The Effect Of Integrated Neuromuscular Inhibition Technique On Improving Neck Functional Ability In Tension-Type Headache

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Received: August 28, 2023; Reviewed: September 29, 2023; Accepted: October 04, 2023; Published: October 26, 2023

ABSTRACT

Tension-type headache is one of the most common complaints of musculoskeletal pain due to myofascial trigger points. The presence of pain and soreness in the neck and head, tightness, stiffness, spasms, and limitation of motion is a complaint that is often experienced by patients. Methods: This study aims to determine the effect of the Integrated Neuromuscular Inhibition Technique exercise on increasing the functional ability of the neck in Tension-Type Headache conditions. This research is a pre-experimental study with a pre-test and post-test one-group design using an accidental sampling technique with a total sample of 30 people. The place of research was conducted at the Telkomedika Makassar Clinic. A tool to measure the functional ability of the neck using the Neck Disability Index (NDI). Result: The results of the study were an increase in the functional ability of the neck based on measurements of the Neck Disability Index (NDI), namely a pre-test value of 48.80 to a post-test of 41.13 in the condition of Tension-Type Headache at the Telkomedika Clinic Makassar because after being given Integrated Neuromuscular Inhibition Technique therapy (INIT) decreased neck pain, decreased spasm of the neck muscles, and increased functional ability of the neck. Conclusion: Integrated Neuromuscular Inhibition Technique exercises can improve the functional ability of the neck in Tension-Type Headache conditions at the Telkomedika Clinic in Makassar.

Keywords: Headache; Neuromuscular; Inhibition; Neck Disability.

INTRODUCTION

In essence, humans must-do activities to fulfill their needs. Doing physical activity by letting the body move actively can certainly have a positive impact on humans such as a healthy body, and can also avoid various chronic diseases (Anggraeni & Wirjatmadi, 2019). However, physical activity does not always have a positive impact on human health. With the development of technology such as computers, gadgets, internet, humans tend to do passive physical activity (Ferry & Welis, 2019).

Too much time in front of a computer can hurt your health. In interviews conducted
with bank workers, it was found that on average they use computers for 7 hours a day. These activities can cause humans to do less movement (hypokinetic). When using a computer, we often do not realize that we are doing activities that are not following ergonomics such as static sitting while working, workplaces that are not ergonomically designed, such as the position of the monitor screen that is too high or too low, causing forward head position, chairs that do not support the body to sit upright, shoulders that are too high or low and so on. If these habits are carried out for a long period and repetitively, they can cause musculoskeletal complaints that can reduce a person's performance (Mega Widya Putri et al., 2021).

Tension-type headache is one of the musculoskeletal pain complaints that can occur due to myofascial trigger points. The presence of pain and pain in the neck and head, tightness, stiffness, spasms, and limitation of movement are complaints that are often experienced by patients. Tension-type Headache arises from daily activities that are carried out continuously, excessive muscle work and often provide loading on the upper trapezius muscle (Amroellah & Santoso, 2022). So that it can cause muscles to spasm, tension, tightness and stiffness. Muscles that experience constant tension can reduce microcirculation so that ischemia can occur in the tissue. In muscle fibres, there are abnormal rope bonds that form taut bands in skeletal muscles and then trigger pain.

According to Skillgate, et al (2015), Tension Type Headache (TTH) commonly referred to as pain or tension headache is the most prevalent primary headache in society with a high impact. Nowadays, many of our people in Indonesia use the Internet network, especially among final-year students who very often interact with the internet either when doing assignments on laptops or other things. They are required to do their work in front of a computer or laptop screen. This will certainly have an impact on their bodies. When sitting for a long time in front of the screen, many muscles of the head, neck and shoulders work extra. Excessive contraction of the neck muscles can cause muscle tension, if this is left for a long period it can cause myofascial pain.

Tension-type headache (TTH) is the most common headache with migraine and its pathophysiology and treatment have been discussed for years without reaching a consensus (Repiso-Guardeño et al., 2023). Wolf concluded from the results of his research that muscle contraction and vasoconstriction due to mechanical and hormonal together that occur continuously will induce the occurrence of tension headaches or tension-type headaches (Zalaquette, 2009).

