



IMPACT OF REHABILITATION THERAPY ON FUNCTIONAL RECOVERY IN TRAUMATIC PARAPLEGIA PATIENTS IN KERALA

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ABSTRACT

Traumatic paraplegia, a debilitating condition often resulting from spinal cord injury, presents significant challenges to individuals' physical function, independence, and quality of life. Rehabilitation therapy plays a crucial role in maximizing functional abilities and promoting well-being in these individuals. This study aims to assess the effectiveness of rehabilitation therapy for individuals with traumatic paraplegia in selected hospitals in Kerala, India. The primary objective is to evaluate the impact of rehabilitation therapy on physical mobility, functional independence, and psychological well-being among individuals with traumatic paraplegia. Additionally, the study aims to identify the challenges faced during rehabilitation and explore the role of multidisciplinary care in recovery. Motor recovery in traumatic spinal cord injury is reported to reach its plateau by 1 year and maximum recovery period is reported to be 2 years. Acute rehabilitation is very well documented in literature with patients reporting for functional rehabilitation immediately after shock period is over. However, the scenario being a bit different in rural areas with comparatively less awareness about role of physiotherapy, patients with reports at later stages. Reported here is a series of chronic cases who showed remarkable clinical and functional recovery in short time. Aim of this study is to report recovery in patients with chronic and to compare the patient outcomes with expected outcomes. Baseline assessment at admission and at discharge was recorded. Improvement was recorded with spinal cord independence at different time points.

Key words: Functional recovery, Rehabilitation therapy, traumatic paraplegia, Kerala

INTRODUCTION

Strategic and evidence-based planning of rehabilitation interventions is of prime importance to improve cost efficiency while maintaining patient and system outcomes in these times of increasing economic pressure. Considerable research effort has been made to delineate which rehabilitation processes are effective and are most associated with positive patient outcomes. Most studies focus on the patient's functional outcome as measured by the Functional Independence Measure) and employ FIM gain per day describe rehabilitation efficiency. For spinal cord injury (SCI), functional recovery gained from rehabilitation is strongly determined by patient and injury characteristics with some influence from the rehabilitation process. The recent SCI Rehab Project conducted the first comprehensive quantification of the SCI inpatient rehabilitation process collecting extensive patient and rehabilitation service data over a five-year period. The study carefully examined the relationships between rehabilitation services and outcomes, and revealed that more time in the rehabilitation disciplines of occupational therapy and physical therapy is positively associated with functional recovery, with a stronger effect observed within functionally homogenous patient grouping. Increasing the intensity at which the therapy is provided has also been shown to improve efficiency and patient functional outcomes in SCI and other impairments. There is currently little known concerning the impact of rehabilitation therapies on system outcomes such as financial and resources requirements, other than the commonly used measure of length of stay as a proxy. For SCI, the care continuum spans over multiple phases, and any decisions made about a rehabilitation program can impact phases of care both upstream and downstream along the continuum. To assess such complex system questions, computer simulation models have been used to optimize management strategies and improve decision-making for a variety of difficult public health problems including health system capacity to deal with the changing SCI epidemiology, and with chronic disease, infectious disease epidemiology, patient journey modeling, diabetes treatment strategies, and secondary complications in SCI. There has been significant progress in the treatment of spinal cord injuries. Spinal cord injuries (SCIs) may be treated in a variety of ways, including with medicine, nutritional supplements, and physical therapy. Treatment plans to restore mobility to injured joints and prevent muscle atrophy are based on the severity of the injury. In theory, the role of treatment is to maintain regular metabolic processes in the respiratory and digestive systems. Patients with spinal cord injuries (SCIs) have a better chance of a complete and functional recovery if they participate in treatment and rehabilitation programs,

according to a limited but increasing amount of research. We urgently need considerable breakthroughs in this field as there are no effective alternatives to SCI treatment. In order to promote their patients' physical and emotional health, nurses must establish and execute care plans and disseminate pertinent information. They will stop at nothing to ensure that patients and their families get the highest quality medical care. Completing these tasks will improve patients' self-assessment of impairment, their speed of return to families and communities, and their overall quality of life. After a devastating spinal cord injury (SCI), a person's whole world could crumble.

