

# APPLICATION OF CHAINING THERAPY FOR IMPROVING FINE MOTORIC SKILLS AS SELF BEING BASIC SKILLS IN CHILDREN WITH DOWN SYNDROME



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## Abstract

Background Every parent want perfection is created for their children. However, if perfection is not obtained, then the only way is to maximize the potential of the child for functioned optimally and can live independently. Aims This study aims to determine the effectiveness of chaining therapy in maximizing fine motor skills that the basis for self-being skills in children with Down syndrome, children are expected can practice maximally motor skills so they can perform many activities of daily life independently. Method The research was conducted by applying the behavior approach chaining therapy in children with Down syndrome to improve their fine motor skills. The subjects in this research 2 people who attend schools for children with special needs in Surabaya. Method of assessment are interview, observation and psychological tests while chaining therapy using chaining technique. Results & Conclusion The chaining technique is effective enough to improve in fine motor skills in children with Down syndrome. In this technique behavior break down the behavior into smaller components and given to the children one by one in a systematic, until children mastered a whole set of behaviors that become intervention target. This makes it easy children with cognitive and physical limitations that occur in children with Down syndrome in order to receive information and training new the behavior gradually. Improvement that appears in the behavior the target activities are the subject doing activities in fine motor skills that more directed, not only do the activity without purpose. Moreover, with this technique becomes more settling the behavior, because each small component the behavior is repeated until the subject doing activities completely mastered before mastered a whole set of behaviors to intervention target. Several factors influence the effectiveness of the application of this therapy in subjects with Down syndrome, i.e. age factor (children's readiness for receive stimulation), cognitive ability, motivation, and support the environment.

*Keywords:* Chaining therapy, down syndrome

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## **1. Introduction**

Based on the data obtained, today more and more abnormal children born in Indonesia, however they also have the opportunity to develop their potential maximally. They did not choose for be them become abnormal as it is now, therefore it is the duty of everyone to help children that have special needs such as Down syndrome child to optimize capabilities. One of the assistances given is direct interventions for improve in fine motor skills with chaining technique. Although Down syndrome children have a deficiency in academic terms, but they can master vocational skills that can help them later. Therefore, children motor skills children need to be considered and developed maximally, so eventually they were able to be independent and not depend on others.

## **2. Problem statement**

The difficulty to form behavior in child with down syndrome.

## **3. Research Questions:**

How to form new behavior using chaining therapy in child with down syndrome?

## **4. Purpose of the Study**

The purpose of this study is for apply the chaining chaining therapy for improve in fine motor skills that eventually followed by an increase in the capacity and skills being self in children with down-syndrome.

## **5. Research Methods**

Clinical interview is the most commonly used assessment in children and the parents (Sattler, 1998 as cited in Mash & Wolfe, 1999). Interviews were conducted in the mother and significant other to dig up information on the subject at home and doing interviews on teacher and school psychologist associated with the behavior of the subjects in school. In addition, the observation made by observing the object or the subject concerned or in a particular environment and behavior. Observations made on the physical appearance of the child, according to the physical characteristics that arise in children with Down syndrome are related to the five aspects of the child's fine motor skills, that is stability, bilateral coordination, sensation, dexterity (skilled) and the ability of self coached. Observations made since the first meeting until the implementation of the intervention. Psychological tests are also given, in the form of a series of tests that have been standardized for the purpose of

assessment of a person to reveal some aspects, such as cognitive ability, skills or capabilities and aspects of personality (Mash & Wolfe, 1999).

One of the instruments use for development assessment in Down syndrome children are Vineland Social Maturity Scale (VSMS) developed by Dr. Edgar A. Doll in Vineland, New Jersey. The main goal in designing this scale for measure social maturity, which can help provide a diagnosis of mental retardation (Payne & Patton, 1981). Scale use VSMS aims to understand the condition of the subjects before and after the intervention associated with the ability of self-adaptive or coaching ability as one of the subjects and tool for evaluating effectiveness of intervention. One of the cognitive assessment instruments in the Down syndrome children use the scale Stanford - Binet in order to know intelligence capacity that owned by the subject to get an IQ score and also Mental Age (MA). MA is the measurement of outcomes the child mental achievement in year term (Mash and Wolfe, 1999). Additionally, in the assessment of motor, that is Visual Motor Integration Test or VMI tests.

