2005; Klatt, Buckworth & Malarkey, 2009; Hülsheger, Alberts, Feinholdt & Lang, 2013; Mrazek, Franklin, Phillips, Baird & Schooler, 2013 & Bazarko, Cate, Azocar & Kreitzer, 2013).

As mentioned above, the therapists reported many beneficial aspects in practising mindfulness mediation during 4 weeks; however, they also faced complex feelings in the beginning of the program. The therapists elucidated that the main difficulties they encountered were based on the fact that MM was a new skill; to them which was not

familiar to and this generated some difficulties in adhering to it. The frequently mentioned difficulties related to the feelings of sleepiness that MMP induced into them in the beginning and also they reported that the long duration of the sessions was another obstacle.

Three of the therapists' who interviewed argued that long meditation practise was not realistic for therapists during their daily tasks. They mentioned that this would interfere with the treatment time with clients; however they suggested that a brief form of meditation would definitely be better, because it would be possible to practise in the time available. Indeed, the issue of the ideal duration of the MMP is controversial, and yet inconclusive. There are studies which implement brief meditation forms of practise such as: Lane, Seskevich & Pieper, 2007; Zeidan, Gordon, Merchant & Goolkasian, 2010; Zeidan, Johnson, Diamond, David & Goolkasian, 2010; & Reich et al., 2017. While there are other studies which follow followed a more lengthy protocol of mindfulness such as: Kabat-Zinn, 2013; Cherkin et al., 2017; Short et al., 2017; & Chen, Yang, Liu & Fang, 2017.

Another difficulty that therapists were experienced was feelings of sleepiness. As Goldstein (2017) stated it is quite common to feel sleepy, lazy and restless in the initial phase of a meditation practice. The first days of meditation practice are usually hard for beginners. Falling asleep is often experienced by meditators; however, 'by paying attention and not identifying with the feeling of sleepiness, it will usually pass away' (Goldstein, 2017: 20). Overall, we can argue that both difficulties reported (difficulties with duration and symptoms of sleepiness) are interrelated to each other. Moreover, our interviewees reported various suggestions that emerged from the therapists' lived experiences. The first was that our sample of therapists seemed to prefer a shorter duration of time for practising MM, such as 15 to 20 minutes, rather than a longer period. This remark was of particular relevance for meditators who were absolute beginners. Indeed, it can be challenging to keep focused and stay constant for long periods of time and it is something that has been reported elsewhere in the literature (Zeidan et al., 2010 & Zeidan et al., 2010).

The second suggestion that therapists reported, is presenting additional formal sessions instead of once a week with less duration of time. Furthermore, a long time between sessions might cause them to disremember or create a change in habituation; however, homework on the CD was beneficial. Our explanation concerning this suggestion was that

the MBSR was originally developed with one long session per week (Kabat-Zinn, 2013). Additionally, therapists were asked to complete a number of requirements during that period. In addition, therapists were also asked to fill in seven quantitative measurements three different times. From this perspective, it was not feasible to offer an additional session, because more requests might have affected their participation.

In addition, one therapist also recommended transforming the CD to other kinds of digital files to be used as mobile applications. Hence, therapists can practise MM in their daily activities such as walking, cycling and also in their work. In other words, therapists would be able to practise and listen multiple times, instead of once a day via a CD. To the best of our knowledge, there is no particular intervention regarding MM that has been found in terms of practise through a mobile application. However, there is research using a mobile app called "Pacifica" which is developed by Poon (2016) to target mindfulness, a relaxation strategy and cognitive behavioural therapy. On the other hand, there are many studies which have utilised online courses, not specifically MBSR, but another model of mindfulness intervention through an online application (Krusche, Cyhlarova, King and Williams, 2012; Murray et al., 2015; Kemper & Khirallah, 2015; Zernicke et al., 2016).

It can be concluded that, MMP had positive influences on therapists in their daily lives and also in the workplace. Therefore, and based upon therapists' attitudes, MMP can be a valuable instrument be applied regularly by both physiotherapists and sport therapists. This could be noticeable in two dimensions; the first was that meditation practice had helped them psychologically (less feelings of stress and anxiety, increases in their attention and concentration spans). The second dimension was that, formal and informal meditation practice helped them cope better with the particular challenges and demands of their work.

## 6.6. Recommendation

Our recommendation in terms of the qualitative investigation in this study can be understood through the point below.

- In terms of directions for future qualitative research regarding STI, it may be beneficial to ask therapists to write down their general attitudes towards the program and then carry out the STI. Thus, the researcher can compare between therapists' own vision and their research questions.

# CHAPTER SEVEN

# General Discussion

# General Discussion

## 7.1 Overall Summary

As mentioned in the literature review, mindfulness meditation (MM) has been applied in various scientific areas, whether in a clinical or non-clinical population. There is no doubt that, sport is one of the areas that MM has been integrated into. To provide evidence for the role of MM in sport many researchers have implemented it (Moore, 2009 and Josefsson et al., 2017). A recent study from Kabat-Zinn (2017) emphasised that for a decade mindfulness has been integrated into mainstream health particularly that of medicine and health care. In addition, it has increased in other scientific domains, such as sports, law, education, government and criminal justice. However and to the best of our knowledge, this thesis is the first attempt to investigate the role of MM on injured athletes alongside therapists. Furthermore, MM has been the subject of experimentation and has been clarified through different methods used by researchers; more specifically, experimental methods (Hölzela et al., 2011 & Tashani et al., 2017), quantitative methods (de Boer et al., 2014 & Gross et al., 2016) and qualitative methods (Shonin, Van Gordon & Griffiths, 2014; Shonin & Van Gordon, 2015). The main objective in this thesis sought to determine, the effect of MM on the psychological demands of both injured athletes and therapists after long term of formal and informal practise. Thus, this thesis will provide a broad consideration in relation to the theoretical and practical familiarity of MM in sports.

It is important to note that, our research question in the first study was to investigate the role of MM practice in reducing the perception of pain, increasing pain tolerance, mindful attention, reducing anxiety/stress and also in improving their mood. In the first study of this thesis, mixed methods were used to assess the dependant variables. A cold Pressor Test (CPT) was utilised to evaluate both pain tolerance (PT) and the perception of pain (PP) with injured athletes in the pre and post MMP. The most obvious finding that emerged from the CPT was that, PT increased for injured athletes in the MM group compared to their pairs in the control group who followed only physiotherapy treatment. This result may be explained by the fact that, regular practise of MM in both formal and informal training improved injured athletes' mind-state. In turn, their PT increased by the end of the program. Therefore, MM can be practised by injured athletes as a means to increase PT.

These results reflect those of Tashani et al., (2017) who also found through CPT that, 10 minutes of MM practise had increased PT time for "healthy individuals at university" who were involved in the mindfulness group. Similarly, Liu, Wang, Chang, Chen& Si (2013) found that PT time had improved after 15 minutes of mindfulness practise with "female college students" who experimented through CPT, compared to a spontaneous group. Consistent with the literature, Zeidan, Gordon, Merchant & Goolkasian (2010) indicated that 3 days of a brief form of mindfulness practise is effective in decreasing pain and improving psychological status. On the other hand, Visual Analog Scale (VAS) scores in PP discovered that there were no significant changes between injured athletes in pre and post intervention and in both groups. A possible explanation for this might be that, they take their hands out of water through CPT once they experience pain at a similar level. Another possible reason for this is that, their injuries had still not completely healed during their participation; consequently, their PP had not changed.

Another important finding was that, Mindful Attention Awareness Scale (MAAS) scores showed that mindful awareness had significantly increased in the MM group. It seems possible that these results were due to injured athletes' understanding that they needed to pay attention to the present-moment which led to an increase in their body-awareness without judging their thoughts or instructions that they gained from the MMP. Other possible interpretation is that, 20 minutes daily of informal MP led to higher scores of mindful awareness. The MMP has different mindfulness practise, such as mindful breathing, body scan meditation, walking meditation, sitting meditation, mindful eating, mindful lying yoga, mindful standing yoga, loving kindness meditation, and meditation for anxiety and stress. This finding supports evidence from non-clinical observations, which found that MM has increased awareness, flow and sports confidence (Kaufman, Glass & Arnkoff, 2009) and significantly increases in observing, acting with awareness, feeling, thoughts and perception in college students (Caldwell, Harrison, Adams, Quin & Greeson, 2010). Likewise, our findings are also consistent with previous research, which observed that home meditation training has had a positive impact on reducing bodily-pain, negative psychological consequences and improving psychological-wellbeing (Rosenzweig et al., 2010), and also brief of meditation practise lead to reduced pain and improved mindfulness skills (Zeidan et al., 2010). Additionally, Greeson et al., (2015) found that daily spiritual training through MBSR directly affected mindfulness, which lead to an improvement in mental health and as result, a better quality of life. In contrast, it was also noticed that

mindfulness had improved in the control group. This was because the injured athletes gained the benefit of physiotherapy treatment during the Sport Rehabilitation Process (SRP). This was even though mindful-attention was significantly greater in the MM group. These results have proved to be two of the main dependent variables (PT and mindful-attention) in our research question.

It is somewhat surprising that no significant changes were observed, regarding other variables (PP, Anxiety/Stress, Mood) used in this study. With regard to psychological components (anxiety/stress and mood), our findings observed that there was a general decrease in mood for tension-anxiety, fatigue-inertia, confusion-bewilderment and depression-dejection. Besides the above, no significant changes were found in vigour-activity or anger-hostility. As these effects did not interact with the group, this suggests no further benefit from the MM program. Essentially, mood scores decreased in the control group. This is possibly because of physiotherapy, however a control-group (without physiotherapy) would be needed to answer this question. Another possible alternative explanation for our findings is that, injuries healed over time whether or not because of physiotherapy, the mood decreases. This lack of change in both vigour-activity and tension-anxiety could return to those injured athletes who were not allowed to participate in their sports, as a result they felt de-active during the MMP. Similarly, there was a general reduction over time during 8 weeks of the MMP related to anxiety and stress in both groups. However, there were no significant changes observed in the anxiety and stress scores. This improvement in the MM group could be because of daily meditation training and physiotherapy treatment in the control group. This finding is contrary to previous studies, which have suggested that, 20 minutes daily of meditation practise is effective in reducing psychological distress, physical symptoms and also leads to a significant improvement in wellbeing and functional status with heterogeneous patients (Reibel, Greeson, Brainard & Rosenzweig, 2001). In addition, Gross et al., (2016) stressed that through 7 weeks of the mindfulness program with “female collegiate athletes” it was found that MM was an effective means to reduce emotional distress, psychological symptoms, behavioural difficulties and improve athletic performance compared to a more traditional psychological approach.

Although, these results differ from some published studies, as mentioned above, there was an improvement in mood state over time for all injured athletes; nevertheless, the findings disagreed with the second part of our research question regarding PP, Anxiety/Stress, and Mood.

With respect to the second study in this thesis, there were two research questions that were investigated. The first was to examine whether MM had an ability to increase therapists' body-awareness and reduce burnout in their workplace. The second was to find out the efficacy of each method in terms of an applied MMP and whether it was more effective with therapists. The first dependent variable in this study was a body-awareness. Notably, body-awareness has been assessed during Multidimensional Assessment of Interoceptive Awareness (MAIA). MAIA has eight subscales that were examined (Noticing, Not-distracting, Not-worrying, Attention-Regulation, Emotional-Awareness, Self-Regulation, Body-Listening and Trusting). The most significant findings regarding to MAIA were, attention-regulation, self-regulation and trust. In other words, in this scale more focus was placed on these three subscales.

### 7.1.1 Attention-Regulation (AR)

Current outcomes in this study revealed that, AR changed significantly between groups. In addition, the Face to Face (FFG) groups had a greater improvement in the pre and post MMP compared to the Self-Directed (SDG) group. These findings were expected, because therapists practised ninety minutes of the MMP per week and in addition they were supposed to practise twenty minutes per day during the second period of the program. This study supports what Kabat-Zinn (2009) mentioned in his book that, practising mindfulness constantly makes you to fully engaged in the present moment that orients you to greater awareness and calmness. In contrast, attention-regulation was reduced in the SDG. This reduction might have happened because of the lower volume of mindfulness practise.

### 7.1.2 Self-Regulation (SR)

With regard to SR, the findings showed that there were significant differences between groups. As well as this, a significant improvement was observed in the FFGs compared to the SDG. These results are likely to be related to, the positive impacts of the MMP that support mediators being calm and less stressed. The reason is that daily mindfulness practise can be added to a formal 90-minute session in the week. As Kabat-Zinn pointed

out, making a commitment to yourself is the most significant thing in order to start the MBSR program. Thus, once meditators are ready to start, they will be motivated by their own experiences to continue the program to the end. In this sense, they will be capable of developing and gaining a benefit during the entire program (Kabat-Zinn, 2013).

From this perspective, it can be estimated that self-regulation increased for the therapists in the FFGs. However, self-regulation decreased in the SDG group. A part of the limitation in this study was that home practise had not been measured with therapists. The potential expectation regarding the therapists in the SDG was that they would undertake daily mindfulness practise, however the word "practise" does not potentially explain that they practised mindfulness repetitively and routinely. Consistent with Kabat-Zinn (2009) it was stated that the word "practise" did not explain the competition level or performance, it simply demonstrated a cultivation of mindfulness. In other words, the core of mindfulness is being present in the moment and not achieving the better performance.

### 7.1.3 Trusting

Related to the findings of this study, it is noteworthy that, trust increased in the second period of the program, particularly in the FFGs. The potential expectation regarding these findings was that MP had supported therapists to trust their abilities and practise. Furthermore, mindfulness meditation had improved their confidence levels after their participation in the MMP. According to Kabat-Zinn (2009), cultivating trust is a part of mindfulness, and that could be possible by trusting ourselves. Thus, if there is nothing to trust in ourselves, then practitioners should be developing a deeper concentration within ourselves. In addition, it is possible to experiment with trust in the present moment. This is through accepting any thoughts, sights and feelings that arise in the present moment (Kabat-Zinn, 2009). On the other hand, data indicated that trust reduced in the SDG. In view of these results, it can be estimated that therapists in the SDG might have not trusted in their abilities regarding MP, as they were practising it by themselves. Therefore, this form of practise might make them doubt their own practice, whether it is correct or not-correct.

The rest of the other subscales (Noticing, Not-distracting, Not-worrying, Emotional-Awareness, and Body-Listening), did not find any changes between groups. However, body-listening and emotional-awareness improved in the FFGs compared to the SDG. This

is because mindfulness can maintain an emotional-awareness by regular practise. Thus, therapists cultivated greater emotional-awareness. The advantage might have occurred because therapists in the FFGs received further guides regarding mindfulness practise. Specifically, during the formal session of the MMP that they practised with the primary researcher. Correspondingly, data indicated that body-listening also significantly increased in the SDG. Our perspective behind these results was that of mindfulness training. Therefore, their body-listening had increased. These results agree with the findings of other studies that indicated that mindfulness can lead to greater body-awareness (Tsur, Berkovitz & Ginzburg, 2016). Additionally, a study by Jain et al., (2007) stated that through a brief form of mindfulness meditation practise and a somatic relaxation training, there was an improvement in positive mood and less distress compared to the control group.

On the other side, data showed that body-listening decreased in the SDG. The possible explanation was that therapists might not have paid enough attention to their body-listening. Surprisingly, no changes were found in the Noticing, Not-distracting and Not-worrying subscales and in both groups. This unexpected finding might be a result of, noticing changes that can emerge from MP that require extensive time and regular bases of training, therefore the time that therapists had expended was not sufficient to improve these subscales.

The second dependent variable in this study was burnout. Burnout has been experimented through Burnout Self-Test and the Maslach Burnout Inventory (BST/MBI). BST include three subscales; burnout, depersonalisation and personal-achievement.

### 7.1.4 Burnout

Expectedly, results showed that there were significant differences in terms of burnout level between groups. One of the most striking results was that burnout had been significantly reduced in the FFGs compare to the SDG. In turn, this explained the effectiveness of MM on therapists. One other potential reason might emerge from the facts that the FFGs attended one 60-90-minute formal session with a primary investigator. Moreover, there was an opportunity to share an idea prior and post all sessions. These results agree with the findings of other studies (Gold et al., 2010 and Goodman & Schorling, 2012), which indicated the effectiveness of the MBSR program in improving well-being and reducing the burnout level in a healthy population.

### 7.1.4.1 Depersonalisation

The results of this depersonalisation subscale indicated that there was a significant improvement in the FFGs compare to the SDG. As noted above, and in addition to the informal MM practise, therapists attended a formal session each week. Therefore, it can be realised that there were reductions in the depersonalisation level with therapists in the FFGs. These results are in agreement with Cohen-Katz et al., (2005) findings that showed, emotional-exhaustion and depersonalisation had significantly improved in nurses after MBSR program. On the other hand, no improvement was found in the depersonalisation level for therapists in the SDG. As mentioned before, therapists carried out the MM by themselves without additional guides from a primary researcher as therapists did in the FFGs.

### 7.1.4.2 Personal-Achievement (PA)

The data revealed that PA had significantly changed in both pre and post mediation practise compare to the SDG. This result could be attributed to, therapists having less negative self-efficacy toward themselves and they believed in their capabilities after they had received the MM program.

