

Identifying the improvement of Gross Motor Skills of preschool children in Monaragala District

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Abstract- Gross Motor Skills (GMS) are the foundations for more complicated motor abilities and movement patterns, and the underlying performance competency required for many types of physical exercise. This study was to identify the improvement of GMS of preschool children in the Monaragala district. Forty Students (n=40) participated from two preschools (30 in the treatment group and 10 in the Control group). GMS was tested using the Test of Gross Motor Development (TGMD-2). Including six skills per subset and there were two subsets. Loco Motor Skills(LMS) (run, gallop, hop, leap, horizontal jump, and slide) and Object Control Skills (OCS) (striking a stationary ball, stationary dribble, catch, kick, overhead throw, and underhand roll). The gathered data were analyzed using, Pearson correlation, paired-sample T-test, and independent T-sample test in SPSS (V22) software and Microsoft Office 2013. According to the results, the paired t-test and independent t-test were utilized to achieve the main objective. Paired t-test showed that there is a significant difference between the pre-test and post-test in the LMS score ($P\text{-value } 0.000 < 0.05$), OCS score ($P\text{-value } 0.000 < 0.05$) in the treatment group, and LMS score ($P\text{-value } 0.024 < 0.05$) in the Control group. There is no significant difference in the OCS score ($P\text{-value } 0.274 > 0.05$) in the Control group. Finally, an independent t-test revealed that the mean difference of the treatment group is greater than the control group in both LMS ($11.87 > 0.60$) and OCS ($11.03 > 0.30$). It could be concluded that there is an improvement in the GMS of treatment group because of the training.

Keywords—Gross Motor Skills, Loco Motor Skills, Object Control skills, Preschool Children

I. INTRODUCTION

Gross motor skills are the foundations for more complicated motor abilities and movement patterns, and the underlying performance competency required for many types of physical exercise. They are usually split into two categories: locomotor skills (running, hopping, and jumping) and object control skills (catch, throw and kick). Because of the importance of motor skills in children's physical, cognitive, and social development, motor skill development is emphasized in early childhood and primary school physical education curricula. According to the Early Childhood Development Authority

(childsec.gov.lk,2023), Preschool children are divided into three age group categories,

- Between Ages 2 – 3
- Between Ages 3 – 4
- Above Age 4

Among These; Early Childhood is considered to be the most special because the human brain finishes 90% of its development. For this reason, need to be given special care in this stage. (N.T.Edwards,1984)

Comparing the world's Preschools, Sri Lankan preschools are in very poor condition. Because since childhood, there is no suitable procedure to conduct physical activity in our country. It is an essential factor in being active from childhood. Movement activity is vital for children's health, well-being, and development, now and in the future. Activity has lots of health benefits for children. It strengthens children's bones, muscles, hearts, and lungs, improves children's coordination, balance, posture, and flexibility, helps children stay healthy, and reduces their risk of getting heart disease, cancer, and type-2 diabetes later in life.

In Sri Lanka, there is currently no established framework for incorporating fundamental movement education into preschool curricula. However, the implementation of a well-structured action plan could significantly enhance children's overall proficiency. This is the primary motivation behind my dedicated efforts in conducting this research. Notably, this study represents a novel undertaking within the context of Sri Lanka, with potential far-reaching advantages for children and those associated with their development. The study aims to unravel the significance of fundamental movements in the growth and development of preschoolers. Given these considerations, delving into the impact of physical activity on preschool children becomes crucial in order to optimize their capabilities.

Major objective

A. To identify the improvement of Gross motor skills of preschool children in Monaragala District.

Specific objectives

B. To identify the gross motor skills level and create a suitable training plan to develop the Gross Motor Skills of preschool children in Monaragala District.

- C. To identify the relationship between gross motor skills and age groups
- D. To identify the difference between the Locomotor skills and Object control skills in Pretest and Posttest
- E.