With this test, expected to know child's abilities visual motoric integration that includes visual perception and coordination of motor movements. Intended use of the test as a screening tool VMI prior to the intervention and measurement as an evaluation after the intervention associated with the change of the fine motor skills in the subject. The subjects in this study were 2 children, i.e. children with characteristics according to Down syndrome patients aged 8 and 10 years. Research sites in inclusive schools in Surabaya, researchers act as a substitute teacher in school and conduct home visit. Implementation of interventions for about 12 days, every day. Interventions performed 30 minutes before the lesson, and continued 30 minutes after class. For the first subject, conducted from 07.00 until 09.00 and from 10.00 second subject until 12:00.

## **6. Design Intervention**

Interventions performed on subjects with fine motor skills using Behavioristic approach, chaining technique. With this technique, the target behavior to be achieved behaviors split into simpler and chain to generate more complex behavior is the target behavior. This is due to the limitations of in cognitive and comprehension in Down syndrome children makes them impossible to receive all the information at once. Limitations on the physical aspects of the child also affects the motor skills that make the child unable to perform complex motor activity at once. Researcher intervening with Forward chaining technique. Interventions performed in the first step of all series of behavior, continue to the next step until the whole series ends.

Physical and mental condition of Down syndrome children are very influential in its development, particularly in developing fine motor skills. There are 5 aspects of fine motor development in Down syndrome child who will be trained, i.e. stability, where they generally show an inability to maintain muscle in certain circumstances. The second aspect is the Bilateral Coordination hampered, because the stability and balance of the body of a poor child and his immaturity in its development as a whole. The third aspect is the sensation, because it develops the ability to be able to distinguish sensory well, very important for children to learn to move his hands and fingers accurately. So, it takes a lot of stimulation in their sensory receptors. Fourth aspect is Dexterity. Barriers in this aspect is their difficulty to move muscles and a different finger conditions with a normal child can make them lose stability and arms control. The last aspect is the ability to self coached. The obstacles are physical conditions that inhibit their activity is more complex subtle motoric in school activities and at home (see table 1).

### 6.1. Intervention by chaining technique

**Table 1.** Fine motor intervention on children with down syndrome

No	Activity	Aims	Description
1	Playing Ball	Increase stability and sensation	When playing football, children using body stability as a basis for moving his arms and hands. In addition, the various forms and types of balls to train children sensation when holding. This activity is to train subjects to perform a series of activities in the play the ball, such as throwing up, toward opponent and also catch the ball out of someone else. So that the subject can skillfully play the ball itself, as well as with others.
2	Pouring Material	Increase stability and establish being selves	This activity can work to train subjects related to daily activities at home. When the subject is able to perform this activity either by sitting or standing, the subject can serve themselves or others associated with the activity of eating or other activities that require the same skills. In addition, children also have to do with neatly with no debris scattered due to his inability to control the power and speed of his hands when the children pour the ingredients. When pouring the ingredients with a variety of severe, children learn to stabilize the body when sitting or standing when poured. Since it takes the body to control the stability of the raised arm to pour the different ingredients.
3	Sweep (floor / yard)	Increase stability, bilateral coordination and being self	This activity requires the body and legs which remain stable when the arm moves to the front and rear. Children can be said to be able to perform these activities when able to make a clean of dirt by sweeping using a broom stick or broom fibers. With subjects can perform these activities, both on the floor just swept open or under furniture in the house, the subject can be more independent and help routines at home everyday.

