

# Impact of Traumatic Brain Injury on Employment Prospects

K. Yogarajan<sup>1\*</sup>, Sugasri Sureshkumar<sup>2</sup>

<sup>1</sup> Associate professor, National institute for Empowerment of Persons with Multiple Disabilities(Divyangjan) Kovalam,India

<sup>2</sup> Head of the Department of neurology ,Faculty of Physiotherapy,Meenakshi Academy of higher Education and Research,Chennai,India.

---

## Abstract

*The employment process is affected by traumatic brain injuries that can develop into permanent or temporary injuries. This is gaining a growth for employment of the persons and affecting the issues of brain injuries are growing the serious health problems for individuals. The brain effects are developing some serious and bad effects in a person gained from different accidents, sports injuries, and other issues that are essential for creating progress. Different behavioral changes are developed in a person affected by traumatic brain injuries. Coma, death, paralysis, and other issues are developed in persons affected by traumatic brain injuries. Different mental issues are developed in a person affected with serious brain injuries creating a major growth in their life. Advanced technologies are developed with curing patients suffering from traumatic brain injuries that are seriously affected by permanent and temporary effects of growth. Solutions are needed and different new technologies are developed for solving the issues of brain problems that are increasing in the persons affected with TBI. People are losing their lives in an increasing manner which is helping to grow every year in India. The government is developing different initiatives that are helping to solve the process and creating awareness to reduce accidents and loss of life. The functional impairment is helping to treat the patients and helping to reduce the effect of TBI in persons. Trauma is developing tools that are helping to solve the issues of patients seriously damaged with brain injuries.*

## Keywords

*effects of TBI, mitigation process of TBI*

---

## INTRODUCTION

Traumatic brain injury (TBI) is developed with different sports injuries and accidents. The symptoms are developed with effects of brain injury such as confusion, blurry vision, developing difficulties in concentration. Sudden head injuries are developed with sudden violent hits through an object. Objects piercing the skull and entering brain tissue are created through the traumatic situation. The TBIs mostly happen to an individual with a fall, injuries related to fire-arm, and crashes due to motorcycle accidents. Suicides are commonly developed with TBI-related deaths in brain injuries. The most effective development created on TBI is essential for lowering the chance of returning to work after recovering from accidents. The worst employment outcomes developed due to the creation of impact with TBI are commonly developed in death. 100000 lives are lost every year and over 1 million suffer from serious brain injury [5]. Penetrating brain injury, brain contusions, concussions, and anoxic brain injuries are developed as traumatic brain injury that is important for categorizing brain contusion. The full and different functional TBI recovery is developed when brain injuries are gaining recovery from regress. Permanent brain damage including death, coma, and paralysis is created by most TBIs with mild, and moderate temporary brain damage [11]. The ability of a person's life is affected by TBI ensured daily life or die in brain damage growth.

This study is showing that traumatic brain injury

developed a serious impact on the employment perspective which is important for gaining growth in the work field. Regulation of emotions, an adaptation to change, social interactional growth, and difficulties in finishing tasks are impacting the ability to work with TBI. Behavioural changes are developed as time is passing and it is gaining personality changes in a person. Life-changing disabilities are developed with damage from brain injury creating cognitive difficulties created with intense rehabilitation care. The issues of sensory difficulties are developed in a person with TBI process as patients are having some problems with hearing, touch, taste, and smell. The moderation of growth can be seen in the recovery process as people are backing in the normal process.

