

Long Term Effects of Post-Traumatic Stress Disorder on Somatosensation

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ABSTRACT

Post-traumatic stress disorder (PTSD) is a psychiatric condition caused by encountering or enduring traumatic or life-threatening events. Traumatic stress causes a wide range of psychological and physiological effects. PTSD has significant psychological consequences that can negatively impact a person's daily life and even put their life in jeopardy. This study will analyse current understanding about PTSD and evaluate the influence of long-term PTSD on Somatosensation to provide a fresh perspective. We looked at 44 evidence-based studies ranging from recent to archaic times focussed on the negative impacts of PTSD in order to better understand the wide range of disorders that can precede it, as well as the impact it has on a person's psychological and physiological functioning. Through the course of this study, we were also able to understand that the current situation could lead to a dramatic increase in the number of patients diagnosed with PTSD in the coming decade. Thus, this research provides evidence that long-term PTSD has a direct relationship with the impacts on Somatosensation, i.e., long lasting PTSD has repercussions on our Somatosensation.

Keywords: *Post Traumatic Stress Disorder, Somatosensation, Mental Disorders*

Post-Traumatic Stress Disorder (PTSD) is a mental disorder that can occur following exposure to events that represent actual or threatened death violence, serious injuries or sexual violence. For instance, it can occur after we have directly experienced a traumatic event or personally witnessed the traumatic event occurring to others or learn that the traumatic event has occurred to a family member, host or close friend. Now in the event of a traumatic incident happening to a close friend or family member, the event can either be deliberate violence or accidental. However, in the case of PTSD, a person develops this disorder after repeated exposure to trauma or extreme exposure to aversive details of the traumatic event. If you possess the disorder then the symptoms present can be divided into two clusters, namely intrusion symptoms: this includes, distressing intrusive memories, flashbacks or the sense of reliving the traumatic event, nightmares related to the trauma or related events, experiencing psychological distress upon reminders of the trauma and

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physiological reactions such as shortness of breath or heart pounding. The second form of symptoms is the avoidance symptoms which entails the tendency to avoid any reminders of the trauma which can lead to a dysfunctional lifestyle followed by shattering of our belief systems, for example; having persistent negative belief about oneself/ about the world/ future, facing difficulty when experiencing positive emotions, persistent negative emotions, diminished interest in activity and of course mood irritability, angry outbursts, hypervigilance, feeling excessively jumpy, sleep disturbance, etc. These symptoms can occur after any traumatic event and varies from person to person in terms of its effects, however in the case of a person who develops PTSD, these symptoms can pose a huge challenge.

Many people have always been under the impression that PTSD is something you suffer from only in a situation like for example; if you've been in a war zone and is something that only a soldier can come back with, however, here it is necessary to bring to light the fascinating example of somebody who served on a jury where the details of a case were so gruesome that he was traumatized and diagnosed as suffering from PTSD. Through the above example it is clear that it is not only the victims who get traumatized by an event but also bystanders and onlookers who on witnessing a distressing event or interacting with a victim can fall prey to the symptoms of PTSD and thereby experience vicarious trauma, again taking the example of jurors who when constantly exposed to written materials, audios, visual pictures, videos as proofs that are extremely gruesome in nature can experience increased stress level, anxiety and overwhelming feelings making them more vulnerable to the symptoms of post-traumatic stress.

Again, for example, considering in this case if some of the proof materials resemble our personal experiences then it can make us more vulnerable to symptoms. While some people may have short-term anguish and impact, others may experience long-term distress and impact. Symptoms may appear for a brief time before disappearing or going away, but what does disappear mean? So, we might have some memories or distress nevertheless to be able to function and experience the sense of quality of life and well-being to the fullest. But at other times we can see that these symptoms are very cosmic or injured and become very prolonged in their effect thereby hampering overall functioning and it's very important to note the symptoms incurred by a younger person as compared to an older adult. In general, when we talk about mental health, we know that younger people always report more mental illness and substance use problems than any other age group but irrespective of that people within the older group are also very much at risk of developing symptoms of post-traumatic stress. Whenever people are within the jury as a part of their duty it does take them outside of their daily lifestyle, routine and responsibilities and so, the happenings in their life can also be a provoking factor. Accepting a mental disorder is still a huge challenge, some never even get diagnosed in their whole life while the disorder continues to affect their daily routines. Though, overall, we have done a good job in the past let's say 5 or 10 years on reducing the stigma attached to mental health problems and so there is a hope for changing the attitude attached with this stigma as well because what it really does is just prolong the suffering and disability of people, thus preventing them from seeking good health. Not only does it strengthen the overall stigma but also strengthens self-stigma. Self-Sigma is when people start internalizing other people's values and belief and start blaming themselves for the misery, for example – “I'm the cause behind everyone's sufferings.” This promotes a sense of isolation and suffering in silence which is nothing but a vicious circle. But now is the moment to normalise open discussions surrounding mental health since, at the end of the day, we are all human beings who require good physical and mental health in order to be

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healthy and happy, and no one is immune to dealing with mental health issues on their own. The least that can be done to feel better is by seeking help. The earlier we seek help the better prognosis and the outcome. Patients with PTSD do have a risk of acquiring cardiorespiratory, gastrointestinal, immunological disorder leading to poor physical health but PTSD does have effective treatments and yes, we can definitely get better and resume a healthy life. For example, evidence-based research highlights that cognitive behavioral treatment particularly for trauma that contains cognitive restructuring, various types of exposure interventions and all the skills and strategies can help better cope with anxiety and post-traumatic stress. Now that we're talking about post-traumatic stress, it's also important to remember that depression can be a significant antecedent to developing post-traumatic stress symptoms.

After the first and second world wars, PTSD ended up having a negative connotation to it, because not only is it a real mental illness but it also showed that an individual need not be a soldier to suffer from its consequences. Post-traumatic stress disorder or PTSD is something we often think about as affecting war veterans who have lived through terrifying conditions in a combat zone. Sufferers experience unexpected rage, tears, panic, nightmares, and are generally emotionally numb to the point that it affects every aspect of their daily life. But PTSD isn't just a soldier's plight, it can affect anyone because regardless of the specific trauma you suffer, it changes everyone's brain in a similar way and in the end it all comes down to the way our body reacts to fear, and specifically, the effect of fear on the brain. The brain is divided into three sections in the Triune Brain hypothesis. The innermost section of the reptilian brain, often known as the brain stem, is responsible for survival instincts. The mammalian brain, often known as the limbic or midbrain, is responsible for processing emotions and relaying sensory information. The neo-mammalian or frontal cortex control is the most developed part of the brain responsible for cognitive processing, decision-making, learning, memory, and inhibitions. Usually, the brain gives orders in a top-down structure: the neo-mammalian, then the mammalian and lastly the reptilian. When confronted with a stressful incident, however, this order is reversed, and the reptilian brain takes command. It stimulates the sympathetic nervous system, which triggers the "fight or flight" response, which releases adrenaline and prepares the body for physical exertion. But a stress situation also causes changes in specific brain regions and this leads to PTSD. This chemical activity from stress causes the brain to create memories that leave temporary imprints in the brain's circuitry and neuro pathways. The imprints on those pathways might reawaken every time we recollect the trauma, bringing back the stress reaction from the initial event and pushing you to relive that life-threatening circumstance. But this doesn't last long. Normally the body and brain start the recovery process, releasing the hormone cortisol and putting the brain back into its normal top-down structure. The imprints on the altered pathways fade, and over time, recalling the trauma won't cause the same stress reaction. However, in the case of PTSD, the brain does not return to normal, and the imprints on altered pathways remain. The reptilian brain is always on the lookout for a threat. The trauma-related memories and stress reaction do not fade away. PTSD is caused by a chemical and biological imbalance that keeps the brain in a fearful state where the event is relived through memories. But there's a lot more to it than that. Trauma can further cause PTSD by overstimulating the amygdala, which keeps memories active, and understimulating the hippocampus, which fails to register that the threat has passed.

