

Current clinical practices of Saudi physiotherapists in stroke rehabilitation.

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Research article

Keywords: Saudi Arabia, Physio/Physical therapy, Stroke rehabilitation, Survey

Posted Date: January 14th, 2020

DOI: <https://doi.org/10.21203/rs.2.20818/v1>

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Version of Record: A version of this preprint was published at Journal of Acute Care Physical Therapy on April 20th, 2021. See the published version at <https://doi.org/10.1097/JAT.000000000000165>.

Abstract

Background Physiotherapy seems to play an important role in stroke rehabilitation. Physiotherapist's ability to assume responsibility for translating rehabilitation programmes to real clinical practice appeared to be one of the most important concept of stroke management. **Objective** This paper aims to investigate the current practice of Saudi Arabian physiotherapists working with patients diagnosed with stroke.

Method An on-line questionnaire is designed by focusing physiotherapists who are working with stroke rehabilitation in Saudi Arabia during August-October 2019 was used. Questionnaire is consisted of 7 sections with 40 items that are related to stroke rehabilitation such as treatment approach, aim of treatment, pertaining to tone facilitation of movement, function and motor rehabilitation. Quantitative data analysis was conducted by using SPSS.

Results Questionnaire survey was distributed among 287 physiotherapists; out of them 197 participants have returned completed questionnaires (68.6%). Based on the results analysed it is shown that physiotherapists preferred Bobath/NDT approach (77.66%), followed by PNF/Brunnstorm (63.45%) and Constrained induced movement therapy (25.38%), respectively. Despite of the fact that respondents have agreed on different treatment approaches; however, there is variation observed between participants in some sections of the survey. Thus, it is highlighted that the developed interventions in stroke rehabilitation are still considered as controversial and inconclusive as variations are observed in between patients' groups and outcome measures.

Conclusion Variation has been observed in between therapists while treatment application approaches in stroke rehabilitation. Future studies might focus on the investigation of how and why practitioners use or do not use evidence in this area.

Background

A stroke is characterized as "a sudden onset of focal neurological impairment, lasting for more than one day (or leading to death), and of presumed vascular origin" (World Health Organization (WHO)). In developed countries, it has been asserted that stroke is the third most common reason for death and the most frequent cause of acquired adult disability[1]. According to the WHO, approximately 15 million individuals suffer from stroke worldwide, and the prevalence of stroke has been reported at 29.8 per 100000 people in Saudi Arabia[2]. However, a precise number or percentage of stroke incidence among Saudi people is currently unavailable due to the lack of appropriate research being conducted in this area compared to that conducted in developed countries.

Physiotherapy forms a major part of stroke patients' rehabilitation and aims to improve their functional abilities and movements[3, 4]. To achieve such improvements, physiotherapists should adopt a problem-solving approach by drawing upon a hierarchy of scientific evidence derived from clinical experience,

patients' needs—that is, making decisions regarding clinical care—and clinical research (i.e., the most beneficial research evidence).

Concerning stroke rehabilitation, many studies have investigated the types and sources of knowledge that physiotherapists draw upon when making decisions in their clinical practice. Study findings demonstrate that most physiotherapists continue to mainly rely on initial training, treatment techniques learned during initial training, prior personal experience, prior experience with a treatment's effects, continuing education concerned with practice that guides practice discussions and involves expert opinions, and colleagues' guidance when selecting modalities or treatment techniques specific to their practice rather than applying current scientific evidence. Furthermore, these former studies provide valuable information about physiotherapists' approaches to stroke treatment. For example, British[3, 5, 6], Swedish[7], and American[8] studies have determined that the Bobath approach is most frequently used. Whereas the most common approach used by Australian[9] and Canadian[10] physiotherapists is the motor relearning approach.

Other findings indicate that various factors might affect physiotherapists' decision making in clinical stroke rehabilitation practice, such as organizational contexts and patient needs. Alatawi, S. (2019)[11] extended these factors to include structured multidisciplinary team working, end users' specific needs, patient factors, and the transferability of evidence. The author conclude that these factors are closely associated with physiotherapy practice in stroke rehabilitation. The author additionally emphasizes that clinicians do not practice in isolation, and clinical decisions require a consistent effort from both clinicians and the organizations in which they work. It is important to acknowledge that organizations must be aware of the requirements involved in clinical decision making.

