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Using mindfulness to reduce the perception of stress during an acute stressful situation

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Abstract

Problem statement: During their military education at the Norwegian Military Academy, officer cadets are required to take part in several challenging and difficult exercises and courses. A particular acute stressful situation is the parachute training course. One of the purposes of this course is to educate the officer cadets on how to deal with stress. Learning to cope with stress is important so that an officer can make good decisions during difficult situations. Purpose of study: The purpose of the present study was to investigate whether training on mindfulness would reduce the perception of stress before taking part in the parachute training course. Method: The experimental group was given an introduction to mindfulness training, and was then requested to practice mindfulness for a period of 12 days before the parachute course took place. The control group was not given any introduction to mindfulness or mindfulness training. The questionnaire CSAI-2 was used to measure subjective perceptions of cognitive anxiety, somatic anxiety, and self-confidence at 3 specific points in time before the parachute course. Results and findings: The results showed that the experimental group scored themselves lower on cognitive anxiety and somatic anxiety, and higher on self-confidence, compared to the control group after ground training, as well as 4.5 hours before and 30 minutes before the first parachute. Conclusion: The conclusion was drawn that practicing mindfulness helps reduce the perception of stress in an acute stressful situation.

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Keywords: Mindfulness; acute stress, CSAI-2; military cadets; parachute jumping

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1. Introduction

Choosing a career in the Norwegian Armed Forces elicits the need to develop an ability to work under conditions that will produce high stress, both over time and in acute stressful situations. As a step to become a professional military officer in the Norwegian army, one has to attend the Norwegian Military Academy (NMA). At the NMA officers – referred to as cadets – are enrolled for three years. After graduating from the NMA the cadets will serve as officers in different military units and will most likely take part in international military operations. Changes, uncertainty, complexity, and ambiguity characterize the modern military operational environments. This forces the military leader to constantly rethink his or her role, as well as their norms and values in the chosen military profession (Snider & Matthews, 2012). As a consequence they also need to think of how they will be able to perform different duties and specific missions under extreme stress. An important part of the education at the NMA revolves around learning how to cope with stress in a variety of difficult situations. Soldiers and officers will usually spend a lot of time training on mission specific tasks. A key element of this training is to use the concept of drill to practice these tasks in order to build up a robustness and confidence, ensuring that they will react properly in such situations.

However, it is not possible to train on everything. This means that soldiers and officers will find themselves in situations where the experience of stress is very high, and this may lead to a reduced ability to regulate emotions and to function optimally under stress. A study conducted by Lane, Bucknall, Davis, and Beedle (2012) provides some insights into the use of mental strategies in stressful situations. Lane et al. found that their participants reported significantly higher anxiety both one hour before and immediately before parachute jumping. Participants were furthermore found to be engaged in strategies to increase pleasant emotions while conducting sports, but despite reporting negative emotions of a similar intensity they did not apply these strategies to parachute jumping. Evidence further suggests that emotion regulation is a critical factor in military performance (Davis, Woodman, & Callow, 2010; Fiore, Hoffman, & Salas, 2008; Janelle & Hatfield, 2008; Tenenbaum, Edmonds, & Eccles, 2008; Wallenius, Larsson, & Johansson, 2004). Eccles and Feltovich (2008) have pointed out that psychological skills such as managing self-talk are highly important for performance.

A study conducted by Tang et al. (2007) showed that 5 days of meditation training produced significantly better attention and stress management among the participants. In this study it was concluded, however, that a qualified instructor is very important for learning and practice, and without a teacher, it will be impossible or very difficult to perform the exercise simply by the use of soundtracks. A previous study has shown that an 8-week Mindfulness-Based Strengths Practice (MBSP) program resulted in the building of character strengths and mindfulness. The program was also found to be beneficial in boosting well-being, signature strengths, engagement, purpose, and positive relationships (Niemiec, 2014). Kabat Zinn (1990) states that tension in the muscles can be relieved by directing a non-judgmental attention towards them. Somatic anxiety manifests itself as bodily tensions and mindfulness training may thus contribute to reducing these feelings. This is where theories about mindfulness and awareness training state that we will be better able to handle stressful situations if we practice mindfulness and awareness types of training. Mindfulness training is thought to bring awareness into the present moment and thus facilitate the opportunity to break the automatic stress reactions that usually occur under stress. Stress can be defined as:*"…any circumstances that threaten or are perceived to threaten one's well-being and that thereby tax one's coping abilities"* (Weiten 2001:530). A meditation exercise that emphasizes mindfulness has been found to have a documented effect on neurological activation, breathing and heart rate (Lazar, 2005). An individual's concentration, attention, serenity and ability to tolerate negative emotions will increase (Baer, 2003). The difference is not that one stops responding to negative events, but that the stress reaction fades faster and one does not ponder upon inappropriate action strategies (Lazar, 2005). However, which mental training strategies will enhance an officer's ability to cope with stressful events is not fully understood yet, nor researched enough.

