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Growth Motor Development Levels of Young Children in Cricket, Volleyball and Athletics

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Abstract

The purpose of this study was to identify the gross motor development level of primary school students playing three different sports (athletics, volleyball and cricket). A total of 90 subjects (athletics = 30, volleyball=30, cricket =30) participated in the study. Gross motor development tests Ulrich (2000) with a coefficient of 0.88-0.96 (Hardy, 2009) was conducted to assess the level of gross motor development of young athletes from different sports. There was a significant difference [F (2,87) = 108.2, p = 0.00] for gross motor development among young athletes for different sports (athletics, crickets, and volleyball). Post hoc analysis on the GMDQ mean scores showed cricket and volleyball players differed from athletics ($p<0.01$). Age of locomotor (AEL) scores for the three types of sports also shows significant differences [F (2,87)=86.6, $p<0.00$] for all three sports. For control object scores (AEM), there were significant differences [F (2,87) = 61.2 , p = 0.00] between volleyball and cricket ($p <0.01$) players. There are differences in gross motor development among young children participating in sports such as athletics, volleyball, and cricket.

Keywords: Motor Development, GMDQ, Volleyball Players

Introduction

Gross motor skills involve the use of large muscle groups in performing daily activities by individuals. Some examples of daily movements that involve gross motor skills are climbing, dancing, running, jumping and kicking. The acquisition of movement skills is very important for young children (Gallahue & Donnelly, 2003) because problems in motor development at an early age may result in less involvement in sports activities or games during childhood and adolescence (Hardy , 2009). Applicable motor development involves not only an increase regarding age and physical growth but refers to the physiology, motor system and nervous system. Motor development is a process that is continuous and lifelong starting in the womb until death (Gallahue & Ozmun, 1998). As a child grows, they acquired movement skills and increased physical competence. At this age period, development of basic movement skills children are sensitive (Gallahue & Donnelly, 2003).

Locomotor skills are the ability to make changes to body movement in activities that involve the whole body such as changing position in galloping, running, or jumping either with one leg or standing long jump and leaping. Object control skills are the ability to manipulate the equipment with the coordination of the body such as hands and feet position either by moving or in a static condition. Examples of object control skills are hitting a stationary ball, bouncing a ball, catching a ball, kicking a ball or throwing a ball.

Gross Motor Development Test (TGMD - 2) is a norm-referenced measure of common gross motor skills of children. It has been used by researchers to identify gross motor functioning by combining fun activities with a reliable and valid measure of gross motor development. TGDM-2 measures locomotor skills (run, gallop, hop, leap, horizontal jump, slid) and object control skills (striking a stationary ball, stationary dribble, kick, catch, overhand throw, and underhand roll). Data are collected through video recordings, and scores are awarded based on successful or failed attempts.

The literature suggests there are no other measures of gross motor abilities for children aged 3 through 10 years. Physical Education teachers are trained to measure the physical performance of children regarding fitness such as cardiovascular endurance, muscular endurance, flexibility and the ability of the other components of fitness. However, teachers are not trained on how to measure the gross motor development of a child. appropriate instructional program in gross motor skill development. This results in the no assessment of the gross motor functioning of children and teachers are not able to identify children who are significantly behind their peers in gross motor skill development and formulate an appropriate instructional program in gross motor skill development. Consequently, children failed to acquire basic movement skills throughout their childhood and adolescents (Gallahue, 2011; Goodway, Crowe, & Ward; 2003). Since problems in motor development at an early age may result in less involvement in sports activities or games during childhood and adolescence, it is important to study common gross motor skills of children. This study seeks to :

1) Identify the level of gross motor development among young children in the sports of cricket, volleyball and athletics.
2) Determine differences in gross motor development of young children in the sports of cricket, volleyball and athletics.
3) Determine differences in the scores for age equivalent locomotor skills young children in the sports of cricket, volleyball and athletics.
4) Determine differences in the scores for age equivalent object control skills young children in the sports of cricket, volleyball and athletics.

