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ARTICLE

Perceptions of Injured Athletes after Eight Weeks of Mindfulness Based Stress Reduction Program

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ABSTRACT

Mindfulness Based Stress Reduction (MBSR) has been extensively applied as a clinical intervention by researchers' who have made on-the-spot decisions research as part of their practice. This research was provided via a knowledge transfer of 8 weeks of MBSR based on the original MBSR version. The main objective of this study was to offer a qualitative explorative insight into the perceived experience of participating in a MBSR program for injured athletes. A semi structured interview was conducted with each injured athlete who participated in this study. A thematic analysis was applied to explore the themes which emerged from injured athletes' experience after 8 weeks of participation in a MBSR program. Five themes emerged from injured athletes' attitudes towards MBSR: 1) Reconnecting with the body, 2) Reconnecting with the mind, 3) Passivity of MBSR as opposed to the athletic praxis, 4) Group versus self-guided MBSR, 5) Acceptance of pain. These different themes are presented and discussed below. This particular qualitative exploratory investigation was based on injured athletes' experiences in this study; MBSR can benefit them during the sport rehabilitation process. As such, the findings will promote scientific understanding about the effectiveness of MBSR 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.

1. Introduction

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 to have the capability to return to their sports after being injured. As Nicholl, Coleman and Williams estimated, 29 million sports injuries occur each year in the UK [1]. According to Hawkins and Fuller 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 1,000 times higher than any other occupation [2]. Moreover, Beynnon et al. 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

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among athletes [3]. As Bahr & Holme 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 vantages. 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 [4]. Schneider et al. have specified that the side effect of physical activity is injuries [5].

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. Second, 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 provides them with a social role, a sense of identity and a specific charisma. The other assumption is that, achieving a 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 [6].

For instance, Brewer & Redmond 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 they 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 [6].

In terms of a psychological point of view, injured athletes might experience both physical and psychological consequences after being injured. Walker and Heaney emphasised that psychological effects on injured athletes can be noticed by anybody who has 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 [7]. More specifically, Schinke et al. 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 [8]. In relation to the psychological consequences, Reese et al. mentioned 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 [9].

It is from this perspective, that paying attention to improving the mental health of injured athletes is very necessary. As outlined by Markser, this is because of the massive social, somatic and mental stress that athletes are exposed to [10]. By the same token, a study by De Heredia et al. 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 [11]. Furthermore, Putukian 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 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 [12]. Consistently, Brewer and Redmond indicated that sport injuries impact upon athletes' behaviour as well as emotions and cognition. Therefore, rehabilitation outcomes can be affected by behavioural responses to sport injuries. It should be noted that, the researchers 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 [6].

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 in handling their injuries. For example, these pieces of research were developed in the realm of the psychology of sports injuries [13-15]. 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

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fruitful, and also encouraging them to feel better about their affiliation and contribution to 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 [16].

With respect to injured athletes' mental health, Keilani et al. 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 the athlete's mental recovery and sport performance, such as breathing techniques, cognitive interventions, progressive muscle relaxation, imagery/visualization and many others [17].

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, in both senses, indicated that they had a greater adherence to the rehabilitation process, better mood state and less judging of their injuries [11].

Mindfulness Based Stress Reduction (MBSR) program has been extensively applied as a clinical intervention by researchers' who have made on-the-spot decisions research as part of their practice. "MBSR is an eight-week evidence-based program that offers secular, intensive mindfulness training to assist people with stress, anxiety, depression and pain" [24].

In addition, a huge body of literature has been derived from the MBSR program, in particular, Mindfulness-Based Cognitive Therapy (MBCT) [18]. Besides, other mindfulness-based programs have been established by Kabat-Zinn for particular purposes, such as cancer treatment, childbirth, eating disorders, parenting and other interventions [19]. Depending upon Kabat-Zinn's approach, working in mindfulness approaches is being continued by other researchers, who are investigating the effectiveness of mindfulness [20,21,22]. Mindfulness has also been integrated into educational approaches for health practitioners. Dobkin and Hassed indicated that delivering mindfulness approaches to undergraduate and postgraduate students as an active clinical skill is essential. This is consistent with the literature, that has emphasised the positive influences of meditation for utilisation with health practitioners and patients [23].

