JOURNAL OF PHYSICAL EDUCATION RESEARCH

Journal of Physical Education Research, Volume 2, Issue III, September 2015, pp.43-52
ISSN: Print-2394 4048, Online-2394 4056, IBI Factor: 4.29

MOTOR SKILLS IN PRE-SCHOOL CHILDREN OF ANGANWADI KENDRAS AND KINDERGARTENS

GAJANANA PRABHU B.[1], MOHAN D.[2]
[1]*Department of P.G. Studies and Research in Physical Education, Kuvempu University, Shimoga, Karnataka, INDIA.*
Email: *prabhuji888@gmail.com*
[2]*Department of P.G. Studies and Research in Physical Education, Kuvempu University, Shimoga, Karnataka, INDIA.*

How to cite this article: Gajanana Prabhu B., & Mohan D., (September, 2015). Motor skills in pre-school children of Anganwadi kendras and kindergartens. Journal of Physical Education Research, Volume 2, Issue III, 43-52.

Received: June 29, 2015 **Accepted:** September 15, 2015

ABSTRACT

The purpose of the present investigation was to examine the differences in motor skills ability between pre-schoolers from kindergartens and Anganwadi Kendras. Subjects for the study were 68 boys of Shivamogga district attending pre-school. Equal representation was given to students from Government run Anganawadi Kendras located in rural (N=34) and private Kindergartens located in urban (N=34) areas of Shivamogga. Gross motor skills were measured using Children's Motor Skill Tool, a valid and reliable tool in kindergarten children in field-based settings. All the randomly selected subjects from different kindergartens and Anganawadi Kendras were tested for motor skills in a flat and soft playground. Each subject was given enough number of chances to exhibit the intended motor skills for testing. Descriptive statistics like mean and standard deviation were calculated. In order to test the hypothesis 't' test for paired variables was calculated using appropriate software. On the basis of the results and within the limitations of the study it is concluded that there is significant difference in motor skills ability between pre-school children from Kindergartens situated in urban areas and Anganwadi Kendras located in rural areas of Shivamogga district. It is observed that the pre-school children studying in Kindergartens have better motor skills than their age matched counterparts in Anganwadi Kendras.
Keywords: *Motor skills, pre-school children, kindergartens, anganwadi kendras.*

1. INTRODUCTION

Even though early childhood is a critical period for the development of active living behaviours, it is the period of growth for which we know the least about the

Correspondence: Gajanana Prabhu B., Ph.D., Assistant Professor, Department of P.G. Studies and Research in Physical Education, Kuvempu University, Shimoga, Karnataka, INDIA, Email: prabhuji888@gmail.com

health impact of physical activity (Timmons, Naylor, & Pfeiffer, 2007). In contrast, the health benefits of physical activity for school-aged children are well established (Janssen, & LeBlanc, 2010; Strong, Malina, Blimkie, Daniels, Dishman, Gutin, …, & Trudeau. 2005). The studies on physical activity patterns and its associated benefits for pre-school children have been scarce. Physical activity provides a number of health benefits, both physical and psychological (Cragg & Cameron, 2006; Warburton, Nicol, & Bredin, 2006). In addition to prevention and reduction of childhood overweight and obesity (Canning, Courage, & Frizzell, 2004; WHO, 2008), physical activity has been associated with cardiovascular health and fitness, muscular strength and endurance, reduction in depression and anxiety, and a positive association with academic achievement (Strong, *et al.*, 2005).

