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

additionally among the most severe.

Neuromuscular dysfunction of the leg and thigh musculature, along with lowered power and postural control, is common in sufferers with continual ankle instability [4]. Nevertheless Osteoarthritis (OA) is a growing public fitness hassle across the globe, affecting more than half of the over sixty five population. In the past, OA was viewed a wear and tear disease, leading to the loss of articular cartilage and joint disability [5]. Ankle strain and sprain are very a whole lot common each in the wearing activities and the everyday community. Ankle sprain is mentioned to be among the most frequent recurrent injuries. About 20% of acute ankle sprain patients boost chronic ankle instability. The failure of useful rehabilitation after acute ankle sprain leads to the development of continual ankle instability [6]. A number of posture taken in the course of working in an every field existing a distinct risk of harm due to the excessive exposure to bent postures [7]. Low back pain (LBP) is one of the very best incidence issues of public health. Low back pain (LBP) influences up to 85% people worldwide. Somebody will be affected at much less in one point of his life. LBP symbolizes a full-size economic burden on society; its complete value includes: direct scientific costs, work absenteeism, insurance, misplaced manufacturing and disability advantages. Low back pain (LBP) is the most frequent incapacity worldwide and turning into Chronic low returned pain which its regular is already elevated [8]. Musculoskeletal disabilities are established and their affects are pervasive. They are the most common cause of severe longterm ache and physical disability, and they have an effect on heaps of millions of humans around the world.

Aging is additionally a strong component of the most common websites for musculoskeletal disorder of continual knee and ankle. In 2010, The European Agency for Safety and Health at Work (OSHA) said that Musculo-Skeletal Disorders (MSDs) had been the most frequent work related fitness hassle in Europe, affecting tens of millions of workers [9]. In the learn about executed with its objectives to check the incidence and depth of musculoskeletal pain as a danger thing for decreased work ability. With sampling 1449 workers participated in the study, 64% had been youthful workers (<45 years old, M 31.4); 36% had been getting old employees (>45 years old, M 50.3). The outcomes of the find out about confirmed that even though in the each groups, i.e., younger and growing older workers, the occurrence and depth of ache in decrease lower back muscle mass two have been a full-size component which decreased work ability intensity, in growing older workers only the occurrence of pain in the lower again generated greater risk elements for reduced work potential ($WAI < 37$) [10]. Musculoskeletal issues (MSDs) are a significant and increasing occupational health issues in the workplace worldwide. The causes of work-related MSDs are normally 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, tense 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. 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

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			
	Instructions	Volume	Intensity	Duration: 20 minutes
Swedish Massage ● Effleurage ● Petrissage ● Friction ● Tapotement: • cupping • Hacking • Beating	• From back layer position: apply effleurage from toes up to abdomen muscles	20-25 floating (1 set)	Low-moderate	2 min
	• Laying down: apply effleurage from toe foot point up to scapula muscles	20-25 floating (1 set)	Low-moderate	2 min
	• Apply petrissage on the whole hips, knee, and ankle muscles	25-30 strokes (1 set)	Moderate	2 min
	• Apply friction on the specific muscle pain or injury	25-30 strokes (1 set)	Moderate	2 min
	• 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
	• Hacking to stimulate nervous and blood flow	40-80 strokes (1 set)	High	40 secs
	• Apply beating on adipose muscles like gluteus, quadriceps and hamstring to destroy myogelosis	40-80 strokes (1 set)	High	40 secs
Deep Tissue • Petrissage • Friction	Apply deeply petrissage and friction again for strains and sports injuries.	25-30 strokes (1 set) 25-30 strokes (1 set)	High High	2 min 2 min
Soft Tissue Release • Petrissage • Friction	Apply petrissage and friction with soft tissue release to stimulate large nervous, tendon, ligament, increase endorphin, and ROM	25-30 strokes (1 set) 25-30 strokes (1 set)	Moderate Moderate	1.5 min 1.5 min
Sport Massage • Effleurage • Vibration	Apply effleurage and Vibration to remove waste product, increase healing, and recovering	25-30 strokes (1 set) 25-30 strokes (1 set)	Moderate Moderate	1.5 min min

Table 2. Program for relieving Hips, Knee, and Ankle Injuries, and Increasing Strength and Flexibility Lower Extremity during 20 minutes X 3 t X 5 W

