

## A Comparison between Task Oriented and Client-Centred Task-Oriented Approaches to Improve Upper Limb Functioning in People with Sub-Acute Stroke

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### Abstract

**Objective:** A comparison between task oriented & client-centred task-oriented approach to improve upper limb functioning in people with sub-acute stroke.

**Purpose:** To compare the different types of goal setting, one by physiotherapist and other by client in stroke rehabilitation. The study was conducted to find out effectiveness of Client-centred goal setting combined with task oriented approach to improve upper limb functioning in sub-acute stroke patients.

**Methodology:** This was an experimental study of 40 stroke patient. All subjects were enrolled and divided in two equal groups. Patients in Control group (group A) were treated with task-oriented program after deciding goals for rehabilitation therapeutically by physiotherapist himself.

In Experimental group (group B), client centred approach was used in setting the goals. Here the therapist plans therapy with the client & their relative as the decision maker and implements therapy based on the goals and priorities identified by the clients themselves. After deciding the goals, task oriented program were given to the Patients to enhance the physical performance components that were identified by the subjects as 'important' according to the COPM. Task-oriented training was given for 40 minutes per session for both the groups for 8 weeks.

**Results:** Results suggest that both the groups shows significant improvement from pre intervention level. At post intervention level there was no significant difference on ARAT Score of both the groups but experimental group has significant higher score in Components of COPM (Performance & Satisfaction).

**Conclusion:** Both task-oriented training and client-centred task oriented training are effective in improving functional recovery of upper limb after stroke. Improvement is more statistically significant in client-centred task oriented training group only on COPM (performance & satisfaction) but there was no statically difference in upper extremity function in both groups of stroke patients.

**Keywords:** Task-oriented training; Client-centred task oriented training; Goal setting; Upper limb function

### Introduction

Stroke is the third leading cause of death after cancer and heart diseases, produces considerable morbidity and is an important public health problem all over the world. Stroke is a major public health concern, being among the most common causes of death and disability [1]. Motor impairments are most prevalent of all deficits seen after stroke, usually with involvement of the face, arm and leg alone or in various combinations. Motor impairments include involvement of cranial nerves, muscle power & tone, reflexes, balance, gait, co-ordination and apraxia [2].

The parietic upper limb is a common and undesirable consequence of stroke that increases activity limitation. The recovery process of upper extremity function is often slower than the recovery process of lower extremity function [3]. Upper limb dysfunction in stroke is characterised by paresis, loss of manual dexterity and movement abnormalities that may impact considerably on the performance of ADL's. Grasping, holding and manipulating objects are daily functions that remain deficient in 55% to 75% of patients 3 to 6 months post stroke [4].

In Physiotherapy, a number of interventions studies have been published evaluating the effect of various rehabilitation methods in improving upper-extremity motor control and functioning [5-17].

Task oriented training is commonly used method to retrain patients with hemiplegia.

Task oriented training is a therapeutic approach based on the system theory of motor control. This was given by Bernstein in 1967 to retain the patients with movement disorders. This approach utilizes a training program that focuses on specific functional tasks to engage the neuromuscular and musculoskeletal system. There is strong evidence that early, intense and task-related training improved motor recovery and cortical reorganization after stroke [11,18-22].

### Goal setting in Neuro-rehabilitation

Goals are central to the process of rehabilitation. Individual members of a team are more likely to coordinate their contributions

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if they share common goals, therefore it is important to involve the patient in the goal-setting process [23].

Two important components of the goal setting process are identification of the patient's problems and goal-setting [24]. Whiteneck states that the individual should be viewed as the primary focus of the rehabilitation process, and subjective perceptions are needed to fill in the gaps left by the traditional objective assessments [25]. Pollock claims that when the client participates in goal-formulation, planning and decision-making, the potential for active participation in the rehabilitation process has been shown to increase. Individuals must set the goals in order to be able to solve the problems, or else the feeling of control over their health is decreased [26].

Locke and Latham's goal-setting theory asserts that goals are immediate regulators or causes of behaviour (e.g., task or work performance). It starts with situational, the specific, conscious, motivational factors closest to action: goals and intentions. The theory then worked backward to determine what caused goals to be formed and what made them effective [27,28].

Goal Setting is defined as the process of agreeing on goals, this agreement usually being between the patient and all other interested parties. The process might include setting goals at various levels and in various time frames [29]. Goal setting is recommended as good clinical practice in stroke. Generally, two types of goal settings are used in clinical practice. In one type of goal setting, the rehabilitation team assesses the patient, identify the problems and set the goal accordingly. The second newer approach is client-centred approach in which the goal is set according to the client and his relatives' needs and priorities [30].

