International Journal of Recent Advances in Multidisciplinary Research
Vol. 01, Issue 04, pp.0111-0113 November, 2014

Full Length Review Article

COMPARISON OF EXPLOSIVE POWER AND SPRINTING PERFORMANCE OF RURAL AND URBAN BOYS AND GIRLS

***Chittibabu, B.**

Department of Physical Education and Sports Sciences, Annamalai University, Chidambaram – 608002, Tamilnadu, India

ARTICLE INFO

Article History:
Received 27th August, 2014
Received in revised form
20th September, 2014
Accepted 31st October, 2014
Published online 30th November, 2014

Keywords:
Vertical jump,
40 meters sprint,
Rural and urban.

ABSTRACT

The aim of this study was to compare explosive power and sprinting performance between rural and urban elementary school boys and girls in tamilnadu. The sample consisted of 3000 (1500 urban and 1500 rural; Age 10.3 ± 0.42 years) boys and 3000 (1500 urban and 1500 rural; Age 10.3 ± 0.43 years) girls with no medical history of disease. Volunteers were recruited randomly from selected schools in ten municipal corporations of Tamilnadu. Urban and rural schools were selected randomly. The explosive power measured through vertical jump test and sprinting performance through 40 meters sprint were conducted on both boys and girls of rural and urban area elementary school. Independent-samples t tests revealed that explosive power and sprinting performance ($p < 0.05$) was significantly higher in boys living in rural settings compared to their urban counterparts. In girls, explosive power and sprinting performance was found to be significantly better ($p < 0.05$) in the rural children than urban. It is concluded that the place of residence has clear impact on explosive power and sprinting performance in 12 year old school children in tamilnadu.

INTRODUCTION

Physical education is unique to the school curriculum as the only program that provides students with opportunities to learn motor skills, develop fitness and gain understanding about physical activity. Physical benefits gained from physical activity include: disease prevention, safety and injury avoidance, decreased morbidity and premature mortality, and increased mental health. The physical education program is the place where students learn about all of the benefits gained from being physically active as well as the skills and knowledge to incorporate safe, satisfying physical activity into their lives. In the elementary grades, the physical education program emphasizes the development of fundamental locomotor, non-locomotor, and manipulative skills through the main content areas of educational games, dance, and gymnastics. The movement framework, (i.e., body, space, effort, and relationship) is also a part of the core content and is the basis for developing, expanding, and refining children's range of motor skills and awareness. Quality instruction by physical education professionals is critical if children are to develop fundamental motor patterns (e.g. jump, throw, skip, hop, catch, and kick).

Corresponding author: Chittibabu, B.
Department of Physical Education and Sports Sciences, Annamalai University, Chidambaram – 608002, Tamilnadu, India.

The motor skill foundations established during the elementary grades may enhance children's social, cognitive and physical development and increase the likelihood of continued interest and participation in physical activity. Fitness at elementary grades is supported by a rich experience in many basic movement forms (Tsimeas *et al*., 2005). Living in areas distinguished by population size can be associated with differences in, inter alia, eating habits, access to sports facilities, and opportunities for physical fitness activities (Kabagambe *et al*., 2002; Parks, Housemann, Brownson 2003) However, it is not entirely clear whether such factors can affect aspects of body composition, motor ability and, therefore, physical fitness. Increased body fatness is a global epidemic (WHO 2000). In adults, ample epidemiological evidence demonstrates a positive association between body fat levels and a greater health risk of all-cause mortality (Bender *et al*., 1998). The sedentary lifestyle is the main reason for fat accumulation and leads to hypokinetic diseases in early age (Koutedakis and Bouziotas 2003). To our knowledge, there is a dearth of such data on tamilnadu elementary school children. Therefore, the aim of this study was to compare explosive power and sprinting performance between rural and urban elementary school boys and girls in tamilnadu.

MATERIALS AND METHODS

Geographical area of residence (urban v small towns or rural areas): Definitions of urban and rural areas are

inconsistent. They are based on variables such as distance from trading centres and cut off population sizes of 100000, 50000, and 10000 inhabitants (United Nations., 2002). The latter criterion was used in this study to describe an urban area (> 10 000 inhabitants) and a rural area (< 10 000 inhabitants).

Subjects

The sample consisted of 3000 (1500 urban and 1500 rural; Age 10.3 ± 0.42 years) boys and 3000 (1500 urban and 1500 rural; Age 10.3 ± 0.43 years) girls with no medical history of disease. Volunteers were recruited randomly from selected schools in ten municipal corporations of Tamilnadu. Urban and rural schools were selected randomly.

Data collection

Procedures took place during morning school visits from September to December 2006, 2007, and 2008. Demonstrations of each test were given to children prior to testing. All measurements were conducted by the same investigating team, following the same order of testing, and allowing 5–10 min rest intervals between tests. These measurements and tests will be presented in the order in which they were conducted.

Vertical jump test (VJ)

The athlete stands side on to a wall and reaches up with the hand closest to the wall. Keeping the feet flat on the ground, the point of the fingertips is marked or recorded. This is called the standing reach height. The athlete then stands away from the wall, and leaps vertically as high as possible using both arms and legs to assist in projecting the body upwards. The jumping technique can or cannot use a countermovement. Attempt to touch the wall at the highest point of the jump. The difference in distance between the standing reach height and the jump height is the score. The best of three attempts is recorded. The jump height was recorded in centimetres.

