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ORIGINAL ARTICLE

Current Practices for the Rehabilitation of Stroke Patients by Physical Therapists in Khyber Pakhtunkhwa

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[1-3]Conception and design, [2-3] Collection and assembly of data, [2-1]Analysis and interpretation of the data, [3]Critical revision of the article for important intellectual content, [2] Statistical expertise,[1]Final approval and guarantor of the article.

Article Info.

Received: January 13, 2023
Acceptance: November, 08, 2023

Conflict of Interest: None
Funding Sources: None

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Cite this article as: Khan Z, Ullah S, Rehman MU, Ul Abidin SZ, Alamzeb Khan S. Current Practices for the Rehabilitation of Stroke Patients by Physical Therapists in Khyber Pakhtunkhwa. JRCRS. 2023; 11(4):250-255.

DOI:https://dxdoi.org/10.53389/JRCRS.2023110412

A B S T R A C T

Background: Stroke is the second leading cause of death and a major cause of disability worldwide. Physiotherapy, which is an important part of stroke rehabilitation, has been demonstrated to improve patient outcomes but there is no such conclusive evidence that shows any specific rehabilitation protocol being followed.

Objective: To find the current practices of physical therapists for the rehabilitation of stroke patients in Khyber Pakhtunkhwa.

Methodology: A Cross sectional study was conducted between November 2021 to April 2022 in which an online questionnaire was distributed to physiotherapists (n = 120) working in different hospitals of Khyber Pakhtunkhwa. The questionnaire acquired has been adapted from previously conducted study in United states by P Natarajan et al examining stroke rehabilitation protocols. Statistical Package for the Social Sciences SPSS 22 version was used for the data analysis. Chi-square test was used to find the association of treatment protocols with experience, age, qualification and gender with P - value of 0.05 as reference.

Results: The total calculated sample size was 120 but only 98 participants properly filled the questionnaire and were included in the study. The survey participants were asked about the stroke rehabilitation approaches they had used in their job and the treatment method they had been taught in school. It was found that Bobath/NDT and PNF techniques were applied by majority of participants 77(78%), while MRP by N=73(74%), Brunnstorm by N= 54(54%) and Constrained Induced Therapy by N= 38%.

Conclusion**:** Physiotherapists' approaches to treatment in stroke rehabilitation have been seen to differ. Lack of knowledge about the most recent treatment protocols and the lack of agreement on any single treatment method for stroke rehabilitation have been noticed by keeping in view the recent research evidence.

Key words: Current Practice, Patients, Physical Therapist, Rehabilitation, Stroke

Introduction

Cerebrovascular accident (CVA), frequently known as stroke or a brain attack, is the world's second largest cause of deaths and the first most common cause of impairment and disability.(1) It has a high mortality and incidence rate, affecting a great extent of survivors with prominent residual psychological, cognitive and physical impairments.[2] Walking impairment affects more than 80% of stroke survivors.[3] The most commonly found complications after stroke managed by neurologists and experts in rehabilitation, is hemiplegia.[4] According to estimates, 25 to 74 percent of the fifty million stroke survivors worldwide require some form of support or are totally dependent on care giver for activities of daily life (ADL).[5] Healthcare workers, providing services to the stroke patients, accept that working with them is rewarding, however, it could

also be challenging because of the need for resources and heavy workloads.[6]

Physical therapists utilize their clinical experience and theoretical knowledge, to assess patients in order to diagnose their fucntional problems and design a treatment plan of their interest.[7] The variations in rehabilitation protocols for the management of stroke applied by clinicians, depends upon theoretical knowledge, skills, experience, and personal interests.[7] Pioneers like Bobath, Rood, Kabatio, and Brunnstrom are the mainstream school of thoughts for the rehabilitation of stroke patients.[8]

