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## Fundamental motor skills, nutritional status, perceived competence, and school performance of Brazilian children in social vulnerability: Gender comparison

Glauber Carvalho Nobre<sup>a</sup>, Nadia Cristina Valentini<sup>b,\*</sup>, Francisco Salviano Sales Nobre<sup>a</sup>

<sup>a</sup> Department of Physical Education and Sports, Federal Institute of Education, Science and Technology of Ceará, Brazil

<sup>b</sup> School of Physical Education, Physiotherapy and Dance, Federal University of Rio Grande do Sul, Brazil

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### ABSTRACT

Being at risk or in social vulnerability situations can affect important aspects of child development. The aim of this study was to investigate fundamental motor skills (locomotor and object control) and school (writing, arithmetic, reading) performances, the perceived competence and the nutritional status of girls and boys living in social vulnerability in the poorest regions of Brazil. Two hundred eleven (211) children (87 girls, 41%), 7–10-year-old ( $M = 8.3$ ,  $SD = 0.9$ ), from public schools in Ceará (Brazil), living in social vulnerability, participated in the study. Children were assessed using the *Test of Gross Motor Development – 2*, the Body Mass Index (BMI), the Self-Perception Profile for Children, and the School Performance Test. Multivariate analysis of covariance (MANCOVA), adjusted for age, did not show any significant effect for locomotion. There was an effect of gender on the object control. Boys showed higher scores in striking, kicking, throwing, and rolling a ball. Quade's nonparametric analysis showed no difference in BMI between the genders. Most children presented healthy weight. The MANCOVA showed no effect of gender on children's scores on perceived competence on the subscales; moderate scores were found for most children. There were no gender effects on school performance; both boys and girls demonstrated inferior performance. Boys and girls in social vulnerability showed inferior performance in most motor skills, moderate perceived competence and inferior school performance. These results reveal that the appropriate development of these children is at risk and that intervention strategies should be implemented to compensate the difficulties presented.

### 1. Introduction

Children at risk or living in social vulnerability often have fewer possibilities of reaching a range of socio-cultural resources, which expose them to inadequate developmental situations (Baars, 2009). The lack of access to appropriate care, health services, as well as the inadequate housing in neighborhoods with low provision of public services and leisure spaces are some of the factors that constitute vulnerability (Abramovay, Castro, Lima, & Martinelli, 2002; Baars, 2009). In this situation, opportunities for motor acquisition and appropriate sports-oriented practices are precarious.

These inadequate conditions for development, associated with the lack of learning experiences in diverse contexts and ineffective instruction, affect negatively the children's motor skills development (Logan, Robinson, Wilson, & Lucas, 2012; Valentini et al., 2016; Zajonz, Müller, & Valentini, 2008). Therefore, children in vulnerability may be more prone to show delays in acquiring motor

\* Corresponding author.

E-mail addresses: [glauber\\_nobre@hotmail.com](mailto:glauber_nobre@hotmail.com) (G.C. Nobre), [nadia.cristina@ufrgs.br](mailto:nadia.cristina@ufrgs.br) (N.C. Valentini), [salvianonobre@gmail.com](mailto:salvianonobre@gmail.com) (F.S.S. Nobre).

milestones, especially girls (Valentini et al., 2016). Basic motor skills are essential since they provide basis for acquiring specialized movements that are applied in different activities, including games, sports, dance and daily life chores (Haywood & Getchell, 2014). Girls and boys with low proficiency in fundamental motor skills show less participation in motor activities, tending to have lower physical fitness and higher levels of sedentary lifestyle.

A lower socioeconomic status also exposes children in situation of vulnerability to risk of inadequate nutritional status, due to deficiency in food consumption (Chung et al., 2016). A dietary inadequacy could lead to underweight as well as higher prevalence of overweight and obesity, since high quality nutrition food are often more expensive (Chung et al., 2016; Ogden et al., 2016). Cognitive deficits, delayed physical growth and neuromotor development, and metabolic complications are some of the negative implications on the development of these children that may occur due to improper nutrition that is the same cause of underweight or overweight and obesity (Victoria & Rivera, 2014). Considering the children in vulnerability exposure to factors such as poor nutrition and nutritional deprivation (Abramovay et al., 2002; Fonseca, Sena, Santos, Dias, & Costa, 2013), studies on anthropometric indicators of nutritional status are essential, especially in developing countries, in order to assist in the implementation of public policies which aimed at combating underweight, overweight and obesity in these children.

