EFFECT OF PHYSICAL EXERCISE PROGRAMME ON OBJECT CONTROL SKILLS IN PRESCHOOL CHILDREN

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Abstract

The purpose of the present study was to investigate the effect of physical exercise programme on object control skills in preschool children. Thirty children (3- 5 years old) from Trivandrum district of Kerala were selected randomly and assigned to two groups, an experimental group (n=15) and control group (n=15). Both the groups were tested in Gross Motor Development -2 Ulrich, 2000 before and after twelve weeks of training period. The experimental group underwent physical exercise programme three times a week for twelve weeks. Paired t- test and Analysis of Covariance (ANCOVA) revealed significant improvement in the experimental group in object control skills while no changes were seen in the control group. It may be concluded that physical exercise programme introduced in early childhood can improve object control skills.

Keywords: *Physical exercise, Object control skills, preschool.*

INTRODUCTION

Human life begins with the union of two germ cells, which multiplies and lead to the formation of too unique, distinctive individual. Human development is often classified by stages describing age- related changes in the behaviors and growth. Especially during the young years, certain developmental task and milestone such as walking, talking and puberty are attainted by all normal children within a general age range (Gabbard, Leblanc & Lowy, 1987). Development of the

child start in the utero is directly reflected by the emotional and physical health of the mother. As described by (Singh A. et. al, 2003) growth and development start with a single cell zygote known as the prenatal stage followed by postnatal stage, the period from birth to severance of the umbilical cord known as parturate stage, and the period from birth to first one month as neonate stage. Babyhood or infancy extends up to the time the child is two years old. Childhood begins when the relatively dependency of the infancy is over and extend to the time when the child reaches the sexual maturity (Singh A. et. al, 2003). The period of childhood can be sub- divide into three stages- early childhood (2-6 years), middle childhood (6-9 years) and late childhood (9-12 years) followed by adolescence from (12- 18 years). Children have different body proportions than adults, sometimes affecting their motor performances (Singh A. et. al, 2003).

The phase of early childhood or preschool is from three to sixth years of life. It is known as the phase of perfection of basic movements. This phase is also characterized by rapid mental and social development along with motor development. There are no significant sexual differences though individual differences can be considerable (Singh H., 1991). The most dominant characteristics of behavior are the extraordinary urge and desire for physical movement. The child's enjoys physical movement and does it even without any specific aim or objectives. They learn to play with other children- beginning of social cooperation and interaction (Singh H., 1991). They are learning to use their bodies. It is a time for learning what they can do and how they can do it as individuals (Morrison, 1995). The changes in size, weight and appearance seen during the early childhood are only the tips of the iceberg. Internally, other physical changes are occurring. Children grow stronger as their muscle size increases and their bones become sturdier. The sense organs continue their development (Feldman, 1997).

Preschool age is thought to be very important for human motor development, as in that specific period the fundamental movement skills are developed (Gallahue & Donnely, 2003).). A motor training content considered very important for brain development is activities emphasizing coordination (Cotman & Berchtold, 2002).The merits of physical activity for children in terms of normal growth, development, and health related physical fitness are supported by a large body of research (Bailey, 1976; Malina, 1969; Elliot, 1966; Rarick, 1973). Some aspects of child's basic orientation to life are well organized by the time the child starts school; however, individuals can make life style changes. The National Association for Sport and Physical Education position statement regarding children birth to five years states that, "all children should engage in daily physical activity that promotes health-related fitness and movement skills" (NASPE, 2002, p 2).

A physical exercise at an early age is not only necessary for normal growth and development but also enhances the chances of physically fit adult life. Physical activity can be defined as "body movement produced by the contraction of skeletal muscle that raises the energy expenditure above the basal level". For children, this can include play, chores, organized sports, or exercise (structured and repetitive for the purpose of increasing or maintaining physical fitness (Goran et. al., 1998). Thus, regular and systematic physical activity during the early childhood may lead to development of several motor abilities and movements which may help in specific sport training by the end of the early childhood.