Tanlaka, (2024) Stroke survivors with cognitive impairments upon admission to inpatient rehabilitation may have difficulties with participation and have worse functional results compared to those without cognitive impairments. The functional outcomes of stroke survivors with and without impaired cognition may vary depending on factors such as age, the severity of the stroke, and the degree of cognitive impairment. The stroke rehabilitation database of a hospital in south western Ontario was queried for health-related administrative data in a retrospective secondary data analysis. The purpose of this study was to investigate possible connections between functional improvements, length of time spent in rehabilitation, and transitions to independent living after a stroke and decreased cognition. Compared to patients without cognitive impairment, those with cognitive impairment after a stroke were older, had a moderate to severe stroke, more moderate cognitive impairment, longer rehabilitation stays, and were more likely to be discharged to longer-term care facilities. The age of the patient, the amount of cognitive impairment, and the intensity of rehabilitation treatments are the factors that significantly differ in rehabilitation stays and post-discharge destinations between stroke survivors with and without cognitive impairment.

Hocking (2023) that individuals with traumatic brain injuries (TBIs) work together to establish goals and discover the drive to achieve them. This will help expedite the recovery process. The opposite is true for in-person treatments, which have a time limit. Quickly implementing modern patient care practices is essential. Conversational agents (CAs) are another name for chat bots; they enable humans to conduct what seem to be natural interactions with computers. This study set out to address the use of a novel CA named Rehab-chat in the treatment of brain injury. We were interested in its functionality, general acceptability, and practicality. Three examples of such techniques include a feasibility study, a mixed-methods approach, and a case-by-case design. Brain

injury rehabilitation programs that are both community-based and publicly-funded need to be set up without delay. Participants in this research also include healthcare professionals, those with a history of brain injury, and the general public. After receiving their personalized instructions, couples participating in conventional treatment continued to utilize Rehab-chat for an additional two weeks.

Schlemmer (2022) traumatic brain injuries cause vertigo, instability, poor eyesight, and an uneven stride in millions of individuals annually. Resting in bed is a common recommendation from doctors for patients suffering from concussions and mild traumatic brain injuries. It may be necessary to investigate other therapy options for people if symptoms persist for more than a few days. Finding the best evidence for vestibule rehabilitation therapy's efficacy in treating mild traumatic brain injuries was the primary motivation for doing this mini-systematic review. The PRISMA statement, a declaration for reporting systematic reviews and meta-analyses, served as the basis for our literature analysis. Results from the VRT and were the only ones taken into account. To locate records that met the inclusion criteria, we searched Pub-med an. Additional research was uncovered during a manual review of reference lists. To take part in this research, you must meet the following criteria: (a) the participant's principal objective was to alleviate vestibule symptoms following a concussion or mild traumatic brain injury through visual response therapy; (b) the participant documented their symptoms through self-report or performance-based outcome measures; and (c) the participant encountered vertigo, imbalance, or any other symptoms related to the vestibule.

Wanjari (2021) People with spinal cord injuries still have very limited access to functional rehabilitation, even though there has been great strides in providing natural therapeutic choices. Paralysis may develop in one or more limbs after a spinal cord injury. The root cause of this condition is damage to the ligaments, vertebrae, or discs that make up the spinal column. Loss of feeling and movement in the lower limbs is a hallmark of paralysis. A partial paralysis of the lower limbs has repercussions across the pelvic region, which in turn affects the trunk and legs. The complexity of SCIs, which may cause both the damage and subsequent dysfunction and disorder in the long run, may be to blame. Important factors that lead to secondary degeneration include brain inflammation, deterioration, neurotoxin, dysfunctional blood vessels, and cell death. The man in this x-ray, who is 34 years old, suffered wedge compression as a result of a fall from a tree. Various treatment approaches are required to accomplish the

aims of regeneration, rehabilitation, and preservation at various phases of the post-injury response. Finally, we will discuss exercise and physical training as a strategy that seems to provide several advantages to those coping with acute or chronic spinal cord injuries

Rehabilitation for Heart Conditions

Exercise, counselling on risk reduction, stress management, and health education are all parts of cardiac rehabilitation, a multidisciplinary approach that may help patients with heart disease or recovering from a myocardial infarction. Some of the goals of these programs include improving patients' mental and occupational health, stabilizing or reversing atherosclerosis, and controlling cardiac symptoms. Improving exercise capacity, mental health, and quality of life are just a few of the many advantages of cardiac rehabilitation. It also helps to decrease the frequency of unplanned hospitalizations. Among these many advantages, upper limb dyspepsia may be lessened and corrective breathing exercises can be a part of rehabilitation programs.

