Combine Massage and Physiotherapeutic Exercise for Recovering Pain, Increasing Strength, and Flexibility

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Abstract Background: Chronic hip, knee, and ankle injuries are very common issues in the whole world. Musculoskeletal disorder hampers the development in several sectors including training and athletes’ performance. Social, industrial, economic, and education declines are often caused by poor muscular-articular problems. This research aims to reveal the effectiveness of combine massage and physiotherapeutic exercises in: (1) the treatment of chronic hips, knee and ankle injuries; (2) improving and increasing the low limb strength and flexibility; (3) reducing the chronic pain of degenerative diseases; (4) improving the physical and mental wellbeing of human body; (5) increasing motor or sensory function; (6) increasing athlete’s performance. This research is quasi-experimental with: quantitative approach. The sample of this study was 15 patients with chronic hips, knee and ankle injuries, taken by purposive sampling technique. The data were collected using measurement and treatment with combine massage and physiotherapeutic exercise. Data were analyzed using the descriptive statistics, independent sample t-test, paired sample t-test, and correlation among items using SPSS Amos.23. The result showed that there is a significant difference between pre-test-posttest strength measurement with P value (0.003<0.05). A significant difference between pre and posttest of all kinds of movement flexibilities is with the P value < 0.05. There is a strong correlation between combine massage and physiotherapeutic to the chronic knee, knee, and ankle with r >0.5. In conclusion, massage and physiotherapeutic exercise were found to be a vital part to improve human body health and it can be used by everybody.

Keywords Effectiveness, Exercise Therapy, Healing Chronic, Low Limbs Injuries, Massage

1. Introduction

Chronic hips, knee, and ankle instability are very common issues in the whole world. This common problem takes origin from many sources: first daily activities such as sports for athletes and coaches, second degenerative disease, and it is noted that the aging is the one of factors which causes the chronic hips, knee, and ankle instability. Next the unbalance between input and output has a high average in causing the later problem [1], in time-honored work or expert associated with posture and long-time taken at some point of working are several reasons of persistent hips, knee, and ankle instability [2]. Knee and ankle disorders can lead to a discount in useful ability, increased dependency, decreased participation in fundamental everyday things to do and extensive fitness to many exclusive researches have been carried out to make up proper how the nature of work or career is very severe on the appearing of the sickness of hips, knee, and ankle [3]. The continual ankle and knee injuries are among the most common accidents sustained and they are...
issues (MSDs) are a significant and increasing problem. The causes of work-related MSDs are multifactorial including physical, ergonomic, and psychosocial factor. According to the ageing knee is the most physique phase affected by using musculoskeletal issues like many diseases, the occur disorder and pathogenesis of osteoarthritis (OA) are multidimensional Anterior cruciate ligament (ACL) injuries are common, extreme knee injuries that result in a excessive chance of growing knee osteoarthritis (OA) in the affected individuals. As proof of excessive influence forces applied to cartilage and bone at the time of injury, tibia bone marrow lesions and osteochondral fractures, positioned predominantly in the lateral tibiofemoral compartment, are oftentimes related with an ACL injury. The subsequent danger of OA may be intently associated with the knee harm mechanism and the panorama of accidents in the knee sustained at the onset of injury [5].

Daily activities are the most cause of chronic injuries and generative chronic injuries. Treatment of chronic injuries is important because chronic injury at early age or aging brings on two types of consequences on physical and mental health. For example, an early sports chronic injury can hinder physical activity for the rest of life and can also affect attitudes toward sport and physical activity. But also it can make severe the physical condition and psychological, so the wellbeing of human body will considerably decrease. With strong participation in the different field: sports and work, the need for injury treatment becomes paramount. In order to reduce sports chronic injuries, work chronic injuries and generative chronic injuries, it is necessary to identify and describe the nature.

However musculoskeletal issues (MSDs) are a predominant health troublesome among human beings of Klaten, and the prevalence is especially excessive on every age. In but in Klaten, there is no statistics on hand among fitness professionals. There is a need for treatment research to heal human against the potential negative consequences from work or degenerative diseases. A prerequisite for the development of treatment strategies is a sufficient understanding of the incidence and determinants (risk factors) work and degenerative injuries. The most the number of participants in every field increases, the most risk of chronic injury increases. Thus, the control of intrinsic and extrinsic factors associated with work and generative injuries have to be suggested because the chronic injury rate and the demands of the daily activities (sports, work… etc.) are high, a rehabilitation program should include massage, exercises therapy that will train the participant as a whole and reduce the pain of further injury, increase flexibility and strength.

