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# Injury Therapy Program Reduce Pain Scale on Knee Injury at Jogja Sports Clinic

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**Abstract**

Health is desired by everyone because it enables individuals to live socially and economically productive lives. Injuries can hinder daily activities, therefore appropriate actions are needed to facilitate recovery. The purpose of this study is to determine the effectiveness of injury therapy programs (manual therapy, electrical therapy, and cold therapy) on reducing pain in knee injuries at Jogja Sports Clinic.The research method used is a quasi experiment one-group pre-test post-test design. The research sample was obtained through purposive sampling, which included patients at Jogja Sports Clinic who met the inclusion criteria. The independent variable in this study is the injury therapy program, which includes manual therapy using massage, electrical therapy using TENS, and cold therapy using ice compresses. The dependent variable is pain perception, which is measured using a visual analog scale (VAS). Data analysis techniques use paired t tests, which has passed the prerequisite tests for normality and homogeneity.The average VAS pretest result of n=15 research subjects is 7, while the average VAS posttest result of n=15 is 2. Using paired t-test with the assistance of SPSS version 27 application, the significance value (2-tailed) is 0.001. Paired t-test is considered effective when the sig. value (2-tailed) < 0.05.The study that concluded the injury therapy program consist of massage, TENS, and cold compression with 3 sessions per week for 2 weeks, effectively reduced knee pain in Jogja Sports Clinic by 71%. The recommendation given for further research is to pay attention to the limitations within the study and the need to increase the sample size in order to obtain more optimal results.

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## INTRODUCTION

Health is desired by everyone, as it enables an individual to live socially and economically productive lives. Health is a crucial factor in life because when a person is healthy, they can engage in activities comfortably and be beneficial to others (Fuadi Husin, 2014). Injuries occur due to various factors and require special attention, especially for athletes. Sports injuries can be caused by accidents, poor fitness performance, faulty equipment, lack of preparation for physical conditions, and inadequate warm-up (Sudirman et al., 2021). Musculoskeletal sports injuries can disrupt an individual's daily activities, such as knee injuries that affect the decline in function and performance of the lower limbs, even the overall human activities. Common sports injuries include sprains, swollen muscles, torn tendons, fractures, and dislocations Darni & Welis (2018) in journal Djangka & Fansuri (2023). The strong structure of knee joint ligaments plays an important role as a support for the body. However, this can also lead to damage to the knee joint if not taken into consideration (Sarah et al., 2007). According to Baumbach et al. (2014), knee injuries, which pose a risk at all ages, are reported at a rate of 1-12 cases per 10,000 hospitalizations per year, with 80% occurring in males aged 40-60 years. Around 1/3 of the cases are septic bursitis, and 2/3 are non-septic bursitis. Most cases of non-septic bursitis occur in athletes due to sports injuries (ice hockey, volleyball, or wrestling) or in certain occupational groups (carpenters, gardeners, roofers) where there is frequent pressure and repetitive motion on the anterior patella.

In the journal Semarayasa (2014), approximately 55 percent of sports-related injuries are knee injuries. These injuries account for one out of 40 orthopedic surgical cases. The most common injuries involve the joints and cartilage (cracks), including pain and discomfort associated with the knee cap, with the highest risk occurring in sports such as running, swimming, aerobics, soccer, basketball, volleyball, and athletics, where the knee bears the weight, thus potentially leading to arthritis. The research conducted by Simatupang & Suprayogi (2019) with the title "Survey of Sports Injuries in PPLP North Sumatra Soccer Athletes" shows the distribution of injuries in percentage, which can occur as follows: head 1%, neck 1.5%, arms 14%, torso 1%, back 16%, hands and wrists 4%, waist/hips 5.5%, thighs 9%, knees 22.5%, feet/lower legs 10%, heels 14%, and soles of the feet 1.5%. Knee injuries have a significant percentage because they serve a dual function as both movers and weight-bearing supports, thereby increasing the risk of injury.

The key to recovery is early evaluation with medical professionals. In the early stages of injury, a common occurrence is the appearance of a lump or swelling in the injured area. Acute neuro-musculoskeletal injuries are often characterized by inflammatory signs such as redness (rubor), heat (calor), swelling (tumor), pain (dolor), and loss of function (functiolaesa) (Hakiki & Kushartanti, 2019). This leads to difficulty in using the injured area as intended. The body unconsciously responds in this way as a defense mechanism to prevent further damage from occurring. This is particularly crucial for athletes, as an injury could result in a lengthy rest period or even require them to give up their hobbies and professions (Artanayasa & Putra, 2014).