4	Bring Tray	Increase stability and establish being selves	<p>This activity is also strongly associated with the day-to-day skills at home. If the subject can carry the load in his hand while walking and the burden does not fall in this activity is a tray with food and drink, then this activity can be said to be capable of doing. By exercising this activity, the subject is expected to be more independent and help routines at home everyday.</p> <p>When carrying a tray of food or drink, the child must keep his arm steady and solid when running.</p>
5	String up	Developing Bilateral Coordination, Sensation and Dexterity	<p>This activity gives children the opportunity to experiment with the dominant hand. Typically, the meronce dominant hand, while the other hand holds his logs. In addition, children learn to control the strength of the hand and fingers in this activity. This activity requires the skills to take control of small objects and hand-crafted to be, do not spoil it by pushing blocks or straws too strong at the base. If this activity can be controlled by, subjects are expected to do so with a variety of tools to measure yangberbeda</p>
6	Playing Sticke	Developing Bilateral Coordination and Dexterity	<p>Opening the sticker from the sticker sheet requires good coordination of both hands as well as the ability to more skilled (Dexterity). This activity is suitable for children aged 7 years and over, as if done at a younger age these activities can make children frustrated.</p> <p>Perfection in this activity is the child able to play off sticker sticker of various sizes and shapes, also stick to other objects with precise and beautiful.</p>
7	Playing Plasticine	Developing Bilateral Coordination and Dexterity	<p>With plasticine leveling by hand and also using circular pipes will help skills on the wrist. This activity can also stimulate sensory subjects, improve hand strength and fingers, as well as encourage creativity while playing.</p> <p>Children were able to play plasticine is when the child is able to squeeze plasticine, shaping, smoothing by hand or with tools.</p>
8	Sensory playing	Stimulate sensory	<p>By getting to know all kinds of materials with diverse textures and flavors, lots of stimulate sensory receptors in the hands and tongue.</p> <p>Children are able to distinguish different textures and flavors, and can tell which one is more preferred and why</p>
9	Cutting with scissors	Developing Bilateral Coordination and Dexterity	<p>This activity train many aspects such as body stability and shoulders to move accurately while scissoring. Besides censory that appear on joints and muscles, those activity can help to adapt while scissoring accurately. Control of thumb could move on joint's clients to open up scissors while she or he moves hand. The stability of hands could open and close the scissors with thumb and index finger, while stability of hand giving control to whole of hand. The dominantly of hand while straighten the scissors with the paper to form the paper while scissoring, and the other hand adapt for the paper. This activity being succeed while the child can scissor any kind of form without spoil something, and scissoring all of form exactly.</p>
10	Wearing shock	Developing Bilateral Coordination and Dexterity	<p>This activity could toughen fingers and stability while wearing socks.</p>

The intervention is done twice times before and after the lesson as long as 30 minutes. It consists of 2-3 different activities, depends on its difficulty, start from the beginning until the end systematically. The exercise needs about 20 sessions which different activities to increase soft skill.

### *6.1.1. Intervention Evaluation Design*

**Each session.** Evaluation does in each session and per activity, right after the program by observing the failed dan success in each activity. Clients have to reach behavior target as a try out and being observed, then compile the results to compare client 1 and client 2.

**As a whole.** Client behavior is observed before and after the intervention, which depend on 5 aspects of soft skill especially stability, billateral coordination, censation, dexterity, self help management for daily activities.

**Table 2.** Holistic design of evaluation

Aspect	Note	Observation	
		Before intervention	After intervention
Stabilities	Consistency between body and shoulder. Stability of whole body while moving.		
Bilateral coordination	Doing 2 activities at the same time with hands, and developing the move of dominantly hand while do some activities		
Senses	Recognizing texture, tastes and forms to develop censory		
Dexterity	Doing activities with small things, and it correlate with control of fingers coordination and wrist of hand		
Self-help management	Skill to do some daily activities that correlate with school tasks		

**The intervention process.** This evaluation is done by observation qualitatively.

## **7. Findings**

According to VSMS results before and after the intervention, it shows improvement in few aspects. In first client, showed improvement in motoric, self-help, and social skill. And the second client, showed improvement in self-help, social skill and communication. It is consistent with the goal of the intervention.

According to VMI results, there are no changes between those clients. It's because of the design of the intervention not correlate with the paper and pencil activities. The intervention was designed focused on soft skill ability and followed by self-help ability.

Each client has reasons to develop skill, such as age. Age shows readiness in every condition, it correlate with condition of neuron, cognitive ability and motoric control that make them could accept any stimulation. To know the readiness, need trial while giving stimulation (Bruni, 2006). If the first trial failed, do not stop, and keep doing the exercise to client patiently. Other factors that contribute the effectivity of intervention are motivation and environment support.

From those interventions, behavioristic approach could improve soft skill in down syndrome. By using it, behavior target arranged systematically and divided into smaller components.

According to the intervention design, each client could improve the behavior target. According to the implementation, every client has two opportunities to repeat each behavior component. If they can do correctly, then could continue with the next behavior target on schedule. But, if they cannot do correctly, then the exercise will do until they reach the intervention target in each behavior component.

## **8. Conclusions**

Using chaining technique of behavioristic approach can increase soft skill in child with down syndrome. It's because the technique simplified the limitation of those children to accept information and exercise gradually. Moreover, the technique makes the behavior more settle, because each small behavior component being repeated until they hold every aspect of intervention target for each behavior component.

By mastering the principal of soft skill developmental, child becomes easier to do difficult activities correlated with self-help skill.

Many factors that influenced the effectivity of this technique in child with down syndrome, such as age, cognitive ability, motivation and environment support.

## **9. Suggestion**

Chaining technique can be applied in the school and the curriculum represents it. If want to apply it at home, parents can follow the program that have been arranged for children, so that avoid the regression behavior.

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