### Client-centred approach

Client-centred care has become an increasingly important health care concept in recent decades. The shift toward addressing client-centred care has been influenced by factors including a rise in client expectations, changing culture, availability of information to the general public and the rise in consumerism [31,32]. Moreover, the emphasis on client-centred care reflects current western societal beliefs about independence, the rights of individuals, and the importance of access to information [33].

Client-centred approach promotes clients and health care providers as equal partners in the management of the client's health care and rehabilitation process with an understanding of and respect for the clients' individual needs. Moreover, adopting a client-centred approach strives to incorporate clients' perspectives into the provision of services at the system level and to maximize the chance of a successful transition between rehabilitation programs and the community [32].

Studies reveal that Task oriented training and Client-centred care is both effective in rehabilitation for the stroke patient alone but there are few studies in which the task oriented training combined with client-centred goal setting for rehabilitation was used. So, to find out the better strategy for stroke rehabilitation, we combined the task oriented approach with client centred care and compared it with task-oriented training in which goals are set according to therapist's clinical judgement.

### Purpose of the study

To compare the different types of goal setting, one by physiotherapist and other by client himself in stroke rehabilitation, Client-centred goal setting combined with task-oriented approach to improve upper limb functioning in sub-acute stroke patients.

## Methodology

### Study design – a randomized clinical trial

- Sample: - Study consisting 40 participants (Males and Females) 20 in each group, with their first stroke.
- Sampling design- Simple Random Sampling
- Sampling method- Lottery method
- Source of subjects – M.M. Medical College and hospital and Private hospitals of Ambala. All the participants were residents of different cities of Haryana, who volunteered for the study.

### Inclusion criteria

1. Patients between ages 40-65 years of age.
2. Both Male and Female.
3. Paresis of Upper limb (MCA infarct).
4. Duration of stroke within 1-5 months, prior to commencement of study.
5. Patients had an ARAT score less than 52.
6. Able and willing to participate in 8 weeks study and to sign consent form.

### Exclusion criteria

1. Any associated medical and high risk cardiovascular disorder.
2. Any neurological disorder or pain that might limit arm movement.
3. Chronic and secondary stroke.
4. Severe cognition impairment (MMSE<23).
5. Still enrolled in any form of physical therapy.

### Independent variable

Task-oriented training

Client centred Goal setting

### Dependent variable

Upper limb function

### Instrumentation

Wooden blocks (2.5, 5, 7.5 and 10 cubic cm) Fig-3.2

Ball bearing of 6 mm.

Tubes (diameter- 1 and 2.25 cm)

Marble (diameter- 1.5 cm)

Cricket ball (diameter- 7.5 cm)

Knee hammer

Washer bolt (diameter 3.5 cm)

Stone

Bottle

Glass

### Outcome measures

**Action research arm test:** The Action Research Arm Test (ARAT)

is an evaluative measure to assess specific changes in Upper limb function among individuals with stroke. It assesses a client's ability to handle objects differing in size, weight and shape and therefore can be considered to be an arm-specific measure of activity limitation. It was designed to assess recovery in the upper limb following cortical damage. The test consists of 19 items grouped in subtests (grasp, grip, pinch, and gross arm movement) and performance of each item is rated on a 4-point scale ranging from 0 (no movement possible) to 3 (movement performed normally). The maximum obtainable score is 57. The administration of the ARAT is quick and simple, and it has good reliability and validity [33-36].

**Canadian occupational performance measure:** The Canadian Occupational Performance Measure (COPM) is an individualized measure designed for use by occupational therapists to detect self-perceived change in occupational performance problems over time.

Administration -Completed through a five-step semi-structured interview individualized to each patient.

Step 1: Patient identifies problems in performance of daily activities.

Step 2: Patient determines priorities by rating the importance of each problem on a 10---point scale (from 'not important at all' to 'extremely important').

Step 3: Patient identifies the five most important problems he or she perceives during Daily activities.

Step 4: Patient rate on a 10---point scale the performance (from 'not able to do it at all' to able to do it extremely well').

Step 5: Patient rates his or her satisfaction (from 'not satisfied at all' to 'extremely satisfied') with regard to each of the five prioritized problems.

The COPM focuses on patient-centered care and it Identifies patient-specific problems not assessed in other standardized measurements.

