<http://www.diva-portal.org>

Postprint

This is the accepted version of a paper published in *International journal of sports science & coaching*. This paper has been peer-reviewed but does not include the final publisher proof-corrections or journal pagination.

Citation for the original published paper (version of record):

Lundqvist, C., Ståhl, L., Kenttä, G., Thulin, U. (2018)
Evaluation of a mindfulness intervention for Paralympic leaders prior to the
Paralympic Games.
International journal of sports science & coaching, 13(1): 62-71
<https://doi.org/10.1177/1747954117746495>

Access to the published version may require subscription.

N.B. When citing this work, cite the original published paper.

Permanent link to this version:

<http://urn.kb.se/resolve?urn=urn:nbn:se:gih:diva-5206>

Evaluation of a mindfulness intervention for Paralympic leaders prior to the Paralympic Games

Carolina Lundqvist¹, Linda Ståhl², Göran Kenttä³ and Ulrika Thulin⁴

¹Department of Behavioural Sciences and Learning, Linköping University, Sweden

²Department of Psychology, Stockholm University, Sweden

³The Swedish School of Sport and Health Sciences, Sweden

⁴Centre for Psychiatric Research and Education, Karolinska Institutet, Sweden

Corresponding author:

Carolina Lundqvist, Department of Behavioural Sciences and Learning, Linköping University, 581 83 Linköping, Sweden

E-mail: carolina.lundqvist@liu.se

Abstract

This article presents an evaluation of the effectiveness of an applied mindfulness intervention for stress reduction delivered to Paralympic leaders prior to the Paralympic Games. The intervention group of Swedish Paralympic leaders ($n=10$) received a mindfulness intervention of eight web-based seminars, while a Norwegian reference group ($n=6$) received no intervention. Three assessments were performed for both samples: at baseline, post-intervention, and six weeks post-intervention. The evaluation indicated intervention effects of higher psychological flexibility ($p = .03$), less rumination ($p = .02$) and lower perceived stress ($p = .001$), and offers initial support for the applied usefulness of a web-based mindfulness training program as a supplement in stress-reduction programs for elite sport leaders. General challenges from an applied sport psychology perspective related to the implementation of mindfulness interventions in samples with experienced high levels of stress and perceived time-constraints are discussed.

Keywords

Workload, elite sport, coach, championship, psychological preparation

Funding

This work was supported by grants from the Swedish Research Council for Sport Science.

Conflict of interest

The authors of this article have no conflicts of interest to declare.

Introduction

At a managing team meeting arranged by the Swedish Paralympic Committee a year before the Paralympics, a number of those in various leadership positions (e.g., head coaches, trainers, assistants and physiotherapists) expressed concerns about a highly stressful work situation. The work situation of the Paralympic leaders was described as characterized by a high workload in combination with increased general stress during the year prior to the Paralympic Games. Moreover, the leaders on the team were concerned that their opportunities and abilities to change or reduce demands and stressful circumstances were mostly lacking. Thus, they requested psychological support in gaining effective psychological skills for managing stressful circumstances in situations when a high level of cognitive processing is needed, and time for recovery is limited. When searching for available coach support interventions, we identified a dearth of studies in the sport psychology literature on psychological support for elite sport leaders. Psychological support and interventions have been developed primarily to meet the needs of athletes [1, 2, 3]. The present evaluation of the mindfulness intervention was therefore conducted as a pilot project, arising explicitly from the needs expressed by the Paralympic sport leaders. In order to address the lack of applied knowledge about the effectiveness of interventions targeting psychological experiences of stress among sport leaders, a decision was made to evaluate the intervention using both baseline and post-intervention assessments.

Elite coaching can be rewarding, but there is also uncertainty as to whether the efforts of time and commitment invested by the coach will result in any tangible rewards at important competitions. In the literature, it is acknowledged that being part of a sport management team at an elite level is characterized by a high level of exposure to a number of unpredictable stressors, often in combination with a low level of control over the situation and high demands [4, 5, 6]. Increased levels of stress may affect psychological processes, for example

decision-making ability, reactions and behaviors (e.g., 7, 8), which may adversely affect leaders' professional effectiveness in coaching and their long-term health (e.g., burnout or other stress-related illnesses) [1, 9, 10, 11]. A psychological approach that has demonstrated effectiveness in addressing stress in non-clinical samples is mindfulness [12, 13].

Mindfulness has its origins in the Buddhist meditative tradition with its focus on the practice of conscious attention in the present moment, including both external events and internal experiences of thoughts, physical sensations and emotions [14]. Kabat-Zinn [15, 16], who introduced one of the first mindfulness curricula to be empirically studied, defines mindfulness as a non-judgmental, purposeful, and moment-to-moment awareness. Conceptually, mindfulness comprises consciousness, awareness and attention. Awareness can metaphorically be described as resembling radar, consciously scanning a person's internal and external environment for stimuli located at the centre of attention or peripherally. Attention includes the process of focused consciousness toward a certain stimulus by which the person narrows and intensifies his/her attention [14].

