
The Effect of Manurak Massage Method and PNF Stretching on Shoulder Muscle Pain in the ITERA Boxing Community

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Abstract: Muscle pain is one of the common issues experienced by boxing athletes, particularly in the shoulder and arm regions, as these joints and muscles are the most frequently engaged in movement. Additionally, improper recovery processes can lead to spasms and chronic shoulder pain, which may negatively impact performance in competitions. Several studies have shown that Manurak massage is quite effective in alleviating pain and muscle stiffness. Meanwhile, stretching has become a common post-match routine among elite athletes to prevent muscle stiffness. This study aims to analyze the effect of the Manurak massage method and Proprioceptive Neuromuscular Facilitation (PNF) stretching on reducing shoulder muscle pain in the boxing community at Institut Teknologi Sumatera (ITERA). The research employed a quasi-experimental design with a pretest-posttest control group approach. The sample consisted of 30 boxers divided into two groups: the treatment group, which received Manurak massage, and the control group, which received PNF stretching. Data were collected by measuring muscle pain levels using the Visual Analog Scale (VAS) before and after the intervention. The results showed that both treatment groups significantly reduced pain levels (p -value < 0.001). However, the Mann-Whitney U test indicated that Manurak massage was more effective in reducing shoulder muscle pain. The study concludes that the Manurak massage method is more effective than PNF stretching in alleviating muscle spasms and reducing muscle pain in boxing athletes. The findings suggest the implementation of Manurak massage as part of recovery programs for minor shoulder joint and muscle injuries in boxing, particularly for athletes in the ITERA boxing community. Further research is recommended to explore the physiological mechanisms underlying the effectiveness of this therapy and to examine its benefits in athletes with varying training intensities.

Keywords: Manurak, PNF, Spasm, Pain, Boxing

INTRODUCTION

High-intensity exercise forces muscles to work harder, which can result in muscle spasms, stiffness, and pain. In high-intensity sports such as boxing, shoulder and arm muscle spasms, accompanied by soreness and pain, are commonly observed. Therefore, proper recovery and appropriate treatment are essential to prevent performance disruption in athletes. According to M. R. Hidayatullah et al. (2022), the body requires sufficient recovery to alleviate pain and soreness, allowing it to regain freshness. Additionally, I. M. Hidayatullah et al. (2021) stated that recovery can be accelerated through various methods, including active rest and massage. Massage has been shown to accelerate recovery and reduce pain in individuals with minor injuries. According to research by Nurdinah et al. (2021), traditional Thai massage provides benefits in reducing shoulder pain intensity and muscle tension in stroke patients. Additionally, a study by Anggriawan (2015) stated that massage therapy combined with exercise therapy is effective in reducing pain and improving joint range of motion (ROM). Furthermore, the combination of friction massage and acupressure has been shown to reduce pain and increase ROM in shoulder injuries (Anggriawan & Kushartanti, 2014). Among various massage techniques, Manurak massage has been recognized as an effective method for recovery.

According to Maulana & Graha (2019), therapeutic manipulation can improve joint function, enhance body flexibility, and relieve muscle tension and pain. Research by M. R. Hidayatullah et al. (2022) found that the Repositioning Bones and Joints Massage (RTS) method significantly reduces pain in neck injuries among agricultural laborers in Mesanggok Village, Gerung District, West Lombok Regency. Additionally, I. M. Hidayatullah et al. (2021) suggested that the Manurak massage method is not only applicable to athletes but can also be used for the general population to treat both acute and chronic minor injuries. More recently, M. R. Hidayatullah et al. (2024) described Manurak as a combined method of massage, movement (stretching), and Proprioceptive Neuromuscular Facilitation (PNF) to help relax and optimize muscle release. Several studies have indicated that Proprioceptive

Neuromuscular Facilitation (PNF) stretching has a significant effect on muscle pain and stiffness. For instance, research by Hapsari & Imania (2016) found that PNF stretching treatment in male individuals with shoulder injuries contributed to reduced shoulder joint stiffness and improved range of motion (ROM). Similarly, a study by Rif'ah (2022) stated that PNF stretching combined with breathing exercises had a positive impact on individuals with frozen shoulder, leading to pain reduction and increased shoulder ROM. Additionally, Hapsari & Imania (2016) demonstrated that a combination of PNF stretching and ultrasound therapy was effective in reducing pain in plantar fasciitis.

Consistent with these findings, Kartika Wulandari (2017) reported that PNF stretching in patients with joint disorders (tendinitis) resulted in decreased pain and improved joint mobility. Furthermore, research by Al Jabar et al. (2023) indicated that friction massage therapy combined with PNF was effective in restoring ROM, reducing pain, and improving movement function in hip injuries. Based on these studies, it can be concluded that PNF stretching is beneficial in treating minor injuries, particularly in muscles and joints, by reducing pain and increasing joint ROM. Through observations, the researcher found that 10 boxing athletes at ITERA experienced muscle spasms due to uncontrolled training and persistent injuries from competitions that did not heal with rest alone. Therefore, an appropriate intervention is needed to address this issue. Manurak massage has been identified as an effective method for relieving muscle spasms. Thus, this study aims to investigate "The Effect of Manurak Massage on Muscle Spasms in the ITERA Boxing Athlete Community."