The autonomic nervous system creates physical changes in the body by sending out impulses that put the body on alert and mobilize the body's energy resources (Grossman, 2007). The main task is to control and manage the fundamental processes that allow us to stay alive, for example respiratory and cardiac functions and the hormone balance. Most processes that occur via the autonomic nervous system are not under deliberate control by oneself, and these processes will take place without us being aware of them (Nielsen & Raaheim, 1997). To what extent we notice this activation is dependent on how strong the eliciting stressor is. However, if one is exposed to a strong stressor, this will trigger a high activation of the autonomic nervous system and result in a fight-flight-freeze

response. During this response people will react by either confronting the situation (fight), by getting away from the situation (flight) or by doing nothing in the situation (freeze) (Weiten, 2001). When the fight-flight-freeze response occurs, the body will redirect blood to the major muscle groups, which in turn leads to reduced fine motor skills and cognition (Siddle, 1995). Siddle (1995) calls this activation a hormone-induced activation of the nervous system (HIA) where it is the hormones in the body that cause the heart rate to rise and not any physical activity per se. It is important for military officers to be able to control the brain and body in order to function well in acute stressful situations. Practicing mindfulness may be one tool in order to learn this. Mindfulness is a particular form of attention. The central issue is that you should be fully aware of what is happening at the moment, with an accepting attitude towards whatever might happen. Sensations, thoughts and emotions are experienced simply for what they are (Mace, 2008).

2. Teaching cadets to cope with stress in acute stressful situations

Considering the mental and physical strain facing officers and soldiers in conflict areas, mindfulness could be a transferable skill and could provide a type of mental preparation that can be of great value in stressful situations. Previous research has shown that NMA cadets most likely will face difficult and challenging situations in military operation after graduating from the NMA (Heen, 2006: Heen & Wathne, 2006). Learning to cope with stressful, difficult and unforeseen situations is an integrated process throughout the entire three years of education the cadets at the NMA goes through. In addition to this, extra emphasis on learning how to cope with stress is given to the cadets during module 2.3 that takes place during the second year of education. One of the overarching goals of this module is that "Cadets should know and be aware of their physical and mental limitations in extreme situations" (Krigsskolen, 2010a: 24; my translation). The purpose of module 2.3 is thus to provide a significant contribution to the cadet's ability to cope. The module begins with lectures on stress and stress management, which then can be linked to individual coping with stressful courses such as a parachute course, combat fatigue courses and summer mountain courses. The cadets' own experiences will provide the basis for them as leaders to get better knowledge of reactions to stress and various aspects of stress. Module 2.3 also aims to provide cadets with a foundation from which to reflect on their physical and psychological reactions to stress, and to give them a basis for further development of appropriate coping strategies (Krigsskolen, 2010b).

3. Experiencing stress in acute stressful situations

It was decided to investigate whether mindfulness could help military officers reduce their perception of stress during an acute stressful situation. It was further decided that a parachute course would serve as the acute stressful situation. Novice parachutists have been found to have high levels of anxiety and stress just before the jump (Chatterton, Vogelsong, Lu, & Hudgens, 1997). In a study by Schedlowski and Tewes (1992), participants' heart rate and respiration rate were recorded before and during a parachute jump. Novice parachutists revealed a higher degree of self-rated arousal during the parachute jumps compared to more experienced parachutists. However, the two groups displayed nearly parallel curves for heart and respiration rates. On the other hand, studies have demonstrated that our inner feelings and heart rate do not seem to be very well correlated or coordinated during a parachute jump (Roth, Breivik, Jørgensen, & Hofmann, 1996). Previous research conducted at the NMA has revealed that the parachute course is a significant contribution to help each cadet develop their coping skills. The cadets were found to have tested out and moved their own boundaries during the parachute course. The cadets were also found to have gained an understanding of how stress affects both themselves and others (Boe, 2006).