40 meters sprint (40 m)

The volunteer started the test from a standing position with one foot on the starting line. The timer stood at the finish line, called ready, and signalled the start of the sprint. Timing was initiated by the first movement of the subject. Time was recorded to the nearest 0.1 s.

Statistical analyses

The independent samples t test was utilised to assess for differences between urban and rural settings. The significance level was set at $p < 0.05$.

RESULTS

Independent-samples t tests revealed that explosive power and sprinting performance ($p < 0.05$) was significantly higher in boys living in rural settings compared to their urban counterparts. In girls, explosive power and sprinting performance was found to be significantly better ($p < 0.05$) in the rural children than urban (Table 1). No further statistical differences were established.

Table 1. Comparison of selected motor ability between rural and urban boys and girls

S. No	Parameters	Rural	Urban	*t*
	Boys			
1	Explosive power (cm)	49.6 ± 7.7	45.9 ± 8.1	16.47*
2	Sprinting performance (sec)	4.9 ± 0.5	5.6 ± 0.6	24.53*
	Girls			
1	Explosive power (cm)	39.0 ± 6.7	31.4 ± 9.0	32.71*
2	Sprinting performance (sec)	5.4 ± 0.4	6.0 ± 0.4	58.09*

*$p < 0.05$

DISCUSSION

In line with previously published reports on elementary school children, the present data have demonstrated that tamilnadu rural elementary school boys and girls are better in explosive power and sprinting performance. The main findings were that explosive power and sprinting performance were significant different between urban and rural children and that these differences were uniformly distributed in children living in either urban or rural environments. It is, therefore, tempting to suggest that, for children, the place of residence has clear impact on motor ability as studied herein. To our knowledge, this is the first study which examined explosive power and sprinting performance in urban and rural children. Nevertheless, the present data do not agree with published reports advocating that the place of residence indeed has an impact on children's motor ability. A report from Poland proposed that rural children were fitter than their urban counterparts (Wilczewski *et al*., 1996). Irrespective of schools size or location, state secondary school PE programmes are not common and compulsory throughout state. However, it has been recently found that these programmes are insufficient to bring about beneficial adaptations in selected health related fitness parameters, such as maximal oxygen intake (Koutedakis, Bouziotas, 2003). These findings are also in line with existing data from other countries questioning the validity of school PE classes (Shephard, 1994) and partly contradict the assertion that school PE lessons should fulfill most of the motor ability and health related fitness needs of children (Sallis and McKenzie, 1991). The emerging trend towards urbanisation of Tamil school children rural life (Anastassea-Vlachou *et al*., 1996) may be an additional explanation for the present findings.

Conclusion

In conclusion, and within this study's limitations, including data collection from a different geographical region, it is suggested that the place of residence has clear impact on explosive power and sprinting performance in 12 year old school children in tamilnadu. Further research is required involving aspects of health and fitness in paediatric populations from different countries.

REFERENCES

Anastassea Vlachou, K., Fryssira Kanioura, H., Papathanasiou Klontza, D., Xipolita-Zachariadi, A. and Matsaniotis, N. 1996. The effects of television viewing in Greece, and the role of the paediatrician: A familiar triangle revisited. *Eur J Pediatr*, 155:1057–60.

Kabagambe, E.K., Baylin, A., Siles, X. and Campos, H. 2002. Comparison of dietary intakes of micro- and macronutrients in rural, suburban and urban populations in Costa Rica. *Public Health Nutr*, 2(5):835–42.

World Health Organization, 2000. Obesity: preventing and managing the global epidemic. *WHO Technical Report Series 894*. Geneva: WHO.

Bender, R., Trautner, C., Spraul, M. and Berger, M. 1998. Assessment of excess mortality in obesity. *Am J Epidemiol*, 147: 42–8.

Koutedakis, Y. and Bouziotas, C. 2003. National physical education curriculum: Motor and cardiovascular health related fitness in Greek adolescents. *Br J Sports Med*, 37: 311–4.

Tsimeas, P.D., Tsiokanos, A.L., Koutedakis, Y., Tsigilis, N. and Kellis, S. 2005. Does living in urban or rural settings affect aspects of physical fitness in children? An allometric approach. *Br J Sports Med*, 39: 671–674.

Parks, S.E., Housemann, R.A. and Brownson, R.C. 2003. Differential correlates of physical activity in urban and rural adults of various socioeconomic backgrounds in the United States. *J Epidemiol Community Health*, 57: 29–35.

Sallis, J.F. and McKenzie, T.L. 1991. Physical education's role in public health. *Res Q Exerc Sport*, 62: 124–37.

Shephard, R.J. 1994. *Physical activity, aerobic fitness, and health. In: Aerobic fitness and health*. Champaign, IL: Human Kinetics, 1994:1–29.

Wilczewski, A., Sklad, M., Krawczyk, B., Saczuk, J. and Majle, B. 1996. Physical development and fitness of children from urban and rural areas as determined by EUROFIT test battery. *Biol Sport Warsaw*, 13:113–26.

****