Effectiveness of Strengthening and Aerobic Exercises among Geriatrics with Arthritis

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ABSTRACT

Joint inflammation might be a term regularly acclimated to mean any confusion that influences joints. Manifestations for the most part, incorporate joint torment and firmness. Different manifestations may incorporate redness, warmth, growing, the diminished scope of movement of the influenced joints. The aim of the study is to determine the effectiveness of strengthening and aerobic exercise among geriatrics with arthritis. A quantitative research approach with a quasi-experimental research design was used for the present study. A total of 60 arthritis clients who fall in the inclusion criteria were selected by purposive sampling technique, among which 30 samples were in the experimental group and 30 in the control group. The data were collected for both the groups, followed by the pre-test was conducted on the 1st day, the intensity level of pain was assessed by the numerical pain rating scale followed by the exercises which are effective in arthritis are a range of motion exercise, strengthening exercises (hand towel knee exercises, knee flexion, long arc quads), aerobic exercise (brisk walking) was initiated only in the experimental group. The post-test was conducted on 7th day and the level of pain was assessed by a numerical pain rating scale in both the groups. The results revealed that there was a significant reduction in the level of pain at $p<0.0001$ after the intervention among the experimental group. Thus, the study proves that strengthening and aerobic exercises can be used as an effective nursing intervention for reducing the arthritis pain among the geriatrics and it is easily applicable exercises, and also considered as a less cost-effective. These exercises can be practiced at home without any stress or harm and it has less side effect as compared to that of pharmacological interventions.

INTRODUCTION

Joint agony is normal and is identified with more terrible utilitarian results and less fortunate personal satisfaction when put next with the scope of other ongoing conditions (Kidd et al., 2007). Geriatric rheumatology could be filled with science looking at the rheumatic sickness influencing the more seasoned age gatherings. Physiological and framework changes seen inside the geriatric populace could likewise be the clarification for the incessant and diverse introduction of provocative rheumatologic infection during this age gathering (Kobak and Bes, 2018). Ageing could be a phenomenon that’s
experienced by all living organisms, and therefore the diseases which are affecting within the old ages are experienced by everyone in their lives. (Sankar, 2019). Joint inflammation might be a constant precise infection that influences the joints, connective tissues, muscle ligaments, and stringy tissues. It will come in the general strike during the first gainful long periods of adulthood between the ages of 20 and 40 additionally at the adulthood and might be a constant handicapping condition regularly causing agony and deformity. (WHO) (Akinpelu et al., 2011).

There are various sorts of joint pain which incorporates rheumatoid joint pain, osteoarthritisis, responsive joint pain, septic joint inflammation. Rheumatoid joint pain is a persistent provocative auto invulnerable illness it is portrayed by balanced joint contribution and extra-articular signs (Maru and Mulla, 2020). Joint torment and other rheumatic conditions are driving reason behind disability among adults within the U.S. This puts you in an exceedingly danger of becoming completely incapable of movement in any respect. State-specific estimates of the prevalence of joint inflammation related handicap and for tracking progress towards meeting state and public wellbeing goals for 2010 (Hootman et al., 2012). ‘October 12’ is dedicated to creating awareness about the dangerous disease, ‘World Arthritis Day’ (Kelley et al., 2011). Recently a study was conducted within the geographical area of Pondicherry reported, pain in joints and joint stiffness was 43.3% (Nath and Ingle, 2008).

As per Centres for irresistible anticipation and Prevention merged information from the National wellbeing overview inside the year 2013-1015, the grown-up centre segments to assess normal yearly joint inflammation pervasiveness is more than 18 years. The assessment is 22.7% (54.4 million) of grown-ups had specialist analysed joint pain, with fundamentally higher age changed predominance in ladies (23.5%) at that point in men (18.1%). Joint pain commonness increments by age. The commonness of joint inflammation will be expanded continuously in 2030 (Purty et al., 2006). Musculoskeletal torment is a major health problem among geriatrics in the present day. The chronic pain of knee and back effects the quality of life. The inflammation of joints or pain in the joints is one of the most common complaints of elderly people nowadays. A study was recently conducted in India and it shows a significant difference in the prevalence rate of arthritis, i.e. 56.6% in the rural areas are affected by arthritis and 32.6% are affected in the urban area. An investigation done by SRL diagnostics on tests for joint inflammation tired its research centres uncovered that a bigger number of ladies than men in India are tortured by ailment. The investigation likewise uncovered that prime ESR and CRP levels endorsed in patients of joint pain and, demonstrative of determined aggravation of joints, were usually found inside the East Zone followed by the North zone. Joint inflammation influences very 180 million individuals in India-pervasiveness over some notable illnesses. Around 14% of the Indian populace looks for a specialist’s assistance for each annum for this joint disease. (Joshi et al., 2003)