What's the good news? PTSD can be treated, but it isn't a quick fix. Recovery is different for everyone and entails reprogramming the brain and body to return to normal function. While it isn't always successful, victims can learn to manage and live with their PTSD with the

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correct treatment. Unfortunately, many victims of PTSD do not seek therapy. PTSD does affect the brain and we're starting to find brain evidence of that injury, now this doesn't mean that your brain is permanently damaged and you can't recover at all, what it means is that parts of the brain that can be visualized on MRIs, PET scans and something relatively new called the Magnetoencephalography (MEG) are showing remarkable changes from PTSD. There appears to be a measurable difference in people with PTSD, it's early and exciting new research suggests that something is going on in the gray matter which is the thinking part of the brain that's a bit like epilepsy where there is a change in the electrical discharge of the brain cells in that part of the brain and it's there irrespective of whether you're having a flashback or not and it appears to be what is responsible for people with PTSD being vulnerable to having flashbacks. In fact, when you think about it, the right brain has a lot more to do with the color and the sense, the sensation, the smell and the texture of memory while the left brain has more to do with knowing that you're having a memory, placing it in the past and having it take the shape like the outlines of a drawing. So, when we think of the outlines of a bad experience this primarily comes from the left brain and the verb that patterns the experiences that haunts us such as bright lights or bad smells comes more from the right brain. PTSD can be thought of as a condition that is fundamentally being led by the worst part of your trauma memory and something that you can't control. The brain anatomy shows that in people who've been hurt and who have a heightened sense of anxiety there are parts of the brain that prepare us for danger and that appear to be more volatile, these include, parts of the limbic system which are activated followed by activation of fear centers. These fear centers seem to be more active in people who have been traumatized and the front part of the mind which is the frontal lobes dampen down the fear centers. There are some people whose PTSD pattern shows less activation in the front part of the brain. Recent research has shown the possibility of the existence of two types of PTSD, one being those who are very aroused and who are more prone to flash bangs and the other being a roughly smaller group who experience dissociation i.e., they go into a trance-like state where they feel like they're living in a dream. They sometimes feel they're somewhere above watching the scene rather than in the scene and in a way, this protects them from feeling anxious. PTSD by definition is having memories you don't want to have which are maybe generated on the spot and as discovered by the Minnesota team it also includes being numb, avoidant and having a lower threshold for being made very anxious and all these changes can be seen in the brain patterns. There are people who are far more adept at comprehending and expressing how portions of the brain are altered in PTSD, but let me share what I know, what I find valuable, and what I try to convey to others. Starting with the part of the brain called the hippocampus: this is present on either side of the brain. Its small anatomical structure is believed to play a role in organizing memory and in converting memories into feelings and actions. Those people who have a smaller hippocampus seem to be more vulnerable to PTSD. A study focused on comparing the hippocampal size with developing or not developing PTSD after you were traumatized, for this a bunch of combat soldiers who were exposed to trauma were examined and it was found that those who were diagnosed with PTSD had a relatively smaller hippocampal volume than those who were similarly exposed to trauma but weren't diagnosed with PTSD. The second part of the study focused on twin brothers who weren't sent to war. They both had the same sized hippocampus and the results showed that the volume of the hippocampus does not shrink when exposed to trauma or when not diagnosed with PTSD. A different study was done on another part of the brain called the anterior cingulate gyrus which is the grey matter that acts like a highway connecting the emotional part of the brain that is the limbic system with the gray matter of the brain dealing with the cortex involved in thought process. Here it was found that after undergoing trauma and getting PTSD there was some reductions in the number of cells in

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this pathway which may result in brain damage in a particular part of the brain may be the right temporal lobe referred to as the Georgopoulos spot whose existence is not certain but there are chances that this part of the brain can be impacted by trauma. There is also the frontal lobe function which is surrounded by discussions as to whether it is more vulnerable and can reflect changes due to trauma or not, however the front lobe function has the capacity to restore its functions after the traumatic episode has passed. Another important part of the brain that is clearly affected is called the amygdala which is the fear center and also called the midbrain structure; this is the part of the brain that we share with reptiles-reptiles can have a fear response that's very similar to human fear response. It is not certain if the amygdala is injured or just affected, causing it to act strangely. There's a lot of fundamental research going on around these brain parts. For somebody who has PTSD it would be preferred to say they are going through an injury because of which their brain is affected rather than having a brain damage and this clearly has a recovery period. Science is now trying to learn more about medication and non-medication devices that help to learn more about just how quickly the brain recovers just as your kidney would recover from an injury or a disease.

Traumas are mainly processed by the body's sensory processing networks and lower brain functions, rather than the higher functions of narrative memory and rational thinking. Trauma Survivors instinctively respond to memories of traumatic events conveyed by sight, sound, smell, etc., but the response is almost or all unconsciously unregulated. We are only now beginning to comprehend the long-term effects of treatment. One of the most important is treatment limited to higher brain function.

Traumatic experiences can have a wide range of consequences. When a child's birth family has suffered complex trauma, it can influence the development of their sensory systems, impacting the child's capacity to regulate their sensory system in everyday life. This injury might manifest itself in a child's reaction to sensory input, such as overreacting to a gentle touch, or it can manifest itself in a lack of equilibrium, poor movements, and balance. If you are raising or caring for a traumatized child, you probably have already identified these types of problems.

REVIEW OF LITERATURE

1) Predictors of PTSD in injured Trauma Survivors: A prospective study.

Arieh Y. Shalev, M.D., Tuvia Pen, Ph.D., Laura Canetti, M.A., and Shaul Schreiber, M.D. (1996)

The Study targets to understand and prospectively examine the relationship between immediate and short-term response to trauma which leads to the development of Post-traumatic stress disorder. Method used in research: All the Patients were admitted to the same hospital and scanned for the presence of any kind of physical injury because of the event which caused trauma. There were 51 eligible subjects assessed within one week, then they were assessed 6 months later. In the initial time, the assessment had high event severity, per traumatic dissociation there were symptoms of depression, anxiety, intrusion and avoidance. During the time of assessment PTSD was added to the clinical interview as per the criteria mentioned in DSM 3. Results showed that, 25% participants were diagnosed with PTSD in the 6 month follow up test and People with PTSD had shown high levels of peritraumatic dissociation, severe depression and anxiety in their initial assessment from week. Further the results showed that PTSD Symptoms intensity raised to 29.4% in 6

months due to exposure to different variables. The avoidance symptoms were mild in the start but eventually got intense due to the development of PTSD.

2) The Association Between the Perception of Threat in a Dating Situation and Sexual Victimization

Breitenbecher, Kimberly H. (1999)

This study tries to find out the relation within perception of threat in a dating situation to someone who has already been a sexual abuse victim. In the initial stages of the sessions, all the members who participated were conditioned experimentally (n 116) where they were basically asked to watch a video that showed a heterosexual love couple conversing during a date followed by a reflection of sexual assault. In a controlled condition there were 108 people who watched the conversation video which did not portray any kind of risk factor of assault. Both the groups were then asked to take a survey that included history of sexual abuse, their demographic details, history of their adolescent sexual assault lastly details about any other threatening incident. From the total population, 66 people were asked to return and take a 5-month therapy session. However, no relation was found between threat perception and sexual victims before and after follow up periods.

