



CASE STUDY

Upper limb, neck and chronic headache pain

INTRODUCTION

C. is a 56 year old female who was in a multiple car accident where she was hit from behind that resulted in a fracture in her left wrist December 2010. She has worked with chiropractors, acupuncture and physical therapists and still has pain. She was administered a nerve ablation, massage and botox in September of 2017 with slight relief. Her pain consists of stabbing head pain from the base of the skull that radiates to the neck, shoulder and upper back. C. operates her own restaurant requiring her to lift tables and keyboarding for prolonged periods of time resulting in headaches and a reduction in engaging in work related tasks. She reports issues related to sleeping and having to leave work to ice her neck due to her pain. In addition she also has degenerative disc disease in her spine.

GOALS

- Patient will decrease pain levels on a more consistent basis
- Patient will increase engagement in work-related tasks with proper body mechanics
- Patient will incorporate breathing techniques in daily work life for coping with pain

PROGRESSION

C. received 8 sessions total of Karunas VET following the protocol below:

- Induction
 - 8-10 minutes of predictive coding
- Graded exposure
 - Varied week by week using goal-directed modules to promote trunk rotational movements as well as trunk flexion and extension. Modules incorporated the following activities:
 - goalkeeping,
 - target shooting,
 - Kitchen ADL scene
- Guided Audio Breathing Module

RESULTS

Overall, C. had decreases in her pain scores using a Visual Analog Scale in 7 of the 8 sessions (see table 1). In addition, she had improved scores on the Fear Avoidance Beliefs Questionnaire (FABQ), Brief Pain Inventory (BPI), The Tampa Scale of Kinesiophobia, the

DASH, the PHQ-9, two of the three domains of the Pain Catastrophizing Scale (PCS), and 6 of the 7 domains of the PROMIS-29.

- The FABQ was used to measure the effects of pain on behavioral avoidance of life situations, work, and physical activities. C. had a decrease in scores demonstrating improvements in her fear-avoidance beliefs related to **work** and **physical activity** (see Table 2).
- C. had an improvement in scores using the Tampa Scale of Kinesiophobia from 45 to 38 from baseline to follow-up (see Table 4).
- The DASH scores improved from 38.3 to 33.6 from baseline to follow-up (see Table 5)
- The PHQ-9 was used to assess items related to the DSM-5 diagnostic criteria for depression, including mood, anhedonia, appetite, sleep, suicidality, guilt, concentration, and others (Kroenke, et al. 2001). Her scores also improved with a score of 23 at baseline and a score of 12 at follow-up (see Table 6)
- The PROMIS-29 is used to measure self - reported physical, mental and social health and wellbeing and improved in scores in 7 of the 8 domains (see Table 9)

C. reported, “The pain situation that precipitated me coming in here is major whiplash which has caused ongoing headaches, daily morning and night, muscle spasms and stiffness and soreness in the neck and shoulders. Having tried other things including nerve ablation I was trying to find something that will continue to provide some relief. Coming into this, I was very open-minded, I've seen some of the evidence of how mirror therapy for people who have missing limbs has worked to eliminate their pain in the phantom limb population so I thought perhaps this could help with moderating to some degree to the pain I have experienced. What has been interesting is just putting yourself in a setting that isn't yourself, which detaches your thoughts that it is you doing the activities, and so I don't know if that distraction is what it seems easier to do the activities or if its something other than that but that has been interesting me. What also has been interesting to me has been very much the highlight of what I have recognized in the treatment overall being the benefit of meditation overall and the central nervous system decompression of deep breathing being the most effective. There was information that was certainly new that is useful to have as part of the tool kit to cope with ongoing pain. I think that the first treatment was the most intense in terms of getting used to the idea of the headset and so that first day really required a bit of recovery form the treatment but in general after figuring out that I just needed to adapt after using the headset, that I did just feel a little more aided and assisted as well as the situation was being addressed so I could get through the day better.”

Table 1: Visual Analog Scale Pain Score Results from session to session:

Session	Pre	Post
1	5.0	4.9
2	4.1	4.4

3	4.1	3.3
4	5.7	5.5
5	5.3	4.2
6	5.8	5.6
7	7.3	5.4
8	5.5	3.9

Table 2: FABQ, Baseline and Follow-up

	Pre	Post
FABQ-Work	38	26
FABQ-Physical Activity	9	7

*FABQ measures the effects of pain on behavioral avoidance of life situations, work, and physical activities. Higher scores are indicative of higher fear-related beliefs

Table 3: BPI, Pain interference on various domains in life

Pain Interference on:	Pre	Post
General Activity	1	6
Mood	4	5
Walking Ability	1	4
Normal Work	6	6
Relationships with other people	4	6
Sleep	8	10
Enjoyment on life	8	10

*BPI assesses clinical pain. Questions are related to assessing how pain interacts with quality of life measures such as activities of daily living.

Table 4: Tampa Scale of Kinesiophobia

Pre	Post
45	38

*measures fear of movement in relation to chronic low back pain and has been used to assess other musculoskeletal conditions

Table 5: DASH

Pre	Post
38.3	33.6

*measures disability of upper extremities

Table 6: PHQ-9

Pre	Post
23	12

*A depression inventory that assesses items related to the DSM-5 diagnostic criteria for depression, including mood, anhedonia, appetite, sleep, suicidality, guilt, concentration, and others

Table 7: Pain Catastrophizing Scale

Subscale	Pre	Post
Rumination	4	5
Magnification	5	3
Helplessness	9	6
Total Score	18	14

*Measures the mechanisms which catastrophizing impacts the experience of pain.

Table 8: Simulator Sickness Questionnaire

Pre	Post
0	0

*Assesses simulator sickness in the domains of nausea and oculomotor symptoms in the context of using as simulator

Table 9: PROMIS-29

Pain Interference on:	Pre	Post
Physical Function	8	8
Anxiety	9	8

Depression	12	7
Fatigue	19	18
Sleep Disturbances	12	11
Ability to participate in social roles and activities	7	10
Pain Interference	12	10
Pain intensity	6	6

*measures self - reported physical, mental and social health and wellbeing