2. Methods

This research is a quasi-experimental with mixed method: quantitative and qualitative approaches. The
A research sample was 15 patients with musculo-skeletal disorder located on Hips, Knee, and Ankle taken by purposive sampling. Data collection technique with playground by applying combine massage and physiotherapeutic exercise program. Data were analyzed with independent t-test.

**Procedures**

To treat the musculo-skeletal disorder located on Hips, Knee, and Ankle (MSDs), to evaluate the strength, and the range of motion, the research applied a new combine massage and Physiotherapeutic program.

The table 1 explained the whole instructions, volume, and intensity used for treatment. It’s required to pay attention before to use the following program, everybody need to read it and understand it in order to expect the full benefit from the program.

| Table 1. | Manipulation and Volume of Hips, Knee, and Ankle Combine Massage Therapy |
|----------|-------------------------------------------------------------------------|
| **Manipulation** | **Volume and Massage Therapy Manipulation** | **Volume** | **Intensity** | **Duration: 20 minutes** |
| **Swedish Massage** | | | | |
| Effleurage | From back layer position: apply effleurage from toes up to abdomen muscles | 20-25 floating (1 set) | Low-moderate | 2 min |
| Pettrissage | | 20-25 floating (1 set) | Low-moderate | 2 min |
| Friction | Laying down: apply effleurage from toe foot point up to scapula muscles | 25-30 strokes (1 set) | Moderate | 2 min |
| Tapotement: | Apply petrissage on the whole hips, knee, and ankle muscles | 25-30 strokes (1 set) | Moderate | 2 min |
| cupping | Apply friction on the specific muscle pain or injury | 40-80 strokes (1 set) | High | 40 secs |
| Hacking | Cupping technique to overall blood flow, promote cell repair, and create new blood vessels to the tissue | 40-80 strokes (1 set) | High | 40 secs |
| Beating | Hacking to stimulate nervous and blood flow | 40-80 strokes (1 set) | High | 40 secs |
| **Deep Tissue** | | | | |
| Pettrissage | Apply deeply petrissage and friction again for strains and sports injuries. | 25-30 strokes (1 set) | High | 2 min |
| Friction | | 25-30 strokes (1 set) | High | 2 min |
| **Soft Tissue Release** | | | | |
| Pettrissage | Apply petrissage and friction with soft tissue release to stimulate large nervous, tendon, ligament, increase endorphin, and ROM | 25-30 strokes (1 set) | Moderate | 1.5 min |
| Friction | | 25-30 strokes (1 set) | Moderate | 1.5 min |
| **Sport Massage** | | | | |
| Effleurage | Apply effleurage and Vibration to remove waste product, increase healing, and recovering | 25-30 strokes (1 set) | Moderate | 1.5 min |
| Vibration | | 25-30 strokes (1 set) | Moderate | 1.5 min |
The table 2 gave more information about the applied program therapeutic exercise which has been combined with the massage to improve human health, all the instructions are explained in the table 1

The research combine the two programs: combine massage and physiotherapeutic exercise to evaluate the pain, strength, and range of motion (ROM). The researcher showed the physiotherapeutic exercise image.
The figure 1 showed how patient must apply the therapeutic exercise, all the positions were shown, about the volume, and intensity they are clarified in the table 2.

The figure 2 is the following of the therapeutic exercise patient need to follow all instructions given in the table 2.

The combine massage and physiotherapeutic exercise model have been valid with 6 experts in massage (5 University Lecturers, and 1 physiotherapist with more than 10 years of practice, 2 experts in Sport and Health, and 1 expert in physical training. Both of the two program have been approved with 9 experts. The two program have met the very high validity before it was applied in the...
field of patients.

3. Result

The result data will be presented respectively: (1) the influence of combine massage and physiotherapeutic exercise on the strength, (2) the impact of the later on the pain level, and (3) the effect of combine massage and physiotherapeutic exercise on the range of motion.