Rehabilitation Settings in Hospitals

Rehabilitation is an all-encompassing process that seeks to develop and sustain abilities in physical, mental, and social domains. It is less probable that environmental causes may incapacitate individuals with health difficulties. In general, habitats are where people and communities call home. There are physical, cultural, and social components to these environments. There is a heavy focus on people and places on environments in the most popular ICF Framework Model for rehabilitation. Any individual's strategy for recovery should include all of these factors. Being mindful of how various settings affect recovery is important since it may happen anywhere. In the medical field, the word "setting" may refer to a variety of things. A healthcare facility may be anything from a standard medical office to a facility that specializes in surgery, rehabilitation, nursing, pain management, dentistry, podiatry, chemotherapy, or endoscopy. It may also include specialized outpatient treatments. Furthermore, several medical treatments may take place in the patients' homes or places of work.

Getaway for paraplegia therapy

One of the most obvious symptoms of neurological diseases or spinal cord injuries is paraplegia. These kinds of accidents and diseases often need prompt medical intervention. This statute does not cover you if your physician has warned that you may develop paraplegia as a result of your condition. If you are paraplegic, your healthcare

practitioner will tell you what to do. If the transfer wasn't executed properly, the patient might experience long-term effects from a spinal cord damage. This is why it is crucial that only trained professionals transfer patients who may have suffered a spinal cord injury. According to the law, you have an obligation to rescue the individual from a life-threatening circumstance if their life is in immediate danger. Secondly, if the individual is inside a burning car, which might happen after an accident, this provision is not applicable.

Rehabilitation Centres

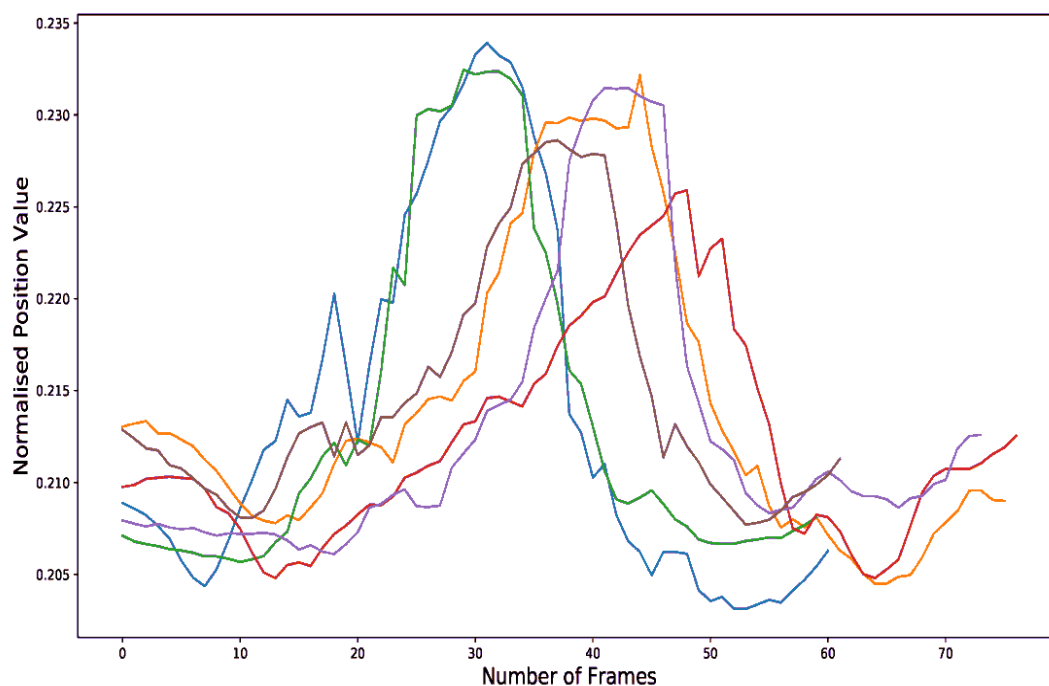
Paraplegia rehabilitation clinics play an essential role in patient care by offering comprehensive programs that improve patients' emotional, functional, and physical well-being. Occupational and physical therapists are examples of qualified professionals who may assist in enhancing mobility, independence, and adaptive capacities. These facilities provide a variety of services, including personal training, mobility courses, information on assistive technology, and emotional support. Paralyzed people may regain confidence and realize their dreams with the help of holistic treatment.

