Original Research Article

A Pilot Study Examining the Efficacy of Occupational Therapy Rehabilitation Programmes for Students with Work-Related Muscular-Skeletal Disorders

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Abstract

Background: Musculoskeletal issues at work have an influence on daily life, productivity, and quality of life. Musculoskeletal issues that go untreated can result in severe damage and function loss, which can limit participation, cause financial loss, and add to the rising burden of illness in the world.

Objective: The purpose of this study was to find the effect of occupational therapy rehabilitation program in occupational therapy students with work related musculoskeletal disorder.

Study Design: Quasi-experimental, pilot study design was chosen for the research

Methods: The study employed a quasi-experimental study design. Thirty occupational therapy students aged 20-25 years were recruited through convenience sampling after a prevalence check where 30 students reported 54 musculoskeletal problems. A total number of participants (n= 30) received occupational therapy rehabilitation program. Standardised Nordic musculoskeletal questionnaire (SNMQ) and Numeric pain rating scale (NPRS) were administered to Pain and work related musculoskeletal disorder for all the participants.

Result: It revealed that there was a statistically significant difference in pre-test and post-test with numeric pain rating scale (t=10.625, p=0.000). There was a significant difference in percentage in 7 days component of SNMQ. There was no statistical difference with post-test of score of 12 months component of SNMQ.

Conclusion: Occupational therapy rehabilitation program is effective for reducing Musculoskeletal disorder or discomfort in occupational therapy students.

Key words: Work related musculoskeletal disorders, Occupational therapy, Occupational therapy rehabilitation program.

Introduction

A collection of inflammatory and degenerative illnesses that impact muscles, tendons, ligaments, joints, peripheral nerves, and other systems are together referred to as "musculoskeletal disorders"[1]. They support the blood vessels as well. The low

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back, neck, shoulder, forearm, and hand are the body areas most commonly affected; however, in recent times, greater focus has been placed on the lower extremities.

Musculoskeletal disorders (MSDs) are a prominent problem in today's society that have a big impact on the job. When it comes to short-term or temporary job impairment, MSDs are second only to the common cold. Musculoskeletal disorders connected to the workplace (WMSDs) are recognised as a major occupational health risk factor, linked to increased medical costs and benefits, reduced productivity, and a worse quality of life. They are the reason behind morbidity in a large number of working people. The traits that define WMSDs are complex. MSD is a major problem with occupational health in India, accounting for about 40% of the expenditures of treating work-related injuries[2,5].

Studies on WMSDs among healthcare workers have mostly concentrated on physicians, dentists, physiotherapists, lab technicians, and nurses[1]. Medical, dental, and nursing personnel most frequently report problems with their backs, necks, shoulders, and knees. It is common for individuals with chronic musculoskeletal diseases to receive occupational therapy (OT)[2]. The goals are to improve their ability to perform routine tasks (i.e., activities and significant life responsibilities at work, home, during leisure, and in social settings), to prevent function losses, to facilitate successful adaptation to lifestyle changes, and to maintain or enhance their psychological well-being[3].

In addition to receiving ergonomics training as part of their academic programme, many therapists also act as occupational health providers for other staff members in their places of employment[4]. Evidence suggests that these physicians are susceptible to musculoskeletal injuries related to patient handling, even with their high degree of training and experience[5,6].

Occupational Therapy Rehabilitation Program

In order to help people who have suffered work-related injuries accept returning to work for pay, occupational rehabilitation programmes are post-acute, comprehensive treatment interventions with the goals of improving client safety, regaining physical function, and addressing psychological issues. Occupational rehabilitation programmes give therapy to increase overall tolerance for occupational obligations using a multidisciplinary approach, a multimodal approach, or a mix of the two[7].

The primary goal of the one discipline's (occupational therapy, for instance) general occupational rehabilitation programme was to help clients develop the general physical endurance and tolerance necessary to return to part-time work, which is defined as up to 20 hours per week.

Methods

A sample of occupational therapy institutions in and around Chennai was selected. Thirty samples in all were collected, and they were enrolled based inclusion and exclusion criteria mentioned below. The Standardised Nordic Musculoskeletal Questionnaire and the Numeric Pain Rating Scale (NPRS) were used for the pre-assessment.

a) Inclusion criteria:

- Age- 20 to 25 years
- Both genders
- Musculoskeletal problem in different body areas over 12 months and 7 days recall period
- Working in any occupational therapy institution for 2hours or more than 2 hours.
- With minimum 3hours clinical practice during college hours.

b) Exclusion criteria

- NPRS score 4 or less than 4
- With other disorders other than musculoskeletal problems
- Students presents with deformities
- Students with other musculoskeletal problems other than occupational injuries.

