

Effectiveness of Stretching and Strengthening Exercises of Hands on Functional Ability among Patients with Rheumatoid Arthritis

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Abstract: *The present study investigated the effectiveness of stretching and strengthening exercises of hands on functional ability among patients with rheumatoid arthritis attending a tertiary care Hospital, Kottayam. A quantitative research approach with quasi experimental pre test post test control group design was used for the study. The study was theoretically supported by Betty Neuman's system model. A total of 70 patients with rheumatoid arthritis, 35 each in control and experimental group were selected for the study by using purposive sampling technique. The data were collected using socio personal and clinical data sheet, Modified Michigan's Hand outcome Questionnaire and Modified rheumatoid arthritis quality of life questionnaire. After the pre test, the subjects in the control group receive routine care and subjects in the experimental group received stretching and strengthening exercises of hands supplemented with information leaflet and video regarding the exercises along with routine care. Adherence to the exercises was ensured by telephonic call and they were also asked to maintain a diary of schedule of exercises performed and it was verified during post test. Post - test was conducted for control group and experimental group after 4 weeks using the same tool. The results of the study revealed that the stretching and strengthening exercises of hands had a statistically significant effect on functional ability ($p < 0.01$).*

Keywords: Rheumatoid arthritis, functional ability, stretching exercises, quantitative research, tertiary care hospital

1. Introduction

Rheumatoid arthritis (RA) is a chronic inflammatory health problem that causes joint problems and progresses insidiously associated with a chronic inflammatory process, which can damage both joints and extra - articular organs, including the heart, kidney, lung, digestive system, eye, skin and nervous system¹. The WHO ranked rheumatoid arthritis as the second leading cause of disability and reported that between 2020 and 2030, disability related to musculoskeletal disorders will rise by 48%².

In 90% of patients with RA, joints of the hands are affected resulting in problems of performing activities of daily living (ADL)³.

Low physical activity is an important and reversible characteristic of RA. Patients with RA do less exercise than healthy people. More than 80% of patients with RA are physically inactive. The extreme physical inactivity of patients with RA becomes a vicious circle in terms of health and disease progression⁴. Exercise interventions are beneficial in improving physical ability, alleviating pain and improving aerobic function in patients with RA. Regular exercise can boost strength and flexibility in people who have rheumatoid arthritis. Stronger muscles can better support the joints of hands, while improved flexibility can aid joint function. Thereby the exercises improve overall function in RA without any proven detrimental effects to disease activity⁵.

2. Objectives

- 1) To assess the functional ability among patients with rheumatoid arthritis

- 2) To evaluate the effectiveness of stretching and strengthening exercises of hands on functional ability among patients with rheumatoid arthritis

3. Materials and methods

The quantitative approach was adopted for the study. Research design selected for the study was quasi experimental pre test post test control group design. Non probability purposive sampling was used in the study. In this study sample consisted of 35 subjects in control group and 35 in experimental group who were having rheumatoid arthritis with pain and dysfunction of both hands attending the rheumatology clinic in Govt Medical College Hospital, Kottayam. Inclusion criteria of present study was subjects having rheumatoid arthritis with pain and dysfunction of both hands, having been diagnosed since 3 months, who were having age within 20 - 60 years and who were able to understand Malayalam or English. Those who excluded from the study were subjects with rheumatoid arthritis having deformities of hands like boutonnière deformity and swan neck deformity, who were having history of surgery or fracture involving upper limb in the previous six months and who were taking alternative treatment for rheumatoid arthritis like Ayurveda, homeopathy. Tools and techniques in the present study were the following: Socio personal and clinical data sheet, Modified Michigan Hand outcome Questionnaire and Modified rheumatoid arthritis quality of life questionnaire.

Among 70 patients, 35 each were allocated in the control and experimental group who meets the inclusion and exclusion criteria. After building a rapport with the patients, pretest was conducted by using socio personal data sheet, clinical data sheet, Modified Michigan's Hand outcome

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Questionnaire and Modified rheumatoid arthritis quality of life questionnaire. The control group received routine care. The stretching and strengthening exercises of hands were demonstrated to the experimental group on the first day of attending rheumatology clinic supplemented with information leaflet and video regarding the exercises. Adherence to the exercises was ensured by telephonic call and they were also asked to maintain a diary of schedule of exercises performed and it was verified during post test. Post - test was conducted for control group and experimental group after 4 weeks using the same tool. The obtained data was tabulated and analysed in terms of objectives of the study using descriptive and inferential statistics.

