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Effectiveness of Comprehensive Intervention Package on Pain And Physical Function Among Patients with Arthritis in Selected Old Age Home At Chennai

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Abstract:
Arthritis is a painful condition affecting joint, joint tissues and other connecting tissues with the manifestation of joint pain, swelling and stiffness which typically worsen with age. Tai chi and guided imagery could minimize those symptoms. The true experimental research design was used for the study. Simple random sampling technique was used to select 30 patients with arthritis as study participants (15 in experimental group and 15 in control group). The level of pain and physical function among patients with arthritis was assessed by WOMAC Osteoarthritis index. After pretest comprehensive intervention package that includes Tai Chi for 30 minutes thrice weekly and Guided Imagery for 30 minutes twice weekly was implemented to the experimental group for one month and the old age home routine was followed for the control group which was followed by the posttest. The study findings showed that the pretest and posttest mean pain score was 9.73 & 6.67 with standard deviation of 1.22 & 1.29 respectively in experimental group. The paired `t` value was 7.99*** which revealed that there was a highly statistically significant difference between the pretest and posttest level of pain at $p<0.001$. The pretest and posttest mean physical function score was 40 & 27.53 with standard deviation of 7.38 & 6.23 respectively in experimental group. The paired `t` value was 5.21*** which revealed that there was a highly statistically significant difference between the pretest and posttest level of physical function at $p<0.001$. The independent 't' test value was 3.10 & 3.11 which revealed that there was a statistically significant difference in the posttest level of pain and physical function between experimental and control group at $p<0.01$. There was no statistically significant difference in the pretest and posttest mean pain and physical function score in the control group.

Keywords: Tai Chi, Guided Imagery, Pain, Physical Function, Patients with Arthritis

INTRODUCTION

Arthritis is the inflammation or swelling of one or more joints. Arthritis affects 15% of people, i.e., over 210 million people in India. According to the Centers for Disease Control and Prevention (CDC), arthritis is more common among adults aged 65 years or older, but people of all ages (including children) can be affected. Nearly two-thirds of people with arthritis are younger than 65. Arthritis is more common among

women (26%) than men (19%) in every age group, and it affects members of all racial and ethnic groups. Arthritis is also more common among adults who are obese than among those who are normal weight or underweight.

Arthritis Statistics (2022) revealed that more than 350 million people have arthritis globally, men are more likely than women to develop arthritis before the age of 55 but more women than men develop arthritis after the age of 55. Women reported more pain from arthritis than men

The management of arthritis focuses on relieving the symptoms and improving the joint function. There are variety of treatment modalities available for treating arthritis. The common medication used are NSAIDs, counterirritants, steroids and disease modifying antirheumatic drugs. Physical therapy especially exercises can improve range of motion and strengthen the muscles surrounding joints. If conservative treatment is not responding surgeries like joint repair or replacement or fusion can be performed. Alternative therapies like acupuncture, Massage, Tai Chi, Yoga, Guided Imagery, Weight Loss, Physical Therapy, Topical Gels, etc., are used to reduce pain and stiffness in patients with arthritis

Li. R., et al., (2020) conducted a systematic review and meta-analysis of 14 randomized control trials involving 815 patients to determine the effectiveness of traditional Chinese exercise (tai chi and qigong) on symptoms of osteoarthritis of the knee. Compared to the control group, the Chinese exercise group showed significant improvement in the Western Ontario and McMaster Universities Arthritis Index (WOMAC) and the Knee Injury and Osteoarthritis Outcome Score (KOOS) measures for pain ($p < 0.001$), stiffness ($p < 0.001$), and physical function score ($p < 0.001$). The study concluded that tai chi and qigong may be effective for alleviating pain, relieving stiffness and improving physical function for patients suffering from osteoarthritis of the knee.

Riasmini, N M., et al., (2021) did a quasi-experimental study with a control group to assess the effectiveness of exercise program (Tai-chi exercise and Cognitive Stimulation) on the health status of the elderly in nursing homes. A total sample of 116 elderly were selected using simple random sampling. Modified version of the Short-Form Health Survey (SF-12) was used to assess the health status of the elderly. The study results revealed that there was a difference in the average value of the health status of the elderly before and after the exercise programs in the intervention group (p-value = 0.001), there was a difference in the average value of the health status of the elderly between the intervention group and the control group after the exercise intervention program (p-value = 0.001), there was a relationship between the length of stay in the orphanage on the health status of the elderly. The study concluded that this exercise program could be employed as complementary therapies replicated more extensively in various health care settings.

