

## Introduction

Early childhood is a crucial time of life when developing physically, emotionally, intellectually and socially (Garcia *et al*, 2002). Fundamental motor skills (FMS) are the foundations for more complex motor skills and movement patterns which are represented through many forms of physical activity (PA) (Cliff *et al*, 2009). There is evidence that suggest pre-schoolers that partake in FMS can be the key factor to life long participation in PA, development of these skill at an early age can be positively linked with PA (Cools *et al* 2011). Therefore the aim of the study was to assess the FMS in children aged 3-4 years old using the TGMD-2 criteria, comparing the children that participate regularly in the physical activity programme Stretch-n-Grow programme with the children that do not attend the programme.

## Methods

### Participants

Following ethical approval and informed parental consent, a sample of healthy children participants (n= 18, age = 3.8±0.5, stature= 129.1±44.2, body mass= 17.3±2.0,) . All participants will be used from the same nursery, 9 of the 18 participants will have regularly attended (1 session per week for past 12 months) this will be the Stretch-N-Grow (SNG) programme that promotes health and exercise to children, this group will represent the treatment group. The remaining participants will not have participated in the SNG programme and therefore will represent the control group.

### FMS Assessment

Each participant will be assessed in 6 locomotive (LM) skills; run, hop, gallop, slide, vertical jump and horizontal jump and 6 object control (OC) skills; strike, dribble, catch, kick, overarm throw and underarm roll. The skill assessment and protocol follow that of the Test of Gross Motor Development (TGMD-2) (Ulrich, 2000). The TGMD- 2 does not specify a set order for which skill is preformed. The order for this study was the LM skills first as they are the more physically demanding skills, followed by the OC skills. The participants were assessed in small groups of about three and four. The assessments took place outside in the playground. Demonstrations and verbal instructions of each skill were given prior to each assessment. Each participant was given time to practise the skill being assessed. Each skill is made up of three to five points of criteria, which were scored as either 1 or 0. Each participant was given two trials of each skill. A total score for LM skills and a total for OC skills the two sets of skills obtained and summed to produce a total FMS score. The skills assessment were filmed then later analysed against the criteria of the TGMD-2.

Using Statistical Package for the Social Sciences (SPSS) an independent test was used to compare the two variables (Fields, 2000) i.e. non SNG against SNG and also males against females. Coefficient of variance (COV) was also measured to maintain the reliability of the study (Atkinson and Nevill, 2001).

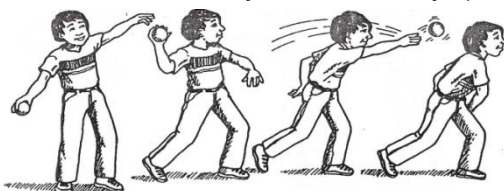


Fig 1. image demonstrating the throwing protocol by Ulrich, 2000

## Results



Fig 2. shows the mean values of LM (1) and OC (2) between non SNG and SNG

The t-test showed that there was a significant difference in the LM Score between the two groups, the OC showed there was no significant between non SNG and SNG. The t-test for female against male showed there was no significance for LM skills and for the OC skills .

Using TGMD-2 criteria (Ulrich, 2000), the COV for repeated analysis of LM skills was 3.9% and 4.6% for OC skills.

## Discussion/Conclusion

The result suggest there is a significant difference between the children who partake in SNG regularly. However from the results it could be said that it isn't beneficial in total FMS as the object control suggests that there is no significant difference. The t-test showed there were no gender differences between LM or OC skills. The study by Cliff *et al* (2009) however suggests that both sexes were found to be equally proficient in OC skills, but females scored higher for LM skills. Hardy *et al* (2009) also had similar results, females tended to have higher mastery of LM skills and boys higher mastery of object control skills. Hardy *et al* (2009) suggests if FMS can be mastered at an early age the children's development when participating in sports and games will be more beneficial to them as they get older, and if they can be master at an early age the skill are retained for life.

## References

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