

Efficacy of Adaptive Devices for Improving ADL's and Quality of Life in Patients with Multiple Conditions

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Abstract

Background:

According to WHO stroke is second leading cause of death while progressive condition gets worse over the time and cause severe weakness and health deteriorations. In both conditions the role of occupational therapy is vital to provide independency in daily lives by provision of adaptive devices.

Objective:

This study intends to find the effectiveness of adaptive devices on functionality and quality of life of patients with multiple conditions.

Method:

Patients with stroke and progressive conditions including RA (rheumatoid arthritis), Parkinsonism disease, multiple sclerosis and other conditions were assessed with FIM SCORING and WHQOL before start ADL TRAINING .22 sessions were conducted by providing Occupational therapy guidelines, suggestions and ADL training with help of ADAPTIVE DEVICES .then they were re assessed with the same tools.

Results:

Marked improvement according to the results of FIM scoring and WHQOL showed the importance of adaptive devices and their great role in person's independence level

Conclusion:

Use of adaptive devices is very important to provide independent life as the main goal of Occupational Therapy treatment and to improve the functionality and quality of life as well

I. INTRODUCTION

Occupational therapy is aimed at providing independent life by improving functionality while reducing Physical barriers and providing Adaptive devices

Adaptive devices are the tools, designed according to person's need to provide independency in everyday tasks (2) Many studies showed the efficacy of modified devices while slowing functional decline (Maan, ottenbacher, fraas, tomita and granger in 1999) and improving functional ability (Sonn, 1996; Verbrugge, Rennert, & Madans, 1997; Verbrugge & Sevak, 2002).(2) Modified devices were also designed for those who had low vision, like talking book ,large sized printing and speaking clocks to simplify and achieve the daily

tasks of life (2) Stroke is a main cause of dependent life , modified walking devices are best suggested by rehabilitation team to improve the walking balance, functionality and mobility to make the patients feel safe while using these walking aids(6 ,4,7,9)Some of the modified tools are used as energy conservation techniques especially for some progressive conditions such as rheumatoid arthritis ,multiple sclerosis, and muscular dystrophy(12,14,15) .Disabilities like CP, developmental delay or any injury can cause hindrances in childhood activities and their normal development and this deficit can be the cause of adverse consequences in his progress and growth like in education and fulfilling life roles, some of parents try minimize life problems by using assistive devices to make children play and complete other productive tasks but it's very important that modified devices should be appropriate according to child's requirement and their age . (3, 5)

some studies have showed the impact of Assistive devices and environmental modification especially for cerebral palsy children , According to a study ,the use of adaptive devices can be more practical and active if combined with some architectural and appropriate with transference and carriage (5,7,9,15) Older age is one of the leading cause of dependent life due to degenerative changes and progressive weakness and mostly people use canes, walkers and other supporting objects to make their mobility safe.(1,4,7.10,11,13), due to weakness older persons feel dependent in daily life activities like bathing , feeding and other daily routine tasks, which can be easily improved by providing modified tools and devices for example curved cutlery, curved bath brushes (4,7.10,11) Training must be comprised with the proper assortment of modified tools and counseling for elder care (10,13,14).

Occupational therapists are experts who mainly focus on environmental modification and use of devices according to the variety of clients with neurological conditions like stroke, Parkinson, cerebral palsy and others. Modifications are based on the needs of clients conditions .Occupational therapist work on both selection and training to use the devices and shows very imperative part to make it more practical .(8)

However, in Pakistan few researches has been done on the use of adaptive devices and their effectiveness to improve the daily routine task performance, so the main purpose of

conducting this study was to assess the improvement in the quality of life and functionality of patients who are dependent in their daily tasks, by the usage of devices with required adaptations and modifications along with professional training and guidelines.

II. METHODOLOGY

Sample selection

Total of 160 participants were recruited from occupational therapy department, of Institute of physical medicine and rehabilitation, Dow University of health sciences. Randomization was done by simple random sampling.

Our inclusion criteria was:

- Diagnosis of stroke, Rheumatoid arthritis, Parkinson disease, multiple sclerosis.
- including both genders were included
- mobility on grade __ according to the FIM
- Age range from 30-65 years,
- who were able to follow a simple command

Exclusion criteria:

- patients unable to follow command
- age below 30
- mobility on grade __ according to the FIM
- conditions other than stroke, RA, MS and Parkinson

Patients were enrolled in the study after informed consent. A total number of 600 devices had been given to 160 patients (average of 4 devices for each patient) these customized modified devices included

- Feeding devices:** curved, light and heavy weighted cutlery
- Bathing devices:** long and curved and angular bath brushes
- Grooming devices:** nail cleaner, modified hair brushes, combs, modified lipsticks for females and adaptive razors for male clients
- Dressing aids:** dressing sticks, shoe horn, sock aids.
- Kitchen items:** rocker knives, cutting board of different sizes with fixed knife.

Procedure:

- Patient were initially evaluated by FIM scoring and WHQOL, before starting the ADL training and provision of customized modified devices as per individual functional limitations and needs.
- Total of 22 to 24 sessions were conducted for each individual or some sessions among the group
- **First session** was based on orientation, awareness, counseling and discussing the details of training contents with explaining the effectiveness of devices.
- **2nd to 4th sessions** were included the professional guideline, suggestions, tips and provision of written home plans for better result and to increase the

interest and motivation level towards the session with regularity.