This research was provided via a knowledge transfer of 8 weeks of MBSR based on the original Mindfulness Based Stress Reduction (MBSR) version, which was developed by Kabat-Zinn in 1979 at the University of Massachusetts Medical Center [24]. 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 MBSR with different kinds of methodology, participants were provided with the opportunity to explain and discuss their expertise, thoughts and experiences after 8 weeks of MBSR 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 MBSR in future. This will help to deal with the problems that might be faced during meditation and also to become more familiar with MBSR as a clinical intervention that can be used with "injured athletes". This study was an attempt to find out what the experiences of injured athletes were in relation to MBSR.

By collecting some exploratory qualitative data, our intention was to get to know what the perception of injured athletes' was after participating in an 8 week MBSR intervention. In this vein, Fitzpatrick et al. indicated that qualitative assessments are a suitable means of realising the acceptability of intervention [25]. Moreover, Fitzpatrick et al. mentioned a qualitative study by Abercrombie et al. [26] to evaluate the acceptability of MBSR with women of different ethnic backgrounds who had a low income. In addition, Cohen-Katz et al. employed qualitative materials to evaluate the effect of MBSR as a long term intervention on nurses' stress and burnout; notably, the qualitative analyses improved their understanding of the effectiveness of MBSR and also the future direction of MBSR research [27].

According to research that had been done by Mackenzie et al. 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 [28]. Therefore, the researchers 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 MBSR intervention. The research question was concerned with what experiences the "injured athletes" had during the eight weeks' formal and self-directed MBSR.

2. Methods

2.1 Procedure

This study was approved by the Ethics Committee at the School of Sport & Exercise Sciences. To inform the participants about the research of this study, they were

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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 the PIS. This was followed by an informed consent form 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 six questions during the interview. The interview was led by the second author 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 (Appendix 1). Once the research was completed, participants were sent a digital copy of the research and all were acknowledged for their assistance in the study. In addition, they were asked to provide their responses with any further comments.

2.2 Participants

The participants who were involved in this study were "injured athletes", who had received 8 weeks of the MBSR program [29]. Six injured athletes from the ten participants were accepted to be interviewed after they had received the MBSR program. The participants were both female and male. Notably, five males and one female (injured athletes) completed the semi-structured interview in this study. Demographic data are presented in (Table 1). Mean and standard deviation of the participants were: (M injured athletes = 28.9 years, $S = 6.21$). 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 1. Participants' demographic, physical activity and kind of injury 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
5	37	Male	Kickboxing	Wrist injury
6	30	Female	Running	Hips injury
7	32	Female	Basketball	Knee ACL
8	34	Male	Body Building	Knee injury
9	31	Male	Football	Shoulder Injury
10	36	Male	Tennis	Ankle Injury

2.3 Data Analysis

Injured athletes' opinions after participating in an 8 week MBSR program were analysed using a Thematic Analysis [30]. Semi-structured interviews (SSI) were carried out with injured athletes to obtain detailed and comprehensive information about their experiences in participating in the MBSR in both formal and informal practice. The interview data were recorded using an audio tape recorder to allow for the transcription and analysis of data at the end of the study. The data were transcribed and then coded openly.

3. Results

After the data collection with injured athletes, five themes were identified: 1) Reconnecting with the body, 2) Reconnecting with the mind, 3) Passivity of MBSR as opposed to the athletic praxis, 4) Group versus self-guided MBSR, 5) Acceptance of pain.

3.1 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 MBSR offered to our participants. According to participant 4:

'I become more aware of my body, I can follow the recovery time better and also feel more aware of the 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 the MBSR program made me feel very connected with my body' (participant 2).

3.2 Reconnecting with the Mind

Sport injuries generate a period of absence from sport

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arenas and this is mentally very demanding for the injured athlete. However according to our data, injured athletes can find in the practice of MBSR a very good mechanism to cope with the injury, in their journey to full recovery.

'I think mindfulness could be a 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 MBSR 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 feelings 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).

3.3 Passivity of MBSR as Opposed to the Athletic Praxis/ Challenges when Practising MBSR

For the totality of our sample, MBSR 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 MBSR had to do with the passive character of MBSR. 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).

3.4 Group versus Self-guided MBSR

Another question that we indented to shed some light upon had to do with the delivery of the MBSR. 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 investigation, 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).