3.1. Effect of Combine Massage and Physiotherapeutic Exercise on the Strength

Table 3. Low limbs Pre-test, Mi-Test, and Posttest Strength Measurements

| Subjects | Strength in N/Kg |
|----------|------------------|
|          | Pre-T | M-T | Posttest |
| 1        | 23    | 38  | 55       |
| 2        | 30    | 35  | 40       |
| 3        | 50    | 60  | 70       |
| 4        | 55    | 65  | 75       |
| 5        | 85    | 122 | 122      |
| 6        | 60    | 85  | 85       |
| 7        | 40    | 37  | 90       |
| 8        | 25    | 50  | 55       |
| 9        | 30    | 23  | 45       |
| 10       | 20    | 60  | 70       |
| 11       | 65    | 65  | 115      |
| 12       | 50    | 50  | 55       |
| 13       | 35    | 35  | 55       |
| 14       | 45    | 45  | 55       |
| 15       | 25    | 35  | 40       |

To evaluate the impact of the later program the research applied first the pre-test of lower member’s strength using leg dynamometer, after treatment of 5 weeks 3 times per week, he did the post-test of the strength. The result is presented in table 3.

The table 3 showed the values of patients before and after treatment. The strengthen measurements were taken with leg dynamometer.

After the registration of the date from the treatment, the researcher made the analysis with T-test to assess the different before and after the treatment.

From the data above in the table 4, it can be seen that Levine’s test showed that P value is superior than 0.05 (P: 0.315>0.05). In statistics, Levene’s check is an inferential statistic used to check the equality of variances for a variable calculated for sample. Thus, the null hypothesis of equal variances is rejected when P value is superior than 0.05. From the above result, it can be concluded that there was a significant difference between the variances in the population. In this study, the null hypothesis was that there is no difference between pre-test and posttest has been rejected and the alternative hypothesis that there is a significant different between the data before and after treatment has been automatically accepted. Test Equal variances assumed (0.003) and Equal variances not assumed (0.004) all of them were inferior than 0.05 which support that combine massage and physiotherapeutic exercise were very benefit in increasing low extremity strength. In fact, combine massage was very great also to improve blood flow, muscle relaxation, decreasing the muscle, ligament pain and by the way it allows the facility of strengthen exercise.

| Levine’s Test for Equality of Variances | t-test for Equality | 95% Confidence interval of different |
|----------------------------------------|---------------------|------------------------------------|
| t                                      | t                   | Sig. (2-tailed)                    |
| Test Equal variances assumed           | 1.048               | .315                               |
| Equal variances not assumed            | -3.215              | 28                                 |
|                                        | -3.215              | 25.659                             |

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3.2. Effect of Combine Massage and Physiotherapeutic Exercise on Lower Extremity Members Pain

To evaluate the pain, the researcher used the numeric scale graduated from 1 to 10. The pain was classified in 4 groups: from 0-3: minor; 4-6: medium; 7-9: severe; 10: very severe. Before and after the result has been taken as the following table 5.

Table 5. Pre-Test and Posttest of the Hips, Knee, and Ankle Pain

| Subjects | Pain evaluation |
|----------|-----------------|
|          | Pre-test | Posttest |
| 1        | [7-9]     | 0        |
| 2        | [7-9]     | 3        |
| 3        | [7-9]     | 0        |
| 4        | [7-9]     | 3        |
| 5        | [7-9]     | 0        |
| 6        | [7-9]     | 0        |
| 7        | [7-9]     | 0        |
| 8        | [7-9]     | 0        |
| 9        | [7-9]     | 0        |
| 10       | [7-9]     | 0        |
| 11       | [7-9]     | 0        |

The table 5 showed that the combine massage and physiotherapeutic exercise were very good applied and found out that all the different kinds of pain have been carried out with P value < 0.05. The subjects have low back pain, knee pain, and ankle pain after applying the treatment during 5 weeks 3 times per week, a post-test has been conducted and showed that there was a significant different in the hand of pain level.