3) Selective Dysfunction of Tool-Use: A Failure to Integrate Somatosensation and Action

Matthew Heath, Quincy J. Almeida, Eric A. Roy, Sandra E. Black, David Westwood (August, 2002)

Apraxia is hypothesised to be the result of a disruption in the distributed praxis network's high-level perceptual, cognitive, and motor systems. The integration of conceptual information, gesture ideation, visual and somatosensory signals, and executive processes is required for naturalistic gesture production. From a clinical and theoretical standpoint, impairments in this setting are of interest. The case of a young female stroke patient (CK) who has a novel limb praxis profile is discussed here. The performance of CK in the conception, evocation, and praxis executive levels was compared to that of 30 healthy controls. CK's ability to pantomime and reproduce transitive motions indicates that her ideational, executive, and visual analytic systems, as well as her conceptual understanding of tools, objects, and actions, were all intact. However, when CK used the instrument linked with the action, she made weak gestures — a chronic and bilateral deficit that lasted during a 5-year follow-up evaluation. As a result, CK's impairment appears to be a specific and long-term disruption of high-level praxis systems that incorporate tactile inputs into the unfolding gesture production process.

4) Violence and risk of PTSD, major depression, substance abuse/dependence, and comorbidity: Results from the National Survey of Adolescents.

Kilpatrick, Dean G. Ruggiero, Kenneth J. Acierno, Ron Saunders, Benjamin E. Resnick, Heidi S. Best, Connie L. (2003)

A national survey of adolescents belonging to the age group 12-17 years was taken from households with a sample size of 4,023, it was conducted using the Telephone – Interview method. The main target to conduct the study was to see the prevalence, comorbidity with the risk factor of Major depressive disorder with Posttraumatic disorder along with substance abuse. Approximately 16% boys and 19% girls met the criteria for any one disorder within the 3. Six-month long PTSD presence was found in 3.7% boys and 6.3 % girls, the same 6

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months prevalence for Major Depressive disorder was found to be in 7.4% of the boys and 13.9% of the girls. Last 12-month prevalence was found in the ratio of 8.2% in boys and 6.2% in girls. Results supported the hypothesis of the study that says that facing or having exposure to interpersonal violence arising from being a victim or a bystander can increase the risk of these disorders in adolescents'.

5) Posttraumatic stress reactions among children following the Athens earthquake of September 1999

G.Kolaitis, J.Kotsopoulos, J.Tsiantis, S.Haritaki, F.Rigizou, L.Zacharaki, E.Riga, A.Augoustatou, A.Bimbou, N.Kanari, M.Liakopoulou, P.Katerelos (April, 2003)

The aim of this study was to examine symptoms of posttraumatic stress disorder (PTSD), depression, and anxiety in children six months after they were subjected to an earthquake (EQ) in Athens' north-western suburbs in September 1999. A total of 115 children from two elementary schools near the EQ's epicentre were evaluated. As controls, a group of 48 children who were not affected by the EQ and who attended a school that was not affected by the EQ were used. A number of questionnaires were completed by the children and their guardians. Overall, the EQ exposed group had a high rate of severe to mild PTSD symptoms. PTSD symptoms, whether extreme or mild, were related to high levels of depression. The anxiety questionnaire's "avoidance" factor was used to examine the connection between PTSD symptoms and anxiety. Children who were alone at the time of the EQ and children who had suffered injuries were the most likely to be affected. In conclusion, countries with a high incidence of EQs should be prepared to provide psychological support to a large proportion of children who identify with PTSD and depressive symptoms, as well as educate and train children to cope with these incidents.

6) A Comparative Study of Trauma and Posttraumatic Stress Disorder Prevalence in Epilepsy Patients and Psychogenic Nonepileptic Seizure Patients (2005)

Harriet J. Rosenberg Stanley D. Rosenberg Peter D. Williamson George L. Wolford (02 August 2005)

In the psychogenic non-epileptic seizure, PTSD has a more competitive investigation with a premise that people have a history of trauma, physical and sexual abuse. In the study, 35 individuals who had previously been diagnosed to have epilepsy or PTSD were assessed to see if they have been epileptic or non-epileptic with EEG. The results show that PTSD and Trauma history of non-epileptic seizures have a correlation. This outcome is Contrary to previous studies which show that sexual abuse in childhood is not correlated to NES Sexual abuse of children in discriminatory analyses has been found to be the cause of PTSD. This study reveals a relationship between PTSD and NES trauma abuse. There should thus be a systematic evaluation of people who are able to treat and give medical attention to patients with PTSD.

7) Posttraumatic stress disorder and major depressive disorder is common in parents of children with epilepsy.

Pervin K.Iseria Eylem, Ozten Ahmet ,TamerAkerb (February, 2006)

The study was to determine the ratio of PTSD, Posttraumatic stress symptoms and Major Depressive Disorder, in the parents of children who have epilepsy. To conduct the study, 77 mothers and 3 fathers whose child suffers from epilepsy were asked to be a part of the study. Tests like structured clinical interview, PTSD and MDD modules, General Health

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Questionnaire were administered. In the outcome, 31.5 % ratio of PTSD and MDD were present. 56% who already had PTSD were diagnosed with MDD. The symptoms of PTSD were clearly seen in the parents of epileptic children. Re-experiencing the symptoms arousal were very frequent (88.8 to 80%) but on the other side, avoidance symptoms were only 32.5%. The conclusion of the study states that there is a good ratio of parents of epileptic children who experience PTSD and MDD. The awareness of the prevention of these disorders will help mental health workers to make intervention programs for the parents.

8) Examination of posttraumatic stress disorder symptom clusters in young Turkish trauma survivors. *European Child and Adolescent Psychiatry*, 16, 449-457.

A. Bal, B. Jensen (September, 2007)

According to this research, the 1999 Marmara Earthquake, which was classified as one of the world's six deadliest earthquakes in the twentieth century, caused post-traumatic stress disorder (PTSD) symptom clusters in Turkish children and adolescents. The study included 293 children and adolescents (152 females and 141 males between the ages of 8 and 15) from Izmit, which was the epicentre of the earthquake. To assess PTSD symptoms, the Post-Traumatic Stress Disorder Reaction Index for Children (CPTSD-RI) was used. The CPTSD-RI data was used to perform a confirmatory factor analysis (CFA) to see whether the DSM-IV-TR symptom structure of PTSD was correct in Turkish children and adolescents. The three-symptom cluster model was sponsored by the CFA model. The research also includes limitations and consequences for future studies.

9) Depression and PTSD symptoms among bereaved adolescents 6½ years after the 1988 Spitak earthquake

Armen K. Goenjian, David Walling, Alan M. Steinberg, Alexandra Roussos, Haig A. Goenjian, Robert S. Pynoos (June, 2008)

The objective of this research is to compare depression and PTSD symptoms in parentally bereaved adolescents to a control group following a devastating natural disaster. The Depression Self-Rating Scale (DSRS) and Child Posttraumatic Stress Disorder Reaction Index (CPTSD-RI) were used to assess 48 parentally bereaved adolescents and a control group of 44 subjects who had not experienced parental loss six and a half years after the Spitak earthquake. Orphans had significantly higher levels of depression than those who had lost a parent, who had significantly higher levels of depression than those who had lost a mother. Within each category, PTSD scores were moderate to severe, with girls scoring higher than boys. To summarise, the death of both parents, as well as, to a lesser extent, the death of a father, is a major risk factor for depression, but not for PTSD. Prior studies documenting post-disaster chronicity of depression and PTSD among bereaved adolescents were expanded in this research, highlighting the need for post-disaster mental health and social services, especially for those who have lost both parents.

10) Quantitative testing of pain perception in subjects with PTSD – Implications for the mechanism of the coexistence between PTSD and chronic pain.