METHODOLOGY

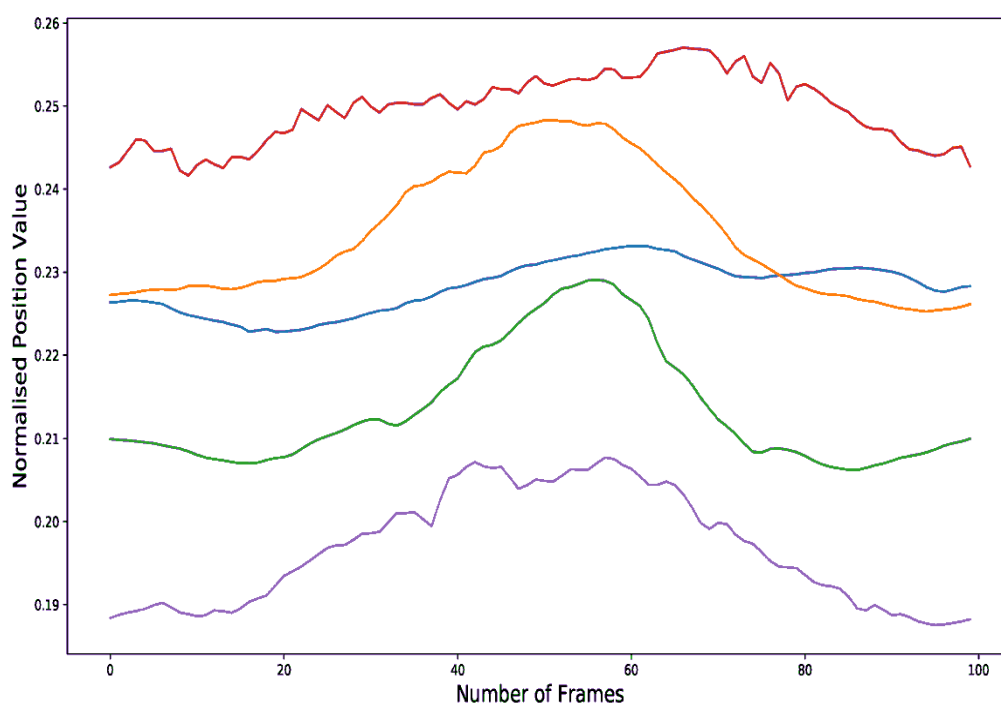
This study employs a quasi-experimental pre-test and post-test design to assess the effectiveness of rehabilitation therapy for individuals with traumatic paraplegia in selected hospitals in Kerala. The study includes both qualitative and quantitative analysis to evaluate the impact of various rehabilitation methods on motor function, Activities of Daily Living (ADLs), and psychological well-being. A quasi-experimental study with a pre-test and post-test control group design will be used to evaluate the effectiveness of rehabilitation therapy in improving functional independence, mobility, and psychological well-being among individuals with traumatic paraplegia. A quasi-experimental design allows for comparing two groups (intervention vs. control) while accounting for ethical concerns in patient care. The pre-test and post-test approach enables measuring the change in functional outcomes after rehabilitation therapy. Traumatic paraplegia, a life-altering condition, results from spinal cord injuries (SCIs) leading to partial or complete loss of motor and sensory function below the affected level. Understanding the clinically relevant anatomy, particularly the spinal cord, neural pathways, and musculoskeletal system, is crucial in designing effective rehabilitation strategies.

