

Rood's Approach in Stroke: A Systematic Review

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Abstract: Stroke is defined as a neurological deficit caused by an acute focal injury of the central nervous system (CNS) due to a vascular cause, such as cerebral infarction, intracerebral hemorrhage (ICH), or subarachnoid hemorrhage (SAH), and it is a leading cause of disability and death worldwide. Rood's sensory motor approach focuses on the developmental process of recovery from basic to complex. The Rood approach, also known as multimodal stimulation therapy, effectively addresses all forms of motor control deficits. The objective of this study was to evaluate the clinical aspects of Rood's approach interventions after stroke. PUBMED, Google scholar, PEDro, Medline and EBSCO database and search engines were searched with keyword of rood's approach, stroke inhibitory and facilitators techniques, RCT, case study, only free full text and articles, in English language. between 2015 to 2025. Comprehensive search of the specified database identified 214 studies. After eliminating duplicates and reviewing titles and abstracts only 11 studies were ultimately chosen for this review. All the selected studies demonstrated a positive effect in reduced spasticity, normalization of tone and improved motor control. This review suggest that Rood's approach has been found to be quite effective alone as well as combined with other neurological approaches in stroke patients.

Keywords: Stroke, rood's approach, free full text articles, inhibitory and facilitatory techniques

1. Introduction

Margaret Rood established the Rood's technique, a neurophysiological technique, in 1940. The Rood approach examines how somatic, autonomic, and psychic factors interact to regulate motor behavior through the activation or deactivation of sensory receptors. This neurophysiological technique was developed for patients who have difficulty controlling their movements. Rood believes that motor functions and sensory systems are inextricably linked. The technique uses a reflex/hierarchical model of the central nervous system to assist or hinder movement during recovery. Rood's main claim was that motor patterns grow from primordial reflexes through appropriate sensory cues to the proper sensory receptors. Rood used sequential development to establish appropriate motor engrams. (1, 9)

Stroke, also known as a cerebrovascular accident, is a sudden onset of neurological impairment caused by damage to the cerebral arteries. Vascular injury in the brain can be caused by abrupt fluctuations in blood pressure and oxygen shortage, which can result in the death of brain cells. It is the second greatest cause of death in the vast majority of countries worldwide. It is assumed that 80% of strokes are ischemic, with the other 20% caused by primary hemorrhage. The clinical staging of stroke is generally accepted as the following: The first two weeks are described as the acute period; 3-11 weeks after stroke is dubbed the subacute stage in which the majority of alterations occur. The early chronic period occurs 12-24 weeks after a stroke. (2)

Upper motor neuron syndrome is characterized by spasticity. Spasticity is characterized by muscle tightness and stiffness, as well as hyperexcitability of reflexes, resulting in involuntary contractions or jerky movements. It can disrupt daily activities, movement, and speech, causing discomfort and pain. Approximately 42% of stroke patients experience spasticity within six months after onset. Spasticity is characterized by increased muscle resistance to passive stretch at varying speeds, often accompanied by exaggerated reflexes and increased muscle tone. (2) Hemiplegics commonly experience impaired motor function. Hemiparetic patients struggle with daily chores including clothing, bathing, and taking care of themselves. deficits including muscular weakness and increased tone, can hinder daily activities. (3)

With the emerging advancements in physiotherapy, the use of rood's approach is quite frequently used in modern day practises to reduce spasticity and regain normal muscle tone as well as movement in patients with stroke. (2, 3)

These studies have shown a marked reduction in spasticity, normalization of tone and regain of normal movements through the use of this approach. the aim of the study is to evaluate the effectiveness of rood's approach in patients with post stroke recovery.

