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# Patterns of everyday functioning in preschool children born preterm and at term

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ABSTRACT

*Background/Aim:* Children born preterm are at risk of neonatal complications but the long-term consequences for everyday functioning is not well known. The study aimed to identify patterns of everyday functioning in preschool children born preterm and at term in relation to perinatal data, neonatal risk factors, behaviour, and socioeconomic status. Registry data and data from parent rated questionnaires were collected for 331 children.
*Method:* A person-oriented approach with a cluster analysis was used.
*Results:* A seven cluster solution explained 65.91% of the variance. Most children (n = 232) showed patterns of strong everyday functioning. A minority of the children (n = 99), showed diverse patterns of weak everyday functioning. Perinatal characteristics, neonatal risk factors and socio-economics did not predict cluster group membership. Children born preterm were represented in all clusters.
*Conclusion, implications:* Most preschool children are perceived by their parents with strong everyday functioning despite being born preterm. However small groups of children are, for various reasons, perceived with weak functioning, but preterm birth is not the sole contributor to patterns of weak everyday functioning. More critical for all children's everyday functioning is probably the interaction between individual factors, behavioural factors and contextual factors. To gain a broader understanding of children's everyday functioning. Child Health Services need to systematically consider aspects of body function, activity and in addition participation and environmental aspects.

**What this paper adds**

This article investigates patterns of everyday functioning in preschool children born preterm and at term. The study adds to a growing body of studies recognizing an ecological perspective for research in child development. To use assessments that measures the functioning in daily activities contribute to a deeper understanding of the child in everyday life situations. We emphasize the performance skills in daily activities and interaction as important factors in evaluation of long term outcome in children. To our knowledge this study is one of few using a person-oriented approach when studying the outcome of children born preterm. As such it contributes with nuanced picture of everyday functioning recognizing the influence of similarities and differences in child characteristics, biological- and contextual factors. The findings add a positive perspective of children born preterm despite being at high risk for neonatal complications.

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## 1. Introduction

Everyday functioning (EF) relates to the child's performance of activities in everyday life and to the fulfillment of the social roles that can be expected based on age, maturity and culture (Vohr & Msall, 1997). For preschool children it could include activities such as eating dinner, getting dressed, riding a bike or engage in play with peers. The activities of everyday life involve a cluster of related activities that requires goal-directed actions and functional performance to contribute to an efficient execution of the activity. These goal-directed and functional actions are referred to as performance skills and describes the observed performance that a child carries out when engaging in a range of activities. Performance skills include motor skills (to move around and interact with task, object and environment), process skills (to initiate, maintain and organize sequences of action) and communication/interaction skills (to convey intentions and needs and to interact with others) (OTPF, AOTA, 2002; Bart, Rosenberg, Ratzon & Jarus, 2010). Thus, it may be assumed that performance skills, together with child characteristics i.e. biological and psychological factors, contribute to EF. Knowledge of how performance skills and individual characteristics affect EF separately or combined may be of particular importance in the care of children exposed to stress in early life.

In some studies, children born preterm (birth before 37 weeks of gestation) have shown disabilities in EF (Fjortoft et al., 2015; Maggi, Magalhães, Campos, & Bouzada, 2014; Palta, Sadeh-Badawi, Evans, Weinstein, & McGuinness, 2000; Sullivan & Msall, 2007; Verkerk et al., 2013). Verkerk et al. (2013) found that about one fifth of preschool children born preterm show disabilities in the performance of everyday activities. Consistent with earlier research, the study presented mobility function s as the most pronounced disability (Palta et al., 2000; Verkerk et al., 2013) Yet other researchers have presented self-care disabilities in children born preterm, such as problems with eating, dressing and toileting (Maggi et al., 2014; Sullivan and Msall, 2007 Sullivan & Msall, 2007), and with social functions (Palta et al., 2000). The disabilities in self-care, mobility and social skills are also apparent in preterm-born children without physical or intellectual disabilities, suggesting that preterm birth per se has an impact on EF (Verkerk et al., 2013; Killeen, Shiel, Law, Segurado, & O'Donovan, 2014). Neonatal morbidities such as intraventricular haemorrhage, retinopathy of prematurity, patent ductus arteriosis and brochopulmonary dysplasia often occur in children born preterm and have been associated with EF (Palta et al., 2000;Sullivan and Msall, 2007 Sullivan & Msall, 2007). These neonatal risk factors have been found to be most influential on mobility functions of everyday life but also on self-care and social function (Palta et al., 2000). Weak EF for children born preterm seems to persist during childhood,with deficiencies in play, leisure and community activities (Fjørtoft et al., 2015). Consequently, children born preterm are at greater risk for long-term negative outcomes, such as restricted participation in society.