## LITERATURE REVIEW

### Problems in the TBI process and employment process

Difficulties in finishing tasks, regulation of emotions, adapting to change, and social interaction are the issues that are growing. TBI is affecting the persistence, speed, and concentration process helping to prevent various issues in the workplace. Difficulties in professional and personal relationships are important for decreasing abilities in jobs and other places to work. Patients with TBI are facing issues of difficulties in the car driving, working on complex machinery systems, and playing a sport are serious damages to the growth of the TBI process [12]. This is developed as a limitation for hearing, listening, smell and touch

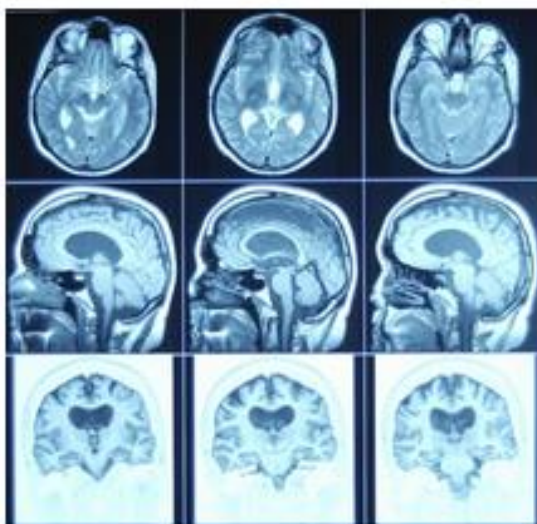
development progress. The process of ringing and roaring is developed in a person creating limitations with TBI. Chronic headaches, bladder and bowel difficulties, impairments of sensory growth, muscle weakness, and development of long and temporary paralysis. Attention, concentration, speech and language, memory and language, reasoning and planning, and different problem-solving skills are developed in the process. Focusing issues and attention problems are developed in a person that is important for a person. The optimal decision-making process is creating difficulties in the TBI process developed in individuals. People with different injuries in the prefrontal cortex are facing difficulties in executive functions. Executive dysfunction processes are developed in TBI patients creating difficulties in functions. The risk of mental health creates issues of anxiety and depression and solves the sleeping problems of patients affected with TBI. Physical abilities, thinking abilities, and behaviors are creating affecting daily life with brain issues. The long-term disabilities are gaining benefits turmeric brain injuries (TBI) are sudden changes in life-changing skills. Disturbance of attention, executive functioning, and monitoring are deficits that are occurring with the TBI process [4]. The neurocognitive consequences of the TBI process are developed with patients. The personality of a person changes completely due to different behavioral changes as time is passing through. The newly injured brain process is a misleading process affecting growth predicting adequate information that is important for creating issues of focal damage. The long-term and permanent difficulties are creating brain injuries. The brain of children is damaged areas that are creating different similar damages affecting persons.

ensured with brain trauma growth. Coma is developed with unconsiouses developed alertness of the table to communicate. The occupational therapist process is creating a speech-language growth process. The mental health problems that increase with the TBI process are creating a major issue affecting the daily lives of persons that are creating difficulties in different maintenance issues. Disturbances in attention, executive functioning, and memory are affected due to the growth of TBI. The feeling of issues in social skill understanding are affecting the social interaction process. The discomfort around the people is helping to develop in the process of TBI growth that is important for gaining an implementation process of different strong emotions such as anger, and excitement. The ability of empathy gained in the patients affected with TBI is not helping to make the optimal decision-making process are developed. Motor impulsivity growth is developed in this process. The production of speech affected with TBI has become slow, slurred, difficult to understand and creating speech problems that are creating dysarthria.

**The Mitigation process of TBI and development of the employment process**

The oxygen and adequate brain injury are focused on preventing injury to the head and neck as emergency care is developed. Adequate blood supply is developing the surety of oxygen supply is getting a solution for severe injuries from the brain. Patients with careful attention are gaining with the help of oxygenation, adequate hemodynamic support development is beneficial for gaining proper growth for the management of head injuries. Hypoxia and hypotension are created by traumatic brain injury for the treatment of head-injured patients. Stopping the bleeding process is necessary for providing a priority for a person with brain injury as the head and shoulders are elevated slightly. The maintenance of airways and ventilation is necessary for gaining a visible solution for minimizing secondary effects and injuries for persons. Recognition and treatment of hypoxia, and hypercapnia are important for preventing serious effects of secondary head injuries in patients [1]. The buckling passengers along with children are helping to lower TBI growth which is important for preventing the effects of major head injuries. Drinking alcohol and drugs is creating a serious effect on people with severe brain injuries.