Given that early childhood is a critical period for the establishment of eating and activity behaviour, (Trost, Sirard, Dowda, Pfeiffer, & Pate, 2003) prevention strategies to ensure that children develop healthy physical activity behavior should start as early in life as possible (Reilly, 2011). Children under the age of 5 years are commonly defined as infants when aged between birth and 1 year, as toddlers when aged between 1 and 3 years, and as preschoolers when aged 3 to 5 years. Teachers and parents previously assumed that preschool-aged children are very active (i.e., continually running around) and have concluded that young children engage in sufficient activity (Benham-Deal, 1993; Sallis, Patterson, McKenzie, & Nader, 1988). However, researchers believe that the amount of time that children spend at daycare, the increases in television viewing, the fact that children have fewer siblings to play with than children of previous generations, and the greater parental constraints in play places and safety concerns have resulted in dramatic increases in sedentary behavior (Boreham & Riddoch, 2001; Davies, Gregory, & White, 1995; Poest, Williams, Witt, & Atwood, 1989). Therefore, parents and teachers' potential overestimation of physical activity levels in children may result in a decreased emphasis placed on the importance of encouraging and supporting active lifestyles in this age group.

Although it was once thought that preschoolers engaged in high levels of physical activity, several recent studies have shown that preschool children actually engage in fairly low levels of moderate to vigorous physical activity (Alhassan, Sirard, & Robinson, 2007; Dowda, Brown, McIver, Pfeiffer, O'Neill, Addy, & Pate, 2009; Trost, Fees, & Dzewaltowski, 2008). Among this age group, low levels of physical activity are associated with increasing body fat (Moore, Nguyen, Rothman, Cupples, & Ellison, 1995), whereas vigorous physical activity is associated with lower odds of overweight (Metallinos-Katsaras, Freedson, Fulton, & Sherry, 2007). In the pre-school set up of India there are no definite curricula to develop fine and gross motor activities in the classroom and yet students are expected to write neatly, which require developed motor skills. Due

to the immaturity of the human nervous system at the time of birth, children grow continually throughout their childhood years. Many aspects contribute to the ability and the rate that children develop their motor skills. Genetic or inherited traits and children with learning disorders may be considered as uncontrollable factors. Although debatable, fundamental motor skills are considered as building blocks of latter motor skill acquisition related to sport-specific movements (Clark, 1994) and skillfulness (Clark, 1994). Moreover, if gross motor development is not mastered, children may experience lifelong difficulties with later motor skill acquisition. Therefore, the acquisition of gross motor skill is critical, but despite its importance, unfortunately, gross motor development has been overlooked by many who work with early education (Clark, 2007). Many might be the reasons for little attention to gross motor skill acquisition, but the main reason comes from the assumption that maturation would underlie gross motor or fundamental motor skill development. Undoubtedly maturation plays an important role in motor development course and acquisition rate, but it might not be considered the sole factor contributing to motor skill development (Thelen, 1986; Ulrich, 1989). Despite happening without specific instruction and practice, several researchers have question factors other than maturation affecting fundamental motor pattern (Gallahue, 1982). Recent explanations about motor development have emphasized that motor skills change through interactive processes between the individual and the environment (Clark, 1994; Thelen, 1995, 2000). Specifically, Gallahue and Donnelly (2007) have suggested that physical education in early school intervention is the only place where children would be instructed and intervened in order to achieve proficiency in fundamental motor patterns.

Research into correlates of preschool children's physical activity was first reported in 1980 (Buss, Block, & Block, 1980); two thirds of the existing literature in this area has been published since 2001. Although reviews of the correlates of the physical activity behaviors of elder children have been published, none have focused on the associations of these behaviors in the preschool population. Despite all its importance, the effects of early physical education intervention, as part of school program, still need to be studied. The purpose of the present investigation was to examine the differences in motor skills ability between pre-schoolers from kindergartens situated in urban and Anganwadi Kendras located in rural areas of Shimoga district.

2. METHODS AND MATERIALS

2.1 Subjects

Subjects for the study were sixty eight boys of Shivamogga district attending pre-school during 2014-15. Equal representation was given to students from

Government run Anganawadi Kendras located in rural (N=34) and private Kindergartens located in urban (N=34) areas of Shivamogga.