Saudi Arabia is the largest country in the Middle East, with a population greater than 28 million. Stroke is becoming a rapidly increasing health problem in Saudi Arabia and may be considered one main cause of death and illness. The burden of stroke is on the rise in the Middle East, where death from stroke is estimated to double by 2030[2].

The information surrounding the reason behind the treatment techniques that Saudi physiotherapists choose to implement with stroke patients is important because it may play a significant role in finding efficient ways to both locate the most beneficial evidence among the clinical healthcare practice and improve stroke patient care. Unfortunately, no study has yet investigated the choices made regarding stroke rehabilitation in Saudi Arabia.

Methods

Sample and setting

All practicing/academic physiotherapists in Saudi Arabia who provide stroke rehabilitation were included in the questionnaire's study sample. Participants were eligible if they met the following inclusion criteria:

(1) they were currently providing stroke rehabilitation services in Saudi Arabia and (2) they were physiotherapists who had a diploma, BSc, MSc, or PhD in physiotherapy.

Managers of stroke rehabilitation services in Saudi Arabian district general hospitals were contacted and asked to identify staff from the above categories to participate in the study. Eighteen managers were reached from district general hospitals, university hospitals, and clinics. A nominated survey coordinator at each region received a copy of an invitation to participate, the associated instructions, and a link to the questionnaire to be distributed among the physiotherapists working in stroke rehabilitation. The study was executed between March and November 2019.

Online survey instruments

The survey utilized in this study was adjusted from that applied by Natarajan et al. (2008)[8] in their study on the current practice of American physiotherapists in stroke rehabilitation, although modifications were made to suit the Saudi context (see Appendix 1). To render the flow of questions more logical, the demographic information section was added to the front side of the questionnaire[12].

Seven sections and forty items were included in the questionnaire, including eight items on demographic characteristics, eight on treatment approach, four on treatment aim, three pertaining to tone, seven on the facilitation of movement, four on function, and six regarding specific questions about motor rehabilitation (Table 1).

Data analysis

To analyze the questionnaire data, the Statistical Package for the Social Sciences (SPSS, Version 23, SPSS Inc.) was employed. To address the primary objective, descriptive and comparative statistics were calculated. Response frequencies for survey questions (i.e., those arising from the Likert scale questions) were determined and displayed in tabular and graphical formats to answer the research questions.

For items evaluated using a five-point Likert scale, the categories “strongly disagree” and “disagree” were combined into a single “disagree” category, while the categories “strongly agree” and “agree” were combined into a single “agree” category such that all responses fell into one of three categories: disagree, agree, or unsure.

Result

Of the 287 questionnaires distributed, 197 were completed, representing a 68.64% response rate. Over half (66.5%) of respondents were men and 33.5% were women. Around 60% of participants were aged between 20-29 years. Over half of participants (51.8%) had clinical experience of 1-5 years, whereas only 4.1% had clinical experience of more than 20 years. The majority of respondents (54.8) were working in governmental hospitals. The majority of respondents (58.4%) had a Baccalaureate degree, 13.2% had a Master degree, while only 8.6 had a doctorate degree. Less than of respondents (41.6%) reported they

saw from 1 to 5 patients daily, 41.1% saw fewer than 10 patients daily, and 4.6% reported they saw more than 15 patients daily (Table 2).

Treatment approach

In terms of the treatment approach of stroke rehabilitation as reported by respondents of this study. The most popular treatment approach was Bobath/NDT, followed by Brunnstrom/PNF. Whereas, Carr and Shepherd approach was the least practices. Figure 1 illustrated the number of therapists for each treatment method either learned in the basic education or using in real practice. Participants were allowed to select all that being learned and/or applied.

Aim of treatment

Based on the data given in Table 3, the majority of the participants agree with all the presented aims of treatment. Although there is a slight difference in the proportions of agreed aims, re-educating normal movement and facilitating postural adjustments represent the highest percentages, 98% and 99% respectively. 2% of the participants show their disagreement with the last two aims: facilitating adaption to function and preventing secondary complications in neuromuscular.