Similarly their present performance ability and satisfaction were assessed using scoring cards as provided with the COPM manual. Sum of the scores for Performance and Satisfaction for 5 identified problems were equated to baseline score on COPM for Performance & Satisfaction. The COPM having good reliability and validity [37-40].

**Protocol:** 40 patients of stroke who fulfilled the inclusion criteria were included in the study. All patients were evaluated by ARAT and COPM prior to the treatment and pre-test readings were recorded. The subjects were assigned into two groups i.e. Group A and Group B comprising with 20 subjects in each group.

Patients in Control group (group A) were treated with task-oriented program after deciding goals for rehabilitation therapeutically by physiotherapist himself. Firstly, the therapist assessed the patients, identified their problems and then set the goals for rehabilitation accordingly. Then Task-oriented training was given for 40 minutes per session.

In Experimental group (group B), client centred approach was used in setting the goals. Here the therapist plans therapy with the client and their relative as the decision-maker and implements therapy based on the goals and priorities identified by the clients themselves. After deciding the goals, task oriented program were given to the patients to enhance the physical performance components that were identified by the subjects as 'important' according to the COPM.

After 8 weeks of intervention, patients were again evaluated with Action Research Arm Test and COPM.

**Client-centred task-oriented program:** The client-centred approach is a newer approach in which goals are set according to clients and their relatives' needs and priorities. Client-centred goal setting encourages the patient to identify their specific aims in relation to their recovery. These aims are then translated into relevant and meaningful goals and used as the basis for the individual's rehabilitation. These goals are used as the rehabilitation framework for each patient.

The client centred approach includes three stages- patient priorities, current status and goal setting. Patient priorities were identified by the administered use of COPM scale. Current status was known by the proper assessment and goals are set by the client-centred. Then, according to previously set goals, task-oriented training was given by the physiotherapist to improve clients' performance and satisfaction. The list contains both simple and more complex tasks and upper extremity functional exercises.

**Task-oriented training:** Task-oriented intervention, inspired by Alon et al, was a standardized programme<sup>15</sup> which was modified from that recommended by Carr and Shepherd (Table 1). This program was conducted for 40 minutes per session for 5 days for 8 weeks. Components of task oriented training include range of motion exercises, weight bearing and supportive reactions, reaching, grasping, holding and release activities upper extremity ADL activities (Table 1).

The number and complexity of the exercises were adjusted by the research therapist for each patient so that he or she was able to practice independently or with assistance from a family member. The specific exercises were further modified by the research therapist as upper extremity performance continued to improve throughout the 8 week study period. Patients practiced their individually tailored task oriented program with the attending therapists (40- minute session, given once a day) 5 days each week.

<b>Passive or Active ROM</b>	Passive ROM: wrist/elbow/shoulder, self or by family member. Active/assistive ROM: wrist/elbow/shoulder. Active ROM: wrist/elbow/shoulder in sitting and standing. Active ROM with resistance: wrist/elbow/shoulder in sitting and standing.
<b>Weight bearing and supportive reactions</b>	Seated weight bearing (forearm on table top) with affected upper extremity. Extending arms, seated or standing with bilateral upper extremity weight bearing on table. Extended arms with transitional movements side lying to sit, sit to stand. Extended arms and wrist/hand on wall with change in base of support, e.g. weight shifting, single lower extremity support, lateral wall walking.
<b>Reaching activities</b>	Forward supported reach bilaterally with cane on table top (elbow extension). Forward supported reach with shoulder elevation, elbow/wrist extension. Reaching against gravity in frontal and sagittal planes. Reaching overhead with active wrist/hand movements. Dynamic reaching to a target, e.g. catches a ball.
<b>Grasping, holding and release</b>	Grasp, hold and release containers with gravity minimized (on table). Pick up and move/release small object on table. Pick up and move/release large objects without proximal support. Incorporate key and pinch grips in hold and release.
<b>Upper extremity ADLs</b>	Dressing, grooming. Carrying objects with affected upper extremity. Opening bottles, stabilizing with paretic extremity for reaching. Writing, drawing and manipulating small objects. Folding and hanging towels. Self-feeding.

Table 1: Exercise programme (Received by both the groups).

**Ethical approval and informed consent:** Before implementing the study, an approval from university ethical committee was taken. All the subject who participated in study received a written explanation about the trial before entry into study and the Informed consent was taken from all the subjects with Stroke, who were willing to participate in study.