Ruth Defrina, Karni Ginzburg, Zahava Solomon (31 August 2008)

This study basically tried to show the increased threshold of pain perception with chronic pain in people who have PTSD. This is the first qualitative study which tried to show the relation of pain perception in PTSD. There were 2 groups of 32 PTSD subjects, 29 subjects of anxiety and 20 health control people. Temperature (warm, cold, heat) touch, pain

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threshold was given to the subjects for assessing qualitatively. With that before performing the task, a self-report questionnaire was given to the PTSD and anxiety group. During the task the PTSD group was given more levels of pain as compared to other 2 groups. This study then results that PTSD people have higher thresholds as compared to other two groups. They do build a new sensory profile that has hypersensitivity for the pain.

11) Traumatic memories, post-traumatic stress disorder and serum cortisol levels in long-term survivors of the acute respiratory distress syndrome

Daniela Hauer, Florian Weis, Till Krauseneck, Michael Vogeser, Gustav Schelling, Benno Roozendaal (April, 2009)

Survivors of acute respiratory distress syndrome (ARDS) patients record painful memories from the Intensive Care Unit (ICU) and demonstrate a high rate of post-traumatic stress disorder (PTSD). The relationship between serum cortisol, traumatic memories and PTSD was investigated in patients after ARDS as part of the research. For pre-defined traumatic memory categories from the ICU, hypothalamic-pituitary-adrenocortical axis reactivity to corticotropin and PTSD, the researchers tested 33 long-term ARDS survivors. During the assessment, there were significantly lower baseline serum cortisol levels in patients with multiple traumatic memories compared to patients with no or only 1 type of traumatic memory, with no discrepancies in peak cortisol levels after corticotropin stimulation between the two subgroups. A strong negative association was found between the levels of basal cortisol and the amount of traumatic memories present. Symptom ratings for PTSD were associated with the number of painful memories, but not with levels of cortisol. These results suggest that lower baseline cortisol levels are associated with an increased occurrence of traumatic memories from the ICU in long-term ARDS survivors and that more traumatic memories are associated with a higher incidence and severity of symptoms of PTSD.

12) Trauma and Posttraumatic Stress Disorder in South African Adolescents -A Case-Control Study of Cognitive Deficits (2009)

Schoeman, Renata MB, ChB, MMed (Psych); Carey, Paul MB, ChB, MMed (Psych); Seedat, Soraya MB, ChB, MMed (Psych)

Few studies have mentioned the cognitive deficits in adolescents who developed Post Traumatic stress disorders but this study in particular aimed to have an assessment of how PTSD impacts on different neurocognitive functions on the population of South African adolescents. This case study was done on 40 Traumatized African adolescents among which 20 were diagnosed with PTSD and 20 not diagnosed. They all were sent for a neuropsychological evaluation done by a standardized neuropsychological battery test. The study found out that presence of PTSD is associated with the deficiency in attention, cognition, visual memory, and non-verbal gesture formation. This shows that PTSD does impact cognitive development of the adolescents as compared to the people who have only faced trauma.

13) The long-term costs of traumatic stress: intertwined physical and psychological consequences

Alexander C McFarlane (January, 2010)

The gradual development of symptoms after exposure to traumatic events has provided psychiatry with a significant conceptual challenge. The process of sensitization and kindling includes the mechanism that triggers the gradual progression of symptoms with the passage

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of time leading to post-traumatic stress disorder (PTSD) delayed onset. Through recurrent environmental triggering of increasing dysregulation of an individual's neurobiology, the production of traumatic memories at the time of stress exposure represents a major vulnerability. An ever-growing body of evidence shows that the increased allostatic load associated with PTSD is related to a slew of physical morbidities, including chronic musculoskeletal pain, hypertension, hyperlipidemia, obesity, and cardiovascular disease. This rising body of literature indicates that it is important to consider the consequences of traumatic stress as a significant environmental threat that puts the physical and psychological health of a person at equal risk.

14) The prevalence of long-term post-traumatic stress symptoms among adolescents after the tsunami in Aceh

EN Agustini, I Asniar, H Matsuo (December, 2010)

The goal of the study was to investigate the symptoms of post-traumatic stress disorder (PTSD) and to evaluate whether the severity of symptoms among 482 adolescent survivors, aged 11 to 19, was influenced by certain associated factors. To measure PTSD symptoms and the Traumatic Exposure Severity Scale to examine the severity of the disaster, the Infant Post-Traumatic Stress Reaction Index was used. Even if the incident happened some years ago, teenagers who undergo a traumatic experience as extreme as a tsunami will suffer PTSD. The findings of this study showed that in 63.1 percent of 482 participants, the variables that affected the severity level of PTSD symptoms were gender, parental loss, low support level and strong somatic response. Females showed more symptoms of PTSD, from moderate to very severe, but on the other hand, this study showed that symptoms of PTSD were not affected by age, school grade and even traumatic experience. Differences for people who had a single traumatic experience or multiple experiences did not vary in the degree of severity of PTSD symptoms.

15) Symptoms of Posttraumatic Stress, Depression and Anxiety among Youths Exposed to a Massive Fire Disaster in Greece

G. Kolaitis, G. Giannakopoulos, C. Mihas, V. Ntre, V. Moulla, E. Sotiropoulou, K. Paflia, K. Argyrou, K. Kotsirilou, V. Leventakou, H. Assimopoulos, J. Tsiantis, V. Tomaras, C. Tzavara (August, 2011)

The goal of this study was to determine the prevalence of depression, anxiety symptoms and PTSD among children and adolescents who were subjected to the 2007 fire disaster in Greece, as well as the connections between these symptoms and disaster-related stressors and sociodemographic characteristics four months after the burn. 343 teenagers aged 9 to 18 years old from schools in a burn-affected area filled out self-reported surveys. To assess roughly equivalent symptoms, researchers used the Children's Post-Traumatic Stress Disorder-Reaction Index-Revised (CPTSD-RI-R), the Children's Depression Inventory (CDI), and the Screen for Child Anxiety Related Emotional Disorders (SCARED), as well as respondents' responses to fire-related stressors. The prevalence rates of heightened levels of PTSD, depression, and anxiety symptoms were reported to be around 45 %, 34 %, and 32 %, respectively, four months following the disaster, according to the findings. Staying without both parents after the fire and a life-threatening encounter with a loved one were strongly associated with higher levels of PTSD symptomatology, whereas housing adversity, loss of property, and injury of a loved one were the most strongly correlated with elevated depressive and anxiety symptoms.

16) Bal, A. (2008). Posttraumatic stress disorder in Turkish child and adolescent survivors three years after the Marmara Earthquake. *Child and Adolescent Mental Health, 13*, 134-139.

Aydin Bal (September, 2011)

This research looked at the occurrence of post-traumatic stress disorder (PTSD) symptoms in child and adolescent survivors three years after the 1999 Marmara Earthquake in Turkey, taking into account the severity of the exposure as well as the survivors' gender and age. The study enlisted the participation of 293 young earthquake survivors (152 females and 141 males between the ages of 8 and 15). Participants' ratings on the Children's Post-Traumatic Stress Disorder Reaction Index showed that 31.4% reported mild, 24.2% reported extreme, and 3.8% reported extremely severe traumatic stress reactions. Examination of the Revised Effect of Children's Events Scale scores showed that 56% reported extreme symptoms of PTSD. While the severity of exposure and gender were also found to be major factors in the severity of PTSD symptoms, age was not. The findings showed that there was a high need to resolve the mental health issues of survivors of infant and adolescent trauma in Turkey.