The third dependent variable in this study was mindful-awareness. Mindful-awareness was measured through the Five Facet Mindfulness Questionnaire (FFMQ). It should be noted that this scale have five subscales (observing, describing, acting with awareness (AA), non-judging (NJ) and non-reactivity NR). Current outcomes in this scale revealed that there was a significant difference in AA level between groups. The most important finding was that there was an improvement in AA in the FFGs compare to the SDG. Besides, in both (describing and NR) subscales, there was a significant improvement in the FFGs whereas no changes were found in the SDG. Even though, findings showed there were no significant differences in terms of groups in both (describing and NR) subscales. As such, no significant changes were observed either between groups or pre and post each group in both (observing and NJ).

The forth dependent variable in this study was compassion. Compassion was measured through Santa Clara Brief Compassion Scale (SCBCS). Results showed that there were significant differences between groups regarding SCBCS. Further, the compassion level in the FFGs had significantly improved compared to the SDG. It may be that these therapists

benefitted from regular training of MM. It is possible that these results are due to both loving-kindness and compassion, which are skills of the MBSR program. Our findings support previous studies which have demonstrated that, MM has a positive impact on increasing compassion (Kuyken et al., 2010; Condon, Desbordes, Miller & DeSteno, 2013; Neff & Germer, 2013).

The fifth dependent variable in this study was depression, anxiety and stress. A Guide to the Depression, Anxiety and Stress Scale (DASS 21), was utilised with therapists to assess their depression, anxiety and stress level during MMP.

What is surprising was that, our findings showed that there were no significant differences between groups in all subscales; depression, anxiety and stress. This is in spite of literature showing that MM practise has a positive influence on therapists in decreasing their level of depression (Serpa, Taylor & Tillisch, 2014 & Greeson et al., 2015), improving well-being and workplace stress (Allexandre et al., 2016 & Ivtzan et al., 2016) and reducing anxiety (Goldin & Gross, 2010).

The next scale is the Positive and Negative Affect Schedule (PANAS). One interesting finding regarding the positive and negative effects of MMP was that, there were significant changes in positive affect between groups. In addition, data showed that there was a clear positive change in therapists in the FFGs and a reduction in negative affect after they had been involved in MMP compared to the SDG. These results are possibly due to therapists practicing meditation frequently in 4 weeks. These results are in line with those of previous studies. Brockman, Ciarrochi, Parker & Kashdan (2017) stated that regular training of MM practise lead to less negative effects and greater positive effects. Likewise, Chambers, Lo & Allen (2008) demonstrated that daily practise of mindfulness is effective in reducing depressive symptoms and improving cognitive functions.

The last variable that was assessed in this study was perceived stress that has been measured through the Perceived Stress Scale (PSS). Our findings displayed no significant changes in pre and post MMP for both groups. Similarly, no significant differences were shown in the means changes between the groups. Several factors could explain this observation; the level of stress at the beginning of the MMP, no prior experience in terms of mindfulness practise, MM being a very calm technique that might have affected their stress and practising of MM through CD guides, which might have oriented therapists to

feel that MM practice was complicated, as result of using such a technological tool. These results were not consistent with pervious literature that has been conducted on MBSR, which has emphasised the effectiveness of MBSR in reducing stress (Weinstein, Brown & Ryan, 2009; Erogul, Singer, McIntyre & Stefanov, 2014; Sallon, Katz-Eisner, Yaffe & Bdolah-Abram, 2017; McConville, McAleer & Hahne, 2017). Furthermore, numerous research has shown the positive effects of the MBSR program in the clinical population in reducing stress symptoms (Carlson, Ursuliak, Goodey, Angen & Speca, 2001; Minor, Carlson, Mackenzie, Zernicke & Jones; 2006; Reich et al., 2017).

In the qualitative, exploratory chapters of this thesis (chapters five and six), a Thematic Analysis has been applied to examine the subjective attitudes of "injured athletes" after 8 weeks of the MMP and of therapists who also participated in the study. Participants from both samples, were invited to attend a 30-minute interview to assess their personal lived experiences.

In regards to the results of study, the themes that were identified were the following: (1) Reconnecting with the body, (2) Reconnecting with the mind, (3) Passivity of MMP as an opposed to the athletic praxis, (4) Group versus self-guided MMP (5) Acceptance of pain. Injured athletes reported that feeling after 8 weeks of the MM program (theme 3) involved them learning new skills and techniques in order to fully understand meditation techniques and they faced difficulties in carrying this out at the beginning of the MMP. These arguments were expectably based on the study's assumption, because they were beginners in this kind of MM. Therefore, regular practise in MM leads to familiarisation with new skills. This finding is consistent with Kornfield's, (2005) statement that cultivating any skills, should depend upon three components, which are regular training, perseverance and patience.

To understand whether MM is a convenient means to be utilised with the clinical population, injured athletes explained that, MM is a beneficial technique which enables them to reconnect to their bodies (theme 1), as well as become more aware of their physical condition. Besides, they can manage their body sensations during the SRP. These results are in accord with recent studies observing that, MBSR is suitable and effective as a "treatment approach" that can be applied as a clinical intervention such as work undertaken by the following suggests; (Arefnasab et al., 2016; Ali et al., 2017; Zhang et al., 2017; Reich et al., 2017).

In relation to the (fourth theme) in this study, injured athletes explained their experiences. Here, instead of running meditation sessions for an individual, workshops might have had a better effect in terms of comparing one person's state to others and sharing an idea with them. It should be noted that, the original MBSR was documented and practised in a group, (Kabat-Zinn, 2013). Nevertheless, meditation sessions in the current study were run individually, instead of practising with a group. In fact, there were several reasons for that, including the athletes' physical state after being injured, different time of physiotherapy treatment, as well as their own personal tasks. These causes made the gathering of participants at one time and place impossible.

There were perceptible explanations from "injured athletes" relating to the PP and PT, (Theme 4). They indicated that MM has positive effects on their pain sensitivity and also their body sensations. Additionally, their PT had increased and they felt a higher level of tolerance; however, they felt fatigue. Our understanding of these attitudes was that, MM has actual effects on their somatic state. In other words, regular meditation practise reinforced their physical state during the SRP. These findings are in line with Kingston et al., (2007) who found significant improvement in PT with "asymptomatic students". Likewise, Tashani et al., (2017) discovered that, a brief form of MM practise has increased PT time for "healthy individuals at university". With regard to the psychological points of pain such as frustration, anger and negative moods, the beneficial aspects of MM were emphasised.

Injured athletes reported that MM positively affected their mood state during the SRP (Theme 5). Further, it was an appropriate technique to manage their negative moods and also it helped them in with their daily tasks. Indeed, and expectedly, injured athletes were able to cultivate awareness through regular meditation and thus they were able to achieve well-being as well as mange their mood state. Moreover, and consistently with other researchers (Carmody & Baer, 2008; Nyklícek & Kuijpers, 2008; Hoffman et al., 2012; Nejati et al., 2016) it was found that MBSR had a positive impact on well-being within various clinical populations.

The research question regarding the clinical population in this study was "what experiences the "injured athletes" had had during the 8 weeks formal and self-directed mindfulness meditation program". In general, and according to these qualitative findings, it can be realised that injured athletes reported positive experiences after having been involved in 8

weeks of formal and informal MMP. These findings raise intriguing questions regarding the nature and extent of, MMP efficiency to be applied by injured athletes. It can therefore be assumed that MM is suitable mental training that can be used by injured athletes' parallel to physiotherapy treatment during SRP. Further work is required to discover, the effect of MMP in sports and particularly injured athletes' in different methodological designs.

With regard to the last investigation in this thesis, we aimed to obtain insights about the perceived benefits and difficulties for therapists to participate in the MMP. Overall all of our participants reported that MM has affected their life in a positive way; particularly, in their daily tasks. The explanation behind these attitudes was that they were able to concentrate for longer, felt less distracted and also felt more relaxed as a result of MMP. Another possible description for this is that, frequent MM practise and self-directed practise assisted therapists to become less stressed and more focused. It may be that the therapist benefitted from MM and it became a habit and thus had a positive impact upon their brain. Related to the mental training, Tang, Tang, Tang & Lewis-Peacock (2017) observed the positive influences of MM being an improvement in awareness, emotion regulation and cognitive performance. However, it is still unclear how MM operates and what is the mechanism in the brain that generates these positive effects (Davidson et al., 2003) and this observation represents a fertile ground for future research.

Therapists explained in their interviews that there were considerable salutary consequences as a result from their participation in the MMP. They stated that formal sessions as well as the CD self-guided practise encouraged them to clear their thoughts, relax their mind state and concentrate for longer. Remarkably, none of them mentioned that MMP was not attractive or it had negative consequences for them. These perceptions of the therapists about their participation in the program are in agreement with previous observational studies such as the one conducted by Shapiro, Schwartz & Bonner (1998) with premedical and medical students who gathered evidence that MBSR had a positive influence in the reduction of anxiety, stress and depression.

Additionally therapists reported that MMP was beneficial in terms of increasing their sense of attentiveness focus and concentration (theme 2). The therapists that took part in our exploratory qualitative study explained that their participation in the programme helped them feel more focused after they received 8 weeks of regular meditation.

Some of the therapists emphasised that MM was beneficial in terms of perceptions of body awareness in terms of handling distressed work life situations. As a result of increasing their feelings of body awareness, therapists stressed that this helped them to make effective and accurate decisions in their daily tasks of diagnosis and assessments. Data collected via interviews contributed to establish the themes mentioned previously. Results are consistent with other studies that have showed positive impact of MBSR in improving body-awareness and attentiveness (Campbell, Labelle, Bacon, Faris & Carlson, 2012; Kabat-Zinn, 2013).

Regarding the third theme MM's effects on therapists' professional practise, therapists reported that their participation in the programme helped cope with some particular aspects of their every day work activities. As clarified by therapists, they gained benefits in terms of an increasing patience and compassion with their clients. Our qualitative data supports previous research indicating that MBSR has a significant impact on improving performance in the work environment when dealing with different types of clinical population (Cohen-Katz et al., 2005; Klatt, Buckworth & Malarkey, 2009; Hülsheger, Alberts, Feinholdt & Lang, 2013; Mrazek, Franklin, Phillips, Baird & Schooler, 2013 & Bazarko, Cate, Azocar & Kreitzer, 2013).

In terms of the difficulties that our therapists pointed in regards to their participation into the programme, those were mainly related to the lack of previous experience in MM. The long duration of the mindfulness sessions produced moments of sleepiness. But they also reported that as they progressed in the MMP it become easier for them to stay alert and mindful at the same time. In meditation practice, beginners experience difficulties in practicing it especially during the first days due to feeling restless, lazy and sleepy that is often caused at the initial stage. In spite of the fact that meditators fall asleep frequently, this habit can be overcome through 'paying attention and not identifying with the feeling of sleepiness,' and this was clearly stated by (Goldstein, 2017: 20).

The MMP's perfect duration is still under debate. Long protocol of mindfulness has been followed in a number of studies (Kabat-Zinn, 2013; Cherkin et al., 2017; Short et al., 2017; & Chen, Yang, Liu & Fang, 2017) whereas some other researches are based on Implementing brief meditation forms of practise (Lane, Seskevich & Pieper, 2007; Zeidan, Gordon, Merchant & Goolkasian, 2010; Zeidan, Johnson, Diamond, David & Goolkasian, 2010; & Reich et al., 2017).

Based on therapists' attitudes, one may conclude that owing to the fact that their daily life is positively influenced by MMP, its regular application as a tool by both sport therapists and physiotherapists could be profoundly valuable. And this can be noticed clearly through both psychological benefits that they gained from meditation practice, such as having more concentration and attention and less stress and anxiety, as well as benefits that they got from either formal or informal meditation practice in their work (e.g. dealing with challenges in a better way).

It is worth mentioning that the qualitative studies presented in chapters five and six were aimed at obtaining a different additional angle to the quantitative/experimental studies that were presented in the first chapters of this thesis. However, we do have to acknowledge that that both qualitative studies had an exploratory character and that a further and deeper qualitative investigation would be able to shed more light. The quality of our interpretation of our data would have been enhanced if we were able to achieve a higher number of participants' athletes and therapists in both qualitative studies. However the clinical nature of our sample (injured athletes) of study 5, and the busy work schedule of therapists (study 6) resulted in difficulties in recruiting a higher number of participants. Also further qualitative studies might consider adopting a phenomenological approach (Smith, 2011) which would offer further insights into how athletes and therapists, in a specific context of injury recovery, can benefit of a mindfulness meditation programme.

## 7.2 Implication

The mindfulness meditation program that has been delivered to both injured athletes and therapists in this thesis found that MBSR techniques were an effective influence as an additional tool that can be used during sport rehabilitation. In addition, MBSR techniques had a significant effect on therapists' experiences after 4 weeks of mindfulness practice.

With regard to the first experimental study in this thesis, there was a promising implication of mindfulness practice in injured athletes. Based on the findings of this study, incorporating MBSR techniques in to sport rehabilitation helped injured athletes to increase their pain tolerance as well as increase mindfulness. In other words, these techniques provided athletes with an ability to cope with their physical pain in a better way, without being attached to negative thoughts of injury. According to some interpretations from injured athletes in a qualitative study in this thesis, they emphasised

that MBSR had changed their attitudes towards their physical pain. For instance, one of the injured athletes who received 8 weeks of MBSR training stated that "MBSR makes me more aware of the pain, and be able to connect with the pain and go through it, just let it go". Therefore, it is clear that MBSR can be a suitable technique for injured athletes to manage their negative emotions and reactions after having been injured and then achieve better results in the recovery time. It can also be noticed through the findings of this study that, mindfulness can play an important role in the recovery period along with SRP. This is consistent with Mahoney and Hanrahan (2011) who found that pracising mindfulness with injured athletes, who suffered from anterior cruciate ligament (ACL) injuries, helped them to improve their rehabilitation protocol and their wellbeing. Hence, mindfulness can become an essential part in the therapeutic toolkit of sport therapy. Another research suggested that the ability of an injured athlete to support pain is related to how quickly they recover from injury (Pen and Fisher, 1994).

In the second experimental study in this thesis, there were some novel findings that emerged as a result of formal and informal meditation practice in therapy. The main implication of using MBSR techniques with therapists was significant improvements in terms of increasing their body awareness, mindfulness compassion and the positive effect of MMP. On the other hand, mindfulness helped therapists to decrease the level of burnout and stress. Based on these results, it can be suggested that MBSR techniques could be suitable strategies that can be used by therapists whether in the workplace or at home, as these techniques are simple and can be practiced at any time. These results are consistent with previous research such as Shapiro et al., (1998) and Cohen-Katz et al., (2005) and many other pieces of research that are mentioned in chapter two and chapter five. In addition, some of the therapists emphasised the usefulness of mindfulness as a way to cope with stressful situations that might be faced by the therapists during sport rehabilitation. A therapist who been interviewed after receiving MBSR stated that "MBSR can help to make you look at situation from a different view and also you can cope with stress and any situation that makes you angry or upset".

Another important implication of this thesis was conducting qualitative studies with injured athletes and therapists. The importance of understanding their attitudes about MBSR techniques provided insightful knowledge with regard to mindfulness practice. In addition, there were further interpretations of how mindfulness had worked for them and what aspects should be improved in future research.

## 7.3 How to Practice Mindfulness Meditation

In this thesis, individual meditation practice was run with both injured athletes and therapists. It is notable that, the only changes regarding MBSR techniques that were delivered to them compared to the original MBSR was the duration of practice. This was due to the physical conditions that the injured athletes had and the nature of the therapists' work, which is addressed thoroughly at the start of this thesis.

The first step to practice meditation is being aware of your breathing, to be aware of your breathing in and out. As Stahl and Goldstein (2010) stated, the foundation of meditation practice is mindful breathing because your breath is always there with you. In breathing meditation there is no need to analyse, visualise, manipulate or count the breath, which is just a matter of breathing naturally and being mindful of your in and out breath. In addition, when applying breathing meditation, there are some methods to pay attention to your breath and it can be through the nose, chest, and abdomen or breathing through the entire body as it breathes in and out. Kabat-Zinn (2013) stressed that an effective way to cultivate mindfulness in your daily life is simply by concentrating on your breath and observing whatever happens and keeping it there.

Often during practicing mindfulness, the mind will inevitably fill with thoughts of the future or past. In mindfulness practice, the attention should be purposely on awareness, such as focusing on the breath, mantra or body-scan and/or the other aims of awareness. After a short period of mindfulness practice, the mind will wander off and this is normal, particularly for those not trained in attention. What is really important is not to judge your thoughts, whilst acknowledging them, letting them be and gently getting back to your breath (Stahl and Goldstein, 2010).

Another important element of practicing mindfulness is the position of the body and posture. Often practitioners wonder how the posture of the body should be during mindfulness meditation practice. As Stahl and Goldstein (2010) mentioned in the MBSR workbook, meditation can be practiced by sitting on the floor with a cushion, sitting on a chair, standing or lying on your back or whatever posture you have that should be very comfortable. Eventually, what is really important is to sit intentionally and to be fully aware and present. In addition, some meditators might also wonder whether their eyes should be closed or open. Most meditators meditate with their eyes closed, but if the

meditator prefers to open his/her eyes, then they can keep them open during meditation whilst focusing on whatever meditation they are practicing.

During meditation practice, sleepiness could be an issue with meditators; therefore, it is preferable to meditate whilst standing or sitting and meditating with the eyes open. Eventually, body position has an essential role in falling into deep meditation. Sometimes meditators sit rigidly and this might make them uncomfortable, and they cannot meditate for long. In contrast, a very relaxed posture might also lead to falling asleep. Therefore, meditators should take into consideration, what posture will make the body remain alert and comfortable (Stahl and Goldstein, 2010).

