

Understanding Post-Traumatic Stress Disorder and the Effectiveness of Therapeutic Mechanisms: A Brief Overview

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Abstract

Post-Traumatic Stress Disorder (PTSD), is often linked to experiences in war, but it can arise from a variety of intense traumatic events. This disorder is characterized by symptoms such as increased avoidance of reminders related to the trauma, heightened negative thoughts, and mood fluctuations that lead to changes in arousal in response to certain stimuli (American Psychiatric Association, 2013). While the exact mechanism behind PTSD remains unclear, research has enhanced our understanding of its underlying processes. Our general knowledge of PTSD largely stems from the interaction between two main brain structures such as the amygdala and the prefrontal cortex along with other associated areas. The amygdala is responsible for most of our survival instincts, whereas the prefrontal cortex is responsible for reasoning. In PTSD as with other traumas the prefrontal cortex is suppressed for longer periods of time (Harnett, N. A., Goodman A. M., & Knight D. C., 2020). There is an indication that the trigger mechanism is more complex often involving coupling CEN and SN before the involvement of DNS system (Dossi, G., Delvecchio, G., Prunas C., Soares J. C. & Brambilla, P., 2020). Effective treatment for PTSD typically involves both top-down and bottom-up approaches, involving the incorporation of several therapeutic methods such as hypnotherapy, cognitive-behavioral therapy (CBT), mindfulness practices, and pharmaceutical interventions.

Keywords: ptsd; trauma; therapy

Introduction

Post-traumatic stress disorder (PTSD) has been historically associated with returning veterans from war. However, it can affect anyone who has undergone or has been exposed to prolonged intense traumatic experiences. PTSD is less pervasive in the general population and exists in about a quarter of the population that suffers from existing trauma (Kedrow, M.A., Fenster R.J. Laurent E.S. & Phelps, E.A., 2021). PTSD can generally be characterized as an intense yet pervasive repeated set of memories occurring in a sequence, eventually exerting control by overshadowing critical mental functioning, and eventually becoming the dominant thought or preoccupation. Even though the exact mechanisms involved are not known, there is evidence from various research observations that elude as to how it functions. Our present understanding of PTSD and its features arises from the human fear response originating from actions of the amygdala and the inability of the prefrontal cortex or PFC to tone it down (Harnett, N. A., Goodman A. M., & Knight D. C., 2020). Perception of incoming external stimuli and the corresponding inappropriate segmentation of incoming information is responsible for the variation in the severity of PTSD (Pitts, B. L., Eisenberg, M.L., Bailey

H.R. & Zacks, J.M., 2022). The therapeutic tools used to curb both increased emotional and cognitive arousal include hypnosis, and CBT to name a few. Our current understanding of PTSD comes from the factors that initially drive the fear response. Symptoms individuals suffering from this condition exhibited greater avoidance of reminders of particular events, elevated negative thoughts, and mood leading to changes in arousal in response to given stimuli (American Psychiatric Association, 2013). Generally, the amygdala being a primal structure, is responsible for vigilance, arousal, and emotional responses related to threats whether real or imagined. Conversely, the PFC along with the hippocampus are responsible for minimizing the effect of this response. In PTSD there seems to be a greater activation of the amygdala and inhibition of the PFC to counteract its effect (Harnett et al, 2020). Other structures, in recent fMRI studies, indicate areas in the DNS system comprised of the middle temporal, PCC, Medial PFC, inferior lobes, and the temporal complex tend to remain active even though they should deactivate when cognitive performance is required (Dossi, G., Delvecchio, G., Prunas C., Soares J. C. & Brambilla, P., 2020). Arousal studies, noted by Ross and Van

Blockstaele (2020), indicate that the Locus Coeruleus (LC), is responsible for coding both psychological and physiological responses through the firing of the Norepinephrine System (NS) and is closely linked to the coupling of CEN (central executive network) and SN (salience networks) and then the DMN, rather than the DMN network alone. Furthermore, it was noted that hyper-activation in response to the lack of coupling in the SN system directly relates to an abnormality in the LC-NE System as seen in the inability to prioritize incoming information and events. This leads to the inability to clarify incoming information and deficits in memory. Arousal has both cognitive and an emotional component usually working in conjunction in the presence of a perceived threat. There is a marked increase in vigilance and emotional responses to that perceived threat. In PTSD cognitively similar memories usually recalled from experience do not elicit the same response as exact memories of a singular event. Incoming sensory information from the environment is likely to be segmented improperly (Zacks, J. M., & Swallow, K. M., 2007). This can be due in part to the inability of these individuals to focus on irrelevant cues leading to the inevitable deficits in processing everyday events (Pitts et al., 2022). Focusing on irrelevant cues might be an attempt to limit the expenditure of unnecessary energy and an attempt to limit relevant cues that spur memories of the traumatic event. In part, this understanding as a backdrop has led to the utilization of many existing therapies and a combination of others providing positive outcomes. In addressing positive therapeutic outcomes both the top-down and the bottom-up therapies have been used. Bozorkhau, Azadmehr, Hashempour, Matloub, Matloub, Mansouri & Taheri (2022) surmised that hypnosis was more effective when taken alone compared to cognitive behavioral therapy. Hypnosis does require critical thinking and cognitive behavioral therapy helps in processing information as it relates to a person's thoughts, feelings, and behaviors. Likewise, Stein and Rothbaum (2018) noted that previous studies indicated patients suffering from PTSD when undergoing 2-3 weeks of cognitive therapy showed a 20-point decrease on the PTSD checklist with a 95 percent completion rate. Field studies using the TRM model which utilizes many of the available talk therapies, combined with CBT, mindfulness, and pharmaceutical treatments have shown significant results in building resiliency (Grabb & Karas, 2017). It is thought to be effective in dealing with both cognitive and emotional impairment and at the same time allows for greater adaptability. For example, when the TRM model was used on Thailand tsunami victims after 1-2 sessions about 90% reported either a partial or full recovery from PTSD (Parker, Doctor, & Selvam, 2008). The results were comparable to Hurricane Katrina and Rita (Leitch, Vanslyke, & Alenn, 2009) noting an increase in resiliency and a marked decrease in PTSD symptomology. PTSD is often a very complex issue to treat as it involves various aspects of human functioning. Two main factors have been noted in most of the research cognition and the perception of a threat and the other is emotional responses to that threat. The responses of both rely on previous history and experiential cues. The hyperactivation of the amygdala and the suppression of the hippocampus, PFC, and other related structures (Harnett et al, 2020) only increase the hypervigilance and emotional arousal of the individual suffering from this disorder. The question then remains why one set of traumatic memories dominates thought processes while ignoring contextually similar ones. If we believe the segmentation

theory, then the various segments of a given memory would be reinforced in the significantly and in the similar manner resulting in its precise parameters when recalled. Arousal studies gave a clearer understanding of the switch between psychological and physiological mechanisms involving the LS-NS system and the effects of coupling of both the CEN and SN systems (Ross, J. A., & Van Bockstaele, E. J., 2021). Treating the effects of this disorder requires an understanding of creating a way to alleviate both cognitive and emotional distress and espousing resiliency during therapeutic interactions. Most successful therapeutic combines aspects of talk therapy without negating emotional understanding of existing abnormalities. Despite the many strides in research the exact mechanisms and precursors to these mechanisms are elusive requiring more research.

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