Independent living skills are ensured with occupational therapies for brain injury rehabilitation. The different variety of physical, physiological, and cognitive functions are developing memory, movement, emotional regulations, sensory processes are mainly gained with the TBI process. The primary survey is necessary for preventing issues of trauma patients gained with airway, breathing, circulation process, disability, and exposure control. The nursing management for patients with head injuries is developed with adequate airways. Clearing the mouth, inserting an oral airway process, assisting the intubation process, oxygen therapies, respiratory system of patients are helping to lower



**Figure 1:** Brain communication in the TBI process  
(Source: [4])

The TBI process is affecting communication for a person that is creating brain muscles of speech mechanism creating dysarthria. The damage to speech mechanism is creating an effect on communication and capabilities of flexibility are

head injuries. The GCS score is important for dealing with head injuries that include airway, cervical spine protection, circulation, and breathing are helping to ensure head injuries for trained healthcare providers are helping patients to grow [6]. The first aid process is important for achieving a first treatment that is helping to ensure the safety of patients. Control of the bleeding process is a method of blood injury prevention technique that is important for wounding first aid [13]. The washing of hands is necessary after completing the process of providing brain injury treatment. Seeking help is important for the first method of injury treatment which is helping to stop blood injuries after the accident. Recognizing, reporting, and recovering are helping to gain the concussion process and avoid complications are part of the concussion management process. The client's acquired brain injuries are affecting behaviours by pushing buttons and developing strategies to create connections with effects and injury of the brain. The assessment of TBI is commonly gained through imaging techniques such as CT scans and MRI scans are essential for identifying a patient's intracranial with persistent symptoms. Skull fractures are helping to reduce is important in the reduction of brain injuries are helping with the wearing of helmets.

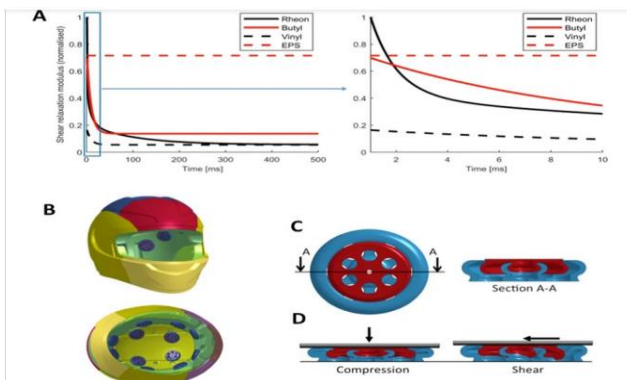


Figure 2: Mitigation process of TBI

(Source: [6])

Focal and diffuse brain injuries are the primary brain injuries that are immediately affecting brain functions. The different evidence of skull fractures is depending on the coexistence of brain injuries that are gaining with TBI cases. Compromised blood supply is assuring neuronal and glial cells are helping to prevent primary brain injuries. Cognitive deficits are creating different behavioral changes and hemiparesis [2]. Degradation of the axonal cytoskeleton brain stem and the corpus callosum is gained with extensive damage of TBI. The provision of hard hats is helping to gain better protection from the process of head injuries that are lowering the risk of any falling objects, electric shocks, and other injuries that are prevented in the workplace. Increased flexibility, wearing the right gear, taking breaks, playing safely, increasing flexibility, and using proper techniques are important for achieving proper development for preventing injuries. The proper safety and wellness plan are important for gaining the prevention of workplace injuries, regular training and injuries are helping to prevent accidents in the

workplace. The identification of safety concerns is helping to prevent accidents in the workplace. Education, enforcement, and engineering are important for injury prevention and are helping to develop the TBI process.

