

Effectiveness of Motor Skill Training on the Performance of Dressing as an Activity of Daily Living by Kenyan Pupils with Cerebral Palsy

Janet Auma Odhiambo

Jaramogi Oginga Odinga University of Science and Technology

Dr. Charles Omoke

Department of Special Needs Education, Jaramogi Oginga Odinga University of Science and Technology

Dr. Peter J. O. Aloka

Department of Psychology, Jaramogi Oginga Odinga University of Science and Technology

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Abstract

The study established the effectiveness of Motor Skill training on the performance of Dressing as an Activity of Daily Living by Pupils with Cerebral Palsy in one special school for pupils who are physically challenged in Kisumu, Kenya. The study adopted a Pre-test, Post-test experimental study design. Sample size of the study comprised 25 respondents which included 12 pupils with cerebral palsy, 3 teachers in charge of the pupils in the school, 8 parents of the pupils and 2 physiotherapists. Purposive sampling technique was adopted to select the respondents. Data collection tools included observational checklist, interviews and Focus Group Discussions. Piloting was carried out before the onset of the study to establish validity and reliability. Wilcoxon Signed Rank Test was used to test the hypothesis. The study's findings revealed that, after motor skill training, there were improvements on motor skill functioning among pupils who received training, while those who did not receive any training had no improvements. The study recommends that community based rehabilitation centers be set in every community to work in collaboration with the medical personnel, teachers and parents in helping with the training of motor skills to aid the pupils in being self reliant.

Keywords: Cerebral Palsy, Motor skill performance, dressing, training and Activity of Daily Living.

1. Introduction

Cerebral palsy can be described as impairment to part of the brain of a child. This can happen before, during or after birth. Parts of brain affected are responsible for movements required in the performance of activities of daily living. Most of people affected do learn the performance of daily activities several years later than their able bodied peers; the severely affected may never learn to do anything. Persons with cerebral palsy have challenges that significantly interfere with their ability to perform daily activities. People with cerebral palsy have a wide variety of concomitant defects that when put together present a tremendous handicap for the performance of motor related activities. They are unable most of the times to perform everyday tasks such as dressing, bathing and washing among others. Motor skills training is the acquisition of motor functioning through repetitive practice. The training of motor skills may be used as a remedy for habituating persons with cerebral palsy.

There are several indications of impairments in a person with cerebral palsy. The signs vary from one individual to the other, depending on which limbs are involved and the number of limbs affected. Except for children with severe impairments, the condition is not life threatening to those who are mildly affected. Many children with cerebral palsy eventually grow up into adults with the same condition. The condition can be managed through medical therapies that help in maximizing independency. A lot of strategies have been put in place to do away with barriers for individuals with cerebral palsy in their being independent. For example, in the United States of America, the Boston Children's Hospital of Cerebral Palsy Program provides interdisciplinary evaluation and treatment for children with cerebral palsy and other neuromuscular conditions. The hospital combines expertise orthopedic surgery and neurosurgery, among several other specialists to improve the functional capabilities of more than 2000 patients each year. The hospital is dedicated to delivering knowledgeable, compassionate care in family centered atmosphere as they focus on maximizing the children's

functional independence, stability and quality of life while offering support for the children's entire family. Other methods used in the management of children with cerebral palsy include; Constraint-Induced therapy which involves restraining the stronger limb in a cast and forcing the weaker arm to perform intensive activities everyday over a period of weeks (Summer, Larkin and Dewey, 2008) Functional electrical stimulation (FES) is another form of therapy, this is a therapeutic use of low level electrical current to stimulate muscle movement and restore useful movements such as standing or stepping which is known as effective way to target and strengthen spastic muscles.

In Europe, occupational therapists work in partnership with parents or caregivers of children with cerebral palsy in the provision of assistive strategies to aid the children in their daily functional abilities. The occupational therapists start with assessing the condition of the children for identification of their abilities and inabilities. Motor impairments of the children are then addressed using several strategies in accordance to individual needs. A lot of exercises are designed for such children meant for gross motor habilitation, movements of legs, arms, hands, fingers and the whole body through repetitive activities. For example, if a child's muscles are weak, progressive resistance exercises are used to improve strength of the muscles and for endurance. Fine motor habilitation is done for precise movements of small muscles such as picking seeds from a container and placing into another container for finger dexterity or the improvements of finger movement and control. Orthoses, casts and splints are used for the correction of joint abnormalities, stability and to prevent unnecessary movements that may result into muscle shortening or lengthening. Orthoses are also used to make dressing easier. Splints are used in the legs to facilitate walking. All the intervention strategies applied are directed towards enabling children with cerebral palsy carry out daily activities while preventing further deformities in the joints and muscles.