II. METHODOLOGY

A. Hypothesis

According to research, the hypothesis was built up, and both independent variables and dependent variables were considered. The hypothesis of this study was,

Ho; There is no significant difference in the Gross motor skills of preschool children

H1; There is a significant difference in the Gross motor skills of preschool children

H0 = There is no improvement in gross motor skills of preschool children

H1= There is an improvement in gross motor skills of preschool children

Research Design

The researcher used the quantitative research method. The study was conducted by self-visit to preschool and engaging with Gross motor skills in each preschool child in Monaragala District. Observation and testing were used as the main data collection method

Study Population and Sample

In the Monaragala District, there are a total of 536 preschools. For this study, a purposive sampling method was employed to select two preschools. From each selected preschool, 20 children were chosen to participate. As a result, the researcher included a total of 40 children from both preschools in the study.

Preschool 1– 20 children (Male = 12, Female = 08)

Preschool 2– 20 Children (Male = 12, Female = 08)

The total sample is 20 + 20 = 40 Students

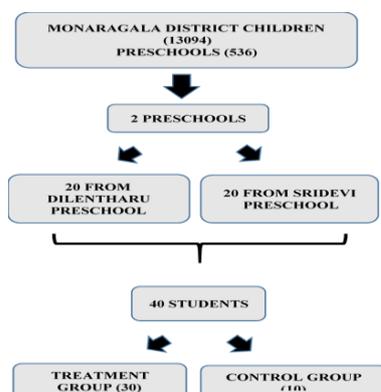


Figure 1: Sample selection method

Data Collection Methods

Data was gathered for the study by observation and a test

was used as the main data collection method. The test TGMD-2 (Test for Gross Motor Development Second Edition) was employed to collect the data.

Test of Gross Motor Development (TGMD-2)

Gross motor movement performance was assessed using the Test of Gross Motor Development-2 (TGMD-2; Ulrich, 2000). The TGMD-2 is a qualitative, process-oriented measure (that is, it evaluates movement based on the demonstration of performance criteria that provide information about how the movement was performed) used to assess 12 gross motor skills. The gross motor skills are classified (Fragala-Pinkham, M.A., 2017) as locomotor skills (run, gallop, hop, leap, jump, and slide) and ball skills (run, gallop, hop, leap, jump, and slide) (striking the ball, stationary bounce, catch, kick, overhand throw, and underhand roll).

Purpose: Combines fun activities with a reliable and valid procedure that gives meaningful results in identifying children with gross motor problems: 3-0 years through 10-11 years. Administration Time; The test took 12-15 minutes per child to administer. Preparation has taken 5 minutes longer. There is some distance measuring. To avoid delays and reduce time spent retrieving balls, the examiner should collect a large number of balls to use and move the student quickly through the test items. In most cases, only one session is required to administer the test. However, the test was administered in two sessions due to inclement weather in some areas, particularly Sikkim.

Scoring the TGMD-2: Each gross motor skill includes several behavioral components that are presented as performance criteria. In general, these behaviors represent a mature pattern of the skill. If the child performs a behavioral component correctly, the researcher marks a 1; if the child does not perform a behavioral component correctly the researcher marks a 0.

Data Analysis and Presentation

Data was acquired through both observation and the TGMD-2 test. Microsoft Office software was utilized to present the gathered data and information. The creation of charts was facilitated using both Microsoft Excel and Word.

Analysis and interpretation of data are planned to do after collecting enough information. The data and information will be presented as tables, percentages, charts, graphs, and images it will be helpful to present the information clearly and in an artistic way.

III. RESULTS

Table 1. Analyze the demographics of the sample

Demographics	Categories	Frequency (n=40)	Percentage (%)
Gender	Male	29	72.5
	Female	11	27.5
3) Age	4 – 4.5 years	02	5
	4.6 – 4.11 years	11	27.5
	5 – 5.5 years	18	45
	5.6 – 5.11 years	09	22.5

The data on respondents' traits are presented and analyzed. These are the demographic characteristics of respondents that were obtained.

