ORIGINAL RESEARCH PAPER

Volume-7 | Issue-7 | July-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

EFFECT OF DIRECTIVE PLAY ACTIVITIES ON COGNITIVE AND MOTOR DEVELOPMENT OF PRIMARY SCHOOL CHILDREN

Physical Education

Dr.Suresh Kutty K* Associate Professor, School of Physical Education and Sports Sciences, Kannur University, Mangattuparamba Campus P.O Kannur, Kerala-670567 *Corresponding Author

Arun K E Assistant Professor, School of Physical Education and Sports Sciences, Kannur University, Mangattuparamba Campus P.O Kannur, Kerala-670567

ABSTRACT

The purpose of the study was to find out the effect of directive play activity on cognitive and motor development of primary school children. Cognitive variables such as concentration and executive function and motor development variables such as locomotor skills and object control were selected as the independent variables for the study. One hundred school students (N = 100) were selected as subjects for the study. Fifty school students (n= 50) equally from boys and girls of St. Mary's English Medium School, Kuzhichal, Kannur formed the experimental group which underwent twelve weeks of Directive Play Activity program (DPAG). Fifty students (n = 50) selected equally from boys and girls of St. Paul's English Medium School formed the control group (CG). The subjects were in the age group of 6-8 years. The pre and post test data on the dependent variables were collected before and after the experimental period of twelve weeks. Standardized tests namely; Concentration Grid Test, Trial Making Test (TMT) and Test of Gross Motor Development-2 were used to collect data on cognitive and motor variables. Analysis of Covariance revealed that there was a significant improvement in the Motor variables of Running, Galloping, Hopping, Jumping, Leaping, Sliding, Two-hand strike, Stationary bouncing, Catching, Kicking, Over hand Throwing and Under hand rolling. Significant improvements were also proved in the Cognitive variable of Executive Function.

KEYWORDS

Directive Play Activity, Cognitive Development & Motor Development

INTRODUCTION

The goal of physical education for children is to enable them to develop health and activity habits that will become a lifestyle throughout adolescence and adulthood. The two most important factors in attaining this goal at the elementary school level are that the children. Enjoy the fitness activities and master the basic skills of physical education that will enable them to participate successfully in the activities that promote fitness. Only if fitness is fun will the children pursue it outside the two or three times they are with us in physical education class each week and on through middle school, high school, and beyond. Children must enjoy exercise and physical activity as well as understand and appreciate the importance of physical fitness if they are to develop lifelong health fitness habits. Fitness for health is not the same as conditioning for competitive sports participation. Therefore, we focus on the teaching and learning of skills, knowledge, and behavior's that will enable children to be physically active today, tomorrow, and throughout their adult life **(Graham, Hale & Parker, 2006)**

METHODOLOGY

For the purpose of the study one hundred (N=100) primary school children in the age group of six to eight (6-8) years were selected from St. Mary's English medium School, Kuzhichal, Kannur and St. Paul's English Medium School, Thrichambaram, Kannur . The selected subjects were equally divided into (n=50) Directive Play Activity Group (DPAG) and Control Group (CG), both groups were equally represented by boys and girls twenty five each (n=25).Directive Play Activity was the independent variable and dependent variables were Cognitive Variables namely; Concentration and Executive Function. The motor development skills were Locomotor skills of running, Hopping, Galloping, Leaping, Horizontal Jumping and Sliding and Object Control skills of Two Hand Strike, Stationary bounce, Two Hand Strike, Stationary Bounce, Catch, Kick, Over Hand Throw and Under Hand Roll. Standardized tests namely; Concentration Grid Test, Trial Making Test (TMT) and Test of Gross Motor Development-2 were used to collect data on cognitive and motor variables. The training program was administered to the Directive Play Activity Group (DPAG) for twelve weeks. Paired(dependent) t- test was applied for comparing the groups with respect to average pre-test andpost-test scores on all the variables. Analysis of covariance (ANCOVA) was applied for comparing the groups.

ANALYSIS OF DATA AND DISCUSSION ON RESULTS

Table I Mean Comparison of Motor Development Components between Directive Play Activity Group and Control Group.