17) Evidence for neural encoding of Bayesian surprise in human somatosensation

Dirk Ostwald, Bernhard Spitzer, Matthias Guggenmos, Timo T. Schmidt, Stefan J. Kiebel, Felix Blankenburg (May, 2012)

Accumulating empirical evidence indicates a role of Bayesian inference and learning in auditory and visual perception to form neural responses. However, its relevance is uncertain for somatosensory processing. The theory that cortical somatosensory processing exhibits dynamics consistent with Bayesian accounts of brain activity is tested in the present study using EEG data recorded from 15 subjects. A computational single-trial modeling of elicited somatosensory potentials was performed for the entire peri-stimulus time span in source space, capitalizing on a somatosensory mismatch roving paradigm. By means of Bayesian model selection, it was found that secondary somatosensory cortex at 140 ms post-stimulus initiation represents Bayesian surprise rather than stimulus transition, which is the traditional EEG mismatch response marker. On the other hand, the right inferior frontal cortex tracks stimulus changes at 250 ms. In conclusion, the present research offers new evidence that is consistent with the Bayesian brain hypothesis for anatomical-temporal/functional segregation in human somatosensory processing.

18) Relations between the underlying dimensions of PTSD and major depression using an epidemiological survey of deployed Ohio National Guard soldiers

Tracey L. Biehn, Ateka Contractor, Jon D. Elhai, Marijo Tamburrino, Thomas H, Marta R. Prescott, Edwin Shirley, Philip K. Chan, Renee Slembariski, Israel Liberzon, Joseph R. Calabrese, Sandro Galea (September, 2012)

In the present study, the authors examined the relationship between the underlying symptom dimensions of posttraumatic stress disorder (PTSD) and major depressive disorder (MDD) dimensions (MDD). The PTSD Checklist (for evaluating PTSD) and the Patient Health Questionnaire-9 (for assessing depression) were administered to 1266 Ohio National Guard soldiers with a history of overseas deployment. The findings of confirmatory factor analysis revealed that both dysphoria and hyperarousal factors in PTSD were more linked to somatic than non-somatic factors in depression. Furthermore, the somatic factor of depression was linked to PTSD dysphoria more than the hyperarousal factor. Results suggest that the dysphoria factor in PTSD is linked to depression, specifically via the somatic construct of

depression. These findings have implications for understanding the essence of PTSD's high comorbidity with depression, given its significant dysphoria/distress portion.

19) Symptoms of PTSD among Adolescents in Malaysia: Four Years Following 2004 Tsunami

Siti Raudzah Ghazali, Ask Elklit, Khatijah Yaman, Mariah Ahmad (December, 2012)

This study investigated the symptoms of posttraumatic stress disorder (PTSD) among adolescents who were subjected to the 2004 tsunami in Northern Peninsular Malaysia. The participants were 216 adolescents ranging in age from 13 to 19 years old who lived in small villages affected by the tsunami. The research included 103 males and the others were females. The Child Posttraumatic Stress Reaction Index (CTPS-RI) was used to measure PTSD symptoms in this cross-sectional study. Findings suggested that 8.3 % of respondents had extreme PTSD symptoms, 39.8 %, had moderate symptoms, 42.1 % had mild symptoms, and 9.7 % had no noticeable PTSD symptoms at all. The criterion B symptom score was substantially higher in females than in males. The number of lifetime traumas and age were found to be important predictors of PTSD score in a multiple regression analysis. Also, four years after the tsunami, the incidence of PTSD symptoms was still high. This result was in line with previous studies.

20) Long-term effects of mild traumatic brain injury on cognitive performance

Philip JA Dean, Annette Sterr (February, 2013)

While persistent cognitive disabilities after mild traumatic brain injury are recorded by a proportion of people, findings from behavioural testing have been inconsistent. Researchers proposed that by accounting for post-concussion syndrome in the study, the variability inherent in mTBI may be minimized. The Paced Visual Serial Addition Task and working memory task were performed by thirty-six participants with mTBI and 36 non-head injured controls. Both groups were divided by PCS diagnosis, with controls focused on symptom report categorization. At any difficulty level except 0-Back, participants with mTBI and persistent PCS had significantly higher error rates on both the n-Back and PVSAT. Therefore, a cognitive deficit can be found in mTBI participants, even 1 year after injury. In addition to the medium effect size association with higher PCS symptoms, PTSD, and anxiety, associations between cognitive performance and symptoms were only found for mTBI participants, with poorer performance correlating with lower quality of sleep. These findings indicate that the decline in cognitive output is not due to the greater symptom report itself, but is to some degree correlated with the initial injury.

21) The Impact of the development timing of trauma Exposure on PTSD symptoms and psychosocial functioning among older Adults

Ogle, Christin M, Rubin, Siegler, Ilene C (2013)

The study examined the effect of development of trauma when exposed to post-traumatic stress disorder and the lookout for symptoms and psychosocial activities in a huge sample that targets a specific community-dwelling older adults population size (N= 1,995). The hypothesis of the study is trying to investigate the negative consequences experienced by people who had previous traumatic experiences in their childhood. Different age groups were taken to see the different changes in the cognitive and psychosocial process that may impact the psychological process. Results say that the older adults who have experienced their most distressing traumatic event during childhood show more severe symptoms of

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PTSD and they also showed lower subjective happiness as compared to adults who have experienced trauma in adulthood. Data was approx similar while measuring social support and coping ability. This finding shows that enduring the nature of trauma encountered in the early age of life and the important impact on development when exposed to trauma can have long term consequences.

22) Long-Term Trajectories of Posttraumatic Stress Disorder in Veterans: The Role of Social Resources

Karen-Inge Karstoft, Cherie Amour, Ask Elklit, Zahava Solomon (December, 2013)

A latent growth mixture modeling analysis on PTSD symptoms was conducted to identify long-term trajectories of symptoms of combat-induced posttraumatic stress disorder in veterans with and without combat stress response over a 20-year period from 1983 to 2002 and to identify social predictors of these trajectories. Israeli male veterans with and without CSR were interviewed at 1, 2, and 20 years after war about combat exposure, military unit support, family environment, and social reintegration. Four distinct trajectories, with varying prevalence across groups, were identified for both study groups: resilience, recovery, delayed onset, and chronicity. Predictors of trajectories in both factions included perception of war threat, and negative social reintegration. Only in the CSR group was social support associated with symptomatology, while family coherence in the non-CSR group was predictive of symptomatology, but not in the CSR group. The findings confirmed the heterogeneity of long-term combat sequelae, revealing 4 resilience, recovery, delay and chronicity trajectories in veterans with and without CSR. For the CSR group, symptomatic trajectories were more common, suggesting that pathological outcomes are predicted by acute functional impairment.

23) Brief Report: Investigating the relationship between PTSD Symptoms and Emotional Intelligence among adolescent refugees from the Middle East.

Siti Raudzah Ghazali (February, 2014)

The aim of this study was to establish a link between PTSD symptoms and various emotional intelligence scale scores. Participants were recruited from the local community health centre in Dearborn, Michigan, for this cross-sectional research analysis. The Adolescents Multifactor Emotional Intelligence Scale (AMEIS) assessed emotional intelligence and the Child Post Traumatic Stress Reaction Index (CPTS-RI) assessed PTSD symptoms. According to the findings, there is an inverse association between the magnitude of PTSD and emotional intelligence. Both AMEIS subscales were negatively associated with the PTSD scores. In the tasks of using and understanding emotion, two major negative associations were discovered. Furthermore, people with extreme PTSD symptoms tend to lack the ability to perceive and use feelings, according to the results. The findings are expected to be useful in identifying factors that may reduce or lead to the severity of these children's PTSD symptoms.