Pertaining to tone

The participants' attitudes towards the three statements relating to tone are shown in table 4. The majority of the participants (87%) agree with the importance of normalizing tone during facilitating movement. However, 84% of them believe that it is not necessary to be resulted. Moreover, 75% agree that practicing functional tasks can result in normalizing the tone and accessing more movement patterns while 7% disagree and 18% are not sure about that. The percentage of disagreeing with the importance of tone or not are the same, (5%).

Facilitation of movement

Table 5 presents the participants' attitudes regarding facilitation of movement. When looking at the given data, it can be noticed that most of the participants agree with the statements; although the proportions are varied. The majority agree that CVA/stroke patients need a task oriented functional practice and hands-on the task oriented functional practice, representing 93% and 92% respectively. Few numbers of participants (2% - 3%) do not agree with that and 5 % of them do not have a response. 79% of participants point out that treating proximal stability will not necessarily result in recovery of distal movement in the limbs while some participants (10%) do not agree and others (11%) are not sure.

Function

Table 6 shows the therapists' attitudes towards the functional tasks. 72% of the participants point out that it is not necessary that changing the patient's ability to move affect positively the patient's ability to do functional activities whereas almost the quarter of the participants (22%) do not agree. Concerning the

attitude about performing certain tasks should be delayed if these tasks improve abnormal movement patterns), 66% of the participants agree with while 16% do not agree. Moreover, almost half of the participants (49%) believe that 'intensive training of single plane movement patterns can carry over into activities of daily living'. 6% of the participants are unsure regarding the last two statements.

Specific questions about motor rehabilitation

The results for some specific statements about motor rehabilitation, which were presented to the therapists, are presented in Table 7. The majority (92%) agree with the usefulness of active assistive movement for patients with muscle weakness. 84% of the participants insist the importance of passive range of motion for treatment.

Regarding the amplitude of movement, 73% of the participants point out that the amplitude of movement should be practiced with the patients with limited active range of motion whereas 72% of participants believe that the amplitude of movement should be practiced with the patients with limited passive range of motion. However, 15% disagree with the idea that the amplitude of movement should be subjected to the patients with limited active range of motion.

Furthermore, Two questions were asked regarding prioritization of movement during sessions of treatment. Table 8 shows the results for the questionnaire regarding some procedures that should be taken for the speed of movement for patients with high or low tone. 52% of participants prefer to increase the movement speed for the patients with low tone. Few numbers (5%) agree with the idea of increasing the speed for the patients with high tone. On the other hand, 40% point out that the speed should be constant for those with low tone while 21% prefer to be constant with high tone.

Discussion

Various therapeutic approaches exist for the rehabilitation of stroke patients such as Proprioceptive Neuromuscular Facilitation (PNF), Brunnstrom Approach, Motor Re-learning Programme (MRL), and Bobath (also called Neuro Developmental Treatment (NDT))[13]. The purpose of the study was to highlight the current clinical practice of Saudi physiotherapists in stroke rehabilitation treatment. Though, online survey was used to collect the data but the response rate was 68.64%.

The majority (51.8%) of participants in this study had less than 5 years' experience in treating patients with stroke rehabilitation. That has highlighted the fact that there are limited or zero physiotherapy programmes linked with stroke in different regions of Saudi Arabia. Nearly all participants in this survey have received training in both approaches: Brunnstrom/ PNF and Bobath/NDT during their basic training education. Moreover, both methods were used widely in their real practice for stroke rehabilitation (Brunnstrom/ PNF 77.66% and Bobath/NDT 63.45% respectively)[14]. However, it is necessary to note that both approaches lack the robust evidence in order to support their effectiveness[15].

Previous studies showed that Bobath theory being widely accepted in physiotherapy, there is no validated evidence of its superiority is observed[14,16]. Furthermore, other findings revealed that there is no statistical significant differences, in favour of the Bobath group, were found between stroke patients that have been treated according to the Bobath method verses stroke patients that have been treated according to alternative approaches such as traditional functional treatment, CIMT, electrotherapy, or motor relearning programme[14].