2.2 Tools

Gross motor skills were measured using Children's Motor Skill Tool (Table 1), a valid and reliable tool in kindergarten children in field-based settings. Concurrent validity was established using the performances on the Children's Activity and Motor Skills in Preschool test and on a criterion test, the Test of Gross Motor Development-2 (Wood, 1989). Because the validity of the Test of Gross Motor Development -2 has been established the Pearson correlation coefficients were used to compare the Children's Activity and Motor Skills in Preschool test and the Test of Gross Motor Development -2. The Pearson coefficient scores ranged from 0.94 to 0.98. Reliability estimates range from R=0.88 to 0.97. Gross motor skill measurements follow William's protocol. The tool measures locomotor (e.g., running, jumping, galloping, skipping) and object control (e.g., throwing, kicking, catching, striking) skills (Williams, Pfeiffer, Dowda, Jeter, Jones, & Pate, 2009). Each skill was rated on a scale of Teams of paired Physical education students with appropriate knowledge of motor skills in children.

Motor skills' scoring is based on two trials of each skill. The two trials are added to give a total score for each skill. The skills are added together to give a total score. The highest possible score could be 66. The total score was used for statistical purposes.

2.3 Data Acquisition

All the randomly selected subjects from different kindergartens and Anganawadi Kendras were tested for motor skills in a flat and soft playground. The subjects were brought with care and attention to the data collecting area with the help of concerned class teacher and ayah. Prior to the administration of the test the investigator had an informal talk with the subjects to make himself familiar and develop rapport. The motor skills to be tested were demonstrated in front of the subjects many times to make them familiar. Each subject was given enough number of chances to exhibit the intended motor skills for testing.

2.4 Statistical Analysis

Descriptive statistics like mean and standard deviation were calculated. In order to examine the differences in motor skills ability between pre-schoolers from kindergartens and Anganwadi Kendras *t* test for paired variables was calculated using SPSS (v.16) software.

Table 1: Measurement tool to assess motor skills in pre-school children

Skill	Rater 1	Rater 2	Movement Characteristics
	0 1	0 1	1. Arms move in opposition to legs, elbows bent (0,1)
	0 1	0 1	2. Brief period of suspension (both feet off the ground) (0,1)
	0 1	0 1	3. Narrow foot placement; lands on heel or toe; not flat footed (0,1)
Run			
12 Possible	0 1	0 1	4. Length of stride even; path of movement horizontal (0,1)
Total _____			
	0 1	0 1	5. Nonsupport leg flexed to approximately 90° (0,1)
	0 1	0 1	6. Eyes focused forward (0,1)
	0 1	0 1	1. Preparatory: flexion of both knees; arms behind body (0,1)
Broad Jump	0 1	0 1	2. Arms extend forcefully; forward and upward to full extension above the head (0,1)
10 Possible			
Total _____	0 1	0 1	3. Take-off and landing on both feet simultaneously (0,1)
	0 1	0 1	4. Arms move downward during landing (0,1)
	0 1	0 1	5. Balance maintained on landing (0,1)
	0 1	0 1	1. Body turned sideways; shoulders aligned with line on floor to initiate (0,1)
	0 1	0 1	2. Steps sideways with lead foot; slides trail foot next to lead foot(0,1)
Slide	0 1	0 1	3. Minimum of four continuous step-slide cycles to right (0,1)
14 Possible			
Total _____	0 1	0 1	4. Minimum of four continuous step-slide cycles to left (0,1)
	0 1	0 1	5. Arms used to assist leg action (0,1)
	0 1	0 1	6. Body maintained in sideways position moving to right (0,1)
	0 1	0 1	7. Body maintained in sideways position moving to left (0,1)
	0 1	0 1	1. Take off on one foot; land on opposite foot (0,1)
Leap	0 1	0 1	2. Brief period of suspension (both feet off the ground) (0,1)
6 Possible			
Total _____	0 1	0 1	3. Forward reach with arm opposite the lead foot (0,1)
	0 1	0 1	1. Nonsupport leg swings forward in pendulum motion to assist force production (0,1,2)
	0 1	0 1	2. Foot of nonsupport leg remains behind body (0,1,2)
Hop	0 1	0 1	3. Arms flexed; swing forward together to produce force (0,1,2)
24 Possible			
Total _____	0 1	0 1	4. Weight received (lands) on ball of foot (0,1,2)
	0 1	0 1	5. Takes off and lands three consecutive times on preferred foot (0,1,2)
	0 1	0 1	6. Takes off and lands three consecutive times on non-preferred foot (0,1,2)

