

# **Effectiveness Manual Therapy & Kinesio Tape, Versus Dry Needling & Exercise Stabilization, on Patient Low Back Pain Due to Hernia Nucleus Pulposus**

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**Abstract.** Herniated nucleus pulposus (HNP) is a situation where the annulus fibrosus along the nucleus pulposus is protruding into the spinal canal. HNP patients often complain of back pain radiating to the lower limbs, especially when bending activity. Rehabilitation programs do help reduce pain. The aim of this research knew which treatment was more effective among manual therapy & Kinesio tape compared to dry needling and exercise stabilization in reducing pain for HNP patients. This study used a double-blind experimental design with an alpha value of 5%. The study was conducted at the Clinic "Rumah Fisio." The sample was 18 patients with medical diagnoses HNP who undergoing physiotherapy from January to Mei 2018. They are taking with randomization techniques. The pain was measured using the Visual Analogue Scale (VAS). The results of the t-test analysis showed that dry needling & exercise stabilization (mean=4.56, SD=1.130) was more effective than manual therapy & Kinesio tape [mean = 2.78, SD = 0.972;  $t(16) = -3.578, p = 0.003$ ] in reducing pain for HNP patients. The results of One-Way ANOVA showed that there was no significant difference in pain reduction produced by manual therapy & Kinesio tape frequency of treatment [ $F(2, 6)=1.857, p=0.236$ ]. In contrast, there were significant differences in pain reduction produced by Core stability frequency treatment [ $F(1, 6)=12.333, p=0.007$ ].

**Keywords:** *manual therapy & Kinesio tape, dry needling, exercise stabilization, herniated nucleus pulposus*

## **1 Introduction**

About 40% of lower back pain is caused by Hernia Nucleus Pulposus (HNP), where patients often complain of back pain radiating to the lower limbs especially during lithe activity (Olmakers, 1998). HNP has protective characteristics of annulus fibrosus and nucleus pulposus into the vertebral canal (Gilroy J, 2000).

Low back pain (LBP) is a highly prevalent health problem and the largest contributor to disability and work absence worldwide (Petrozzi, M.J,2015). Low back pain is quite common and affects 65 to 80% of the population (Ozturk, B,2006). Which is about 85% of all humans suffer from low back pain (LBP) at least once in their lifetime (MartinAlfuth,2017).

Disc herniation on the lumbar, caused by an emphasis on the joints generally occurring in the posterolateral part, depending on the amount of material from the spreading nucleus pulposus in the spinal canal, with or without emphasis on the dural sac, which can cause pain and disability (de Carvalho, 2016), where the highest prevalence was found at age between 30 and 50 years, with the incidence of men higher than women in a 2:1 ratio (Vialle LR,2010).

Manual therapy is a conservative management for treatment musculoskeletal problem that includes different skilled hands/fingers on techniques directed to the patient's body (spine and extremities) for the purpose of assessing, diagnosing, and treating a variety of symptoms and conditions (Clar et al. 2014)

Physiotherapeutic interventions within multimodal treatment programs are recommended in the rehabilitation of subacute and chronic LBP (MartinAlfuth,2017). Therefore, continuous application of KT around the trunk may be an additional treatment method for acute LBP in physical therapists and allows continuous patient treatment without loss of work time due to occupational LBP. In addition, KT can also be applied to prevention and treatment of occupational LBP in other professions involving heavy lifting equipment. (Hwang-Bo, G. & Lee, 2016). In the other side using dry needling, compared against placebo, to reduce pain, following treatment, and at four weeks follow-up in patients with Myofascial Pain Syndrome of the Upper Quadrant. However, new studies to support this recommendation are required (Rayegani, S.M, 2014). but the effectiveness of dry needling is controversial. In some studies, it has been shown to be effective, while in other studies, no beneficial effect was observed. We could not find any research regarding the comparison of these two methods (Rayegani, S.M,2014).