3.3. Impact of Combine Massage and Physiotherapeutic Exercise on Lower Extremity Members Range of Motion

About the range of motion, first the researcher showed the different side human parties which have been applied or treat. It can be cited: For the knee there were: Right Flexion, Left Flexion, Right Extension, Left Extension; for the Ankle: Right back flexion, left back flexion, Right Plantar, Left Plantar, Right Inversion, Left Inversion, Right Eversion, Left Eversion; for the hips: Flexion Right Leg, Flexion Left Leg, Extension Right Leg, Extension Left Leg. As the research was conducted there was the pre-test and the post-test after the treatment. The result showed that there were significant improvements comparing the pre-test and the post-test with P value < 0.05. It can be concluded that the combine massage and physiotherapeutic exercise were very benefit for human body range of motion. (cf. Appendix)

4. Discussion

The result showed that massage contribute for healing chronic hips, knee and ankle injuries from different case. Most of the subjects have low back pain; it was very difficult to apply some movements like: right flexion, left flexion, flexion-extension of the hips. The treatment was firstly effleurage to allow the blood flow. Massage can grant a number of benefits to the body. These consist of accelerated blood flow, reduced muscle pressure [11]. Secondly Petrissage (kneading, rolling, and lifting), kneading) technique was used to relaxing the muscle tension. Petrissage is assumed to impact circulation as nicely as interstitial drainage of each superficial and deep tissue [12]. The Tapotement (percussion rhythmic tapping) technique was applied and it procured the wellbeing and relieved the muscle pain. Myofascial pain syndrome was treated with Friction (with fibres or cross-fibres wringing or small circular movements), while Vibration / Shaking rocking and shaking movements. The balance of the knee joint is maintained via four ligaments, thick bands of tissue that stabilize the joint. The medial collateral ligament (MCL) and lateral collateral ligament (LCL) are on the facets of the knee and prevent the joint from sliding sideways. The anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) shape an "X" on the internal of the knee and prevent the knee from sliding returned and forth. These boundaries on knee motion enable the knee to listen the forces of the muscular tissues on flexion and extension. Trigger point massage and soft tissue massage were applied to take off the knee chronic injuries. During five weeks of treatment, the result showed that there was a significant different according to the Range of Motion of the hips, knee but also the ankle ROM has increased. The P value of the following movements ( right flexion hips, left flexion hips, right extension hips, left extension hip, right and left knee flexion; right and left knee extension; right and left back flexion ankle; right and left plantar ankle; right and left back inversion ankle; right and left eversion ankle) was inferior to 0.05. The last P value meant that there was a significant different. Massage was very benefit in healing chronic hip, knee, and ankle.

Many researches have been done to show how massage is effective to the treatment of injuries. Swedish massage regimen was used to relieve Osteoarthritis of the Knee (OA) during 8 weeks [13]. For the combined massage in five weeks, the pain was almost fixed. The research done showed that manipulation of body tissues with rhythmical pressure and stroking for the purpose of advertising health and well-being [14]. Massage is defined as systematic manual manipulation of the body via movements such as rubbing, kneading, pressing, roll, slap and tap for therapeutic purposes. These actions promote blood and lymphatic circulation, muscle relaxation, pain relief, restoration of metabolic balance and various physical and
mental benefits. Combined massage is a strong tool to treat or healing chronic hips, knee, and ankle injuries.

After massage the patients flowed the physiotherapeutic exercise program, because of the longue time of the injuries, some human parts were not totally used, at the end the muscles fibres lost their capacity. The researcher applied a pre-test first to know before the weakness of muscles and joints. To improve strength and flexibility a group of exercise like: (1) Knee life, (2) Hips and lower back stretch, (3) Double hips rotation, (4) Bridging, (5) External hips rotation, (6) Chair stand, (7) Hips abduction, (8) Hips flexion have been used. The treatment has been done three times per week during five weeks. The moderate intensity was used; the time used was six minutes (6 min) for the hips, for whom has both of injuries (hips, knee, and ankle), after the first session a rest of one minute (1 min) has been taken before applying the knee and ankle treatment during seven minutes each other, but a rest of one minute must be respected between the sessions. The whole time of treatment were 20 minutes.