In most of the African countries, Cerebral Palsy is a huge hidden problem. Primary care is limited due to lack of medical personnel who are knowledgeable in the management of cerebral palsy, moreover, there is lack of medical equipment for diagnostic purposes. Cerebral Palsy Association African partners have recognized the need to introduce training programs for key medical practitioners to provide therapy services for persons with cerebral palsy. In the absence of any early therapeutic interventions, children with cerebral palsy can easily develop secondary complications which hinder them further from performing the activities of daily living independently. Research by Townsend and Polatjko, (2007), in South Africa revealed that a lot of progress has been made to habilitate children with cerebral palsy. Subsidies from the state and voluntary associations have developed very good schools in the whole of South Africa to cater for persons with cerebral palsy. Assessment and diagnostic centers have been made available in most of the learning institutions in the country. Provincial hospitals have also taken the initiative of providing clinical services to persons with cerebral palsy. As a result a lot of improvements are seen after exercising for one to three months in the rehabilitation centre. Moreover, in Uganda, Cerebral Palsy Africa (CPA), have funded three trained cerebral palsy therapists to run a training program for community based rehabilitation workers in Kampala (CDC, 2010), their main work is to identify further opportunities for training which involves both therapies and practical skills to support children with cerebral palsy and their families.

In Kenya, statistics by (CDC, 2006) reveals that there are warning signs of 970 children having cerebral palsy in an area of 32,982, 1092. As mentioned earlier cerebral palsy describes lack of muscle control that affects a person's ability to move and to maintain balance and posture. These disorders occur because a person's brain cannot control his or her muscle (Rosenbaum, Panneth, Lewinton, Goldenstein and Bax, 2007). It implies therefore, that children with cerebral palsy have difficulties in performance of activities of daily living. Even though some parents of children with cerebral palsy have formed an association whereby they are able to access some of the available support services for their children, the National Dissemination Centre for Children with Disabilities (2004) observed that there are very few physiotherapists, occupational therapists and speech therapists in proportion to the number of children who require their services. Pupils with cerebral palsy in a special school for the physically challenged in Kisumu are not exempted from the experiences of the challenges in the performance of activities of daily living, and are not able to access the services of the physiotherapists and occupational therapists for their functionality. With or without enough medical personnel, the children need support in their habilitation to perform the daily life skills such as dressing without depending on others.

1.1 Theoretical Framework

The study was guided by the Conscious competence theory by Broadwell (1996). The concept is commonly known as the conscious competence learning model or the conscious learning theory. The theory explains how people can be trained in stages of learning a skill, this begins from unconscious incompetence of the skill for personal use, one is ignorant of the importance of the skill, in the next stage, the person becomes aware that he or she is in competent in

executing a task. This motivates one to learn a new skill and therefore makes a commitment to learn and practice, stage three is conscious competence, one is able to learn the skill and perform it reliably and at will but still there is need of proper concentration for the skill to be performed without assistance, at this stage the skill is not yet well mastered, there is still need for a lot of practice for perfection to be realized. The fourth stage is when the skill has been fully mastered and can be performed unconsciously.

The theory was relevant to the study as it explains how an individual can be unaware of existence of a skill and its relevance for daily use, but on realizing the importance of the skill he or she develops an interest to learn. During early childhood up to early adulthood, children with cerebral palsy may be ignorant about the existence of functional abilities in them in the performance of everyday activities and may be comfortable getting assistance from their care givers. However, as they grow up to teenage, they realize that there are certain activities such as bathing, toileting and dressing that needs to be performed in privacy. As they recognize the relevance of being able to perform these activities on their own, they willfully desire to learn and with the help of a trainer in motor skill activities, the children with cerebral palsy may be able to perform the activities of daily living independently.

1.2 Related literature

Several studies have been carried out on the effects of exercise as a therapy for children with physical disabilities. A study by Magil, (2007), in Netherlands on effects of exercise on children with physical disabilities showed that an exercise program for children with cerebral palsy improved kids fitness, participation and quality of life. In addition to the research findings, parents of the kids in the exercise group reported an improvement in basic motor functioning, autonomy and cognitive functioning. The parents however, noticed little difference in pain or social functioning. In a follow up four months after the exercise sessions ended, the kids in the exercise group had lost some of the aerobic gains made during the exercise sessions. Confirming the value of a long term exercise, in the reviewed study, play was a recommended therapy as a form of exercise for children with cerebral palsy.

Amy, Latimer, Lara, Audrey, Hicks, Kathleen, Alyssa, Anne and Robert, (2012) -in San Diego carried out a systematic review of evidence surrounding effects of exercise training on physical fitness, mobility, fatigue and health related quality of life in adults with multiple sclerosis. A population of 50 patients with sclerosis was sampled purposively. The study was experimental, with the use of observations and questionnaires as research tools. The analysis was done using descriptive approach. The findings had strong evidence that exercises performed 2 times per week at moderate intensity increases aerobic capacity and muscular strength, the evidence however, was not consistent regarding the effects of exercise training on other outcomes. The studies nevertheless concluded that among those with mild to moderate disability from multiple sclerosis, there is sufficient evidence that exercise training is effective for improving both aerobic capacity and muscular strength.