METHODOLOG

The purpose of the study was to know the effect of physical exercise programme on object control skills in preschool children.. To achieve this purpose thirty children between the age group of 3-5 years from Trivandrum, Kerala, were selected as participants. They were randomly assigned to a

control group and an experimental group of fifteen each for the period of twelve weeks. The participants of control and experimental groups were administered with TGMD- 2 Ulrich, 2000 before the start of the experimental training session and finally after the experimental training session. The data was statistically analyzed by using descriptive statistics, ANCOVA to find out the significant difference if any. The level of significance chosen was $P< 0.01$ and $P<0.05$.The experimental group performed the prescribed physical exercise programme thrice a week for a period of twelve weeks with duration of 45-60 minutes. The exercise programme included activities for improving rhythm, balance, responding to auditory, visual stimuli.The planning of the programme was done taking into consideration the individual differences, play and fun was incorporated. Activities were such that children were provided an opportunity to be successful which would enable them for continued participation. Consideration not the performance mean of the group but the individual differences and the children play an important role in the progress of each lesson.

STASTICAL ANALYSIS

The Analysis of Covariance (ANCOVA) was used as a statistical tool, to test the significance of 'adjusted posttest mean' difference between the control and experimental groups for each of the selected variables. The level of significance was fixed at 0.01 level of confidence.

FINDINGS & DISCUSSION

Table 1: Main characteristics of the data distribution of pretest and posttest object control skills score of subjects in control and experimental group.

		Group	N	Mean	SD	95 % Confidence Interval for Mean	
						Lower bound	Upper bound
striking a stationary ball	Pretest	Con.	15	4.86	1.92	3.80	5.93
		Exp.	15	4.26	1.83	3.25	5.93
	Posttest	Con.	15	5.13	1.76	4.15	6.11
		Exp.	15	7.13	1.30	6.41	7.85
Stationary dribble	Pretest	Con.	15	0.40	0.73	-8.01	0.80
		Exp.	15	1.20	1.65	0.28	2.11
	Posttest	Con.	15	0.60	0.73	0.12	1.00
		Exp.	15	3.60	1.80	2.60	4.59
Catch	Pretest	Con.	15	3.13	0.99	2.58	3.68
		Exp.	15	3.00	1.51	2.16	3.83
	Posttest	Con.	15	3.20	1.01	2.63	3.76
		Exp.	15	5.46	1.35	4.71	6.21
Kick	Pretest	Con.	15	4.13	1.76	3.15	5.11
		Exp.	15	3.46	1.64	2.55	4.37
	Posttest	Con.	15	4.13	1.84	3.11	5.15
		Exp.	15	6.20	1.08	5.60	6.79
Overhand throw	Pretest	Con.	15	4.06	1.83	3.05	5.08
		Exp.	15	3.40	1.50	2.56	4.23
	Posttest	Con.	15	3.80	1.74	2.83	4.76
		Exp.	15	5.66	1.75	4.69	6.64
Underarm roll	Pretest	Con.	15	3.86	1.33	2.99	4.47
		Exp.	15	3.73	1.62	2.83	4.63
	Posttest	Con.	15	3.86	1.35	3.11	4.61
		Exp.	15	7.00	1.69	6.06	7.93
Total scores of object control skills	Pretest	Con.	15	20.40	5.61	17.28	23.51
		Exp.	15	19.06	5.20	16.18	21.94
	Posttest	Con.	15	20.60	5.39	17.61	23.58
		Exp.	15	35.06	3.69	33.02	37.11

Table 2: ANCOVA for adjusted post- test TGMD- 2 Ulrich 2000, object control skills scores of experimental and control groups.