The result of current study can be compared to previous conducted researches that have investigated the practice of physiotherapy in stroke rehabilitation in diverse countries including the United States, Sweden, the United Kingdom, and Australia. Based on the survey results, around 94% of Saudi physiotherapists agreed to aim and re-educate normal movement for stroke rehabilitation and facilitate adaption to function in their current practice with stroke patients. Findings suggested that receiving the highest percentages on both aims may represents different approaches. This may indicate that using one method alone in stroke rehabilitation is not effective but using different approaches are required to be used to treat stroke patients based on patients' case history.

Findings showed that around 87% of participants have suggested that tone should be normalized when facilitating movement. This response is closely linked to Bobath/NDT approach, which pointed out towards facilitating encouragement of normal movement patterns while inhibiting tone. However, diverse literature has concluded on the comparisons of Bobath or Burnnstrom/PNF methods with other approaches that do not demonstrate any validated evidence of its superiority over the other approaches, in stroke rehabilitation[14].

One of the core concepts linked with the contribution of physiotherapy in stroke rehabilitation is constraint induced therapy movement therapy (CIMT)[17]. However, only 16 (8.12%) participants reported that they have been taught in their basic training and 50(25.38%) participants used CIMT in their real clinical practice. The characteristic of intensive, repetitive, and task-specific training of CIMT might explain the existing variations between physiotherapists among their learning of CIMT in the basic education and using of CIMT in the real clinical practice. Moreover, since the use of such approaches and other strategies (such as functional electrical stimulation, bilateral arm training, mirror therapy and biofeedback) were not a common practice in stroke rehabilitation in Saudi Arabia, thus they have faced many issues linked with therapist factors (such as knowledge, skills and beliefs about the research) and organisational factors (such as culture, courses and resources) which needs more investigations to close this gap between evidence and clinical practice[17]. This may explain the low percentage of these strategies in real practice.

The majority of participants (66%) suggested that performing activities should be delayed if these activities reinforcing abnormal movement patterns. However, there is no evidence that has shown that delaying in some patterns will affect negatively or abnormal tone or movement. Nearly half of participants (49%) believed that single plane movement can be useful in improving the function, whereas rest of the participants disagreed or uncertain about it.

This paper is considered as the first and foremost study that has investigated the current practice of Saudi physiotherapists in stroke rehabilitation. However, the research questionnaire lacked consideration of influencing factors while implementation of evidence in stroke rehabilitation in real practice such as context of practice and service delivery. Furthermore, future studies need to engage therapists to test any intervention practice in stroke rehabilitation against best practice, rather than usual care which is not considered as an evidence-based practice.

Conclusion

To conclude, although this study has targeted the current Saudi's physiotherapist practice in stroke rehabilitation, the data shows that the clinicians themselves need more training and practice in efficacious treatment and implementation. Thus, uncertainty in their responses for some sections in the survey can be considered as evidence that the therapists are required to be aware of what's new in their field related to practice and the updated methods. Also, there is need to enhance treatment practices and methods that should be more investigative and effective for stroke rehabilitation.

Abbreviations

WHO: World Health Organization.

PNF: Proprioceptive Neuromuscular Facilitation.

MRL: Motor Re-learning Programme.

CIMT: constraint induced therapy movement therapy.

Declarations

Ethics approval and consent to participate

This study was approved by the local research ethics committee (LREC) at University of Tabuk-Saudi Arabia. Approval number is UT-76-02-2019. Additionally, written consent to participate was received from physiotherapists. This study is anonymous survey conducted in the form of a web survey questionnaire and the content information is kept confidential.

Consent for publication

Not applicable.

Availability of data and materials

The data used to support the findings of this study are included within the article.

Competing interests

The author declare that no conflicts of interest regarding the publication of this article.

Funding

The author received no financial support for the research, authorship, and/or publication of this article.

Author Contributions

SF conducted data collection, calculations, analyzed results and writing the manuscript.

Acknowledgment:

The author would like to thank all participants in this study for their time.

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Tables

Table 1: Content of the online questionnaire.

Subject area	Questions	Subhead
Demographic characteristics	1-8	Gender, age, place and region of work, qualifications, experience, number of patients
Treatment approach	9-16	Stroke treatment approaches, types of care, continuing education/training in stroke rehabilitation, professional literature on stroke
Treatment aim	17-20	Movement, posture, function, complications
Pertaining to tone	21-23	Likert scale
Facilitation of movement	24-30	Likert scale
Function	31-34	Likert scale
Motor rehabilitation	35-40	Likert scale

Table 2: Sociodemographic characteristics of the study participants (n= 197).