**Data analysis:** The data analysed using SPSS version 22.0 software package. Descriptive statistics were used for subject’s demographic characteristics. The p-value was set at 0.05. Paired ‘T’ test was used to analyse within group analysis. Unpaired ‘T’ was used to analyse between group analyses. Levene’s Test is used to calculate for Equality of Variances.

**Result**

**Demographic profile**

Total 58 subjects assessed for study, out of that 15 were unable to fulfill the inclusion criteria (5 medically unstable, 3 had cognitive dysfunction, 4 had flaccidity and mild spasticity so unable to initiate the movements and 3 were refused to participate). There was 3 drop out because they unable to complete the total intervention period, so total 40 subject of stroke included in this study. The patients were divided into two equal groups (20 patients in each group) as group A (Task-oriented PT program), group B (Client-centred goal setting with Task-oriented PT intervention). Firstly, baseline data was measured in terms of age, gender and side affected.

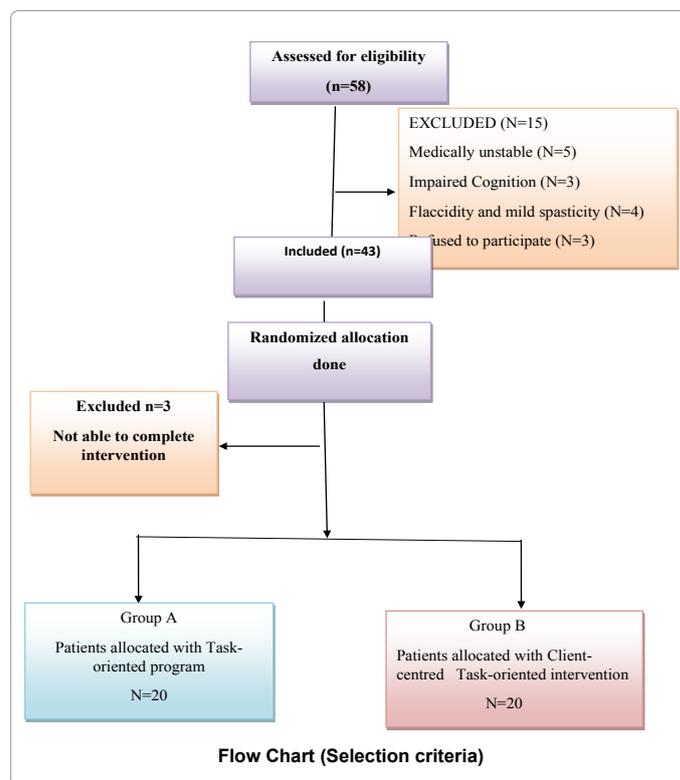
Above table shows demographic data of the population of group A and group B Flow chart 1. The groups did not differ regarding age, gender and side affected. Difference in Age of both groups was not significant with p-value 0.133.

**Discussion**

The main objective of the present study was to compare the different types of goal setting, one by physiotherapist and another by active involvement of client and their relatives in client-centred goal setting combined with task-oriented approach for both the groups to improve upper limb functioning in sub-acute stroke patients. Analysis was done at three levels, first as baseline level between the groups, 2nd from pre

to post intervention level within group and later at post intervention level. When analysis was done at baseline level it was found that there was no statistically significant difference between both the groups as it is shown in Tables 2 and 3 and Figure 1 which shows that both the groups were matched at baseline level.

When analysis was done from pre to post intervention level, results show that there is statistically significant difference between both the groups. Both the groups improve significantly in ARAT and COPM (performance and satisfaction) as it is shown in Tables 4 and 5, and Figures 2 and 3, Which suggest that task oriented training is an effective intervention strategies for stroke rehabilitation.



	GROUP A	GROUP B	DEGREE OF FREEDOM	T-TEST	P VALUE
AGE	56.75 ± 4.58	54.40 ± 5.07	38	1.537	.133(NS)
GENDER	MALE	13	11		
	FEMALE	7	9		
SIDE AFFECTED	RIGHT	12	8		
	LEFT	9	11		

Above table shows demographic data of the population of group A and group B. The groups did not differ regarding age, gender and side affected. Difference in Age of both groups was not significant with p-value 0.133.

