Liedl, A. & Knaevelsrud, C. (2008). ***PTBS und chronische Schmerzen - Entstehung, Aufrechterhaltung und Zusammenhang: ein Überblick.*** Der Schmerz, 22, 644-651.

Der Zusammenhang zwischen chronischen Schmerzen und der Posttraumatischen Belastungsstörung (PTBS) wird erst seit kurzem intensiver diskutiert. Ziel dieses Artikels ist es einen aktuellen Literaturüberblick zur Entstehung und Aufrechterhaltung der PTBS und chronischer Schmerzen zu geben sowie die existierenden Zusammenhangsmodelle der beiden Störungen kritisch zu erläutern. Abschließend wird ein eigenes Modell, das „Perpetual Avoidance Model", dargestellt und daraus abgeleitet Implikationen für die Praxis beschrieben.

Liedl, A. & Knaevelsrud, C. (2008). ***Chronic Pain and PTSD: the Perpetual Avoidance Model and its treatment implications*.** Torture, 18 (2), 69-76.

Posttraumatic Stress Disorder (PTSD) and chronic pain are frequently seen in the aftermath of a traumatic experience. Torture survivors have an increased risk suffer from these two disorders. Although many studies report the high comorbidity, there is still insufficient knowledge on the mechanisms of the development and maintenance of PTSD and chronic pain.
After providing an overview of the current literature concerning the comorbidity of these two disorders, we will present the „Perpetual Avoidance Model" (PAM). This model provides an explanation of the reciprocal maintenance of both disorders and offers treatment implications.

Liedl, A., O'Donnell, M., Creamer, M., Silove, D., McFarlane, A., Knaevelsrud, C. & Bryant, R. (2010). ***Support for the mutual maintenance of pain and posttraumatic stress disorder symptoms***. Psychological Medicine, 40 (7), 1215-1224.

Background. Pain and post-traumatic stress disorder (PTSD) are frequently co-morbid in the aftermath of a traumatic event. Although several models attempt to explain the relationship between these two disorders, the mechanisms underlying the relationship remain unclear. The aim of this study was to investigate the relationship between each PTSD symptom cluster and pain over the course of post-traumatic adjustment. **Method**. In a longitudinal study, injury patients (n=824) were assessed within 1 week post-injury, and then at 3 and 12 months. Pain was measured using a 100-mm Visual Analogue Scale (VAS). PTSD symptoms were assessed using the Clinician-Administered PTSD Scale (CAPS). Structural equation modelling (SEM) was used to identify causal relationships between pain and PTSD. **Results**. In a saturated model we found that the relationship between acute pain and 12 month pain was mediated by arousal symptoms at 3 months. We also found that the relationship between baseline arousal and re-experiencing symptoms, and later 12-month arousal and re-experiencing symptoms, was mediated by 3-month pain levels. The final model showed a good fit [x2=16.97, df=12, p>0.05, Comparative Fit Index (CFI)=0.999, root mean square error of approximation (RMSEA)=0.022]. **Conclusions**. These findings provide evidence of mutual maintenance between pain and PTSD.

Liedl, A., Mueller, J., Morina, N., Karl, A., Denke, C. & Knaevelsrud, C. (2011). ***Physical activity within a CBT improves coping with pain in traumatized refugees – results of a randomized controlled design.*** Pain Medicine, 12 (2), 234-45.

Objective. Many traumatised refugees suffer from chronic pain and posttraumatic stress disorder. Based on the Mutual Maintenance Theory and the Perpetual Avoidance Model we examined in this study the additional effect of physical activity within a biofeedback-based cognitive behavioural therapy (CBT-BF) for pain management in traumatized refugees. **Design.** In a controlled design 36 patients were randomised into one of three conditions (biofeedback-based CBT (CBT-BF), biofeedback-based CBT with physical activity (CBT-BF+active) and waiting list control group (WL)). Thirty patients (n=10 in each group) completed treatment and 3 months follow up assessment. Participants were assessed for coping strategies, pain and mental health status and physiological reactivity before and after the intervention and at 3 months follow up. Treatment effects were analyzed using analyses of variance with baseline scores as covariates (ANCOVAs) and reliable change index (RCI). **Results**. CBT-BF and CBT-BF+active showed improvements in all outcome measures as compared to WL. Effect sizes in the main outcome measures were higher in CBT-BF+active compared to CBT-BF. Repeated measures ANCOVAs showed significant group effects for coping strategies in particular for the subscales “cognitive restructuring” and “counter-activites”, as well as a by trend significant group effect for “perceived self competence” showing that participants in CBT-BF+active showed better results compared to CBT-BF. Moreover 60% of participants in CBT-BF+active showed intraindividual clinically reliable change in at least one subscale of the pain coping strategies questionnaire. For comparison, only 30% of participants in CBT-BF showed clinically reliable change. **Conclusion**. Results of improved coping strategies, higher effect sizes and higher amount of clinical improvement in the CBT-BF+active group suggest that physical activity has added value to interventions that address pain management in traumatized refugees. Because of the small sample size these preliminary results should be replicated in a larger trial.