### Different technologies to reduce the TBI process

The technologies are helping to reduce the effects of TBI on a person. The effects are minimized by different processes helping patients to grow. Different advances are essential for healing patients with techniques helping the effects of TBI. The governments are taking different initiatives that are beneficial for the growth process. Lack of awareness and different progressive measures are taken by governments for helping patients and lowering the issues of accidents. Governmental processes are helping to reduce the risks of TBI in persons. In terms of the TBI process, implementing several technologies helps to prevent this process. Some of the technological initiatives are-

### Appropriate diagnosis

Brain injuries are considered an emergency. In the case of this scenario, TBI can be more severe and the consequences can be worse gradually due to the lack of diagnosis. In terms of this situation, doctors can implement different technologies through which they can diagnose the situation in the initial stage.

### Glasgow Coma Scale

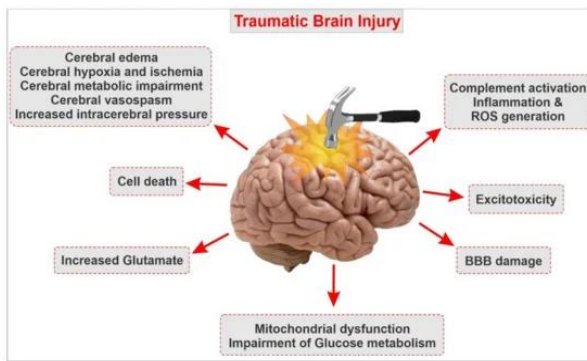
It is known as a 15- point test which helps the doctor or different medical professionals to determine the initial severity of a brain injury by analyzing the ability of the person. On the other hand, following the moving directions of eyes and limbs also helps to determine the TBI symptoms. The coherence of speech can be beneficial thing for this test and also helps to reduce the rate of TBI.

### Imaging tests

A computerized tomography scan is known as a crucial test that can be implemented in the initial stage to determine the TBI. In terms of this test, it is usually performed within an emergency for the determination of traumatic brain injury. CT scan usually uses a series of X-rays to analyze a detailed view of the brain [7]. A CT scan can quickly visualize factors and can determine other factors such as uncovering evidence of bleeding within the brain, blood clots, bruised brain tissue along with brain tissue swelling.

### Magnetic resonance imaging

It is mostly known as MRI which uses powerful radio waves along with magnetic waves to create a visualized detailed view of the brain [19]. This test can be used after the patient stabilizes and when symptoms are not improved after the injury.



**Figure 3:** Traumatic brain injury growth

(Source: [10])

### Intracranial pressure monitor

Tissue swelling issue from a traumatic brain injury can increase pressure within the skull and results in additional damage to the brain [18]. In terms of doctors, they can insert a probe into the skull to determine this pressure.

### Utilization of EEG

EEG signals are known as voltage signals which can recognize the waves of the brain and helps to determine the TBI process [17]. Usually, brain amplitudes are quite small and less than 100  $\mu\text{V}$ . Before starting the TBI detection several initiatives must be maintained and for that reason, EEG signals are first preprocessed to differentiate the noise along with artifacts.

### Magnetic resonance spectroscopy

It can be considered as MRS which is based on the metabolism of the brain. In terms of this technology, the numbers are generated through this scan which can provide a general prognosis regarding the ability of the patients. On the other hand, it helps to prevent the TBI process by determining it at the initial stage.

All of the mentioned technologies can be implemented for TBI detection and mentioned techniques also help to prevent brain injury at the beginning stage [20]. Mentioned techniques are also utilized by the Indian government and many other countries and medical teams or professionals are also able to prevent this process.

## METHODOLOGY

The methodology part of the study plays an important role and helps others to obtain an appropriate result. Therefore, a secondary qualitative data collection method has been chosen to conduct the research for the future. Secondary data can be easily collected from previously conducted research and those are second-hand sources of Data. Most of the cases secondary information is highly preferable because it can be further collected within a short time. Some important sources of secondary data are Journals, books, and some other government websites and articles. After searching for relevant journals one can find enough information for the current research. Previously conducted studies can easily

demonstrate that brain injuries can alter the lifestyles of individuals and also change their employment status. Previously conducted research helps to evaluate that employees after TBI always prefer to join their old workplaces rather than join a new environment. On this note, it can be stated that employees may feel insecure and uncomfortable after joining a new office. The post-traumatic lives of individuals are life-threatening and there are nearly 1.5 million individuals who suffer from TBI [8].