Stroke therapy's main goal is to teach functional abilities and restoration of normal mobility, which serves as a baseline for every stroke rehabilitation.[4] The Motor Learning Program (MRP), which emphasizes feedback and particular motor tasks, is recommended as the most popular therapeutic strategy for the rehabilitation of stroke patients in the UK, Australia, and Sweden.[9] It is a task-oriented training program that includes training the patients and assessment of patients in seven different everyday tasks.[10] The Bobath approach, also recognized as a neurodevelopmental treatment in the United States, is among the most common methods for rehabilitating stroke patients.[11,12] Proprioceptive neuromuscular technique (PNF) technique is a group of techniques immensely used in clinical setting and consists of both passive and active movements as per demand of patient's condition.[13]

Constrained Induced Movement Therapy (CIMT) involves overutilization of the affected limb as compared to the unaffected side to reinsure cortical reorganization after the stroke.[14] Task specific training consists of goal-oriented, high intensity practice with adequate repetitions, for a lost function after any neurological condition like stroke.[(15)] Virtual reality is a computer modulated technology that utilizes electronic head sets and multi projected environments for enhanced patient rehabilitation.[16]

Despite the fact that treatment idea is the unanimous, physiotherapists' beliefs and presumptions differ distinctly. Different variables, such as organizational circumstances and patient demands, along with the level of expertise and basic training of physiotherapists may influence physiotherapists' decision-making that can lead to variations in treatment methods even within a same location. Planning health policies and running continuing education programs in this area require an understanding of the perspectives and attitudes of physiotherapists on the treatments currently used for stroke therapy. [17]

The main purpose of this study was to determine the most frequently utilized physical therapy protocols for stroke rehabilitation by physical therapists in KP as numerous studies have been conducted in different countries examining treatment protocols used for stroke rehabilitation, but no such kind of study has been done in Pakistan, especially in Peshawar, examining the preferred techniques and protocols utilized by physiotherapists in Khyber Pakhtunkhwa for stroke rehabilitation and to examine if they are still employing, conventional techniques or modern, evidence-based techniques.

Methodology

This research study was a cross-sectional descriptive survey conducted over a period of 6 months, starting from November 2021 to April 2022. Data was collected from all the physical therapists working in Tertiary Care and District Head Quarter Hospitals of KP, through census method as the total strength of physical therapists was about 120. Strict inclusion and exclusion criteria were followed before data collection. Inclusion criteria included participants willing to participate, graduation completed in physiotherapy, therapists treating both major types of stroke patients (hemorrhagic and ischemic) since at least one year, while internees and physiotherapists working in administrative roles were excluded from the study.

After acceptance of synopsis, written ethical approval of the study was obtained from Advanced Study and Research Board of Khyber Medical University. (Ref no: **KMU (IPM & R) MSPT/811**).

The questionnaire used in this study was adapted from the survey conducted by Natarajan et al in 2008 in Kansas City developed by group of experts working with stroke population and was approved by institutional review board at the University of Kansas Medical Center (KUMC).[(18)] The questionnaire was designed online and shared with the participants through email addresses and WhatsApp numbers. The questionnaire had seven parts and 39 items, including subsections of demographic information, treatment technique, treatment goal, related to tone, movement facilitation, function, and motor rehabilitation. Information sheet about study details and consent form was provided to all participants. Link of the google form questionnaire was shared with them. After sharing the questionnaires, they were given a reminder every two weeks for their incomplete responses, if any. After waiting for 6 months, out of (120) participants, 98 physiotherapists properly filled the questionnaire and submitted the responses. The data was initially imported into excel sheet after that into SPSS version 22 for final analysis. Frequency distributions were demonstrated with the help of percentages and counts. To

check association of treatment protocols with experience, age, post-graduation and gender, Chi-square test was applied.

Results

Out of the total physiotherapists working in KP, 98 PTs returned the questionnaire. Among them 57(58.2%) were male and 41(41.8%) were female PTs. Detailed demographic data about age, post-graduation qualification, experience and working hospitals are shown in (table I).

Table I: Shows demographic characteristics of participants.

