PHYSIOTHERAPISTS' PERSPECTIVE ON NEUROTHERAPEUTIC APPROACHES SUGGESTED FOR STROKE REHABILITATION

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Abstract
This study examines the viewpoints and methodologies employed by physiotherapists in the field of stroke rehabilitation, with a specific emphasis on neurotherapeutic techniques. The demographic composition of the 150 participants is representative of a heterogeneous sample, consisting of 65% male and 35% female therapists, covering a wide variety of age groups, education levels, and experience levels. Examination indicates that 62.66% of individuals acquire neurodevelopmental therapy (NDT) during their college education, and 67.33% of them subsequently utilize it in hospitals. The study reveals a notable disparity in the implementation of acquired methods, particularly in constraint-induced movement therapy (CIMT) and rehabilitation techniques (RT). Therapists hold diverse perspectives on treatment objectives, with 77% endorsing compensatory methods, while viewpoints differ about the significance of functional tasks in normalizing muscle tension (57%). Most people recognize the significance of promoting movement in the therapy of spasticity (63%), and they emphasize the need for retraining in proper movement (98%). Interestingly, 97% of people agree that proximal stability is very important for distal isolated movements, while 98% agree that assignments that lead to bad behavior should be put off. Nevertheless, a significant 62% remain impartial regarding the provision of functional activity as a work. These results highlight the necessity for additional research into the perspectives of therapists, coordinating the clinical application of educational lessons with clinical practice, and addressing different points of view regarding particular therapeutic tenets in stroke rehabilitation.
Keywords: *Current Practice; Evidence-Based Practice; Neuro Approaches; Stroke Rehabilitation*

Introduction
Stroke is the third-most common cause of death globally, resulting in survivors experiencing a range of problems (Feigin et al., 2015). Stroke is a very incapacitating neurological condition that affects people all over the world. It causes 5.5 million deaths annually and leaves 44 million individuals with different levels of disability (Langhammer and Birgitta, 2015). Due to the higher prevalence of stroke among older individuals, it is anticipated that the prevalence of stroke will rise in the future. This is because the demographic trend in the country is characterized by a predominance of young people, which results in a lower incidence rate of stroke (Alqahtani et al., 2018).
A survey examining the occurrence of different types of stroke has found that 2.2% of cases were subarachnoid haemorrhage and 79% were ischemic infarcts (Chen et al., 2021). Several further studies investigating the patterns, risk factors, diagnosis, and outcomes following stroke in children have reported similar findings (Almekhlafi, 2016). 87% of stroke patients experienced cerebral infarction. A smaller percentage of patients had other types of stroke, such as cerebral haemorrhage (6.5%) and subarachnoid haemorrhage (4.5%) (Liu et al., 2018). The least common type of stroke was venous infarction, which accounted for only 2% of cases. Research indicates that ischemic stroke has a higher prevalence compared to other types of stroke. Hence, a physiotherapist must engage in evidence-based practice (EBP) to select the most effective method and attain optimal levels of functional independence and social engagement for those affected by stroke (Asirvatham and Marwan, 2014).
Evidence-Based Practice (EBP) entails the meticulous evaluation of the most reliable data derived from well-executed clinical research to address clinical issues. EBP consists of three essential elements: (1) the high standard of research conducted; (2) the extensive knowledge and experience of the clinicians involved; and (3) the benefits and worthiness of the study to the patients. The implementation of EBP in practice consists of four distinct parts. The first step involves identifying a

clinical problem that research can address (Martindale, 2016). Secondly, it requires conducting a thorough search for pertinent research data and critically analyzing it. Thirdly, practitioners must use the evidence found in the data to inform decision-making and practice. Lastly, it necessitates evaluating the success of the implemented changes. Despite its apparent simplicity, the task of discovering pertinent research evidence can be arduous for healthcare practitioners due to its inherent complexity (Ioannidis, 2016).

