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Development of Physiotherapy Standard Operating Procedures for Tennis Elbow Cases in Badminton Players

Niken Hertiana Wulandari *[1], Totok Budi Santoso [2]
[1,2] Physiotherapy, Universitas Muhammadiyah Surakarta, Surakarta, Indonesia

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Abstract

The hand is one of the limbs that is most often used in various daily activities. Excessive hand and wrist activity if prolonged can cause a problem. Problems caused by excessive activity can cause injury. Tennis elbow is one of the injuries also called the lateral epicondylus, this injury occurs due to excessive use of extensor muscles (overuse) resulting in inflammation (inflammation) of the extensor carpi radialis brevis tendon. Usually this injury occurs in tennis players, badminton and various jobs that dominantly use the wrist. Physiotherapy as one of the implementers of health services that play a role and are responsible for improving health status, physiotherapy is a form of health service aimed at individuals and / or groups to develop, maintain and restore motion and body function throughout the life span by using manual handling, motion enhancement, equipment (physical, electrotherapeutic and mechanical). To develop Standard Operating Procedures in performing physiotherapy treatment in cases of tennis elbow. This research was conducted using the research method of developing physiotherapy operational standards with this model of handling injuries to tennis elbow starting from preliminary studies, history taking, assessment, diagnosis, intervention and evaluation. The type of research conducted is quantitative research using quasi experimental methods with pretest-posttest control group design. The experimental group and control group did an initial test. Both groups received different treatments, where the experimental group received thrust manipulation intervention and the control group received non thrust intervention in the form of deep transverse friction. There is a decrease in pain after the thrust and nonthrust method manipulation therapy in both groups as measured using the Numeric Rating Scale (NRS), after being evaluated for two weeks it is known that the pain does not increase. The action of thrust and nonthrust manipulation therapy is recommended for the treatment of pain in tennis elbow injuries. However, between these two methods does not yet exist. There is no significant difference between these two methods given the time constraints of the study.

*Corresponding email : nikenhertiana@gmail.com
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INTRODUCTION

The hand is one of the limbs that is most often used in various daily activities. Excessive hand and wrist activity if prolonged can cause a problem. Problems caused by excessive activity can cause injury. Tennis elbow is one of the injuries also called the lateral epicondylus, this injury occurs due to excessive use of the extensor muscles (overuse) resulting in inflammation of the extensor carpi radialis brevis tendon. The prevalence of lateral epicondyle tendinopathy is estimated to be between 1% to 3% and usually between the ages of 35 to 50 years in the general population and up to 15% in high-risk occupations that include butchers, manual laborers, and employees in the fish processing industry. Only 5% of cases are associated with racquet sports. However, exactly 50% of tennis players will suffer from this condition at some point in their career (Najafi et al., 2016).

Lateral Elbow Tendinopathy (LET) or also known as tennis elbow is a health problem that occurs in the elbow, this soft tissue injury occurs in the extensor tendons of the wrist especially the extensor carpi radialis brevis tendon, causing lateral elbow pain, aggravated by gripping or repetitive hand movements during sports or work (Divandari et al., 2022). Tennis elbow is also known as lateral epicondylitis. It is a very common type of inflammation of the tendon and can lead to decreased function of the affected limb. Due to overuse while performing activities or activities. The constraints of this injury can interfere with and limit the functional and daily activities of the sufferer. The most common problem with tennis elbow is the loss of ability to perform work, exercise, and daily activities (Coombes, 2015). As for other problems caused by this tennis elbow, namely the presence of pain when doing dorso flexion movements, back hand or other movements that resemble back hand blows, the pain is felt in the outer back of the elbow and outer forearm and radiates to the wrist and causes pain when resting, there is a limited range of motion of the wrist joint due to pain. Patients who experience tennis elbow conditions often experience difficulty in carrying out basic functional activities such as washing, wringing, drying cloth, turning bolts, painting, cleaning the garden, clenching and playing (Rudianto, 2018).