Government websites or published data can be considered one of the most reliable sources of information for this research. Anyone can easily gather secondary data after clicking once on the internet and it is also a time-saving process. A huge amount of information can be easily gathered from authentic sources of scholarly journals. In this context, the primary research method has not been selected because it may take lots of time to gather data and analyse it properly. As secondary information can cover different countries and also successfully provide information about different TBI cases. From this research, people can understand that TBI can negatively impact the mental condition of individuals from all over the world. Most of the cases, individuals with TBI face lots of difficulties while interacting with others and completing tasks. People become unsocialized after having a Traumatic Brain Injury and people may forget to deal with basic duties due to partial disabilities,

To conduct the research properly, only scholarly journals can be selected and it should be maintained that data must not be older than the year 2018 [10]. Journals selected from the scholar can effectively provide information about Traumatic Brain Injury and also provide a clear insight into the SSA guidelines regarding TBI. Further guidelines of SSA include the neurocognitive disorders that can damage the tissues of the brain which leads to ultimate disabilities. After collecting the data from the secondary method, it is required to analyse it properly. Further analysis should be done after comparing with several relevant journals. Observation can be considered the most reliable method for obtaining the best result regarding the complications regarding TBI.

## DISCUSSION

The aforementioned study, helps individuals to understand that “a traumatic brain injury” is the result of a “motor vehicle accident”. In that case, trauma can be induced by the activities of abusers, and the sudden emergence of violence can be observed within the workplace. TBI can convert individuals to inactive and disabled, henceforth the rate of productivity within the workplace becomes reduced. The study further provides insight into the rehabilitation method for Traumatic brain injury, which is less in number [16]. Most of the researchers have been concentrating on the intervention model of TBI, to reintegrate disabled individuals into the workforce. Further categorization of brain injury can be denoted as brain concussion and anxious brain injuries. The estimation of the ratio helps to understand that men are

frequently experiencing TBI and the rate is near about 80%. As a result, individuals receive permanent disabilities, and every year India experiences the death of individuals due to TBI [9]. Therefore, TBI can be considered one of the most complicated injuries for individuals in the United States. After recovering from the accidents individuals cannot return to the work immediately due to their incapability of working. After occurring TBI to the individual's further difficulties can be observed during accomplishing the tasks, therefore individuals may face difficulties to finish their work. Therefore, it can be observed that, after moderate injury in the brain, nearly 70% of individuals are incapable of returning to work. On the other hand, 20% of employees become unemployed after receiving a traumatic brain injury. In the phase of the post-traumatic region, only 2% of individuals can be further employed on a short-term basis [4]. As a result, those individuals can not properly return to their work as their self-worth becomes hampered. People who cannot return to their work after TBI can deliberately lose their self-motivation and also cannot manage their well-being. After TBI, individuals from all over the world become unemployed and that situation leads them to take some inappropriate steps. The competency of those individuals becomes decreased due to the loss of self-esteem and they also think that there is no contribution towards their society.