According to systematic review studies, coordinated multidisciplinary treatment and rehabilitation following a stroke improve patients' functional abilities and shorten their time in the hospital (Langhorne, 2021). The reason behind patients' superior recovery in stroke units compared to standard treatment centers remains unknown. Several factors indirectly link greater improvement in stroke specialized units, including the thorough assessment of medical problems, impairments, disabilities, and handicaps; dynamic physiological assessment; early mobilization and prevention of bed rest-related complications; and skilled nursing care (Billinger et al., 2014). Physiotherapy is frequently mentioned as one of the essential specialties in structured stroke care, strongly linked to many of these variables (Richards et al., 2015). Physiotherapists have demonstrated a significant propensity for adopting the best evidence in their practice as clinicians and for professional accountability over the past few decades. When making clinical judgments, they also take into account their nonresearched knowledge, or implicit knowledge, as well as their explicit research proof (Schuster-Amft et al., 2014). Occasionally, more recent physical therapy techniques with substantial research supporting their efficacy and effectiveness make an appearance in the scientific literature (Scurlock-Evans et al., 2014). To choose the most practical and successful course of therapy, a physiotherapist must be aware of the stages involved in EBP (Hatem et al., 2016). In order to gain insight into the use of evidence-based techniques in stroke rehabilitation, this research effort looked at the clinical procedures used by physiotherapists who specialize in stroke rehabilitation. The following major research questions were the focus of the investigation:

1. How do physiotherapists' real-world practices in hospital settings for stroke rehabilitation relate to the implementation of neurotherapeutic techniques learned during college training?
2. How do therapists view the connection in stroke rehabilitation between muscle tone and treatment objectives?
3. How do therapists feel about incorporating functional activities and facilitating movement during stroke rehabilitation?

Literature Review

Kim Brock et al. (2011) found that individuals who underwent the Bobath intervention experienced a considerably larger enhancement in their walking speed compared to those who underwent the Task Practice (TP) response. With regards to balance, there were no significant fluctuations observed among the groups. Due to the study being conducted at two separate sites, the Bobath group had a somewhat greater average improvement compared to the TP group.

The study conducted by Muhammad Kilinc et al. (2016) aimed to assess the effectiveness of Proprioceptive Neuromuscular Facilitation (PNF) and Bobath therapy in improving post stroke trunk control, lower and upper extremity function, walking, and balance. Both groups, consisting of 22 participants each, demonstrated improvement. The observed advantages were statistically significant ($P < 0.05$) for both groups.

Krukowska et al. (2016) conducted a randomized experiment with 72 patients who were divided into four groups. The division's criteria encompassed the affected side of the body (either left or right) and the requisite rehabilitation treatments employed. Upon comparing the NDT-Bobath therapy group with the PNF technique, a statistically significant improvement was seen ($P < 0.05$).

In a study conducted by Diaz-Arrribas et al. (2020), the effectiveness of Bobath's approach in sensory-motor rehabilitation after a stroke was evaluated. They observed that alternative therapy modalities, including CIMT, surpass Bobath in terms of efficacy.

Nidhi and Priya (2020) examine the impact of task-specific training and proprioceptive neuromuscular facilitation (PNF) on different functions in a group of 50 individuals who have experienced a stroke.

After a ten-week treatment period, a comparison of pre and post data revealed a significant difference between both groups in terms of the effectiveness of proprioceptive neuromuscular facilitation (PNF) and task-specific training. The task-specific training group demonstrated somewhat greater progress than the PNF group.
Ozen et al. (2021) did a study to determine the impact of task-specific training and proprioceptive neuromuscular facilitation (PNF) on different functions in individuals who have had a stroke. The objective is to determine the impact of computer game-assisted task-specific exercise on stroke rehabilitation. Upon analysis, it was determined that the significant disparity in the outcome measures' scores indicates a notable improvement in patients following the treatment.