Physiotherapy as one of the implementers of health services plays a role and is responsible for improving health status, physiotherapy is a form of health service aimed at individuals and or groups to develop, maintain and restore body movement and function throughout the life span by using manual handling, motion enhancement, equipment (physical, electrotherapeutic and mechanical). Physiotherapy treatment has been shown to be effective and, in general, includes manual therapy to relieve pain and increase joint range of motion (ROM), taking into account that this therapy should be below the pain threshold. In tendinopathies, good results are obtained from strengthening the affected area for example, using eccentric exercises have been reported to reduce pain and improve functionality (Landesa-Piñeiro & Leirós-Rodríguez, 2022).

In addition, Manual therapy techniques at the elbow and wrist can reduce pain and increase grip strength, Some studies combine physical modalities for rehabilitation programs in cases of tennis elbow with multimodal programs involving manual therapy techniques in the form of transverse fiction, Mill's manipulation, US, stretching and Mobilization with movement. Therapeutic techniques provide results to relieve pain and can improve functional activity (Bisset & Vicenzino, 2015).

METHODS

This research was conducted using the development research method, because it is in accordance with the problems found in the preliminary study, so to solve the gap between expectations and reality that occurs, development research is suitable for this. The research developed physiotherapy operational standards with a model of handling injuries due to tennis elbow, which began with a preliminary study, history taking, assessment, diagnosis, intervention, and evaluation. The type of research conducted is quantitative research using quasi experimental methods with pretest-posttest control group design. Experimental and control groups conducted an initial test. Both groups received different treatments, where the experimental group received thrust manipulation intervention and the control group received non thrust intervention. This design is used to determine the effects of acute and chronic manipulation therapy on tennis elbow. This result will be proven by PRTEE and NRS examination. In this study, the groups will be measured before and after receiving manipulation therapy.

Participants

Population, namely a set or group of people, events or symptoms of something that has certain characteristics, (Amin et al., 2023). The population in this study were all individuals who participated in badminton at Karen Sport Banjamasin. With a total of 6 members and after observation using questionnaire filling with temporary results obtained. Which will be divided into 2 intervention groups, which will be given thrust manipulation and 2 control groups given non thrust manipulation.

Sampling Procedures

Samples are individuals who experience pain in the elbow. The sampling technique in this study used purposive sampling technique. Purposive sampling is a sampling technique with certain considerations, namely based on inclusion criteria and exclusion criteria (Lenaini, 2021).

1. Inclusion criteria
    a) Individuals with a history of grade 2 elbow injury
    b) Willing to participate in the study
    c) Individuals aged 18-28 years
    d) Injury to the elbow
2. Exclusion criteria
    a) Patients have complications of other diseases that can be dangerous (fracture, post op, open wounds on the elbow)
    b) Has a history of previous elbow injuries less than 6 months such as fractures and post op

Materials and Apparatus

Research instruments are tools or facilities used by researchers in collecting data so that their work is easier and the results are better, in the sense that they are more careful, complete and systematic so that they are easy to process.

The instruments or tools used in this study include the following:

1. Data Collection Tools:
    a) Informed consent
    b) PRTEE questionnaire
    c) Numeric Rating Scale (NRS)
    d) Goniometer
2. Data Collection Methods:
    a) Make observations and preliminary studies on badminton players at Karen Sport Banjarmasin
    b) Requesting the consent of prospective respondents to become research samples by providing informed consent

c) Distributing PRTEE questionnaires to prospective badminton player respondents
d) Collecting questionnaires and biodata that have been filled in to prepare samples that match the inclusion and exclusion criteria.
e) Researchers provide interventions according to variables, namely manipulation therapy to respondents
f) Before intervening with respondents, researchers measured pain and joint motion scope using NRS and Goniometer which were carried out every day for one week for the last evaluation.