METHOD

The research method used in this study is an experimental method. Experimental research design is a method used to determine the effect of a specific treatment on an object under controlled conditions (Sugiyono, 2021). This study employs a quantitative research approach with a two-group pretest-posttest design. The population is defined as the generalization area consisting of objects or subjects with specific characteristics that will be studied to draw conclusions (Sugiyono, 2013). The population in this study consists of 70 boxing athletes from the ITERA boxing community. According to Subhaktiyasa (2024), a sample in quantitative research is a subset of the population selected for analysis to ensure that the findings can be generalized to the entire population. The sample in this study consists of boxing athletes experiencing mild shoulder injuries. The sampling technique used in this study is purposive sampling. As stated by Subhaktiyasa (2024), purposive sampling is a sampling technique where subjects are deliberately selected based on specific criteria deemed relevant by the researcher. In this study, the 30 selected participants are boxing community athletes who experience shoulder muscle pain. The instruments used in this study include Manurak massage treatment, PNF stretching, and questionnaires. Data collection methods consist of documentation, treatment implementation, and pretest-posttest questionnaire completion.

The data processing method in this study utilizes SPSS software, including validity and reliability tests for the questionnaire, as well as a normality test to determine whether the data are normally distributed. The Wilcoxon Signed-Rank Test is used to assess the effect of the treatments, while the Mann-Whitney U Test is applied to compare treatments and determine which is more effective.

RESULTS AND DISCUSSION

Table 1. Wilcoxon Signed-ranked Test

Treatment	N (pairs)	Negative Ranks (n, Mean Rank, Sum of Ranks)	Positive Ranks (n, Mean Rank, Sum of Ranks)	Ties	Z	p-value	information
PNF (Pre-Post pain)	30	28; 14.50; 406.00	0; 0.00; 0.00	2	-4.658	< 0.001	Significant
Manurak (Pre-Post paini)	30	28; 15.36; 430.00	1; 5.00; 5.00	1	-4.635	< 0.001	Significant

Table 1 showed that both treatments, PNF stretching and Manurak massage, significantly reduced shoulder muscle pain ($p < 0.0001$). The dominant negative difference indicates the effectiveness of the treatments in alleviating pain. Furthermore, 28 out of 30 participants in both groups experienced a reduction in shoulder muscle pain.

Table 2. Mann Whitney U

Variabel	Grub	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	p-value	infomation
PNF Pre pain	PNF	15	14.97	224.50	104.500	-0.351	0.726	Not Significant
	Manurak	15	16.03	240.50				
PNF Post pain	PNF	15	20.17	302.50	42.500	-3.093	0.002	Significant
	Manurak	15	10.83	162.50				
Manurak Pre Pain	PNF	15	13.90	208.50	88.500	-1.113	0.266	Not Significant
	Manurak	15	17.10	256.50				
Manurak Post Pain	PNF	15	21.50	322.50	22.500	-3.831	< 0.001	Significant
	Manurak	15	9.50	142.50				

The initial conditions (pretest) of both groups were equivalent ($p > 0.05$). Both treatments were effective in reducing pain ($p < 0.05$); however, Manurak massage proved to be more effective than PNF stretching, as indicated by a significant difference in posttest scores ($p = 0.002$ and $p < 0.001$). The lower average ranking in the Manurak group during the posttest suggests a greater reduction in pain levels. While both methods successfully alleviated shoulder muscle pain, Manurak massage demonstrated superior effectiveness.