Almost three billion people were estimated to have migraine or tension-type headaches in 2016: 1.89 billion (95% uncertainty interval with tension-type headaches and 1.04 billion
with migraine. However, because migraine has a much higher disability burden than tension-type headache, migraine caused 45.1 million and tension-type headache only 7.2 million YLD globally in 2016. Headaches weigh most heavily on women between the ages of 15 and 49 years, with migraine causing 20.3 million and tension-type headaches 2.9 million in 2016, accounting for 11.2% of all YLDs in this age and gender group. Age-standardized DALYs for each headache type show a slight increase as SDI increases (Stovner et al., 2018).

Researchers have identified several triggers of tension-type headache (TTH) as a result of stress or mental tension, accompanied by sleep disturbances, as well as fatigue. There is also evidence that tension-type headache (TTH) can be influenced by factors such as weather changes, menstruation in women and the absence of time to relax or rest the body briefly during work and after work (Waldie et al., 2015). Patients with tension-type headaches (TTH) always complain of symptoms of pain and muscle stiffness (muscle spasms). Stiffness itself will cause complaints of pain which in turn will worsen the situation. The pain felt is stiffness in the forehead head and radiates to the neck (Rahmasari, 2015)

Physiotherapy is a form of non-pharmacological health service that can help patients suffering from Tension Type Headaches to reduce pain and pain in the head due to tension of the neck muscles improve body movement and function and improve the musculoskeletal system and improve the quality of life of Tension Type Headache patients. One of the physiotherapy methods that can be applied is Integrated Neuromuscular Inhibition Technique (INIT).

Intervention with Integrated Neuromuscular Inhibition Technique combines 3 interventions namely Ischemic Compression, Strain Counter Strain and Muscle Energy Technique which influence increasing cervical ROM through reducing Tension Type Headache pain. Giving ischemic compression with an emphasis on the muscle can lengthen the muscle sarcomere and a reduction in pain caused by stimulation of mechanoreceptors that affect pain. When pain decreases, it is continued with the provision of counter strain which can cause the upper trapezius muscle to relax. And the last action taken is the muscle energy technique method. This method uses isometric contractions in the affected muscles by producing post-isometric relaxation through the influence of the Golgi tendon organ (GTO) so that ROM increases due to decreased muscle tension and increased muscle flexibility.

INIT aims to stretch the fascia and muscle structures and increase muscle flexibility, prevent and eliminate taut bands/trigger points and adhesions on the fascia, eliminate complaints of pain and headaches, reduce stiffness, and improve functional abilities (Nagrale et al., 2010).
Some research in the Journal of Manual and Manipulative Therapy by Amit V Nagrale in 2010 states that the Integrated Neuromuscular Inhibition Technique (INIT) technique is effective in reducing pain, increasing ROM limitations in neck pain conditions due to muscle tension which results in Tension Type Headache.

METHOD

Research design using pre-experimental with one group pre-test and post-test design consisting of one treatment group. The population used in this study were 30 respondents at Telkomedika Clinic Makassar. Sampling was done with a purposive sampling technique. The inclusion criteria are Neck pain patients accompanied by headaches, patients aged 20-59 years, and Tension-Type Headache patients who do not have radial irritation based on physiotherapy examinations. The exclusion criteria in this study are Tension-Type Headache patients who have a history of HNP, Spondyloarthrosis, TB Spondylitis, and Tension-Type Headache patients who have fractures in the cervical. The sample used in this study was 30 respondents with one treatment group.

The measuring instruments used in this study are the Neck Disability Index to measure neck functional ability in Tension-Type Headache conditions. Data analysis used is the Wilcoxon test to determine the effect of Integrated Neuromuscular Inhibition Technique training on improving neck functional ability in Tension-Type Headache conditions.

This research has been approved by the Research Ethics Commission of the Health Polytechnic of Makassar. Informed consent has been obtained from the research sample before conducting the study.