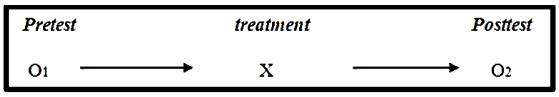
The researchers conducted fieldwork practice from August 2022 to December 2022 at Jogja Sports Clinic, which is one of the injury rehabilitation centers in Yogyakarta where numerous cases of knee injuries were handled. During that period, the researchers developed an interest in the initial treatment of knee injuries to minimize the severity of the injuries, especially those affecting the lower limbs, considering that the knee is an active joint that significantly influences a person's activities. The injury therapy program in this research is based on non-exercise sports injury therapy applied at Jogja Sports Clinic, which includes manual therapy (massage) on the surrounding areas of the injury, electrical therapy (TENS) on the

injured area to alleviate pain, and cold therapy (ice compression) to control swelling and reduce pain. The massage techniques used in the research include effleurage, friction, and myofascial release. The injury therapy program was conducted to determine its effectiveness and to control initial injuries to prevent them from worsening.

Based on the background of the problem and discussions held by the researchers with therapists, as well as the increasing awareness of the community about the early treatment of injuries, especially knee injuries, the researchers conducted a study titled "The Effectiveness of Injury Therapy Program on Reducing Pain in Knee Injuries at Jogja Sports Clinic." The purpose of this research is to determine the effect of the therapy program in reducing pain in knee injuries.

## METHODS

The research utilizes a quasi-experimental research design. The design used is the one group pretest-posttest design, which reveals cause-and-effect relationships by involving a single group of subjects.




**Picture 1.** Research Design

Description:

$O_1$: Pre-test consists of measuring knee pain levels using VAS before the implementation of the injury therapy program (manual therapy, electrical therapy, and cold therapy).

X: The application of the injury therapy program (manual therapy, electrical therapy, and cold therapy).

$O_2$: Post-test involves measuring pain levels using VAS after the implementation of the injury therapy program (manual therapy, electrical therapy, and cold therapy).

The population used in this study consisted of 20 knee patients from Jogja Sports Clinic. The subjects selected for this research were chosen using purposive sampling technique, with the following inclusion criteria: 1) patients from Jogja Sports Clinic, 2) currently experiencing knee injuries, 3) still experiencing knee pain, and 4) willing to participate as research samples. From these criteria, 15 individuals were found to meet the inclusion criteria. The independent variables include the injury therapy program (manual therapy, electrical therapy, cold therapy). The dependent variable is the level of pain, measured using the visual analog scale (VAS) instrument, ranging from 0 (indicating no pain) to 10 (indicating severe pain) (Umami et al., 2014). Data analysis was conducted using a parametric paired t-test, preceded by testing for prerequisites such as normality and homogeneity (Usmadi, 2020).

## RESULTS AND DISCUSSION

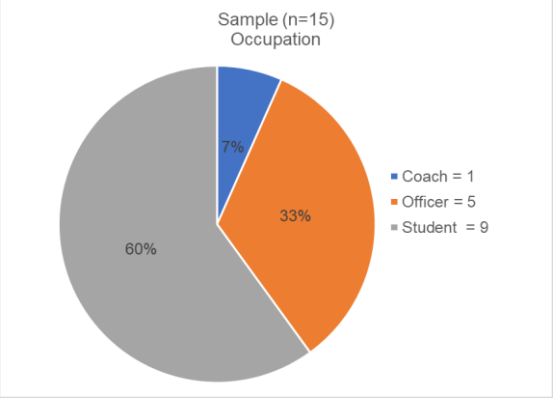
The data analysis collected from the research conducted from May 15, 2023, to June 17, 2023, will be statistically tested using SPSS version 27 software. The data has been processed using the paired t-test and has passed the tests for normality and homogeneity. The obtained data are presented in Table 1:

**Table 1.** Sample Characteristics Data

| Variable | Sample (n) Mean±SD. | Min-Max |
|---|---|---|
| Age (yr) | 2.,8±6.9 | 15-46 |
| Height (cm) | 169.6±2.7 | 165-175 |
| Weight (kg) | 60.8±3.7 | 52-69 |
| BMI (kg/m$^2$) | 21.1±1.2 | 182-23.3 |
| VAS Pretest | 7±1.4 | 4-9 |
| VAS Posttest | 2±1.3 | 0-4 |

Based on Table 1, it shows that the sample characteristics have a minimum age of 15 years and a maximum age of 46 years, with a mean±Std. Deviation of 23,8 ± 6,9 years. The minimum height is 165 cm, and the maximum height is 175 cm, with a mean±Std. Deviation of 169,6 ± 2,7 cm. The minimum weight is 52 kg, and the maximum weight is 69 kg, with a mean±Std. Deviation of 60,8 kg±3,7. The Body Mass Index (BMI) ranges from a minimum of

18,2 kg/m2 to a maximum of 23,3 kg/m2, with a mean±Std. Deviation of 21,1 ±1,2 kg/m2. The VAS pretest ranged from 4 to 9 with a mean±Std. Deviation of 7±1,4, while the VAS posttest ranged from 0 to 4 with a mean±Std. of 2±1,3.




