Main title – Investigating the effect of emotions on the experience of pain

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Summary

The overall aim of this experiment was to investigate the effect of emotions on the experience of pain. The researchers were particularly interested in the positive and negative effects of emotion, mood and feelings in dealing with the physical sensation of pain when a person is in a relaxed, mindful state in comparison to when a person is in a distressed state of mind. The overall aim of the experiment was to find out if mindfulness would make a difference to the perception of pain.

Participants were assigned randomly to one of three groups, mindfulness, distress or control. The mindfulness exercise was a 14-minute relaxing pre-taped instructions on how to relax and breathe, and gave suggestions about pain management. The distress exercise was a 14-minute documentary on frostbite, which showed graphic scenes of frostbite victims. The control group watched a 14-minute documentary on 'How Insight works.'

There were two separate self-report questionnaires that participants filled in several times throughout the experiment. The first was the pain catastrophizing scale (PCS) whereby participants were asked to rate 13 items from 0 to 4, 0 being 'not at all' to 4 being 'all the time.' These statements related to how the participants felt when they were ever in pain, such as experiencing a headache or muscle pain. The second self-report questionnaire was the positive and negative affect schedule (PANAS), which consisted of 10 negative and 10 positive words relating to mood, emotion and feelings. Participants again rated the positive affect (PA) and negative affect (NA) from 0 to 4, with 0 being 'very slightly or not at all' to 4 being 'extremely.'

The other two tests dealt with how participants perceived the sensations of distress or pain at the time. Pulse transducers were connected to each side of the forehead to determine the blood flow. These were connected throughout the experiment and were used to determine at any point how the physical body was responding. An algometer was used to measure the participant's sensitivity to pain. Participant were trained to identify when the sensation turned to pain, first on the back of the hand and then on each side of the forehead at different times during the experiment.

The painful event that each participant experienced was called the cold pressor test (CPT). The participants were to place a hand in icy water for 1 minute, three times. The results of the tests were analysed and the experiment was divided into three separate studies for each researcher to investigate.

This specific study investigated the effects of short-term, therapist-free mindfulness and distress on anticipatory anxiety to painful events. This study only concentrated on how a participant felt before the actual mindfulness/distress/control exercise took place and compared these reactions to how they felt immediately afterwards. Participants would have been experiencing a certain amount of

anxiety knowing that there was going to be a certain amount of discomfort, unpleasantness and pain, that is, anticipatory anxiety, when they placed their hand in icy water. Anticipatory anxiety usually makes the pain event even more painful, causing more anxiety and possibly setting up a cycle of increasing anxiety and pain. This has devastating effects on individuals, who avoid and procrastinate to the point of not dealing with their injury, or avoiding events such as the dentist or surgery, or even participating in exams or doing a presentation.

By using a mindfulness exercise before the CPT, it was anticipated that this would reduce the anxiety and relax the person, bringing them back to a more neutral, non-emotional state of mind so that their perception of the actual painful event would not be as exaggerated. By using the distress exercise before the CPT, it was anticipated that there would be more distress and anticipatory anxiety. By having a control group, it was anticipated that the anxiety would remain the same before and after the documentary.

There were several interesting effects that happened. Participated in the short-term, therapist-free mindfulness training exercise had the most significant results. They performed exactly as was anticipated. Catastrophizing (using CPS), moods, emotions and feelings (using PANAS) and their sensitivity to pain (using the PPT) were reduced. An interesting concept about mindfulness is that it reduces not only the negative but also the positive state of mind bringing the person back to a more neutral mind state, so they can make better decisions. For instance, if a person is extremely angry or extremely happy it can distort the situation and therefore affect the reality of the situation. Mindfulness brings the person back to a more neutral, non-emotional state whereby they are neither angry nor happy. Previous research has not been able to make this distinction, so this study may have broken new ground for future research.

People who were in the distressed group did not perform as was anticipated. They actually behaved as though they were fearful rather than anxious after the frostbite video. When a person is anxious their perception of pain increases, however, when a person is in a fearful situation, their perception of pain actually decreases as they appear to be in a survival mode, so they can attend to the situation itself rather than the pain. More research is needed to determine when anxiety begins and when fear takes over.

The control that was used turned out to be yet another distraction strategy, whereby most of the results were similar to the mindfulness exercise. Mindfulness, however, had the most dramatic effects, showing that mindfulness was the best activity to reduce anticipatory anxiety.

This study has been very successful in investigating the effects of short-term, therapist-free mindfulness showing in this instance that mindfulness reduces anticipatory anxiety to a painful event. More research is needed to replicate this experiment and use more participants to be able to analyse more results. Thank you to all those who participated making this such an exciting and worthwhile experiment