A study conducted by Fisher (2010) in Sierra-Leone on assessment of motor and process of training children with cerebral palsy revealed that generally, with training, a child with cerebral palsy who is not severely affected can learn to perform the activities of daily living. Best and Bigge (2005) however, states that with the condition of children with cerebral palsy, extra effort is needed to find new and interesting ways to keep them progressing in the performance of the activities of daily living. Trombly (2008) in agreement on activities of daily living performance after stroke contends that even severely retarded children can often learn the important skills of daily activities. Best and Bigge (2005) concludes that rather than trying to treat cerebral palsy, a condition which is untreatable, motor skill training can be initiated to enable the children function independently.

Research carried out by the CDC (2006) in Kenya with a population of 18 patients with physical disabilities revealed that with the help of physiotherapy and occupational therapy as sure trainers of strengthening the weak muscles, patients with weak muscles need the help of multi-disciplinary team for proper rehabilitation. Gruten, Brunner, Ward and Chamer (2006) carried out a study on exercises for people with physical disabilities. The study was done in three different hospitals through survey. Manipulation was recognized as another method of motor skill training, the findings showed that patients who underwent sessions of physical training with the help of physiotherapists and occupational therapists had shown a lot of improvements on their motor skill functional abilities.

From the cited related literature, it is evident that researchers have highlighted certain methods of motor skills training programs, under health context, the studies however failed to consider pupils in educational institutions and the motor skills training strategies necessary for them in the performance of activities of daily living while they are in the learning institutions. The majority of the previous studies has examined the training programs for the building of hand strength and coordination, building of visual integration, bilateral coordination and grasping objects of different sizes, but

has failed to give information on the training strategies necessary for performance of specific daily living activities such as dressing among children with cerebral palsy. Most of the studies done concentrated in using quantitative methods of data collection and analysis leaving out the qualitative aspects. The results from this study leads to an innovative cheap therapy that can be used in the strengthening of both the fine motor skills and gross motor skills.

1.3 Goal of the study

The study investigated the effectiveness of motor skill training on the performance of dressing as an activity by pupils with cerebral palsy in a special school in Kisumu, Kenya. The main objective was to assess if both fine and gross motor muscles can be strengthened through training for the performance of dressing as one of the activities of daily living by pupils with cerebral palsy.

2. Methodology

2.1 Design

Mixed methods were used. Mixed methods involve both quantitative and qualitative approaches. The study applied a sequential explanatory design. Quantitative data was collected first, followed by qualitative data, then interpretations done. An experiment was used as a tool for collecting quantitative data. A pre-test was done before the onset of the experiment. There was a non-discriminatory evaluation on the level of performance of the whole class of pupils with cerebral palsy on dressing as an activity of daily living, and this was recorded. The pupils who could not dress themselves were divided into two groups of children who were functioning at the same level, six children were placed in the experimental group and another six were in the control group. Treatment was administered to the experimental group for three months and no treatment was given to the control group. A post-test was then administered to both the experimental and the control group to measure the effect of the intervention.

2.2 Population

Targeted population was 250 pupils with physical disabilities, 23 teachers of pupils with physical disabilities in a special school for the physically challenged, 250 parents of pupils with physical challenges, and 2 physiotherapists. Twenty five (25) participants were used in the study, these included, 12 pupils with cerebral palsy, 3 teachers in charge of the pupils with cerebral palsy in school, 8 parents and 2 physiotherapists.

2.3 Sample size and Sampling Techniques

The sample size was twelve (12) pupils with cerebral palsy at a special school, sampled through purposive sampling technique, Eight (8) parents of pupils with cerebral palsy were sampled through purposive sampling procedures based on their knowledge on the population of the study, two (2) physiotherapists were purposively sampled as key informants based on their medical knowledge on motor skill training programs suitable for the study population and three (3) teachers of the pupils were purposively sampled based on their knowledge on the existing motor skill training programs, the curriculum and the level of performance of the pupils.

2.4 Research Instruments

The primary source of data in the study was through the use of observational checklist. Supporting data was gathered through interviews by the teachers, parents, and physiotherapists and a Focus Group discussion with parents of the children.