RESULTS AND DISCUSSION

Sample Characteristics

| Table 1. Sample Characteristics |
|-------------------------------------------------|-------------------|-------------------|
| **Characteristics** | **Frequency** | **Percentage** |
| Age | | |
| 20-45 years | 27 | 90,0 |
| 46-59 years | 3 | 10,0 |
| Total | 30 | 100,0 |
| Gender | | |
| Male | 10 | 33,3 |
| Female | 20 | 66,7 |
| Total | 30 | 100,0 |
Table 1 shows that the characteristics of the sample based on age, 20-45 years are more, and based on gender, women are more than men.

Normality test value of Integrated Neuromuscular Inhibition Technique (INIT) exercise

<table>
<thead>
<tr>
<th>Neck Disability Index</th>
<th>Mean</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>48.80</td>
<td>0.018</td>
</tr>
<tr>
<td>Post-test</td>
<td>41.13</td>
<td>0.045</td>
</tr>
</tbody>
</table>

Table 2 shows that the results of the normality test have a p-value <0.05, which means the data is not normally distributed.

Neck Disability Index score before and after giving Integrated Neuromuscular Inhibition Technique (INIT) exercise

<table>
<thead>
<tr>
<th>Neck Disability Index</th>
<th>Mean</th>
<th>Sig.</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>48.80</td>
<td>3.38</td>
<td>0.000</td>
</tr>
<tr>
<td>Post-test</td>
<td>41.13</td>
<td>3.45</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 shows that the results of the Wilcoxon test have a p-value <0.05, which means that there is an effect of the Integrated Neuromuscular Inhibition Technique on improving the functional ability of the neck in Tension-Type Headache conditions at the Telkomedika Clinic Makassar.

The research respondents were patients with Tension-Type Headache conditions at the Telkomedika Clinic Makassar consisting of 30 respondents. Based on the characteristics of the respondents, the number of Tension-Type Headache patients is male, totalling 10 respondents (33.33%), while those who are female are 20 respondents (66.67%). Based on the age characteristics of respondents aged 20 - 45 years, there were 27 people (90%), and those aged 46 - 59 years were 3 people (10%).

Integrated Neuromuscular Inhibition Technique (INIT) is a combination of ischemic compression, positional release technique (PRT) also known as strain counter-strain technique, and muscle energy technique (MET). Integrated Neuromuscular Inhibition Technique (INIT) is an effective intervention in overcoming myofascial syndrome because it works directly on trigger points.

Based on the research, it was found that integrated neuromuscular inhibition techniques can reduce neck disability and increase the scope of motion of the neck joint following the results of previous studies. In the study, it was reported that compression on myofascial tissue areas that have taut bands and trigger points causes an increase in
osmolarity pressure on cell membranes that can affect membrane permeability and increase hydrostatic pressure in peripheral blood vessels. When the pressure is released, there will be an overflow of blood flow in the trigger point area which can result in the release of residual irritants in the form of metabolic waste that accumulates in myofascial tissue which will be brought back through the reabsorption process and cause a decrease in irritation to nociceptors so that pain is reduced (Dewi et al., 2016).

Based on the description of the discussion above, we can conclude that there is an increase in the functional ability of the neck in the condition of Tension-Type Headache at Telkomedika Clinic Makassar because after being given Integrated Neuromuscular Inhibition Technique (INIT) therapy there is a decrease in neck pain, a decrease in spasm of the neck muscles, and an increase in the functional ability of the neck based on the measurement of the Neck Disability Index (NDI), namely the pre-test value of 48.80 to post test 41.13.

**CONCLUSIONS AND SUGGESTIONS**

Integrated Neuromuscular Inhibition Technique exercise can improve neck functional ability in Tension-Type Headache conditions at Telkomedika Clinic Makassar.

It is recommended that physiotherapists at the Telkomedika Clinic Makassar apply the Integrated Neuromuscular Inhibition Technique to improve neck functional abilities in Tension-Type Headache conditions.

**REFERENCES**


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