Being exposed to an acute stressful situation may trigger changes in cognitive anxiety, somatic anxiety, and in ones self-confidence in how to handle these types of situations. Cognitive anxiety may be defined as follows: "Cognitive anxiety is the mental component of anxiety caused by such things as fear of negative social evaluation, fear of failure and loss of self-esteem" (Cox 2007: 201). Somatic anxiety can be described as the anxiety one perceives by perception of and judging of one's own bodily reactions to a situation (Gruszka, Jago, Lea, & Parish, 2001). Siddle (1995) describes self-confidence as a mental condition where anxiety, fear and self-doubt are not present. Siddle (1995) also states that when you lack confidence, your body will produce stress and anxiety. The

degree of self-confidence is very important in stressful situations where one must perform, and the more confidence you have the better you perform.

4. Method

The purpose of this paper was to examine whether it is possible to reduce the perceived experience of stress in an acute stress situation using mindfulness training. More specifically, the purpose of the present study was to investigate whether training on mindfulness would reduce the perception of stress before, during, and after taking part in the parachute training course. An experiment was conducted by randomly dividing the participants into an experimental group that received mindfulness training and a control group that did not. The experiment was conducted during a module devoted to learning to cope with stress, given to the 2nd year cadets at the NMA. Included in this module was a parachute course organized and conducted under the auspices of the Norwegian Army Special Forces. Because of both practical considerations and time limitations, the intervention period consisting of mindfulness training was relatively short and lasted only 12 days.

4.1. Participants

The participants consisted of 63 2nd year officer cadets at the NMA who were attending a military parachute course in November 2010 (FSK/HJK, 2010) as part of their education. The 63 participants were alphabetized and then given a randomized number. The numbers were randomized using a number randomization program (Web 1, 2010). After having set the initial exclusion criteria, the total number of participants was 46. The 46 participants were divided into an experimental group that was given mindfulness training, and a control group that was asked to do as they normally did. The distribution of the two groups was made by typing participant numbers (numbered from 1-46) on small pieces of paper and then blindly picking out 23 of these pieces of paper. When this was completed, another draw decided whether the 23 chosen participants would be placed in the experimental or in the control group. Because of other exclusion criteria being effective during the parachute course, only 27 participants remained at the end of the experiment. 17 participants were in the experimental group and 10 participants were in the control group.

4.2. Procedure

The experiment was based on subjective measurements of perceived stress by collecting data of the participants perceived degree of cognitive anxiety, somatic anxiety and the perceived degree of self-confidence. A questionnaire called Competitive State Anxiety Inventory - 2 (CSAI-2) (Martens, Burton, Vealey, Bump & Smith, 1990) was used to collect data. A full version of CSAI-2 was handed out to the participants at three different times. In addition to the CSAI-2 the participants had to answer a question of how stressful they perceived that their first parachute jump would be, on a scale ranging from 0 (not stressful at all) to 100 (the most stressful situation I have experienced in my entire life). This question was indicated on the first page of the CSAI-2 questionnaire. The first time the questionnaire was given to the participants was in the bus on the way to the landing field after they had been on the training ground just before the day of jumping from the aircraft. The purpose was to measure perceived stress levels after completion of the ground training. The second time the questionnaire was handed out was in the bus in the morning on the jump day, about 4.5 hours before the jumps would be conducted. The purpose of this was to measure perceived stress levels early on the jump day. The third time the questionnaire was handed out was approximately 30 minutes before the participants were going into the aircraft to conduct their first jump. The purpose of this was to measure perceived stress levels close before the first jump.

4.3. The mindfulness intervention

The experimental group who received mindfulness training consisted of 23 cadets. The entire intervention period consisted of 12 days before the actual day of jumping. The experimental group received a 4 hour lecture on mindfulness. During this lecture the group received information about the history and function of mindfulness,

previous findings, and practical training in how to practice mindfulness. After the lecture each participant in the experimental group was given an Mp3 player with two soundtracks and an accompanying booklet with instructions on how to practice mindfulness. The soundtracks consisted of a mindfulness training focusing on body scans and an exercise in attention to breathing. A session would take approximately 30 minutes. The participants were requested to practice a session of mindfulness each day of the intervention period.