After meditators become familiar with some important meditation roles, they can start practicing mindfulness whether through formal or informal practice. Formal meditation practice means that the meditators are intentionally taking time every day to sit, lie down or stand and pay attention to their breath, sounds, body sensations, thoughts, emotions and other senses. In formal meditation practice, the meditators bring their attention to their daily activities, such as exercising, eating and walking. In other words, informal practice includes any other activity or action, whether at work or home to return back to their awareness (Stahl and Goldstein, 2010).

Based on the findings of this thesis, MBSR can be a very suitable technique that can be implemented by injured athletes during the sport recovery period. Therefore, MBSR can be incorporated into sport therapy as an additional treatment to help athletes during their recovery time. In addition, injured athletes can benefit from MBSR to cope with the circumstances of the injury such as emotional responses to their injury, their physical pain and adherence to physiotherapy treatment. Another possibility to incorporate MBSR in to sport therapy is to have these techniques within a sport medicine strategy. Thus, injured athletes can get this form of mental practice within their sports medicine team easily.

Furthermore, mindfulness meditation practice should be delivered by mindfulness instructors who have years of experience and practice. Besides, an instructor should also have theoretical and practical knowledge to be an active instructor. According to the promising results of this thesis, MBSR should be available in sport medicine strategies within sport clubs, and then injured athletes can have the opportunity to practice it.

The findings from the second experimental study indicated that MBSR techniques benefit therapists in terms of improving their body-awareness by reducing their level of stress and

burnout in the workplace. Furthermore, MBSR was more effective when delivered face to face with therapists, rather than in self-directed practice. In addition, through a qualitative study with some therapists who received MBSR techniques, they emphasised that MBSR is a convenient tool that can be used by therapists to achieve greater well-being. MBSR helped therapists to increase their level of awareness, which encouraged a lesser degree of burnout at work and better coping strategies with their clients. One of the therapists in our sample mentioned that "after MBSR I felt that I could concentrate longer than before especially during the treatment with my clients". Moreover, MBSR techniques also helped therapists in terms of decision making with clients. Another therapist stated that "the more grounded I am and the more aware of everything, the more clear I am in terms of my decision making. So, this is important for therapists to make the right decision for clients".

Therefore, and based on the current findings, MBSR can help therapists to overcome stressful situations with clients and achieve greater well-being in their lives. The techniques of MBSR are simple and could be applied anytime and anywhere. Thus, it is strongly recommended to therapists in both formal and informal practice, which could lead to calmness and better productivity at work.

# CHAPTER EIGHT

# Conclusion

# Conclusion

## 8.1 Conclusion

Considerably, there is an increase tend in applying mindfulness mediations in different kinds of sport. In particular, the role of MM affects athletes' performance by increasing it. The key strengths of this thesis are its long duration, in practising MM in both a clinical population (injured athletes) and non-clinical population (therapists). This thesis has provided a deeper insight into understanding the beneficial effects of MM with injured athletes' and therapists.

To the extent of our knowledge, this is the first attempt to investigate the effect of MM on injured athletes. As such, there was very limited research in terms of understanding the effect of MM on therapists. All studies in this thesis have been designed with a different methodology to investigate the role of MMP according to the participants' nature in addition to study objectives.

The experimental outcomes of the first study observed that MMP has beneficial effects in increasing PT for injured athletes' and particularly for the intervention group compared to the control group. Another significant finding was that mindfulness had increased with injured athletes' and also that there were potential benefits in terms of mood state. Based on our findings, MMP is a beneficial means of increasing PT and mindfulness. In addition, it can enhance mood state during the SRP.

In the second investigation in this thesis, one of the most important results was that, FFGs had advantages compared to SDG. The most obvious finding to emerge from this study was that, in the MAIA scale and particularly attention-regulation, self-regulation and trusting subscales there were significant improvements for the FFGs. The research has also shown that, the positive affect of PANAS changed significantly in the FFGs compared to the SDG. Additionally, there were significant differences in acting with awareness regarding the FFMQ scale. Likewise, therapists in the FFGs gained an improvement in the BST and SCBCS.

The qualitative findings in this thesis showed that, both injured athletes and therapists have reported positive experiences after being involved in MMP. In general, injured athletes reported that MMP was a suitable strategy that could be used parallel to physiotherapy treatment during the SRP. By the same taken, therapists, explained that MMP could support them in the workplace and their daily tasks. More specifically, they emphasised MMP could increase their awareness, reduce burnout and negative thoughts.

In conclusion, this thesis delivers a valuable understanding regarding MM in sport, in both theoretical and practical knowledge. However, further research is required to shed light on the effects of MM in both clinical and non-clinical populations in sport.

# Bibliography


Abercrombie, P. D., Zamora, A., & Korn, A. P. (2007). Lessons learned: Providing a mindfulness-based stress reduction program for low-income multiethnic women with abnormal pap smears. *Holistic Nursing Practice, 21*(1), 26-34. doi:00004650-200701000-00006 [pii]

Ali, A., Weiss, T. R., Dutton, A., McKee, D., Jones, K. D., Kashikar-Zuck, S., et al. (2017). Mindfulness-based stress reduction for adolescents with functional somatic syndromes: A pilot cohort study. *The Journal of Pediatrics, 183*, 184-190.

Allexandre, D., Bernstein, A. M., Walker, E., Hunter, J., Roizen, M. F., & Morledge, T. J. (2016). A web-based mindfulness stress management program in a corporate call center: A randomized clinical trial to evaluate the added benefit of onsite group support. *Journal of Occupational and Environmental Medicine, 58*(3), 254-264. doi:10.1097/JOM.0000000000000680 [doi]

Almeida, Pedro Henrique Garcia Lopes de, Olmedilla, A., Rubio, V. J., & Palou, P. (2014). Psychology in the realm of sport injury: What it is all about. *Revista De Psicología Del Deporte, 23*, 395-400.

Andreou, E., Alexopoulos, E. C., Lionis, C., Varvogli, L., Gnardellis, C., Chrousos, G. P., et al. (2011). Perceived stress scale: Reliability and validity study in greece. *International Journal of Environmental Research and Public Health, 8*(8), 3287-3298.

Angius, L., Hopker, J. G., Marcora, S. M., & Mauger, A. R. (2015). The effect of transcranial direct current stimulation of the motor cortex on exercise-induced pain. *European Journal of Applied Physiology, 115*(11), 2311-2319.

Arefnasab, Z., Babamahmoodi, A., Babamahmoodi, F., Noorbala, A. A., Alipour, A., Panahi, Y., et al. (2016). Mindfulness-based stress reduction (MBSR) and its effects on psychoimmunological factors of chemically pulmonary injured veterans. *Iranian Journal of Allergy, Asthma and Immunology, 15*(6), 476.

Arvinen-Barrow, M., & Walker, N. (2013). *The psychology of sport injury and rehabilitation* Routledge.

Arvinen-Barrow, M., Massey, W. V., & Hemmings, B. (2014). Role of sport medicine professionals in addressing psychosocial aspects of sport-injury rehabilitation: Professional athletes' views. *Journal of Athletic Training, 49*(6), 764-772.

Arvinen-Barrow, M., Penny, G., Hemmings, B., & Corr, S. (2010). UK chartered physiotherapists' personal experiences in using psychological interventions with injured athletes: An interpretative phenomenological analysis. *Psychology of Sport and Exercise, 11*(1), 58-66.

Azulay, J., & Mott, T. (2016). Using mindfulness attention meditation (MAP) with a mixed brain injury population to enhance awareness and improve emotional regulation. *J Psychol Clin Psychiatry, 6*(5), 00372.

Bach, P., & Robinson, S. B. (2017). A case study and the manifestation of thich nhat Hanh's vision of the five mindfulness trainings. *Journal of the International Association of Buddhist Universities (JIABU), 9*(2), 89-102.

Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice, 10*(2), 125-143.

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*(1), 27-45.

Bahr, R., & Holme, I. (2003). Risk factors for sports injuries--a methodological approach. *British Journal of Sports Medicine, 37*(5), 384-392.

Bazarko, D., Cate, R. A., Azocar, F., & Kreitzer, M. J. (2013). The impact of an innovative mindfulness-based stress reduction program on the health and well-being of nurses employed in a corporate setting.*Journal of Workplace Behavioral Health, 28*(2), 107-133.

Beach, M. C., Roter, D., Korthuis, P. T., Epstein, R. M., Sharp, V., Ratanawongsa, N., et al. (2013). A multicenter study of physician mindfulness and health care quality. *Annals of Family Medicine, 11*(5), 421-428. doi:10.1370/afm.1507 [doi]

Becona, E., Vázquez, F. L., Fuentes, M. J., & del Carmen Lorenzo, M. (1998). Anxiety, affect, depression and cigarette consumption. *Personality and Individual Differences, 26*(1), 113-119.

Bergen-Cico, D., Possemato, K., & Cheon, S. (2013). Examining the efficacy of a brief mindfulness-based stress reduction (brief MBSR) program on psychological health. *Journal of American College Health, 61*(6), 348-360.

Beynnon, B. D., Renström, P. A., Alosa, D. M., Baumhauer, J. F., & Vacek, P. M. (2001). Ankle ligament injury risk factors: A prospective study of college athletes. *Journal of Orthopaedic Research, 19*(2), 213-220.

Bianco, T., Malo, S., & Orlick, T. (1999). Sport injury and illness: Elite skiers describe their experiences. *Research Quarterly for Exercise and Sport, 70*(2), 157-169.

Bishop, S. R. (2002). What do we really know about mindfulness-based stress reduction? *Psychosomatic Medicine, 64*(1), 71-83.

Bohlmeijer, E., ten Klooster, P. M., Fledderus, M., Veehof, M., & Baer, R. (2011). Psychometric properties of the five facet mindfulness questionnaire in depressed adults and development of a short form.*Assessment, 18*(3), 308-320.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101.

Brewer, B. W. (2010). The role of psychological factors in sport injury rehabilitation outcomes. *International Review of Sport and Exercise Psychology, 3*(1), 40-61.

Brewer, B. W., & Redmond, C. (2016). *Psychology of sport injury* Human Kinetics.

Brewer, B. W., Van Raalte, J. L., & Linder, D. E. (1991). Role of the sport psychologist in treating injured athletes: A survey of sports medicine providers. *Journal of Applied Sport Psychology, 3*(2), 183-190.

Brewer, B., Andersen, M., & Van Raalte, J. (2002). Psychological aspects of sport injury rehabilitation: Toward a biopsychosocial approach. *Medical and Psychological Aspects of Sport and Exercise, ,* 41-54.

Brockman, R., Ciarrochi, J., Parker, P., & Kashdan, T. (2017). Emotion regulation strategies in daily life: Mindfulness, cognitive reappraisal and emotion suppression. *Cognitive Behaviour Therapy, 46*(2), 91-113.

Broom, J. P., & Williams, J. (1996). Occupational stress and neurological rehabilitation physiotherapists. *Physiotherapy, 82*(11), 606606-614614.

Brown, C. A., & Jones, A. K. (2010). Meditation experience predicts less negative appraisal of pain: Electrophysiological evidence for the involvement of anticipatory neural responses. *Pain, 150*(3), 428-438.

Brown, C. A., & Jones, A. K. (2013). Psychobiological correlates of improved mental health in patients with musculoskeletal pain after a mindfulness-based pain management program. *The Clinical Journal of Pain, 29*(3), 233-244. doi:10.1097/AJP.0b013e31824c5d9f [doi]

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*(4), 822.

Burger, J. M., & Caldwell, D. F. (2000). Personality, social activities, job-search behavior and interview success: Distinguishing between PANAS trait positive affect and NEO extraversion. *Motivation and Emotion, 24*(1), 51-62.

Caldwell, K., Harrison, M., Adams, M., Quin, R. H., & Greeson, J. (2010). Developing mindfulness in college students through movement-based courses: Effects on self-regulatory self-efficacy, mood, stress, and sleep quality. *Journal of American College Health, 58*(5), 433-442.

Calvert, T. (2015). "Psychology in injury prevention and rehabilitation", in *Sports injury prevention and rehabilitation,* ed. Joyce, D., & Lewindon, D. (Routledge), 22-30.

Campbell, T. S., Labelle, L. E., Bacon, S. L., Faris, P., & Carlson, L. E. (2012). Impact of mindfulness-based stress reduction (MBSR) on attention, rumination and resting blood pressure in women with cancer: A waitlist-controlled study. *Journal of Behavioral Medicine, 35*(3), 262-271.

Carlson, L. E., Ursuliak, Z., Goodey, E., Angen, M., & Speca, M. (2001). The effects of a mindfulness meditation-based stress reduction program on mood and symptoms of stress in cancer outpatients: 6-month follow-up. *Supportive Care in Cancer, 9*(2), 112-123.

Carmody, J., & Baer, R. A. (2008). Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress reduction program. *Journal of Behavioral Medicine, 31*(1), 23-33.

Cassidy, E. L., Atherton, R. J., Robertson, N., Walsh, D. A., & Gillett, R. (2012). Mindfulness, functioning and catastrophizing after multidisciplinary pain management for chronic low back pain. *Pain, 153*(3), 644-650.

Chambers, R., Lo, B. C. Y., & Allen, N. B. (2008). The impact of intensive mindfulness training on attentional control, cognitive style, and affect. *Cognitive Therapy and Research, 32*(3), 303-322.

Chen, Y., Yang, H., Liu, L., & Fang, R. (2017). Effects of mindfulness-based stress reduction on the anxiety, depression and quality of life of patients with intrauterine adhesion: A randomized controlled trial.*International Journal of Clinical and Experimental Medicine, 10*(2), 2296-2305.

Cherkin, D. C., Anderson, M. L., Sherman, K. J., Balderson, B. H., Cook, A. J., Hansen, K. E., et al. (2017). Two-year follow-up of a randomized clinical trial of mindfulness-based stress reduction vs cognitive behavioral therapy or usual care for chronic low back pain. *Jama, 317*(6), 642-644.

Chiesa, A., & Serretti, A. (2011). Mindfulness-based interventions for chronic pain: A systematic review of the evidence. *The Journal of Alternative and Complementary Medicine, 17*(1), 83-93.

Cohen, S., & Williamson, G. (1988). Perceived stress in a probability sample of the united states. the social psychology of health: Claremont symposium on applied social psychology. edited by: Spacapan S, oskamp S. 1988.

Cohen-Katz, J., Wiley, S. D., Capuano, T., Baker, D. M., Kimmel, S., & Shapiro, S. (2005). The effects of mindfulness-based stress reduction on nurse stress and burnout, part II: A quantitative and qualitative study. *Holistic Nursing Practice, 19*(1), 26-35.

Condon, P., Desbordes, G., Miller, W. B., & DeSteno, D. (2013). Meditation increases compassionate responses to suffering. *Psychological Science, 24*(10), 2125-2127.

Crawford, J. R., Garthwaite, P. H., Lawrie, C. J., Henry, J. D., MacDonald, M. A., Sutherland, J., et al. (2009). A convenient method of obtaining percentile norms and accompanying interval estimates for self-report mood scales (DASS, DASS-21, HADS, PANAS, and sAD). *British Journal of Clinical Psychology, 48*(2), 163-180.

Crossman, J. (1997). Psychological rehabilitation from sports injuries. *Sports Medicine, 23*(5), 333-339.

Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S. F., et al. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine, 65*(4), 564-570.

Dawes, H., & Roach, N. K. (1997). Emotional responses of athletes to injury and treatment. *Physiotherapy, 83*(5), 243-247.

de Boer, M. J., Steinhagen, H. E., Versteegen, G. J., Struys, M. M., & Sanderman, R. (2014). Mindfulness, acceptance and catastrophizing in chronic pain. *PLoS One, 9*(1), e87445.

Dobkin, P. L., & Hassed, C. S. (2016). Steps for starting and sustaining programs. *Mindful medical practitioners* (pp. 65-74) Springer.

Donohoe, E., Nawawi, A., Wilker, L., Schindler, T., & Jette, D. U. (1993). Factors associated with burnout of physical therapists in massachusetts rehabilitation hospitals. *Physical Therapy, 73*(11), 750-756.

Ergas, O. (2014). Mindfulness in education at the intersection of science, religion, and healing. *Critical Studies in Education, 55*(1), 58-72.

Erogul, M., Singer, G., McIntyre, T., & Stefanov, D. G. (2014). Abridged mindfulness intervention to support wellness in first-year medical students. *Teaching and Learning in Medicine, 26*(4), 350-356.

Fischer, M., Mitsche, M., Endler, P., Mesenholl-Strehler, E., Lothaller, H., & Jorgensen Jorgensen, R. (2013). Burnout in physiotherapists: Use of clinical supervision and desire for emotional closeness or distance to clients.*International Journal of Therapy & Rehabilitation, 20*(11)

Fitzpatrick, L., Simpson, J., & Smith, A. (2010). A qualitative analysis of mindfulness-based cognitive therapy (MBCT) in parkinson's disease. *Psychology and Psychotherapy: Theory, Research and Practice, 83*(2), 179-192.

Ford, I. W., & Gordon, S. (1997). Perspectives of sport physiotherapists on the frequency and significance of psychological factors in professional practice: Implications for

curriculum design in professional training. *Australian Journal of Science and Medicine in Sport, 29*(2), 34-40.