**Table 2:** Demographic Characteristics of the Population.

	GROUP A (MEAN ±SD)	GROUP B (MEAN ±SD)	DEGREE OF FREEDOM	T-VALUE	P VALUE
ARA TEST	13.65 ± 2.36	12.85 ± 2.34	38	1.073	.290(NS)
COPM(PERFORMANCE)	2.86 ±.36	2.75 ± .41	38	.894	.377(NS)
COPM(SATISFECTION)	2.51 ± .40	2.53 ± .45	38	-.147	.884(NS)

NS\*- NON-SIGNIFICANT

P<0.05\* shows a statistically significant result

The above table shows that groups are matched for their baseline characters. The baseline values for ARAT, COPM (Performance & Satisfaction) are not significant with p-values 0.290, 0.377 and 0.884 respectively.

**Table 3:** Baseline Comparison of Group A and B.

### PRE INTERVENTION SCORE OF ARAT, COPM (PERFORMANCE & SATISFACTION) OF GROUP A & GROUP B

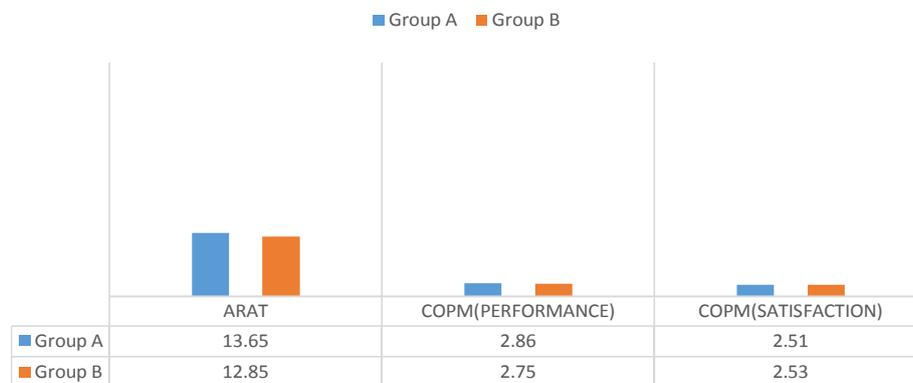


Figure 1: Comparison of baseline ARAT, COPM (Performance & Satisfaction) score between group A and B. Above chart shows baseline scores of ARAT, COPM (Performance & Satisfaction) of Group A and Group B.

GROUP A	PRE (MEAN ± SD)	POST (MEAN ± SD)	DEGREE OF FREEDOM	T-VALUE	P VALUE
ARA TEST	13.65 ± 2.36	21.75 ± 4.11	19	15.80	.000(S)
COPM(PERFORMANCE)	2.86 ± .36	6.64 ± .66	19	21.642	.000(S)
COPM(SATISFECTION)	2.51 ± .40	4.51 ± .57	19	15.41	.000(S)

S\*- Significant

P<0.05\* shows a statistically significant result

The above table shows pre & post intervention values of ARAT, COPM (Performance & Satisfaction) of group A. The post intervention values for ARAT, COPM (Performance & Satisfaction) was significant with p-values 0.000, 0.000 and 0.000 respectively.

Table 4: Pre and post intervention comparison of ARAT and COPM (Performance & Satisfaction) within Group A.

	PRE (MEAN ± SD)	POST (MEAN ± SD)	DEGREE OF FREEDOM(df)	T-VALUE	P VALUE
ARA TEST	12.85 ± 2.34	24.95 ± 3.94	19	-16.94	.000(S)
COPM(PERFORMANCE)	2.75 ± .41	7.25 ± .56	19	-36.17	.000(S)
COPM(SATISFECTION)	2.53 ± .45	5.18 ± .61	19	-14.82	.000(S)

S\*- Significant

P<0.05\* shows a statistically significant result

The above table shows pre & post intervention values of ARAT, COPM (Performance & Satisfaction) of group B. The post intervention values for ARAT, COPM (Performance & Satisfaction) are significant with p-values 0.000, 0.000 and 0.000 respectively.

Table 5: Pre and post intervention comparison of ARAT and COPM (Performance & Satisfaction) within Group B.

The results of the present study are consistent with the findings of the study done by Blennerhasset et al. [41] who investigated the effects of additional practice of either upper limb or mobility tasks in stroke patients and concluded that additional task-related practice is effective in improving functional outcomes during in patient stroke rehabilitation, the results of the present study are consistent with the findings of this study.