Contextual factors as well as biological factors are influential on child development and long-term outcome (Wong & Edwards, 2012). Socioeconomic factors such as parent education, have shown strong relationships with child development (Davis-Kean, 2005). The relation between socioeconomic factors and social function in children born preterm has been recognized (Palta et al., 2000). In a systematic review including 15 studies the authors concluded that maternal education level was the most frequently reported indicator of socioeconomic factors and was consistently related to cognitive outcome in children born preterm (Wong & Edwards, 2012). However, how the relationship between biological and contextual factors influences EF for preterm-born children is not well described, and further investigation is needed.

Behaviour problems may have an impact on everyday life in preschool children. Fuchs et al. (2012) found that parents perceived that the behaviour problems of their 3–5 year-old children, had a negative impact especially on learning but also on home life and friendships. Assessed with the Strength and Difficulties Questionnaire (SDQ), emotional problems and hyperactivity were perceived as most influential (Fuchs, Klein, Otto, & von Klitzing, 2012). The relation between contextual factors and biological vulnerability in regard to child behaviour may be of particular significance in children born preterm. An increased prevalence of behaviour problems has been reported with internalizing problems such as anxiety, withdrawal and emotional behaviour, and externalizing problems such as hyperactivity, conduct problems, and aggressiveness (Delobel-Ayoub et al., 2009; Elgen et al., 2012; Månsson, Stjernqvist, & Bäckström, 2014). In a previous study, in six-year-old children born preterm and at term, we investigated EF operationalized as performance skills and interaction pattern. Hyperactivity and conduct problems were found to be negatively associated with EF (Andersson, Martin, Strand Brodd, & Almqvisthors, 2016). How these behaviours interact with other dimensions of EF on an individual level is however unclear. It could be assumed that patterns of EF varies depending on both performance skills and abilities, contextual factors and behaviours such as hyperactivity and conduct problems.

This multidimensional relationship of biological, behavioural and contextual factors in EF requires a study design that enables the study of patterns rather than of isolated factors. To the best of our knowledge, in most research neonatal risk factors, health issues and development of children born preterm are compared with those of term-born rather than studying how different covariant factors contribute to health and development in both groups. Clearly, if studies are based on groups it means the data provide an overall picture of differences between preterm and term-born children, with the preterm-born often exhibiting a higher degree of vulnerability to negative development in EF. However, with a group-based study there is a risk of missing likely interaction factors relevant for EF. Bergman et al. (2003) argue that child development is a process influenced by biological, behavioural and mental factors as well as social, cultural and physical factors. Similarities and differences in individual characteristics, including personal as well as contextual factors, influence child development and functional abilities (Bergman, Magnusson, & El-Khouri, 2003; Bronfenbrenner, 2005; WHO, 2007). A person-oriented approach focusing on patterns of individual characteristics, involving a simultaneous analysis of all variables in the pattern, may provide valuable knowledge about inter-individual similarities and differences in EF (Bergman et al., 2003). Thus, with a person-oriented study design including a cluster analysis, different patterns of EF and the impact of the included variables, may emerge.