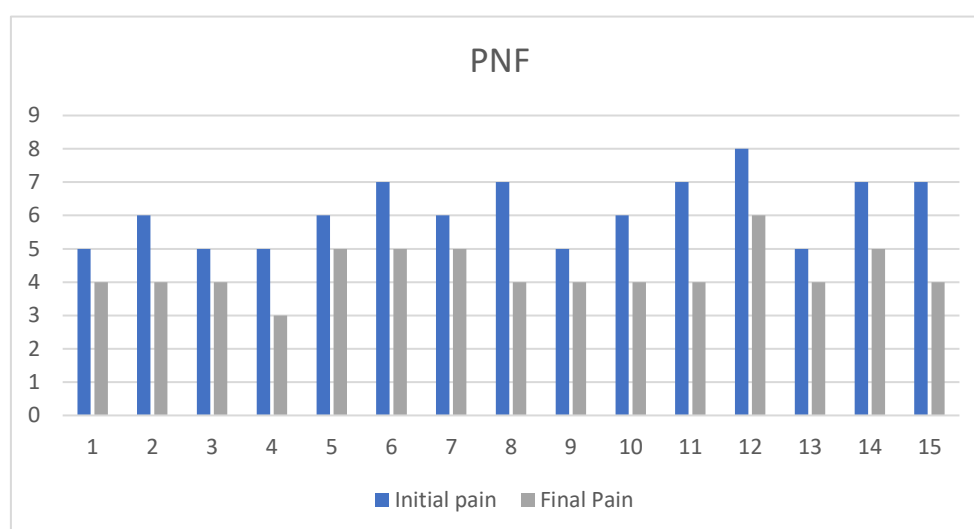


Diagram 1. Pretest and Posttest for PNF Stretching Treatment.

Diagram 1 explains that shoulder pain in boxing athletes after receiving PNF Stretching treatment experienced a decrease in pain in all samples, although not very significant.

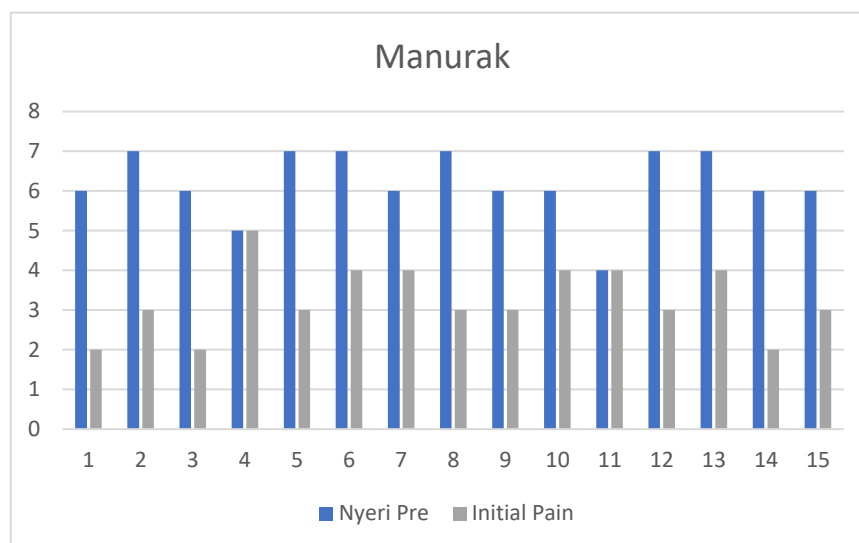


Diagram 2. Pretest and Posttest for Manurak Massage Treatment

Diagram 1 explains that shoulder pain in boxing athletes after being given Manurak Massage treatment experienced a decrease in pain in almost all samples, and quite significantly.

DISCUSSION

The analysis results in Table 1 indicate that both interventions, Proprioceptive Neuromuscular Facilitation (PNF) stretching and Manurak massage, significantly reduced shoulder pain levels in ITERA boxing athletes ($p < 0.05$). The greater reduction in pain observed in the Manurak massage group is supported by a significant difference in posttest scores ($p = 0.002$ and $p < 0.001$) and a lower average ranking in the posttest, indicating lower pain levels. Manurak massage combines massage and stretching techniques, which provide mechanical stimulation to soft tissues, improve local blood circulation, and facilitate muscle recovery. Additionally, Manurak massage can target muscles that are difficult to reach with stretching alone. This finding aligns with previous research by Alfen (2022), which reported that Manurak massage contributes to pain reduction and increased range of motion (ROM). Furthermore, research by Rahayu (n.d.) suggests that Manurak massage, when combined with infrared therapy, can effectively reduce muscle pain. Although the results indicate that PNF stretching was not as effective as Manurak massage, it still had a significant impact on pain reduction. This finding aligns with neuromuscular theory, which suggests that PNF stretching can enhance muscle flexibility and reduce spasms by maximizing the muscle relaxation reflex (Sharman et al., 2006). The isometric contractions performed during PNF techniques are believed to inhibit pain signals through the gate control theory mechanism, leading to a more significant reduction in pain perception. Similarly, research by Pragassame et al. (2019) found that PNF stretching treatment can alleviate pain while improving flexibility and functional mobility in knee injuries. Additionally, a study by Hendrawan & Lestari (2017) reported that a combination of ice massage and PNF stretching effectively reduced pain levels in individuals with lower back pain (LBP).