4.4. The parachute course

The parachute course was a military course adapted to the needs of the NMA. The course consisted of a ground period of 2-3 days of the necessary theory and practical training, followed by one day where two static-line parachute jumps were performed. The days of ground training consisted of introductory parachute knowledge, knowledge of materials, drills to be performed in the aircraft, drills on how to exit the aircraft, how to steer the parachute while in the air, how to land, and sessions in the jump tower to train properly on how to exit the aircraft. The jump tower is a 12-meter-high tower with a wire path attached to it. Here, participants wore harnesses that were attached to the wire path, making sure the participants could jump out of the tower, get a short fall, and then slide further down the wire path. The ground training ended with an examination jump from the tower and a practical test in parachute landing falls (PLFs) before the participants were approved to perform parachute jumps from an aircraft.

4.5. The parachute jumps

The jumps were conducted during daylight at a military airport in Norway. Participants completed two static-line parachute jumps from a Norwegian Armed Forces Hercules C-130 aircraft. Due to limitations in load capacity, the participants were divided into two groups so that when one group conducted a parachute jump the other group was waiting on the ground. The first jump was performed from the side door, while the second jump was performed from the load ramp at the back of the aircraft. The participants were equipped with a SF-N10 round canopy parachute. This parachute comes with a reserve chute to be mounted on the stomach. The parachute is static-line triggered, which means that it is triggered by a line attached to the aircraft. This line is pulled out of the chute when a person jumps out of the airplane, and when the line is fully stretched it opens up the parachute. The parachute can to some extent be controlled, but it descends relatively straight down, which means that each jumper is dependent upon the jump master inside the plane to know where to drop the jumpers. After exit it takes about 3-4 seconds before the jumper is hanging under the unfolded parachute. On this course the plane used three fly-overs in order to drop the jumpers directly over the landing zone. On the first two fly-overs, 10 jumpers were dropped in each fly-over and on the third fly-over 8 jumpers were dropped. The participants jumped from 1200 feet, approximately 372 meters.

4.6. Exclusion criteria

To be part of the experimental group, it was critical that the participants in this group had been taking part in the initial lecture on mindfulness training. The purpose of the experiment was to investigate the effect of mindfulness training in reducing perceived stress, on participants who had not previously taken part regularly in mental training. Therefore, participants who had been practicing meditation exercises regularly over the past year were excluded from the experiment. Regularity of mindfulness training was set to 1 once a week over a period of 2 months. Participants who previously had performed parachute jumps were also excluded, as this probably would lead to a learning effect and thus affect the perceived degree of confidence and anxiety. Participants who had not filled out all questionnaires during the experiment were also excluded. In addition, all participants had to complete a set of physical tests involving strength tests, running 7 km in 52 minutes with a 22 kg backpack, and a swim test. Participants who failed the tests did not complete the course and were thus excluded from the experiment. During the ground training period, some participants voluntarily withdrew from the course. The total percentage of participants taking part throughout the experiment ended up at 43% in the control group and 73% in the experimental group.

5. Results

The data from the 3 distributed CSAI-2 questionnaires were entered in SPSS 18.0. CSAI-2 is a questionnaire consisting of 27 questions. 9 of the questions measure the degree of perceived cognitive anxiety, 9 other questions measure the degree of perceived somatic anxiety, and 9 questions measure the degree of perceived confidence in a situation characterized by competition. The 9 questions that measured the degree of cognitive anxiety were merged into a new variable. One of the 9 questions was reversed in SPSS so that it was possible to obtain an average of the 9 questions. Another new variable was constructed for the 9 questions that measured the degree of perceived somatic anxiety. A third new variable was likewise constructed for the 9 questions that measured the degree of perceived confidence. These three variables were used in the subsequent analyses of the answers participants gave to the CSAI-2 questionnaires, which were distributed 3 times; that is, after ground training, in the bus on the morning of the day of the jump, and 30 minutes before the actual parachute jump.