Mindfulness differs substantially from traditional psychological skill techniques (e.g., emotional and arousal regulation, thought control, or cognitive reframing) that emphasize increasing the participant's control of inner states through efforts to alter or reduce stressful or otherwise disturbing stimuli (e.g., 17, 18, 19). In contrast, mindfulness training is focused on non-judgmentally accepting internal states as naturally occurring phenomena, observing thoughts and feelings as non-dangerous psychological states in order to increase one's awareness of all the experiences the present moment has to offer [19]. Thus, participants in mindfulness training learn to act on situations and other persons more thoughtfully and compassionately, with a high degree of awareness and understanding, rather than acting emotionally or impulsively [13, 20].

In the clinical literature, mindfulness has received increasing empirical support as an effective treatment for reducing stress-related difficulties and avoiding relapse into a range of various conditions including, for example, depression [21, 22, 23], psychosis [24], worry and anxiety disorders [25], chronic pain [26] and sleep disturbances [27]. To date, fewer studies have been conducted with subclinical and healthy populations. College students who received mindfulness training showed a general feeling of increased control over life, more acceptance of demanding situations in life, increased positive emotions and reduced experiences of stress, as well as an increased ability for non-judgmental awareness [28]. Systematic reviews and meta-analyses have found support for the effectiveness of mindfulness on psychological well-being and stress reduction among healthy participants [13, 29, 30]. Mindfulness also resulted in larger effects than traditional relaxation on decreased rumination and worry, as well as on increased ability for empathy and compassion [13].

In the sport psychology literature, there is increasing support for the efficacy and effectiveness of mindfulness interventions for athletes [31, 32]. For example, Bernier, Thienot, Codron, and Fournier [33] showed that an educational mindfulness practice, based on Mindfulness based Cognitive Therapy (MBCT; 34) and Acceptance Commitment Therapy (ACT; 35) and performed during a complete season with seven young golfers, increased their mindfulness skills as well as their awareness of activation level and routines. The golfers also perceived the intervention as positive for their performance. Mindfulness practice has also been associated with an increased experience of flow among athletes, as well as decreased maladaptive perfectionism, perceived organizational demands and performance worries [36, 37, 38]. Long-term effects (e.g., ability to act with awareness, increased trait mindfulness, decreased levels of task-irrelevant worries/thoughts) a year after a mindfulness intervention have also been reported in the literature [39].

Whereas empirical studies have focused on presenting evidence for the effectiveness of mindfulness on demands placed on competitive athletes, its applicability on stress reduction for sport coaches is still largely unexplored [40]. By use of a mixed-method approach including assessments of mindfulness, emotional stability and anxiety as well as qualitative interviews, in a first study on coaches Longshore and Sachs [40] found some initial support that mindfulness practice increased emotional stability and decreased anxiety among coaches. Interviewed coaches also reported that the mindfulness training had a positive impact on other aspects of their lives (e.g., personal life, patience, and interaction with athletes). Thus, based on research results in both sport and other settings, mindfulness training could be a promising approach to improving sport leaders' ability to change their attitudes towards stressors and to helping them enable breaks and recovery on a daily basis [41].

The purpose of the present article is to report on an evaluation of a mindfulness intervention with Paralympic leaders conducted in a highly ecological setting prior to the Paralympics. The intervention was an integral part of a larger support program, offered by the Swedish Paralympic Committee, to prepare the leaders before the Paralympic Games. The effectiveness of the intervention was evaluated by use of variables related to mindfulness and stress (i.e., perceived stress, level of mindfulness, rumination, psychological flexibility and sleep quality). The hypothesis prior the implementation of the intervention was that Paralympic sport leaders participating in the mindfulness program would show improved results on all mindfulness-related dependent variables (increased mindful awareness and psychological flexibility, and decreased rumination), decreased levels of perceived stress, and improved sleep. The intervention sample was also compared to a reference group, which received no treatment.

Method

Participants

A total of 15 Swedish Paralympic leaders were initially invited to participate in the intervention, and ten Norwegian Paralympic leaders were invited to be part of the reference group who received no treatment at all. Five Swedish leaders and four Norwegian leaders did not participate in more than the baseline assessment. Thus, these participants were excluded from the analyses and the final samples consisted of ten Swedish leaders (men = 6, women = 4; mean age = 48.40, $SD = 8.86$) and six Norwegian leaders (men = 3, women = 3; mean age = 38.67, $SD = 9.69$). All leaders belonged to either the Swedish or the Norwegian Paralympic committee support program, and were to participate in the Paralympic Games. Prior to consenting to participate in the intervention, all leaders were given ethical information and signed informed consent. The data collection presented in this article constituted a master's thesis project conducted at Stockholm University [42]. According to the Swedish law of ethics, student theses written at Swedish universities are regarded as educational papers and are thus not required to receive ethics approval from the national board in Sweden. Nevertheless, the ethics of student projects are judged by the supervisor group at the university to ensure that the Declaration of Helsinki's ethical principles for research involving human subjects are complied with before students receive approval to conduct their thesis.