When performed correctly, dry needling techniques constitute one of the most effective treatment options (Fan, A.Y., Xu, J.,2017). In the treatment of low back pain, tendon-regulating manipulation plus kinesiotherapy can mitigate topical pain, improve the motion of low back, enhance the quality of life, and produce a more significant therapeutic efficacy compared to tendon-regulating manipulation alone (Cheng LL et al., 2016)

Exercise stability has become a trend of modality of current physiotherapy for treating lower back pain, following the core muscle strengthening principles (core muscles including: abdominal, paraspinal, diaphragm and pelvic floor muscles. The widespread benefits of core stability have been mentioned, can improve athletic performance, prevent injuries and to reduce lower back pain (Richardson, Jull, Hodges, Hides, 1999)

**2. Methodology**

This research uses the quantitative approach with double-blind experimental research design. The study was conducted at the Rumah Fisio Clinic. The study population was a patient with a medical diagnosis of HNP undergoing a physiotherapy program. The samples in this study were patients with a medical diagnosis of HNP undergoing physiotherapy program from January to Mei 2018. Samples were taken using randomization technique. This research uses a primary data source with a questionnaire as its instrument. Pain is measured using Visual Analyze Scale (VAS). After the data is collected, the data is entered into statistical software and analyzed by t-test and ANOVA, with a 5% alpha value.

**3. Results**

In the dry needling & Exercise stabilization group, the average age of respondents was 45.78 years, with the youngest aged 24 and 60 years old. In manual therapy & kensio tape group, the average age of respondents was 55.22 years, with the youngest respondent age 47 years and the oldest age 62 years. This can be seen in table 1.

**Table 1. distribution of respondents by age**

Groups	Mean	Median	SD	Min – Max	95% CI
<i>DN &amp; ES</i>	45,78	48	5,17	24 – 60	37,37 – 54,19
<i>MT &amp; KT</i>	55,22	56	10,94	47 – 62	51,25 – 59,19

The majority of respondents in the DN & ES group were male, i.e., six people (66.7%), while in the group of MT & KT, the majority of respondents were female, i.e., seven persons (77.8%).

The majority of respondents in the DN & ES group underwent therapy once, as many as six people (66.7%). In the group of MT & KT respondents underwent therapy 1, 2 and 3 to 5 times, i.e., each of 3 people (33.3%).

This is complete in table 2.

**Table 2. Distribution of respondents by sex and frequency of therapy**

Characteristic	Category	DN & ES groups		MT & KT groups	
		amount	percentage (%)	amount	percentage (%)
sex	female	3	33,3	7	77,8
	male	6	66,7	2	22,2
Frequency of therapy	ones	3	33,3	6	66,7
	twice	3	33,3	2	22,2
	3 - 5	3	33,3	1	11,2

In the DN & ES group, the mean pain scale before the action was 6.22 and the mean pain scale after the action was 1.67. The average decrease in the pain scale of respondents was 4.56. In the MT & KT group, the average pain scale before action was 4.56 and the mean pain scale after the action was 1.78. The average decrease in the pain scale of respondents was 2.78. This can be seen in table 3.

**Table 3. Distribution of respondents by the scale of pain**

Characteristic	Category	Mean	Median	SD	Min – Max	95% CI
Pain scale <i>DN &amp; ES groups</i>	Before intervention	6,22	6	1,20	4 – 8	5,30 – 7,15
	After intervention	1,67	2	0,70	1 – 3	1,12 – 2,21
Pain scale <i>MT &amp; KT groups</i>	Before intervention	4,56	4	1,01	4 – 7	3,78 – 5,33
	After intervention	1,78	2	0,83	1 – 3	1,14 – 2,42
Pain decrease	<i>DN &amp; ES groups</i>	4,56	4	1,13	3 – 7	3,69 – 5,42
	<i>MT &amp; KT groups</i>	2,78	3	0,97	2 – 5	2,03 – 3,52

Furthermore, the data normality test on the variable of pain scale decrease, where Shapiro-Wilk value shows the result of normally distributed data (p-value <0.068).