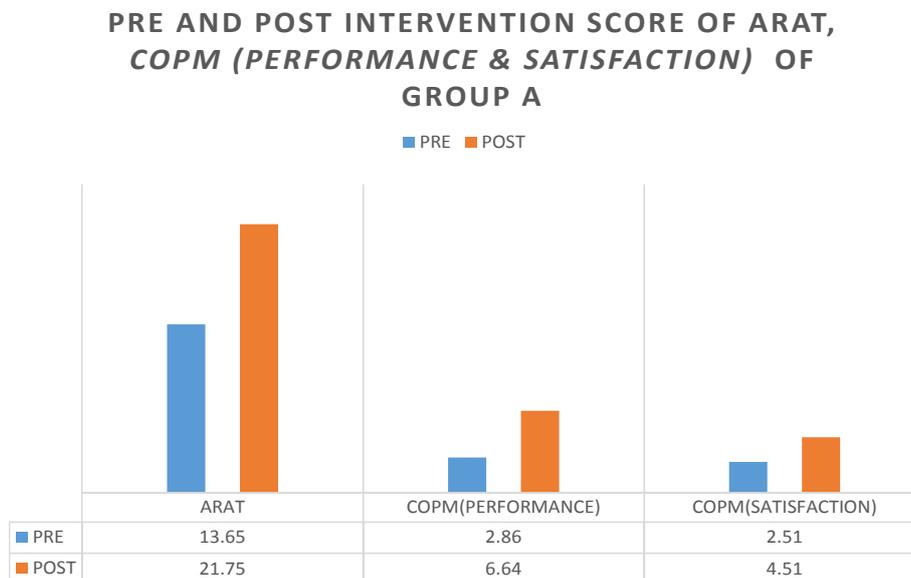
Salbach et al. [42] reported that task oriented intervention did not improve voluntary movement or manual dexterity of affected arm in chronic stroke patients. The greater relative improvements reported in this study indicated that the effect of task oriented training is magnified if it is commenced during early rehabilitation.

Liepert et al. [43] examined the effects on dexterity and motor cortex function of a single task-oriented session focussed on improving dexterity of mildly to moderately paretic hand in patients early (4-8 weeks) after stroke. They observed that the size of the representation in contra-lateral motor cortex of paretic hand enlarged whereas that of

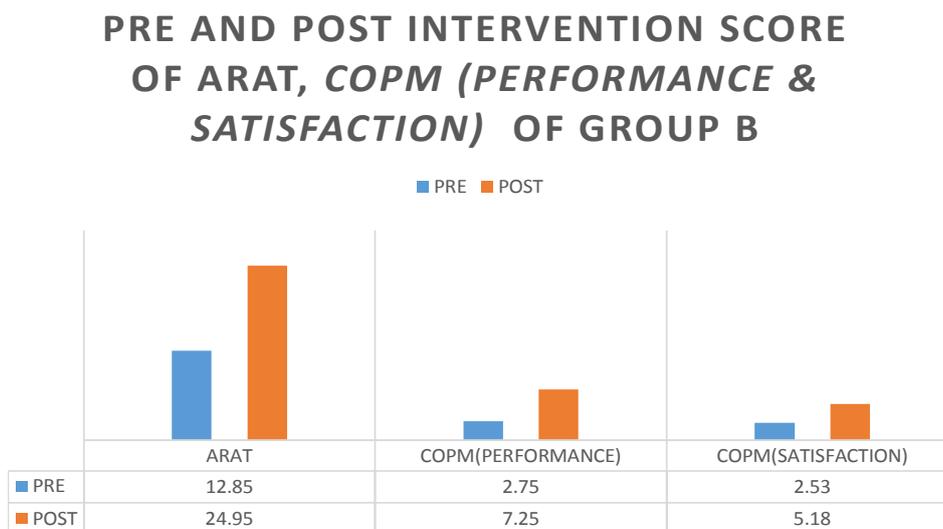
the unaffected hand was unchanged. These changes are associated with increased activity in ipsilesional primary cortex and redistribution of activity in several areas of sensorimotor network.

In the current study, the subjects worked with the therapist to safely practice new movement strategies to improve their functional ability in intervention period that is pre requisite for returning to work and regaining the ability to perform routine activities necessary for an independent life style. The task-specific program was modified in accordance with the individual patient's progress.

The finding of present study is also supported by Jang et al. [44] who described that task-oriented training focuses on practice of skilled motor performance is the critical link to facilitating neural reorganization and rewiring in the central nervous system. Furthermore Cook et al. [45] explained in their book "Motor Control- Translating research into clinical practice" that task-oriented approach is based on the system theory of motor control. This theory states that normal movement emerges as an interaction among many different systems,



**Figure 2:** Comparison of ARAT, COPM (Performance & Satisfaction) scores before and after treatment within Group A. Above chart shows pre & post intervention scores of ARAT, COPM (Performance & Satisfaction) of GroupA.