Material and Methods

This research used a questionnaire-based survey methodology. The self-designed questionnaire had a focus on neurotherapeutic methods. It was validated by three neurorehabilitation clinical experts. A set of interactive meetings involving stroke rehabilitation experts and the research team resulted in the development of a questionnaire. Every question was created to explain a single method connected to a single neurological approach. The relationship between each question and the neurological method was not disclosed in the poll. A Likert scale was used to record the responses. Clinical therapists with Bachelor of Physiotherapy and Master of Physiotherapy degrees from different parts of India were included in the study. Using Google Docs, a survey was created for the study and sent to more than a thousand therapists in India. Furthermore, the survey link was disseminated on social media sites that served various physiotherapy communities. 150 therapists in all consented to participate in the survey. The goal of the respondent data sheet is to inform the respondents of the nature of the research. There were no personal questions on the questionnaire that the researcher used. Therefore, there was no risk of any kind to the participants' confidentiality. Nevertheless, to protect the information and guarantee anonymity, each survey was given a special identifying number. Descriptive analysis was performed on the data after the replies were received.
The software SPSS for Windows, Version 16.0 (SPSS Inc., Chicago, USA), was utilized to analyze the data collected from the questionnaire. The researcher used frequency and descriptive statistics to analyze the demographic profile data and identify the characteristics of the sample. The researcher looked at experience, year of graduation, education level, and practice setting data to see if there were any differences in the experts' methods.

Results

A detailed summary of the demographic characteristics of the participants in this neurotherapeutic approaches study can be found in Table 1. The gender distribution of the participants shows that men make up 65% of the responders, while women make up 35%. The survey's age distribution suggests that a wide range of respondents are included: 30% of respondents are between the ages of 21 and 29, 53% are between the ages of 30-39, 11% are between the ages of 40 and 49, and 6% are older than 50. In terms of education, the respondents' levels of academic achievement vary: 26% possess a diploma, 46% a graduation degree, 23% have completed post-graduate coursework, and 5% have obtained a Ph.D. The distribution of experience shows that the largest group of therapists is those with 5–9 years of experience (36%), followed by those with 10–14 years (29%), 0–4 years (15%), 15–19 years (16%), and 20 years and above (4%). This demographic breakdown highlights how the physiotherapists surveyed represented a wide range of genders, ages, educational backgrounds, and experiences. It also offers a solid basis for delving into their opinions regarding neurotherapeutic approaches in stroke therapy.

Table 1: Demographic Profile of Respondents

Characteristics	Frequency	Percentage
Gender		
Male	98	65
Female	52	35
Age		
21-29	45	30
30-39	79	53
40-49	17	11
50 and Above	9	6
Education		
Diploma	39	26
Graduation	70	46
Post-Graduation	34	23
Ph.D.	7	5
Experience		
0-4	23	15
5-9	54	36
10-14	43	29
15-19	24	16
20 Above	6	4

Table 2 shows information on how therapists surveyed used hospital-based versus college-based techniques. The most popular strategy that therapists learn in college is called Neurodevelopmental Therapy (NDT); 62.66% of therapist's report having encountered it, and a slightly larger percentage (67.33%) use it in hospital settings. The Muscle Re-Education Programme (MRP) is absorbed by 13.33% of participants but used by 21.33%, suggesting that clinical practice outweighs academic training in terms of its use. There is a constant trend in the use of Brunnstrom, which is taught to 53.33% of therapists and utilized by 60.66%. 46.66% of people learn Proprioceptive Neuromuscular Facilitation (PNF), and 48% apply it, indicating a correlation between clinical practice and education. Only 5% of people apply Constraint-Induced Movement Therapy (CIMT), despite 14% of people learning it; this suggests a lower acceptance rate in hospital settings. The Rehabilitation Technique (RT) has the least alignment, with 16% of therapists having learnt it but only 1% using it. This indicates a notable mismatch between training and application in this instance. All things considered, the table sheds light on the relationship between the therapeutic modalities that are taught in college and how they are really used in hospital settings.