This difference in effectiveness can also be explained in the context of the specific needs of boxing athletes. The repetitive movements in boxing pose a high risk of muscle tension and shoulder pain. Due to its combination of massage and stretching, Manurak massage induces a contraction-relaxation mechanism and targets deeper muscle areas that cannot be reached by stretching alone. This makes it more suitable for boxers, as it helps optimize pain reduction, improve joint range of motion, and prevent recurrent injuries. Additionally, Manurak massage stimulates the parasympathetic nervous system, which aids in lowering pain sensitivity and accelerating tissue recovery. This effect is particularly beneficial for athletes experiencing chronic muscle strain due to the high-intensity demands of their sport. From a physiological perspective, Manurak massage enhances blood flow to muscle tissues, which optimizes oxygen and nutrient supply, thereby expediting the repair of microtears in muscle fibers. This

process also facilitates the removal of metabolic waste products, such as lactic acid, which is a common contributor to muscle soreness following intense physical activity. Conversely, PNF stretching primarily focuses on lengthening muscle fibers and reducing tension through neuromuscular activation. While this method effectively enhances flexibility and mitigates muscle stiffness, it may not be as efficient in promoting deep tissue healing and circulation compared to massage-based interventions. Another crucial consideration is the psychological aspect of pain management. Previous studies suggest that massage therapies, including Manurak massage, can have a calming effect on the nervous system, reducing stress and anxiety associated with muscle discomfort. The tactile stimulation from massage has been shown to promote endorphin release, which serves as a natural pain reliever and mood enhancer. PNF stretching, although effective in physiological terms, may not elicit the same level of relaxation response, potentially making it less effective for athletes requiring holistic recovery strategies.

Despite these findings, this study has certain limitations that should be addressed in future research. One of the primary limitations is the lack of assessment regarding the long-term effects of both interventions. While the immediate benefits of Manurak massage and PNF stretching have been established, it remains unclear how long these effects persist and whether repeated sessions could yield cumulative advantages. Future studies should incorporate follow-up assessments to evaluate sustained pain reduction and functional improvements over extended periods. Additionally, further research should explore individual variability in response to these interventions. Factors such as baseline fitness level, pain tolerance, and prior injury history may influence the effectiveness of each technique. Investigating these variables could lead to a more personalized approach to rehabilitation, ensuring that athletes receive the most suitable treatment based on their unique needs. Moreover, it would be beneficial to examine the synergistic effects of combining both interventions. While this study evaluated Manurak massage and PNF stretching separately, future research could investigate whether an integrated approach incorporating both techniques could enhance overall recovery outcomes. Given that each method operates through distinct physiological mechanisms, a combined protocol might offer a more comprehensive solution for pain management and muscle recovery. In conclusion, both Manurak massage and PNF stretching are effective non-pharmacological interventions for reducing shoulder muscle pain in boxing athletes. However, Manurak massage demonstrated superior efficacy in alleviating muscle spasms and promoting deep tissue recovery. These findings suggest that Manurak massage should be prioritized as a primary treatment modality for athletes experiencing repetitive strain injuries. Nonetheless, PNF stretching remains a valuable complementary approach, particularly for enhancing muscle flexibility and preventing future injuries. By refining rehabilitation protocols and considering individual athlete characteristics, sports practitioners can optimize recovery strategies, ultimately improving athletic performance and injury prevention efforts.

CONCLUSION

This study demonstrates that Manurak massage therapy and PNF stretching have a significant impact on reducing shoulder muscle pain and spasms in boxing athletes at ITERA. Based on the Wilcoxon Signed-Rank test and the Mann-Whitney U test, a significant difference was found between the group receiving Manurak therapy and the group undergoing PNF stretching ($p < 0.05$). Specifically, Manurak massage was proven to be more effective in reducing shoulder muscle spasms, while PNF stretching showed a greater effect in reducing pain intensity. These findings support the theory that a combination of manual therapy and stretching techniques can provide optimal benefits for muscle recovery in athletes. Manurak massage enhances blood circulation, reduces muscle tension, and improves soft tissue elasticity, which accelerates the healing process and helps prevent further injuries. Meanwhile, PNF stretching works through neuromuscular reflex mechanisms, promoting muscle relaxation, flexibility, and reducing tension buildup in overused muscle groups. Given the repetitive and high-impact nature of boxing movements, these two interventions serve as effective recovery strategies for athletes, helping them regain their optimal performance while minimizing the risk of recurring injuries. The ability of Manurak massage to target deep muscle layers provides additional benefits compared to stretching alone, as it alleviates muscle tightness in areas that are difficult to reach. Furthermore, the combined use of these techniques could enhance athlete endurance, post-exercise

recovery, and overall mobility, making them valuable additions to rehabilitation protocols. Therefore, Manurak therapy and PNF stretching are recommended as effective non-pharmacological interventions in shoulder injury rehabilitation programs, particularly for athletes in contact sports such as boxing. Future research should focus on larger sample sizes and longer intervention durations to confirm these findings and explore the long-term effects and physiological mechanisms of these techniques. Additional studies should also investigate the frequency, intensity, and individual responsiveness to these therapies to refine treatment protocols for optimal recovery and performance enhancement in athletes.

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