Characteristics		Count	%
Gender Of Physical therapist	Male	57	58.2
	Female	41	41.8
Age Of Participants in Years	22-30	40	40.8
	31-40	52	53.1
	41-50	5	5.1
	>50	1	1
Post-Graduate Specialty	Cardiopulmonary PT	2	2
	Musculoskeletal PT	43	43.9
	Neurological PT	28	28.6
	Sports PT	6	6.1
	Having no Post-Graduate Degree	18	18.4
Other degree Obtained	PPDPT	5	5
	MPH	1	1
Currently Working Hospitals	Public Tertiary Care Hospital	27	27.6
	Private Tertiary Care Hospital	28	28.6
	District Head Quarter Hospital	43	43.9
Years in Practice Since Graduation	0-2	20	20.4
	3-6	34	34.7
	7-12	38	38.8
	13-20	4	4.1
	>20	1	1
Working in different units	Rehabilitation unit	90	(91%)
	Acute Care	69	(70%)
	Outpatient Clinic	63	(64%)
	Home Health	9	(9%)

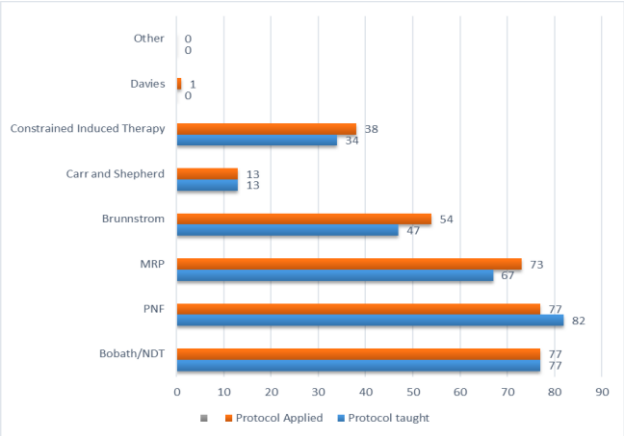

Figure 1. Showing number of PTs who learned different treatment protocols and number of PTs who apply treatment protocols .

The most common protocol applied by the PTs was PNF (Figure 1). Majority of them attended seminars and conferences in order to enhance their skills and update their knowledge (Figure 2). Similarly, Table II illustrates the primary goal of therapy in stroke recovery, which was agreed upon by majority of physical therapists. About 97% of the participants stressed upon tone normalizing during movement facilitation, while 44% agreed that changing the patient's ability to do movement will not necessarily improve the patients to perform his/her functional duties. Similarly, 64% agreed that treating proximal stability of patient will not result in retaining distal movement of the limb and that movement of distal limb needs to be facilitated. There was no association between Bobath/NDT, PNF, MRP and Constrained Induced therapy with experience, age, post-graduation and gender. (Table III)

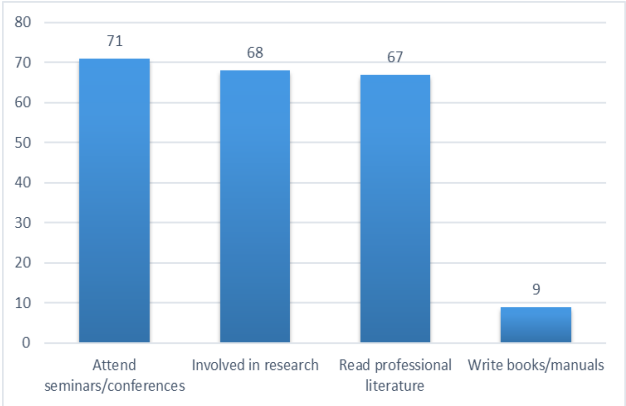

Figure 2. Showing physical Therapists continuing education.