		Source of Variance	Sum of Squares	df	Mean Square	F Ratio
striking a stationary ball	Adjusted posttest	Between groups	41.82	1	41.82	45.18**
		Within groups	24.99	27	0.92	
		Total	66.81	28		
Stationary dribble	Adjusted posttest	Between groups	41.94	1	41.94	33.16**
		Within groups	34.15	27	1.26	
		Total	76.09	28		
Catch	Adjusted posttest	Between groups	41.40	1	41.40	53.29**
		Within groups	20.37	27	0.777	
		Total	61.77	28		
Kick	Adjusted posttest	Between groups	47.84	1	47.84	78.57**
		Within groups	16.44	27	0.609	
		Total	64.28	28		
Overhand throw	Adjusted posttest	Between groups	41.25	1	41.25	30.54**
		Within groups	36.47	27	1.35	
		Total	77.72	28		
Underhand roll	Adjusted posttest	Between groups	73.63	1	73.63	49.02**
		Within groups	40.55	27	1.50	
		Total	114.18	28		
Total scores of object control skills	Adjusted posttest	Between groups	459.95	1	459.95	89.61**
		Within groups	138.58	27	5.133	
		Total	598.53	28		

**Significant at 0.01 level.

The calculated F ratio in the adjusted posttest were 45.18, 33.16, 53.29, 78.57, 30.54, 49.02, 89.61which was significant (p<0.01) at 0.01 level since the table values for F with degrees of freedom (df) 1/27was 4.23 at 0.05 level and 7.72 at 0.01 level (1 df is lost because of the covariate).

This significant F ratio for the adjusted post test object control skills shows that the two post mean scores, viz. the post mean score in the control group and experimental group do differ significantly after they have been adjusted for differences in pretest scores.

Figure 1: The percentage gain object control skills scores in Control and Experimental groups.
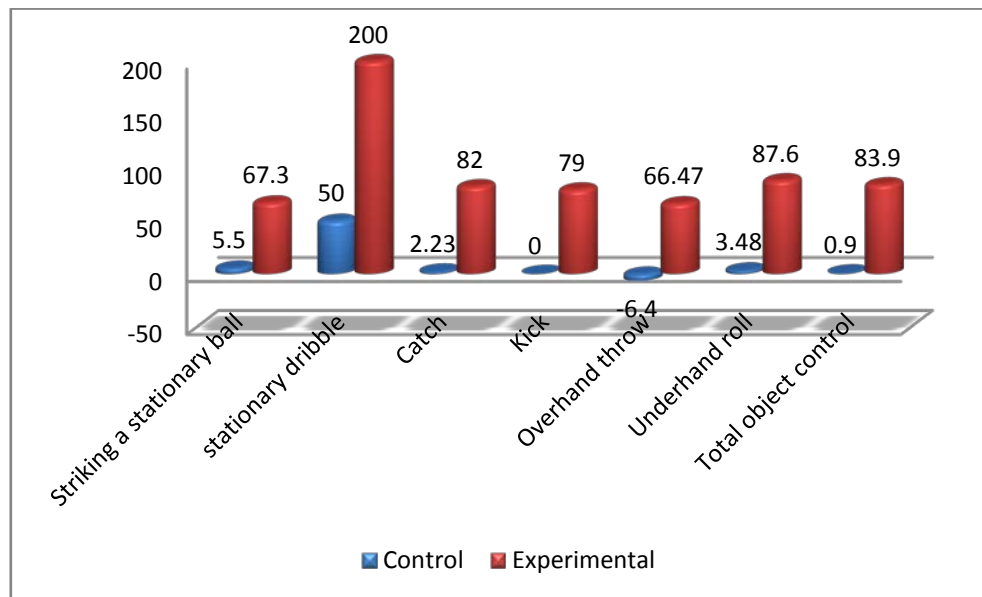
Discussion of findings

The analysis of the results revealed that in the case of experimental group, significant changes was seen in the object control variables of TGMD-2 following the twelve week exercise programme. No changes were noticed in the control group.