Individuals suffering from a brain injury should get some extra expenses from hospitals because they may face challenges regarding traveling. The positive contribution of healthcare providers and individuals can be observed in this case. Within this method, healthcare providers are giving treatment facilities to individuals suffering from TBI [14]. Those patients can easily collect medicines from their nearby hospitals to avoid traveling issues. The study has been conducted with the help of secondary qualitative data collection and analysis process. Therefore, some previously conducted research articles have been selected for the further accumulation of data. Health professionals are interpreting these kinds of cases through open communication. On the other hand, a patient-centered approach can help those TBI individuals to obtain care and assistance from occupational therapists. As a result, those patients may be able to return to their workplace as soon as possible. Medical examinations are helpful to identify the issues of brain injuries that are gaining with neurological developments. Thinking, sensory functioning, coordination, eye movement, and reflexes are not beneficial for using the TBI process. The people who are able to recover from brain functioning are helped to gain neurosurgery, and physical therapy, physiological services, and social services are developed to grow in the process of reducing the brain injury process. The healing process takes a long time for solving brain injuries in serious cases for ten years and in normal cases, it takes a few weeks [15]. The number of individuals affected with TBI issues getting out multiple physical and mental disorders is increasing.

## CONCLUSION

From the study, it can be concluded that traumatic brain injury is developed with the regulation of emotions creating social interaction. Prescience, speed, and concentration affect growth in the ability to work. Serious and life-changing injuries are affecting brain damage creating sudden damage in the brain. The physical illness developed with TBI is creating cognitive relationships that are important for understanding disabilities important for rehabilitation care. The people are not able to develop working conditions that are helping to gain permanent physical and mental disabilities. Long-term and short-term disabilities are developing in individuals creating different changes in working conditions. Chronic headaches and long and short-term paralysis are developed in persons with serious TBI processes who are changing their personalities. Aggressive outbursts are developed in persons that are naturally developed with personality changes in the TBI process. The recovery from brain injuries can be done with different difficulties that are essential for gaining development in behavioural changes. The patients of TBI lack empathy and are created with serious health issues measuring the effects. The brain function of the person can get normal in the process of growing and can be solved within a week or months. The loss of vision can be developed in a person in the TBI process and can have a major impact on individuals.

Disturbances in attention, memory and executive function are affected in TBI and are common with neurocognitive consequences. Permanent and mental disabilities can be developed in a person creating a long-term effect and creating injuries. The balance, coordination, and quick reactions of a person get affected in the process of traumatic brain injuries. Riding a bike, or car and walking are difficult as these processes are affecting people suffering the issues of mental problems. Most people who are not able to back to normal life after being affected by the TBI process are declining daily life persons. Death and permanent brain injuries are creating severity and are going away. Damaged brain cells are not regenerated with the repair. Memory difficulties, anxiety, and depression are created in persons in the TBI process. Maintaining good food habits and balanced growth in lifestyle is helping to gain solutions for brain injury problems. The proper maintenance of diet plans and regular balanced diet charts are helping to grow individuals and helping to get out of brain issues. Brain functioning is getting solutions with MRI processes to reduce the injured and dead brain tissues helping out TBI.

## REFERENCES

- [1] Jasien, J.M., Bonner, M., D'alli, R., Prange, L., Mclean, M., Sachdev, M., Uchitel, J., Ricano, J., Smith, B. and Mikati, M.A., 2019. Cognitive, adaptive, and behavioral profiles and management of alternating hemiplegia of childhood. *Developmental Medicine & Child Neurology*, 61(5), pp.547-554.