Motor Development Components	Groups	SV	df	SS	MS	F
Locomotor Skill – Run	DPAG	Between	1	24.72	24.72	63.55*
	CG	Within	97	37.73	0.39	
Locomotor Skill – Gallop	DPAG	Between	1	44.45	44.45	69.86*
	CG	Within	97	61.72	0.64	
Locomotor Skill – Hop	DPAG	Between	1	76.82	76.82	198.37*
	CG	Within	97	37.56	0.39	
Locomotor Skill – Leap	DPAG	Between	1	16.31	16.31	57.52*
	CG	Within	97	27.50	0.28	
Locomotor Skill – Horizontal Jump	DPAG	Between	1	41.29	41.29	93.55*
	CG	Within	97	42.81	0.44	
Locomotor Skill – Slide	DPAG	Between	1	41.56	41.56	51.37*
	CG	Within	97	78.48	0.81	
Object Control – Two Hand Strike	DPAG	Between	1	115.43	115.43	161.73*
	CG	Within	97	69.23	0.71	
Object Control – Stationary Bounce	DPAG	Between	1	25.24	25.24	66.32*
	CG	Within	97	36.92	0.38	
Object Control – Catch	DPAG	Between	1	47.63	47.63	59.08*
	CG	Within	97	78.20	0.81	
Object Control – Kick	DPAG	Between	1	39.41	39.41	56.90*
	CG	Within	97	67.18	0.69	
Object Control – Over Hand Throw	DPAG	Between	1	50.37	50.37	91.68*
	CG	Within	97	53.29	0.55	
Object Control – Under Hand Roll	DPAG	Between	1	59.29	59.29	86.21*
	CG	Within	97	66.71	0.69	

From Table 1 it is evident that the Directive Play activity program had a significant effect on the selected motor development components since the calculate 'F' value was higher than the required table value of

Table II Mean Comparison of Cognitive Variables between Directive Play Activity Group and Control Group.

Cognitive Variables	Groups	SV	df	SS	MS	F
Executive Function	DPAG	Between	1	3330.58	3330.58	31.12*
	CG	Within	97	10382.77	107.04	
Concentration	DPAG	Between	1	6.61	6.61	2.20
	CG	Within	97	292.05	3.01	

From Table II it is evident that the Directive Play activity program had a significant effect on the cognitive variable of executive function since the calculate 'F' value of 31.12 was higher than the required table value of however the program had no significant effect on the cognitive variable of Concentration.

Illustration of Comparative effect of DPAG and CG on Motor Development Components.

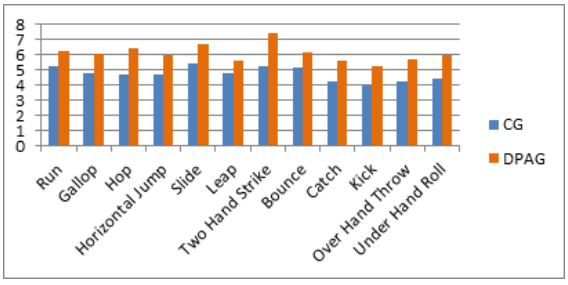
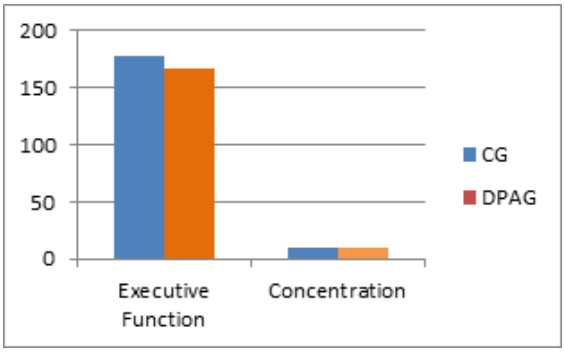


Illustration of Comparative effect of DPAG and CG on Cognitive Variables



DISCUSSION ON RESULTS

Twelve weeks of directive play activity program had resulted in significantly improving the selected Motor Development Variables of Run, Gallop, Hop, Jump, Leap, Slide, Two Hand Strike, Stationary Bounce, Catch, Kick, Over Hand Throw and Under Hand Roll and Cognitive variable of Executive Function

Directive play activity program mainly consist of movements. Play activities and physical movement improves motor skills of children. Directive play activities arespecifically structured instructional program. It includes the contents of space awareness, pathways, travelling, chasing, dancing, jumping, balancing, kicking, throwing, catching, volleying, dribbling, striking etc.

There is a direct relationship between play activities and cognitive development of children. Play activities and physical movement makes an impact on the brain function. Parts of brain such as frontal lobe, temporal lobe (memory), parietal lobe (sensory information), occipital lobe (visual information), and cerebellum (balance, coordination and attention) get activated when they engage in any play activity. Directive play activities are more effective than the normal play activities to improve brain function. Studies prove that frontal lobe of the brain helps in the executive function of children.