24) Migration, Trauma, PTSD: A Gender Study in Morrison's Jazz

Motlagh, Leila Tafreshi, Yahya, Wan Roselezam Wan Jun 2014

The article is based on the trauma theory with gender response as a major component. The Author's novel introduced Two migrants who was affected by trauma. The women choose some other way to cope with the situation that resulted in some mental health distortion which includes stress factors from the society alongside dealing with trauma. The migration

and segregation lead to disconnecting black migrant community to get accepted by the receiving society. The trauma and stigma also marginalized migrant women from the African American community. This whole situation of the women then leads to isolation which means less social ties and social identity further associated with mental health issues like PTSD. This study aims to identify the main elements that are included in Trauma specifically in Morrison's Jazz; moreover, it also explores the coping strategies that are mostly used by the female gender to deal with Trauma. The novelty of this study has an approach towards gender and their mental health with reference to the migration literature.

25) Validation of the five-factor symptom model of PTSD symptom structure among delinquent youth

Diana C. Bennett, Patricia K. Kerig, Shannon D. Chaplo, Andrew B. McGee, and Brian R. Baucom (April, 2014)

In a sample of 1,363 juvenile-justice-involved youths (990 boys, 373 girls), this research compared the Diagnostic and Statistical Manual of Mental Disorders diagnostic 3-factor structure of posttraumatic stress disorder (PTSD) symptoms with leading 4-factor models and the recently suggested 5-factor dysphoric arousal model. According to the study, girls had stronger factor loadings for all but the Anxious Arousal factor, and the 5-factor dysphoric arousal model suited them better than boys. The 5-factor model's factors were then examined for their ability to mediate the connection between interpersonal and non-interpersonal trauma and mental health problems. Non interpersonal trauma experience was only associated with PTSD symptoms in boys, while interpersonal trauma was associated with PTSD symptoms in both boys and girls. The results suggested that girls revealed stronger pathways leading to depression/anxiety, somatic complaints, and suicidal ideation via PTSD symptoms, while boys revealed stronger pathways leading to anger/irritability symptoms. These findings contribute to the growing body of evidence that the 5-factor dysphoric arousal model can be used to create developmentally sensitive criteria for the diagnosis of PTSD in traumatised children and adolescents.

26) Monitoring in Neurointensive Care – The Challenge to Detect Delayed Cerebral Ischemia in High-Grade Aneurysmal SAH

Asita S. Sarrafzadeh, Peter Vajkoczy, Philippe Bijlenga, Karl Schaller (July, 2014)

Following aneurysmal subarachnoid haemorrhage (aSAH), delayed cerebral ischemia (DCI) is a dreaded and serious medical consequence. It affects about 30% of individuals who survive the first haemorrhage, and it usually happens between days 4 and 10 after aSAH. Clinical deterioration due to DCI is a diagnosis of exclusion, and inpatients who are comatose or drugged make it much more difficult to identify. Patients with a high World Federation of Neurosurgical Societies (WFNS grade 4–5) make up about 40–70 percent of the ruptured aneurysm patient population. When compared to patients with low WFNS grades, the incidence of DCI in this group is frequently overestimated and increased. The article covers the most recent guideline for DCI definition and explores their advantages and problematic concerns in neurocritical care practise to overcome difficulties in identifying DCI, which is especially pertinent in sedated and comatose patients. Finally, relevant neuromonitoring approaches are discussed, as well as their clinical effects in high-grade SAH patients.

27) The Long-Term Effect of Trauma for Disaster Victims.

Alessandra Scalmati, Albert Einstein College of Medicine, Montefiore Medical Center (2014)

There are many studies that support the evidence of traumatic experiences older adults but since the past few years, data have emerged about the real lifetime prevalence of PTSD in later life along with its chronic cause on mental health. PTSD has been playing a major role in the history of past traumatic events that increase the risk factors for adults who have faced disastrous events and complicating the delivery of good care and immediate help by the mental health professionals after trauma that can later be associated with mental illness. This study focusses on a long term follow up of Holocaust survivors.

28) Trajectory of post-traumatic stress following traumatic injury: 6-year follow-up

Richard A Bryant, Angela Nickerson, Mark Creamer, Meaghan O'Donnell, David Forbes, Isaac Galatzer-Levy, Alexander C McFarlane, Derrick Silove (February, 2015)

Millions of patients are affected by traumatic injuries each year, and the resultant post-traumatic stress disorder (PTSD) contributes greatly to subsequent disability. The aim of this study is to use latent growth mixture modeling to graph the distinctive long-term trajectories of PTSD responses over 6 years. At 3, 12, 24 and 72 months, randomly selected injury patients admitted to four hospitals across Australia were examined in the hospital. It analyzed the lifetime medical history and present severity and functioning of PTSD. Over the six years, five PTSD response trajectories were noted: (a) chronic, (b) improvement, (c) worsening/recovery, (d) worsening and (e) resilient. Female gender, recent life stressors, presence of mild traumatic brain injury and admission to intensive care units were expected to have a weaker trajectory. The long-term PTSD effects that may occur after traumatic injury are demonstrated by these results. The multiple trajectories illustrate that tracking a subset of patients over time is likely to be a more precise way to detect PTSD rather than depending on variables that can be measured during hospital admission.

29) Assessing possible DSM-5 ASD subtypes in a sample of victims meeting caseness for DSM-5 ASD based on self-report following multiple forms of traumatic exposure

Maj Hansen, Cherie Armour, Li Wang, AskElklit, Richard A. Bryant (February, 2015)

Acute stress disorder (ASD) was incorporated into the DSM-IV to identify early traumatic reactions and to serve as a guide to post-traumatic stress disorder (PTSD). While the medical criteria for ASD were changed in DSM-5 to be more similar to those for PTSD, only the PTSD condition involves a dissociative subtype. According to recent studies, there tends to be a strongly symptomatic subtype of ASD. However, the exact existence of the subtype is unknown at this time. The current research looks into the possibility of ASD subtypes in a mixed group of victims (N=472) who met the caseness criteria for DSM-5 ASD based on self-report after four different types of traumatic exposure. The results suggested that a 5-class solution emerged from the latent profile evaluation. And compared to the other grades, the extremely symptomatic class had the highest endorsement on avoidance and dissociation. The findings are addressed in terms of their clinical consequences, including what they mean for the upcoming ICD-11 and the newly published DSM-5.

30) Identifying latent profiles of posttraumatic stress and major depression symptoms in Canadian veterans: Exploring differences across profiles in health-related functioning

Cherie Armour, Ateka Contractor, Jon D. Elhai, Maurice Stringer, Gary Lyle, David Forbes, J. Don Richardson (April, 2015)

Posttraumatic stress disorder (PTSD) has long been known to be strongly comorbid with major depressive disorder (MDD) and to be linked to health-related functional impairment (HRF). The research relied on archival data from 283 Canadian veterans who had previously served in war zones. Patterns of PTSD and MDD comorbidity as measured by the PTSD Checklist-Military version (PCL-M) and the Patient Health Questionnaire-9 were discovered using latent profile analysis (LPA) (PHQ-9). Individual latent class membership was used in a series of one-way ANOVAs to determine group differences in HRF as calculated by the Short-Form-36 Health Survey (SF-36). High symptoms, moderate symptoms, and low symptoms were the three distinct patterns of PTSD and MDD comorbidity caused by LPA. All of the ANOVAs comparing class membership on the SF-36 subscales were statistically significant, indicating that there were group variations across HRF levels. The HRF was worse in the group with the most symptoms, followed by the groups with mild and low symptoms. These findings are clinically significant because they highlight the importance of ongoing evaluation and treatment of co-occurring PTSD and MDD.