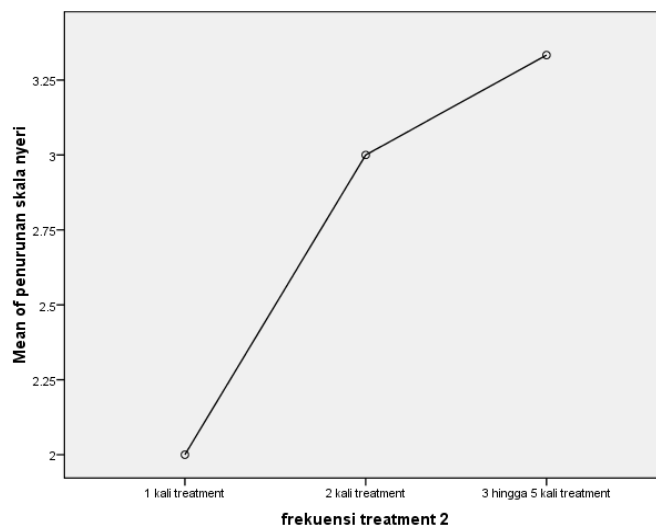
The results of analysis with t-test show that DN & ES (mean = 4.56, SD = 1,130) is more effective than MT & KT [mean = 2.78, SD = 0.972; t (16) = - 3,578, p = 0.003] in reducing the pain of HNP patients. The results of One-Way ANOVA analysis showed that there was no significant difference in pain reduction resulting from the frequency of treatment of MT & KT [F (2, 6) = 1.857, p = 0.236]. Conversely, there was a significant difference in the decrease in pain resulting from the frequency of treatment of DN & ES [F (1, 6) = 12.333, p = 0.007]. The results of the analysis can be seen in tables 4 and 5, as well as figures 1 and 2.

**Table 4. the result of data analysis with the t-test**

Characteristic	category	Mean	SD	t	df	P values
Pain decrease	<i>DN &amp; ES groups</i>	4,56	1,13	-3,578	16	0,003
	<i>MT &amp; KT groups</i>	2,78	0,97			

**Table 5. The result of data analysis with One-Way ANOVA**

Characteristic	Frequency of therapy	N	Mean	df1	df2	F	P values
<i>MT &amp; KT groups</i>	ones	3	2,00	2	6	1,857	0,236
	twice	3	3,00				
	3 - 5	3	3,33				
<i>DN &amp; ES groups</i>	ones	6	4,00	1	6	12,333	0,007
	twice	2	5,00				
	3 - 5	1	7,00				



**Figure 1. Mean value of decreased pain scale based on the frequency of therapy in the MT & KT groups**

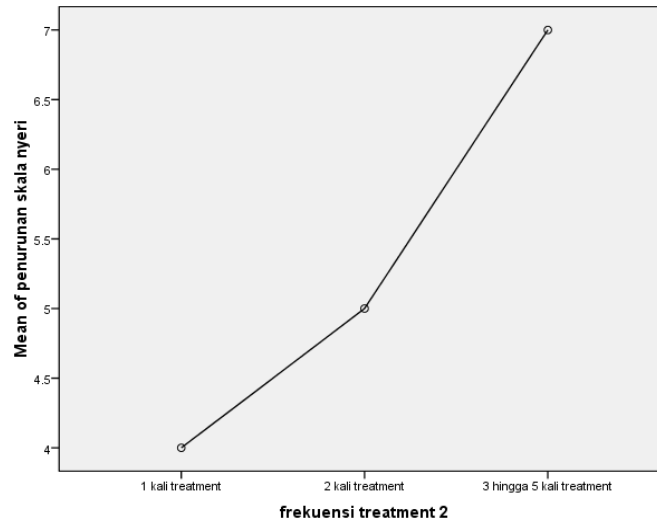


Figure 2. Mean value of decreased pain scale based on the frequency of therapy in the *DN & ES* groups

#### 4. Conclusion

Based on the results of the research, it can be concluded that *DN & ES* (mean = 4.56, SD = 1,130) is more effective than *MT & KT* [mean = 2.78, SD = 0.972;  $t(16) = -3,578$ ,  $p = 0.003$ ] in reducing the pain of HNP patients. The results of One-Way ANOVA study also showed that there was a significant difference in the decrease of pain produced by frequency treatment of *DN & ES* [ $F(1, 6) = 12,333$ ,  $p = 0,007$ ].

#### Acknowledgments

The author would like to thank Allah Azza Wa Jalla, my dear Hannah, Vinka, Juno and Echa. Deep gratitude for Prof. Sigit and the doctor's team for the valuable discussions and assistance during the drafting process.

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