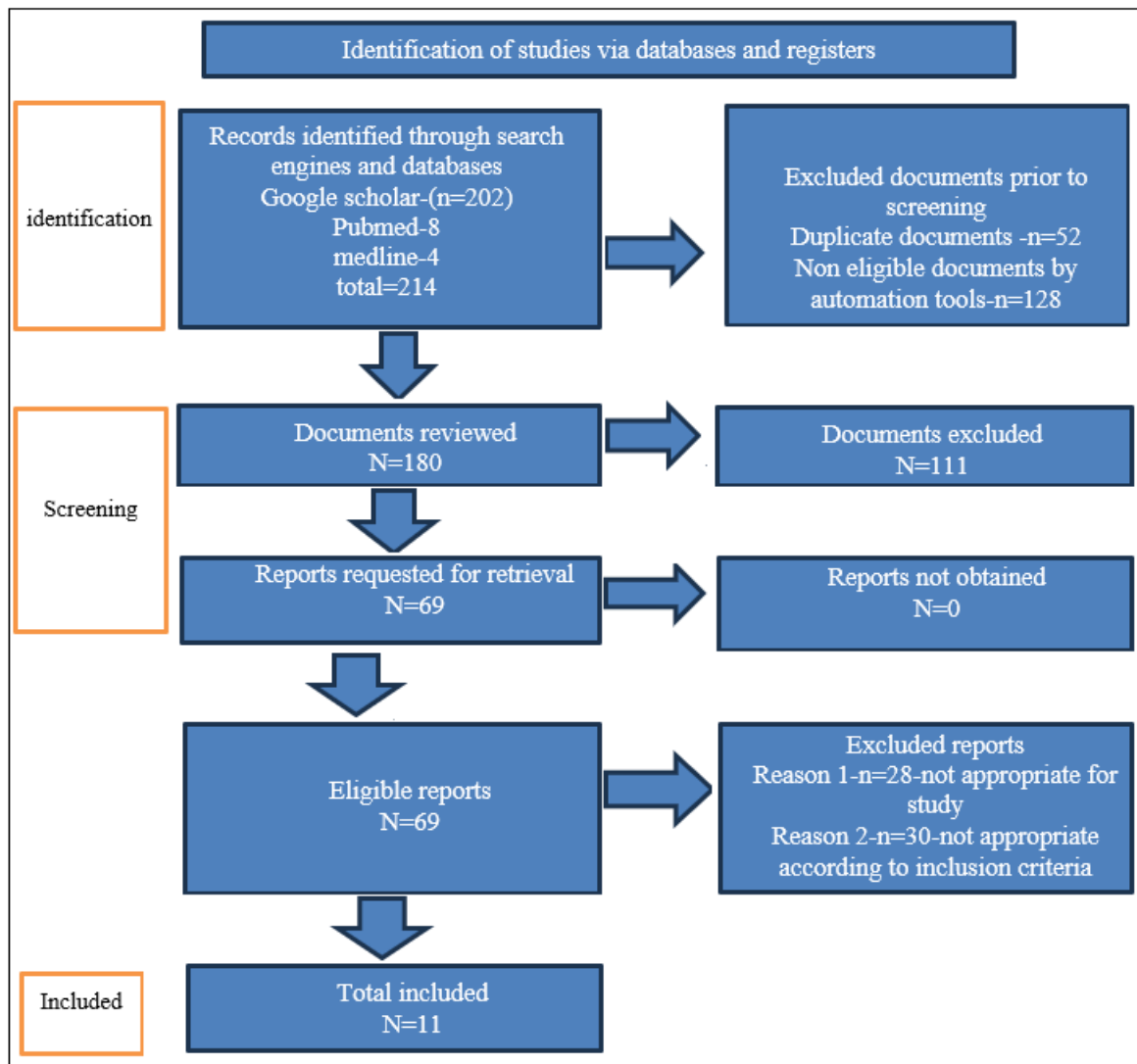
2. Methods

Search strategy

Independent search was carried out by researchers using a well-defined search strategy in following databases; Medline,

EBSCO, DOAJ, Science Direct and Google Scholar published from 2015 to 2025 using the key terms Rood's approach, spasticity, motor dysfunction, stroke. All randomized controlled trial (RCTs), case-controlled studies, single case studies and case series were used in evaluating the effectiveness of Rood's approach in stroke patients. All age

groups and both sexes were included for selection of review. Fugl Meyer assessment scale, functional independence measure, modified ashworth scale, motor function test were taken as an outcome measure. Studies published in English language on effectiveness, efficacy, effects of Rood's approach were included in the review.



3. Result

Out of the selected articles, only 11 articles were found to be relevant in the context of Rood's approach application in stroke

rehabilitation which supports the fact that Rood's inhibitory and facilitatory techniques help in the different stages of motor recovery in stroke patients.

Serial no	Author (year)	topic	design	No. of articles/ patients	intervention	Outcome measure	conclusion
1	Saira jahan (2023)	Effects of Rood's sensory motor training along with constraint induced movement therapy in sub-acute stroke	RCT	29	Rood's and CIMT	FMA	Rood's along with CIMT produced improvement in motor functions
2	Xiaowei Chen (2018)	Therapeutic effects of sensory input training on motor function rehabilitation after stroke	Systematic review	550	ROM, Rood's, strengthening,	MMSE, Rhomberg, dtr, gcs	Sensory input plays a crucial role in motor rehabilitation
3	Salim Shaikh (2024)	Comparison of the Effectiveness between Tendonous Pressure and Maintained Stretch in	experimental	18	Tendonous pressure and maintained stretch	MAS	tendonous pressure technique and maintained stretch were equally effective in reducing spasticity among stroke patients.