Hips, Knee, and Ankle hips Massage Therapy					
Principles		Type of Exercise / Component	Instructions	Volume, intensity, frequency, duration, set, rest	The benefits
1. Readiness Principle	1. Knee lift	1. Knee lift	Apply exercise number one to seven [1-7] in laying position. Do yourself of with partner. Number three and four you are oblige to be parenting.	2x3x10 sec/session Volume: One set Repetition: Three (3)	- Relaxing muscle tension - Relaxing tendon - Relaxing ligements - Relaxing joints - Increasing flexibility - Increasing blood circulation - Decreasing cortisol hormone - Increase insulin sensitivity - reduce muscle fatigue - Reduces anxiety - Soothes headache - Decreasing muscle soreness: - Improving posture - Decreasing stress relief - Improving endorphins hormone - Strengthen muscle and tendons - Lowered injury risks. - Strengthened mental health - Controlled blood sugar levels - Better cardiovascular health - Maintaining Muscle Tissue - Increased Strength - Improved Bone Health. - to protect your joints from injury - maintaining flexibility and balance - remain independent - endocrine system
2. Individual Principles	2. Hip and low back stretch	2. Hip and low back stretch	Apply it on each side or on each member concerned. Three times for concerned member	2: Two members or two size Duration: one menite (1 min) Rest: 10 sec between one exercise and other	
3. Adaptation Principles	3. Double hips rotation	3. Double hips rotation	Hold it during 10 sec for one repetition	3times /week during 5 weeks	
4. Overload Principle	4. Hips swinging	4. Hips swinging	Do one set	2x2x15sec/session Duration: one minute (1 min) Rest: 10 sec between one exercise and other	
5. Progressive (Enhancement) Principle	5. Squeeze	5. Squeeze	Maximum duration: one minute for each exercise	2x2x10x10 sec 2 sets	
6. Principle of Specification	6. Muscle cladding	6. Muscle cladding	From exercise number 8-11	2 times 10 repetitions time 10 sec rest time repetition: 5 sec rest time between set 10 sec	
7. Principle of Variation	7. Hamstring stretch	7. Hamstring stretch	Two times for each member		
8. The principle of heating	8. Bridging	8. Bridging	Hold it during 15 sec for one repetition		
9. Principles of Long Term Training	9. Side leg raises	9. Side leg raises	Maximum duration: one minute for each exercise		
10. The Reversibility Principle	10. Prone straight leg raises	10. Prone straight leg raises	From exercise number 12-18		
11. The Principle of Over-moderation (Moderate)	11. External hip rotation	11. External hip rotation	10 repetitions		
12. Systematic Principles	12. Towel and tissue scrunches	12. Towel and tissue scrunches	Four times		
	13. Heel raises	13. Heel raises			
	14. Calf stretch	14. Calf stretch			
	15. Hip abduction	15. Hip abduction			
	16. Hip flexion	16. Hip flexion			
	17. Mini-squat parenting	17. Mini-squat parenting			
	18. Mini-squat	18. Mini-squat			

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.

Figure 1. Physiotherapeutic Exercise Image

Figure 2. 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.

Table 4. Independent Samples Test Pre-test and Posttest Strength Measurement

	Levine's Test for Equality of Variances	t-test for Equality		95% Confidence interval of different	
	F	Sig.	t	t	Sig. (2-tailed)
Test Equal variances assumed	1.048	.315	-3.215	28	.003
Equal variances not assumed			-3.215	25.659	.004

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 followed the physiotherapeutic exercise program, because of the long 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 there 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 blanketed 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	35	28	7	10	10	10
10	20	13	35	35	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	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.

Table 8. Pre-Test and Posttest of the Hips Range of Motion (ROM)

Subjects	Hips Range of Motion (ROM) in Degree							
	Flexion Right Leg		Flexion Left Leg		Extension Right Leg		Extension Left Leg	
	Pre-Test	Posttest	Pre-Test	Posttest	Pre-Test	Posttest	Pre-Test	Posttest
1	100	145	84	110	30	26	20	26
2	105	130	105	130	20	30	25	30
3	111	130	112	132	35	40	30	35
4	107	120	111	131	20	25	40	45
5	110	135	109	135	30	35	25	30
6	110	123	100	117	14	20	10	20
7	130	140	100	120	45	50	35	40
8	100	135	104	109	25	30	35	40
9	116	130	105	110	27	32	18	23
10	106	130	100	122	35	40	30	35
11	112	140	110	115	15	20	55	60
12	100	130	105	110	27	32	18	23

