

THE EFFECT OF NEURO-DEVELOPMENTAL TREATMENT (NDT) ON MOTOR DEVELOPMENT AND HYPOTONUS IN CHILDREN WITH DOWN SYNDROME AT RSAB HARAPAN KITA

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ABSTRACT

Background: The first year of life, especially the period from the fetus in the womb until the child is 2 years old is an important period in growth and development. However, not all children can grow and develop normally. One of the growth and development disorders that is often found is Down Syndrome.

Objective: This study aims to determine the effect of Neuro-Developmental Treatment (NDT) on motor development and hypotonia in children with Down syndrome at RSAB Harapan Kita.

Method: This study is a Pre-Experiment study. The population of the study was all Down syndrome patients at RSAB Harapan Kita Jakarta. The sample of the study was patients who had undergone a physiotherapy program for at least 2 weeks and a maximum of 1 year who met the inclusion criteria of 30 people.

Results: Paired Sample T-test after intervention with NDT Therapy on motor development and muscle tone obtained a p value of 0.000 $p < 0.05$. **Conclusion:** Therapy with NDT can have a significant effect in improving motor development and muscle tone in children with Down Syndrome.

Keywords: Neuro-Developmental Treatment (NDT), Down Syndrome, Motor Development, Hypotonus

ABSTRAK

Latar Belakang: Tahun pertama kehidupan, terutama periode sejak janin dalam kandungan sampai anak berusia 2 tahun merupakan periode penting dalam pertumbuhan dan perkembangan. Namun tidak semua anak dapat bertumbuh dan berkembang dengan normal. Salah satu gangguan tumbuh-kembang yang sering ditemukan adalah *Down Syndrome*.

Tujuan: Penelitian ini bertujuan untuk mengetahui Pengaruh *Neuro-Developmental Treatment (NDT)* Terhadap Perkembangan Motorik dan Hipotonus Pada Anak Dengan *Down Syndrome* di RSAB Harapan Kita.

Metode: Penelitian ini adalah penelitian *Pra Experiment*. Populasi penelitian adalah semua pasien down syndrome di RSAB Harapan Kita Jakarta. Sampel penelitian adalah pasien yang telah menjalani program fisioterapi minimal 2 minggu maksimal 1 tahun yang memenuhi kriteria inklusi sebanyak 30 orang.

Hasil: Uji *Paired Sample T-test* sesudah intervensi dengan Terapi NDT terhadap perkembangan motorik dan tonus otot diperoleh nilai p value 0,000 $p < 0,05$.

Kesimpulan: Terapi dengan NDT dapat berpengaruh secara signifikan dalam memperbaiki perkembangan motorik dan tonus otot anak dengan gangguan *Down Syndrome*.

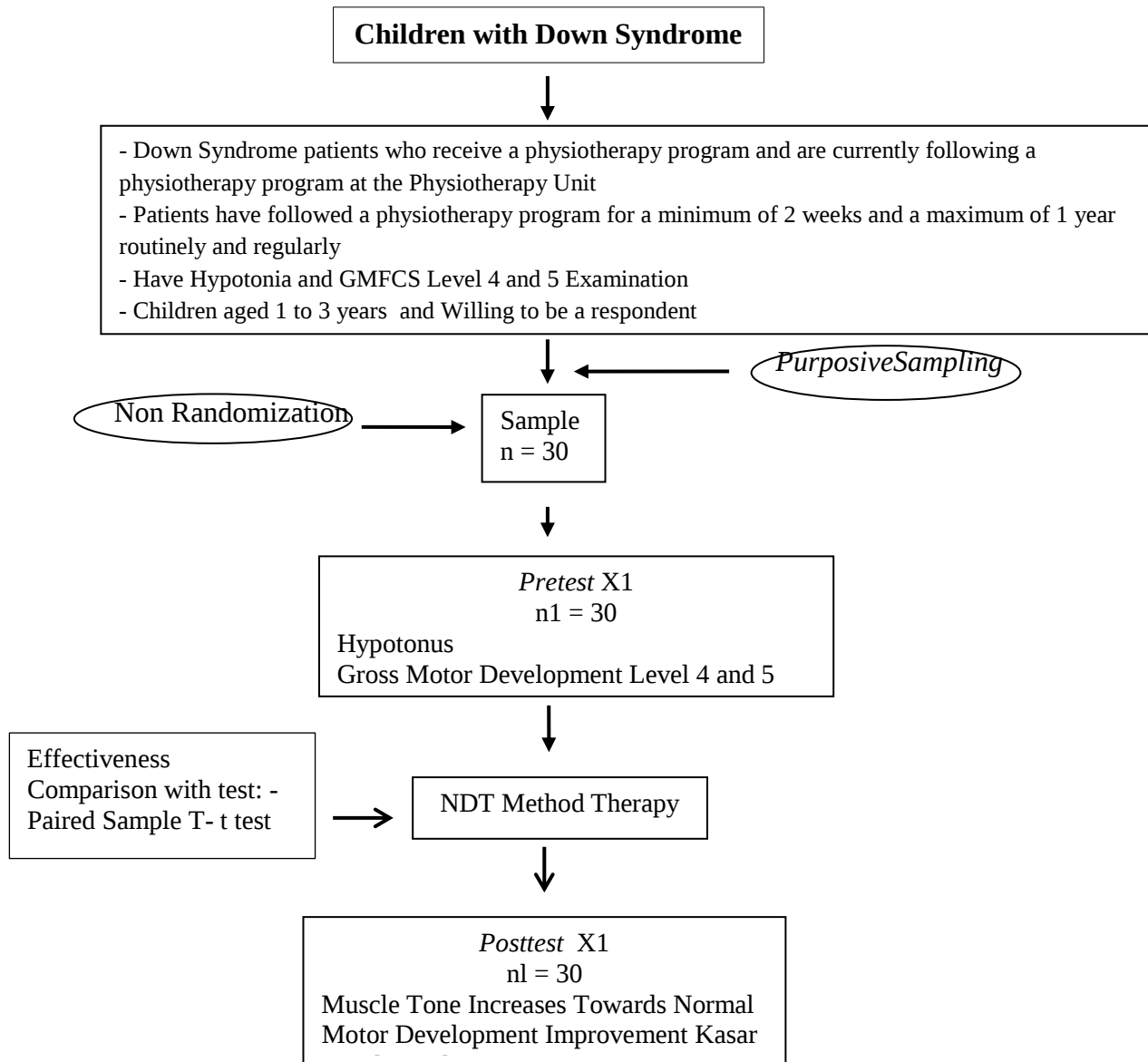
Kata Kunci : *Neuro-Developmental Treatment (NDT)*, *Down Syndrome*, *Perkembangan Motorik*, *Hipotonus*