Singh, P (2021) conducted a study to assess the effect of guided imagery on pain and anxiety in post cardiac surgery patients in first ambulatory stage. A quasi experimental design was selected for the study. A total 50 (25 in each experimental and control group) were included through non-probability purposive sampling technique. Pain was assessed by numerical rating scale and critical care pain observation checklist and anxiety was assessed by Beck Anxiety Inventory followed by opinionnaire about guided imagery were assessed. The study findings revealed that the mean scores of pain in experimental group was less (NRS=3.72, CPOT=3.48 ≤ NRS= 5.38, CPOT= 4.64) than the control group. Anxiety mean score in experimental group was less (22.96 ≤ 30.48) than the control group after the intervention. The study concluded that the guided imagery was an effective intervention in reducing pain and anxiety level.

STATEMENT OF THE PROBLEM

A study to assess the effectiveness of comprehensive intervention package on pain and physical function among patients with arthritis in selected old age home at Chennai.

OBJECTIVES

1. To assess the pretest and posttest level of pain and physical function among patients with arthritis in experimental and control group.
2. To determine the effectiveness of comprehensive intervention package on pain and physical function among patients with arthritis in experimental and control group.
3. To correlate the relationship between the posttest level of pain and physical function among patients with arthritis in experimental and control group.
4. To associate the pretest and posttest level of pain and physical function among patients with arthritis with their selected demographic variables in experimental and control group.

NULL HYPOTHESES

H_1: There is no significant difference between the pretest and posttest level of pain and physical function among patients with arthritis in experimental and control group.

H_2: There is no significant difference in the posttest level of pain and physical function among patients with arthritis between the experimental and control group.

H_3: There is no significant relationship between the posttest levels of pain and physical function among patients with arthritis in experimental and control group.

H_4: There is no significant association between the pretest and posttest level of pain and physical function with their selected demographic variables among patients with arthritis in experimental and control group.

Research Methodology

Quantitative research approach was adopted for the study. True experimental design was selected. The formal written permission was obtained from the management. The study was carried out with 30 patients with arthritis who fulfilled the inclusion criteria. Sastha old age home, Kundrathur, Chennai was selected for Experimental Group & Sai old age home, Kundrathur, Chennai was selected for Control Group. Simple random sampling technique was used to select the patients with arthritis to experimental group (n=15) and control group (n=15). Self-introduction was given followed by adequate explanation about the purpose of the study to ensure better cooperation and informed consent was obtained.

Pain and physical function were assessed by WOMAC osteoarthritis index developed by Bellamy.N, Buchanan.WW, and Goldsmith. It is a 24-item questionnaire divided by 3 subscales such as Pain – 5 items, stiffness – 2 items and physical function – 17 items. Higher scores indicate worse pain, stiffness, or physical function.

The pain score was interpreted as follows:

Low pain	:	< 10
Moderate pain	:	10 – 15
Severe pain	:	> 15

The physical function score was interpreted as follows:

Low functional limitation	:	< 40

Moderate functional limitation : 40 – 60
Severe functional limitation : > 60

A pretest was conducted to assess the existing level of pain and physical function among patients with osteoarthritis using WOMAC osteoarthritis index for both groups. The comprehensive intervention package that includes Tai Chi a group of exercise with slow movements and breathing which includes warmup exercises with 3 basic moves such as warrior & scholar, brush the knee and part the horse mane for 30 minutes thrice weekly on alternate days and Guided Imagery which includes assessing the problem, positioning, breathing, developing the scene and creating the journey for 30 minutes twice weekly on alternate days was implemented to the experimental group for one month and the old age home routine was followed for the control group. A posttest was conducted by same tool for the both group at the end of one month.

RESULTS AND DISCUSSION

The data collected was analyzed using descriptive and inferential statistics. The demographic variables of patients with arthritis in experimental group revealed that majority 11 (73.4%) of the patients were in the age group of >65 years, most of them 9 (60.0%) were males, majority 12 (80%) were Hindus, majority 8 (53.33%) of patients had completed secondary education, most of the patients 12 (80%) were married, 7 (46.7%) patients had hypertension as a comorbid illness, all 15 (100%) patients were having osteoarthritis, majority 12 (80%) had >6 months of duration of illness, all 15 (100%) of patients were undergoing allopathy as a type of treatment, all 15 (100%) of patients had the duration of treatment for < 6 months, most of the patients 12 (80%) had no family history of arthritis, in the BMI majority 8 (53.3%) were in the normal category, majority 8 (53.3%) patients were not having the habit of physical exercise and none of the patients were using complementary therapies.