In the research done by Sangam showed that Stretching of hamstring and strengthening of quadriceps muscle can enhance the pain and energy of the muscle mass [15]. Hip injuries were associated with age, life activities, but a therapeutic exercise of myofascial muscle could decrease pain [16]. Therapeutic exercise can remedy hip and knee osteoarthritis [17]. In this research, the proposed exercises were very benefit because they increased the hip, knee flexion and strength at the same time. Secondly a game of exercise like: (1) Hamstring stretch, (2) Straight leg raise, (3) Quad set, (4) Pillow Squeeze, (5) Prone Straight leg raises, (6) Side leg raise, (7) One leg balance, (8) Wall Squats. The different exercises used were respected during five weeks, three times per week. The time was seven minutes. It was found that those exercises were very easy and helpful in increasing strength and knee flexibility. The study by Page showed that Human movement is dependent on the amount of range of motion (ROM) reachable in synovial joints. In general, ROM might also be confined by means of 2 anatomical entities: joints and muscles. Joint restraints include joint geometry and congruency as well as the capsule ligamentous structures that encompass the joint[18]. Next a group of exercise like: (1) Ankle alphabet (2) Towel tissue scrunches, (3) Heel raise, (4) Heel-to-buttock exercise, (5) Elastic band pull, (6) Calf Stretch, (7) One-leg balance, the previous exercises were applied on ankle injuries. It was found that there was an increasing of strength and ankle flexibility. Analysis of the pre-test and posttest data from the hips, knee, and ankle showed that the was a significant different between them before and after the treatment. In other word, therapeutic exercise was very benefited on healing chronic hip, knee, and ankle injuries. Sprain and strain can be relieved by soft tissue massage but we need to complete the recovering with strength exercise [19]. At the end the posttest of strength and have been done and the outcomes showed that there was an improving of them comparing to the pre-test data. In conclusion based on the result and the relevant studies, combine massage and physiotherapeutic exercise were very benefit on the strength and flexibility improving.

The combination method of massage therapy and physiotherapeutic exercise is very easy to apply in the field as a guide to help patients with chronic hip, knee and ankle pain. The combination of massage and exercise therapy can (1) restore pain / chronic injury, (2) launch blood bleeding, (3), increase muscle and ligament strength, (4) increase joint flexibility. With a combination of therapeutic massage and therapeutic exercises the patient lives healthy and fit.

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Conflict of Interest

The authors declare that there is no conflict of interest.

Appendix

The table 6 showed that the pre-test of ROM has been carried out to consider the knee flexibility however additionally to determine the pain level. As the results are presented in the table 6 confirmed that there used to be proper flexion between 20-40°; its post-test was once between 17-30°. For the left flexion result used to be blanket between 27-65° for the duration of pre-test, at the post-test end result was 27-60°. For the two first results there is different between the pre-test and the post-test.

The table 7. a); gave the information about ankle articulations. The ankle articulation is very complex and has more- less than four articulations: Plantar, back flexion, inversion and eversion flexion. At the commencing the back-flexion result was between 5-30°; the last check confirmed the following result: 12-30°; the result confirmed that there is distinctive adaptation among subjects according to the treatment: rub down and exercise therapy, this is very appreciation because they have one-of-a-kind ache stage the reason whilst their values are different. Three patients didn’t enhance left returned flexion among as quantity 2, 3, 6 for them they have low movement coordination in the left member. It can be concluded that the coordination is an influenced thing for flexibility.
Table 6. Pre-Test and Posttest of the Knee Range of Motion (ROM)

| Subjects | Knee Range of Motion (ROM) |   |   |   |   |   |   |   |
|----------|---------------------------|---|---|---|---|---|---|---|
|          | Right Flexion | Left Flexion | Right Extension | Left Extension |   |   |   |   |
|          | Pre-Test | Posttest | Pre-Test | Posttest | Pre-Test | Posttest | Pre-Test | Posttest |
| 1        | 35     | 29     | 35     | 34     | 8      | 14     | 10      | 14     |
| 2        | 35     | 30     | 30     | 30     | 10     | 20     | 15      | 22     |
| 3        | 35     | 30     | 28     | 28     | 8      | 10     | 10      | 10     |
| 4        | 30     | 30     | 27     | 27     | 7      | 22     | 10      | 15     |
| 5        | 30     | 22     | 45     | 40     | 7      | 9      | 15      | 18     |
| 6        | 25     | 17     | 40     | 34     | 12     | 24     | 10      | 12     |
| 7        | 40     | 33     | 45     | 40     | 8      | 10     | 8       | 8      |
| 8        | 35     | 30     | 65     | 60     | 10     | 20     | 15      | 18     |
| 9        | 35     | 30     | 28     | 28     | 7      | 10     | 10      | 10     |
| 10       | 20     | 13     | 35     | 28     | 7      | 13     | 15      | 20     |
| 11       | 20     | 20     | 40     | 35     | 8      | 10     | 10      | 15     |

