

Mindfulness, slow diaphragmatic breathing and virtual reality based intervention for chronic pain – a case study.

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Mindfulness based interventions (MBI) are widely used in treatment of chronic pain. Substantial evidence exists supporting beneficial effects of those methods. MBI's are characterised by open, non-judgemental attention to present moment experiences, without an attempt to change those experiences.

However, several other effective methods of working with pain exist, which imply certain modifications of experience. One of them is slow diaphragmatic breathing (SDB) – with frequency of about 6 cycles per minute. Such breathing techniques may influence pain through cardiovascular mechanisms.

Other potentially useful methods involve guided imagery – creating, and transforming visual mental representation of pain. The same underlying logic may be realised with virtual reality (VR) interventions – allowing patients to observe, and transform virtual representation of pain. Using VR may be especially useful for patients with low mental imagery abilities. We present a feasibility study of therapeutic protocol combining mindful awareness, SDB, and VR based interventions – with the hope, that synergistic effects on pain could be obtained by applying three different therapeutic mechanisms. Protocol consisted of 10 one-hour long sessions, including body scan, observation of breath, biofeedback-based SDB, and a combination of VR with SDB, where patients were also encouraged to cultivate attention to present moment experience of both slow breathing, and pain.

Protocol was tested on 10 chronic pain patients, however we focus on a single-case - presenting in more detail both the procedure, and therapeutic experiences of one patient with lower back and hip joints pain. Both qualitative and quantitative data are presented and analysed. Entire procedure lasted 8 weeks. Pain intensity data was collected every day using visual analogue scale. Linear regression was computed to predict pain intensity based on time. Regression equation was significant ($F(1,49)=20.47, p<.0001$), with R-squared of 0.29. Participant's pain intensity decreased 0.04 points on VAS for each day. Qualitative data from patient's descriptions of pain experience also show beneficial effects of therapeutic intervention on pain, stress level, and well-being.

In conclusion – it seems possible to combine MBI, SDB and VR based interventions into one coherent therapeutic procedure. Such procedure was well received by patients, and we present more detailed data from one particular case.