Exercise is critical for individuals with joint pain. It builds the strength and gracefulness, decreases joint agony and enables the shell to stun. Indeed, even moderate exercise can facilitate the torment and help to keep up a sound weight. Exercise helps to improve wellbeing and wellness without harming joints. It assists with dealing with bone strength, assists with overseeing weight improve the equilibrium. Absence of activity really can make the joints much more difficult and hardened. Activities for joint pain incorporates a scope of movement works out, reinforcing works out, oxygen-consuming activities. Scope of movement works out. These activities relieve firmness and increment the adaptability to move the joints through their full scope of movement. This incorporates raising your arms overhead or rolling the shoulders forward and in reverse. These activities might be done every day. Reinforcing works out These activities help to make solid muscles that help uphold and ensure the joints. It incorporates, face towel knee works out, knee flexion, long bend quads. Vigorous activities Aerobic or perseverance practices help within general wellness. They improve cardiovascular wellbeing. It incorporates Brisk Walking Exercise for 10 minutes. (Dey et al., 2001).

The purpose of the study (1) to assess the intensity level of pain in geriatrics with arthritis before strengthening and aerobic exercises. (2) to assess the intensity level of pain in geriatrics with arthritis after strengthening and aerobic exercises (3) to determine the effectiveness of aerobic and strengthening exercises among geriatrics with arthritis. (4) to compare the pre and post-test intensity level of joint pain in geriatrics with arthritis. (5) to find out the association between the intensity level joint pain with the selected demographic variables.

**MATERIALS AND METHODS**

A quantitative approach, quasi-experimental research design with purposive sampling technique was used to conduct the study in Mappedu village. 60 samples were selected by purposive sampling technique. The standards for sample selection are,
geriatrics who are willing to participate, geriatrics who are available at the time of the study and geriatrics who can understand Tamil and English. The data collection period was through with prior permission from the Institutional Ethical Committee (IEC) of Saveetha Institute Of Medical and Technical Sciences was obtained. The aim of the study was explained to the clients, and written consent was obtained from them. The steps of the exercise were explained by the investigator to the client for the duration of 10 minutes twice every day for 7 days. The pre-test was conducted on a primary day, and also the intensity of pain was assessed by using a numerical pain rating scale. The strengthening and aerobic exercises include the range of motion exercise, face towel knee exercise, knee flexion, long arc quads and brisk walking. A period of seven days was given to the clients to try and do the exercise as followed by the post-test. The effectiveness of the exercise was firm by the descriptive and inferential statistics.

RESULTS AND DISCUSSION

Section A: Sample characteristics

Among 60 samples, 30 belongs to the experimental group, in the experimental group 6.6 % geriatric were of the age group of 60-65 years, 20% were of the age group of 66-70 years, 40% were of 71-75 years of age group, whereas 33.3% were above 76 years. In gender 16 (53.6%) were male, and 14(46.6%) were female. Majority 20(66.6%) were educated. In occupation, 15(50%) were in the field of agriculture. 14(45.6%) experience joint pain all the time. Mostly 9(30%) have 6-10 years duration of joint pains. 11(36.6%) take a pain killer as management of joint pain. The frequency of taking drug 11(36.6%) were once a day. Remaining 30 belongs to the control group, majority 8(26.6%) were of age group 60-65 years, 6(20%) were of age group 66-70 years, 18(60%) were female and 12(40%) were male. 21(70%) were educated. 12 (40%) were in the field of agriculture. 24(80%) were non-vegetarian. 12(40%) experience joint pain all the time. 9(30%) have less than 1 year and 6-10 years of duration of joint pain. 14(46.6%) take a pain killer as management of joint pain and 14(46.6%) has once a day frequency of taking the drug.

