



REVIEW ARTICLE

Effect of preterm birth on motor development, behavior, and school performance of school-age children: a systematic review ☆,☆☆

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KEYWORDS

Premature birth;
Dexterity;
Behavior;
Learning disorders

Abstract

Objectives: to examine and synthesize the available knowledge in the literature about the effects of preterm birth on the development of school-age children.

Sources: this was a systematic review of studies published in the past ten years indexed in MEDLINE/Pubmed, MEDLINE/BVS; LILACS/BVS; IBECs/BVS; Cochrane/BVS, CINAHL, Web of Science, Scopus, and PsycNET in three languages (Portuguese, Spanish, and English). Observational and experimental studies that assessed motor development and/or behavior and/or academic performance and whose target-population consisted of preterm children aged 8 to 10 years were included. Article quality was assessed by the Strengthening the reporting of observational studies in epidemiology (STROBE) and Physiotherapy Evidence Database (PEDro) scales; articles that did not achieve a score of 80% or more were excluded.

Summary of findings: the electronic search identified 3,153 articles, of which 33 were included based on the eligibility criteria. Only four studies found no effect of prematurity on the outcomes (two articles on behavior, one on motor performance and one on academic performance). Among the outcomes of interest, behavior was the most searched (20 articles, 61%), followed by academic performance (16 articles, 48%) and motor impairment (11 articles, 33%).

Conclusion: premature infants are more susceptible to motor development, behavior and academic performance impairment when compared to term infants. These types of impairments, whose effects are manifested in the long term, can be prevented through early parental guidance, monitoring by specialized professionals, and interventions.

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☆☆ Study conducted at the Post-Graduation Program in Health Sciences, Faculty of Medicine, Universidade Federal de Minas Gerais.

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PALAVRAS-CHAVE

Nascimento prematuro;
Destreza motora;
Comportamento;
Transtornos de aprendizagem

Efeito do nascimento prematuro no desenvolvimento motor, comportamento e desempenho de crianças em idade escolar: revisão sistemática

Resumo

Objetivos: examinar e sintetizar o conhecimento da literatura sobre os efeitos do nascimento prematuro no desenvolvimento de crianças em idade escolar.

Fontes de dados: revisão sistemática de estudos dos últimos 10 anos indexados nas bases de dados *Medline/Pubmed*; *Medline/BVS*; *Lilacs/BVS*; *IBECs/BVS*; *Cochrane/BVS*; *Cinahl*; *Web of Science*; *Scopus e PsycNET*, em três línguas (português, espanhol e inglês). Foram incluídos estudos observacionais e experimentais que avaliaram o desenvolvimento motor e/ou comportamento e/ou desempenho escolar e que tinham como população-alvo crianças prematuras na faixa etária de oito a 10 anos. A qualidade dos artigos foi avaliada pelas escalas STROBE e PEDro e utilizou-se ainda, como critério de exclusão, artigos que não atingissem uma pontuação correspondente a 80% ou mais nos itens das referidas escalas.

Síntese de dados: a busca eletrônica identificou 3.153 artigos, sendo que 33 foram incluídos a partir dos critérios de elegibilidade. Apenas quatro estudos não encontraram qualquer efeito da prematuridade sobre os desfechos pesquisados (dois artigos sobre o comportamento, um sobre desempenho motor e um sobre desempenho escolar). Dentre os desfechos de interesse, o comportamento foi o mais pesquisado (20 artigos/61%) seguido do desempenho escolar (16/48%) e dos problemas motores (11/33%).

Conclusão: crianças prematuras são mais susceptíveis a prejuízos no desenvolvimento nas áreas motoras, de comportamento e de desempenho escolar em longo prazo quando comparadas a crianças nascidas a termo. Portanto, esses diferentes tipos de agravos, cujos efeitos se manifestam, em longo prazo, podem ser prevenidos precocemente através de orientação dos pais, acompanhamento dos profissionais especializados e intervenção.

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Introduction

Preterm birth has been the subject of concern for families, professionals, and healthcare managers, as early detection of its consequences can facilitate therapeutic interventions and minimize future sequelae. Thus, programs were created to follow premature infants; in most cases, these programs follow the children until the age of 2 years, and are intended primarily for the detection of severe disabilities such as cerebral palsy.¹ This follow-up policy does not appear to be based on evidence, since a small number of premature infants will develop severe sequelae, yet many will have lifelong social limitations and restrictions, as they will have mild motor skill, behavior, school performance, and language impairments, among others, and they often are not specifically diagnosed.²

More extensive follow-up programs require time and imply in additional costs. Hospitalization during the neonatal period has a high cost,³ but the long-term economic and social impact of these children's outcomes in the different sectors of society cannot be underestimated. Although prevention and intervention programs demand a high short-term investment, the costs related to special schools and social services can be significantly reduced in the long run, as well as rates of school failure.⁴

Preterm children have a history of biological vulnerability and a greater risk of developmental problems. Many of these children, considered "apparently normal", have more learning disabilities, as well as a worse motor repertoire and behavioral problems than children born at term.^{5,6} It should

be considered that, in many cases, preterm infants may be exposed to multiple risks, and the context in which they are inserted can be vital for positive or negative effects on their development.⁷

Research worldwide has shown concern for the long-term effects of preterm birth. This concern should also be extended to the developing countries, such as Brazil, as the poor conditions of life can become an aggravating factor for biological vulnerability.⁴ However, there have been few national studies that investigated the development of these children at school age.⁸

In spite of the technological advances in neonatology and increased survival of preterm infants, there are still knowledge gaps in this area. Studies involving preterm children at school age have important limitations, such as different assessment tools; small and heterogeneous samples, which are not representative of the population; little or no detailing of clinical and sociodemographic characteristics; and inadequate comparison groups, among others.^{9,10} Thus, the influence of perinatal variables and the cumulative effects of multiple risk factors during the course of development remain unconfirmed. It is essential to know the association between prematurity and the future performance of preterm infants in order to clarify its possible effects on the different aspects of these children's lives, such as health, education, etc.

Considering the importance of monitoring the development of children in vulnerable situations, the aim of this study was to assess and synthesize the available knowledge in the literature on the effects of premature birth on the development of school-aged children (8 to 10 years).

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