The findings of the study was in agreement with the findings of the study conducted by Tortella et.al (2016) who had investigated the specificity of structured and unstructured activities played at the playground on motor skill competence in five year old children. The results shows that the experimental group who practiced gross motor activities in the playground improved significantly on gross motor task. The findings of the study was also in agreement with the findings of the study conducted by Goodway, Crowe & Ward (2003). They had investigated the influence of a nine-week instructional program on locomotor and object control skill development of preschoolers who are at risk of developmental delay. The intervention group performed significantly better than the control group for both locomotor and object control skills. The findings were in consonance with the findings of the study conducted by Sibley & Etnier (2003) who had quantitatively combined and examined the results of studies pertaining to physical activity and cognition in children.

JOURNALS AND PERIODICALS

1] Bailey R (2006) "Physical education and sport in schools: a review of benefits And outcomes". Journal of School Health Vol. 76, No. 8, Pg. 397-401 retrieved June 10, 2017 fromhttps:// www. ncbi.nlm.nih. gov/pubmed/ 16978162

[2] Diamond. A (2012) "Activities and Programs That Improve Children's Executive Functions". Sage journals. Vol. 21, No. 5, Pg: 335-341 retrieved June 25, 2017 from https:// doi.org/ 10. 1177/0963721412453722

[3] Evans.J. and Roberts C.G., (1987) "Physical Competence and the Development of Children's Peer Relations". Quest -Illinois-National Association for Physical Education in Higher Education-Vol. 39, No.1 retrieved June 10, 2017 from https: //www. researchgate.net/ publication/234644626

[4] Fisher, A., Reilly, J. J., Kelly, L. A., Montgomery, C., Williamson, A., Paton, J. Y., & Grant, S. (2005)." Fundamental Movement Skills and Habitual Physical Activity in Young Children". Medicine and Science in Sports and Exercise, Vol 37, Pg: 684-688 retrieved June 10, 2017 fromhttps:// www.ncbi.nlm. nih.gov/ pubmed/15809570

[5] Garaigordobil M, and Berrueco L., (2011). "Effects of a play program on creative thinking of preschool children". Span Journal for Psychology. Vol. 14, No. 2, Pg: 608-18 retrieved June 25, 2017 from https://www. ncbi. nlm.nih.gov/pubmed/22059307

[6] Hillman C.H, Pontifex M.B, Castelli D.M, Khan N.A, Raine L.B, Scudder M.R, Drollette E.S, Moore R.D, Wu C.T, and Kamijo K.(2015) "Effects of the FIT Kids randomized controlled trial on executive control and brain function". Paediatrics. Vol. 134, No. 4, Pg.: 1063-71 retrieved June 20, 2017 from https:// www. ncbi.nlm. nih.gov/pubmed/25266425

[7] Ishihara T, Mizuno M (2017) "Effects of tennis play on executive function in 6-11-year-old children: a 12-month longitudinal study". European Journal for Sport Science. Pg: 1-12 retrieved December, 2017 from https://www.ncbi.nlm. nih. gov/ pubmed/ 29529951

[8] Jones. H.P., Taylor. J, and Sutton. L (2002).The Effect of Play on the Creativity of Young Children during Subsequent Activity". Early Child Development and Care. Vol. 172, No. 4 Pg: 323-328 retrieved June 2017 fromhttps: //www. researchgate. net/ publication/233035688

[9] Pesce. C, Masci. I, Marchetti. R, Vazou. S, and Tomporowski. D.P. (2016) "Deliberate Play and Preparation Jointly Benefit Motor and Cognitive Development: Mediated and Moderated Effects". Frontiers in Psychology retrieved January 2017 from https:// www. ncbi.nlm.nih.gov/pmc/ articles/ PMC4786558/

[10] Tortella.P, Haga. M, Loras H, Sigmundsson. H, and Fumagalli.G. (2016). "Motor Skill Development in Italian Pre-School Children Induced by Structured Activities in a Specific Playground". PLoS One retrieved June 10, 2017 from https:// www. ncbi. nlm. nih. gov/pmc/articles/PMC4963078/

[11] Tandon. S.P, Tovar. A, Jayasuriya. T.A, Welker.E, Schober.J.D, and Kristen, (2016) "The relationship between physical activity and diet and young children's cognitive development: A systematic review". Elsevier. Pg: 379–390 retrieved June 10, 2017 from https://www.ncbi.nlm. nih. gov/pmc /articles/ PMC4 929214/

[12] Niet V, Anneke G. ; Smith, J; Oosterlaan, J ; Scherder, Erik J. A. ; Hartman, Eand Visscher, C.(2015) "Effects of a Cognitively Demanding Aerobic Intervention During Recess on Children's Physical Fitness and Executive Functioning". Pediatric Exercise Science. Vol. 28, No. 1. Pg. 64-70 retrieved June 10, 2017 from https://www.rug.nl/research/portal /publications/effects-of-a-cognitively-demanding-aerobic-intervention-during-recess-on-childrens-physical-fitness-and-executive-functioning(bde195ce-ebd2-4ce7-aba2-b220546731e9)/export.html