Instruments

The Perceived Stress Scale (PSS) [43] is a ten-item inventory that assesses individuals' perceptions of situations in their lives as stressful. Answers are rated on a scale ranging from 0 (*not at all*) to 4 (*very often*). The PSS has revealed adequate internal consistency ($<.70$) and adequate concurrent and predictive validity in terms of correlations with ratings of life events, depressive and physical symptoms, and use of health care and social anxiety [43, 44].

The Rumination-Reflection Questionnaire (RRQ) assesses the two sub-dimensions of rumination and reflection. Rumination refers to a person's tendency for self-focus, and has revealed correlations with neuroticism [45]. The RRQ has displayed adequate internal consistency and convergent validity [45, 46]. In the present study, only the rumination subscale with 12 items was used, based on its association with stress and in order to limit the number of items. Respondents rate their answers on a five-point scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

The Mindfulness Attention and Awareness Scale (MAAS) [47] was used to assess the level of mindfulness among participants. The questionnaire consists of 15 items on which participants rate their experiences of mindfulness during the day. Answers are provided on a six-point scale, ranging from 1 (*almost always*) to 6 (*almost never*). A higher score on the MAAS indicates a higher awareness of internal and external experiences, and has been shown to be related to a better capacity to alter one's emotions and higher well-being, perceived autonomy, competence and relatedness, as well as less social anxiety [47]. Studies have shown good internal consistency, test-retest reliability, and concurrent and incremental validity among college students and adult populations [47, 48, 49].

Sleep was assessed using two subscales from the Karolinska Sleep Questionnaire (KSQ) [50], which includes four items on sleep quality and three on awakening during the night. Respondents rate their answers on a five-point scale ranging from 1 (*never*) to 5 (*always*), with a high score on the two subscales indicating disturbed sleep. Studies have shown adequate validity and reliability, and have displayed a relationship between disturbed sleep and high work-related demands, low social support at work, and high physical workload [50].

Psychological flexibility – that is, a person's ability to accept unpleasant experiences such as thoughts, feelings and physical sensations and continue to pursue long-term goals and

Lundqvist et al.

values – was assessed using the ten-item Acceptance and Action Questionnaire (AAQ-II), with a response scale ranging from 1 (*never true*) to 7 (*always true*). The scale has demonstrated adequate reliability and validity [51]. The opposite of psychological flexibility is psychological inflexibility, which involves emotional avoidance whereby a person has difficulty distancing him/herself from inner thoughts, feelings and physical sensations, and acts primarily based on emotions instead of long-term goals and values. Psychological inflexibility has shown a relationship with depressive symptoms, worry, stress and psychological ill-being [51].

Procedures

Three assessments were conducted: pre-intervention (5 days before the intervention started), post-intervention (immediately after the intervention ended) and six-week follow-up. The intervention group participated in the mindfulness intervention, whereas the reference group received no treatment. The Swedish leaders (the intervention group) were initially contacted by e-mail with information about the study. Interested leaders were thereafter gathered and given verbal information about the study and intervention. The leaders were also given a theoretical lecture on the concept of mindfulness, and were allowed to practice a few mindfulness exercises. Leaders interested in participating in the full intervention were included in the study, and were provided with the necessary material (e.g., a CD with mindfulness exercises and a logbook with instructions to note how often they listened to it) to take part in the web-based program. Two weeks prior to the start of the intervention, the participants again received written information about the study and its design. The intervention was scheduled to start three months before the Paralympic Games and to end four weeks before the opening ceremony. The intervention leader was a mindfulness instructor

with ten years' experience practicing mindfulness, and was also a final-year clinical psychologist student.

The reference sample was selected based on their similarity to the Swedish sample regarding the ratio of leaders to athletes on the team, the general culture across the countries, and the similar goal-setting of the team, which for both samples was to exceed their results in the previous Paralympic Games. The Norwegian leaders were contacted by e-mail three weeks prior to the first assessment. They were provided with information about the study and asked to complete the questionnaire three times during the study (the same time points as the assessments for the Swedish leaders). One week before the first assessment, leaders who had volunteered to take part in the study received further information on how to complete the questionnaires. For both the Swedish and Norwegian leaders, login information and instructions for completing the questionnaires were sent prior to each assessment.

Intervention

A mindfulness intervention, originally designed to reduce stress and increase well-being among employees in various businesses and companies, was used in this study (Corporate-Based Mindfulness Training) [www.potentialproject.se]. The majority of the participants held a combination of part-time work positions as leaders in sports and various part-time business positions (see Table 1). A brief summary of the content of the intervention is available in Appendix 1. In order to optimize the possibility to participate in the study despite the participants' scattered geographic locations, the intervention was delivered via a web platform.