- [2] Jo, K.W., 2022. Target temperature management in traumatic brain injury with a focus on adverse events, recognition, and prevention. *Acute and Critical Care*, 37(4), pp.483-490.
- [3] Mollayeva, T., Mollayeva, S. and Colantonio, A., 2018. Traumatic brain injury: sex, gender and intersecting vulnerabilities. *Nature Reviews Neurology*, 14(12), pp.711-722.
- [4] Saadi, A., Bannon, S., Watson, E. and Vranceanu, A.M., 2022. Racial and ethnic disparities associated with traumatic brain injury across the continuum of care: a narrative review and directions for future research. *Journal of racial and ethnic health disparities*, 9(3), pp.786-799.
- [5] McGuire, J.L., Ngwenya, L.B. and McCullumsmith, R.E., 2019. Neurotransmitter changes after traumatic brain injury: an update for new treatment strategies. *Molecular Psychiatry*, 24(7), pp.995-1012.
- [6] Alashram, A.R., Annino, G., Padua, E., Romagnoli, C. and Mercuri, N.B., 2019. Cognitive rehabilitation post traumatic brain injury: a systematic review for emerging use of virtual reality technology. *Journal of Clinical Neuroscience*, 66, pp.209-219.
- [7] Xiong, Y., Mahmood, A. and Chopp, M., 2018. Current understanding of neuroinflammation after traumatic brain injury and cell-based therapeutic opportunities. *Chinese Journal of Traumatology*, 21(03), pp.137-151.
- [8] Wardlaw, C., Hicks, A.J., Sherer, M. and Ponsford, J.L., 2018. Psychological resilience is associated with participation outcomes following mild to severe traumatic brain injury. *Frontiers in neurology*, 9, p.563.
- [9] Pavlovic, D., Pekic, S., Stojanovic, M. and Popovic, V., 2019. Traumatic brain injury: neuropathological, neurocognitive and neurobehavioral sequelae. *Pituitary*, 22(3), pp.270-282.
- [10] Wright, T., Urban, R., Durham, W., Dillon, E.L., Randolph, K.M., Danesi, C., Gilkison, C., Karmonik, C., Zgaljardic, D.J., Masel, B. and Bishop, J., 2020. Growth hormone alters brain morphometry, connectivity, and behavior in subjects with fatigue after mild traumatic brain injury. *Journal of neurotrauma*, 37(8), pp.1052-1066.
- [11] Joshua, A.M., Vijaya Kumar, K. and Naidu, R.C., 2022. Traumatic Brain Injury. In *Physiotherapy for Adult Neurological Conditions* (pp. 423-493). Springer, Singapore.
- [12] Rauchman, S.H., Albert, J., Pinkhasov, A. and Reiss, A.B., 2022. Mild-to-Moderate Traumatic Brain Injury: A Review with Focus on the Visual System. *Neurology International*, 14(2), pp.453-470.
- [13] Poddar, S., 2020. Analysis of pre hospital emergency management in case of head injury. *Enfermeria clinica*, 30, pp.228-233.
- [14] Holloway, M. and Tasker, R., 2019. The experiences of relatives of people with acquired brain injury (ABI) of the condition and associated social and health care services. *Journal of Long-Term Care*, 2019, pp.99-110.
- [15] Pavlovic, D., Pekic, S., Stojanovic, M. and Popovic, V., 2019. Traumatic brain injury: neuropathological, neurocognitive and neurobehavioral sequelae. *Pituitary*, 22(3), pp.270-282.
- [16] Elbourn, E., Kenny, B., Power, E., Honan, C., McDonald, S., Tate, R., Holland, A., MacWhinney, B. and Togher, L., 2019. Discourse recovery after severe traumatic brain injury: Exploring the first year. *Brain Injury*, 33(2), pp.143-159.
- [17] Kim, N., Watson, W., Caliendo, E., Nowak, S., Schiff, N.D., Shah, S.A. and Hill, N.J., 2022. Objective Neurophysiologic Markers of Cognition After Pediatric Brain Injury. *Neurology: Clinical Practice*, 12(5), pp.352-364.
- [18] Hung, K.L., 2020. Pediatric abusive head trauma. *biomedical journal*, 43(3), pp.240-250.
- [19] Stenroos, P., Paasonen, J., Salo, R.A., Jokivarsi, K., Shatillo, A., Tanila, H. and Gröhn, O., 2018. Awake rat brain functional magnetic resonance imaging using standard radio frequency coils and a 3D printed restraint kit. *Frontiers in neuroscience*, 12, p.548.
- [20] O'Connell, G.C., Alder, M.L., Smothers, C.G., Still, C.H., Webel, A.R. and Moore, S.M., 2020. Use of high-sensitivity digital ELISA improves the diagnostic performance of circulating brain-specific proteins for detection of traumatic brain injury during triage. *Neurological research*, 42(4), pp.346-353.