Discussion

This study examines the clinical practice pattern along with physical therapists' knowledge and attitude level related to the rehabilitation of stroke patients in Khyber Pakhtunkhwa. The most commonly taught technique was PNF by more than 83%, followed by Bobath 78%, MRP 68%, Brunstorm 48% and Constrained induced therapy 34%, but the most commonly applied technique was also PNF and Bobath (77%) followed by MRP (73%), Brunstorm (55%) and constrained induced therapy by 38%. Mazen et al conducted the same cross-sectional study on stroke patient's rehabilitation by physiotherapists in Saudi Arabia. The physiotherapists preferred Bobath/NDT (77.5%), followed by Brunnstorm (65%), PNF (48%), and MRP (21.7%) for the treatment and rehabilitation of stroke patients [19]

In our study, 98(100%) of PTs agreed that the emphasis should be made on re-educating the normal movement and 94(96%) facilitating adaption to function both of which are newer research-proven treatments. This indicates that the therapist utilized a diverse approach rather than

sticking to a single approach. Similarly, Pollock et al conducted a study which reviewed 21 randomized and quasi-randomized controlled trials, that stated there is currently no convincing evidence that one physiotherapy strategy is superior to another in facilitating disability rehabilitation therefore combine approach, appears to be more beneficial. [20]

In our study, majority of physical therapists enhanced their clinical skills and updated their knowledge by attending seminars and conferences (72%), followed by (69%) involved in research and reading professional literature (69%), while a similar study conducted by Natarajan et al (2008) showed that clinicians confessed to be unaware about recent studies and

Table II : Shows Responses of PTs' survey of stroke rehabilitation regarding aim of treatment, pertaining to tone, aim of function and facilitation of movement.

Aim of treatment	Agree (%)	Disagree (%)	Unsure (%)
Re-educate normal movement	100	0	0
Facilitate postural adjustment	96	0	4
Facilitate adaptation to function	90	1	9
Prevent secondary complication	89	2	9
Pertaining to tone			
In patients where tone is abnormal, normalizing tone is necessary when facilitating movement	97	1	2
The repetition of functional task may normalize patient's normal movement pattern	71	23	5
To reduce spasticity does not necessarily resulting movement; movement need to be facilitated	71	23	5
Aim of function			
To change the patient ability to do movement will not necessarily improve the patient ability to complete functional duties	44	38	18
In those stroke patients where the chance of recovery for normal movement exist, PT should delay performing their certain activities if they reinforce abnormal movement pattern.	53	30	17
And intensive training for single plane movement would carry it into activities of daily living	44	38	18
Aim of facilitation of movement			
Stability of proximal part is a pre-requisite for selective movement of distal part	88	2	10
Treating proximal stability will not necessarily result in recovery of distal movement in the limbs; distal movement needs to be facilitated.	64	22	13
The therapist's role is to facilitate. normal movement components	91	2	7
CVA/Stroke patients need hands-on training.	95	1	6
CVA/Stroke patients need task oriented functional practice.	90	1	9
Activating movements bilaterally makes use of ipsilateral movements to promote recovery of the affected side.	91	3	6

Table III: Association of choice of treatment with age, gender, post-graduation and experience.

	Treatment Protocols in Practice										
	PNF		**Bobath/NDT**		**MRF**		**Brunstormn**		**Constrained Induced therapy**		**P-value**
	Yes %	*No %*	*Yes %*	*No %*	*Yes %*	*No %*	*Yes %*	*No %*	*Yes %*	*No %*	
Post graduate Specialties											
MSK	72	28	77	23	70	30	51	49	43	57	
Neuro	89	21	67	33	82	18	46	54	46	54	>0.05
Cardiopulmonary	50	50	50	50	50	50	50	50	0	100	
Experience in Years											
0-2	60	40	65	35	60	40	100		40	60	
3-6	85	15	79	21	82	18	55	45	29	71	>0.05
7-12	82	18	81	19	74	26	57	43	47	63	
13-20	50	50	0	100	25	75	25	75	25	75	
Age in years											
22-30	75	25	70	30	77.5	22.5	35	65	35	65	
31-40	82.6	17.4	82	12	75	25	42.5	58	40	60	>0.05
41-50	60	40	100		40	60	20	80	30	70	
Gender											
Female	73	27	73	27	73	27	53	47	29	71	>0.05
Male	82	18	82	18	75	25	56	44	46	54	

literature related to stroke rehabilitation and therapies and concluded that reading current literature should be an essential component of a clinician's job in an area that is always growing, such as stroke therapy.[18]