In this study, exercises and examples were slightly rewritten in language (e.g., using words like *leaders* instead of *employees*, and *sport* or *the Paralympics* instead of *business* or *company*) suiting sport leaders working for the Swedish Paralympic Committee. Eight web

Lundqvist et al.

seminars, each given on a Thursday, were offered to the participants. In order to make it easier for the sport leaders to participate, the same seminar was offered in the morning and in the afternoon so they could choose the most convenient time of day. The theme for each seminar was e-mailed to the sport leaders beforehand. The themes were: (1) pauses with mindfulness and awareness; (2) mindful work and coaching; (3) mindful communication; (4) mindful travels with a beginner's mind; (5) mindful meetings; (6) mindful e-mailing; (7) mindful eating; and (8) letting go. The seminars were also audio recorded and e-mailed to all participants, which allowed them to listen to the content again after the seminars had been completed. All sport leaders participated in the first two seminars ($n=10$); participation decreased slightly over time (Seminar 3: $n=9$, Seminars 4-6: $n=7$, Seminar 7: $n=5$, Seminar 8: $n=8$). The intervention leader started each seminar with a review of the previous one and a discussion of good experiences and difficulties or obstacles the participants may have encountered during the week. The seminars always ended with a traditional ten-minute mindfulness exercise based on anchoring attention to breathing, and the possibility to ask questions and continue the discussion in a chat forum.

Results

Descriptives of the demographic characteristics of the participants in the two samples are provided in Table 1. As shown, all leaders were experienced in working with the Paralympics. One participant in each sample held a full-time position in Paralympic sport, whereas the majority also held part-time positions in non-sport occupations. All participants practiced mindfulness for ten minutes or more each week (range: 1 to 7 days/week) during the intervention, and all but one participant continued to practice after the intervention ended (range: 1 to 5 days/week).

The mean values for the three assessments of the samples on the dependent variables are displayed in Table 2. Independent sample t-tests performed on all dependent variables at the baseline assessment showed no significant differences between the intervention and reference groups. An exception to this was the scores on mindful awareness (MAAS), with the intervention group scoring significantly higher than the reference group ($t(14) = 2.47, p = .03$).

Paired sample t-tests on the dependent variables, shown in Table 2, were performed to evaluate any changes between the baseline and the post-intervention assessments, as well as between the assessments at baseline and six weeks post-intervention. Results revealed no significant changes in the scores for any variable (mindful awareness, perceived stress, psychological flexibility, rumination, sleep quality and awakening) in the reference group across the assessments ($p > .05$). However, significant changes were revealed in the intervention group regarding perceived stress, rumination, psychological flexibility and sleep quality. Participants in the intervention group scored significantly lower, and the analyses displayed moderate to large effect sizes (i.e., Cohen's d), at the end of the intervention on perceived stress ($t(9) = 2.30, p = .05, d = .78$) and rumination ($t(9) = 3.38, p = .01, d = 1.22$) as well as six weeks after the intervention (perceived stress: $t(9) = 4.93, p = .001, d = 1.65$ and rumination: $t(9) = 2.91, p = .02, d = .93$). As shown in Figure 1, mean scores of perceived stress and rumination for the intervention group showed a trend of gradually becoming lower over time even when the intervention had ended, whereas the reference group revealed a rather unchanged pattern. Regarding psychological flexibility, no significant change was detected in the intervention sample immediately after the intervention ended ($t(9) = 1.06, p = .32, d = .34$) but significantly lower scores indicating increased psychological flexibility were shown six weeks post-intervention ($t(9) = 2.60, p = .03, d = .84$) with a large effect size. Finally, sleep quality improved significantly, with a large effect size in the

Lundqvist et al.

intervention sample when the intervention ended ($t(9) = 2.54, p = .03, d = .89$), but did not display significant changes in the six-week post-intervention assessment ($t(9) = 1.29, p = .23, d = .41$).

Discussion

The present evaluation of a mindfulness intervention showed no significant change in sleep or in general mindfulness awareness among the intervention participants, but did show a trend of decreased levels of perceived stress, lower rumination, and increased psychological flexibility. These results are in line with previous studies on healthy populations, which have indicated positive results after mindfulness training on well-being and stress reduction [23, 28, 40]. According to Kabat-Zinn [16], mindfulness practice for 45 minutes six days a week is to be recommended. In the present evaluation, however, participant self-reports showed that they generally practiced mindfulness to a lesser extent than had been recommended at the onset of the intervention. Mindfulness practice on a daily basis with a long duration may be perceived by sport leaders as highly demanding, especially during stressful periods prior to and during championships. The effects of brief mindfulness interventions, with shortened mindfulness programs, have received increased interest in the research literature and shown promising results on, for example, increased mindful awareness, reduced psychological discomfort, self-control and subjective vitality in healthy samples (e.g., 52, 53). Further research is encouraged to continue the investigation of plausible beneficial brief mindfulness interventions among sport leaders suitable to this population's work situation. Nevertheless, the results from the present evaluation indicate that mindfulness training conducted at a low dosage could be a promising complement to stress management interventions in order to obtain beneficial psychological effects among sport leaders.

From an applied perspective, the utility of mindfulness training might be highly relevant for elite sport leaders working in a highly unpredictable elite sport environment where it is generally difficult to change, control, or adequately reduce perceived stressors. Yet, conducting stress-management interventions with healthy populations exposed to a high workload poses the delicate problem of motivating participants to devote and prioritize time on a daily basis to the exercises in the intervention. From the burnout literature and clinical experience [54], it is known that highly stressed individuals also tend to ignore their bodies' warning signs as long as they are not immediately severe. Instead, a short-term solution is a common response in which persons react to stress-related emotions by increasing their efforts to manage the work at hand. At the same time, perceived time constraints usually lead people to down-regulate self-care and recovery activities. Unfortunately, this may result in long-term adverse health effects [54].