Table 2: Approach taught in college and applied in hospitals.

Approach	Learned; N (%)	Applied; N (%)
NDT	94 (62.66)	101 (67.33)
MRP	20 (13.33)	32 (21.33)
Brunnstrom	80 (53.33)	91 (60.66)
PNF	70 (46.66)	72 (48)
CIMT	21 (14)	8 (5)
RT	24 (16)	2 (1)

Table 3 presents therapists' viewpoints regarding treatment goals and muscular tone in stroke therapy. 77% of individuals support the implementation of a compensating strategy for functional adaptation. Nevertheless, there is a divergence of viewpoints regarding the extent to which functional obligations alone can standardize tone, with 57% of individuals in agreement and 22% expressing neutrality. 63% of individuals acknowledge the significance of movement facilitation in the treatment of spasticity, highlighting that inhibiting movement may not always yield desired results. An overwhelming majority (98%) agrees that movement happens only when tone recovers to its natural state, emphasizing the importance of addressing tone in the process of rehabilitation. Furthermore, there is

a consensus among many that it is crucial to minimize difficulties arising from neuromuscular diseases (95%) and to minimize postural deviation (98%) in order to achieve positive results. The overwhelming consensus (98%) on the necessity of re-education in regular physical activity highlights its perceived significance in attaining therapeutic objectives. In general, the responses demonstrate a sophisticated comprehension of the connection between treatment goals and muscle tone in rehabilitation after a stroke.

Table 3: Treatment objective and muscular tone

Statements	Agree (%)	Disagree (%)	Neutral (%)
compensatory approach to function adaptation	77	22	1
Functional duties will normalize tone and eliminate the requirement for any specialized approach or techniques.	57	21	22
Movement facilitation is a crucial component of spasticity treatment; movement inhibition is not always effective in promoting movement.	63	24	13
Movement only occurs once tone has returned to normal.	98	0	2
Preventing the development of subsequent neuromuscular disease complications	95	2	3
Reducing postural deviation is necessary to reach the intended outcome.	98	0	2
Re-education in normal movement	98	0	2

The table 4, displays the survey results of therapists regarding several claims pertaining to the principles of stroke therapy. An overwhelming consensus exists regarding the significance of attaining proximal stability for distal isolated movements (97%) and the therapist's duty to support the patient's customary movement pattern (97%). Nevertheless, there is a significant disparity regarding the need to offer functional activity as a task, with 62% expressing a neutral position. Almost all (97%) of the individuals hold the belief that involving both parties in an activity leads to the movement of activity towards the affected side. Therapists are in strong consensus (98%) on willingly delaying tasks that promote deviant behavior. There is a substantial discrepancy in therapeutic approaches regarding the use of force on the affected side and restricting movement of the unaffected limb, with 96% of experts disagreeing on this matter. Furthermore, there is a divergence of perspectives regarding the necessity of reducing spasticity prior to facilitating regular functional activities, with a 75% discordance rate. In general, the responses indicate an agreement on key fundamental principles, but also highlight varying viewpoints on specific therapeutic approaches in stroke rehabilitation.

Table 4: Enhancement in mobility and functional ability following a stroke

Statements	Agree (%)	Disagree (%)	Neutral (%)
Only if proximal stability is achieved can distal isolated motions occur.	97	3	1
Recovery of distal movements is not assured by correcting proximal stability.	94	3	3
In stroke therapy, a therapist's primary responsibility is to facilitate the patient's typical movement pattern.	97	3	0
Functional activity needs to be provided as a task.	17	21	62
If both sides engage in activity, the impacted side experiences a transfer of activity.	97	1	2
The therapist must willingly put off certain tasks that encourage abnormal behavior.	98	2	0
Must employ force on the affected side and limit movement of the unaffected limb	2	96	2
Without attempting to lessen spasticity, normal functional activities must be enabled.	11	75	14