INTRODUCTION

Currently, cases of Down syndrome in Indonesia tend to increase. Based on the results of the Basic Health Research in 2010, in children aged 24-59 months the cases of Down syndrome were 0.12%, in 2013 it increased to 0.13% and in 2018 it increased again to 0.21%. Meanwhile, the number of new cases of outpatient Down syndrome patients in hospitals in Indonesia based on data from the Online Hospital Information Site (SIRS online) reported in 2015 that there were 2,488 hospitals, in 2016 there were 2,598 hospitals, and in 2017 there were 2,776 hospitals that reported cases of Down syndrome. Children with Down syndrome often show muscle weakness, decreased endurance and development of motor skills. Children with Down syndrome show delays in controlling motor movements compared to children with normal development. Walking ability and postural disorders often occur in Down syndrome sufferers which limit their quality of life. (Aly et al., 2016). The role of Physiotherapy in improving the quality of life of sufferers, especially in terms of improving motor skills. Thus, the author is interested in further studying the effects of NDT Therapy in cases of Down Syndrome, which is the 3rd most common case at the Special Clinic for Growth and Development RSAB Harapan Kita.

METHOD

This study is a Pre-Experimental study. The population of the study was all Down syndrome patients at RSAB Harapan Kita Jakarta. The research sample was patients who had undergone a physiotherapy program for a minimum of 2 weeks and a maximum of 1 year who met the inclusion criteria of 30 people. The study was conducted at the Physiotherapy Unit of RSAB Harapan Kita Jakarta from January to October 2022 with the obtaining of Ethical Review Approval from RSAB Harapan Kita Jakarta



Research Flow Scheme

RESULTS AND DISCUSSION (12pt)

Characteristics of the sample

Table 1. Characteristics of the sample based on age, gender, causative factors, maternal birth history

Variable	f	%
Age (years)		
1 – 3	9	30
3 – 6	21	70
Total	30	100
Gender		
Male	15	50

Female	15	50
Total	30	100
Types of Down Syndrome		
Nondisjunction		
Total	30	100
Initial Muscle Tone		
Normal	0	0
Hypotonic	29	96
Hypertonic	1	3
Total	10	100
Final Muscle Tones		
Normal	29	96
Hypotonic	0	0
Hypertonic	1	3
Total	30	100
Early Motor Development		
Level 4	2	7
Level 5	28	93
Total	30	100
Late motor development motoric Akhir		
Level 1	25	83
Level 2	3	10
Level 4	2	7
Total	30	100

The Effect of Therapy with NDT Method on Changes in Muscle Tonus

Table 2. Effect of Therapy with NDT Method on Changes in Muscle Tonus before and after treatment

NDT	Mean $\pm$ SD	CI 95%	P value
Muscle Tones Otot pre - post	1.939 $\pm$ 0.348	1.815 – 2.062	0.000

From the results of the Paired Sample T-test, a p-value of 0.000 (p-value <0.05) was obtained. It can be concluded that there is a difference in the average muscle tone between before and after intervention with the NDT Method. The data analysis above shows that intervention with the NDT Method has an effect on changes in muscle tone.

The Effect of Therapy with the NDT Method on Gross Motor Development

Table 3. The Effect of Therapy with the NDT Method on Gross Motor Development before and after treatment

NDT	Mean $\pm$ SD	CI 95%	<i>P value</i>
Gross Motoric <i>pre - post</i>	3.878 $\pm$ 0.484	3.706 – 4.050	0.000

From the results of the Paired Sample T-test, a p-value of 0.000 (p-value <0.05) was obtained. It can be concluded that there is a difference in the average gross motor development between before and after intervention with the NDT Method. The data analysis above shows that intervention with the NDT Method has an effect on gross motor development.

CONCLUSION

1. Based on age, the respondents studied who participated in the Physiotherapy program at RSAB Harapan Kita Jakarta were in the age range of 1 - 3 years as many as 9 people (30%) and 3 - 6 years as many as 21 people (70%).
2. Based on Gender, the respondents studied who participated in the Physiotherapy program at RSAB Harapan Kita Jakarta, were male as many as 15 people (50%), female as many as 15 people (50%).
3. Based on the Type of Down Syndrome, the respondents studied who participated in the Physiotherapy program at RSAB Harapan Kita Jakarta were all Nondisjunction Down Syndrome.
4. Therapy with the NDT Method has a significant effect on improving Muscle Tone and Motor Development after treatment.

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