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## Assessing the developmental level of overarm throwing skill performance of kindergarten (KG) two pupils at Esau Ofori KG in the Akuapem north district, Ghana

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### Abstract

Research has shown that Fundamental Motor Skills (FMS) are primary skills in which individuals aged between 2 to 7 should gain a proficiency level of competency in to be able to apply for lifelong physical activities, sports and games. The purpose of this study was to assess the developmental level of overarm throwing skill performance among kindergarten two pupils. Quasi experimental design of single group was employed. The sample for the study was made up of 37 (22 boys and 15 girls) kindergarten two pupils from Esau Ofori Presby KG using purposive sampling technique. Data was collected using Test of Gross Motor Development -2 (TGMD-2) instrument designed by Ulrich (2000) with reliability coefficient ranging from 0.67 to 0.93. The instrument was designed to assess the fundamental motor skills of children between the ages of 3 to 10. The process measure of overarm throwing skill was assessed by observation (video recording) and coded with the TGMD-2 instrument with inter-observer reliability coefficient of 0.81. One hypothesis was tested. A sample t-test assuming unequal variance was used to analyse the gender difference in pupil's overarm throwing for each participant were identified through the assessment. Also, the study revealed that none of the participant was found to have acquired the matured pattern of the overarm throwing skill ( $t(36) = 2.021, p 1.5 < 0.05$ ). It is therefore recommended that teachers in the preschools assess the fundamental motor skills of pupils to identify each pupil's level of FMS, also identify pupils who might be found delayed and plan developmentally appropriate intervention programmes for such pupils.

**Keywords:** fundamental motor skills, overarm, contralateral, developmental level, delay.

### 1. Introduction

Physical education in schools has been found to be one subject that presents pupils with the opportunities to acquire and develop their movement skill repertoire. According to Payne and Isaacs (2007) <sup>[2]</sup>, the term "movement skill" refers to a series of movements performed with accuracy and precision; thus a movement skill may be a fundamental motor skills (FMS) or a specialized movement skill (SMS). Gallahue and Ozmun (2006) <sup>[3]</sup>, reiterated that in movement repertoire, FMS are the primary skills in which children aged 2-7 should gain a proficiency level of competency in order to apply them for lifelong physical activities, sports and games. In the same view, Garcia and Garcia (2008), argued that children with advanced levels of FMS proficiency are more likely to participate in physical activities and develop future habits for physical activities as compared to their counterparts who may have delayed in motor skill acquisition.

FMS consist of locomotor skills such as running, jumping, skipping, hopping and galloping that move the body through space and object control skills such as catching, throwing, kicking, striking etc. These skills are commonly considered to be the building blocks to more advanced movement skills and specific sports skills. According to Payne and Isaacs (2007) <sup>[2]</sup>, FMS help children control their bodies, manipulate their environment and form complex skills and movement patterns involved in sports and other recreational activities. Therefore any delay in the acquisition of the mature patterns of these motor skills may jeopardize future physical activities participation. Assessment of FMS should therefore be a major focus of physical education in early childhood **through** to the basic schools in order to identify pupils who might be found delayed.

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Barret (1995) [5] observed that, throwing involves imparting force on an external object such as a ball. During physical education lessons and other sporting activities, the use of the overarm throwing action varies in sport such as handball, spiking in volleyball and throwing the javelin. In order for pupils to exhibit competencies in such sports skills, they must first acquire the matured patterns of the overarm throwing skill. In terms of gender, Thomas and French (1985) [6] in their research in overarm throwing skill found out that boys in all cases perform better than girls in overarm throwing skill at all levels.

Literature has shown that girls are to acquire the mature patterns (wind up with contralateral follow through) of overarm throw at age 102 months while boys are also expected to acquire the mature patterns of overarm throw at the age of 64 months but as to whether they acquire the mature patterns of overarm throw is yet to be ascertained. This study therefore assessed the developmental levels of overarm throwing skill performance of kindergarten two pupils by gender. Specifically, the basic question that drove this study was: what was the gender difference in overarm throw among the participants of the study?. The null hypothesis that "there would be no gender difference in developmental level of overarm throwing skill performance among participants" was tested.

## 2. Methodology

A single group, one shot quasi experimental design was used to assess the developmental level of KG2B pupils overarm throwing skill performance.

### 2.1 Population

The participants in this study were pupils from Esau Ofori Presby Kindergarten two (KG2B) class in the Akuapem North District. A KG class was selected for this study because researchers have found out that by the age of three to six (3 -6) years, the common attractors that describe the overall throwing patterns are more stable and more mature.

### 2.2 Sample and Sampling Technique

The participants (N=37) who represented a census of pupils from an intact class at Esau Ofori Presby kindergarten Two (KG2B) were used for the study. The class was made up of twenty two (22) boys and fifteen (15) girls aged between five (5) and six (6) years eleven months old. Since it was an intact class, all the subjects were involved in the study. Purposive sampling technique was used to select the class based on their age.

### 2.3 Instrumentation

The TGMD-2 instrument designed by Ulrich (2000) [1] with a reliability coefficient between 0.67 and 0.93 was adopted and used to code the performance level of pupils' overarm throwing skill. The instrument was designed in such a way that each participant had two trials with a total mastery standard skill score of eight (8) points. For example, criterion elements for overarm throw include: (a) windup initiated with downward movement of hand/arm, (b) rotating hips and shoulders to a point where the non-throwing side faces the wall, (c) weight transfer by stepping with the foot opposite the throwing hand, and (d) follow – through beyond ball release diagonally across the body toward the non-preferred side (Ulrich, 2000) [1]. Thus each criterion if present and well executed in the participant's overarm throwing skill performance attracts one (1) point for each trial. In all, a well-executed overarm throwing skill at the mastery level with all the criteria as stated by the TGMD-2 instrument attracts 8

points. A high score indicates the participant's skill is well developed, whereas a lower score indicates that the skill is less developed.