3. RESULTS

The results pertaining to motor skills in terms of mean, standard deviation, maximum and minimum is given in table 2.

Table 2: Descriptive statistics on motor skills of pre-school children attending Kindergartens and Anganwadi Kendras

Subjects	Mean	SD	Minimum	Maximum
Kindergarten (N=34)	36.62	6.87	19	52
Anganawadi Kendras (N=34)	32.38	9.34	5	47

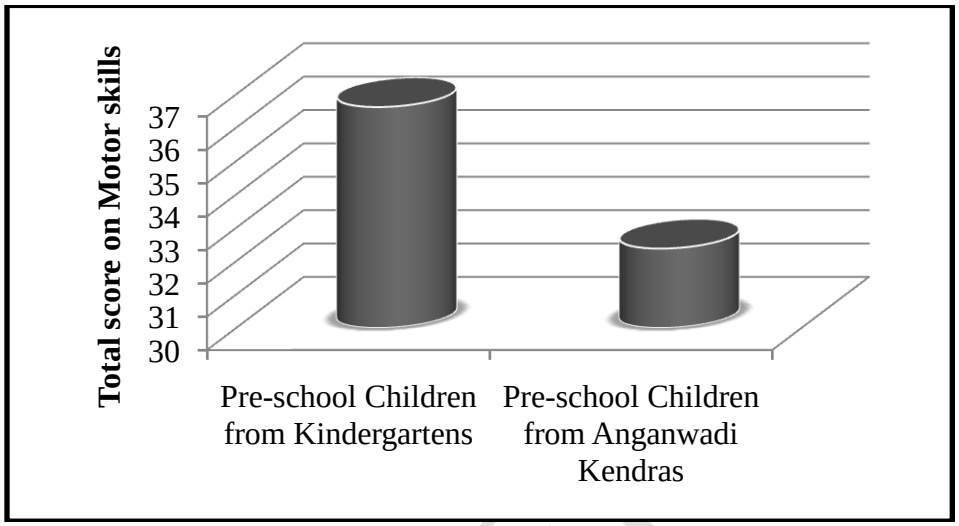
The raw data on motor skills of subjects attending Kindergartens and Anganwadi Kendras were subjected to suitable statistical analysis and results are depicted in above table 2.

Table 3: Summary of *t* test to compare mean scores on motor skills among pre-school children attending Kindergatrens and Anganawadi Kendras

	Paired Differences Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Children from Kindergarten	4.23	10.79	1.85	2.28	33	0.029
Children from Anganawadi Kendras						

In order to compare mean scores on motor skills *t* test for paired variables were employed and results depicted in table 3. It is clear from table 3 that there is significant difference in motor skills ability between pre-school children attending Kindergartens and Anganwadi Kendras. The calculated *t* value is 2.28 which is sufficient to describe that there is significant difference in mean scores of two set of scores. The above result is depicted graphically in figure 1.

Figure 1: Graphical illustration on differences in motor skills ability in pre-school children from kindergartens and anganwadi kendras



4. DISCUSSION

The results of the present cross sectional study indicates that there is significant difference in motor skills ability between pre-school children from Kindergartens and Anganwadi Kendras of Shivamogga district. It is observed that the subjects belonging to Kindergartens were better than their counterparts from Anganwadi kendras in the present cross-sectional study.