Ford, I. W., & Gordon, S. (1998). Perspectives of sport trainers and athletic therapists on the psychological content of their practice and training. *Journal of Sport Rehabilitation, 7*(2), 79-94.

Ford, I. W., Eklund, R. C., & Gordon, S. (2000). An examination of psychosocial variables moderating the relationship between life stress and injury time-loss among athletes of a high standard. *Journal of Sports Sciences, 18*(5), 301-312.

Ford, I., & Gordon, S. (1993). Social support and athletic injury: The perspective of sport physiotherapists. *Australian Journal of Science and Medicine in Sport, 25*, 17-17.

Francis, S. R., Andersen, M. B., & Maley, P. (2000). Physiotherapists' and male professional athletes' views on psychological skills for rehabilitation. *Journal of Science and Medicine in Sport, 3*(1), 17-29.

Gale, N. K., Heath, G., Cameron, E., Rashid, S., & Redwood, S. (2013). Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Medical Research Methodology, 13*(1), 117.

Gethin, R. (2011). On some definitions of mindfulness. *Contemporary Buddhism, 12*(01), 263-279.

Gh, M. E., Alilou, A., Fereydounnia, S., & Zaki, Z. (2009). Factors associated with burnout syndrome in physiotherapy staff: A questionnaire study.

Gilbert, D., & Waltz, J. (2010). Mindfulness and health behaviors. *Mindfulness, 1*(4), 227-234.

Gold, E., Smith, A., Hopper, I., Herne, D., Tansey, G., & Hulland, C. (2010). Mindfulness-based stress reduction (MBSR) for primary school teachers. *Journal of Child and Family Studies, 19*(2), 184-189.

Goldin, P. R., & Gross, J. J. (2010). Effects of mindfulness-based stress reduction (MBSR) on emotion regulation in social anxiety disorder. *Emotion, 10*(1), 83.

Goldstein, J. (2017). *The experience of insight: A simple and direct guide to buddhist meditation* Shambhala Publications.

Goodman, F. R., Kashdan, T. B., Mallard, T. T., & Schumann, M. (2014). A brief mindfulness and yoga intervention with an entire NCAA division I athletic team: An initial investigation. *Psychology of Consciousness: Theory, Research, and Practice, 1*(4), 339.

Goodman, M. J., & Schorling, J. B. (2012). A mindfulness course decreases burnout and improves well-being among healthcare providers. *The International Journal of Psychiatry in Medicine, 43*(2), 119-128.

Gordon, A. D. D., Grove, J. R., & Milios, D. (1990). *Psychological aspects of the recovery process from sport injury: The perspective of sports physiotherapists* Australian Sports Commission, National Sports Research Centre.

Greeson, J. M., Smoski, M. J., Suarez, E. C., Brantley, J. G., Ekblad, A. G., Lynch, T. R., et al. (2015). Decreased symptoms of depression after mindfulness-based stress reduction: Potential moderating effects of religiosity, spirituality, trait mindfulness, sex, and age. *The Journal of Alternative and Complementary Medicine, 21*(3), 166-174.

Gross, M., Moore, Z. E., Gardner, F. L., Wolanin, A. T., Pess, R., & Marks, D. R. (2016). An empirical examination comparing the mindfulness-acceptance-commitment approach and psychological skills training for the mental health and sport performance of female student athletes. *International Journal of Sport and Exercise Psychology, ,* 1-21.

Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of Psychosomatic Research, 57*(1), 35-43.

Gupta, S., Paterson, M. L., Lysaght, R. M., & Von Zweck, C. M. (2012). Experiences of burnout and coping strategies utilized by occupational therapists. *Canadian Journal of Occupational Therapy, 79*(2), 86-95.

Hamson-Utley, J. J., Martin, S., & Walters, J. (2008). Athletic trainers' and physical therapists' perceptions of the effectiveness of psychological skills within sport injury rehabilitation programs. *Journal of Athletic Training, 43*(3), 258-264.

Hardison, M. E., & Roll, S. C. (2016). Mindfulness interventions in physical rehabilitation: A scoping review. *American Journal of Occupational Therapy, 70*(3), 7003290030p1-7003290030p9.

Hawkins, R. D., & Fuller, C. W. (1999). A prospective epidemiological study of injuries in four english professional football clubs. *British Journal of Sports Medicine, 33*(3), 196-203.

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change.* Guilford Press.

Heaney, C. (2006). Physiotherapists' perceptions of sport psychology intervention in professional soccer. *International Journal of Sport and Exercise Psychology, 4*(1), 73-86.

Heaney, C. A., Rostron, C. L., Walker, N. C., & Green, A. J. (2017). Is there a link between previous exposure to sport injury psychology education and UK sport injury rehabilitation professionals' attitudes and behaviour towards sport psychology? *Physical Therapy in Sport, 23*, 99-104.

Heaney, C. A., Walker, N. C., Green, A. J., & Rostron, C. L. (2017). The impact of a sport psychology education intervention on physiotherapists. *European Journal of Physiotherapy, 19*(2), 97-103.

Hemmings, B., & Povey, L. (2002). Views of chartered physiotherapists on the psychological content of their practice: A preliminary study in the united kingdom. *British Journal of Sports Medicine, 36*(1), 61-64.

Hempel, S., Taylor, SL., Marshall, NJ., Miake-Lye, IM., Beroes, J M., Shanman, R., Solloway, MR., & Shekelle, PG.(2014). Evidence Map of Mindfulness: VA-ESP Project #05226.https://www.hsrd.research.va.gov/publications/management_briefs/default.cfm?ManagementBriefsMenu=eBrief-no88.

Herring, S. A. (2006). Clinical Colloquium–Outcomes from the team physician consensus Conference–Psychological issues in athletes and the team physician. *Medicine & Science in Sports & Exercise, 38*(5), 80.

Higgs, Kathryn Refshauge, Elizabeth Ellis, Joy. (2001). Portrait of the physiotherapy profession. *Journal of Interprofessional Care, 15*(1), 79-89.

Hill, R. J., McKernan, L. C., Wang, L., & Coronado, R. A. (2017). Changes in psychosocial well-being after mindfulness-based stress reduction: A prospective cohort study. *Journal of Manual & Manipulative Therapy*,1-9.

Hoffman, C. J., Ersser, S. J., Hopkinson, J. B., Nicholls, P. G., Harrington, J. E., & Thomas, P. W. (2012). Effectiveness of mindfulness-based stress reduction in mood, breast-and endocrine-related quality of life, and well-being in stage 0 to III breast cancer: A randomized, controlled trial. *Journal of Clinical Oncology, 30*(12), 1335-1342.

Hoge, E. A., Guidos, B. M., Mete, M., Bui, E., Pollack, M. H., Simon, N. M., et al. (2017). Effects of mindfulness meditation on occupational functioning and health care utilization in individuals with anxiety. *Journal of Psychosomatic Research, 95*, 7-11.

Hölzel, B. K., Carmody, J., Vangel, M., Congleton, C., Yerramsetti, S. M., Gard, T., et al. (2011). Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Research: Neuroimaging, 191*(1), 36-43.

http://www.csp.org.uk/professional-union/union-support/health-safety/occupational-stress.

Hülsheger, U. R., Alberts, H. J., Feinholdt, A., & Lang, J. W. (2013). Benefits of mindfulness at work: The role of mindfulness in emotion regulation, emotional exhaustion, and job satisfaction. *Journal of Applied Psychology, 98*(2), 310.

Hwang, J. Y., Plante, T., & Lackey, K. (2008). The development of the santa clara brief compassion scale: An abbreviation of sprecher and Fehr's compassionate love scale. *Pastoral Psychology, 56*(4), 421-428.

Ivarsson, A. (2015). *Psychology of Sport Injury: Prediction, Prevention and Rehabilitation in Swedish Team Spo*Highlighted Highlighted *rt Athletes,*

Ivarsson, A., Johnson, U., & Rees, L. (2013). Psychological predictors of injury occurrence: A prospective investigation of professional swedish soccer players. *Journal of Sport Rehabilitation, 22*(1), 19-26.

Ivtzan, I., Young, T., Martman, J., Jeffrey, A., Lomas, T., Hart, R., et al. (2016). Integrating mindfulness into positive psychology: A randomised controlled trial of an online positive mindfulness program. *Mindfulness, 7*(6), 1396-1407.

Jain, S., Shapiro, S. L., Swanick, S., Roesch, S. C., Mills, P. J., Bell, I., et al. (2007). A randomized controlled trial of mindfulness meditation versus relaxation training: Effects on distress, positive states of mind, rumination, and distraction. *Annals of Behavioral Medicine, 33*(1), 11-21.

Jekauc, D., Kittler, C., & Schlagheck, M. (2017). Effectiveness of a mindfulness-based intervention for athletes. *Psychology, 8,* 1-13.

Jevon, S. M., & Johnston, L. H. (2003). The perceived knowledge and attitudes of governing body chartered physiotherapists towards the psychological aspects of rehabilitation. *Physical Therapy in Sport, 4*(2), 74-81.

Johnson, C. (2005). Measuring pain. visual analog scale versus numeric pain scale: What is the difference? *Journal of Chiropractic Medicine, 4*(1), 43-44.

Jorgensen, P. (2000). Concepts of body and health in physiotherapy: The meaning of the social/cultural aspects of life. *Physiotherapy Theory and Practice, 16*(2), 105-115.

Josefsson, T., Ivarsson, A., Lindwall, M., Gustafsson, H., Stenling, A., Böröy, J., et al. (2017). Mindfulness mechanisms in sports: Mediating effects of rumination and emotion regulation on sport-specific coping. *Mindfulness,* , 1-10.

Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry, 4*(1), 33-47.

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice, 10*(2), 144-156.

Kabat-Zinn, J. (2005). *Coming to our senses: Healing ourselves and the world through mindfulness* Hachette UK.

Kabat-Zinn, J. (2009). *Wherever you go, there you are: Mindfulness meditation in everyday life* Hachette UK.

Kabat-Zinn, J. (2013). *Full catastrophe living, revised edition: How to cope with stress, pain and illness using mindfulness meditation* Hachette UK.

Kabat-Zinn, J. (2017). Too early to tell: The potential impact and Challenges—Ethical and Otherwise—Inherent in the mainstreaming of dharma in an increasingly dystopian world. *Mindfulness, 8*(5), 1125-1135.

Kabat-Zinn, J. (2018). *Meditation is not what you think*: *Mindfulness and why it is important* Hachette UK.

Kabat-Zinn, J., Lipworth, L., & Burney, R. (1985). The clinical use of mindfulness meditation for the self-regulation of chronic pain. *Journal of Behavioral Medicine, 8*(2), 163-190.

Kabat-Zinn, J., Lipworth, L., Burney, R., & Sellers, W. (1987). Four-year follow-up of a meditation-based program for the self-regulation of chronic pain: Treatment outcomes and compliance. *The Clinical Journal of Pain, 3*(1), 60.

Kaufman, K. A., Glass, C. R., & Arnkoff, D. B. (2009). Evaluation of mindful sport performance enhancement (MSPE): A new approach to promote flow in athletes. *Journal of Clinical Sport Psychology, 3*(4), 334-356.

Keilani, M., Hasenöhrl, T., Gartner, I., Krall, C., Fürnhammer, J., Cenik, F., et al. (2016). Use of mental techniques for competition and recovery in professional athletes. *Wiener Klinische Wochenschrift, 128*(9-10), 315-319.

Kemper, K. J., & Khirallah, M. (2015). Acute effects of online mind–body skills training on resilience, mindfulness, and empathy. *Journal of Evidence-Based Complementary & Alternative Medicine, 20*(4), 247-253.

Keng, S., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: A review of empirical studies. *Clinical Psychology Review, 31*(6), 1041-1056.

Kingston, J., Chadwick, P., Meron, D., & Skinner, T. C. (2007). A pilot randomized control trial investigating the effect of mindfulness practice on pain tolerance, psychological well-being, and physiological activity. *Journal of Psychosomatic Research, 62*(3), 297-300.

Klappa, S. G., Fulton, L. E., Cerier, L., Peña, A., Sibenaller, A., & Klappa, S. P. (2015). Compassion fatigue among physiotherapist and physical therapists around the world. *Health Education, 3*(5), 124-137.

Klatt, M. D., Buckworth, J., & Malarkey, W. B. (2009). Effects of low-dose mindfulness-based stress reduction (MBSR-ld) on working adults. *Health Education & Behavior, 36*(3), 601-614.

Kornfield, J. (2005). *Meditation for beginners: Six guided meditations for insight, inner clarity, and cultivating a compassionate heart* Random House.

Krasner, M. (2004). Mindfulness-based interventions: A coming of age? *Families, Systems & Health, 22*(2), 207-213.

Krusche, A., Cyhlarova, E., King, S., & Williams, J. M. (2012). Mindfulness online: A preliminary evaluation of the feasibility of a web-based mindfulness course and the impact on stress. *BMJ Open, 2*(3), 10.1136/bmjopen-2011-000803. Print 2012. doi:10.1136/bmjopen-2011-000803 [doi]

Krzeczkowski, J. E., Robb, S. A., & Good, D. E. (2017). Trait mindfulness is associated with lower post-injury psychological symptoms following a mild head injury. *Mindfulness,* , 1-9.

Kuyken, W., Watkins, E., Holden, E., White, K., Taylor, R. S., Byford, S., et al. (2010). How does mindfulness-based cognitive therapy work? *Behaviour Research and Therapy, 48*(11), 1105-1112.

La Forge, R. (2005). Aligning mind and body: Exploring the disciplines of mindful exercise. *ACSM's Health & Fitness Journal, 9*(5), 7-14.

Landsman-Dijkstra, J. J., van Wijck, R., & Groothoff, J. W. (2006). The long-term lasting effectiveness on self-efficacy, attribution style, expression of emotions and quality of life of a body awareness program for chronic a-specific psychosomatic symptoms. *Patient Education and Counseling, 60*(1), 66-79. doi:S0738-3991(04)00407-0 [pii]

Lane, J. D., Seskevich, J. E., & Pieper, C. F. (2007). Brief meditation training can improve perceived stress and negative mood. *Alternative Therapies in Health and Medicine, 13*(1), 38.

Larson, G. A., Starkey, C., & Zaichkowsky, L. D. (1996). Psychological aspects of athletic injuries as perceived by athletic trainers. *The Sport Psychologist, 10*(1), 37-47.

Lee, A., Harvey, W., Price, L., Morgan, L., Morgan, N., & Wang, C. (2017). Mindfulness is associated with psychological health and moderates pain in knee osteoarthritis. *Osteoarthritis and Cartilage, 25*(6), 824-831.

Leppanen, M., Aaltonen, S., Parkkari, J., Heinonen, A., & Kujala, U. M. (2014). Interventions to prevent sports related injuries: A systematic review and meta-analysis of randomised controlled trials. *Sports Medicine, 44*(4), 473-486.

Levoy, E., Lazaridou, A., Brewer, J., & Fulwiler, C. (2017). An exploratory study of mindfulness based stress reduction for emotional eating. *Appetite, 109*, 124-130.

Lindsay, R., Hanson, L., Taylor, M., & McBurney, H. (2008). Workplace stressors experienced by physiotherapists working in regional public hospitals. *Australian Journal of Rural Health, 16*(4), 194-200.

Little, J. C. (1969). The athlete's neurosis-a deprivation crisis. *Acta Psychiatrica Scandinavica, 45*(2), 187-197.

Liu, X., Wang, S., Chang, S., Chen, W., & Si, M. (2013). Effect of brief mindfulness intervention on tolerance and distress of pain induced by cold-pressor task. *Stress and Health, 29*(3), 199-204.

Loera, B., Converso, D., & Viotti, S. (2014). Evaluating the psychometric properties of the maslach burnout inventory-human services survey (MBI-HSS) among italian nurses: How many factors must a researcher consider? *PLoS One, 9*(12), e114987.

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the depression anxiety stress scales (DASS) with the beck depression and anxiety inventories. *Behaviour Research and Therapy, 33*(3), 335-343.

Lykins, E. L., & Baer, R. A. (2009). Psychological functioning in a sample of long-term practitioners of mindfulness meditation. *Journal of Cognitive Psychotherapy, 23*(3), 226-241.

Mackenzie, C. S., Poulin, P. A., & Seidman-Carlson, R. (2006). A brief mindfulness-based stress reduction intervention for nurses and nurse aides. *Applied Nursing Research, 19*(2), 105-109.

Mackenzie, M. J., Carlson, L. E., Munoz, M., & Speca, M. (2007). A qualitative study of self-perceived effects of mindfulness-based stress reduction (MBSR) in a psychosocial oncology setting. *Stress and Health, 23*(1), 59-69.

Maddison, R., & Prapavessis, H. (2005). A psychological approach to the prediction and prevention of athletic injury. *Journal of Sport and Exercise Psychology, 27*(3), 289-310.

Mahoney, J., & Hanrahan, S. J. (2011). A brief educational intervention using acceptance and commitment therapy: Four injured athletes' experiences. *Journal of Clinical Sport Psychology, 5*(3), 252-273.

Maloney, J. E., Lawlor, M. S., Schonert-Reichl, K. A., & Whitehead, J. (2016). A mindfulness-based social and emotional learning curriculum for school-aged children: The MindUP program. *Handbook of mindfulness in education* (pp. 313-334) Springer.