		Roods Inhibitory Techniques on Reduction of Upper Limb Spasticity in Patients with Stroke					
4	Gajanan Bhalerao (2016)	Perspective of Neuro Therapeutic Approaches Preferred for Stroke Rehabilitation by Physiotherapists	survey	402	Pnf, cimt, mrip, roods	questionare	Roods, cimt, ndt are most common practises in neurological approach
5	Vandana Yadav (2018)	Evolution in Hemiplegic Management	Review article	22	Conventional therapy, rood's	Cranial nerve testing, muscle tone, posture, balance, etc	Bobath, NDT, PNF, Roods approach, speech therapy, robotic devices, balance training and kinesiotapping are effective improvement of patient's condition.
6	Maryam Derakhshanfar (2020)	Sensory interventions on motor function, activities of daily living, and spasticity of the upper limb in people with stroke	RCT	60	Exteroceptive and proprioceptive stimulation	FMA, Barthel index	Exteroceptive and proprioceptive stimulations in upper limb can be used in chronic phase of stroke.
7	Jawaria Shahid (2023)	A Comprehensive Review of Physical Therapy Interventions for Stroke Rehabilitation: Impairment-Based Approaches and Functional Goals	review	1233	Pnf, rom, rood's	FMA	Stroke convalescence is normally firmly fixed in the early weeks and months after the attack by neurological approaches of physiotherapy like rood's and others.
8	Prajyot Ankar (2022)	Effect of Physiotherapy on Hand Rehabilitation in Acute Ischemic Stroke Survivor	Case study		Rood's, pnf, FES	STREAM score	Early hand rehabilitation has been shown to be beneficial in improving a patient's condition,
9	Kuki bordoloi (2019)	Effectiveness of home exercise programmewith modified rood's approach on muscle strength in post cerebral haemorrhagic individuals of assam	RCT	1200	ROM ex, strenthening stretching, Weiwei bearing, rood's	MMT	Home exercise programme along with roo'd approach hasb been found to be effective in enhanving the muscular strength
10	Neha RajeSh Badwaik (2023)	Approach-oriented Physiotherapeutic Management of a Patient with Right thalamic Bleed	Case study		Pnf, roods, ATM	Montreal Cognitive Assessment Scale	Rood's approach may be used to facilitate and inhibit tonal input at appropriate time.
11	Suraj kinase (2020)	Role of physiotherapy on quality of life in stroke survivors	Systematic review	24	Pnf, rood's, MRP, CIMT, brunnstromm	Wolf motor function test	Various inhibitory and facilitatory techniques are used in order to regain motor control

4. Conclusion

Various physiotherapeutic approaches have been used in the treatment of stroke previously and in modern day practises. the outcome of different approaches has been beneficial to the patients of stroke. Rood's approach has been found to be quite effective alone as well as combined with other neurological approaches. its independent use in stroke pateints has resulted in reduced spaticity, normalization of tone and improved motor control. it's inhibitory and facilitatory techniques are used according to the stages of brunnstorm motor recovery to enhance motor control.

5. Discussion

11 studies are included in this systematic review. Studies are heterogeneous in design, use different measures at different times and often includes small number of unrepresentative patients. In addition important clinical aspects of Rood's approach interventions search as a detailed description of the treatment protocol and possible side effects are only

insufficiently addressed. For systematic reviews and meta analysis the Cochrane collaboration the comments presenting the overall quality of evidence using the GRADE approach which stands for grading of recommendations assessment, development and evaluation. Because of the heterogeneity often included studies, this was not possible in our study. In stroke patients we found a moderate quality of evidence that Rood's approach helps in regaining the motor functions and normalization of tone.

In 1950, Roods created a mechanism to facilitate and inhibit movement using different inputs. Patients with neurologic impairment may exhibit muscle tone ranging from hypotonic to hypertonic. Inhibition strategies are commonly utilized in spastic individuals. Tendinous pressure is applying manual pressure on the muscle's tendinous insertion or across lengthy tendons to provide an inhibitory effect. According to a cross over study conducted by Dr, chetna kunde, tendinous pressure is more effective as compared to MFR in reducing the spasticity of stroke patients. (13)

Carey et al studied the effect of touch and proprioception sense in four stroke people in the acute phase of the disease. They found significant improvement in the sensory function. (9)

According to Hunter et al., tactile stimulation enhanced upper limb motor recovery. The outcomes of the current investigation, which employed tactile stimulation as a roods facilitative sensory motor technique, demonstrated a notable improvement in upper extremity motor skills. This is comparable to a research by Allen et al. that claimed the Roods approach supports functional activation of the limb by facilitating muscle movements through tactile stimulation. (5)

Normalization of muscle tone by facilitation or inhibition by using sensory-stimuli is a basic principle of Roods. Muscle tone varies from hypotonic to hypertonic in patients with neurological dysfunction. Where an inhibition technique like Tendon Pressure Technique can be used to reduce spasticity and to reduce motor neuron excitability. Manual pressure is applied to the tendinous insertion of the muscles or across long tendons producing an inhibitory effect. (2)

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