Valid percentage	Frequency	Q1 Gender	
66.5	131	Male	Valid
33.5	66	Female	
100	197	Total	
		Q2: Age	
59.4	117	20-29	
30.5	60	30-39	
7.6	15	40-49	
2.5	5	50 >	
100	197	Total	
		Q3: Work of place	
54.8	108	Government hospitals	
33.5	66	Private hospitals	
11.7	23	Other	
100	197	Total	
		Q4: Region of work	
21.3	42	Central	
24.9	49	East	
11.2	22	West	
29.9	59	North	
12.7	25	South	
100	197	Total	
		Q5: Experience in year	
51.8%	102	1-5	
23.9%	47	6-10	
16.8%	33	11-15	
3.6%	7	16-20	
4.1%	8	More than 20	
100	197	Total	
		Q7: Highest qualification	
7.6	15	Diploma	
58.4	115	BSc	
12.2	24	DPT	
13.2	26	MSc	
8.6	17	PhD	
0	0	Other	
100	197	Total	
		Q8: Work with	
54.8	108	Adult	
22.8	45	children	
22.3	44	Both	
		Q9: Number of patient/day	
41.6%	82	1-5	
41.1%	81	5-10	
12.7%	25	11-15	
4.6%	9	15 ≤	
100	197	Total	

Table 3 : Survey responses of stroke rehabilitation clinicians in Saudi Arabia (n=197) regarding aim of treatment.

Statement	Agree (%)	Unsure (%)	Disagree (%)
Re-educate normal movement	98	2	0
Facilitate postural adjustments	99	1	0
Facilitate adaptation to function	94	4	2
Prevent secondary complications in neuromuscular function	94	4	2

Table 4: Survey responses of stroke rehabilitation clinicians in Saudi Arabia (n=197) pertaining to tone.

Statement	Agree (%)	Unsure (%)	Disagree (%)
In patients where tone is present , normalizing tone is important when facilitating movement	87	8	5
The practice of functional tasks may normalize the patients tone and access more normal movement patterns	75	18	7
Inhibition of spasticity does not necessarily result in movement; movement needs to be facilitated	84	11	5

Table 5: Survey responses of stroke rehabilitation clinicians in Saudi Arabia (n=197) about facilitation of movement

Statement	Agree (%)	Unsure (%)	Disagree (%)
Proximal stability is a pre-requisite of distal selective movement	86	8	6
Treating proximal stability will not necessarily result in recovery of distal movement in the limbs ; distal movement needs to be facilitated	79	11	10
The therapist`s role is to facilitate normal movement components	85	7	8
CV A/stroke patient need hands-on training.	91	7	2
CV A/stroke patients need task oriented functional practice	93	5	2
CV A/stroke patients need hands-on an task oriented functional practice	92	5	3
Activating movement bilaterally makes use of ipsilateral movement to promote recovery of the affected side	83	16	1

Table 6: Survey responses of stroke rehabilitation clinicians in Saudi Arabia (n=197) pertaining to function.

Statement	Agree (%)	Unsure (%)	Disagree (%)
In patients where the potential for recovery of normal movement exists, therapists should delay performing certain activates if they are reinforcing abnormal movement patterns	66	18	16
Changing the patient's ability to move does not necessarily improve the patient's ability to perform functional tasks	72	6	22
Intensive training of single plane movement patterns can carry over into activities of daily living	49	6	45

Table 7: Survey responses of stroke rehabilitation clinicians in Saudi Arabia (n=197) to specific statements about motor rehabilitation.

Statement	Agree (%)	Unsure (%)	Disagree (%)
Active assistive movement is useful in patients with muscle weakness	92	4	4
Patients presenting with limited active range of motion would begin with small amplitude movement	73	12	15
Patients presenting with limited passive range of motion would begin with small amplitude movements	72	19	9
Passive range of motion is important for treatment	84	9	7

Table 8: Specific statements regarding the prioritization of movement during treatment.