Markser, V. Z. (2011). Sport psychiatry and psychotherapy. mental strains and disorders in professional sports. challenge and answer to societal changes. *European Archives of Psychiatry and Clinical Neuroscience, 261*(2), 182.

Marlatt, G. A., & Donovan, D. M. (2005). *Relapse prevention: Maintenance strategies in the treatment of addictive behaviors* Guilford Press.

Maslach, C., & Jackson, S. (1996). Maslach burnout inventory-human services survey (MBBHSS). *C.Maslach, SE Jackson & MP Leiter, MBI Manual (3rd Ed.).Mountain View, CA: CPP,*

Maslach, C., Jackson, S. E., & Leiter, M. P. (2006). *Maslach burnout inventory* CPP.

McConville, J., McAleer, R., & Hahne, A. (2017). Mindfulness training for health profession Students—The effect of mindfulness training on psychological well-being, learning and clinical performance of health professional students: A systematic review of randomized and non-randomized controlled trials. *Explore: The Journal of Science and Healing, 13*(1), 26-45.

McNair, D. M. (1971). *Manual profile of mood states* Educational & Industrial testing service.

Mehling, W. E., Price, C., Daubenmier, J. J., Acree, M., Bartmess, E., & Stewart, A. (2012). The multidimensional assessment of interoceptive awareness (MAIA). *PloS One, 7*(11), e48230.

Mills, N., & Allen, J. (2000). Mindfulness of movement as a coping strategy in multiple sclerosis: A pilot study. *General Hospital Psychiatry, 22*(6), 425-431.

Minor, H. G., Carlson, L. E., Mackenzie, M. J., Zernicke, K., & Jones, L. (2006). Evaluation of a mindfulness-based stress reduction (MBSR) program for caregivers of children with chronic conditions. *Social Work in Health Care, 43*(1), 91-109.

Mitchell, L. A., MacDonald, R. A., & Brodie, E. E. (2004). Temperature and the cold pressor test. *The Journal of Pain, 5*(4), 233-237.

Moore, Z. E. (2009). Theoretical and empirical developments of the mindfulness-acceptance-commitment (MAC) approach to performance enhancement. *Journal of Clinical Sport Psychology, 3*(4), 291-302.

Morone, N. E., Greco, C. M., & Weiner, D. K. (2008). Mindfulness meditation for the treatment of chronic low back pain in older adults: A randomized controlled pilot study. *Pain, 134*(3), 310-319.

Morone, N. E., Lynch, C. S., Greco, C. M., Tindle, H. A., & Weiner, D. K. (2008). "I felt like a new person." the effects of mindfulness meditation on older adults with chronic pain: Qualitative narrative analysis of diary entries. *The Journal of Pain, 9*(9), 841-848.

Morone, N. E., Rollman, B. L., Moore, C. G., Li, Q., & Weiner, D. K. (2009). A mind–body program for older adults with chronic low back pain: Results of a pilot study. *Pain Medicine, 10*(8), 1395-1407.

Mrazek, M. D., Franklin, M. S., Phillips, D. T., Baird, B., & Schooler, J. W. (2013). Mindfulness training improves working memory capacity and GRE performance while reducing mind wandering. *Psychological Science, 24*(5), 776-781.

Murray, G., Leitan, N. D., Berk, M., Thomas, N., Michalak, E., Berk, L., et al. (2015). Online mindfulness-based intervention for late-stage bipolar disorder: Pilot evidence for feasibility and effectiveness. *Journal of Affective Disorders, 178*, 46-51.

Nathiya, N., Sasikumar, K., Jagannath, M., Thangaraj, M., & Adalarasu, K. (2017). An observational study on occupational stress among physiotherapists. *Biomedical and Pharmacology Journal, 10*(2), 889-894.

Neff, K. D., & Germer, C. K. (2013). A pilot study and randomized controlled trial of the mindful self-compassion program. *Journal of Clinical Psychology, 69*(1), 28-44.

Nehra, D. K., Nehra, S., & Dogra, R. (2012). Positive psychological functioning with mindfulness based stress reduction (MBSR) program. *Biopsychosocial Issues in Positive Health.Delhi: Global Vision Publishing House,*

Nejati, S., Esfahani, S. R., Rahmani, S., Afrookhteh, G., & Hoveida, S. (2016). The effect of group mindfulness-based stress reduction and consciousness yoga program on quality of life and fatigue severity in patients with MS. *Journal of Caring Sciences, 5*(4), 325.

Nicholl, J. P., Coleman, P., & Williams, B. T. (1995). The epidemiology of sports and exercise related injury in the United Kingdom. *British Journal of Sports Medicine, 29*(4), 232-238.

Nyklícek, I., & Kuijpers, K. F. (2008). Effects of mindfulness-based stress reduction intervention on psychological well-being and quality of life: Is increased mindfulness indeed the mechanism? *Annals of Behavioral Medicine, 35*(3), 331-340.

Ogiwara, S., & Hayashi, H. (2002). Burnout amongst physiotherapists in ishikawa prefecture. *Journal of Physical Therapy Science, 14*(1), 7-13.

Ott, M. J., Norris, R. L., & Bauer-Wu, S. M. (2006). Mindfulness meditation for oncology patients: A discussion and critical review. *Integrative Cancer Therapies, 5*(2), 98-108.

Pavlakis, A., Raftopoulos, V., & Theodorou, M. (2010). Burnout syndrome in cypriot physiotherapists: A national survey. *BMC Health Services Research, 10*(1), 63.

Pazit, L., Karen, H., Fraser, D., Pile, R., Clare, A., Moreira, B., et al. (2017). A novel web-support intervention to promote recovery following anterior cruciate ligament reconstruction: A pilot randomised controlled trial. *Physical Therapy in Sport,*

Pbert, L., Madison, J. M., Druker, S., Olendzki, N., Magner, R., Reed, G., et al. (2012). Effect of mindfulness training on asthma quality of life and lung function: A randomised controlled trial. *Thorax, 67*(9), 769-776. doi:10.1136/thoraxjnl-2011-200253 [doi]

Pen, Lorette J. and Craig A. Fisher. (1994). Athletes and Pain Tolerance. *Sports Medicine 18*, 496 *no.* 5 319-329. 497

Peterson, Lars, and Per AFH Renstrom. 2000. Sports injuries: Their Prevention and treatment 498 CRC Press.

Piko, B. F. (2006). Burnout, role conflict, job satisfaction and psychosocial health among hungarian health care staff: A questionnaire survey. *International Journal of Nursing Studies, 43*(3), 311-318.

Plante, T. G., & Mejia, J. (2016). Psychometric properties of the santa clara brief compassion scale. *Pastoral Psychology, 65*(4), 509-515.

Podlog, L., Heil, J., & Schulte, S. (2014). Psychosocial factors in sports injury rehabilitation and return to play. *Physical Medicine and Rehabilitation Clinics of North America, 25*(4), 915-930. doi:10.1016/j.pmr.2014.06.011 [doi]

Pollard, A., Burchell, J., Castle, D., Neilson, K., Ftanou, M., Corry, J., et al. (2017). Individualised mindfulness-based stress reduction for head and neck cancer patients undergoing radiotherapy of curative intent: A descriptive pilot study. *European Journal of Cancer Care, 26*(2)

Poon, S. K. (2016). Pacifica: Stressed or worried? an app to help yourself (mobile app user guide). *Br J Sports Med, 50*(3), 191-192.

Pradhan, E. K., Baumgarten, M., Langenberg, P., Handwerger, B., Gilpin, A. K., Magyari, T., et al. (2007). Effect of mindfulness-based stress reduction in rheumatoid arthritis patients. *Arthritis Care & Research, 57*(7), 1134-1142.

Pustułka-Piwnik, U., Ryn, Z. J., Krzywoszański, Ł., & Stożek, J. (2014). Burnout syndrome in physical therapists-demographic and organizational factors. *Medycyna Pracy, 65*(4), 453-462.

Putukian, M. (2016). The psychological response to injury in student athletes: A narrative review with a focus on mental health. *British Journal of Sports Medicine, 50*(3), 145-148. doi:10.1136/bjsports-2015-095586 [doi]

Radolph, P., Cadera, Y., & Tacone, A. (1999). The longterm combined effects of medical treatment and a mindfulness-based behavioural program for the multidisciplinary management of chronic pain in west texas. *Pain Digest, 9*, 103-112.

Rees, T., Mitchell, I., Evans, L., & Hardy, L. (2010). Stressors, social support and psychological responses to sport injury in high-and low-performance standard participants. *Psychology of Sport and Exercise, 11*(6), 505-512.

Reese, L. M. S., Pittsinger, R., & Yang, J. (2012). Effectiveness of psychological intervention following sport injury. *Journal of Sport and Health Science, 1*(2), 71-79.

Reibel, D. K., Greeson, J. M., Brainard, G. C., & Rosenzweig, S. (2001). Mindfulness-based stress reduction and health-related quality of life in a heterogeneous patient population. *General Hospital Psychiatry*, *23*(4), 183-192.

Reich, R. R., Lengacher, C. A., Alinat, C. B., Kip, K. E., Paterson, C., Ramesar, S., et al. (2017). Mindfulness-based stress reduction in post-treatment breast cancer patients: Immediate and sustained effects across multiple symptom clusters. *Journal of Pain and Symptom Management, 53*(1), 85-95.

Rosenzweig, S., Greeson, J. M., Reibel, D. K., Green, J. S., Jasser, S. A., & Beasley, D. (2010). Mindfulness-based stress reduction for chronic pain conditions: Variation in treatment outcomes and role of home meditation practice. *Journal of Psychosomatic Research, 68*(1), 29-36.

Ruddock-Hudson, M., O'Halloran, P., & Murphy, G. (2014). The psychological impact of long-term injury on australian football league players. *Journal of Applied Sport Psychology, 26*(4), 377-394.

Sáez De Heredia, Ramón Alzate, Muñoz, A. R., & Artaza, J. L. (2004). The effect of psychological response on recovery of sport injury. *Research in Sports Medicine, 12*(1), 15-31.

Saldaña, J. (2015). *The coding manual for qualitative researchers* Sage.

Sallon, S., Katz-Eisner, D., Yaffe, H., & Bdolah-Abram, T. (2017). Caring for the caregivers: Results of an extended, five-component stress-reduction intervention for hospital staff. *Behavioral Medicine, 43*(1), 47-60.

Santi, G., & Pietrantoni, L. (2013). Psychology of sport injury rehabilitation: A review of models and interventions. *Journal of Human Sport and Exercise, 8*(4)

Schenström, A., Rönnberg, S., & Bodlund, O. (2006). Mindfulness-based cognitive attitude training for primary care staff: A pilot study. *Complementary Health Practice Review, 11*(3), 144-152.

Schinke, R. J., Stambulova, N. B., Si, G., & Moore, Z. (2017). International society of sport psychology position stand: Athletes' mental health, performance, and development. *International Journal of Sport and Exercise Psychology,* , 1-18.

Schlenz, K. C., Guthrie, M. R., & Dudgeon, B. (1995). Burnout in occupational therapists and physical therapists working in head injury rehabilitation. *American Journal of Occupational Therapy, 49*(10), 986-993.

Schmukle, S. C., Egloff, B., & Burns, L. R. (2002). The relationship between positive and negative affect in the positive and negative affect schedule. *Journal of Research in Personality, 36*(5), 463-475.

Schneider, S., Seither, B., Tonges, S., & Schmitt, H. (2006). Sports injuries: Population based representative data on incidence, diagnosis, sequelae, and high risk groups. *British Journal of Sports Medicine, 40*(4), 334-9; discussion 339. doi:40/4/334 [pii]

Segal, Z. V., Teasdale, J. D., Williams, J. M., & Gemar, M. C. (2002). The mindfulness-based cognitive therapy adherence scale: Inter-rater reliability, adherence to protocol and treatment distinctiveness. *Clinical Psychology & Psychotherapy, 9*(2), 131-138.

Serpa, J. G., Taylor, S. L., & Tillisch, K. (2014). Mindfulness-based stress reduction (MBSR) reduces anxiety, depression, and suicidal ideation in veterans. *Medical Care, 52*(12 Suppl 5), S19-24. doi:10.1097/MLR.0000000000000202 [doi]

Shapiro, S. L., & Carlson, L. E. (2009). *The art and science of mindfulness: Integrating mindfulness into psychology and the helping professions.* American Psychological Association.

Shapiro, S. L., Astin, J. A., Bishop, S. R., & Cordova, M. (2005). Mindfulness-based stress reduction for health care professionals: Results from a randomized trial. *International Journal of Stress Management, 12*(2), 164.

Shapiro, S. L., Brown, K. W., & Biegel, G. M. (2007). Teaching self-care to caregivers: Effects of mindfulness-based stress reduction on the mental health of therapists in training. *Training and Education in Professional Psychology, 1*(2), 105.

Shapiro, S. L., Schwartz, G. E., & Bonner, G. (1998). Effects of mindfulness-based stress reduction on medical and premedical students. *Journal of Behavioral Medicine, 21*(6), 581-599.

Shonin, E., & Van Gordon, W. (2015). Managers' experiences of meditation awareness training. *Mindfulness, 6*(4), 899-909.

Shonin, E., Van Gordon, W., & Griffiths, M. D. (2014). Meditation awareness training (MAT) for improved psychological well-being: A qualitative examination of participant experiences. *Journal of Religion and Health, 53*(3), 849-863.

Short, V. L., Gannon, M., Weingarten, W., Kaltenbach, K., LaNoue, M., & Abatemarco, D. J. (2017). Reducing stress among mothers in drug treatment: A description of a mindfulness based parenting intervention. *Maternal and Child Health Journal, 21*(6), 1377-1386.

Siegel, D. J. (2008). *The mindful brain: The neurobiology of well-being* Sounds True.

Silverton, S. (2012). *The mindfulness breakthrough: The revolutionary approach to dealing with stress, anxiety and depression* Watkins Media Limited.

Śliwiński, Z., Starczyńska, M., Kotela, I., Kowalski, T., Kryś-Noszczyk, K., Lietz-Kijak, D., et al. (2014). Life satisfaction and risk of burnout among men and women working as physiotherapists. *International Journal of Occupational Medicine and Environmental Health, 27*(3), 400-412.

Smith, A. M., Scott, S. G., O'FALLON, W. M., & Young, M. L. (1990). Emotional responses of athletes to injury. Paper presented at the *Mayo Clinic Proceedings, 65.* (1) pp. 38-50.

Smith, J. A. (2011). Interpretative phenomenological analysis: Getting at lived experience. *The Journal of Positive Psychology, 12*(3), 303-304.

Sprecher, S., & Fehr, B. (2005). Compassionate love for close others and humanity. *Journal of Social and Personal Relationships, 22*(5), 629-651.

Stahl, B., & Goldstein, E. (2010). *A mindfulness-based stress reduction workbook* New Harbinger Publications.

Stamm, B. (2010). The concise manual for the professional quality of life scale.

Tang, Y., Tang, Y., Tang, R., & Lewis-Peacock, J. A. (2017). Brief mental training reorganizes large-scale brain networks. *Frontiers in Systems Neuroscience, 11*

Tashani, O., Burnett, D., & Phillips, G. (2017). The effect of brief mindfulness meditation on cold-pressor induced pain responses in healthy adults. *Pain Studies and Treatment, 5*, 11-19.

Tatsumi, T., & Takenouchi, T. (2014). Causal relationships between the psychological acceptance process of athletic injury and athletic rehabilitation behavior. *Journal of Physical Therapy Science, 26*(8), 1247-1257.

Terry, P. C., Lane, A. M., & Fogarty, G. J. (2003). Construct validity of the profile of mood States—Adolescents for use with adults. *Psychology of Sport and Exercise, 4*(2), 125-139.

Tracey, J. (2003). The emotional response to the injury and rehabilitation process. *Journal of Applied Sport Psychology, 15*(4), 279-293.

Tragea, P., Damigos, D., Mavreas, V., & Gouva, M. (2012). Burn out among greek physical therapists.

Tsur, N., Berkovitz, N., & Ginzburg, K. (2016). Body awareness, emotional clarity, and authentic behavior: The moderating role of mindfulness. *Journal of Happiness Studies, 17*(4), 1451-1472.

van Dijk, I., Lucassen, P. L. B. J., Akkermans, R. P., van Engelen, B. G. M., van Weel, C., & Speckens, A. E. M. (2017). Effects of mindfulness-based stress reduction on the mental health of clinical clerkship students: A cluster-randomized controlled trial. *Academic Medicine: Journal of the Association of American Medical Colleges, 92*(7), 1012-1021. doi:10.1097/ACM.0000000000001546 [doi]

Van Vliet, K. J., Foskett, A. J., Williams, J. L., Singhal, A., Dolcos, F., & Vohra, S. (2017). Impact of a mindfulness-based stress reduction program from the perspective of adolescents with serious mental health concerns. *Child and Adolescent Mental Health, 22*(1), 16-22.

Veehof, M. M., Oskam, M., Schreurs, K. M., & Bohlmeijer, E. T. (2011). Acceptance-based interventions for the treatment of chronic pain: A systematic review and meta-analysis. *Pain®, 152*(3), 533-542.

Venkatesh, S., Raju, T., Shivani, Y., Tompkins, G., & Meti, B. (1997). A study of structure of phenomenology of consciousness in meditative and non-meditative states. *Indian Journal of Physiology and Pharmacology, 41*, 149-153.