Procedures

1. Conducting observations and preliminary studies to badminton players at Karen Sport Banjarmasin.
2. Distribute informed consent, then distribute PRTEE questionnaires to prospective respondents
3. Conducting an examination to find inclusion and exclusion criteria.
4. Preparing the tools needed for research
5. Conducting the study:
   a) Pre test (Initial patient condition):
      Before performing manual therapy to patients who experience pain in the elbow, researchers measure pain with NRS and joint range of motion.
   b) Intervention:
      The researcher will intervene if the respondent has entered the inclusion criteria which is given manipulation therapy one by one in order to find out the development of elbow pain felt by the respondent.
   c) Post test (Final Condition Test):
      Respondents will be observed in the development of their pain for one week, given one intervention and always followed up every day for one week in order to find out whether the pain is reduced or not.
6. Recording research results

Design or Data Analysis

Data analysis technique is a way to find the meaning of data analysis as an effort to systematically search and organize records of observations, interviews and others to increase understanding of the case under study (Rijali, 2018). In this study, the analysis technique uses descriptive analysis methods, the data analysis techniques used are as follows:

1. Data reduction: Data reduction is the simplification, sorting and centralizing of raw data obtained from the field, data reduction starts from the beginning of the activity and continues during data collection.
2. Presentation of data: Presentation of data in this study in the form of the results of the subject's development during manual therapy and presented in the form of graphs to make it easier to explain the subject's behavior, the characteristics of the subject that will be displayed in the graph such as name, age, gender and occupation, the data obtained from the graph are interpreted by looking at the increase or decrease in the graph in the initial phase of the patient before being given the intervention and after being given the intervention, if the graph goes up then the intervention is declared effective and if the graph goes down then the intervention is said to be ineffective, with the graph it will also be easier to know the time and results of the experiment, the independent

variable, the design used and the relationship between variables.

3. Conclusion drawing/verifying: The third step in qualitative data analysis according to Miles and Huberman is conclusion drawing and verification. The initial conclusions put forward are still temporary, and will change if no strong evidence is found that supports the next stage of data collection. But if the conclusions put forward at an early stage are supported by valid and consistent evidence when researchers return to the field to collect data, then the conclusions put forward are credible conclusions.

RESULT

The results of this study indicate that there is a significant decrease in pain after the manual therapy intervention in the form of thrust mobilization with movement and non thrust deep transverse friction in both groups using NRS, after being evaluated for two weeks that the pain felt by respondents did not increase.

Table 1. Respondent Characteristics

Name	Gender	Age	Duration Of Complaint	Treatment Type
A	Male	29	1 month	Thrust Manipulasi
R	Female	23	1 month 2 weeks	Thrust Manipulasi
S	Female	24	1 month	Thrust Manipulasi
R	Male	24	2 month	Non Thrust Manipulasi
A	Female	25	1 month	Non Thrust Manipulasi
E	Female	22	2 month	Non Thrust Manipulasi

Description:

Thrust: A high-velocity, low-amplitude movement.

Nonthrust: A slow, gentle movement or pull

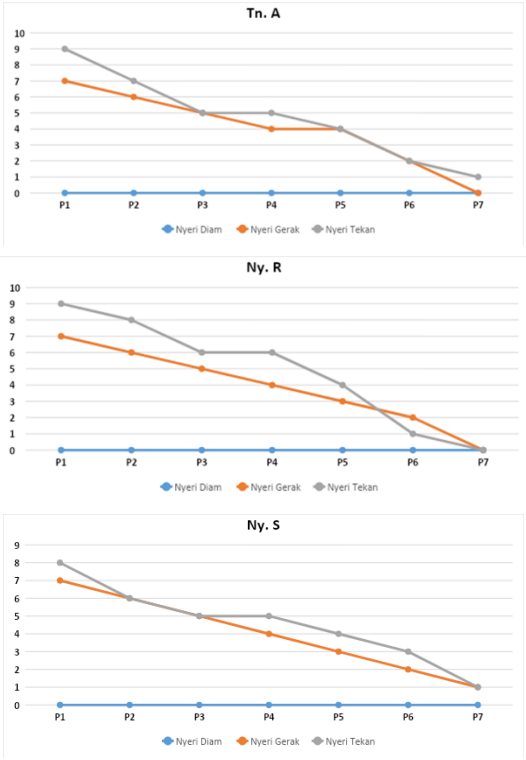

Fig 1. Pain graph of the thrust manipulation group

Description:

P0= Measurement before therapy

P1= Measurement after therapy

P2= Measurement 6 hours after therapy

P3= Measurement 12 hours after therapy

P4= Measurement 24 hours after therapy

P5 = Measurement 48 hours after therapy

P6 = Measurement 1 week after therapy

P7 = Measurement 2 weeks after therapy NRS score 0 = No pain

NRS score 1-3 = Mild pain

NRS score 4-6 = Moderate pain

NRS score 7-10 = severe pain

In the graph above, the value on Mr. A consists of silent pain 0, motion pain before therapy gets a value of 7 then after 24 hours the value of motion pain drops to 4 after therapy, after giving therapy and measuring for 2 weeks it drops to 0. Mr. A consists of silent pain 0, motion pain before therapy gets a value of 7 then after 24 hours the value of motion pain drops to 4 after therapy, after being given therapy and measurement for 2

weeks it drops to 0. In compressive pain the value felt before therapy is 9 then after 24 hours it drops to 5 and 2 weeks after therapy it drops to 1. In respondent Mrs. R silent pain 0, before therapy the motion pain was 7, after 24 hours the motion pain dropped to 4 after therapy, after 2 weeks the motion pain dropped to 0 while the pressure pain in Mrs. R before therapy was 9, then after 24 hours it dropped to 6 and after 2 weeks it dropped to 0 after therapy. In the respondent Mrs. S obtained silent pain 0, and motion pain obtained a value of 7 before therapy and after 24 hours the value decreased to 4 and 2 weeks after therapy decreased again to 1, while in pressure pain obtained a value of 8 before therapy and 5 after 24 hours of therapy and decreased again to 1 after 2 weeks of therapy.

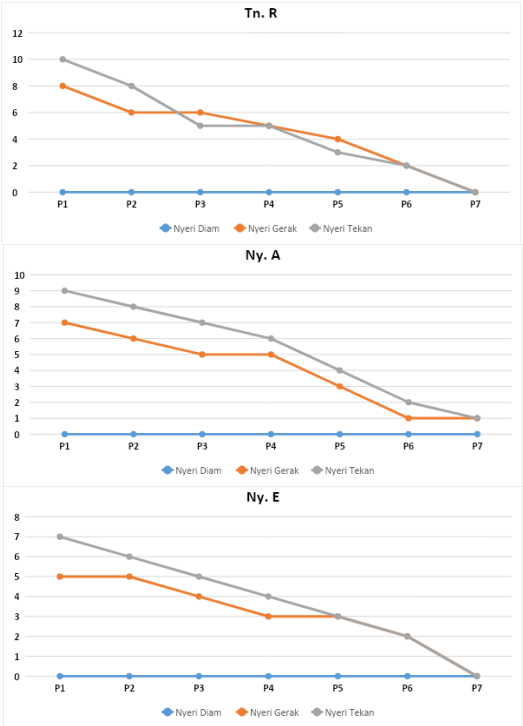

Fig 2. Pain graph of the non thrust manipulation group

Description:
P0= Measurement before therapy
P1= Measurement after therapy
P2= Measurement 6 hours after therapy
P3= Measurement 12 hours after therapy
P4= Measurement 24 hours after therapy
P5 = Measurement 48 hours after therapy
P6 = Measurement 1 week after therapy
P7 = Measurement 2 weeks after therapy NRS score
0 = No pain
NRS score 1-3 = Mild pain
NRS score 4-6 = Moderate pain
NRS score 7-10 = severe pain