Methodology

This ex-post facto study involves six tests of locomotor skills and object control skills using the Test of Gross Motor Development (TGMD) by Ulrich (2000). TGMD is a test of skills such as running, walking, gallop, jump on one foot, standing long jump, leaping , and sliding. Object control skills test involves hitting a stationary ball, catching, rolling, throwing, kicking and bouncing a ball. Both locomotor skills and control objects contain scores ranging from 0 to 48. The subject chosen was children who represented their school in cricket, volleyball and athletics in the state of Selangor. The gross motor development test (TGMD) is used to measure the development of respondents with the accountability test level, r=.96 to .97

within high contains validity (Anastasi & Urbina, 1997: Wouter, Kristine, Christiane, & Coroline, 2008).

Findings

ANOVA for Gross Motor Development Quotient (GMDQ) between groups

The three groups of subjects were analysed descriptively. Table 1 shows the scores for GMDQ to evaluate the mean and standard deviation for each group of subjects. The mean value for subjects in the cricket group was 46.0 with a standard deviation of 7.02. While the mean value for volleyball subjects was 73.5 with a standard deviation of 12.92 followed by mean of 85.5 for subjects in the athletics group with a standard deviation of 13.1.

Table 1.
Descriptive Statistics for GMDQ Overall Score according to the Type of Sports

Variable	Sport	N	Mean	Standard Deviation
GMDQ	Cricket	30	46.0	7.02
	Volleyball	30	73.5	12.92
	Athletic	30	85.5	13.1

Subjects in the athletics group obtainde the highest mean and standard deviation (mean = 85.5 , sd = 13.1). Based on ANOVA analysis, there were significant differences in GMDQ scores for three different groups [F (2,87) = 108.2 , p = 0.00] as shown in Table 2 .

Table 2.
Summary of ANOVA for Comparison between Sports Scores GMDQ

Variance	df	Min (Square)	F	P Value
Between Groups	2	12302.5	108.2	0.01
In Groups	87	113.6		

Post Hoc Analysis of Gross Motor Development Quotient (GMDQ) between Groups

Post hoc analysis (Tukey HSD) is shown in table 3. There is a significant difference in GMDQ scores between those in the athletics group from those in volleyballl and cricket (p <.01). Subjects in the volleyball and cricket gropus also differed significantly also showed a significant difference (p < 01).

Table 3.
Difference Scores GMDQ Post Hoc Analysis between Sports

Sport		Difference Mean	P Value
Athletic	Volleyball	12.00	0.01
	Cricket	39.5	0.01
Volleyball	Cricket	27.5	0.01

ANOVA for Age Equivalent Locomotor (AEL) and Age Equivalent Object Control (AEM) between Groups

Table 4 shows the mean score for AEL for subjects in the athletics group was 7.30 with a standard deviation of 1.71. For the volleyball group, AEL mean score was 5.73 with a standard deviation of 1.31, followed by cricket (mean=3.10, s.dev = 0.16). For AEM, subjects in the

athletics group obtained the highest mean scores of 7.77 with a standard deviation of 1.18 followed by volleyball (mean=6.74) and cricket (mean=3:58). Results of ANOVA analysis age equivalent of locomotor for young athletes, there are significant differences in the level of p <0.05 in AEL score for three games [F (2 , 87) = 86.6 , p = 0.00] as shown in Table 5 .

Table 4.
Descriptive Statistics for Scoring Difference Age Equivalent of Locomotor and ObjectControl Overall by Sports

Variable	Sport	N	Mean	Standard Deviation
AEL	Athletic	30	7.30	1.71
	Volleyball	30	5.73	1.31
	Cricket	30	3.10	0.16
AEM	Athletic	30	7.77	1.18
	Volleyball	30	6.74	1.88
	Cricket	30	3.58	0.37

Table 5.
Summary of Comparison on ANOVA for AEL Scores between Sports

Variance	df	Min (Square)	F	P Value
Between Groups	2	135.5	86.6	0.00
In Groups	87	1.56		

Table 6 are the results of the analysis ANOVA test showed that there were significant differences [F (2 , 87) = 61.2, p = 0.00] to age equivalent of control object for young athletes in sports.