4. Results

4.1 Sociopersonal data of patients with rheumatoid arthritis

Among 70 patients, majority of patients in the control group (68.6%) and experimental group (54.3%) belonged to the age group of 51 - 60 years. The data showed that majority of patients in the control group (85.7%) and experimental group (82.9%) were females. Data pointed out that most of the patients in the control group (54.3%) and experimental group (62.9%) having secondary education only. The data showed that 71.4% of patients in the control group and 61% of patients in the experimental group were unemployed. Among 70 patients, 60% of patients in the control group and 71.4% of patients in the experimental group were belonged to BPL category. The data pointed out that majority of patients in the control group (91.4%) and experimental group (94.3%) were married. Majority of patients in the control group (91.4%) and the experimental group (80%) were non vegetarians. With regards to unhealthy habits, 100% of patients in both control and experimental group had no unhealthy habits.

4.2 Clinical data of patients with rheumatoid arthritis

The data pointed out that 60% of patients in the control group and 65.7% of patients in the experimental group were having normal BMI. With regards to duration of RA, 20% of patients in the both control group and experimental group having RA less than one year. The data showed that 20% of patients in control group and 25.7% of patients in the experimental group took treatment for RA less than one year. It also shows that 28.6% of patients in control group and 20% of patients in the experimental group took treatment for RA for above ten years. The data pointed out that most of the patients in the control group (71.4%) and experimental group (65.7%) took Ayurveda treatment previously. None of the patients in both control group and experimental group were took any treatment other than allopathy at present. The data showed that majority of patients in the control group (80%) and experimental group (60%) had no family history of RA. With regards to comorbidities, 37.1% of patients in the control group and 42.9% of patients in the experimental group had no other comorbidities.

4.3 Functional ability among patients with rheumatoid arthritis

Table 1: Frequency distribution and percentage of patients with rheumatoid arthritis based on functional ability during pretest (n=70)

Functional ability	Control group (n=35)		Experimental group (n=35)		df	χ^2	p
	f	%	f	%			
Good (35 - 81)	13	37.10	14	40.00	2	0.18	0.91
Moderate (82 - 128)	18	51.50	18	51.50			
Poor (129 - 175)	4	11.40	3	8.50			

Table 1 depicts that 51.5% of patients in both the control group and experimental group had moderate functional ability whereas 11.4% of patients in the control group and 8.5% of patients in the experimental group had poor functional ability. Chi square value shows that there is no statistically significant difference between control and experimental group in terms of functional ability and hence both groups were homogenous in terms of functional ability.

4.4 Effectiveness of stretching and strengthening exercises of hands-on functional ability among patients with rheumatoid arthritis

H_{01} : There is no significant difference in the functional ability among patients with rheumatoid arthritis between control and experimental group

Table 2: Median and IQR of pre test and post test score of functional ability among patients with rheumatoid arthritis in control and experimental group (n=70)

Functional ability	Control group (n=35)		Experimental group (n=35)	
	Median	IQR	Median	IQR
Pre test	92.54	34	91	32
Post test	95.00	28	66	23

Table 3: Mean rank, sum of ranks and U value of post test scores of functional ability among patients with rheumatoid arthritis in the control and experimental group (n=70)

Functional ability				
Group	Mean rank	Sum of ranks	U	p
Control (n=35)	46.67	1633.50	221.50	0.00
Experimental (n=35)	24.33	851.50		

The table 3 shows that the mean rank of post test scores of functional ability among patients with rheumatoid arthritis in the control group is 46.67 and in the experimental group was 24.33. The obtained U value (221.5) is significant at 0.01 level. Hence the null hypothesis is rejected. So, the stretching and strengthening exercises of hands is effective in improving functional ability among patients with rheumatoid arthritis.

5. Conclusion

The stretching and strengthening exercise of hands is effective in improving the functional ability among patients with rheumatoid arthritis. Findings of the study can be used to improve the patient in the clinical as well as rehabilitation centers and home care settings. The stretching and

strengthening exercise of hands is safe and beneficial in patients with rheumatoid arthritis. Practising stretching and strengthening exercise of hands is effective in improving functional ability thereby enhancing their quality of life among patients with rheumatoid arthritis.

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