**Figure 3:** Comparison of ARAT, COPM (Performance & Satisfaction) scores before and after treatment within Group B. Above chart shows pre & post intervention scores of ARAT, COPM (Performance & Satisfaction) of Group B.

each contributing different aspects of motor control. In task oriented approach movement is organized around a behavioural goal; thus multiple systems are organized according to the inherent requirements of the task being performed.

In this approach, the patient is working on functional tasks rather than on movement patterns for movement sake alone. Feedback is a fundamental characteristic of this approach. As the patient getting feedback and the activities of daily living are emphasized so this goes to long term memory.

When analysis was done at post intervention level, it was found that there was no statistically significant difference between ARAT scores of both the groups which suggest that both the groups at similar level at post intervention level in terms of upper limb function. Client-centred

Task-oriented group had significant higher COPM (performance and satisfaction) score as compared with control group as it is shown in Table 6 and Figures 4. The results obtained after the data analysis did not support the null hypothesis and thus, the null hypothesis was rejected and the alternate hypothesis was accepted in terms of COPM (performance and satisfaction).

The significant improvement of COPM (performance and satisfaction) in experimental group is due to combined Task-oriented approach and goal setting which is decided by the patient with the help of COPM. When analysis was done between components of COPM (Performance and Satisfaction), it is seen that satisfaction score is more than performance. The Client-centred approach, which requires the active role of the clients in treatment implementation, enables them

	GROUP A (MEAN ± SD)	GROUP B (MEAN ± SD)	DEGREE OF FREEDOM	T-VALUE	P VALUE
ARA TEST	21.75 ± 4.11	24.95 ± 3.94	38	-2.512	.016(NS)
COPM(PERFORMANCE)	6.64 ± .66	7.25 ± .56	38	-3.147	.003(S)
COPM(SATISFECTION)	4.51 ± .57	5.18 ± .61	38	-3.548	.001(S)

S\*- Significant, NS\*- Non-Significant

P<0.05\* shows a statistically significant result

The above table shows post intervention values of ARAT, COPM (Performance & Satisfaction) of group A & B. The post intervention values for ARAT, COPM (Performance & Satisfaction) are significant with p-values 0.016, 0.003 and 0.001 respectively.

Table 6: Post Intervention comparison of ARAT, COPM (Performance & Satisfaction) scores of Group A and B.