Table 6.
Summary of Comparison on ANOVA for AEM Scores between Sports

Variance	df	Min (Square)	F	P Value
Between Groups	2	143.1	61.2	0.00
In Groups	87	2.33		

Post Hoc Analysis age Equivalent Locomotor (AEL) and Age Equivalent Control Objects (AEM) Which of Sports

Table 7 shows a comparison between sports for age equivalent score locomotor and object control through analysis post hoc test. The findings indicate that there is a significant difference between the scores AEL and AEM sports with volleyball (p = 0.00) , sport with cricket (p = 0.00) and between volleyball and cricket also showed a significant difference (p = 0.00) .

Table 7.
Difference Post Hoc Analysis of Test Scores AEL and AEM between Sports

Sport		Different mean	P Value
AEL:			
Athletic	Volleyball	1.57	0.00
	Cricket	4.20	0.00
Volleyball	Cricket	2.63	0.00
AEM:			
Athletic	Volleyball	1.02	0.00
	Cricket	4.19	0.00
Volleyball	Cricket	3.16	0.00

Discussion

Gross Motor Development Stage for Young Athletes by Different Type of Sport

This study aims to determine the level of gross motor development of young athletes based on three types of sports athletics, volleyball and cricket. Analysis shows that young athletes obtain sports scores better in the age of equivalent locomotor score, control objects and Gross Motor Development Quotient (GMDQ). Based on the interpretation GMDQ, young athletes that sport is a collection reached the highest level on the development of the locomotor, control objects and GMDQ. The second highest group is young volleyball athletes in all aspects and was followed by younger athletes cricket obtain low mean value of the three tests conducted. The development of gross motor skills in young athletes is important enhanced with the help of structured program for structured and unstructured. (Sofianidis, Hatzitaki, Douka, & Grouios; 2009). This shows that physical activity at this stage of preparation is very important and effective training program should be done properly because it is a basic skill that is very important for this group. In fact, different game types, equipment and activity area also needs to be improved to suit the type of sport offered (Raudsepp, & Pall ; 2006)

Difference of Level Age Equivalent for Locomotor Skills and Control Object for Young Athletes between Type Sports

Based on the analysis, the findings showed that there are differences in the level of age equivalent of locomotor skills and control objects for young athletes in sports. Sport in a mean value was found locomotor skill and object control followed by volleyball. While for cricket is a team of young athletes have the lowest mean value in both tests were carried out. The provision of appropriate according to the type of sport has to offer can help improve motor skills development of young athletes for each sport (Venetsanou & Kambas, 2010).

Conclusion and Recommendation

The conclusions of this study show that young athletes are the main stages that need to be focused on the development of the motor skill. The existence of gross motor developmental delay these athletes ranked in the primary school. It shows gross motor development is not

balanced athlete sequence chronological age. The physical environment of the area in terms of facilities and equipment is a key factor to motor development of children of primary school. Appropriate facilities and comprehensive scheduling regular activities helped improve their motor skills. Therefore, it is suggested that more physical activity was held in the training program. Element of fun during training is the main focus of each training session is to encourage them to improve their performance. Through fun and physical activity performed regularly, is believed to help the development of children's motor skills indirectly.

In addition, it is proposed also to the coach knows the development of gross motor skills of children. Gross motor development tests is one way that can be performed on children to determine their level of development according to age equivalent. Gross motor development test procedures can be included in the training of trainers program. This can help coaches provide program or activity different physical and motor skills appropriate to the achievement of these athletes (Bahtiri, 2012) . This situation can foster the development of motor skills of athletes in accordance with the age equivalent. It is hoped that the results of this study can help coach sports at school find out the level of development of motor skills of their athletes. Designing the coaching and learning activities appropriate to athletes to help improve gross motor skills among them.

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