## 2.4 Protocols

The assessment took place in a large empty classroom which the school uses as a playing ground. A standard international tennis federation approved tennis ball was used for the assessment. During the assessment period, pupils were neither informed nor taught how they should carry out the overarm throwing skill but were encouraged to throw the tennis ball. The participants were asked to stand on a white line marked 20 feet from a wall as stated by the TGMD-2 instrument and throw a tennis ball as hard as they could to hit the wall. Their performances were videotaped using a digital Sony camcorder video camera with two new energizer batteries. Pupil's overarm throwing performance was coded later from the video tape recorder.

## 3. Results

**Table 1:** Results for Developmental Level of KG2 Pupils Overarm Throwing Skill Performance

Criterion level	Male	%	Female	%	Overall	%
1	10	45.5	7	46.7	17	46.0
2	9	40.9	6	40.0	15	40.5
3	3	13.6	2	13.3	5	13.5
4	0	0	0	0	0	0
Total	22	100	15	100	37	100

From table one, a total number of seventeen (17) participants representing 46.0% performed the overarm throwing skill at level one. This was the highest level at which most of the participants performed the overarm throwing skill. In terms of gender, 86.4% of the males performed at level one and two whilst a total number of thirteen (13) girls representing 86.7% performed the overarm throwing skill at level one and two. The result further indicated that 13.3% of the girls performed at level three whilst an absolute number of three (3) representing 13.6% of the boys were performing at level three. This implies that most of the girls (13) with average age of 5.5 years performed the overarm throwing skill at level one and two compared to their male counterparts who also performed with higher frequency at the same level one and two.

**Table 2:** Gender Difference in Overarm Throwing Skill Performance among Participants

Gender	N	X	SD	DF	t-critical	t-cal	Sig
Male	22	3.00	1.38				
				36	2.021	0.15	0.05
Female	15	2.98	1.25				

$t\text{-critical} < t\text{-calculate}$ ,  $df = 36$

Table 2 shows the test scores of participants in the overarm throwing skill performance as measured by the TGMD-2 instrument. The Mean and Standard Deviation for the raw scores for the boys (M= 3.0, SD = 1.38) compared to that of the girls (M = 2.98, SD = 1.25) indicated that the overarm throwing skill performance of the boys were not different from that of the girls thus they both showed the same level of performance. To evaluate whether a significant difference occurred, a two sample t-test assuming unequal variance was conducted using the 0.05 level of significance. Table 2 showed that the calculated t value (t-stat) was lesser than the t-critical value for two-tailed. Hence the null hypothesis which stated

that there would be no gender difference in developmental level of overarm throwing skill performance among participants was accepted. This implied that both boys and girls level of performing the overarm throwing skill was insignificant as they were both found to be at the same level.

#### 4. Discussion

The results as reported in table 1 strongly demonstrated that, none of the genders observed was able to perform the overarm throw at criterion level four (4). Level one (1) overarm throwing patterns which involved a windup initiated with downward movement of hand/arm and block rotation of the trunk with all-out force was mostly observed among the throwing patterns of both boys and girls. These findings imply that some developmental instruction and exposure are needed to advance the development of mature throwing patterns at the early stages as opined by Garcia and Garcia (2002) [4].

It was also observed during the test stage that the subjects were not aware of how they should position themselves before executing the overarm throw. Thus the participants were throwing in their own natural way without any step, or movement of their arms and rotating of their bodies as they released the ball without any follow through of the throwing arm. Comparing gender, Thomas and French (1985) [6] in their research in overarm throwing skill found out that boys in all cases outperform girls in overarm throwing skill at all levels but the findings of this study indicated that both boys and girls performed at the same level as there were no significant difference in their overarm throwing skill performance. This may be attributed to the difference in environment and characteristics of the participants used for this study. The result also suggests that the participants did not have any prior experience with the overarm throwing skill. One possible reason for this might be due to limited physical activity opportunities available to these children in their homes, school and outdoor environment.

#### 4.1 Implication for Early Childhood Programme and School Administrators

School administrators should assess and monitor their pupils' motor development level on a regular basis. This can be done by assessing the FMS right from day one that the child enrol in the school in order to identify any developmental delays that may exist in their motor skill acquisition.

#### 4.2 Implication for Kindergarten Teachers

Kindergarten teachers should be educated on the need to assess their pupils FMS's and also how they can assess FMS of their pupils for further redress. Also, Kindergarten teachers should liaised with parents and inform them about their children motor skill levels and progress on regular basis.

#### 5. Conclusion

The result from the study imply that the pupils used for this study needs to be provided with enough opportunities to practice to help develop their FMS. Furthermore, boys and girls should be given equal opportunities to practice during physical activity lessons. The researcher conclude that gender difference do not exist in participants process measure of overarm throwing skill performance.

#### 6. Recommendations

It is therefore recommended that:

1. Teachers at the early childhood or preschools should be equipped with the prerequisite skills to be able to assess

the FMS of their pupils in order to identify pupils who might be found delayed and plan an appropriate intervention programmes for such pupils.

2. Also, this study can be replicated by improving upon pupils overarm throwing skill performance using an intervention programme.

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