31) Posttraumatic stress reactions of Norwegian children and families after the Southeast Asian tsunami

Egil Nygaard (November, 2015)

The deadliest tsunami in recorded history struck Southeast Asia on December 26, 2004, killing an estimated 230,000 people. The primary goal of this research is to learn more about the factors that influence the development of and recovery from posttraumatic stress reactions in children and families after a single traumatic event. At 10 months after the tsunami, levels of posttraumatic stress reactions were related to the trauma events, while at 2 years after the tsunami, levels of reactions were related to gender, receiving psychological treatment for mental health issues prior to the tsunami, tsunami-related parental sick leave, and the death of family members. The levels of posttraumatic stress reactions in children were found to be linked to the levels of posttraumatic stress in their parents. As a result, the findings suggest that therapies for adults suffering from posttraumatic stress disorder should include a family perspective. These findings are based on quantitative data from interviews with Norwegian children conducted 10 and 12 months after the tsunami, as well as questionnaires completed by adults six and two years later.

32) Cognitive disruption in stress related psychiatric disorder: A role for corticotropin releasing factor (CRF)

DebarA. Bangasser, Yushi Kawasumi (2015)

Two disorders Post – traumatic stress disorder and major depression have the same etiologic contributor is stress. Stress neuropeptide which gets hyper secreted in both the disorders is named as corticotropin releasing factor. Disturbance in the regulation of CRF that affects emotions and mood that has a direct link with the symptoms and characterizes PTSD and depression. Cognitive disruption is also being seen in the patients by the CRF. Previous studies in the paper mentioned indicate that CRF can affect cognitive functions. Some anatomical study suggests that CRF do regulate and modulate the regions of the brain which

are needed to perform learning and memory. The study itself has mentioned by the support of pre cranial studies that CRF is capable of conditioning fear to do change in executive functioning for eg: attention and cognitive flexibility. These studies can be helpful for the implications in practical basis for the ethology with treatment of the cognitive dysfunctions that is observed when the person is in stress and related psychiatric disorders.

33) Violence beyond the battlefield: PTSD and its Effect on the youth from urban communities.

Lyons, Afrika (2016-Sep)

Posttraumatic stress disorder is directly related to veterans stress as this research is based on area combat. This particular disorder is not just related to the soldiers coming from the war, in fact people who are in the age range of adolescents and children can also be affected by PTSD. There is a huge population of children and adolescents who get affected by the disorder. Psychologists have noted that children get affected by PTSD as a result of hard and unfortunate situations that majorly take place in their native environment that includes their home. The main motive of the article is to give better understanding to school psychologists about ways in which children can get affected by violence particularly home placed children and facilitate ways to help them.

34) Veterans' perceptions of the impact of PTSD on their parenting and children.

Sherman, Michelle D. Gress Smith, Jenna L. Straits-Troster, Kristy Larsen, Jessica L. Gewirtz, Abigail (2016)

A noticeable amount of research has been done on PTSD effects on couples but very few are on how PTSD can affect parenting, children, and the relationship between parents and children. In this study 3 site, mixed methods have been used on 19 veteran parents who had already been diagnosed with PTSD; the collection of participants was taken from the veteran's affairs hospitals. Parents participated within groups, the individual first had an interview followed by a Questionnaire which included the impact of PTSD on their daily functioning as parents. In this qualitative inquiry, there were two sets, First, they show difficulty in parenting that was associated with the two main symptoms of PTSD: First (avoidance, alteration in arousal, cognition and mood) second- emotional (hurt, frustration, confusion) and behavioral (withdrawal, mimicking parent behaviour). The parents also mentioned that sometimes its their child who gives them practical and emotional support. So, the conclusion highlighted clinical care, development programs, and online parenting resources to be provided for the parents dealing with PTSD.

35) The neural correlates of childhood maltreatment and the ability to understand mental states of others.

Charlotte C. van Schie, Anne-Laura van Harmelen (2017)

It is said that imparted interpersonal functioning can happen because of emotional abuse and emotional neglect in the childhood. This can be seen by the delay in the development mechanism and the ability of the child to understand other people's emotions and thoughts. This particular study tries to find the neural correlation to understand the relation between emotional abuse and negating behaviour shown by the child who has faced sexual or physical abuse. The method used to know was RMET, an FMRI scanner study was done on 64 adolescents (M = 18.70, SD = 1.46). CM was measured by using self-report questionnaires. Results displayed the increased activation in the area of left IFG that

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basically indicates delay growth of mirroring or emotional stage and thoughts of people possessed by children who faced both emotional neglect and sexual abuse. Activation in IFG also shows increased activation in the area of Insula and Right STG indicates the lack of mirroring emotions of others even if the emotions are correctly decoded from expression.

36) The ventromedial Prefrontal cortex model of traumatic stress: Fear inhibition or contextual processing.

Pennington, Zachary T, Anderson, Austin S, Fanselow, Michael S (sep 2017)

The ventromedial prefrontal cortex model surrounds PTSD. The ventromedial prefrontal cortex is known to support the remainder of learned fear response; many studies show that it involved the role of fear regulation. This can be characterized by the relationship between ventromedial prefrontal cortex dysfunction and response to traumatic brain events. The study was done on the ventromedial prefrontal cortex lesion on trauma event and increased fear learning in the rodent model of PTSD Experiment 1; lesion in the area does not promote the difference in shock reactivity by having an acute traumatic event neither does it boost the strength of traumatic memory but when the lesion animals were tested the same way they were given a single mild and average stimuli in experiment, thus in this case animals showed a blunting increased fear response. Experiment 2 Increased fear for discrete cues where the trauma was given to the lesion animal showing that there is a deficit in the observation in experiment 1 and it is limited to present stimuli. The findings shows that ventromedial prefrontal cortex supports past studies and agreed that it is involved in the influence on context learning and contrasts the prevailing view which regulates and inhibits the fear.

37) Predictive Modeling of Post-Traumatic Stress Disorder

Ayca Erdogan, Minnie Patel, Yasser Dessouky, Steven Sanchez, Balmatee Bidassie (June, 2018)

Posttraumatic Stress Disorder (PTSD) is a psychological disorder that may occur in individuals after a life-threatening incident such as war/military-combat, terrorist attack, natural disaster, serious injury, sexual or other abusive personal abuse has been encountered or witnessed. It is one of the Veterans Health Administration's main challenges facing veterans. This paper introduces a technique used to evaluate a sample data set with dummy data generated on the basis of literature findings and to develop a prediction model. First, to examine the statistical independence of variables, 2X2 Contingency tables are used. A Bayesian model is then developed to explain the underlying relationship between PTSD and various risk factors, including depression, drug abuse, bipolar disorder, service duration, battle experience and various demographic factors, but not limited to them. Finally, to establish the link between PTSD and other variables that are found to be significantly related to PTSD, logistic regression is used. The results show that PTSD has an essential correlation to depression and drug abuse.

38) Predictive Value of Somatosensation for Manual Dexterity and Upper Limb Motor Function in Stroke Survivors

Mahbubeh Mandehgari Najafabadi, Akram Azad, Hajar Mehdizadeh, Ghorban Taghizadeh (June, 2018)

Despite the significant role of somatosensory function in motor control and the high prevalence of somatosensory defects in survivors of stroke, little attention was paid to the

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effect of somatosensory function on UE motor function in survivors of chronic stroke. The goal of this study is, therefore, to explore the connection in patients between different somatic sensations and manual dexterity as well as UE motor control. 225 chronic stroke survivors (112 Females and 113 Males) participated in this correlational analysis, selected among the stroke survivors admitted to the rehabilitation centers in Tehran. The Box-Block Test, Purdue Pegboard Test and Wolf Motor Function Test were used to determine Gross and Fine manual dexterity and UE motor function, respectively. Within all regression models, WPST alone accounted for 38.8 percent - 56.6 percent of the difference, the WEST was the second most appropriate predictor and only a small percentage of the variance was explained by HORT, m2PD and HAST. These findings indicate that therapies targeting somatosensory impairments, in particular proprioception of the wrist and light contact, may be especially effective for improving manual dexterity and UE motor control in survivors of chronic stroke.