Table 7. a) Pre-Test and Posttest of the Ankle Range of Motion (ROM)

| Subjects | Ankle Range of Motion (ROM) |   |   |   |   |   |   |   |
|----------|----------------------------|---|---|---|---|---|---|---|
|          | Right back flexion | Left back flexion | Right Plantar | Left Plantar |   |   |   |   |
|          | Pre-Test | Posttest | Pre-Test | Posttest | Pre-Test | Posttest | Pre-Test | Posttest |
| 1        | 10     | 20     | 10     | 19     | 60     | 85     | 85      | 85     |
| 2        | 30     | 30     | 10     | 10     | 55     | 70     | 70      | 70     |
| 3        | 30     | 30     | 30     | 10     | 60     | 80     | 80      | 80     |
| 4        | 10     | 26     | 22     | 32     | 65     | 81     | 75      | 85     |
| 5        | 10     | 15     | 10     | 15     | 60     | 80     | 80      | 80     |
| 6        | 20     | 20     | 20     | 20     | 60     | 80     | 80      | 80     |
| 7        | 16     | 21     | 16     | 17     | 50     | 65     | 75      | 80     |
| 8        | 15     | 24     | 15     | 25     | 60     | 65     | 80      | 75     |
| 9        | 10     | 30     | 10     | 22     | 65     | 74     | 65      | 85     |
| 10       | 10     | 20     | 10     | 15     | 70     | 80     | 70      | 85     |
| 11       | 15     | 30     | 10     | 22     | 60     | 85     | 50      | 60     |
| 12       | 10     | 25     | 5      | 20     | 60     | 65     | 60      | 75     |
| 13       | 5      | 20     | 5      | 10     | 60     | 80     | 80      | 80     |
| 14       | 10     | 20     | 10     | 24     | 50     | 65     | 55      | 75     |
| 15       | 10     | 12     | 10     | 12     | 55     | 60     | 70      | 80     |

Table 7. b) Pre-Test and Posttest of the Ankle Range of Motion (ROM)

| Subjects | Ankle Range of Motion (ROM) |   |   |   |   |   |   |   |
|----------|----------------------------|---|---|---|---|---|---|---|
|          | Right Inversion | Left Inversion | Right Eversion | Left Eversion |   |   |   |   |
|          | Pre-Test | Posttest | Pre-Test | Posttest | Pre-Test | Posttest | Pre-Test | Posttest |
| 1        | 21     | 65     | 21     | 70     | 21     | 65     | 22      | 65     |
| 2        | 18     | 18     | 25     | 25     | 41     | 41     | 50      | 50     |
| 3        | 10     | 10     | 30     | 10     | 20     | 20     | 20      | 20     |
| 4        | 45     | 80     | 45     | 70     | 55     | 70     | 30      | 60     |
| 5        | 82     | 82     | 65     | 65     | 45     | 45     | 55      | 55     |
| 6        | 40     | 70     | 40     | 70     | 25     | 60     | 25      | 60     |
| 7        | 30     | 65     | 30     | 65     | 30     | 50     | 30      | 70     |
| 8        | 30     | 70     | 30     | 70     | 30     | 50     | 30      | 30     |
| 9        | 20     | 55     | 20     | 70     | 20     | 60     | 20      | 65     |
| 10       | 20     | 70     | 20     | 55     | 20     | 60     | 20      | 60     |
| 11       | 40     | 60     | 40     | 57     | 30     | 40     | 15      | 20     |
| 12       | 50     | 70     | 40     | 70     | 12     | 55     | 12      | 50     |
| 13       | 50     | 75     | 50     | 75     | 45     | 65     | 45      | 65     |
| 14       | 40     | 55     | 50     | 70     | 28     | 50     | 28      | 32     |
The table 7.b) declared that the results in the pre-test had been respectively: 10-820(right inversion); 21-650(left inversion); 21-550(right eversion); 12-550(left eversion). Their post-test has been consecutively: 10-820(right inversion), 10-750(left inversion), 20-700(right eversion), and 20-700(left eversion).