The demographic variables of patients with arthritis in control group revealed that majority 9 (60%) of the patients were in the age group of >65 years, most of them 9 (60%) were females, majority 13 (86.7%) were Hindus, majority 7 (46.7%) of patients had completed secondary education, most of the patients 10 (66.7%) were married, 6 (40%) patients had hypertension as a comorbid illness, all 15 (100%) patients were having osteoarthritis, majority 8 (53.3%) had <6 months of duration of illness, all 15 (100%) of patients were undergoing allopathy as a type of treatment, all 15 (100%) of patients had the duration of treatment for < 6 months, most of the patients 13 (86.7%) had no family history of arthritis, in the BMI majority 8 (53.3%) were in the normal category, majority 11 (73.33%) patients were not having the habit of physical exercise and none of the patients were using complementary therapies.

The first objective was to assess the pretest and posttest level of pain and physical function among patients with arthritis in experimental and control group

Table 1: Frequency and percentage distribution of pretest and posttest level of Pain and Physical Function among patients with arthritis in experimental and control group.

N = 15+15

Selected Parameters	Experimental Group (15)				Control Group (15)			
	Pretest		Posttest		Pretest		Posttest	
	N	%	N	%	N	%	N	%
Level of Pain								
Low	8	53.33%	13	86.67%	7	46.67%	8	53.33%

Moderate	7	46.67%	2	13.33%	8	53.33%	7	46.67%
Severe	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Level of Physical Function								
Low functional limitation	5	33.33%	13	86.67%	4	26.67%	8	53.33%
Moderate functional limitation	10	66.67%	2	13.33%	11	73.33%	7	46.67%
Severe functional limitation	0	0.00%	0	0.00%	0	0.00%	0	0.00%

Table 1 shows the frequency and percentage distribution of pretest and posttest level of pain and physical function among patients with arthritis in experimental and control group. With regard to level of pain in experimental group, 8 (53.33%) of them were having low pain, 7 (46.67%) of them were having moderate pain and none of them were having severe pain in the pretest whereas in posttest, 13 (86.67%) of them were having low pain, 2 (13.33%) of them were having moderate pain and none of them were having severe pain.

In control group, 7 (46.67%) of them were having low pain, 8 (53.33%) of them were having moderate pain and none of them were having severe pain in the pretest whereas in posttest, 8 (53.33%) of them were having low pain, 7 (46.67%) of them were having moderate pain and none of them were having severe pain.

With respect to the level of physical function in experimental group, 5 (33.33%) of them were having low functional limitation, 10 (66.67%) of them were having moderate functional limitation and none of them were having severe functional limitation in the pretest whereas in posttest, 13 (86.67%) of them were having low functional limitation, 2 (13.33%) of them were having moderate functional limitation and none of them were having severe functional limitation.

In control group, 4 (26.67%) of them were having low functional limitation, 11 (73.33%) of them were having moderate functional limitation and none of them were having severe functional limitation in the pretest whereas in posttest, 8 (53.33%) of them were having low functional limitation, 7 (46.67%) of them were having moderate functional limitation and none of them were having severe functional limitation.

The second objective was to determine the effectiveness of comprehensive intervention package on pain and physical function among patients with arthritis in experimental and control group

Table 2: Mean and Standard Deviation of pretest and posttest level of Pain and Physical Function among patients with arthritis in experimental group. N = 15

Selected Parameters	Experimental Group				Mean Difference	Paired t test
	Pretest		Posttest			
	Mean	SD	Mean	SD		
Level of Pain	9.73	1.22	6.67	1.29	3.06	**t=7.99 p=0.001***(S) DF=14**
Level of Physical Function	40.00	7.38	27.53	6.23	12.46	**t=5.21 p=0.001***(S) DF=14**