5.1. The perception of how stressful the actual parachute jump would be

One of the questions in the distributed CSAI-2 questionnaires was intended to measure how stressful the participants felt that parachute jumping would be for them. They were asked to indicate a value ranging from 0 to 100 as their response to this question, where 0 was not stressful at all and 100 indicated the most stressful situation they had experienced throughout their life. Table 1 gives an overview of the participants' answers to this question divided into the three times the CSAI-2 was distributed.

Table 1. Participants' answers to the question of how stressful it would be to perform a parachute jump. Mean values, F values and significance values.

	Experimental group (n=17)	Control group (n=10)	F-values	Significance values
After the ground training period	48.0	65.2	2.16	.155
4.5 hours before the first parachute jump	54.4	64.5	0.84	.368
30 minutes before the jump	58.1	65.6	0.37	.547

Scale ranging from 0 (not stressful at all) to 100 (the most stressful situation I have experienced in my entire life).

None of the one-way analyses of variance (ANOVAs) showed any significant differences between the two groups. It is still possible to see that the experimental group, clearly, scores much lower than the control after ground training (M=48.0, and M=65.2). The same direction in difference was found 4.5 hours before the first parachute jump, but the difference is smaller (M=54.4 and M=65.4). 30 minutes before the participants' first jump, this difference declined further (M=58.1 and M=65.6). Additional analysis conducted for the experimental group showed an increase of how stressful the participants felt that the parachute jump would be from after the ground training (M = 48.0) 4.5 hours before the first parachute jump (M = 54.4), and then to 30 minutes before the actual jump (M=58.1). This may mean that the closer to the first jump the experimental group came the more stressful the experience of being about to jump was perceived. The effect of mindfulness training was possibly less apparent as the participants approached their first jump. A further analysis for the control group revealed almost no differences in the perceptions of how stressful it would be to parachute out of the aircraft. In other words, the participants in the control group were equally stressed after the ground training (M=65.2) 4.5 hours before the first parachute jump (M=64.5) and 30 minutes before the first jump would take place (M=65.6). The low scores found in the experimental group on the question of how stressful it would be to parachute jump suggests that mindfulness training helped reduce the perception of stress in an acute stressful situation.

5.2. Analyses of CSAI-2

One-way analyses of variance (ANOVAs) were used to investigate whether there were differences between the experiment and the control group. Group was used as the independent variable and the degree of cognitive or somatic anxiety and the degree of self-confidence was used as the dependent variables in the analyses. For each of the three CSAI-2 questionnaires three one-way analyses of variance (ANOVA) were conducted. The three one-way analyses of variance (ANOVAs) measured, respectively, the participants' degree of cognitive anxiety, somatic degree of anxiety and level of self-confidence.

5.3. Perceptions of stress after ground training

The answers given by the participants to the CSAI-2 handed out after completion of ground training yielded no significant differences in the degree of cognitive anxiety, somatic anxiety or self-confidence between the two groups. Table 2 provides an overview of the participants' answers.

Table 2. Participants answer to the CSAI-2 after ground training. Mean values, F values and significance values.

	Experimental group (n=17)	Control group (n=10)	F-values	Significance values
Cognitive anxiety	1.39	1.50	1.09	.306
Somatic anxiety	1.51	1.60	0.42	.523
Self-confidence	3.44	3.11	0.26	.119

Scale ranging from 1 (not at all) to 4 (very much).

As one can see from table 2, no significant differences were found between the two groups regarding the perceived degree of cognitive anxiety, somatic anxiety or self-confidence. It turned out that participants in the experimental group had a higher degree of self-confidence (M=3.44) compared to the control group (M=3.11). Again, the lower scores on cognitive anxiety and somatic anxiety as well as the higher score found on self-confidence in the experimental group indicates that mindfulness training helped in reducing the perception of stress in an acute stressful situation.

5.4. Perceptions of stress 4.5 hours before the first parachute jump

4.5 hours before the first parachute jump the participants had to fill out the CSAI-2 for the second time. One-way analyses of variance (ANOVAs) were performed and a significant difference in the degree of somatic anxiety between the two groups was found. The participants' answers given to the CSAI-2 questionnaire that was distributed 4.5 hours before the first jump can be seen in table 3.

Table 3. Participants answer to the CSAI-2 4.5 hours before the first parachute jump. Mean values, F values and significance values.