Significant improvement was seen in the object control subtest like striking a stationary ball, stationary dribble, catch, kick overhand throw, underhand roll. Strength is the expression of muscular force, or individual capacity to develop tension against external resistance. Throwing task require coordination in projecting an object. As, early childhood is the time of increasing experimentation

with the variety of motor development and learning. The development of proficiency in the fundamental movement patterns and motor skills is thus one of the most important developmental tasks of early childhood (Malina& Bouchard, 1991).Children who develop competent motor skills grow in confidence, which can lead to further participation (Romance, 1985). The improvement may be probably due to the exposure activities with varieties of ball like small ball (hard, soft), basketball, football, balloons and scarves activities. Improvement may be also due to development in the function of the brain where motor function is governed by the brain. Motor development in infancy ad early childhood, which reflects to a large extent neuromuscular maturation, is related to the rapid growth of the brain at this time. It may be also due to the development of the unique growth spurt of the cerebellum, as cerebellum is associated with the function of development and maintenance of neuromuscular coordination, balance and muscle tone (Malina& Bouchard, 1991). Through repetitive or experience appears to exert its effects by strengthening and bonding synapses, which are the connections that are made between neurons (Gabbard& Rodrigues, 2008).

CONCLUSION

It is often assumed that children would develop their fundamental motor skills through free play. Early childhood is crucial for motor skill development.The findings of the study indicates that object control skills can be improved through structures exercise programme.

REFERENCES

1. Bailey, D. (1976). *The growing child and the need for physical activity.* Baltimore: University Park Press.
2. Elliot, G.M. (1966). The effects of exercise on the structural growth. *Journal of Canadian Association, HPER*, 36, 21.
3. Cotman, C. W. and Berchtold, N. C. (2002). Exercise: a behavioral intervention to enhance brain health and plasticity. *Trends in Neurosciences*, 25, 6, 295-301.

4. Feldman, S. R. (1997). *Development across the Life span.*USA: Prentice Hall Inc.
5. Gabbard, C., Blanc, B.L. & Lowy, S. (1987).*Physical Education for Children: Building the foundation.* New Jersey: A Division of Simon & Schuster.
6. Gabbard, C. P, Cacola, P., & Rodrigues, L. P., (2008). A New Inventory for Assessing Affordances in the Home Environment for Motor Development (AHEMD-SR).*Early Childhood Education Journal*, 36, 5-9.
7. Gallahue, D. &Donnely, F. (2003).*Developmental physical education for all children*. Human Kinetics, Champaign.
8. Gallahue, D. &Ozmun, J. (1998).*Understanding motor development: infants, children, adolescents, Adults*. Singapore: Mc Graw Hill.
9. Goran MI, Gower BA, Treuth M & Nagy TR (1998).Prediction of intra-abdominal and subcutaneous abdominal adipose tissue in healthy pre-pubertal children.*Int J ObesRelatMetabDisord*. 22, 549–558.
10. Malina, R.M. & Bouchard, C. (1991).*Growth, Maturation and Physical Activity.*Champaign: Human Kinetics.
11. Morrison, G. S. (1995). *Early Childhood Education Today (6thed)*. New Jersey: A Simon & Schuster Company.
12. National Association for Sport and Physical Education (2009).*Active Start: A statement of physical activity guidelines for children birth to five years (2nd Ed)*. Oxon Hill, MD: AAHPERD Publications.
13. Rarick, G. (1973). *Physical Activity: human growth and development.* New York, Academic Press.
14. Romance, T. (1985). Observing for confidence.*Journal of Physical education, Recreation & Dance,* 56(7), 47-49.
15. Singh, A., Bains, J., Gill, J. S. &Brar, R. S. (2003).*Essential of Physical education.* New Delhi: Kalyan Publishers.
16. Singh, H. (1991). *Science of Sport Training.* New Delhi: DVS Publication.
17. Ulrich, D. A. (2000).Test of Gross Motor Development (2nded).Austin, TX; Pro-Ed, Inc.