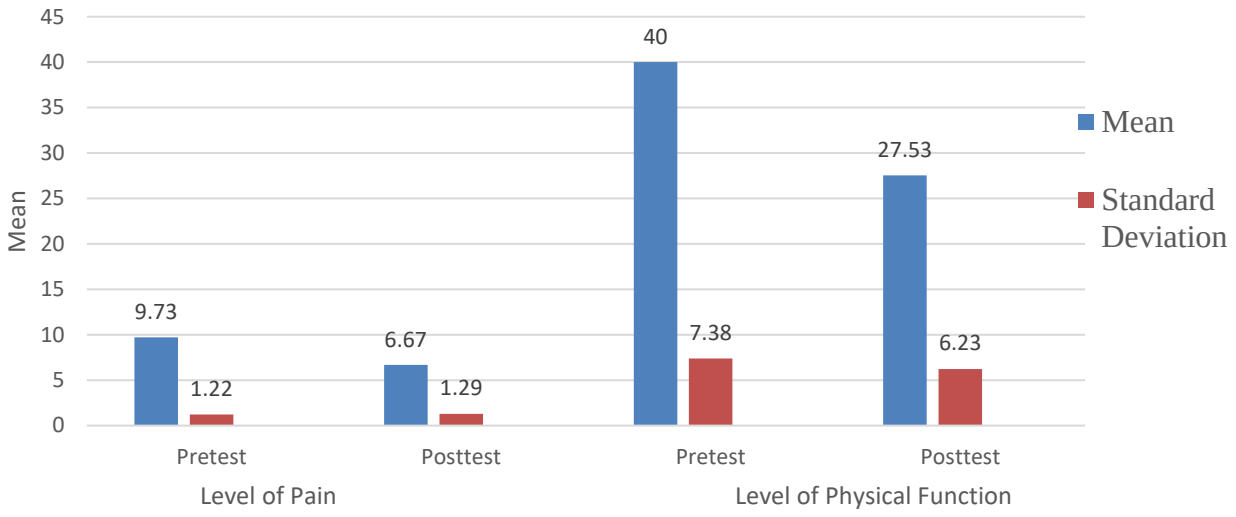

Fig. 1: Mean and Standard Deviation of Pretest and Posttest Level of Pain and Physical Function in Experimental Group

Table 2 & Fig. 1 shows the mean and standard deviation of pretest and posttest level of pain and physical function among patients with arthritis in experimental group. With regard to the level of pain, the pretest mean was 9.73 with the standard deviation of 1.22 and the posttest mean was 6.67 with the standard deviation of 1.29. With regard to the level of physical function, the pretest mean was 40.00 with the standard deviation of 7.38 and the posttest mean was 27.53 with the standard deviation of 6.23. The paired t test value of 7.99 and 5.21 showed a statistically significant difference in the pretest and posttest level of pain and physical function respectively at $p<0.001$ in experimental group.

Table 3: Mean and Standard Deviation of pretest and posttest level of Pain and Physical Function among patients with arthritis in control group. N = 15

Selected Parameters	Control Group				Mean Difference	Paired t test
	Pretest		Posttest			
	Mean	SD	Mean	SD		
Level of Pain	9.53	1.36	9.20	1.52	0.33	t=1.78 p=0.10(NS) DF=14
Level of Physical Function	37.60	7.24	35.80	8.21	1.80	t=1.23 p=0.24(NS) DF=14

Table 3 shows the mean and standard deviation of pretest and posttest level of pain and physical function among patients with arthritis in control group. With regard to the level of pain, the pretest mean was 9.53 with the standard deviation of 1.36 and the posttest mean was 9.20 with the standard deviation of 1.52. With regard to the level of physical function, the pretest mean was 37.60 with the standard deviation of 7.24 and the posttest mean was 35.80 with the standard deviation of 8.21. There was no statistically significant difference in the pretest and posttest level of pain and physical function in control group.

Table 4: Mean and Standard Deviation of posttest level of Pain and Physical Function among patients with arthritis between experimental and control group. N = 15+15

Selected Parameters	Experimental Group		Control Group		Mean Difference	Independent t test
	Posttest		Posttest			
	Mean	SD	Mean	SD		
Level of Pain	6.67	1.29	9.20	1.52	2.53	**t=3.10 p=0.01**(S) DF=28**
Level of Physical Function	27.53	6.23	35.80	8.21	8.27	**t=3.11p=0.01** (S) DF=28**