According to Gender, there were 72.5 percent (n = 29) Males and 27.5 percent (n=11) Females among the total number of participants (40) who participated in the study. According to the age categories, 4 – 4.5 years, 4.6 – 4.11 years, 5 – 5.5 years, and 5.6 – 5.11 years were four age categories in this research study. Percentage and number of age category between 4 – 4.5 years (5%, n= 2), the age 4.6 – 4.11 years (27.5%, n=11), age category of 5 – 5.5 years are (45%, n=18), age category 5.6 – 5.11 years are (22.5%, n=9).

Correlation Analysis

Correlation of Age and Gross Motor Quotient

Pearson measures the relationship between two variables. There is a negative Correlation (Relationship) Between Age and Gross Motor Quotient in this case. Because $R = (-0.657)$ and $(P = 0.000)$ which is correlated and is perfectly significant because it is less than 0.05. The negative correlation means that when age is decreased Gross Motor Quotient Will Increase.

Table 2: Locomotor skill score in the treatment group

Treatment Group	Mean	N	Sig;
Pair 1 Pretest Loco Motor Skill Score	28.50	30	0.000
Posttest Loco Motor Skill Score	40.37	30	

Ho; There is no significant difference in the Loco Motors Skill in Treatment Group

H1; There is a significant difference in the Loco Motors Skill in Treatment Group

According to the Treatment Group's Results, there is a significant difference in the mean scores of the Loco Motor skill scores of the Treatment group. The pretest mean score is 28.50 and the post-test mean score is 40.37. It means the performance of children who have provided the training is increased.

Table 3: Locomotor Skill Scores in Control Group

Control Group	Mean	N	Sig:
Pair 1 Pretest Loco Motor Skill Score	26.80	10	0.024
Posttest Loco Motor Skill Score	27.40	10	

Ho; There is no significant difference in the Loco Motors Skill in Control Group

H1; There is a significant difference in the Loco Motors Skill in the Control Group

According to the Control Group's Results, There is a significant difference in the mean scores of the Loco Motor skill scores of the Control group. The pretest mean score is 26.80 and the post-test mean score is 27.40, the performance of children who have not been provided the training also increased.

Table 4: Object Control Skill Scores in Treatment Groups

Treatment Group	Mean	N	Sig:
Pair 1 Pretest Object Control Skill Score	29.40	30	0.000
Posttest Object Control Skill Score	40.43	30	

Ho; There is no significant difference in the Object Control Skill in the Treatment Group

H1; There is a significant difference in the Object Control Skill in the Treatment Group. There is a significant difference in the mean scores of the Object Control skill scores of the Treatment group. In the pretest mean score is 29.40 and the post-test mean score is 40.43 It means the performance of children who have provided the training is increased.

Independent sample t-test

Table 5: Difference of Loco Motor Scores of Treatment and Control Group

Training Groups		N	Mean	Sig;
Loco Motor Difference	Treatment Group	30	11.87	0.000
	Control Group	10	.60	

H0: There is no significant difference in the difference of Loco motor skills

H1: There is a significant difference in the difference of Loco motor skills

There is a significant difference of loco motor skills in both treatment and control group. Both the things have been tested this is a significant difference in the group of children who have been provided the training (treatment group) and the group of children who have not been provided the training. There is a significant increase in the performance of both groups. But increase in the performance of the treatment group is greater than the control group.

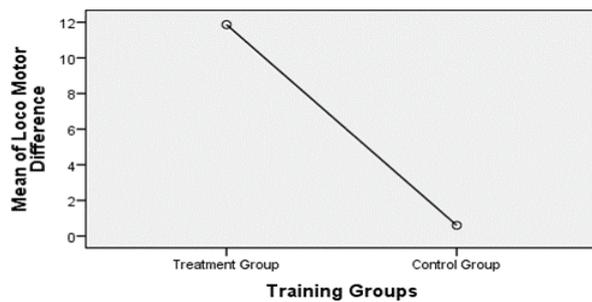


Figure 2: Mean difference of treatment group

Table 6: Difference of Object Control Score of Treatment and Control Group

Training Groups		N	Mean	Sig:
Object Control Difference	Treatment Group	30	11.03	0.000
	Control Group	10	.30	

H0: There is no significant difference in the difference of Object Control skills

H1: There is a significant difference in the difference of Object Control skills

There is a significant difference of Object control skills in both treatment and control group. Both the things have been tested this is a significant difference in the group of children who have been provided the training (treatment group) and the group of children who have not been provided the training. There is a significant increase in the performance of both groups. But increase in the performance of the treatment group is greater than the control group.