Section B: Intensity level of joint pain in geriatrics before and after strengthening and aerobic exercises within both the experimental and control group.

In pre-assessment for control and experimental group, among the experimental group, 5(16.7%) is having moderate pain, 25(83.33%) are having severe pain. In the control group, 4(13.3%) of the geriatrics have moderate pain, 26(86.7%) have severe pain.

In post-assessment among the experimental group, 24(80%) of them are having no pain, 6(20%) of the geriatrics have mild pain. In the control group, 5(16.7%) of the geriatrics are having moderate pain, 25(83.3%) have severe pain. The data findings show that the mean pre score in the pre-test experiment group of geriatrics have 7.90 pain score and a control group have 7.30 pain score, so the difference is 0.6, the difference is so small and is not a statistically significant difference. [Table 1 & Figure 1]

The present study, supported by Karen Raphael et al., led an examination on torment predicts Function One Year Later: A correlation across torment measures in stiffness Sample. Torment power was estimated through a mathematical rating scale. These estimates incorporated the number line and requested the patients to rate the power from torment from 0 to 10 with 0 as no agony and 10 as serious torment. The outcome uncovered that 95% announced some degree of torment inside the most recent 24 hours or inside the most recent month. The recurrence of extreme torment was (4.2), while torment meddles with rest had an absolute bottom mean (3.3). Of the 2 agony force measures, references to the most recent month were more related to recurrence of extreme torment (p<0.05). (Ahluwalia, 2004). The present study, supported by Krishna Kumar Singh directed an investigation on the impacts of customary reinforcing practices stanzas useful assignment preparing on agony, balance, strolling speed and utilitarian versatility on osteoarthritis knee. In the investigation, the useful errand preparing bunch showed a reduction in torment level by (75%) when contrasted and the conventional activities gathering (half), which accordingly could represent the

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Table 1: Frequency and percentage distribution of pre-test and post-test intensity level of joint pain among geriatrics with arthritis in the experimental and control group before and after the strengthening and aerobic exercise. N= 60 (30+30)

| Group     | Joint pain/No | No | %   | Mild/No | %   | Moderate/No | %   | Severe/No | %   |
|-----------|---------------|----|-----|---------|-----|-------------|-----|-----------|-----|
|           | No Pain       |    |     | Mild    |     | Moderate    |     | Severe    |     |
| Experimental Group | Pretest       | 0  | 0   | 0       | 0   | 5           | 16.67 | 25        | 83.33 |
|           | Post Test     | 24 | 80.0| 6       | 20.0| 0           | 0    | 0         | 0    |
| Control Group  | Pretest       | 0  | 0   | 0       | 0   | 4           | 13.3 | 26        | 86.7  |
|           | Post Test     | 0  | 0   | 0       | 0   | 5           | 16.7 | 25        | 83.3  |

Table 2: Comparison of pre-test and post-test level of joint pain scores among geriatrics with arthritis in both experimental and control group before and after strengthening and aerobic exercise. N=60 (30+30)

| Group      | Test | Mean | S.D. | Paired ‘t’ test Value |
|------------|------|------|------|-----------------------|
| Experimental Group | Pre-test | 7.90 | 1.42 | t = 24.028 p = 0.0001 S**** |
|             | Post Test | 0.60 | 1.22 |                         |
| Control Group | Pre-test | 7.30 | 0.85 | t = 1.218 p = 0.229 N.S |
|             | Post Test | 7.10 | 1.06 |                         |

P<0.0001, t= paired t-test, S = Significant

Table 3: Comparison of the post-test intensity level of joint pain among the clients between the experimental and control group. N= 60(30+30)

| Group       | Mean | S.D. | Student Independent ‘t’ test value |
|-------------|------|------|-----------------------------------|
| Experimental Group | 0.60 | 1.22 | t = 22.032 p = 0.0001 S*** |
| Control Group | 7.10 | 1.06 |                         |

***p<0.001, S – Significant

utilitarian capacity contrasts seen between gatherings. The result of the investigation shows useful assignment preparing procedure gives early and profoundly critical alleviation in torment and firmness and gives great equilibrium, utilitarian versatility, and speed (Santiago et al., 2016).