RESULTS & DISCUSSIONS

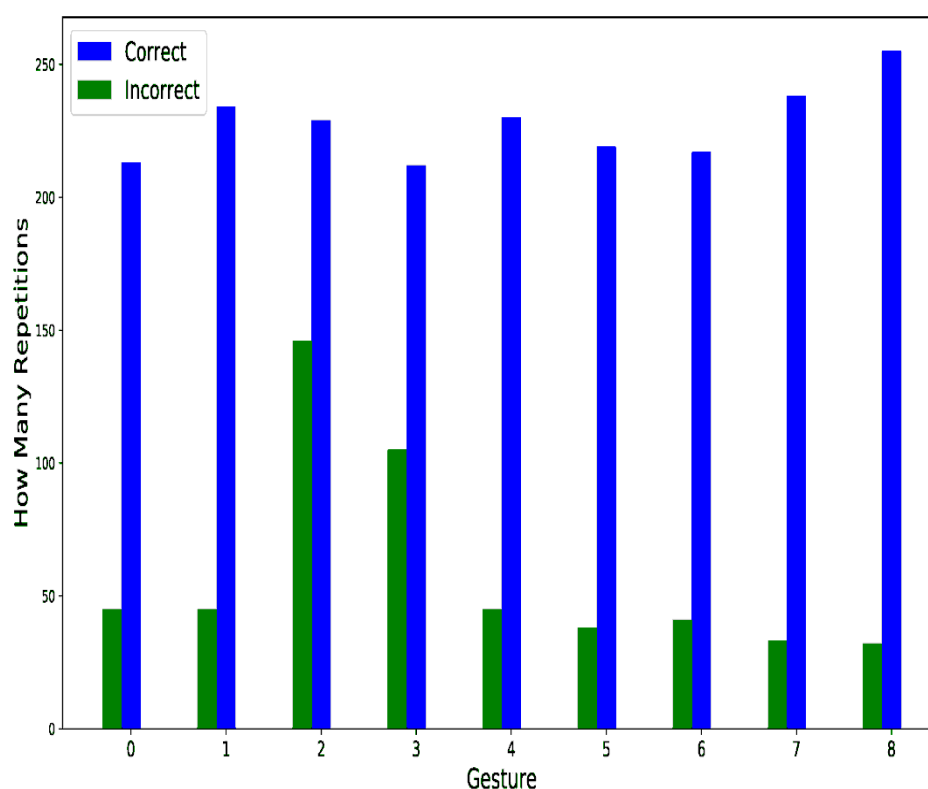
Results may vary greatly as these figures are derived from real people. What we mean by "within variability" is the way things change when the same individual performs an action again. The difference in the number of times an individual performs a certain action is known as the between variability. Physiotherapy patient 103 is seated on the x-axis, and she is standing while abducting her right shoulder. A broad variety of position values (coordinates) and length (the sum of all frames) are readily seen in the normalized data, which was obtained by deleting the spine-base x-axis.



Graph 1: This is an example of a right-handed version of gesture number five that the same individual does perfectly six times.



Graph 2: Here we see five individuals (averaging their repetitions) properly performing variant number five of the right wrist gesture



Graph 3: Amount of postulation for to each one movement

While some patients managed to get a few of repetitions correct, the controls were generally accurate. This means that different acts may have different success rates when

it comes to repetitions. A substantial amount of bias is present in the data. It bears repeating that there is a wide disparity between right and wrong, and that the classifications and groups are not uniform. If you want to achieve equilibrium, it may help to record more negative motions and erase some favorable ones. We should avoid the first option since it would surely cause data loss. Because it's not easy to find actual patients who are ready to be tracked as they go, the second method may be expensive. The third way to take advantage of this is to make it seem as if the created data is behaving wrongly. Several methods for enhancing time-series data have been published in scholarly articles. Using several GAN networks to enhance and label gesture data as accurate or erroneous is one example. We also present an alternative set of steps. Among the affine and geometric changes used by these methods are rotation and temporal warping. Basic techniques such as scaling, jittering, and adding random noise are also taught. Due to the availability of the source code, we do not believe any more augmentation data is required. It should be noted that the function's output varies somewhat with each execution.

CONCLUSION

The study focuses on the effectiveness of rehabilitation therapy in improving motor function, mobility, daily living activities, and psychological well-being among individuals with traumatic paraplegia in selected hospitals in Kerala. The research employs SPSS (Statistical Package for the Social Sciences) to analyse data and assess the effectiveness of the therapy across different functional domains. The study begins by analysing demographic characteristics and baseline functional status to understand the distribution of participants and their initial health conditions before undergoing rehabilitation. Demographic profile includes mean age, gender distribution, and duration since injury, type of rehabilitation received, baseline functional status, and psychological well-being scores. A paired sample t-test was used to compare pre-rehabilitation and post-rehabilitation outcomes. Results show that there was a statistically significant increase in mobility scores post-rehabilitation, indicating that therapy effectively enhanced the patients' ability to move independently. Muscle strength scores also showed significant improvement post-therapy, suggesting that rehabilitation programs contributed to enhanced muscular function and endurance.

Post-rehabilitation ADL scores were significantly higher, confirming that the therapy had a positive impact on independent living skills.

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