Effective interventions that promote and foster physical activity in children are necessary. Regular physical education, composed by structured practice, ministered by a specialist promotes gross motor development of children even at young age such as in kindergarten Lemos, Avigo and Barela (2012).

The influences on the physical activity behaviors of preschool children are multidimensional. According to Hodges (2013) common factors and contexts associated with physical activity levels in preschoolers included (a) child characteristics; (b) interpersonal dynamics between preschoolers and their families, childcare providers, and health care providers; (c) childcare setting; and (d) neighborhood environment.

Measurement of motor skills in pre-school children is very important. It provides an insight into the activity levels of such children. On the basis of this understanding an accurate program to develop physical fitness can be planned. A combination of objective monitoring and direct observation may provide the best standard for the assessment of physical activity measurement tools (Oliver, Schofield, & Kolt, 2007).

5. CONCLUSIONS

On the basis of the results and within the limitations of the study it was concluded that there is significant difference in motor skills ability between pre-school children from Kindergartens situated in urban areas and Anganwadi Kendras located in rural areas of Shivamogga district. It is observed that the pre-school children studying in Kindergartens have better motor skills than their age matched counterparts in Anganwadi Kendras.

6. REFERENCES

Alhassan, S., Sirard, J.R., & Robinson, T.N. (2007). The effects of increasing outdoor play time on physical activity in Latino preschool children. *International Journal of Pediatric Obesity, 2*, 153-158.

Benham-Deal, T. (1993). Physical activity patterns of preschoolers during a developmental movement program. *Child Study Journal, 23*, 115-133.

Boreham, C., & Riddoch, C. (2001). The physical activity, fitness and health of children. *Journal of Sports Sciences, 19*, 915-929.

Buss, D.M., Block, J.H., & Block, J. (1980). Preschool activity level: Personality correlates and developmental implications. *Child Development, 51*, 401-408.

Canning, P.M., Courage, M.L., & Frizzell, L.M. (2004). Prevalence of overweight and obesity in a provincial population of Canadian preschool children. *Canadian Medical Association Journal, 171*, 240-242.

Clark, J.E. (1994). Motor development. *Encyclopedia of Human Behavior, 3*, 245-255.

Clark, J.E. (2007). On the problem of motor skill development. *Journal of Physical Education, Recreation and Dance, 78*, 39-45.

Cragg, S., & Cameron, C. (2006). Physical activity of Canadian youth-An analysis of 2002 health behaviour in school-aged children data. Ottawa Ontario: Canadian Fitness and Lifestyle Research Institute.

Davies, P.S., Gregory, J., & White, A. (1995). Physical activity and body fatness in pre-school children. *International Journal of Obesity, 19*, 6-10.

Dowda, M., Brown, W.H., McIver, K.L., Pfeiffer, K.A., O'Neill, J.R., Addy, C.L., & Pate, R.R. (2009). Policies and characteristics of the preschool environment and physical activity of young children. *Pediatrics, 123*, e261-e266.

Gallahue, D.L. (1982). *Understanding motor development in children*. Boston, MA: John Wiley & Sons, Inc.

Gallahue, D.L., & Donnelly, F.C. (2007). *Developmental physical education for all children (4th ed.)*. Urban-Champaign, IL: Human Kinetics.

Hodges, E.A., Smith, C., Tidwell, S., & Berry, D. (2013). Promoting physical activity in preschoolers to prevent obesity: A review of the literature. *Journal of Pediatric Nursing, 28*, 03-19

Janssen, I., & LeBlanc, A.G. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *International Journal of Behavioral Nutrition and Physical Activity, 7*, 40.

Lemos, A.G., Avigo, E.L., & Barela, J.A. (2012). Physical education in kindergarten promotes fundamental motor skill development. *Advances in Physical Education, 2*(1), 17-21.