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3.5 Acceptance of Pain

In terms of pain aspects, injured athletes who were involved in this study have attributed their practise in MBSR to clearly changing their attitudes towards pain. A number of injured athletes were focused on how MBSR 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 MBSR intervention 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 MBSR. 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 for 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. 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 MBSR. Notably, six 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 MBSR as opposed to the athletic praxis, 4) Group versus self-guided MBSR, 5) Acceptance of pain.

Injured athletes reported that MBSR 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 had any previous experience. Therefore, to learn and be familiarised with new skills, is indeed a difficult task, as the MBSR requires some perseverance and a series of repetitions. Kornfield stressed that the cultivation of any new skills requires three components systematic training, patience and perseverance [31].

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 MBSR, 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.

To understand whether MBSR is a convenient means to be utilised with the clinical population, injured athletes explained that, MBSR is a beneficial technique, which enables them to reconnect with their bodies, as well as become more aware of their physical condition. Besides, they can manage their body sensations during the SRP. Overall our participants regarded MBSR as a beneficial method to help them reconnect with their bodies and be more aware of their injuries and to accept them. These results are in accordance with recent studies, which have observed 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 [32,33,34,21].

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 statement to

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others and sharing an idea with them. Fundamentally, the original MBSR was developed and practised in a group Kabat-Zinn, [35,36]. 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 the injured athletes, which made the gathering of those injured athletes at one particular time and place not possible. In addition to the MBSR, 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 MBSR. Noticeably, injured athletes reported that after a period of regular meditation, their pain sensitivity improved and their body sensations changed after MBSR. Further, their 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 MBSR 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 et al. who found that pain tolerance significantly improved with asymptomatic students [37]. Consistently, Zeidan et al. verified that a brief form of mindfulness meditation was effective in reducing pain and anxiety [38]. 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 [39].

All injured athletes reported that MBSR 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 furthermore, 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 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 [40]. Moreover, this is consistent with the findings from other research [41-44], which discovered the positive impact of MBSR on improving wellbeing and the quality of life within different clinical populations.

The research question 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 the MBSR program. These findings raise intriguing questions regarding the nature and extent of MBSR efficiency to be applied by injured athletes. It can therefore be assumed that MBSR is suitable mental training that can be used by injured athletes parallel to physiotherapy treatment during SRP.

In spite of the exploratory nature of this study, it should be noted that the findings revealed a considerable positive perception regarding the injured athletes' participation in the MBSR. Further qualitative studies could enhance our knowledge and scientific understanding about what it is that makes MBSR 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.

5. Conclusions

Based on the findings of this study, incorporating MBSR techniques into 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, 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

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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 who found that practising mindfulness with injured athletes, who suffered from anterior cruciate ligament (ACL) injuries, helped them to improve their rehabilitation protocol and their wellbeing [45]. Hence, mindfulness can become an essential part of 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 [46].

In addition, injured athletes can benefit from MBSR in order 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 into 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.

Another implication of this study is that it provided more understanding regarding MBSR, and also finding out what difficulties injured athletes faced during the intervention period. This could encourage researchers to avoid those problems that were mentioned in this study in future research. Furthermore, this study was a deep subjective analysis with regard to injured athletes' experiences of long-term mindfulness meditation practise.

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Conflict of Interest

The authors report no declarations of interest.

Authorship and Contribution

AP had the original idea for the study and was responsible of interpreting the data. WM collected the data, conducted the preliminary analyses and wrote the draft of manuscript. DS led the design of the methodology and contributed in data processing. All authors contributed to the interpretation of the data, reviewed/edited the manuscript and approved the final manuscript.

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Appendix 1. Semi-Structured Interview Questions

1. How do you feel after eight weeks' practice of a Mindfulness Based Stress Reduction Program?
Follow up questions:
Could you tell us more about your experience of participating in this program?
2.Would you recommend Mindfulness Based Stress Reduction, as a clinical intervention that can be used with injured athletes'?
3.What do you suggest/recommend to improve Mindfulness Based Stress Reduction?
4.Do you think Mindfulness Based Stress Reduction had helped you to reduce your perception of pain and also of pain tolerance?
Follow up questions: If yes, how? In what sense?
5.Do you feel that Mindfulness Based Stress Reduction was helpful and helped you (psychologically) feel better?
6.Do you have any further comments you would like to mention regarding Mindfulness Based Stress Reduction.

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