**Picture 2.** Percentage Occupation

Based on Picture 2 the percentage for occupations is as follows: there is 1 coach, percentage 6.7% of the sample; there are 5 officer, percentage 33.3% of the sample; and there are 9 students, making up 60% of the sample.

The pretest and posttest data for the Visual Analog Scale (VAS) were also obtained, which are the primary data for this research. Here are the details:

**Table 2.** VAS Pretest-Posttest

| VAS | Pretest | | Posttest | |
|---|---|---|---|---|
| n=15 | n | % | n | % |
| 10 | 0 | 0 | 0 | 0 |
| 7-9 | 8 | 53 | 0 | 0 |
| 4-6 | 7 | 47 | 1 | 6 |
| 1-3 | 0 | 0 | 10 | 67 |
| 0 | 0 | 0 | 4 | 27 |

In Table 2, the distribution of pain data in the measurement of the injury therapy program using the VAS instrument is presented. In the Pretest (n=15), there were 8 samples experiencing severe pain, and 7 samples experiencing moderate pain. After 6 sessions of the injury therapy program (Posttest), the results showed that 1 sample experienced moderate pain, 10 samples experienced mild pain, and 4 samples did not feel any pain.

The data obtained were then analyzed using a parametric test, specifically the paired t-test. Prior to that, prerequisite tests were conducted, and the data passed the tests for normality and homogeneity. The paired t-test produced the following data:

**Table 3.** Paired T Test

| VAS | Mean | Δ | Percentage | *p* (sig.) |
|---|---|---|---|---|
| Pretest | 7 | 5 | 71 | 0.001 |
| Posttest | 2 | | | |

The data in Table 3 shows that the average VAS score for the pretest was 7, while for the posttest, it was 2, with a difference of 5 score, indicating a 71% reduction. The statistical test conducted using SPSS version 27 resulted in a significance value (2-tailed) of 0,001 < 0,05. This indicates that the injury therapy program (manual therapy, electrical therapy, and cold therapy) is effective in reducing pain in knee injuries at Jogja Sports Clinic.

## DISCUSSION

The study concluded that the injury therapy program consist of massage, TENS, and cold compression, is a form of implementation in sports science to provide appropriate treatment for reducing knee injury pain. Manual therapy (massage) is one of the therapies aimed at relaxing the muscles around the injured area. This is done to reduce the tension in the muscles caused by the body's response and alleviate pain in the injury. Injured massage is a treatment utilizing touch with gentle pressure, aiming for relaxation to reduce pain during sports injuries (Huda et al., 2022).

The study used the treatment segment of massage on the calf and front lower leg. The research involved 50 respondents and concluded that the treatment was effective with an 88% reduction in pain for ankle injuries (Candra et al., 2022). Electrical therapy functions as a nerve block in the knee. Due to the injury, compressed nerves can cause pain (Pradita, 2021). Another

study on TENS and myofascial release for reducing mechanical neck pain found that the therapy reduced pain in patients measured with VAS (Haryatno & Kuntono, 2016). By applying TENS nerve impulses to the knee, the sensation of pain can be inhibited. Cold therapy, using ice compression, also known as cryotherapy, is one of the methods used in acute injury management. Its function is to relieve pain and reduce swelling, thereby improving joint range of motion (Indriastuti & Pristianto, 2021). Physiologically, 10-15 minutes after applying cold compression, a vasoconstriction process occurs due to the relaxation effect on smooth muscles caused by stimulation of the autonomic nervous system, which can stimulate the release of endorphins and reduce inflammation that causes pain. This ice therapy is recommended 1-3 days after the injury (Risnah et al., 2019). The injury therapy program used in the research is based on non-exercise sports injury therapy applied at Jogja Sports Clinic. This program incorporates the components of manual therapy, electrical therapy, and cold therapy in its implementation, effectively reducing pain experienced by the subjects.

Several factors influenced the research results and became limitations for the researchers concerning the subjects. The researchers were unable to fully control external factors that could potentially impact the treatment's achievement, such as work, environmental conditions, or rest periods. Efforts made included providing advice to avoid injury contraindications and scheduling the injury therapy program for maximum effectiveness. Furthermore, the geographical location of Jogja Sports Clinic, situated in the city center, sometimes posed difficulties in scheduling during busy hours. To address this, steps were taken to book convenient schedules for the subjects and avoid peak hours.

## CONCLUSION

The study concluded that the injury therapy program consist of massage, TENS, and cold compression with 3 sessions per week for 2 weeks, 71% reduced knee pain in Jogja Sports Clinic. As such, this therapy program can be considered as a reference for reducing knee pain caused by injuries.

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