2.5 Data collection procedures

Consent to carry out the study was granted by all the relevant authorities which included, Board of post graduate studies of Jaramogi Oginga Odinga University of science and Technology, National Council of Science and Technology, Ethical approval committee, County education office, school's principle and parents of children with cerebral palsy. The

performance of dressing as an activity by pupils with cerebral palsy was assessed in three different stages. The first stage was a pre- test which was done with twelve pupils with cerebral palsy on their performance of specific activities. The activities they were assessed on included, raising hands, inserting hands into armhole, buttoning, unbuttoning, raising legs, inserting legs into shorts' leg hole, zipping, unzipping, raising legs, inserting legs into shoes, tying shoe laces and untying shoe laces. The pupils' abilities in these areas were assessed and recorded. The pupils were then divided into two equal parts, six in the group to be given trainings and another six in a group which was not to receive any training. Motor skill training programs was administered to the experimental group for three months while the control group was left without any training. A post-test was carried out for the twelve pupils and a comparison made between the performances of the two groups. Analysis was then made and recorded.

2.6 Analysis

Quantitative data was analyzed using both descriptive and inferential statistics with the use of Wilcoxon Signed Test. Inferential statistics was purely focused on the non-parametric methods. The study followed Creswell, (2005) step-by-step guidelines. Qualitative data was analyzed through thematic analysis to determine the themes, trends and opinions expected, considering the range and diversity of participants experiences and perceptions.

3. Findings and Discussions

3.1 Findings

After three months training sessions with six pupils in the experimental group, a post-test was done with the twelve pupils in the experimental and control group on their performance on the same activities done in pre-testing and observations recorded for every individual. Analysis was done using the Wilcoxon Signed Rank Test and the results presented in Table 1.

Table 1: Wilcoxon Signed Rank Test results (control group)

Hypothesis Test Summary			
Null Hypothesis	Test	Sig.	Decision
1 The median of differences between Post-Test (Control group) and Pre-Test (Control group) equals 0.	Related-Samples Sign Test	0.5 ¹	Retain the null hypothesis.
2 The median of differences between Pre-Test (Control group) and Post-Test (Control group) equals 0.	Related-Samples Wilcoxon Signed Rank Test	.180	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.
¹Exact significance is displayed for this test.

It was clear, from the output in Table 1, that there were sufficient evidence to reject the null hypothesis that the median of differences between pre-training and post-training scores in performance on dressing activity for the pupils with cerebral palsy was zero. Wilcoxon Signed Rank Test indicated statistical significance of $p=.028$ and Sign Test, which was also computed, had significant value of $p=.0313$, all at the significant level of .05. This therefore indicated there was indeed significant difference in performance on dressing activity between pre-training and post-training on motor skills among pupils with cerebral palsy. The members of the control group's dressing ability were also measured and recorded at the beginning of January. However, they were not exposed to motor skill training on the performance of dressing as an Activity of Daily Living, like the experimental group; they were put on the normal programs of the institution. After three months their performance on dressing as an Activity of Daily Living was again measured and recorded. The two records, 1st at the start and 2nd at the end, were compared using the related samples tests.

The findings of the study show that there was no significant difference between the two records of performance, 1st and 2nd performance measurements, as was tested using non-parametric related samples tests of Wilcoxon Signed Rank Test and Signed Test among the control group, as shown in the SPSS output in Table 1 Wilcoxon Signed Rank

Test had p-value = .180 and Signed Test had a p-value = 0.5, all at significant level of .05. After training sessions for three months with pupils with cerebral palsy on both fine and gross motor skills on dressing, all the six children in the experimental group showed significant improvements on the performance of specific skills required for dressing as an activity of daily living. Even though the children were still not able to dress independently, two of the pupils in the experimental group were able to dress with very little assistance. All the six children who were in the control group showed no improvements or deterioration on their performance. Their level of performance during pre-test and post-test remained the same.

4. Discussion

The present study findings supports the argument of Best and Bigge (2005) which states that rather than trying to treat cerebral palsy, a condition which is untreatable, motor skill training can be initiated to enable pupils with cerebral palsy function independently. Waerehen et al (2010) similarly recommended the training of fine and gross motor skills for the performance of dressing as an activity of daily living. On the contrary, Daving, Clarson & Sunner (2009) observed that even though training in physical activities has important therapeutic effects on children with physical disabilities, it might cause secondary contractures. This is in corroboration with Hillman, Erickson and Kramer (2008) who observed that even though physical training has numerous health benefits, it also has some risks. The findings of this study has shown that motor skill training on the performance of dressing as an Activity of Daily Living by pupils with cerebral palsy was effective as a way of helping these pupils acquire skills of self-dependence in dressing.

5. Concluding Remarks

Since there were improvements in performance of specific skills necessary for dressing as an activity of daily living among pupils with cerebral palsy in the experimental group and no improvements in the performance of any skill necessary for dressing among pupils in the control group, it was safe to argue that the difference noted in the experimental group was as a result of training on both fine and gross motor skills for the performance of dressing as an activity of daily living that was given to the pupils in the experimental group. The study, recommends that teachers of children with physical disabilities to be trained on motor skill training programmes suitable for pupils with functional limitations to habilitate their performance in all the activities of daily living.

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