In the non thrust chart above, it was found that the silent pain in Mr. R was 0. R is 0, before therapy the motion pain is 8 after 24 hours the motion pain decreases to 5 after therapy and after 2 weeks the motion pain drops to 0, while the tenderness in Mr. R is 10 before therapy then drops to 5. R 10 before therapy then dropped to 5 after therapy and dropped to 0 after 2 weeks of therapy. In the next respondent, Mrs. A, the silent pain obtained was 0, and the motion pain before therapy was 7, then decreased to 5 after 24 hours and decreased to 1 after 2 weeks of therapy. The third respondent giving non thrust manipulation was Mrs. E, whose silent pain value was 0, motion pain before therapy was 5 and after 24 hours of therapy decreased to 3 and decreased again after 2 weeks of therapy to 0, in pressure pain before therapy received a value of 7 and decreased to 4 after 24 therapy and decreased again after 2 weeks of therapy to 0.

DISCUSSION

1. Characteristics of Respondents

   The characteristics of the first respondent, namely Mr. A with male gender aged 29 years with a long complaint of pain in the elbow about 1 month ago. The second respondent is Mrs. R with the age of 23 years, female gender years with complaints of 1 month 2 weeks of pain felt in the elbow. The third respondent is Mrs. S, female gender, aged 24 years with a length of complaint of about 1 month. The fourth respondent, Mr. R, is male, aged 24 years with complaints of about 2 months of pain in the elbow. The fifth respondent, Mrs. A, female, aged

25 years with a duration of complaints of pain felt for about 1 month. And with the sixth last respondent, Mrs. E is 22 years old with a long complaint of pain of 2 months with female gender. The six respondents are random respondents who often play badminton intensely at Karen Sport Banjarmasin. The six respondents were divided into 2 treatment groups, three respondents namely Mr.A, Mrs.R, Mrs.S were given thrust manipulation in the form of mobilization with movement and three other respondents namely Mr.R, Mrs.A, Mrs.E were given non thrust manipulation with deep transverse friction.

2. The therapy given is Thrust manipulation and Nonthrust therapy.

Manipulation therapy is a physiotherapy technique used in joint disorders and related soft tissues or physical abilities in therapy by performing a sudden passive movement (pounding) with a small amplitude and done quickly so that the patient cannot prevent or stop the movement that occurs. Manipulation therapy is also part of joint mobilization where the goal is to improve joint play movement and thus improve roll-gliding that occurs during active movement. This manipulation therapy is also one of the modalities to reduce pain and improve joint dysfunction because it can stretch the soft tissue around the shortened joint (Zaimsyah, 2020). Manual therapy is a type of non-surgical conservative management that includes a variety of skillful hand/wrist techniques directed at the patient's body for the purpose of assessing, diagnosing, and treating various symptoms and conditions. Manual therapy consists of various major categorization groups: a) thrust manipulation, b) non thrust mobilization, c) static stretching, and d) muscle energy techniques, (Clar et al., 2014). Thrust is a thrust technique using high-velocity low amplitude, thrust movements are usually performed at the end of the affected joint, and are also used to change the relationship with the sendi position, until it makes a clicking sound, while non thrust is a manipulation technique that is based on the concepts already described and consists of passive, low velocity movements with oscillatory movements (Puentedura et al., 2016).

The technique used is Mobilization with movement (MWM), which is a technique that corrects errors in joint position after injury and muscle tension. This technique combines passive physiological movements with active movements applied by the therapist (Hariharasudhan & Balamurugan, 2015). Mobilization techniques are special manual therapy techniques developed to restore normal arthro-kinematic and osteokinematic conditions. This trapping intervention combines pain-free accessories with active and passive movements (Pourahmadi & Mohsenifar, 2018).