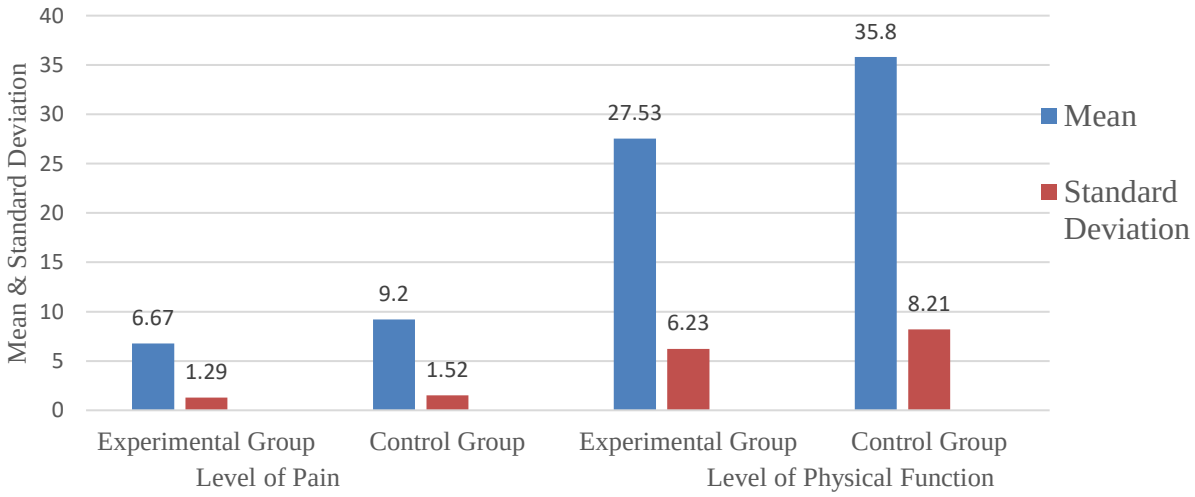

Fig. 2: Mean and Standard Deviation of Posttest Level of Pain and Physical Function between Experimental and Control Group

Table 4 & Fig. 2 shows the mean and standard deviation of posttest level of selected parameters among patients with arthritis between experimental and control group. With regard to the level of pain, the posttest mean was 6.67 with the standard deviation of 1.29 in experimental group and the posttest mean was 9.20 with the standard deviation of 1.52 in control group. With regard to the level of physical function, the posttest mean was 27.53 with the standard deviation of 6.23 in experimental group and the posttest mean was 35.80 with the standard deviation of 8.21 in control group. The independent t test value of 3.10 and 3.11 showed a statistically significant difference in the posttest level of pain and physical function respectively at $p<0.01$ between experimental and control group.

The third objective was to correlate the relationship between the posttest level of Pain and Physical Function among patients with arthritis in experimental and control group.

Table 5: Correlation between posttest level of pain and physical function among patients with arthritis in experimental group. N=15

Correlation Between	Mean Score	Karl Pearson Correlation Coefficients	Interpretation
Pain Vs Physical Function	6.67±1.29 27.53±6.23	r= 0.42 P=0.001***	Moderate correlation

Table 5 shows the correlation between posttest level of pain, physical function, quality of sleep and anxiety among arthritis patients in experimental group. There was a moderate correlation between pain and physical function with the correlation value of 0.42 in experimental group.

Table 6: Correlation between posttest level of pain and physical function among patients with arthritis in control group. N=15

Correlation Between	Mean Score	Karl Pearson Correlation Coefficients	Interpretation
Pain Vs Physical Function	9.20±1.52 35.80±8.21	r= 0.15 P=0.39	Poor correlation

Table 6 shows the correlation between posttest level of pain, physical function, quality of sleep and anxiety among arthritis patients in control group. There was a poor correlation between pain and physical function, with the correlation value of 0.15 in control group.

The fourth objective was to associate the pretest and posttest level of Pain and Physical Function among patients with arthritis with their selected demographic variables in experimental and control group

There was no significant association found between the pretest level of pain and physical function among patients with arthritis in experimental group and control group with any of the demographic variables.

The chi square value of 4.68 showed a significant association between posttest level of pain among patients with arthritis in experimental group and habit of physical exercise at $p<0.05$. There was no significant association found between the posttest level of pain among patients with arthritis in experimental group with other demographic variables. There was no significant association found between the posttest level of pain among patients with arthritis in control group with any of the demographic variables.

The chi square value of 4.66 showed a significant association between posttest level of physical function among patients with arthritis in experimental group and sex at $p<0.05$. There was no significant association found between the posttest level of physical function among patients with arthritis in experimental group with other demographic variables. There was no significant association found between the posttest level of physical function among patients with arthritis in control group with any of the demographic variables.

CONCLUSION

The present study was conducted to assess the effectiveness of comprehensive intervention package on pain and physical function among patients with arthritis in selected old age home at Chennai. The study findings showed a statistically significant difference in the pretest and posttest level of pain and physical function respectively at $p<0.001$ in experimental group. It also showed a statistically significant difference in the posttest level of pain and physical function between experimental control group. There was a moderate correlation between pain and physical function with the correlation value of 0.42 in experimental group. There was a poor correlation between pain and physical function in control group.

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