- **5th to 20th sessions** were included the provision of customized devices according to individuals limitations , training under supervision of therapist for the proper use of devices , home
- plans to adjust the life with help of guidelines to use tools independently ,
- **Re assessment** was done at the end of 20th or 21st session to re-evaluate the residual needs by FIM SCORING and WHQOL, provided the further suggestions and expert opinions as per need.

III. RESULT

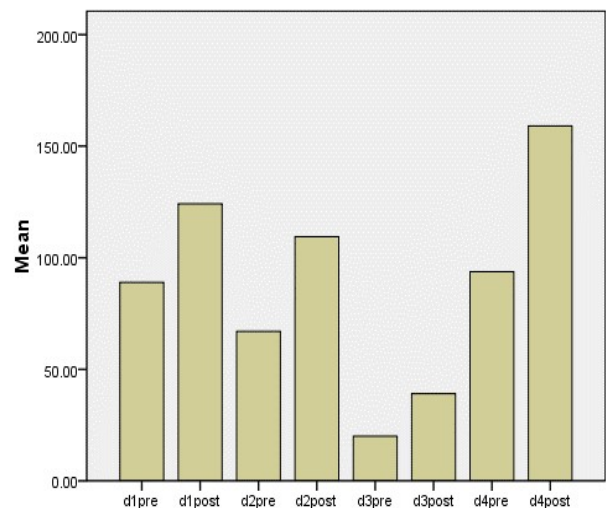
Paired samples t-test was applied to find out the difference between pre and post scores for FIM scoring and quality of life scale. Marked difference shown in post intervention results.

Table 1: indicating marked improvement in all four domains after intervention, while domain 2 (**Psychological**) and domain 4(**Environmental**) showed distinct improvement according to the p value which is 0.00 in both domains which is highly significant.

Graph 1.1: showed the pre and post results in all domains of WHQOL, including Domain 1 (**Physical health**), Domain 2(**Psychological**), Domain 3(**Social Relationships**) and Domain 4(**Environmental**)

Table 2 and **graph 1.2** representing the FIM SCORING of Patients performance on the basis of Daily living activities with the help of modified devices. Pre and post results showed the marked Improvement in their functionality which was limited before training and provision of modified devices.

Graph 1.1: Pre And Post Results Of Whqol



Graph 1.2: Pre And Post Results Of Fim Scoring

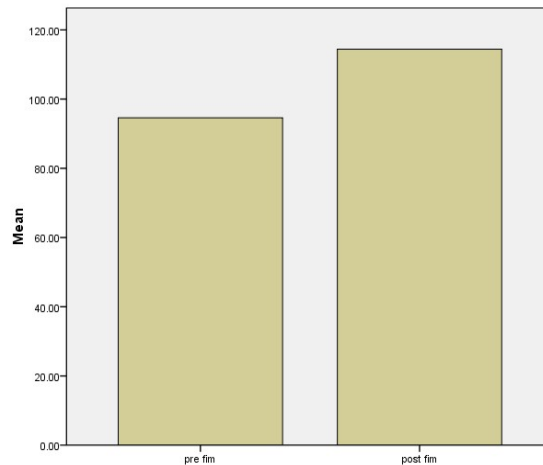


Table 1: Pre And Post Results Of Whqol

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Qol pre dom 1 - Qol post dom 1	5.64850	31.79690	2.51377	.68382	10.61318	2.247	159	.026
Pair 2	Qol pre dom 2 - Qol post dom 2	-6.99141E1	30.33720	2.39837	-74.65083	-65.17730	-29.151	159	.000
Pair 3	Qol pre dom 3 - Qol post dom 3	4.23319	25.36343	2.00516	.27301	8.19336	2.111	159	.036
Pair 4	Qol pre dom 4 - Qol post dom 4	-1.10288E2	29.11993	2.30213	-114.83427	-105.74086	-47.907	159	.000

Table2: Pre and Post Results of Fim Scoring

Paired Samples Test.									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	pre fim - post fim	-1.98438E1	12.24465	.96802	-21.75559	-17.93191	-20.499	159	.000

IV. CONCLUSION

Independent life is the main goal of Occupational therapy treatment and modified devices are the important tools to achieve these goals to improve functional needs and quality of life.

V. DISCUSSION

Adaptive devices are the major tools used worldwide by the Occupational therapists as per the goal of field to provide independent life but unfortunately, Pakistan is low

socioeconomic country and being an underdeveloped country it was difficult to provide devices to the patients according to person’s financial status and lack of awareness among health professionals regarding the efficacy of the adaptive devices.

It was a first ever attempt by Institute of Physical Medicine and Rehabilitation, DOW University of Health Sciences ,team of Occupational Therapy department to design customized , cost effective adaptive devices by using raw materials which are cheaper in cost to fulfil the individual’s need to provide independence in functionality.

The future plan is to introduce the devices on other platforms and make these tools assessable for everyone and this research will guide other rehabilitation experts of Pakistan and other countries the usage of low price tools and enhance quality of life by proper training , counseling and give the chance to elaborate work by start visiting individuals home to identify the issues and works on modification and adaptations by removing hurdles from their physical environment and it will be definitely a step towards success and achieving the proper goals of Occupational therapy rehabilitation program.

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