Discussion

This research paper delves into the viewpoints and methods of physiotherapists in stroke rehabilitation, illuminating the principles, neurotherapeutic strategies, treatment objectives, and demographic traits of stroke therapy. The respondents' demographic profile (Table 1) offers a broad sample of physiotherapists' gender, age, education, and experience, creating a solid basis for comprehending their viewpoints on neurotherapeutic approaches. Males make up the bulk of respondents (65%), and the age distribution shows that the group is diverse, with a sizable part of respondents (53%) falling between the 30-39 age range. The study explores the degree to which treatment approaches used in hospitals and colleges are aligned. The strategy that is most taught and utilized is neurodevelopmental therapy (NDT), suggesting a close relationship between clinical practice and academic study. Disparities between the use of the Constraint-Induced Movement Therapy (CIMT) and the Muscle Re-Education Programme (MRP) have been noted, though, which may indicate a disconnect between theory and practice. Table 3 gives information about how therapists view the objectives of treatment and the tone of the muscles during stroke treatment. The findings provide a complex picture, with most respondents endorsing compensating techniques (77%) and stressing the significance of reducing postural deviation (98%). The near unanimity (98%) about the imperative need of re-educating individuals in frequent physical activity highlights its recognized importance in accomplishing therapeutic objectives.

The study also examines therapists' perspectives on the fundamentals of stroke treatment. It is widely agreed upon that maintaining the patient's usual movement pattern (97%) and providing proximal stability for distal isolated motions are crucial. Nonetheless, opinions on whether or not to provide functional exercise as a task vary (62%), suggesting that treatment approaches can differ. Conflicting viewpoints among therapists are highlighted by the disagreement (96%) about the use of force on the affected side and limiting movement of the unaffected limb. The study highlights the significance of EBP in stroke recovery, emphasizing the necessity for medical professionals to combine their clinical judgement, patient values, and the best available research data. This complies with the general healthcare trend towards evidence-based decision-making. The study also emphasizes the difficulties healthcare professionals encounter when trying to find and understand pertinent research findings, highlighting the complexity of evidence-based practice. This study provides insightful information about how physiotherapists are currently approaching stroke rehabilitation. The results provide insight into how neurotherapeutic techniques are applied, how therapists see treatment objectives and muscle tone, and what obstacles evidence-based practice faces. Future research areas and interventions aiming at enhancing the efficacy and consistency of stroke rehabilitation procedures can benefit from these insights.

Conclusion

This study examines the complex field of stroke rehabilitation, specifically focusing on the viewpoints and methods employed by physiotherapists in India. The therapists polled had a varied demographic profile, encompassing different genders, ages, levels of education, and levels of experience. This diversified representation provides a strong basis for the future research. The high incidence of stroke, ranking as the third most common cause of death worldwide, emphasizes the immediate need and significance of efficient rehabilitation measures. The survey results provide insight into the therapists' utilization of various neurotherapeutic techniques, emphasizing a notable correlation between the teachings in academic contexts and their application in hospital practice. Neurodevelopmental Therapy (NDT) and Brunnstrom are often studied and implemented approaches, but other methods are used to different extents. The investigation moreover examines the viewpoints of therapists regarding treatment objectives, muscular tension, and principles of stroke therapy. There is agreement on several fundamental ideas, nevertheless, conflicting viewpoints emerge about particular therapeutic methodologies, highlighting the intricate and fluctuating nature of stroke rehabilitation procedures. The incorporation of synchronized interdisciplinary therapy and rehabilitation in stroke units is emphasized as advantageous for enhancing functional capabilities and decreasing hospitalization duration. This research offers useful insights into the present state of stroke rehabilitation methods

among physiotherapists in India. This text highlights both the identification of current trends in neurotherapeutic methods and the continuous significance of evidence-based practice in improving patient outcomes. The findings enhance the continuing discussion on improving and progressing stroke rehabilitation strategies for the well-being of persons impacted by this incapacitating condition.

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