Almost all 95(97%) of the PTs of our study agreed upon the fact that tone normalizing is important while facilitating the movement. While a similar study done by Salem et al in 2019 in Saudi Arabia has similar findings that 87% of the PTs have suggested that normalizing the tone is important for facilitating the movement.[21] The Bobath technique, which allows normal patterns of movement while tone inhibiting, is closely linked to this response.[22] According to a cross-sectional study conducted by Sheila et al in UK suggested that Bobath approach was the most popular strategy (67%), followed by an eclectic technique (31%). Bobath therapists believed that in order to execute functional tasks, patients needed to have normal tone and movement patterns. [23]

More than half of participants (53%) suggested that in those stroke patients, where the chance of recovery for normal movement exists, PT should delay performing their certain activities, if they reinforce abnormal movement pattern, while about one third (30%) of them disagreed. A study done in Saudi Arabia in which 66% of the participants showed agreement.(21) However study done by Lennon et al in Northern Ireland stated that PT should not delay performing their certain activities if they reinforce abnormal movement pattern.[24]

Apart from MRP, Bobath PNF/NDT, Brunnstorm, and CIMT, there are other protocols used for the rehabilitation of stroke which were not mentioned by anyone, as they have been given open ended question to enlist other treatment protocols apart from the mentioned protocols in the questionnaire. These protocols are Task specific training, Circuit training, Robotics and Functional electrical stimulation.[25] More than half (58.2%) of the Physiotherapists were young and having age less than 40 years. This has highlighted that physiotherapy educational program is relatively new and in the growing stage here in KP. A Study with large sample size need to be conducted to determine truly the choice of treatment practices of physical therapist working across Pakistan. As this study was conducted in KP, so the therapists working here were included only and the sample size of the study was small so the results of the study can't be generalized to whole population of physical therapists working in Pakistan. Moreover, commonly used treatment protocols were discussed, and latest protocols have not been discussed.

Conclusion

Physical therapists employ a range of treatment protocols for stroke patient rehabilitation, with Bobath/NDT, PNF, and MRP being the most used ones. All participants indicated their commitment to improving clinical skills and staying contemporary by attending seminars, conferences, and reading professional literature Interestingly, they seemed unaware of the latest treatment approaches like circuit training, virtual reality training, robotics, and task-specific training, as these methods were not mentioned during the discussions, suggesting a potential knowledge gap in these areas.

Acknowledgement: We would like to thank all the physical therapist who took out their precious time and facilitated us in every possible way.

References

1. Walker ER, McGee RE, Druss BG. Mortality in mental disorders and global disease burden implications: a systematic review and meta-analysis. JAMA psychiatry. 2015;72(4):334-41.
2. Aichner F, Adelwöhrer C, Haring H-P. Rehabilitation approaches to stroke. Stroke-Vascular Diseases. 2002:59-73.
3. Rimmer JH, Wang E. Aerobic exercise training in stroke survivors. Topics in stroke rehabilitation. 2005;12(1):17-30.
4. Raine S, Meadows L, Lynch-Ellerington M. Bobath concept: theory and clinical practice in neurological rehabilitation: John Wiley & Sons; 2013.
5. Miller EL, Murray L, Richards L, Zorowitz RD, Bakas T, Clark P, et al. Comprehensive overview of nursing and interdisciplinary rehabilitation care of the stroke patient: a scientific statement from the American Heart Association. Stroke. 2010;41(10):2402-48.
6. Pound P, Ebrahim S. Redefining 'doing something': health professionals' views on their role in the care of stroke patients. Physiotherapy Research International. 1997;2(2):12-28.
7. Aho K, Harmsen P, Hatano S, Marquardsen J, Smirnov VE, Strasser T. Cerebrovascular disease in the community: results of a WHO collaborative study. Bulletin of the World Health Organization. 1980;58(1):113.
8. Kwakkel G, Kollen BJ, Wagenaar RC. Therapy impact on functional recovery in stroke rehabilitation: a critical review of the literature. Physiotherapy. 1999;85(7):377-91.
9. Nilsson LM, Nordholm LA. Physical therapy in stroke rehabilitation: bases for Swedish physiotherapists' choice of treatment. Physiotherapy Theory and Practice. 1992;8(1):49-55.
10. Chen L, Xiong S, Liu Y, Lin M, Zhu L, Zhong R, et al. Comparison of Motor Relearning Program versus Bobath approach for prevention of poststroke apathy: a randomized controlled trial. Journal of Stroke and Cerebrovascular Diseases. 2019;28(3):655-64.
11. Jackson J. Approaches to neurological rehabilitation by physiotherapists. British Journal of Therapy and Rehabilitation. 1994;1(2):71-4.