In the present mindfulness intervention, an approach entailing web seminars offered at two different times of day was chosen in order to facilitate participation and reduce time constraints. Whereas the majority of the leaders took part in most of the seminars, the participation rates varied somewhat over time, suggesting that all participants still could not or did not prioritize the sessions every week. A further complicating matter is that mindfulness may require a period of regular training before participants become aware of any effect. Thus, in similarity to many other behavioral changes, the direct gain of effects will likely not be fully experienced early in the intervention and thus some persistence from the participant will be needed over time [34]. Moreover, various perceived effects may be apparent at various phases of the intervention. In the present evaluation, both perceived stress and rumination already showed significant decreases by the end of the intervention. Psychological flexibility, on the other hand, had not improved significantly until six weeks after the intervention. Thus, the re-

sults imply that some effects may occur relatively soon after participants start their mindfulness training whereas other effects may be delayed. Altogether, these issues suggest that future research and applied work on mindfulness training not only need to consider the efficacy of mindfulness training as a method; researchers also need to evaluate and design effective strategies to support participants in their performance of continuous mindfulness training despite perceived time constraints and, in the early intervention phases, to motivate participants to persist with the mindfulness training until beneficial effects are likely to occur. Regardless of whether the method itself is highly efficient, the results will depend on the degree to which participants engage in and commit to the mindfulness training and apply the approach learned in their daily activity both during the intervention and after it ends. All but one participant in this evaluation had continued the mindfulness training to some extent at least six weeks after the intervention had ended. As suggested by Thompson and colleagues [39], the implementation of one or a few booster sessions after an intervention ends may nevertheless help participants maintain their motivation for continued practice over a prolonged time. Furthermore, this may be an important strategy for the retention of elite-level coaches in a highly demanding context.

In the present article, mindfulness training was evaluated in a highly ecological setting with sport leaders at a true elite level, which resulted in the use of small samples and thus decreased power of the statistical analyses. Thus, stronger statistical effects in both the intervention and reference groups might have been displayed with larger sample sizes. A further limitation was that the intervention and reference groups consisted of participants from two different countries; thus, specific parameters related to each Paralympic team and their preparations for the games cannot be ruled out. Sweden and Norway are culturally close, however, and the Paralympic teams were similar with regard to many parameters, such as their goal-setting and the ratio of leaders to athletes. Whereas the results do indicate support for the suitability and

effectiveness of applying mindfulness training as part of stress-reduction training among sport leaders, future research that replicates as well as extends the study design is warranted.

References

1. Giges B, Petitpas AJ and Vernacchia RA. Helping coaches meet their own needs: Challenges for the sport psychology consultant. *Sport Psychol* 2004; 18: 430-444.
2. Tedeschi RAB and Glynn BA. "Focus on what?": Applying research findings on attentional focus for elite-level soccer coaching. *J Sports Psychol Action* 2013; 4: 122-132.
3. Olusoga P, Manyard I, Butt J and Hays K. Coaching under pressure: Mental skills training for sport coaches. *Sport Exerc Psychol Rev* 2014; 10: 31-44.
4. Fletcher D and Scott M. Psychological stress in sports coaches: A review of concepts, research, and practice. *J Sport Sci* 2010; 28: 127-137.
5. Levy A, Nicholls A, Marchant D and Polman R. Organisational stressors, coping and coping effectiveness: A longitudinal study with an elite coach. *Int J Sports Sci Coach* 2009; 4: 31-45.
6. Thelwell R, Weston NJV, Greenlees IA and Hutchings NV. Stressors in elite sport: A coach perspective. *J Sport Sci* 2008; 26: 905-918.
7. Schneiderman N, Ironson G and Siegel SD. Stress and health: Psychological, behavioral, and biological determinants. *Annu Rev Clin Psychol* 2005; 1: 607-628.
8. Simonovic B, Stupple EJN, Gale M and Sheffield D. Stress and risky decision making: Cognitive reflection, emotional learning or both: Stress and reflection effects on the IGT. *J Behav Decis Mak*, 2016; 30: 658-665.
9. Bentzen M, Lemyre PN and Kenttä G. The process of burnout among professional sport coaches through the lens of self-determination theory: A qualitative approach. *Sports Coach Rev* 2014; 3: 101-116.
10. Hjälm S, Kenttä G, Hassmén P and Gustafsson H. Burnout among elite soccer coaches. *J Sport Behav* 2007; 30: 415-427.
11. Thelwell RC, Wagstaff CRD, Chapman MT and Kenttä G. Examining coaches' perceptions of how their stress influences the coach-athlete relationship. *J Spor Sci* 2017; 35: 1928-1939.