In addition to MWM, one of the manual therapy techniques provided is Deep Transverse Friction, this technique is a manipulation technique that aims to release adhesions, improve blood circulation, and reduce pain directly. This technique is carried out by pressing at a certain point on the target therapy tissue transversely using the thumb, the tip of the index finger gently, small and only at the point that is the target of therapy and still maintains contact with the skin (Olaussen et al., 2015). Deep transverse friction that is given also releases endorphin so that it causes a counter irritation effect and results in inhibition of neurotransmitter

production, thus the transmission of pain at a higher central level is reduced in intensity (Rudianto, 2018). Deep Transverse Friction is performed by applying pressure with the thumb or middle finger assisted by the index finger. Friction movements vary according to the structure being treated, but in fat or thick muscles it is necessary to apply rather deep pressure. When friction is applied to the muscle, position it in a relaxed position (Ramli & Nim, 2016).

3. Pain in the elbow

Tennis elbow is lateral elbow pain or at the epicondylus lateralis that occurs due to tendon inflammation. At the epicondylus lateralis there is an incomplete tear in the tenoperiosteal origo and extensor carpi radialis brevis muscle. In dorso flexion movements the wrist will increase pain and pain occurs after activity (Wulandari, 2020). Pain itself is a condition in the form of unpleasant feelings, and is very subjective. The feeling of pain in each person is different in terms of scale or level, and only that person can explain or evaluate the pain he is experiencing (Patients et al., 2022). Pain is an unpleasant sensory and emotional experience related to tissue damage, actual or potential or describing the same damage (Kumar & Elavarasi, 2016).

CONCLUSION

From the results of this study there was a significant decrease in pain after giving manipulation therapy with the thrust and non thrust methods in both groups accompanied by NRS (Numeric Rating Scale). Both groups after being evaluated for two weeks found that the pain did not increase. Therefore, it is proven that manipulation therapy with this method gives real results. This manipulation therapy is also a safe technique for injury rehabilitation.

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REFERENCES

Ahmed, S., Akter, R., Saraswat, A., & Esht, V. (2019). Core stability and its impact on upper extremity function in racket sports: a narrative review. Saudi Journal of Sports Medicine, 19(2), 31-37.

Anto, A., & Varadharajulu, G. (2022). Prevalence Of Wrist Tendonitis In Sub Elite Badminton Players. Journal of Pharmaceutical Negative Results, 10634-10640.

Amin, N. F., Garancang, S., Abunawas, K., Makassar, M., Negeri, I., & Makassar, A. (2023). Konsep Umum Populasi Dan Sampel Dalam Penelitian. 14(1), 15–31.

Bisset, L. M., & Vicenzino, B. (2015). Physiotherapy management of lateral epicondylalgia. Journal of Physiotherapy, 61(4), 174–181. https://doi.org/10.1016/j.jphys.2015.07.015

Bhuse, S. Y., & Kulkarni, M. (2024). Assessment Of Pain In Shoulder, Elbow And Wrist In Recreational Badminton Players. Journal for ReAttach Therapy and Developmental Diversities, 7(3), 11-18.

Clar, C., Tsertsvadze, A., Court, R., Hundt, G. L., Clarke, A., & Sutcliffe, P. (2014). Clinical effectiveness of manual therapy for the management of musculoskeletal and non-musculoskeletal conditions :

systematic review and update of UK evidence report.

Coombes, B. K. (2015). Management of Lateral Elbow Tendinopathy: One Size Does Not Fit All. 45(11), 938–949. https://doi.org/10.2519/jospt.2015.5841

Divandari, A., Mostafaee, N., Negahban, H., Kachooei, A. R., Moradi, A., & Ebrahimzadeh, M. H. (2022). Responsiveness and Minimally Important Changes for Persian-version of Patient-Rated Tennis Elbow Evaluation Questionnaire in Patients with Lateral Elbow Tendinopathy Following Physiotherapy Intervention. Archives of Bone and Joint Surgery, 10(10), 885–891. https://doi.org/10.22038/ABJS.2022.65220.3128