Vergeer, I. (2006). Exploring the mental representation of athletic injury: A longitudinal case study. *Psychology of Sport and Exercise, 7*(1), 99-114.

Wadey, R., Evans, L., Hanton, S., & Neil, R. (2012a). An examination of hardiness throughout the sport injury process. *British Journal of Health Psychology, 17*(1), 103-128.

Wadey, R., Evans, L., Hanton, S., & Neil, R. (2012b). An examination of hardiness throughout the sport-injury process: A qualitative follow-up study. *British Journal of Health Psychology, 17*(4), 872-893.

Walker, N., & Heaney, C (2013). Relaxation techniques in sport injury rehabilitation. In M. Arvinen-Barrow, & N. Walker: *The psychology of sport injury and rehabilitation* (pp. 86-99). Routledge.

Watson, D., & Pennebaker, J. W. (1989). Health complaints, stress, and distress: Exploring the central role of negative affectivity. *Psychological Review, 96*, 234.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063.

Watson, D., Clark, L. A., McIntyre, C. W., & Hamaker, S. (1992). Affect, personality, and social activity. *Journal of Personality and Social Psychology, 63*(6), 1011.

Weinstein, N., Brown, K. W., & Ryan, R. M. (2009). A multi-method examination of the effects of mindfulness on stress attribution, coping, and emotional well-being. *Journal of Research in Personality, 43*(3), 374-385.

Wiese-Bjornstal, D. M., Smith, A. M., Shaffer, S. M., & Morrey, M. A. (1998). An integrated model of response to sport injury: Psychological and sociological dynamics. *Journal of Applied Sport Psychology, 10*(1), 46-69.

Wirch, J. L., Wolfe, L. A., Weissgerber, T. L., & Davies, G. A. (2006). Cold pressor test protocol to evaluate cardiac autonomic function. *Applied Physiology, Nutrition, and Metabolism, 31*(3), 235-243.

World Health Organization. (2003). Investing in mental health.

Young, S. (2011). *Natural pain relief: How to soothe and dissolve physical pain with mindfulness* Sounds True.

Zeidan, F., Gordon, N. S., Merchant, J., & Goolkasian, P. (2010). The effects of brief mindfulness meditation training on experimentally induced pain. *The Journal of Pain, 11*(3), 199-209.

Zeidan, F., Johnson, S. K., Diamond, B. J., David, Z., & Goolkasian, P. (2010). Mindfulness meditation improves cognition: Evidence of brief mental training. *Consciousness and Cognition, 19*(2), 597-605.

Zernicke, K. A., Campbell, T. S., Speca, M., Ruff, K. M., Flowers, S., Tamagawa, R., et al. (2016). The eCALM trial: ETherapy for cancer applying mindfulness. exploratory analyses of the associations between online mindfulness-based cancer recovery participation and changes in mood, stress symptoms, mindfulness, posttraumatic growth, and spirituality. *Mindfulness*, *7*(5), 1071-1081.

Zhang, J., Zhou, Y., Feng, Z., Fan, Y., Zeng, G., & Wei, L. (2017). Randomized controlled trial of mindfulness-based stress reduction (MBSR) on posttraumatic growth of chinese breast cancer survivors. *Psychology, Health & Medicine*, *22*(1), 94-109.

# APPENDICES

# The First Study Published in Peer Reviewed Journals/Frontiers in Psychology:

frontiers in Psychology

ORIGINAL RESEARCH
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# Effect of Mindfulness Based Stress Reduction (MBSR) in Increasing Pain Tolerance and Improving the Mental Health of Injured Athletes

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Literature indicates that injured athletes face both physical and psychological distress after they have been injured. In this study, a Mindfulness Based Stress Reduction (MBSR) was utilised as an intervention for use during the period of recovery with injured athletes and, to the best of our knowledge, this is the first study using MBSR as an intervention for this purpose.

**Objective:** The aim of this research was to investigate the role of MBSR practise in reducing the perception of pain and decreasing anxiety/stress, as well as increasing pain tolerance and mindfulness. An additional aim was to increase positive mood and decrease negative mood in injured athletes.

**Methods:** The participants comprised of twenty athletes (male = 14; female = 6; age range = 21–36 years) who had severe injuries, preventing their participation in sport for more than 3 months. Prior to their injury, the participants had trained regularly with their University teams and participated in official university championships. Both groups followed their normal physiotherapy treatment, but in addition, the intervention group practised mindfulness meditation for 8 weeks (one 90-min session/week). A Cold Pressor Test (CPT) was used to assess pain tolerance. In contrast, the perception of pain was measured using a Visual Analogue Scale. Other measurements used were the Mindful Attention Awareness Scale (MAAS), Depression Anxiety and Stress Scale (DASS), and Profile of Mood States (POMS).

**Results:** Our results demonstrated an increase in pain tolerance for the intervention group and an increase in mindful awareness for injured athletes. Moreover, our findings observed a promising change in positive mood for both groups. Regarding the Stress/Anxiety scores, our findings showed a notable decrease across sessions; however, no significant changes were observed in other main and interaction effects in both groups.

**Conclusion:** Injured athletes can benefit from using mindfulness as part of the sport rehabilitation process to increase their pain tolerance and awareness. Further research is required to assess whether increasing pain tolerance could help in the therapeutic process.

**Keywords: injured athletes, mindfulness meditation, pain tolerance, stress, mental health**

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# The effect of mindfulness meditation on therapists' body-awareness and burnout in different forms of practice

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**RESEARCH PARTICIPANT EXCLUSION CRITERIA**

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If you have any queries please contact: Warhel (see above)

Title of Study: The effect of mindfulness meditation as a clinical intervention to reduce pain and psychological disorders for injured athletes

Subject ID: …… Date: / / Time:

Dear Participant,

Thank you for showing an interest in participating in the study. Please read the questions below carefully and answer honestly. Undertaking a pain pressure or cold pressor test with any of the below conditions can be dangerous – your safety is our priority. Consequently, you should not perform this test if you answer 'yes' to the below.

| **Do you have** | **Yes** | **No** | **Don't know** |
|---|---|---|---|
| History of any cardio-vascular disorder (e.g. angina, heart attack, high blood pressure etc. | ☐ | ☐ | ☐ |
| Type I or II diabetes | ☐ | ☐ | ☐ |
| Any bleeding disorders (e.g. haemophilia) | ☐ | ☐ | ☐ |
| History of fainting | ☐ | ☐ | ☐ |
| History of seizures | ☐ | ☐ | ☐ |
| Any recent cuts to the hand | ☐ | ☐ | ☐ |
| Reynaud's syndrome (condition which causes pain, discoloration, and cold/ numbness in hands when exposed to cold) | ☐ | ☐ | ☐ |
| Any other condition that you think may be a danger to you participating in a pain pressure or cold pressor test (e.g. injury, or anything not mentioned above) | ☐ | ☐ | ☐ |

**What if I have questions?** If you have questions about this research project, please contact the research investigator, Warhel A. Mohammed wamm2@kent.ac.uk

## Visual Analog Scale (VAS) for pain severity measurement.

Subject ID: _____

Gender: F / M DOB: ____ / ____ / ____ Date: ____ / ____ / ____ Time: ____: __

Condition: ___

**NOTES:** ----------
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-

**(VAS)**

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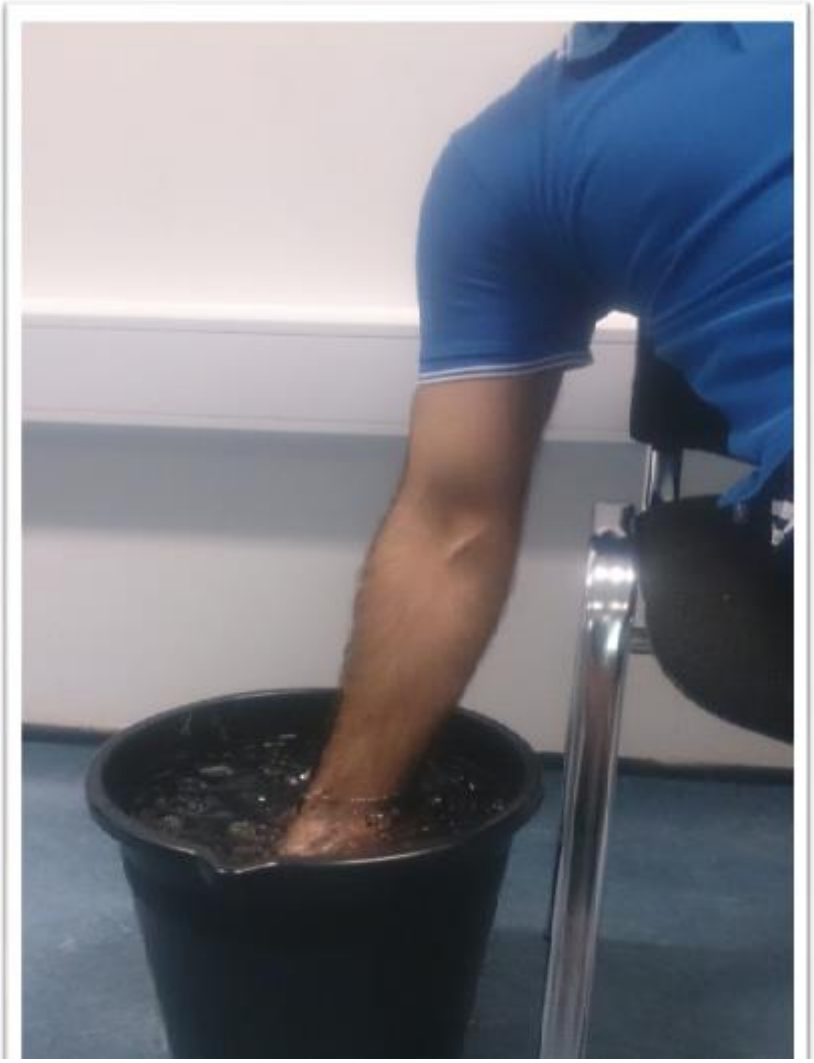
**No pain** **Most pain**

# Cold Pressor Test (CPT)



# Thermometer Measurement

# Mindful Attention Awareness Scale (MAAS)

Subject ID: _____

Description:

The MAAS is a 15-item scale designed to assess a core characteristic of dispositional mindfulness, namely, open or receptive awareness of and attention to what is taking place in the present. The scale shows strong psychometric properties and has been validated with college, community, and cancer patient samples. Correlational, quasi-experimental, and laboratory studies have shown that the MAAS taps a unique quality of consciousness that is related to, and predictive of, a variety of self-regulation and well-being constructs. The measure takes 10 minutes or less to complete.

## Day-to-Day Experiences

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be. Please treat each item separately from every other item.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Almost Always | Very Frequently | Somewhat Frequently | Somewhat Infrequently | Very Infrequently | Almost Never |

| | | | | | | |
|---|---|---|---|---|---|---|
| I could be experiencing some emotion and not be conscious of it until sometime later. | 1 | 2 | 3 | 4 | 5 | 6 |
| I break or spill things because of carelessness, not paying attention, or thinking of something else. | 1 | 2 | 3 | 4 | 5 | 6 |
| I find it difficult to stay focused on what's happening in the present. | 1 | 2 | 3 | 4 | 5 | 6 |

| | | | | | | |
|---|---|---|---|---|---|---|
| I tend to walk quickly to get where I'm going without paying attention to what I experience along the way. | 1 | 2 | 3 | 4 | 5 | 6 |
| I tend not to notice feelings of physical tension or discomfort until they really grab my attention. | 1 | 2 | 3 | 4 | 5 | 6 |
| I forget a person's name almost as soon as I've been told it for the first time. | 1 | 2 | 3 | 4 | 5 | 6 |
| It seems I am "running on automatic," without much awareness of what I'm doing. | 1 | 2 | 3 | 4 | 5 | 6 |
| I rush through activities without being really attentive to them. | 1 | 2 | 3 | 4 | 5 | 6 |
| I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there. | 1 | 2 | 3 | 4 | 5 | 6 |
| I do jobs or tasks automatically, without being aware of what I'm doing. | 1 | 2 | 3 | 4 | 5 | 6 |
| I find myself listening to someone with one ear, doing something else at the same time. | 1 | 2 | 3 | 4 | 5 | 6 |
| I drive places on "automatic pilot" and then wonder why I went there. | 1 | 2 | 3 | 4 | 5 | 6 |
| I find myself preoccupied with the future or the past. | 1 | 2 | 3 | 4 | 5 | 6 |
| I find myself doing things without paying attention. | 1 | 2 | 3 | 4 | 5 | 6 |
| I snack without being aware that I'm eating. | 1 | 2 | 3 | 4 | 5 | 6 |

## Scoring information:

To score the scale, simply compute a mean of the 15 items. Higher scores reflect higher levels of dispositional mindfulness.

# Depression Anxiety and Stress Scale

Subject ID: _____ Date:

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

*The rating scale is as follows:*

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time
(D= Depression, A= Anxiety S= Stress)

| | | | | | |
|---|---|---|---|---|---|
| S 1 | I found myself getting upset by quite trivial things | 0 | 1 | 2 | 3 |
| A 2 | I was aware of dryness of my mouth | 0 | 1 | 2 | 3 |
| D 3 | I couldn't seem to experience any positive feeling at all I experienced breathing difficulty (eg, excessively rapid. | 0 | 1 | 2 | 3 |
| A 4 | I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion). | 0 | 1 | 2 | 3 |
| D 5 | I just couldn't seem to get going | 0 | 1 | 2 | 3 |
| S 6 | I tended to over-react to situations | 0 | 1 | 2 | 3 |
| A 7 | I had a feeling of shakiness (eg, legs going to give way). | 0 | 1 | 2 | 3 |
| S 8 | I found it difficult to relax. | 0 | 1 | 2 | 3 |
| A 9 | I found myself in situations that made me so anxious I was most relieved when they ended. | 0 | 1 | 2 | 3 |
| D 10 | I felt that I had nothing to look forward to. | 0 | 1 | 2 | 3 |
| S 11 | I found myself getting upset rather easily. | 0 | 1 | 2 | 3 |
| S 12 | I felt that I was using a lot of nervous energy. | 0 | 1 | 2 | 3 |
| D 13 | I felt sad and depressed. | 0 | 1 | 2 | 3 |
| S 14 | I found myself getting impatient when I was delayed in any way (eg, lifts, traffic lights, being kept waiting). | 0 | 1 | 2 | 3 |
| A 15 | I had a feeling of faintness. | 0 | 1 | 2 | 3 |
| D 16 | I felt that I had lost interest in just about everything. | 0 | 1 | 2 | 3 |
| D 17 | I felt I wasn't worth much as a person. | 0 | 1 | 2 | 3 |
| S 18 | I felt that I was rather touchy. | 0 | 1 | 2 | 3 |
| A 19 | I perspired noticeably (eg, hands sweaty) in the absence of high temperatures or physical exertion. | 0 | 1 | 2 | 3 |
| A 20 | I felt scared without any good reason. | 0 | 1 | 2 | 3 |
| D 21 | I felt that life wasn't worthwhile. | 0 | 1 | 2 | 3 |
| S 22 | I found it hard to wind down. | 0 | 1 | 2 | 3 |

| | | | | | |
|---|---|---|---|---|---|
| A 23 | I had difficulty in swallowing. | 0 | 1 | 2 | 3 |
| D 24 | I couldn't seem to get any enjoyment out of the things I did I was aware of the action of my heart in the absence of. | 0 | 1 | 2 | 3 |
| A 25 | Physical exertion (eg, sense of heart rate increase, heart missing a beat). | 0 | 1 | 2 | 3 |
| D 26 | I felt down-hearted and blue. | 0 | 1 | 2 | 3 |
| S 27 | I found that I was very irritable. | 0 | 1 | 2 | 3 |
| A 28 | I felt I was close to panic. | 0 | 1 | 2 | 3 |
| S 29 | I found it hard to calm down after something upset me. | 0 | 1 | 2 | 3 |
| A 30 | I feared that I would be "thrown" by some trivial but unfamiliar task. | 0 | 1 | 2 | 3 |
| D 31 | I was unable to become enthusiastic about anything. | 0 | 1 | 2 | 3 |
| S 32 | I found it difficult to tolerate interruptions to what I was doing. | 0 | 1 | 2 | 3 |
| S 33 | I was in a state of nervous tension. | 0 | 1 | 2 | 3 |
| D 34 | I felt I was pretty worthless. | 0 | 1 | 2 | 3 |
| S 35 | I was intolerant of anything that kept me from getting on with what I was doing. | 0 | 1 | 2 | 3 |
| A 36 | I felt terrified. | 0 | 1 | 2 | 3 |
| D 37 | I could see nothing in the future to be hopeful about. | 0 | 1 | 2 | 3 |
| D 38 | I felt that life was meaningless. | 0 | 1 | 2 | 3 |
| S 39 | I found myself getting agitated. | 0 | 1 | 2 | 3 |
| A 40 | I was worried about situations in which I might panic and make a fool of myself. | 0 | 1 | 2 | 3 |
| A 41 | I experienced trembling (eg, in the hands). | 0 | 1 | 2 | 3 |
| D 42 | I found it difficult to work up the initiative to do things. | 0 | 1 | 2 | 3 |

# Manual for the Profile of Mood States

Subject ID: _____

Gender: F / M DOB: ____ / ____ / ____ Date: ____ / ____ / ____ Time: ____ : ____
Condition: ____

## PSYCHOLOGICAL QUESTIONNAIRES

General Instructions : These three questionnaires are concerned with your feelings and thoughts at the moment. Please answer **every** question, even if you find it difficult. Answer, as honestly as you can, what is true of **you**. Please do not choose a reply just because it seems like the 'right thing to say'. Your answers will be kept entirely confidential. Also, be sure to answer according to how you feel AT THE MOMENT. Don't just put down how you usually feel. You should try and work quite quickly: there is no need to think very hard about the answers. The first answer you think of is usually the best.