Section C: Effectiveness of strengthening and aerobic exercises on geriatrics with arthritis

The calculated paired ‘t’ test value of t = 24.028 was found to be statistically highly significant at p<0.001 level. This indicates that there was a significant reduction in the intensity level of joint pain among geriatrics with arthritis. Whereas, for the control group, the pre-test mean score of the intensity of the level of pain was 7.30 with SD 0.85 and the post-test mean score was found to be 7.10 with the SD 1.06. The calculated paired ‘t’ test value of t = 1.218 was not found to be statistically significant. The present study, supported by Britt Elin Oiestad et al., they led an examination about viability, strength and oxygen-consuming activities on the patient, detailed results and underlying changes in patients with knee osteoarthritis. A 3 randomized control preliminary including two activities mediations and a benchmark group of people doing as they normally do, was portrayed. The patients will have mellow to direct radiographic osteoarthritis. The mediation was a 14 weeks practice program. The patients are arbitrarily dispensed to strength practice gathering, a cycling gathering. The examination contributed with information on the viability of fortifying activity as opposed to cycling understanding announced results, ligament quality and cost adequacy. The activities treatment was discovered to be viable in knee osteoarthritis. The out-
come uncovered that 207 people, 69 each gathering, is expected to recognize a clinically pertinent distinction of 10 focuses with 80% force and a criticalness of 5%. (Singh and Tiwari, 2016). In the present study, for the control group, the pre-test means score intensity level of joint pain was 7.30 with SD 0.85, and the post-test mean score was 7.10 with SD 1.06. The calculated ‘t’ test value of t= 1.218 was not found to be statistically significant [Table 2].

The present study, supported by Hayley J. Denison et al., led an examination on impacts of high-impact on muscle strength and actual execution. The outcomes uncover that there was 0.75 (95%) second more noteworthy improvement inside the 6m TUG execution inside the activities bunch contrasted and the benchmark group (p=0.004). Normal TUG times diminishes from 11.0 seconds at the pattern. The advancement in TUG execution inside the activity bunch was somewhat more prominent among men (0.87 seconds) than ladies (0.57 seconds) (Øiestad et al., 2013).

Section D: Comparison intensity level of joint pain among the geriatrics between the experimental and control group

For the present study, in the post-test, there was a significant reduction in the intensity level of joint pain in geriatrics in the experimental group than the control group, which clearly highlights that the calculated student independent ‘t’ value of t= 22.032 was found to be statistically significant at p<0.0001 level. This clearly infers that there is a reduction in the intensity level of pain among geriatrics after the initiation of strengthening and aerobic exercises. [Table 3]. The current study, supported by Nader Rahnama et al., they led an examination about the impacts of fortifying and oxygen-consuming activities on agony seriousness and execution in patients with joint pain. 48 male patients with knee RA were haphazardly doled out into 3 gatherings, including oxygen consuming activities, fortifying activity, and control. The outcomes uncover that there’s critical (p<0.001, F=26.4) contrast in agony power between the three gatherings after treatment. The patient’s agony in both A and B bunches diminished fundamentally (p<0.001) when contrasted with bunch C, in spite of the fact that there was no huge (p>0.05) distinction between these 2 exploratory groups (Rahnama and Mazloum, 2012)

Section E: To find out the association between the selected demographic variables of geriatrics and the intensity of the level of joint pain before and after the strengthening and aerobic exercise.

The result shows, the association between the demographic variables with the intensity level of joint pain with arthritis was (p= <0.05). There was statistically significantly found in the gender and the occupation—statistical significance using the chi-square test.

The present study, supported by Hongbo Chen et al. They led an investigation about the aftereffects of a locally situated exercise intercession on old patients with knee osteoarthritis. A total of 171 old patients were chosen. Information was acquired from 141 patients with a middle-age of 68 who finished the 12-week study. No huge gathering contrasts were found in any result measures at standard. At week 12, the pre-test/post-test changes 3 huge between bunch contrasts in reductions in torment force and stiffness. (Chen et al., 2019).

CONCLUSION

There was a major difference within the mean pain perception score of the clients with arthritis before and after the exercises. There was an association between the degree of pain perception of the clients with the chosen demographic variables. Justification for undertaking this study was to alleviate the clients from arthritis by exercises and to work out the effectiveness, so exercises are often suggested within the future for all types of arthritis and other rheumatic diseases.

Funding Support

The authors declare that they have no funding support for this study.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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