Statement	Increase (%)	Remain constant (%)	Disagree (%)	Unsure (%)
In your opinion , what should be done to spend of movement for individuals with high tone ? Velocity should	5	21	71	3
In your opinion , what should be done to the speed of movement for individuals with low tone ? Velocity should	52	40	5	3

Figures

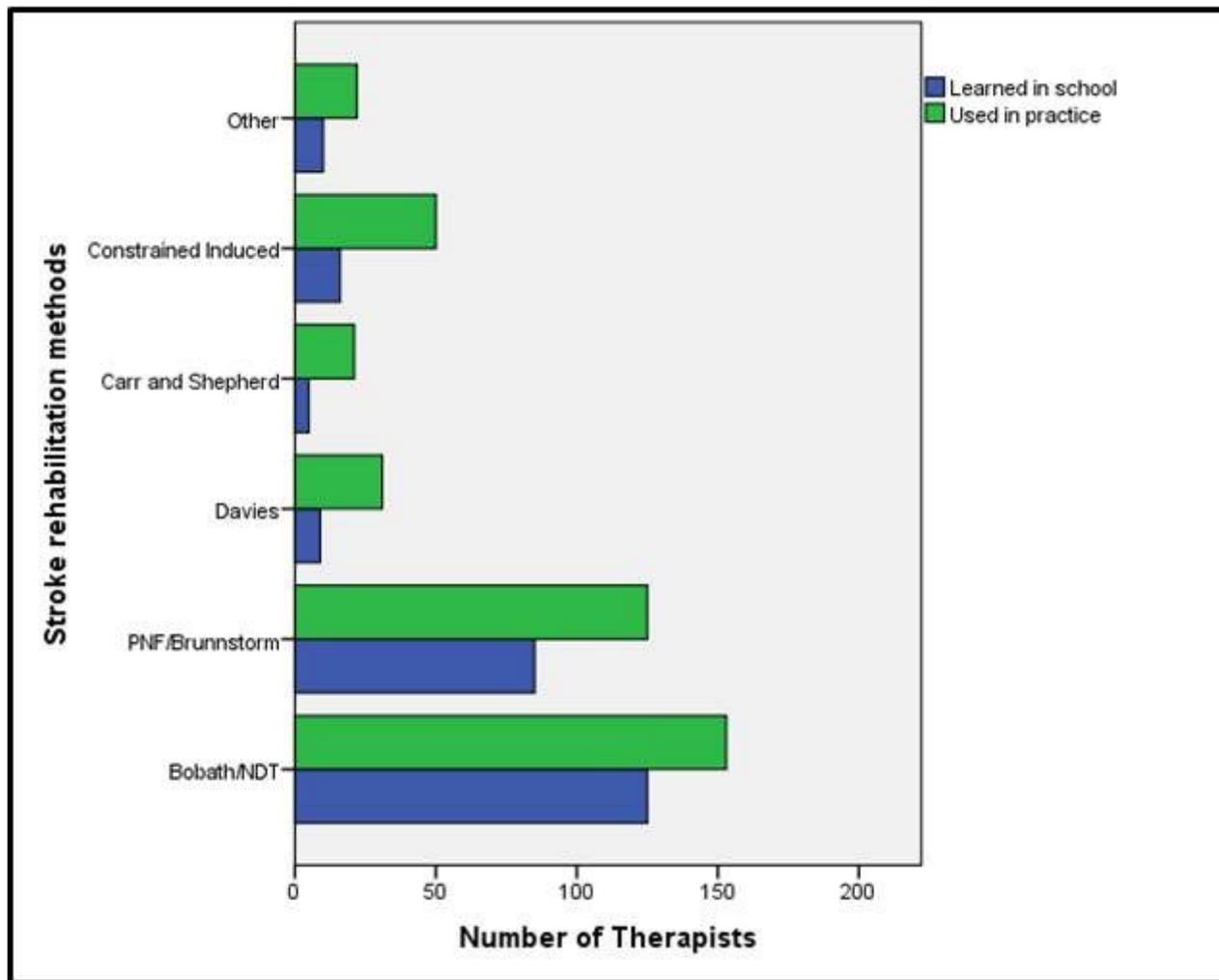


Figure 1

Stroke rehabilitation approaches learned in the basic education and approaches used in clinical practiced. NDT: Neurodevelopmental treatment, PNF: Proprioceptive neuromuscular facilitation.