	Experimental group (n=17)	Control group (n=10)	F-values	Significance values
Cognitive anxiety	1.29	1.39	0.59	.448
Somatic anxiety	1.48	1.85*	6.11	.021
Self-confidence	3.38	3.00	3.15	.089

Scale ranging from 1 (not at all) to 4 (very much). *p<. 05.

Table 3 reveals that the experimental group scored themselves much lower on the degree of somatic anxiety (M=1.48) compared to the control group (M=1.85). Furthermore, a strong tendency was found as the experimental

group scored themselves higher (M=3.38) on self-confidence than the control group (M=3.00). Regarding the degree of cognitive anxiety, an almost negligible difference was found between the two groups. The experimental group scored themselves somewhat lower (M=1.29) than the control group (M=1.39). Following the same pattern as found after ground training, the experimental group revealed lower scores on cognitive anxiety and somatic anxiety and a higher score on self-confidence than the control group. This indicates that the mindfulness training given to the experimental group helped the participant reduce the perception of stress in an acute stressful situation.

5.5. Perceptions of stress 30 minutes before the first parachute jump

The CSAI-2 questionnaire was distributed for the third time to the participants 30 minutes before the first jump. One-way analyses of variance (ANOVAs) were again conducted and an almost significant difference in the degree of somatic anxiety between the two groups was found. The answers that the participants gave to the CSAI-2 questionnaire that was distributed 30 minutes before the first jump can be seen in table 4.

Table 4. Participants answers given to the CSAI-2 distributed 30 minutes before the first parachute jump. Mean values, F values and significance values.

	Experimental group (n=17)	Control group (n=10)	F-values	Significance values
Cognitive anxiety	1.30	1.67	0.04	.845
Somatic anxiety	1.71	1.94	3.39	.078
Self-confidence	3.23	3.17	0.06	.547

Scale ranging from 1 (not at all) to 4 (very much), *p<. 05.

Table 4 reveals that the experimental group scored themselves a bit lower on cognitive anxiety (M= 1.30) when compared to the control group (M=1.67). Regarding the degree of somatic anxiety, again a strong tendency was found: the experimental group scored themselves a little lower (M=1.71) compared to the control group (M=1.94). Although the difference just before the first parachute jump was not significant, this indicates that there is a strong tendency for the experimental group to continue to have lower somatic anxiety than the control group. Thus the perception of stress was reduced during an acute stressful situation. Table 4 furthermore shows that there was a very small difference between the two groups regarding the degree of self-confidence, M=3.23 and M=3.17 for the experimental group and the control group, respectively. The strong tendency revealing a difference in somatic anxiety between the two groups may indicate that the mindfulness training that the experimental group had conducted still had an effect, but that the total stress level just before the first parachute jump is high anyway. Corroborating the previously found pattern, for the third time, the experimental group scored lower on cognitive anxiety and somatic anxiety and scored higher on self-confidence than the control group. It must be pointed out that the self-confidence in the two groups is almost identical; indicating that mindfulness training may have an effect upon reducing the perceived stress in an acute stressful situation, but that this effect is not transferable to self-confidence.

5.6. Differences in perceptions of stress over time

In order to find out if the mindfulness training had an effect over time in reducing the perceived stress during an acute stressful situation, a comparison between the answers from the three CSAI-2 questionnaires was made. Table 5 provides an overview of the participants' answers given to the CSAI-2 the three times it was distributed, that is, after ground training (T1), 4.5 hours before the first parachute jump (T2) and 30 minutes before the first parachute jump (T3).

Table 5. Participants' answers to the CSAI-2 after ground training (T1), 4.5 hours before the first parachute jump (T2) and 30 minutes before the first parachute jump (T3). Mean values, F values and significance values.

		Experimental group (n=17)	Control group (n=10)	F-values	Significance values
Cognitive anxiety	at T1	1.39	1.50	1.09	.306
Cognitive anxiety	at T2	1.29	1.39	0.59	.448
Cognitive anxiety	at T3	1.30	1.67	0.04	.845
Somatic anxiety	at T1	1.51	1.60	0.42	.523
Somatic anxiety	at T2	1.48	1.85*	6.11	.021
Somatic anxiety	at T3	1.71	1.94	3.39	.078
Self-confidence	at T1	3.44	3.11	0.26	.119
Self-confidence	at T2	3.38	3.00	3.15	.089
Self-confidence	at T3	3.23	3.17	0.06	.547

