Poster presentation

Relationship between physical features and motor abilities among young children: A study of a specialized kindergarten for teaching sports and physical activity

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Introduction: Insufficient physical activity and unsound physical development among children in Japan were first reported several decades ago. For children, insufficient physical activity may result in impaired motor abilities, health problems such as obesity, and impeded physical development. Changes in the environment in which children are raised have been regarded as one cause of insufficient physical activity among children; however changes in the kinds of play that children engage in must also be considered. Insufficient physical activity may cause inadequate physical development; children who have insufficiently engaged in physical activity may be prone to falls even in flat areas and may be unable to avoid landing face-first because of their lack of motor abilities. Walking and running are movements that are fundamental to young children's development. Walking and running are executed using the feet. Children that exhibit favorable physical development may have excellent motor abilities. However, among Japanese children motor abilities and foot sole configuration have not been investigated. Therefore, we examined the relationship between motor abilities and the foot sole configuration among 3–5-year-old preschool children who frequently engaged in sports activities.

Method: Preschool children (n = 125) aged 3 (20 boys, 10 girls), 4 (26 boys, 12 girls), and 5 (40 boys, 17 girls) from suburban Kanagawa Prefecture, Japan were recruited. The participants frequently engaged in sports activities such as track and field, soccer, basketball, gymnastics, dance, and swimming. We recorded their age in months as well as their sex; furthermore, we measured their 25-m sprint time, distance in the standing broad jump, and the number of marbles they could move by using their toes. The participants' foot sole configuration (comprising foot length, foot breadth, spread foot angle, and number of floating toes) were assessed using Footlook equipment (Footlook, Inc., Japan). Pearson's correlation coefficients were calculated for each index. We set the level of statistical significance at .05. Statistical analysis was executed using Microsoft Excel 2010.

Results and Discussion: Among in 3-, 4-, and 5-year-old boys, the degree of completion in the arch of the foot was 89%, 91%, and 100%; among 3-, 4-, and 5-year-old girls, the degree of completion in the arch of the foot was 92%, 100%, and 100%. For boys, 25-m sprint time was related to age, as well as right and left foot length. Distance in the standing broad jump was related to age. For girls, 25-m sprint time was related to age, right and left foot length, and foot breadth. Distance in the standing broad jump was related to age, right and left foot length, foot breadth, and the number of marbles they could move by using their toes. The number of marbles they could move was related to age, right and left foot length, and foot breadth. The finding that 25-m sprint time and distance in the standing broad jump are strongly associated with age in both boys and girls is consistent with results of previous studies that have reported that children with a good constitution have an advantage in motor abilities.
and task that demand bodily movement. For girls but not for boys, the number of marbles they could move by using their toes was related to foot size. Thus, older girls could move more marbles than could younger children. Considering the reduced participation of preschool children’s physical activities that require the use of sole of the foot, continual longitudinal data collection is required.

**Conclusion:** The results of this study indicated that motor abilities are related to foot sole configuration among 3–5-year-old children.

**Keywords:** Floating-toes; physical constitution; motor abilities; motor skills; young children