Instruments Used[12]

Standardised Nordic Musculoskeletal Questionnaire (SNMQ) and NPRS (Numeric Pain Rating Scale)

Intervention Protocol

The intervention is referred from an article published in AJOT which stated success of

occupational rehabilitation program for factory workers[14].

Occupational rehabilitation program

- Flexibility routine Whole-body stretching and injury-site–specific flexibility
- Strengthening at moderate repetition for[8,13]
    - o Lower extremity strengthening
    - o Upper extremity strengthening
- **Core stability[9]**
- Scapular stability exercises
- Spinal stabilization exercises (e.g., straight-leg raises)
- **Work simulation of general work-related tasks, including**
- Lifting and carrying with lifting box[13]
- Pushing and pulling using a weighted sled or rolling cart
- Standing tolerance with upper-extremity tasks.[10]
- **Initial intensity** -3days/2week 30 minutes/ session.
- **Maximum intensity-** 5days/4week 45min/ session.

Data Analysis

With SPSS 22.0, data analysis was carried out. The institutions were informed of the purpose of the study, and a permission form was acquired. Based on the inclusion and exclusion criteria, thirty students studying occupational therapy were included in the research. The NPRS with a score of at least four and the Standardised Musculoskeletal Questionnaire (SNMQ) were used for the screening. A programme for occupational therapy rehabilitation was presented to the patients. For the first two weeks, the treatment was administered three days a week for thirty minutes each session. After that, individuals received four weeks of maximum intensity, five days a week, and forty-five minutes of training per session. Using NPRS and SNMQ, the post-test results were acquired after six weeks.

Result

Descriptive analysis such as frequencies and measures of central tendency was used to describe the demographic data. T-test was used to calculate the significance of scores in this study. The hypothesis being tested identifies whether there exists statistically significant effect of the treatment being given.

Table 1 depicts the demographic data in terms of age. Total of 30 participants were included in the study. Individuals between ages of 21-22 were 9 in number and 23-25 were 21 in number. The mean and standard deviation are 23.10 and 1.34 respectively.

Table 2 depicts the demographic data in terms of gender. Total of 30 participants were recruited for the study. Male and female participants were 43.33% and 56.67% respectively.

Table 3 depicts the demographic data in terms of hand dominance. Total of 30 participants were recruited for the study. Right-handed and left-handed participants were 86.67% and 13.33% respectively.

Table 4 depicts the demographic data in terms of body mass index. Total of 30 participants were included in the study. Individuals between BMI of 18.5 - 24.9 were 16 in number, 25 - 29.9 were 14. The mean and standard deviation are 23.06 and 3.06 respectively.

Table 5 depicts the demographic data in terms of year of study. Total of 30 participants were recruited for the study. Post graduates and interns' participants are 53.33% and 46.67% respectively.

Table 6 depicts the demographic data in terms of clinical working hours. Total of 30 participants were recruited for the study. The mean and standard deviation are 5.40 and 1.52 respectively.

Table 7 depicts the demographic data in terms of part time working hours. Total of 30 participants were recruited for the study. The mean and standard deviation are 3.10 and 0.60 respectively.

Table 8 depicts the demographic data in terms of primary focus of caseloads by the participants. Total of 30 participants were recruited for the study. The neurological caseloads are 6.67%, orthopaedic caseloads are 3.33% and paediatrics caseloads are 90% respectively.

Table 9 depicts the descriptive analysis for Prevalence of reported musculoskeletal problems, prevention of activity and needs to seek attention in the sample reporting a problem in the 12 months. The percentage analysis showed highest risk of WRMDs on lower back (40%) followed by neck (37%) respectively.

Table 10 depicts the descriptive analysis for Prevalence of reported musculoskeletal problems, prevention of activity and needs to seek attention in the sample reporting a problem in the 7 days. The above analysis reported highest WRMDs around lower back (37%) followed by neck (33%) respectively.