Metallinos-Katsaras, E.S., Freedson, P.S., Fulton, J.E., & Sherry, B. (2007). The association between an objective measure of physical activity and weight status in preschoolers. *Obesity (Silver Spring), 15*, 686-694.

Moore, L.L., Nguyen, U.S., Rothman, K.J., Cupples, L.A., & Ellison, R.C. (1995). Preschool physical activity level and change in body fatness in young children. The Framingham children's study. *American Journal of Epidemiology*, *142*, 982-988.

Oliver, M., Schofield, G.M., & Kolt, G.S. (2007). Physical activity in preschoolers: Understanding prevalence and measurement issues. *Sports Medicine*, 37, 1045-1070.

Poest, C.A., Williams, J.R., Witt, D.D., & Atwood, M.E. (1989). Physical activity patterns of preschool children. *Early Childhood Research Quarterly*, *4*, 367-376.

Salbe, A.D., Fontvieille, A.M., Harper, I.T., & Ravussin, E. (1997). Low levels of physical activity in 5-year-old children. *Journal of Pediatrics*, *131*, 423-429.

Reilly, J.J. (2011). Physical activity in early childhood: topic commentary. In: Encyclopedia on early childhood development. *Encyclopedia on Early Childhood Development*, 1-4, Available online at: http://www.child-encyclopedia.com/documents/ReillyANGxp1- Physical.pdf. (Accessed June 12, 2015).

Sallis, J.F., Patterson, T.L., McKenzie, T.L., & Nader, P.R. (1988). Family variables and physical activity in preschool children. *Journal of Developmental and Behavioral Pediatrics*, *9*, 57-61.

Strong, W.B., Malina, R.M., Blimkie, C.J.R., Daniels, S.R., Dishman, R.K., Gutin, B., ……, & Trudeau, F. (2005). Evidence-based physical activity for school-aged youth. *Journal of Pediatrics*, *146*, 732-737.

Thelen, E. (1986). *Development of coordinated movement: Implications for early human development*. In M.G. Wade, & H.T.A. Whiting (Eds.), Motor development in children: Aspects of coordination and control (pp.106-119). Boston, MA: Martin Nijhoff.

Thelen, E. (1995). Motor development: A new synthesis. *American Psychologist*,

50, 79-95

Timmons, B.W., Naylor, P.J., & Pfeiffer, K.A. (2007). Physical activity for preschool children: How much and how? *Canadian Journal of Public Health*, *98*(2), S122-S134.

Trost, S.G., Sirard, J.R., Dowda, M., Pfeiffer, K.A., & Pate, R.R. (2003). Physical activity in overweight and nonoverweight preschool children. *International Journal of Obesity and Related Metabolic Disorder, 27*, 834-839.

Trost, S.G., Fees, B., & Dzewaltowski, D. (2008). Feasibility and efficacy of a "move and learn" physical activity curriculum in preschool children. *Journal of Physical Activity & Health*, *5*, 88-103.

Ulrich, B.D. (1989). Development of stepping patterns in human infants: A dynamical systems perspective. *Journal of Motor Behavior*, *21*, 392-408.

Warburton, D.E., Nicol, C.W., & Bredin, S.S. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal*, *174*, 801-809.

Williams, H.G., Pfeiffer, K.A., Dowda, M., Jeter, C., Jones, S., & Pate, R.R. (2009). A field-based testing protocol for assessing gross motor skills in preschool children: The children's activity and movement in preschool study motor skills protocol. *Measurement in Physical Education & Exercise Science*, *13*(3), 151-165.

Wood, T.M. (1989). *The changing nature of norm-referenced validity*. In: Safrit MJ, Wood TM, editors. Measurement Concepts in Physical Education and Exercise Science. Human Kinetics; Champaign, IL.

WHO. (2008). Childhood overweight and Obesity. Available online at: http://www.who.int/dietphysicalactivity/childhood/en/ (Accessed June 6, 2015)