Scale ranging from 1 (not at all) to 4 (very much). *p<. 05

Table 5 indicates that the experimental group had lower cognitive anxiety at all three data collection points (T1-T3) compared to the control group. Participants in the experimental group also experienced a slight decrease in cognitive anxiety from T1 to T3, indicating that as the first parachute jump got closer, they perceived that they felt less cognitive anxiety and were less stressed than the control group. The control group also decreased their level of cognitive anxiety from T1 to T2, but increased their level of cognitive anxiety from T2 to T3. This may indicate that as the first parachute jump came closer in time, the participants in the control group became more stressed, especially 30 minutes before the first jump. Furthermore, the experimental group had lower somatic anxiety than the control group at the three different data collection points (T1-T3), again indicating an effect of the mindfulness training they had received. The largest difference in somatic anxiety between the two groups was found at T2, indicating that the experimental group felt considerably less somatic anxiety 4.5 hours before the first parachute jump than the control group. This difference was significant, supporting the claim that mindfulness training had a significant effect upon reducing the perceived level of somatic anxiety in the experimental group. However, the experimental group revealed an increase in somatic anxiety at T3 30 minutes before the first parachute jump, but still scored lower than the control group.

The experimental group also revealed higher self-confidence than the control group on all three data collection points (T1-T3), indicating that the received mindfulness training reduced the perception of stress during an acute stressful situation. However, the self-confidence in the experimental group decreases somewhat from T1 to T2 and then again from T2 to T3, suggesting that as the first parachute jump becomes closer in time, the self-confidence goes down. The control group also drops in self-confidence from T1 to T2, but shows an increase from T2 to T3. Still, the control group scores lower at T3 than the experimental group. The difference between the experimental group and the control group at T2, that is, 4.5 hours before the first parachute jump, lends support to the notion that mindfulness had reduced the perception of stress during an acute stressful situation.

6. Conclusion

The purpose of the present study was to investigate whether mindfulness training could help to reduce the perception of stress during an acute stress situation. An experiment was conducted with an experimental group that received mindfulness training and a control group with no mindfulness training. A questionnaire measuring perceived cognitive anxiety, somatic anxiety and confidence was used at three different data collection points. The participants were also requested to answer a question indicating how stressful they perceive the first parachute jump would be. It was found that the experimental group had scored themselves lower than the control group regarding the question of how stressful it would be to parachute. This was found after ground training, as well as 4.5 hours and 30 minutes before the first parachute jump, indicating that the mindfulness training had had an effect and reduced the perception of stress during an acute stress situation. However, the differences were not significant.

The experimental group also scored lower than the control group on cognitive anxiety and somatic anxiety after ground training, 4.5 hours and 30 minutes before the first parachute jump, again indicating an effect of mindfulness

training. The experimental group also revealed a higher self-confidence after ground training, and 4.5 hours and 30 minutes before the first parachute jump. This finding lends support to that mindfulness training again had an effect and aided in the reduction of perceived stress during an acute stress situation.

In total, the results showed a consistent difference between the experimental group and the control group regarding their perception of stress. Keeping in mind that both groups initially had the same assumptions, prior to the intervention given to the experimental group, it is initially tempting to conclude that it is mindfulness training that contributed to this difference. Bearing in mind that the differences found were not significant, except at one occasion, one may only suggest that mindfulness training may help to reduce the perception of stress in an acute stressful situation such as a parachute jump.

It is also difficult to rule out any other factors that may have influenced the results. The theories around mindfulness training support the idea that it could reduce stress in the short term, but are contradicted by the notion that the training one receives should be guided by competent teachers. As only subjective measurements were used in the present study it is difficult to know what the results would have been if objective measures had been used instead (for instance by using heart rate monitors). The participants were also unevenly distributed, indicating that differences within the control group would result in a greater influence on the result than in the experimental group. In addition, the motivation to answer as honestly as possible might have had have an impact on the results. The Hawthorne factor could also be a possible explanation for the differences in results between the groups (McCarney et al., 2007). Just the fact that the participants in the experimental group were given more attention may have inflated the differences that were found. A conclusion is drawn that mindfulness training may have an effect and helped reduce perceived stress in the experimental group. The basis for this is that the data showed consistent results, as well as both strong trends and significant differences. However, more research is needed on this subject.

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