12. Bazarko D, Cate RA, Azocar F and Kreitzer MJ. The impact of an innovative mindfulness-based stress reduction program on the health and well-being of nurses employed in a corporate setting. *J Workplace Behav Health* 2013; 28: 107-133.
13. Chiesa A and Serretti A. Mindfulness-based stress reduction for stress management in healthy people: A review and meta-analysis. *J Altern Complement Med* 2009; 15: 593-600.
14. Brown KW, Ryan RM and Creswell JD. Mindfulness: Theoretical foundations and evidence for its salutary effects. *Psychol Inq* 2007; 18: 211-237.
15. Kabat-Zinn, J., An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *Gen Hosp Psychiatry* 1982; 4: 33-47.
16. Kabat-Zinn J. *Full catastrophe living: Using the wisdom of your mind to face stress, pain and illness*. New York: Dell Publishing, 1990.
17. Birrer D, Röthlin P and Morgan G. Mindfulness to enhance athletic performance: Theoretical considerations and possible impact mechanisms. *Mindfulness* 2012; 3: 235-246.
18. Gardner FL and Moore ZEA. Mindfulness-acceptance-commitment-based approach to athletic performance enhancement: Theoretical considerations. *Behav Ther* 2004; 35: 707-723.
19. Gardner F and Moore ZEA. *The psychology of enhancing human performance. The mindfulness-acceptance-commitment (MAC) approach*. New York: Springer Publishing Company, 2007.
20. Siegel DJ. *Mindsight: The new science of personal transformation*. New York: Bantam, 2010.
21. Ma SH and Teasdale JD. Mindfulness-based cognitive therapy for depression: Replication and exploration of differential relapse prevention effects. *J Consult Clin Psychol* 2004; 72: 31-40.
22. McCarney RW, Schulz J and Grey AR. Effectiveness of mindfulness-based therapies in reducing symptoms of depression: A meta-analysis. *Eur J Psychother Couns* 2012; 14: 279-299.
23. Speca M, Carlson L, Goddey E and Angen M. A randomized wait-list controlled trial: The effects of a mindfulness meditation-based stress reduction program on mood and symptoms of stress in cancer outpatients. *Psychosom Med* 2000; 62: 613-622.

24. Langer AI, Cangas AJ, Salcedo E and Fuentes B. Applying mindfulness therapy in a group of psychotic individuals: A controlled study. *Behav Cogn Psychother* 2012; 40: 105-109.
25. Vøllestad J, Nielsen MB and Nielsen GH. Mindfulness- and acceptance-based interventions for anxiety disorders: A systematic review and meta-analysis. *Br J Clin Psychol* 2012; 51: 239-260.
26. Kabat-Zinn J, Lipworth L and Burney R. The clinical use of mindfulness meditation for the self-regulation of chronic pain. *J Behav Med* 1985; 8: 163-190.
27. Winbush NY, Gross CR and Kreitzer MJ. The effects of mindfulness-based stress-reduction on sleep disturbance: A systematic review. *Explore* 2007; 3: 585-591.
28. Chang YV, Palesh O, Caldwell R, Glasgow N, Abramson M and Luskin F,... Koopman C. The effects of a mindfulness-based stress reduction program on stress, mindfulness, self-efficacy, and positive states of mind. *Stress Health* 2004; 20: 141-147.
29. Eberth J and Sedlmeier P. The effects of mindfulness meditation: A Meta-analysis. *Mindfulness* 2012; 3: 174-189.
30. Sharma M and Rush SE. Mindfulness-based stress reduction as a stress management intervention for healthy individuals: A systematic review. *J Evid Based Complementary Altern Med* 2014; 19: 271-286.
31. Gardner FL and Moore ZE. Mindfulness and acceptance models in sport psychology: A decade of basic and applied scientific advancements. *Can Psychol* 2012; 53: 309-318.
32. Sappington R and Longshore K. Systematically reviewing the efficacy of mindfulness-based interventions for enhanced athletic performance. *J Clin Sport Psychol* 2015; 9: 232-262.
33. Bernier M, Thienot E, Codron R and Fournier JF. Mindfulness and acceptance approaches in sport performance. *J Clin Sport Psychol* 2009; 4: 320-333.
34. Segal ZV, Williams JMG and Teasdale JD. *Mindfulness-based cognitive therapy for depression: A new approach to preventive relapse*. New York: Guilford Press, 2002.
35. Hayes SC and Strosahl KD (eds). *A practical guide to Acceptance and Commitment Therapy*. New York: Springer-Verlag, 2004.
36. Aherne C, Moran AP and Lonsdale C. The effect of mindfulness training on athletes' flow: An initial investigation. *Sport Psychol* 2011; 25: 177-189.