Table 9. Descriptive statistics of pre-test and posttest the Hips Range of Motion (ROM)by Paired Samples Statistic

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	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
Pair 2	Pre-test left hip flexion	103.75	12	7.533	2.175
	Posttest left hip flexion	120.08	12	9.765	2.819
Pair 3	Pre-test right hip extension	26.92	12	8.969	2.589
	Posttest right hip extension	31.67	12	8.742	2.524
Pair 4	Pre-test left hip extension	28.42	12	11.996	3.463
	Posttest left hip extension	33.92	12	11.301	3.262

Table 10. Compared Mean Pre-test and Posttest Strength Measurement

	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

Table 11. Independent Samples Test Pre-test and Posttest Strength Measurement

	Levine's Test for Equality of Variances		t-test for Equality		95% Confidence interval of different
	F	Sig.	t	t	Sig. (2-tailed)
Test Equal variances assumed			-3.215	28	.003
Equal variances not assumed	1.048	.315	-3.215	25.659	.004

Table 12. Descriptive statistics of pre-test and posttest knee flexion and extension (ROM) by Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-test (Right Flexion)	30.9091	11	6.64010	2.00207
	Posttest (Right Flexion)	25.8182	11	6.63051	1.99917
Pair 2	Pre-test (Left Flexion)	38.6364	11	10.68899	3.22285
	Posttest (Left Flexion)	35.5455	11	9.27754	2.79728
Pair 3	Pre-test (Right Extension)	8.3636	11	1.62928	.49125
	Posttest (Right Extension)	14.7273	11	5.65846	1.70609
Pair 4	Pre-test (Left Extension)	11.6364	11	2.73030	.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					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Pre-test - Posttest	5.09091	2.77325	.83617	3.22782	6.95400	6.088	10	.000
Pair 2	Pre-test - Posttest	3.09091	2.84445	.85763	1.17998	5.00184	3.604	10	.005
Pair 3	Pre-test - Posttest	-6.36364	4.69623	1.41597	-9.51860	-3.20867	-4.494	10	.001
Pair 4	Pre-test - Posttest	-3.09091	2.38556	.71927	-4.69355	-1.48827	-4.297	10	.002

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

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-test Right back Flexion	14.07	15	7.382	1.906
	Posttest Right back Flexion	22.87	15	5.630	1.454
Pair 2	Pre-test Left back Flexion	12.87	15	6.717	1.734
	Posttest Left back Flexion	18.20	15	6.372	1.645
Pair 3	Pre-test Right Plantar Flexion	59.33	15	5.300	1.369
	Posttest Right Plantar Flexion	74.33	15	8.474	2.188
Pair 4	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					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Pre-test - Posttest	-8.800	6.570	1.696	-12.439	-5.161	-5.187	14	.000
Pair 2	Pre-test - Posttest	-5.333	8.633	2.229	-10.114	-.553	-2.393	14	.031
Pair 3	Pre-test - Posttest	-15.000	6.876	1.775	-18.808	-11.192	-8.448	14	.000
Pair 4	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.

Table 16. Descriptive statistics of pre-test and posttest Ankle inversion and eversion (ROM) by Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-test Right Inversion	35.43	14	18.484	4.940
	Posttest Right Inversion	60.36	14	21.252	5.680
Pair 2	Pre-test Left Inversion	36.14	14	13.381	3.576
	Posttest Left Inversion	60.14	14	19.082	5.100
Pair 3	Pre-test Right Eversion	30.14	14	12.184	3.256
	Posttest Right Eversion	52.21	14	13.045	3.487
Pair 4	Pre-test Left Eversion	28.71	14	12.916	3.452
	Posttest Left Eversion	50.14	14	17.373	4.643

Table 17. Comparison of pre-test and posttest Ankle inversion and eversion (ROM) by Paired Samples Test, 95% Confidence Interval difference

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Pre-test - Posttest	-24.929	16.550	4.423	-34.485	-15.373	-5.636	13	.000
Pair 2	Pre-test - Posttest	-24.000	19.663	5.255	-35.353	-12.647	-4.567	13	.001
Pair 3	Pre-test - Posttest	-22.071	16.170	4.322	-31.407	-12.735	-5.107	13	.000
Pair 4	Pre-test - Posttest	-21.429	18.924	5.058	-32.355	-10.502	-4.237	13	.001

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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