IV. DISCUSSION AND FINDINGS

This study identifies the improvement of gross motor skills in preschool children in the Monaragala District. Gross Motor skills are critical to integrating into the lives of children and adolescents. It sets the foundation for facilitating and maintaining healthy active living through adulthood (Cragg & Cameron, 2006; Stolleyetal. 2003), and physical activity levels have been shown to track from

year to year (Pate, Baranowski, Dowda, & Trost, 1996). The training program is conducted to develop Locomotor skills and object control skills. There are 40 preschool children and females 11 (27.5%) and males 29 (72.5%). There is a Treatment group that consists of 30 children and 10 in the Control group. There are four age categories and are age category between 4 – 4.5 years (5%, n= 2), the age 4.6 – 4.11 years (27.5%, n=11), the age category of 5 – 5.5 years (45%, n=18), age category 5.6 – 5.11 years are (22.5%, n=9). According to the correlation analysis, there is a relationship between the age effect on the Gross Motor Quotient of Children and the relationship is negative. When age is increased Gross Motor Quotient will Increase.

According to the Paired sample t-test analysis, there is an improvement in the mean score of locomotor skills of both treatment and group and they are significantly different. As well as there is an improvement in the mean score of object control skills of the treatment group and it is also significant. But if there is an improvement in the mean score of object control skills in the control group it is not significantly different. Because it is improved in less amount.

According to the independent t-test analysis, there is a huge difference in mean scores and there is a significant improvement in the treatment group greater than the control group because of the training program.

V. CONCLUSION

Parents are facilitating their children's involvement in physical activities, driven either by their lack of familiarity with physical activities or their desire for their child to participate in the study program. All sectors possess a comprehensive comprehension of movement patterns and the development of gross motor skills. The government has initiated several initiatives with the objective of motivating school children to partake in physical activities. Physical development, also known as gross motor development, is not solely the duty of the government and schools; it also falls on the shoulders of parents and individuals. Gross motor development is always aided by excellent muscle and muscle tone; however, when this is lacking, gross motor development is slowed. The physical activity knowledge program is critical in establishing scholastic prospects for gross motor development and its implications in sports and other forms of gross movement alertness. Physical activity is defined as gross motor movement, which is an important indicator of a person's lifespan. When we are physically active, our daily activities continue. In conclusion, the analysis was made based on the statement and objective of the study. The following finding was there is a negative correlation between age and gross motor quotient, A significant difference was found between the pretest and post-test in

the locomotor skills in the treatment group, and A test in the loco motor skills in the control group, A significant difference was found between pretest and post-test in the object control skills in the treatment group, no significant difference was found between pretest and post-test in the object control skills in the control group and finally, there is a significant improvement in treatment group greater than control group because of the training program.

significant difference was found between pretest and post-

REFERENCES

Akbari, e. a. (2009). The effect of traditional games in functional motor skill development in 7-9-year-old boys.

Alhassan, e. a. (2012). Effect of Locomotor Skill Program on Minority Preschoolers' Physical Activity Levels.

Atkins, L. &. (2004). methods for generating windows of achievement for six gross motor developmental milestones and to compare the actual windows with commonly used motor development scales.

Casey, L. &. (2013). The effect of picture task cards on performance of the test of gross motor development by preschool-aged children.

Catherine, M. J. (2012). Impact of a community-based programme for motor development on gross motor skills and cognitive function in preschool children from disadvantaged setting.

Chow, B. C. (2019). Gross Motor Skills of Hong Kong Preschool Children.

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