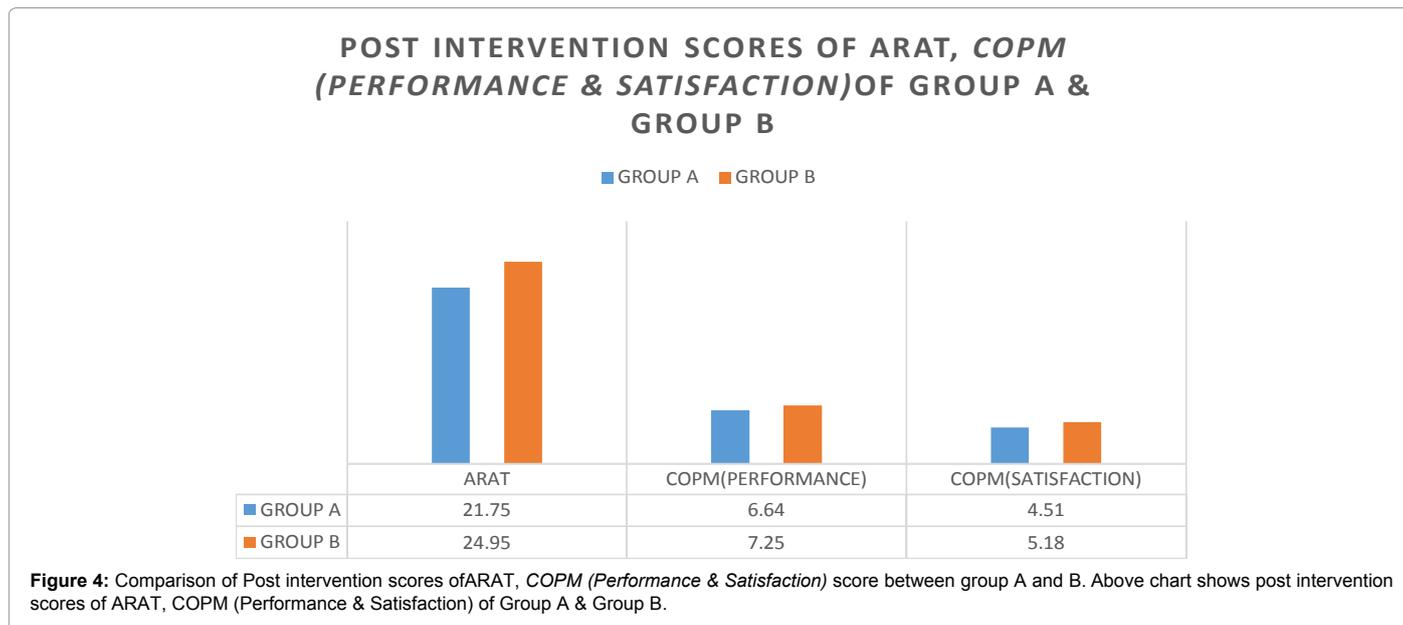


Figure 4: Comparison of Post intervention scores of ARAT, COPM (Performance & Satisfaction) score between group A and B. Above chart shows post intervention scores of ARAT, COPM (Performance & Satisfaction) of Group A & Group B.

to see the improvements by themselves, even there is no significant difference in both the groups in upper extremity function assessed by ARAT.

The above finding is supported by a similar study done in a Neuro-rehabilitation setting by Bodiam et al [46] in which it was seen that the change in ‘satisfaction’ score is more than that in the ‘performance’. This could be attributed to the fact that subject’s expectancies regarding ‘performance’ differ. Further as put forth by Pound et al. [47] that if the client is not taking an active role in the post stroke treatment it can reduce the client’s self-determination and sense of control over health. An active role played by client centred task oriented group subjects in deciding goal and activities may lead to higher score in COPM (Performance and Satisfaction).

Gauggel et al. [30] contradicts the efficacy of client- centred approach as it is shown in their study, the effect of goal origin (i.e., self-set vs. assigned) was assessed in a simple arithmetic task. Patients were randomly assigned to one of three conditions: (1) one that set a specific, difficult goal, (2) one that set a “do-your-best” goal, and (3) one in which patients stated their own goal. The results indicate that assigned, difficult goals lead to better performance than assigned easy goals or self-set goals. The reason that participants with self-set goals did not perform better is that they chose only moderately difficult goals, and their actual performance approximated the goal that they had set. These findings indicate that although brain-damaged patients are responsive to goals that they set for themselves, letting patients self-set their performance goals does not always lead to maximal performance.

These findings imply that a client-centred approach in physiotherapy

is an effective and a feasible approach as emphasized by Gilbertson et al. [48] in a randomized controlled trial involving 138 subjects from the Glasgow Royal Infirmary, U.K. These findings led to the need for investigating the efficacy of such an intervention in the Indian context. Also convincing results were obtained by Clarke et al. [49]; Corr et al. [50], Drummonds et al. [51] in their earlier trials that stroke survivors can benefit from a client-centred program of physiotherapy.

### Clinical implication

Approximately 70% to 80% patients who sustained stroke have upper extremity impairment which can lead to difficulties in daily living and engage in social life. Active involvement of client in goal setting combined with task oriented training will help the patients to enhance the functional recovery of upper extremity in stroke patients and increased functional recovery will in turn improve the quality of life. This treatment can be used clinically as it will be much convenient, safer and easy to perform by the patients and it provides better client satisfaction and performance.

### Limitations of the study

Substantial number of patients had to be excluded because of the strict inclusion criteria and the study population is probably not enough to generalize the results. Secondly, these kinds of pragmatic trials cannot be blinded, as the intervention is specific to individual groups.

Third limitation of study is that in earlier studies, the Task oriented training combined with Client centred approach was not used, so

there is not much literature to support the findings of this trial. Fourth limitation of the study is that subjects could not be followed up after study.

### Future suggestions

Study can be carried out with large sample size. Follow-ups can be done to see long term effects of this training. Study can be replicated by increasing the duration of intervention.

### Conclusion

Both task-oriented training and client-centred task oriented training are effective in improving functional recovery of upper limb after stroke. Improvement is more statistically significant in client-centred task oriented training group only on COPM (performance and satisfaction) but there was no statically difference in upper extremity function in both groups of stroke patients.

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