37. De Petrillo LA, Kaufman KA, Glass CR and Arnkoff DB. Mindfulness for long-distance runners: An open trial using mindful sport performance enhancement (MPSE). *J Clin Sport Psychol* 2009; 4: 357-376.
38. Kaufman KA, Glass CR and Arnkoff DB. Evaluation of Mindful Sport Performance Enhancement (MPSE): A new approach to promote flow in athletes. *J Clin Sport Psychol*, 2009; 4: 334-356.
39. Thompson RW, Kaufman KA, De Petrillo LA, Glass CR and Arnkoff DB. One year follow-up on Mindful Sport Performance Enhancement (MSPE) with archers, golfers, and runners. *J Clin Sport Psychol* 2011; 5: 99-116.
40. Longshore K and Sachs M. Mindfulness training for coaches: A mixed-method exploratory study. *J Clin Sport Psychol* 2015; 9: 116-137.
41. Roche M, Haar JM and Luthans F. The role of mindfulness and social capital on the well-being of leaders. *J Occup Health Psychol* 2014; 19: 476-489.
42. Ståhl L. *Stresshantering genom mindfulnesssträning för coacher och personal inom ledningsgruppen för paralympics - en pilotstudie*. Master's thesis, Stockholm University, Stockholm, 2012.
43. Cohen S, Kamarck T and Mermelstein R. A global measure of perceived stress. *J Health Soc Behav* 1983; 24: 386-396.
44. Cohen S and Williamson G. Perceived stress in a probability sample of the United States. In: Spacapan S and Oskamp S (eds) *The social psychology of health: Claremont symposium on applied social psychology*. Newbury Park, CA: Sage, 1988, pp. 31-67.
45. Trapnell PD and Campbell JD. Private self-consciousness and the five-factor model of personality: Distinguishing rumination from reflection. *J Pers Soc Psychol* 1999; 76: 284-304.
46. Teasdale JD and Green HAC. Ruminative self-focus and autobiographical memory. *Pers Individ Dif* 2004; 36: 1933-1943.
47. Brown KW and Ryan RM. The benefits of being present: Mindfulness and its role in psychological well-being. *J Pers Soc Psychol* 2003; 84: 822-848.
48. Brown KW, West AM, Loverich TM and Biegel GM. Assessing adolescent mindfulness: Validation of an adapted mindful attention awareness scale in adolescent normative and psychiatric populations. *Psychol Assess* 2011; 23: 1023-1033.

49. MacKillop J and Anderson EJ. Further psychometric validation of the mindful attention awareness scale (MAAS). *J Psychopathol Behav Assess* 2007; 29: 289–293.
50. Åkerstedt T, Knutsson A, Westerholm P, Theorell T, Alfredsson L and Kecklund G. Sleep disturbances, work stress and work hours. A cross-sectional study. *J Psychosom Res* 2002; 53: 741-748.
51. Bond FW, Hayes SC, Baer RA, Carpenter KM, Guenole N and Orcutt HK,... Zettle RD. Preliminary psychometric properties of the Acceptance and Action Questionnaire-II: A revised measure of psychological flexibility and experiential avoidance. *Behav Ther* 2011; 42: 676-688.
52. Klatt MD, Buchworth J and Malarkey WB. Effects of a low-dose mindfulness-based stress reduction (MBSR-ld) on working adults. *Health Educ Behav* 2009; 36: 601-614.
53. Canby NK, Cameron IM, Calhoun AT and Buchanan GM. A brief mindfulness intervention for healthy college students and its effects on psychological distress, self-control, meta mood, and subjective vitality. *Mindfulness* 2015; 6: 1071-1081.
54. Ekstedt M. *Burnout and sleep*. PhD Thesis, Karolinska Institutet, Stockholm, Sweden, 2005.

Table 1. Descriptives of the intervention and reference groups regarding age, number of each sex, employment, and level of mindfulness practice during and after the intervention.

Variable	Intervention (<i>n</i> =10)	Reference (<i>n</i> =6)
Mean age (<i>SD</i>)	48.40 (8.86)	38.67 (9.69)
Number of men/women	6/4	3/3
Experience working in Paralympics (years)	12.2 (7.01)	7.67 (5.01)
Employment degree in Paralympics		
Full-time	<i>n</i> = 1	<i>n</i> = 1
Part-time	<i>n</i> = 0	<i>n</i> = 2
Part-time and other work	<i>n</i> = 9	<i>n</i> = 3
Employment degree in work other than Paralympics		
81-100%	<i>n</i> =7	<i>n</i> =1
70-80%	<i>n</i> =3	<i>n</i> =1
20-30%	<i>n</i> =1	<i>n</i> =1
None	<i>n</i> =1	<i>n</i> =3

Self-reported mindfulness training per week during intervention (≥ 10 minutes)

None	$n=0$	--
1-2 days	$n=4$	--
3-5 days	$n=5$	--
6-7 days	$n=1$	--

Self-reported mindfulness training per week after intervention

None	$n=1$	--
1-2 days	$n=5$	--
3-5 days	$n=4$	--
6-7 days	$n=0$	--

Table 2. Mean values and standard deviations for the three assessments and paired sample t-tests in each sample.