Paired t-Test was used to identify the effect of occupational therapy rehabilitation protocol on NPRS. The results showed that there was statistically significant difference ($p<0.05$) between the pre-test and post-test scores in NPRS ($t=10.625$, $p=0.000$). (Table 11)

Table 12 depicts the descriptive analysis for Prevalence of reported musculoskeletal problems, prevention of activity and needs to seek attention in the sample reporting a problem in the 12 months. The Pre-test and post-test values in percentage for the body areas are as follows in the table.

Table 13 depicts the descriptive analysis for Prevalence of reported musculoskeletal problems, prevention of activity and needs to seek attention in the sample reporting a problem in the 7 days. The Pre-test and post-test values in percentage for the body areas are as follows

Table No. 1 Demographic distribution based on age

Years		Frequency	Percentage	Mean ± SD	Min-Max
AGE	21	5	16.67	23.10 ± 1.34	21 - 25
	22	4	13.33		
	23	10	33.33		
	24	5	16.67		
	25	6	20.00		
	TOTAL	30	100		

Table No. 2 Demographic distribution based on Gender

Gender	Frequency	Percentage
MALE	13	43.33
FEMALE	17	56.67
TOTAL	30	100

Table No. 3 Demographic distribution based on Hand dominance

Hand Dominance	Frequency	Percentage
Right	26	86.67
Left	4	13.33
Total	30	100

Table No. 4 Demographic distribution based on Body Mass Index

BMI		Frequency	Percentage	Mean ± SD	Min-Max
BMI	19	2	6.67	23.06 ± 3.06	19 - 29
	20	2	6.67		
	21	5	16.67		
	23	6	20.00		
	24	1	3.33		
	25	1	3.33		
	26	5	16.67		
	27	4	13.33		
	28	2	6.67		
	29	2	6.67		
	TOTAL	30	100		

Table No. 5 Demographic distribution based on Year of Study

Year of Study	FREQUENCY	PERCENTAGE
Post Graduate	16	53.33
Interns	14	46.67
TOTAL	30	100

Table No. 6 Demographic distribution based on Clinical hours

Hours		Frequency	Percentage	Mean ± SD
Clinical Hours	4	16	53.33	5.40 ± 1.52
	7	14	46.67	
	TOTAL	30	100	

Table No. 7 Demographic distribution based on Part time working hours

Hours		Frequency	Percentage	Mean ± SD
Part time working Hours	2	4	13.33	3.10 ± 0.60
	3	19	63.33	
	4	7	23.34	
	TOTAL	30	100	

Table No. 8 Demographic distribution based on Primary focus of caseload

Caseload		Frequency	Percentage
Primary Focus of caseloads	Neurological	2	6.67
	Paediatrics	27	90.00
	Orthopaedics	1	3.33
	TOTAL	30	100

Table No. 9 Prevalence of musculoskeletal pain of occupational therapy students within 12 months.

Body Area	Total Problems (n%)	Problems preventing daily activities (n)	Problems requiring physician or health professional assistance (n)
Neck	11(37)	9(30)	8(27)
Shoulder	5(17)	5(17)	5(17)
Upper back	4(13)	3(10)	3(10)
Elbows	2(7)	1(3)	1(3)
Wrist/Hands	8(27)	7(23)	6(20)
Lower back	12(40)	10(33)	8(27)
Hip/thighs	4(13)	4(13)	4(13)
Knees	5(17)	5(17)	5(17)
Feet/ankles	3(10)	3(10)	3(10)

Table No. 10 Prevalence of musculoskeletal pain of occupational therapy students within 7 days.

Body Area	Total Problems (n)	Problems preventing daily activities (n)	Problems requiring physician or health professional assistance (n)
Neck	10(33)	7(23)	3(10)
Shoulder	5(17)	3(10)	1(3)
Upper back	3(10)	2(7)	2(7)
Elbows	2(7)	1(3)	1(3)
Wrist/Hands	5(17)	1(3)	1(3)
Lower back	11(37)	7(23)	4(13)
Hip/thighs	2(7)	2(7)	2(7)
Knees	3(10)	1(3)	1(3)
Feet/ankles	2(7)	1(3)	0(0)

Table No. 11 Effects of occupational therapy intervention on NPRS

		MEAN	N	Std. Dev.	t-value	df	p-value
NPRS	PRE	6.633	30	1.033	10.625	29	0.000 S
	POST	2.233	30	2.079			