[13] Verbitskaya. A.L., Malykh B.S., Zinchenko. P.Y., and Tikhomirova. N. T., (2015) "Cognitive predictors of success in learning Russian". Psychology in Russia: State of the Art. Volume 8, Issue 4 retrieved June 15, 2017 from http:// psychologyinrussia. com/volumes/ pdf/2015_4 /psychology 2015_4_8.pdf

[14] Flynn. M.R., Richert. A.R., Staiano. E.A., Wartella. E., and Calvert. L.S., (2014). "Effects of Exergame Play on EF in children and Adolescents at a Summer Camp for Low Income Youth". Journal for Educational Development Psychology. Vol. 4, No.1, Pg: 209–225 retrieved June 2017 from https:// www.ncbi. nlm.nih.gov/pmc/articles/PMC4196243/

[15] Donnelly. E.J, Hillman. H. C, Castelli. D, Etnier. L.J, Lee. S, Tomporowski. P, Kate Lambourne, and Amanda N. (2013). "Physical Activity, Fitness, Cognitive Function, and Academic Achievement in Children: A Systematic Review". Medical Science and Sports Exercise. Vol. 48, No. 6, Pg: 1197–1222 retrieved June 2017 from https://www.ncbi. nlm.nih.gov/pmc

/articles /PMC4874515/
[16] Lees.C. and Hopkins. J (2013). "Effect of Aerobic Exercise on Cognition, Academic Achievement, and Psychosocial Function in Children: A Systematic Review of Randomized Control Trials". Preventing chronic disease. Vol.10, Pg. 1-8 retrieved June 25, 2017 from https://www. researchgate.net /publication /258042664
[17] Lubans D.R, Morgan P.J, Cliff D.P, Barnett L.M, and Okely A.D (2010) "Fundamental movement skills in children and adolescents: review of associated health benefits". Sports Medicine Vol. 40, No. 12 Pg: 1019-1035 retrieved June10, 2017 https://www.ncbi.nlm.nih. gov/ pubmed/ 21058749
[18] Raudsepp. L and Päll. P. (2006), "The Relationship between Fundamental Motor Skills and Outside-School Physical Activity of Elementary School Children". Pediatric Exercise Science Vol.18, No. 4, Pg: 426-435 retrieved June 10, 2017 from https:// www. researchgate.net/ publication/ 282372192_
[19] Sibley, B., and Etnier, J. (2003). "The Relationship between Physical Activities and Cognition in Children: A Meta-Analysis". Pediatric Exercise Science, Vol. 15, Pg: 243-256 retrieved June 20, 2017 from http:// journals. Human kinetics. Com/pes
[20] Tomporowski. D.P., Davis. L, C., Miller. H. P, and Naglieri. A.J. (2008) "Exercise and Children's Intelligence, Cognition, and Academic Achievement". Educational Psychology Review. Vol. 20, No. 2, Pg: 111–131 retrieved June 25, 2017 fromhttps: //www. ncbi.nlm.nih.gov /pmc/articles/ PMC2748863/
[21] Wong M.S., Zhenlin W., and D. Cheng. (2008) "A play-based curriculum: Hong Kong children's perception of play and non-play". International Journal of Learning Vol.17, No. 10, Pg: 165-180 retrieved June10, 2017 from https:// www. researchgate. net/publication/283838876

References

[1] Cone, T.P., Werner, P., & Cone, S.L. (2009); Interdisciplinary Elementary Physical Education. United States: Human Kinetics.
[2] Fleming, T.M., & Bunting, L. (2007); PE Connections. United States: Human Kinetics.
[3] Graham, G. (2008); Teaching Children Physical Education, United States: Human Kinetics.
[4] Graham, G., Parker, M., & Hale, S. A. (1998); Children Moving. London: Mayfield Publishing Company.
[5] Lambdin, D.D., Corbin, C.B., Le Masurier, G.C., & Greiner, M. (2010); Fitness for Life: Elementary School Class Room Guide. United States: Human Kinetics.
[6] NASPE. (2004); Physical Best Activity Guide Elementary Level. United States: Human Kinetics
[7] Pangrazi, R. P., (1995); Dynamic Physical Education for Elementary School Children.United States: Macmillan Publishing Company.
[8] Pangrazi, R. P., &Dauer, V. P (1995); Dynamic Physical Education for Elementary School Children. United States: Macmillan Publishing Company.
[9] Rovengo, I., &Bandhauer, D. (2017). Elementary Physical Education; United States: Cathy L. Esperti.
[10] Stidder, G., & Hayes, S. (2011). The Really Useful Physical Education Book; Great Britain: MPG Books Group.