					Paired Sample <i>t</i> -Test							
		Assessment 1	Assessment 2	Assessment 3	Assessments 1 and 2				Assessments 1 and 3			
Scale	Condition	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>
MAAS	Intervention	4.13 (.50)	4.39 (.36)	4.45 (.32)	-2.12	9	.06	-.69	-1.90	9	.09	-.62
	Reference	3.53 (.42)	3.72 (.53)	3.88 (.84)	-1.38	5	.23	-.60	-.78	4	.48	-.57
AAQ	Intervention	25.00 (5.79)	23.10 (5.63)	20.80 (4.42)	1.06	9	.32	.34	2.60	9	.03*	.84
	Reference	30.83 (13.24)	28.50 (12.63)	33.40 (13.54)	1.31	5	.25	.54	.28	4	.79	-.31
PSS	Intervention	18.20 (4.85)	14.70 (2.79)	13.30 (3.77)	2.30	9	.05*	.78	4.93	9	.001*	1.65
	Reference	18.33 (6.86)	15.83 (6.55)	17.40 (5.03)	.62	5	.57	.25	.69	4	.53	.08
RRQ	Intervention	36.10 (8.53)	32.30 (6.80)	31.80 (7.70)	3.38	9	.01*	1.22	2.91	9	.02*	.93

	Reference	38.50 (11.74)	40.50 (6.72)	40.40 (6.11)	-.75	5	.49	-.46	.00	4	1.0	-.74
KSQ:	Intervention	9.30 (2.87)	8.20 (2.25)	8.30 (2.67)	2.54	9	.03*	.89	1.29	9	.23	.41
Quality	Reference	10.33 (3.56)	10.17 (3.19)	10.20 (3.27)	.11	5	.91	.05	.63	4	.57	.05
KSQ:	Intervention	7.00 (2.45)	7.00 (2.45)	6.70 (2.06)	.00	9	1.00	.00	.38	9	.71	.12
Awakening	Reference	7.83 (1.60)	8.17 (2.14)	8.60 (2.41)	-.42	5	.70	-.18	-.78	4	.48	-.36

Figure 1

Descriptives of the significant intervention effects of psychological flexibility (AAQ), rumination (RRQ) and perceived stress (PSS).

Appendix 1. Themes and content of the eight mindfulness seminars in the intervention.

Theme	Mindfulness Seminars
1. Pauses with Mindfulness and Awareness	<p>Content: The conceptual mind and the perceptual mind, positive effects of mindful pauses (i.e., time for recovery, refocus and performance). Attitude of the week: Fully experience life's richness instead of being in the past or future.</p> <p>Exercises to practice during the week: Pause regularly during the workday (once an hour) to mindfully focus on your breathing. Practice mindful breathing ten minutes a day by observing each breath, moment by moment.</p>
2. Mindful Work and Coaching	<p>Content: Consequences of multitasking for performance and stress, ways to manage daily distractions, and how to coach mindfully. Attitude of the week: Patience both in mindfulness training and in work within the Paralympic setting, especially when discomfort is perceived. Exercises during the week: Continue with mindful pauses, practice mindfulness ten minutes every day with an attitude of patience, and practice mindful coaching.</p>
3. Mindful Communication	<p>Content: Mindful communication defined as listening and speaking with compassion, kindness and consciousness, and being present in the moment in order to communicate meaningfully and constructively. Attitude of the week: Friendliness.</p> <p>Exercises during the week: Continue with mindful pauses, practice mindfulness and friendliness ten minutes a day, and in contact with others practice mindful communication.</p>

4. Mindful Travels with a Beginner's Mind Content: View of travels as wasted time or as a moment for mindfulness practice to regain energy and focus on the task or people awaiting us. Attitude of the week: View things with a beginner's mind, which may help you detect new potential in yourself and the present situation. Exercises during the week: Continue to mindfully pause during the workday, practice mindful travelling, and practice mindfulness ten minutes each day with a beginner's mind.

 5. Mindful Meetings Content: A mindful awareness in the presence of others provides as an opportunity to, for example, open yourself when appropriate or pinpoint the essence of a task if needed. Attitude of the week: Enjoyment. Exercises during the week: Continue to mindfully pause, be mindfully aware during meetings, and practice mindfulness with the attitude of enjoyment for ten minutes each day.

 6. Mindful E-mailing Content: An awareness of the true content of the message and words used through a few moments of mindfulness before sending an e-mail is an effective way to decrease the risk of conflict and to save time and energy in e-mail conversations. Attitude of the week: Being non-judgmental. Exercises during the week: Continue to mindfully pause, observe your own reaction to things in your awareness, practice mindfulness ten minutes a day with a non-judgmental attitude, and be mindfully aware of the written text in e-mails before sending them.

 7. Mindful Eating Content: Mindfulness during lunch or dinner (as well as during cooking and doing dishes) to enjoy eating and for mindfulness practice to increase energy and focus as well as awareness of eating habits. Attitude of the week: Acceptance. Exercises during the week: Continue with mindful pauses, practice mindful eating, and also practice mindfulness with an accepting attitude ten minutes each day (i.e., meet situations with acceptance/have an accepting attitude towards yourself).

 8. Letting Go
-

Content: Mindfulness to develop mental stability by consciously choosing what to direct our attention towards and letting go of perceived thoughts and feelings. Exercises during the week: All seven previous mindfulness themes during the day, and practice mindfulness with an attitude of letting go ten minutes a day.

1

2

3