The children's psychosocial development is also affected by the vulnerability condition (Angel, 2013; Nobre, Bandeira, Ramalho, Nobre, & Valentini, 2015). Children living in social vulnerability report difficulties in developing positive beliefs about themselves (Pereira, 2010), demonstrate limited perceptions about their competences (Nobre et al., 2015; Valentini, 2008), and show lower motivation to perform and achieve different tasks (Piek, Baynam, & Barrett, 2006). Favorable developmental conditions which involve significant social and personal support are paramount to foster positive global self-worth (Harter, 2012b, 1990). Children in vulnerability often do not have those need met (Pereira, 2010).

In addition, girls and boys may show different perceptions about their own competencies (Robinson, 2011; Villwock & Valentini, 2007), reinforced by social expectations that guide sex roles. It impacts even more negatively the few learning opportunities that those children have for developing motor and sports skills, leading to decreasing social opportunities to make friends and be in a group (Cairney et al., 2012; Ridgers, Fazey, & Fairclough, 2007). However, the literature still lacks studies on the self-perceptions of girls and boys living in vulnerable conditions. Therefore, addressing this issue seems essential to clarify how children are affected by this situation, specifically involving psychosocial parameters and relating school achievements.

Nowadays, the few studies with Brazilian children in vulnerability reported poor performance in school activities, higher failure rates, delays, evasion, and difficulties in learning school content, specifically in boys (Alves & Soares, 2013; Ministry of Education, 2015; Padilha, Érnica, Batista, & Pudenzi, 2012). Among the school contents, arithmetic has presented the worst results (Osti & Martinelli, 2013; Tavares, Valle, & Maciel, 2015). Modest family support, as parents need to engage in long hours of work, inadequate housing conditions, restricted access to socio-cultural resources, and resource-poor learning contexts may have an influence on the schooling process of these children, increasing their vulnerability.

There is a high number of children living in vulnerability in developing countries, such as Brazil (Baars, 2009). Taking it into account, this study focused a region where the population is one of the most vulnerable in the country, the northeastern region, where the lowest municipal human development index (IDHM = 0.663) is found, according to the Brazilian Institute of Geography and Statistic (2010). Information for proposing and implementing intervention strategies and assistance to public policies that meet the specificities of this public can be derived from research on this complex theme. Therefore, the objective of this study was to investigate fundamental motor skills (locomotor and object control) and school (writing, arithmetic, reading) performances, the perceived competence and the nutritional status of girls and boys living in social vulnerability in one of the poorest regions of Brazil.

## 2. Method

### 2.1. Participants

Participated in the present exploratory study, 211 children (87 girls, 41%; 7–10-year-old; Girls:  $M = 8.3$ ,  $SD = 0.9$ ; Boys:  $M = 8.2$ ,  $SD = 0.4$ ) from public schools, living in social vulnerability in one of the poorest states of Brazil. Children from low-income families (household income per capita less than a minimum wage) who participated in government social welfare assistance programs was the criterium considered to establish the situation of children's social vulnerability (Baars, 2009) adopted in the present study. Most of children's parents or legal guardians had low formal schooling and incomplete elementary education (75%) and 25% were semi-literate.

### 2.2. Context

Three cities located in the mountain, in the semi-arid and in the coast of Ceará, showing low municipal human development index (IDHM = 0.673, 0.629 and 0.657, respectively), were enrolled in the present study. Unfavorable developmental conditions were observed in the three cities, where 16.6% at 28.51% of the economically active population lived in extreme poverty (Ceará Economic Research & Strategy Institute, 2012). Participants lived in peripheral neighborhoods, having no access to leisure spaces and presenting high rates of violence. They also attended to insecure public schools and had no further care or support from public services (Ceará Economic Research & Strategy Institute, 2012). The few physical structures for sport activities were in poor conservation conditions, with precarious or limited resources. Governmental sport programs were occasionally offered, conducted by few physical education teachers with precarious training. In the schools, classroom teachers were responsible for physical education lessons once a week, for approximately 50 min. The activities implemented by these teachers consisted of free games organized by the

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