39) The Role of Somatosensation in Perceptual Recalibration from Speech Imagery.

Jacob B. Phillips, Lenore A. Grenoble, Giovanna Hooton, Peggy Mason (August, 2019)

Perceptual recalibration is the long-term effect of non-auditory stimuli, such as speech imaging, i.e., silent and imagined articulations, on category boundaries. Perceptual recalibration from speech imagery in American English sibilants is investigated in this research, as well as the impact of haptic feedback and motor system recruitment in perceptual recalibration. Kim, a woman with a rare congenital neuropathy who lacks all somatosensation, is compared to a control group. The results of this study show that the control group experienced perceptual recalibration from both silent and imagined articulations, whereas Kim did not experience recalibration in either condition. The findings imply that even when the articulators are stationary, perceptual recalibration from speech imagery may necessitate the activation of haptic sensations.

40) From anatomy to function: the role of the somatosensory cortex in emotional regulation.

Erika Kropf, Sabrina K. Syan, Luciano Minuzzi, Benicio N. Frey, (2019)

The somatosensory cortex which starts from the post central gyrus is known for the main role in the processing of sensory information from different parts of our body. Recently studies done by converging body of literature has shown that the somatosensory cortex has major roles in the regulation of emotion processing that must include differentiating between emotions significant from stimuli, generation of emotions states, and regulation of emotions and studies were done on people who are suffering from mental disorders specifically abnormal emotion regulation like bipolar, depression, schizophrenia, post-traumatic stress disorder, anxiety, panic disorder, phobia, OCD and Obesity. In these people, there was a structural change in the somatosensory cortex. The most visible observation in the cortex comes from those who suffer from mood disorders. The change is an alternation in grey matter volume, cortex thickness, and abnormal connection with different brain areas that lead to change in metabolic rate. Previous studies support the hypothesis that the somatosensory cortex can be a source of treatment for certain mental disorders.

41) Sexual trauma history is associated with reduced orbitofrontal network strength in substance-dependent women.

Tasha Poppa, Vita Droutman, Hortensia Amaro (2019)

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Study tries to find out the relation of PTSD having women and comorbidity associated in substance use intake as well as functional impairment with the risk of relapse and PTSD as a result of sexual and domestic abuse. The study also shows that SUD and trauma have a strong neurobiological correlation in terms of an abnormal somatic introspection in women with PTSD. Current study will try to find out the neural connection of women who have both SUD and PTSD in comparison with only PTSD diagnosed women. In the method Analysed Data was collected from 43 subject who already had SUD and who were involved in treatment by mindfulness therapy. There were 2 group- 14 subjects were diagnosed with PTSD and 29 with no PTSD. There was a task to record somatic and visceral sensation of the breath when women were performing a functional FMRI scan. At First the study assessed functional connections of interception that help in the working network within PTSD and non-PTSD women. Second, they assessed the network strength association and lifelong sexual violence across the participants. Results said that women with PTSD had reduced functional connection of an orbitofrontal network with in lateral prefrontal cortex angular gyrus, precuneus and mid posterior insula.

42) Severity profiles of posttraumatic stress, depression, anxiety, and somatization symptoms in treatment seeking traumatized refugees

Ruud A. Jongedijk, Dorien D. Eising, Niels van der Aa, Rolf J. Kleber, Paul A. Boelen (January, 2020)

This research looked at subgroups of refugees in Western countries based on a variety of psychopathology and several predictors, such as trauma characteristics and gender. The Participants were 1147 traumatised refugees seeking care. The researchers used latent profile analysis to classify various subgroups based on levels of PTSD, depression, anxiety, and somatic symptoms, and multinomial logistic regression to find predictors of subgroup membership. The findings indicated that three distinct subgroups were identified, representing symptom severity levels of Moderate, Severe, and Highly Severe, respectively. When compared to the Moderate subgroup, participants in the Severe and Highly Severe Symptoms subgroups reported more forms of traumatic events. Traumatic events associated with human rights violations, a lack of human needs, and alienation from others, as well as gender, all predicted subgroup membership.

43) The Underlying Dimension of DSM 5 Post-traumatic stress disorder (PTSD) and their Relationship with Mental and Somatoform Dissociation Depression and Anxiety among Jail Inmates.

Ogulmus, Selahiddin, Boysan, Murat, Fidan-Acar, Ozlem Koca Hanife (2020)

This study mainly focuses on the DSM-5 factor structure of scores in the Turkish Version which includes a checklist of Post Traumatic Stress Disorder (PTSD) symptoms. This study is gender based including male Prisoners. The well-known 7 factor Hybrid model was the Optimal, which is an alternative. Majority of the Prisoners had PTSD- 96.7% average PTSD diagnosis- 68.4%, Pathological Dissociation- 46.8% and somatoform Dissociation 52.3%. PTSD was also associated with depression, dissociation, and marriage. Re-experiencing was strongly associated with mental issues which include depression and anxiety.

44) Post-Traumatic stress disorder in patients with epilepsy

Lisa Dounia Soncin, Aileen McGonigal, (August 2021)

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We commonly study the link between psycho trauma genic events with epilepsy. This study had 54 patients with epilepsy with 61 controls. They used some validate questionnaires to test the anxiety, depression with PTSD symptoms. The study also conducted an interview to have the presence of PTSD during interracial and parietal period. The paper results show patients reported more exposure to trauma genic events that have more severe PTSD symptoms. 78% of patients have been diagnosed with trauma genic events and 26 % of people have scored above the diagnostic threshold of the PTSD scale. 18.6% have stated that their symptoms of epilepsy began at the same time they started having PTSD with the symptoms of TE. Patients having high PTSD reported to have more depression symptoms. Within the time frame 72% anxiety and 33% depression symptoms had correlation with PTSD symptoms shown in scale. In this study the participant's show that patients with epilepsy are raised in prevalence of self-reported PTSD symptoms.

DISCUSSION

The above study clearly highlights the ever-growing body of evidence which shows that the increased allostatic load associated with PTSD is related to a myriad physical morbidity, including chronic musculoskeletal pain, hypertension, hyperlipidemia, obesity, cardiorespiratory/cardiovascular, gastrointestinal and immunological disorders. However, there is also clear evidence that PTSD can be a huge antecedent for developing and worsening the symptoms of various mental disorders namely Major Depression, Substance abuse/dependence and comorbidity, Trauma in Epilepsy, Acute respiratory distress syndrome and Anxiety. It can also hamper an individual's psychosocial environment and emotional intelligence and may even increase the chances of acquiring a psychiatric disorder in future. Thus, the above study presents proof that PTSD that is long standing is directly proportional to the effects on Somatosensation i.e, there are long term effects of PTSD on our somatosensation.

PTSD can affect anyone regardless of the specific traumas suffered by them as its effects cause similar changes in the functioning of everyone's brain. It all comes down to the way our body reacts to fear, and specifically, what fear does to the brain followed by the inability to recover from that fear mode. Trauma-focused Cognitive Behavioral Therapy, Prolonged Exposure, and Cognitive Processing Therapy are all effective therapies for PTSD supported by a large body of evidence. Each of these approaches is trauma-focused, which means they directly address traumatic memories associated with the distress as well as thoughts and feelings associated with the feared incident.

CONCLUSION

PTSD is linked to a number of factors, including traumatic events and their severity and several epigenetic factors. PTSD is a long-term degenerative illness that is destructive to people's mental and physical health. The above study which focussed on understanding the long-term effects of PTSD on somatosensation provides evidence that over the course of time if PTSD continues to last and remains untreated then it can have some severe effects on an individual's somatosensation. Future research could focus on figuring out how to lessen the effects of trauma on somatosensation, thus preventing more people from developing the illness.

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Conflict of Interest

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