**NOTES:**

_____
_____
_____
_____

**MOOD**

Below is a list of words that describe feelings. Please read each one carefully. Then circle one of the following answers that best describes HOW YOU FEEL RIGHT NOW. Make sure you answer every question.

0 = not at all 1 = a little 2 = moderately 3 = quite a bit 4 = extremely

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | Panicky……..……... | 0 | 1 | 2 | 3 | 4 |
| 2. | Lively…….…….....….…….. | 0 | 1 | 2 | 3 | 4 |
| 3. | Confused…….…… | 0 | 1 | 2 | 3 | 4 |
| 4. | Worn out…….……. | 0 | 1 | 2 | 3 | 4 |
| 5. | Depressed…….…… …….. | 0 | 1 | 2 | 3 | 4 |
| 6. | Downhearted…….……... | 0 | 1 | 2 | 3 | 4 |
| 7. | Annoyed……..…….. | 0 | 1 | 2 | 3 | 4 |
| 8. | Exhausted…….…….…. | 0 | 1 | 2 | 3 | 4 |
| 9. | Mixed-up…….…… | 0 | 1 | 2 | 3 | 4 |
| 10. | Sleepy…….……. | 0 | 1 | 2 | 3 | 4 |
| 11. | Bitter…….……... | 0 | 1 | 2 | 3 | 4 |
| 12. | Unhappy…….……. | 0 | 1 | 2 | 3 | 4 |
| 13. | Anxious…….……0 | | 1 | 2 | 3 | 4 |
| 14. | Worried…….……0 | | 1 | 2 | 3 | 4 |
| 15. | Energetic…….…… | 0 | 1 | 2 | 3 | 4 |
| 16. | Miserable…….…… | 0 | 1 | 2 | 3 | 4 |
| 17. | Muddled…….…… | 0 | 1 | 2 | 3 | 4 |
| 18. | Nervous…….…… | 0 | 1 | 2 | 3 | 4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 19 | Angry……0 | 1 | 2 | 3 | 4 |
| 20. | Active……0 | 1 | 2 | 3 | 4 |
| 21. | Tired…… 0 | 1 | 2 | 3 | 4 |
| 22. | Bad tempered……0 | 1 | 2 | 3 | 4 |
| 23. | Alert…… 0 | 1 | 2 | 3 | 4 |
| 24. | Uncertain…… 0 | 1 | 2 | 3 | 4 |

# The Effect of Mindfulness Meditation as a Clinical Intervention to Reduce Pain and Psychological Disorders for Injured Athletes

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2: Sch of Psych, Uni of Kent, UK

## Introduction

Reese et al, (2012) and Heaney (2006), mentioned that when athletes become injured there are numerous negative psychological changes including mood, decreased self-esteem, loss of identity and isolation. As a result, sport injuries lead to worsening consequences in athletes' health. The aim of this research is to investigate the role of mindfulness meditation in assisting injured athletes in reducing the perception of pain and mood. Mindfulness can be defined as the awareness that emerges through paying attention in a particular way, on purpose, in the present and nonjudgmentally Zinn, (1994).

## Methods

Independent variables: Group (Mindfulness-based Stress Reduction [MBSR], control) and Time (pre, post). Dependent variables: pain perception (of the injury) and pain tolerance (time to remove the hand in the cold pressor test). Both groups followed their normal physiotherapy treatment, but in addition the MBSR group practiced meditation for 8 weeks (one 30 minute session/week). Each week additional measures were: Mindfulness Attention Awareness Scale-MAAS, Profile of Mood State-POMS, Depression, Anxiety and Stress scale-DASS.

## Results

Changes in mean pain perception scores showed no differences between the two groups ($p=0.242$), however, there was greater variability in pain perception scores after MBSR ($p=.01$). Pain tolerance showed a significant interaction between Group and Time with greater pain tolerance in the MBSR group after meditation ($F(1,12) = 12.453$, $p= 0.004$). MAAS scores increased over the 8 weeks and in addition increased after MBSR. POMS and DASS scores showed a decrease in all mood scores over the 8 weeks.

## Discussion

MBSR has two effects on pain. First, an increase in pain tolerance indicating either less sensitivity/habituation to pain. This supports previous research that indicates the self-regulation benefits of MBSR on pain management and well-being (Nehra et al. 2012; Lykins & Baer, 2009). Second, an increase in the variability of the perception of pain to their injury. This indicates that MBSR can increase as well as decrease pain perception. Further research is required to determine the cause and could support other research that finds limited evidence for effectiveness of Mindfulness-based interventions for patients with chronic pain (Bawa, 2015).

## References

Bawa FLM, Mercer SW, Bond CM. (2015). Br J Gen Pract 65.635, e387-e400.

Heaney C (2006). IJSEP, 4:1, 73-86.

Lykins, EL, Baer RA (2009). J Cog Psychotherapy, 23(3), 226-241.

Nehra DK, Nehra S, Dogra R (2012). Global Vision Publishing House.

Reese S, Pittsinger LMR, Yang J (2012). JSHS, 1(2), 71-79.

Zinn K (1994). Mindfulness Meditation in Everyday Life. Hyperion.

Contact

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# Multidimensional Assessment of Interoceptive Awareness (MAIA)

Subjects ID: ……..

Date: / /

Time:

Although the MAIA survey is copyrighted, it is available without charge and no written permission is required for its use. This assumes agreement with the following as a consequence of using a MAIA survey:

- Please refer to the survey using its complete name – Multidimensional Assessment of Interoceptive Awareness - and provide the appropriate citation.

- Modifications may be made without our written permission. However, please clearly identify any modifications in any publications as having been made by the users. If you modify the survey, please let us know for our records.

- We recommend including entire subscales when selecting items from the MAIA to retain the psychometric features of these subscales (rather than selecting items from subscales).

- If you translate the MAIA into another language, please send us a copy for our records.

- If other investigators are interested in obtaining the survey, please refer them to the source document (PLoS-ONE 2012, and www.osher.ucsf.edu/maia/) to assure they obtain the most recent version and scoring instructions.

Below you will find a list of statements. Please indicate how often each statement applies to you generally in daily life. Circle one number on each line

| | **0 Never** | **1** | **2** | **3** | **4** | **5 Always** |
|---|---|---|---|---|---|---|
| When I am tense I notice where the tension is located in my body. | | | | | | |
| I notice I am uncomfortable in my body. | | | | | | |
| I notice where in my body I am comfortable. | | | | | | |
| I notice changes in my breathing, such as whether it slows down or speeds up. | | | | | | |
| I do not notice (I ignore) physical tension or discomfort until they become more severe. | | | | | | |
| I distract myself from sensations of discomfort. | | | | | | |
| When I feel pain or discomfort, I try to power through it. | | | | | | |
| When I feel physical pain, I become upset. | | | | | | |
| I start to worry that something is wrong if I feel any discomfort. | | | | | | |
| I can notice an unpleasant body sensation without worrying about it. | | | | | | |
| I can pay attention to my breath without being distracted by things happening around me. | | | | | | |
| I can maintain awareness of my inner bodily sensations even when there is a lot going on around me. | | | | | | |
| When I am in conversation with someone, I can pay attention to my posture. | | | | | | |
| I can return awareness to my body if I am distracted. | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| I can refocus my attention from thinking to sensing my body. | | | | | | |
| I can maintain awareness of my whole body even when a part of me is in pain or discomfort. | | | | | | |
| I am able to consciously focus on my body as a whole. | | | | | | |
| I notice how my body changes when I am angry. | | | | | | |
| When something is wrong in my life I can feel it in my body. | | | | | | |
| I notice that my body feels different after a peaceful experience. | | | | | | |
| I notice that my breathing becomes free and easy when I feel comfortable. | | | | | | |
| I notice how my body changes when I feel happy / joyful. | | | | | | |
| When I feel overwhelmed I can find a calm place inside. | | | | | | |
| When I bring awareness to my body I feel a sense of calm. | | | | | | |
| I can use my breath to reduce tension. | | | | | | |
| When I am caught up in thoughts, I can calm my mind by focusing on my body/breathing. | | | | | | |
| I listen for information from my body about my emotional state. | | | | | | |
| When I am upset, I take time to explore how my body feels. | | | | | | |
| I listen to my body to inform me about what to do. | | | | | | |
| I am at home in my body. | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| I feel my body is a safe place | | | | | | |
| I trust my body sensations. | | | | | | |

Scoring Instructions:
Take the average of the items on each scale.

Note: Reverse-score items 5, 6, and 7 on Not-Distracting, and items 8 and 9 on Not-Worrying.
1. Noticing: Awareness of uncomfortable, comfortable, and neutral body sensations
Q1_____ + Q2_____ + Q3_____ + Q4_____ / 4 = _____

2. Not-Distracting: Tendency not to ignore or distract oneself from sensations of pain or discomfort
Q5(reverse)_____ + Q6(reverse)_____ + Q7(reverse)_____ / 3 = _____

3. Not-Worrying: Tendency not to worry or experience emotional distress with sensations of pain or discomfort
Q8(reverse)_____ + Q9(reverse)_____ + Q10_____ / 3 = _____

4. Attention Regulation: Ability to sustain and control attention to body sensations
Q11_____ + Q12_____ + Q13_____ + Q14_____ + Q15_____ + Q16_____ + Q17_____ / 7 = _____

5. Emotional Awareness: Awareness of the connection between body sensations and emotional states

Q18_____ + Q19_____ + Q20_____ + Q21_____ + Q22_____ / 5 = _____
6. Self-Regulation: Ability to regulate distress by attention to body sensations

Q23_____ + Q24_____ + Q25_____ + Q26_____ / 4= _____
7. Body Listening: Active listening to the body for insight

Q27_____ + Q28_____ + Q29_____ / 3= _____
8. Trusting: Experience of one's body as safe and trustworthy

Q30_____ + Q31_____ + Q32_____ / 3= _____

## Five Facet Mindfulness Questionnaire: Short Form (FFMQ-SF)

Below is a collection of statements about your everyday experience. Using the 1–5 scale below, please indicate; in the box to the right of each statement, how frequently or infrequently you have had each experience in the last month (or other agreed time period). Please answer according to what really reflects your experience rather than what you think your experience should be.

Subject ID: ……. Date: ……..

Time …….

1. Never or very rarely true
2. Not often true
3. Sometimes true and sometimes not true
4. Often true
5. Very often or always true

| | | | |
|---|---|---|---|
| 1 | I'm good at finding the words to describe my feelings | DS | |
| 2 | I can easily put my beliefs, opinions, and expectations into words | DS | |
| 3 | I watch my feelings without getting carried away by them | NR | |
| 4 | I tell myself that I shouldn't be feeling the way I'm feeling | /NJ | |
| 5 | it's hard for me to find the words to describe what I'm thinking | /DS | |
| 6 | I pay attention to physical experiences,<br>such as the wind in my hair or sun on my face | OB | |
| 7 | I make judgments about whether my thoughts are good or bad. | /NJ | |
| 8 | I find it difficult to stay focused on what's happening in the present moment | /AA | |
| 9 | when I have distressing thoughts or images,<br>I don't let myself be carried away by them | NR | |
| 10 | generally, I pay attention to sounds, such as clocks ticking, | OB | |

| | | | |
|---|---|---|---|
| | birds chirping, or cars passing | | |
| 11 | when I feel something in my body, it's hard<br>for me to find the right words to describe it | /DS | |
| 12 | it seems I am "running on automatic"<br>without much awareness of what I'm doing | /AA | |
| 13 | when I have distressing thoughts or images, I feel calm soon after | NR | |
| 14 | I tell myself I shouldn't be thinking the way I'm thinking | /NJ | |
| 15 | I notice the smells and aromas of things | OB | |
| 16 | even when I'm feeling terribly upset, I can find a way to put it into words | DS | |
| 17 | I rush through activities without being really attentive to them | /AA | |
| 18 | usually when I have distressing thoughts or<br>images I can just notice them without reacting | NR | |

| | | | |
|---|---|---|---|
| 19 | I think some of my emotions are bad<br>or inappropriate and I shouldn't feel them | /NJ | |
| 20 | I notice visual elements in art or nature, such as colors,<br>shapes, textures, or patterns of light and shadow | OB | |
| 21 | when I have distressing thoughts or<br>images, I just notice them and let them go | NR | |
| 22 | I do jobs or tasks automatically without being aware of what I'm doing | /AA | |
| 23 | I find myself doing things without paying attention | /AA | |
| 24 | I disapprove of myself when I have illogical ideas | /NJ | |

Scoring:

| (Note: R = reverse-scored item) Subscale Directions | Your Score TOTAL | Your score item Avg. |
|---|---|---|
| Observing: Sum items<br>1 + 6 + 11 + 15 + 20 + 26 + 31 + 36 | | |
| Describing: Sum items<br>2 + 7 + 12R + 16R + 22R + 27 + 32 + 37. | | |
| Acting with Awareness: Sum items<br>5R + 8R + 13R + 18R + 23R + 28R + 34R + 38R. | | |
| Non-judging of inner experience: Sum items 3R + 10R + 14R + 17R + 25R + 30R + 35R + 39R. | | |
| Non-reactivity to inner experience:<br>Sum items 4 + 9 + 19 + 21 + 24 + 29 + 33. | | |
| TOTAL FFMQ (add subscale scores | | |

## Burnout Self-Test Maslach Burnout Inventory (MBI)

The Maslach Burnout Inventory (MBI) is the most commonly used tool to self-assess whether you might be at risk of burnout. To determine the risk of burnout, the MBI explores three components: exhaustion, depersonalization and personal achievement. While this tool may be useful, it must not be used as a scientific diagnostic technique, regardless of the results. The objective is simply to make you aware that anyone may be at risk of burnout. (Thank you to the Association des médecins vétérinaires (AMVQ) en pratique des petits animaux for providing us with a copy of this tool).

For each question, indicate the score that corresponds to your response. Add up your score for each section and compare your results with the scoring results interpretation at the bottom of this document.

Subjects ID: ……  Date: / /  Time:

| Questions | Never | A few times per year | Once a month | A few times per month | Once a week | A few times per week | Every day |
|---|---|---|---|---|---|---|---|
| **SECTION A** | **0** | **1** | **2** | **3** | **4** | **5** | **6** |
| I feel emotionally drained by my work. | | | | | | | |
| Working with people all day long requires a great deal of effort. | | | | | | | |
| I feel like my work is breaking me down. | | | | | | | |
| I feel frustrated by my work. | | | | | | | |
| I feel I work too hard at my job. | | | | | | | |
| It stresses me too much to work in direct contact with people. | | | | | | | |
| I feel like I'm at the end of my rop | | | | | | | |
| **Total score – SECTION A** | | | | | | | |

| Questions | Never | A few times per year | Once a month | A few times per month | Once a week | A few times per week | Every day |
|---|---|---|---|---|---|---|---|
| **SECTION B** | **0** | **1** | **2** | **3** | **4** | **5** | **6** |
| I feel I look after certain patients/clients impersonally, as if they are objects. | | | | | | | |
| I feel tired when I get up in the morning and have to face another day at work. | | | | | | | |
| I have the impression that my patients/clients make me responsible for some of their problems. | | | | | | | |
| I am at the end of my patience at the end of my work day. | | | | | | | |
| I really don't care about what happens to some of my patients/clients. | | | | | | | |
| I have become more insensitive to people since I've been working. | | | | | | | |
| I'm afraid that this job is making me uncaring. | | | | | | | |
| **Total score – SECTION B** | | | | | | | |

| Questions | Never | A few times per year | Once a month | A few times per month | Once a week | A few times per week | Every day |
|---|---|---|---|---|---|---|---|
| **SECTION C** | **0** | **1** | **2** | **3** | **4** | **5** | **6** |
| I accomplish many worthwhile things in this job. | | | | | | | |
| I feel full of energy. | | | | | | | |
| I am easily able to understand what my patients/clients feel. | | | | | | | |
| I look after my patients'/clients' problems very effectively. | | | | | | | |
| In my work, I handle emotional problems very calmly. | | | | | | | |
| Through my work, I feel that I have a positive influence on people. | | | | | | | |
| I am easily able to create a relaxed atmosphere with my patients/clients. | | | | | | | |
| I feel refreshed when I have been close to my patients/clients at work. | | | | | | | |
| **Total score – SECTION C** | | | | | | | |

SCORING RESULTS – INTERPRETATION

Section A: Burnout

Burnout (or depressive anxiety syndrome): Testifies to fatigue at the very idea of work, chronic fatigue, trouble sleeping, physical problems. For the MBI, as well as for most authors, "exhaustion would be the key component of the syndrome." Unlike depression, the problems disappear outside work.

- Total 17 or less: Low-level burnout
- Total between 18 and 29 inclusive: Moderate burnout
- Total over 30: High-level burnout

Section B: Depersonalization

"Depersonalization" (or loss of empathy): Rather a "dehumanization" in interpersonal relations. The

notion of detachment is excessive, leading to cynicism with negative attitudes with regard to patients or colleagues, feeling of guilt, avoidance of social contacts and withdrawing into oneself. The professional blocks the empathy he can show to his patients and/or colleagues.