S-Significance NS- No Significance

Table No. 12 Effect of occupational therapy intervention on reported musculoskeletal problems, prevention of activity and needs to seek attention in the sample reporting a problem in the 12 months

BODY AREA	TOTAL PROBLEMS N (%)		PROBLEMS PREVENTING DAILY ACITVITIES N (%)		PROBLEMS REQUIRING PHYSICIAN OR HEALTH PROFESSIONAL ASSISTANCE, N (%)	
	PRE - TEST	POST-TEST	PRE - TEST	POST-TEST	PRE - TEST	POST-TEST
NECK	11 (37)	11 (37)	9 (30)	9 (30)	8 (27)	8 (27)
SHOULDERS	5 (17)	5 (17)	5 (17)	5 (17)	5 (17)	5 (17)
UPPER BACK	4 (13)	4 (13)	3 (10)	3 (10)	3 (10)	3 (10)
ELBOWS	2 (7)	2 (7)	1 (3)	1 (3)	1 (3)	1 (3)
WRIST	8 (27)	8 (27)	7 (23)	7 (23)	6 (20)	6 (20)
LOWER BACK	12 (40)	11 (37)	10 (33)	10 (33)	8 (27)	8 (27)
HIPS/THIGHS	4 (13)	4 (13)	4 (13)	4 (13)	4 (13)	4 (13)
KNEES	5 (17)	5 (17)	5 (17)	5 (17)	5 (17)	5 (17)
FEETS/ ANKLES	3 (10)	3 (10)	3 (10)	3 (10)	3 (10)	3 (10)

Table No. 13 Effect of occupational therapy intervention on reported musculoskeletal problems, prevention of activity and needs to seek attention in the sample reporting a problem in the 7 days

BODY AREA	TOTAL PROBLEMS N (%)		PROBLEMS PREVENTING DAILY ACITVITIES N (%)		PROBLEMS REQUIRING PHYSICIAN OR HEALTH PROFESSIONAL ASSISTANCE, N (%)	
	PRE - TEST	POST-TEST	PRE - TEST	POST-TEST	PRE - TEST	POST-TEST
NECK	10 (33)	5 (17)	7 (23)	5 (17)	3 (10)	2 (7)
SHOULDERS	5 (17)	3 (10)	3 (10)	3 (10)	1 (3)	2 (7)
UPPER BACK	3 (10)	3 (10)	2 (7)	3 (10)	2 (7)	3 (10)
ELBOWS	2 (7)	1 (3)	3 (10)	1 (3)	2 (7)	1 (3)
WRIST	5 (17)	3 (10)	1 (3)	2 (7)	1 (3)	1 (3)
LOWER BACK	11 (37)	4 (13)	7 (23)	4 (13)	4 (13)	2 (7)
HIPS/THIGHS	2 (7)	1 (3)	4 (13)	2 (7)	3 (10)	1 (3)
KNEES	3 (10)	1 (3)	4 (13)	1 (3)	2 (7)	0
FEETS/ANKLES	2 (7)	0	1 (3)	0	0	0

Discussion

One in three occupational therapy students already have musculoskeletal work-related problems prior to graduation, which interfere with daily activities and require medical treatment[11,14]. Because musculoskeletal illnesses are so common, it is imperative that researchers and educators develop long-term remedies for them, taking into account the residual effects of previous disorders and working with psychosocially oriented musculoskeletal health caseloads[15].

Furthermore, the results demonstrated a noteworthy improvement for study participants and demonstrated the efficacy of an occupational rehabilitation programme for patients with musculoskeletal problems associated to their place of employment[14].

Conclusion

The purpose of the study was to evaluate the efficacy of an occupational therapy rehabilitation regimen in treating musculoskeletal diseases connected to the workplace in students pursuing occupational therapy. Based on the NPRS (Numeric Pain Rating Scores) pre- and post-test results, there was a statistically significant difference between the subjects (t=10.625, p=0.000). and a sharp decline in the Standardised Nordic Musculoskeletal Questionnaire's (SNMQ) prevalence % of musculoskeletal illnesses. As a result, among students studying occupational therapy, the rehabilitation programme is beneficial for musculoskeletal disorders connected to the workplace.

Conflict of Interest: No conflicts in this work.

Source of Funding: Self

Ethical Clearance: This study obtained ethical approval with the ethical clearance number SRMIEC-ST1122-263 from the institutional committee of SRM Medical college & Research centre, kattankulathur, Chengalpattu.

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