12. Tyson S, Selley A. A content analysis of physiotherapy for postural control in people with stroke: an observational study. Disability and rehabilitation. 2006;28(13-14):865-72.
13. Hindle KB, Whitcomb TJ, Briggs WO, Hong J. Proprioceptive neuromuscular facilitation (PNF): Its mechanisms and effects on range of motion and muscular function. Journal of human kinetics. 2012;31:105.
14. Charlotte Brunner I, Sture Skouen J, Inger Strand L. Recovery of upper extremity motor function post stroke with regard to eligibility for constraint-induced movement therapy. Topics in stroke rehabilitation. 2011;18(3):248-57.
15. Hubbard IJ, Parsons MW, Neilson C, Carey LM. Task-specific training: evidence for and translation to clinical practice. Occupational therapy international. 2009;16(3-4):175-89.
16. Jack D, Boian R, Merians AS, Tremaine M, Burdea GC, Adamovich SV, et al. Virtual reality-enhanced stroke rehabilitation. IEEE transactions on neural systems and rehabilitation engineering. 2001;9(3):308-18.
17. Rahman Khan F, Vijesh P, Rahool S, Radha AA, Sukumaran S, Kurupath R. Physiotherapy practice in stroke rehabilitation: a cross-sectional survey of physiotherapists in the state of Kerala, India. Topics in stroke rehabilitation. 2012;19(5):405-10.
18. Natarajan P, Oelschlager A, Agah A, Pohl PS, Ahmad SO, Liu W. Current clinical practices in stroke rehabilitation: regional pilot survey. Journal of Rehabilitation Research & Development. 2008;45(6).
19. Alqahtani MM, Kashoo FZ, Ahmad F. Current scenario of evidence-based practice and rationale of preferred approach in stroke rehabilitation among physiotherapists in Saudi Arabia: A cross-sectional survey. Saudi Journal for Health Sciences. 2018;7(1):53.
20. Pollock A, Baer G, Langhorne P, Pomeroy V. Physiotherapy treatment approaches for the recovery of postural control and lower limb function following stroke: a systematic review. Clinical rehabilitation. 2007;21(5):395-410.
21. Alatawi SF. Current clinical practices of Saudi physiotherapists in stroke rehabilitation. Journal of Acute Care Physical Therapy. 2021;12(4):194-204.
22. Mepsted R, Tyson S. The Bobath concept. A guru-led set of teachings unsupported by emerging evidence. A response to Vaughan-Graham and Cott.(J Eval Clin Pract. 2016. Journal of Evaluation in Clinical Practice. 2017;23(5):1127-8.
23. Lennon DB, Ann Ashburn, Sheila. Physiotherapy based on the Bobath concept in stroke rehabilitation: a survey within the UK. Disability and Rehabilitation. 2001;23(6):254-62.
24. Lennon S. Physiotherapy practice in stroke rehabilitation: a survey. Disability and rehabilitation. 2003;25(9):455-61.
25. Meadmore KL, Exell TA, Hallewell E, Hughes A-M, Freeman CT, Kutlu M, et al. The application of precisely controlled functional electrical stimulation to the shoulder, elbow and wrist for upper limb stroke rehabilitation: a feasibility study. Journal of neuroengineering and rehabilitation. 2014;11(1):1-11.