Hariharasudhan, R., & Balamurugan, J. (2015). Effectiveness of muscle energy technique and Mulligan ' s movement with mobilization in the management of lateral epicondylalgia. 198–202. https://doi.org/10.4103/2321-4848.171904

Kumar, K. H., & Elavarasi, P. (2016). Definition of pain and classification of pain disorders. 3(June), 87–90. https://doi.org/10.15713/ins.jcri.112

Landesa-Piñeiro, L., & Leirós-Rodríguez, R. (2022). Physiotherapy treatment of lateral epicondylitis: A systematic review. Journal of Back and Musculoskeletal Rehabilitation, 35(3), 463–477. https://doi.org/10.3233/BMR-210053

Lenaini, I., Islam, U., Raden, N., & Palembang, F. (2021). TEKNIK PENGAMBILAN SAMPEL PURPOSIVE DAN. 6(1), 33–39.

Martin, F., & Zeisig, E. (2022). Management of tennis elbow in racket sports: a literature review. International Journal of Racket Sports Science, 4(1), 25-31.

Najafi, M., Arazpour, M., Aminian, G., Curran, S., Madani, S. P., & Hutchins, S. W. (2016). Effect of a new hand-forearm splint on grip strength , pain , and function in patients with tennis elbow. https://doi.org/10.1177/0309364615592694

Olaussen, M., Holmedal, Ø., Mdala, I., Brage, S., & Lindbæk, M. (2015). Corticosteroid or placebo injection combined with deep transverse friction massage , Mills manipulation , stretching and eccentric exercise for acute lateral epicondylitis : a randomized , controlled trial. ??? https://doi.org/10.1186/s12891-015-0582-6

Patients, D., Rsud, I. N., Ahmad, J., Metro, Y., & Kunci, K. (2022). Jurnal Cendekia Muda Volume 2 , Nomor 3 , September 2022 ISSN : 2807-3469

Pourahmadi, M. R., & Mohsenifar, H. (2018). Effectiveness of mobilization with movement (Mulligan concept techniques) on low back pain : a systematic review. https://doi.org/10.1177/0269215518778321

Puentedura, E. J., Slaughter, R., Reilly, S., Ventura, E., Puentedura, E. J., Slaughter, R., Reilly, S., Ventura, E., Puentedura, E. J., Slaughter, R., Reilly, S., Ventura, E., & Young, D. (2016). Thrust joint manipulation utilization by U . S . physical therapists Thrust joint manipulation utilization by U . S . physical therapists *. 9817(June). https://doi.org/10.1080/10669817.2016.1187902

Ramli, F., & Nim, A. (2016). Pengaruh penambahan kinesio taping pada transverse friction terhadap

penurunan nyeri tennis elbow naskah publikasi. 1–15.

Rijali, A. (2018). Analisis Data Kualitatif Ahmad Rijali UIN Antasari Banjarmasin. 17(33), 81–95.

Rudianto, S. (2018). Jurnal Keperawatan & Fisioterapi (JKF). 30–35.

Wulandari, 2020. (2020). Penatalaksanaan Fisioterapi Pada Tennis Elbow Dengan Ultrasound, Massage, Dan Muscle Energy Technique.

Xie, G. P., Qi, J., Liu, B. P., & Zhong, R. S. (2021, January). Therapeutic effect of double needle acupuncture therapy for 63 case of tennis elbow. In 2021 International Conference on Information Technology and Contemporary Sports (TCS) (pp. 473-476). IEEE.

Zaimsyah, F. R. (2020). Jurnal Ilmiah Fisioterapi (JIF) Volume 03 Nomor 02 Agustus 2020 Perbedaan Pengaruh Stretching Dengan Terapi Manipulasi Terhadap Peningkatan Aktivitas Fungsional Bahu Pada Penderita Frozen Shoulder. 03, 30–37.