- Total 5 or less: Low-level burnout
- Total between 6 and 11 inclusive: Moderate burnout
- Total of 12 and greater: High-level burnout

Section C: Personal Achievement

The reduction of personal achievement: The individual assesses himself negatively, feels he is unable to move the situation forward. This component represents the demotivating effects of a difficult, repetitive situation leading to failure despite efforts. The person begins to doubt his genuine abilities to accomplish things. This aspect is a consequence of the first two.

- Total 33 or less: High-level burnout
- Total between 34 and 39 inclusive: Moderate burnout
- Total greater than 40: Low-level burnout

A high score in the first two sections and a low score in the last section may indicate burnout.

Note: Different people react to stress and burnout differently. This test is not intended to be a scientific analysis or assessment. The information is not designed to diagnose or treat your stress or symptoms of burnout. Consult your medical doctor, counselor or mental health professional if you feel that you need help regarding stress management or dealing with burnout.

## Perceived Stress Scale (PSS)

The Perceived Stress Scale (PSS) is the most widely used psychological instrument for measuring the perception of stress. It is a measure of the degree to which situations in one's life are appraised as stressful. Items were designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives. The scale also includes a number of direct queries about current levels of experienced stress. The PSS was designed for use in community samples with at least a junior high school education. The items are easy to understand, and the response alternatives are simple to grasp. Moreover, the questions are of a general nature and hence are relatively free of content specific to any subpopulation group. The questions in the PSS ask about feelings and thoughts during the last month. In each case, respondents are asked how often they felt a certain way.

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.

Subject ID: _____ Date: / /

Time:

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | In the last month, how often have you been upset because of something that happened unexpectedly? | 0 | 1 | 2 | 3 | 4 |
| 2. | In the last month, how often have you felt that you were unable to control the important things in your life? | 0 | 1 | 2 | 3 | 4 |
| 3. | In the last month, how often have you felt nervous and "stressed"? | 0 | 1 | 2 | 3 | 4 |
| 4. | In the last month, how often have you felt confident about your ability to handle your personal problems? | 0 | 1 | 2 | 3 | 4 |
| 5. | In the last month, how often have you felt that things were going your way? | 0 | 1 | 2 | 3 | 4 |
| 6. | In the last month, how often have you found that you could not cope with all the things that you had to do? | 0 | 1 | 2 | 3 | 4 |
| 7. | In the last month, how often have you been able to control irritations in your life? | 0 | 1 | 2 | 3 | 4 |
| 8. | In the last month, how often have you felt that you were on top of things?.. | 0 | 1 | 2 | 3 | 4 |
| 9. | In the last month, how often have you been angered because of things that were outside of your control? | 0 | 1 | 2 | 3 | 4 |
| 10. | In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? | 0 | 1 | 2 | 3 | 4 |

Scoring: PSS scores are obtained by reversing responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0) to the four positively stated items (items 4, 5, 7, & 8) and then summing across all scale items. A short 4 item scale can be made from questions 2, 4, 5 and 10 of the PSS 10 item scale.

## Santa Clara Brief Compassion Scale

The Santa Clare Brief Compassion Scale is a brief index that assesses compassion and its link to prosocial behaviors. An example from a 'compassion for humanity' item include “”When I hear about someone (a stranger) going through a difficult time, I feel a great deal of compassion for him or her.” Responses are given on a 7-point scale from “Not at all true for me” to “Very true for me.”

Subjects ID: ……..

Date: / /

Time:

Please answer the following questions honestly and quickly using the scale below:

1 2 3 4 5 6 7

Not at all true of me Very true of me

1. When I hear about someone (a stranger) going through a difficult time, I feel a great deal of compassion for him or her.
2. I tend to feel compassion for people, even though I do not know them.
3. One of the activities that provide me with the most meaning to my life is helping others in the world when they need help.
4. I would rather engage in actions that help others, even though they are strangers, than engage in actions that would help me.
5. I often have tender feelings toward people (strangers) when they seem to be in need.

## The Positive and Negative Affect Schedule (PANAS)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. Indicate to what extent you feel this way right now, that is, at the present moment or indicate the extent you have felt this way over the past week (circle the instructions you followed when taking this measure).

Subjects ID: …….

Date: / /

Time**:**

1 = Very Slightly or Not at All 2 = A Little 3 = Moderately 4 = Quite a Bit 5 = Extremely

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | Interested …….…… | 1 | 2 | 3 | 4 | 5 |
| 2. | Distressed …….…… | 1 | 2 | 3 | 4 | 5 |
| 3. | Excited …….…… | 1 | 2 | 3 | 4 | 5 |
| 4. | Upset …….…… | 1 | 2 | 3 | 4 | 5 |
| 5. | Strong …….…… | 1 | 2 | 3 | 4 | 5 |
| 6. | Guilty …….…….. | 1 | 2 | 3 | 4 | 5 |
| 7. | Scared …….…… | 1 | 2 | 3 | 4 | 5 |
| 8. | Hostile …….…… | 1 | 2 | 3 | 4 | 5 |
| 9. | Enthusiastic …….…… | 1 | 2 | 3 | 4 | 5 |
| 10. | Proud …….…….. | 1 | 2 | 3 | 4 | 5 |
| 11. | Irritable …….…… | 1 | 2 | 3 | 4 | 5 |
| 12. | Alert …….…….... | 1 | 2 | 3 | 4 | 5 |
| 13. | Ashamed …….…… | 1 | 2 | 3 | 4 | 5 |
| 14. | Inspired …….…… | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 15. | Nervous …….…… | 1 | 2 | 3 | 4 | 5 |
| 16. | Determined ……..…… | 1 | 2 | 3 | 4 | 5 |
| 17. | Attentive …… | 1 | 2 | 3 | 4 | 5 |
| 18. | Jittery …… | 1 | 2 | 3 | 4 | 5 |
| 19 | Active …… | 1 | 2 | 3 | 4 | 5 |
| 20. | Afraid ……... | 1 | 2 | 3 | 4 | 5 |

Scoring Instructions: Positive Affect Score: Add the scores on items 1, 3, 5, 9, 10, 12, 14, 16, 17, and 19. Scores can range from 10 – 50, with higher scores representing higher levels of positive affect. Mean Scores: Momentary 29.7 ( SD 7.9); Weekly 33.3 ( SD 7.2) Negative Affect Score: Add the scores on items 2, 4, 6, 7, 8, 11, 13, 15, 18, and 20. Scores can range from 10 – 50, with lower scores representing lower levels of negative affect. Mean Score: Momentary 14.8 ( SD 5.4); Weekly 17.4 ( SD 6.2).

# A Guide to the Depression, Anxiety and Stress Scale (DASS 21)

**Introduction**

The DASS 21 is a 21 item self-report questionnaire designed to measure the severity of a range of symptoms common to both Depression and Anxiety. In completing the DASS, the individual is required to indicate the presence of a symptom over the previous week. Each item is scored from 0 (did not apply to me at all over the last week) to 3 (applied to me very much or most of the time over the past week).

The essential function of the DASS is to assess the severity of the core symptoms of Depression, Anxiety and Stress. Accordingly, the DASS allows not only a way to measure the severity of a patient's symptoms but a means by which a patient's response to treatment can also be measured.

Subject ID: ……. Date: / /

Time:

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no rights or wrong answers. Do not spend too much time on any statement.

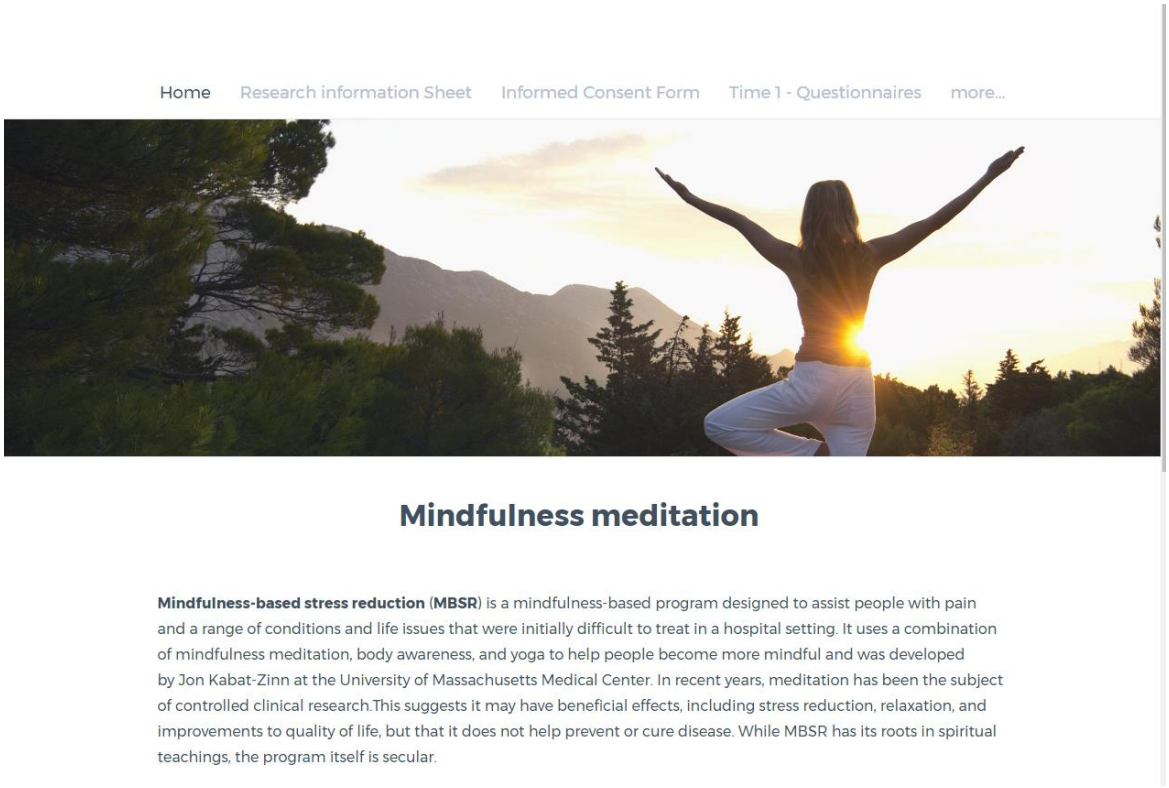
The rating scale is as follows:

0 Did not apply to me at all - NEVER
1 Applied to me to some degree, or some of the time - SOMETIMES
2 Applied to me to a considerable degree, or a good part of time - OFTEN
3 Applied to me very much, or most of the time - ALMOST ALWAYS
(D= Depression, A= Anxiety S= Stress)

| | | | | | |
|---|---|---|---|---|---|
| S 1 | I found myself getting upset by quite trivial things | 0 | 1 | 2 | 3 |
| A 2 | I was aware of dryness of my mouth | 0 | 1 | 2 | 3 |
| D 3 | I couldn't seem to experience any positive feeling at all I experienced breathing difficulty (eg, excessively rapid. | 0 | 1 | 2 | 3 |
| A 4 | I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion). | 0 | 1 | 2 | 3 |
| D 5 | I just couldn't seem to get going | 0 | 1 | 2 | 3 |
| S 6 | I tended to over-react to situations | 0 | 1 | 2 | 3 |
| A 7 | I had a feeling of shakiness (eg, legs going to give way). | 0 | 1 | 2 | 3 |
| S 8 | I found it difficult to relax. | 0 | 1 | 2 | 3 |
| A 9 | I found myself in situations that made me so anxious I was most relieved when they ended. | 0 | 1 | 2 | 3 |
| D 10 | I felt that I had nothing to look forward to. | 0 | 1 | 2 | 3 |
| S 11 | I found myself getting upset rather easily. | 0 | 1 | 2 | 3 |
| S 12 | I felt that I was using a lot of nervous energy. | 0 | 1 | 2 | 3 |
| D 13 | I felt sad and depressed. | 0 | 1 | 2 | 3 |
| S 14 | I found myself getting impatient when I was delayed in any way (eg, lifts, traffic lights, being kept waiting). | 0 | 1 | 2 | 3 |
| A 15 | I had a feeling of faintness. | 0 | 1 | 2 | 3 |
| D 16 | I felt that I had lost interest in just about everything. | 0 | 1 | 2 | 3 |
| D 17 | I felt I wasn't worth much as a person. | 0 | 1 | 2 | 3 |
| S 18 | I felt that I was rather touchy. | 0 | 1 | 2 | 3 |
| A 19 | I perspired noticeably (eg, hands sweaty) in the absence of high temperatures or physical exertion. | 0 | 1 | 2 | 3 |
| A 20 | I felt scared without any good reason. | 0 | 1 | 2 | 3 |
| D 21 | I felt that life wasn't worthwhile. | 0 | 1 | 2 | 3 |

# Website that has been used for Data Collection in the Second Study in this Thesis

(http://mindfullnessmeditationresearch.weebly.com)



# The Effect of Mindfulness Meditation on Therapists' Body-Awareness, and Personal Experiences in Different Forms of Practice

**This abstract has been presented at Mindfulness in Health & Higher Education Conference 16-17th June 2017, in the University of Warwick, Coventry, UK.**

We are inviting abstracts for oral and poster presentations for inclusion in this conference, which will address the teaching of mindfulness in Higher Education. Contributions from any discipline or professional group are welcomed. Abstracts may focus on research/ evaluation or reflect upon experiences.
Closing date: Friday 21st April

**PRESENTER'S DETAILS**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| | |
|---|---|
| **Authors:** | **Mr Warhel Asim Mohammed, Dr Sakis Pappous, Dr Dinkar Sharma, Mr Karthik Muthumayandi**<br>I would like to present this study through **Poster**. |
| **Title of Study:** | The Effect of Mindfulness Meditation on Therapists' Body-Awareness, and Personal Experiences in Different Forms of Practice |
| **Return to:**<br>**By** | MindConf2017@warwick.ac.uk<br>Friday 21st April |

**Setting (discipline, undergraduate/post graduate; course)**

Post graduate and graduate therapists.

**Approach (universal/selected; curricula/extra-curricular; facilitators; length of course; size of group; approach to mindfulness).**

The study lasted 8 weeks in total, in the first four weeks therapists did not participate in Mindfulness Meditation (MMP) at all and baseline measures were taken before and after four weeks. The second four weeks, MBSR was conducted with participants. In this study MMP was used with 2 different groups. The first group was the therapists, who trained in MMP face to face (FFG) with the primary researcher. Each week involved one session lasting 60 to 90 minutes. Further, each participant was given one CD from the MMP to listen to and practice at home for about 20 minutes per day. A part of therapists were practiced MMP via skype that was led by the primary researcher with the same duration. The second group were self-direct group (SDG) participants who applied the MMP by themselves, using a CD that was provided to them. The outcomes were collected via study website**.**

**What happened** (**results of research; evaluation reports, successes; challenges; drop outs; is the course on going**?)**.**

Our results showed that Attention Regulation, Self-Regulation and Trusting in Multidimensional Assessment of Interoceptive Awareness (MAIA) scale were significantly changed between groups for the FFG. As such, acting with awareness/ Five Facet Mindfulness Questionnaire (FFMQ), positive affect of Positive and Negative Affect Schedule (PANAS). Moreover, significant improvement were found in pre and post mediation scores for FFG for Burnout, Depersonalisation, Personal Achievement/ Burnout Self-Test (BST), emotional awareness/ MAIA, describing and non-reactivity/ FFMQ and Santa Clara Brief Compassion Scale SCBCS However, no changes were observed in The Depression, Anxiety and Stress Scale (DASS 21), PSS, and negative affect of PANAS.

**Reflection (what worked and why; what didn't work and why; what might be done differently?).**

To best of our knowledge, this is the first investigation that used MM with therapists to increase the body awareness and improving the mental health. In addition, technological tools such as websites, Skype and online surveys were used with participants as part of the methodology. Other different point in this study, it was possible for therapists to participants in any country in the world through Skype or Self direct groups.

## (Semi Structured Interview with Injured Athletes)

1. How do you feel after an eight weeks practice of Mindfulness Meditation Program?

Follow up questions:

Could you tell us more about your experience in participating in this programme?

2. Would you recommend the Mindfulness Meditation Program, as a clinical intervention that can be used with injured athletes'?
3. What do you suggest/recommend to improve the Mindfulness Meditation Program?
4. Do you think the Mindfulness Meditation Program had helped you to reduce perception of pain and also pain tolerance?

Follow up questions: If yes, how? In what sense?

5. Do you feel that Mindfulness Meditation Program was helpful, helped you (psychologically) feel better?

6. Do you have any further comments you would like to mention regarding to Mindfulness Meditation Program (MMP).

## (Semi Structured Interview with Therpists)

1. How do you feel after an eight weeks practice Mindfulness Meditation Program?

   And Why?

2. Did you like the Mindfulness Meditation Program (MMP)?

   And why?

3. Would you recommend the Mindfulness Meditation Program (MMP), as a convenient tool that can be used with therapists to increase their body-awareness?

   And why?

4. Do you think that the Mindfulness Meditation Program, has helped you in your everyday professional practise?

   If yes how? In what sense?

5. How do you think that the Mindfulness Meditation Program can be improved?

6. Do you have any further comments you would like to mention regarding to Mindfulness Meditation Program (MMP).