Only variety three has a precise on inversion and eversion due to the fact he didn’t join two periods which confirmed that much less than 5 meeting there is no right and left inversion and eversion enhancement for anybody who has continual ankle injury.

The table 8 gave the great information about the pre-test and post-test, the result showed that there was a great different after treatment, the conclusion has been taken after making a compared mean.

The table 9 showed that the mean of the pre and post-test about the hip’s ROM were totally different which attested that the program applied was great for improving flexibility.

The table 10 and 11 showed the result which tasted that the program applied has a great influence on increasing strengthen. The different between the mean of pre and post was high but the standard of deviation was great which showed that the program was helpfully.

| Subjects | Pre-Test Right Leg | Flexion | Flexion Left Leg | Extension Right Leg | Extension Left Leg |
|----------|-------------------|---------|-------------------|---------------------|-------------------|
| 1        | 100               | 145     | 84                | 110                 | 30                |
| 2        | 105               | 130     | 105               | 130                 | 20                |
| 3        | 111               | 130     | 112               | 132                 | 35                |
| 4        | 107               | 120     | 111               | 131                 | 20                |
| 5        | 110               | 135     | 109               | 135                 | 30                |
| 6        | 110               | 123     | 100               | 117                 | 14                |
| 7        | 130               | 140     | 100               | 120                 | 45                |
| 8        | 100               | 135     | 104               | 109                 | 25                |
| 9        | 116               | 130     | 105               | 110                 | 27                |
| 10       | 106               | 130     | 100               | 122                 | 35                |
| 11       | 112               | 140     | 110               | 115                 | 15                |
| 12       | 100               | 130     | 105               | 110                 | 27                |

| Mean     | N     | Std. Deviation | Std. Error Mean |
|----------|-------|---------------|-----------------|
| Pre-test right leg hip flexion | 108.92 | 12 | 8.404 | 2.426 |
| Posttest right leg hip flexion | 132.33 | 12 | 7.127 | 2.057 |
| Pre-test left hip flexion | 103.75 | 12 | 7.533 | 2.175 |
| Posttest left hip flexion | 120.08 | 12 | 9.765 | 2.819 |
| Pre-test right hip extension | 26.92  | 12 | 8.969 | 2.589 |
| Posttest right hip extension | 31.67  | 12 | 8.742 | 2.524 |
| Pre-test left hip extension | 28.42  | 12 | 11.996| 3.463 |
| Posttest left hip extension | 33.92  | 12 | 11.301| 3.262 |

| Classes   | N  | Mean     | Std. Deviation | Std. Error Mean |
|-----------|----|----------|---------------|-----------------|
| Test      |   |          |               |                 |
| Pre-test  | 15 | 42.5333  | 18.45406      | 4.76482         |
| Posttest  | 15 | 68.4667  | 25.20450      | 6.50777         |

| Levine’s Test for      | t-test for Equality | 95% Confidence interval of different |
| Equalities of Variances| t    | Sig. | t   | Sig. (2-tailed) |
| Equal variances assumed| F    |     |     |                  |
| Equal variances not assumed| .048 | .315 | -3.215 | 28 (.003) |
|                             |      |     | -3.215 | 25.659 (.004) |
Table 12. Descriptive statistics of pre-test and posttest knee flexion and extension (ROM) by Paired Samples Statistics

| Pair  | Pre-test (Right Flexion) | Mean    | N  | Std. Deviation | Std. Error Mean |
|-------|--------------------------|---------|----|----------------|-----------------|
|       |                          | 30.9091 | 11 | 6.64010        | 2.00207         |
|       | Posttest (Right Flexion) | 25.8182 | 11 | 6.63051        | 1.99917         |
|       | Pre-test (Left Flexion)  | 38.6364 | 11 | 10.68899       | 3.22285         |
|       | Posttest (Left Flexion)  | 35.5455 | 11 | 9.27754        | 2.79728         |
|       | Pre-test (Right Extension)| 8.3636 | 11 | 1.62928        | 0.49125         |
|       | Posttest (Right Extension)| 14.7273| 11 | 5.65846        | 1.70609         |
|       | Pre-test (Left Extension)| 11.6364| 11 | 2.73030        | 0.82322         |
|       | Posttest (Left Extension)| 14.7273| 11 | 4.47417        | 1.34901         |

Table 13. Comparison of pre-test and posttest knee flexion and extension (ROM) by Paired Samples Test, 95% Confidence Interval difference

| Paired Differences | Mean  | Std. Deviation | Std. Error Mean |
|--------------------|-------|----------------|-----------------|
|                    |       |                |                 |
| Pair 1             | Pre-test - Posttest | 5.09091 | 2.77325 | .83617 | 2.22782 | 6.95400 | 6.088 | 10 | .000 |
|                    | Pre-test - Posttest | 3.09091 | 2.84445 | .85763 | 1.17998 | 5.00184 | 3.604 | 10 | .005 |
|                    | Pre-test - Posttest | -6.36364 | 4.69623 | 1.41597 | -9.51860 | -3.20867 | -4.494 | 10 | .001 |
|                    | Pre-test - Posttest | -3.09091 | 2.38556 | .71927 | -4.69355 | -1.48827 | -2.397 | 10 | .002 |

Table 14. Descriptive statistics of pre-test and posttest Ankle back flexion and plantar (ROM) by Paired Samples Statistics

| Pair  | Pre-test Right back Flexion | Mean  | N  | Std. Deviation | Std. Error Mean |
|-------|-----------------------------|-------|----|----------------|-----------------|
|       | Pre-test Right back Flexion | 14.07 | 15 | 7.382          | 1.906           |
|       | Posttest Right back Flexion | 22.87 | 15 | 5.630          | 1.454           |
|       | Pre-test Left back Flexion  | 12.87 | 15 | 6.717          | 1.734           |
|       | Posttest Left back Flexion  | 18.20 | 15 | 6.372          | 1.645           |
|       | Pre-test Right Plantar Flexion | 59.33 | 15 | 5.300          | 1.369           |
|       | Posttest Right Plantar Flexion | 74.33 | 15 | 8.474          | 2.188           |
|       | Pre-test Left Plantar Flexion | 71.67 | 15 | 10.293         | 2.658           |
|       | Posttest Left Plantar Flexion | 78.33 | 15 | 6.726          | 1.737           |

Table 15. Comparison of pre-test and posttest Ankle back flexion and (ROM) by Paired Samples Test, 95% Confidence Interval difference

| Paired Differences | Mean  | Std. Deviation | Std. Error Mean |
|--------------------|-------|----------------|-----------------|
|                    |       |                |                 |
| Pair 1             | Pre-test - Posttest | -8.800 | 6.570 | 1.696 | -12.439 | -5.161 | -5.187 | 14 | .000 |
|                    | Pre-test - Posttest | -5.333 | 8.633 | 2.229 | -10.114 | -.553 | -2.393 | 14 | .031 |
|                    | Pre-test - Posttest | -15.000 | 6.876 | 1.775 | -18.808 | -11.192 | -8.448 | 14 | .000 |
|                    | Pre-test - Posttest | -6.667 | 8.165 | 2.108 | -11.188 | -2.145 | -3.162 | 14 | .007 |

The table 12 and 13 showed that the combine massage and physiotherapeutic exercise applied were benefit in increasing ROM about flexion, and extension of the knee, all the P value were inferior than 0.05 which means that there was a significant different between the pre-test and post-test.

The desk 14 and 15 confirmed that the combine rubdown and physiotherapeutic exercising utilized had been advantage in growing ROM about flexion, and plantar of the ankle, all the P value had been inferior than 0.05 which skill that there used to be a vast extraordinary between the pre-test and post-test.
The desk 16 and 17 confirmed that the combine rubdown and physiotherapeutic exercising utilized had been advantage in growing ROM about flexion, and extension of the knee, all the P value had been inferior than 0.05 which skill that there used to be a vast extraordinary between the pre-test and post-test.

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