

Monitoring of child development held in Brazil

Monitoramento do desenvolvimento infantil realizado no Brasil

La monitoración del desarrollo infantil realizada en Brasil

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ABSTRACT

Objective: To review scientific literature in order to check how infant development surveillance is being carried out in Brazil.

Data sources: Search on databases (PubMed, Medline, SciELO and CAPES Database Thesis) for studies on medical practices related to surveillance and monitoring of child development in Brazil from 2000 to 2011. The terms used for research were: child development surveillance, early intervention, developmental screening, and developmental screening tests. There were ten texts on the subject under study. Original articles, reviews, and thesis were analyzed, as well as the reference lists of publications on the topic.

Data synthesis: Studies on monitoring of child development in Brazil showed major failures from pediatrician formation to clinical practice.

Conclusions: It is urgent to offer continued medical education to pediatricians in order to update their knowledge about child development monitoring, especially due to the increasing numbers of preterm infants.

Key-words: infant development; child care; education, medical.

RESUMO

Objetivo: Revisar a literatura científica para verificar como a vigilância do desenvolvimento infantil vem sendo realizada no Brasil.

Fontes de dados: Pesquisa em bases de dados (PubMed, Medline, SciELO e Banco de Teses da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior) sobre estudos das práticas médicas em relação à vigilância e ao monitoramento do desenvolvimento infantil no Brasil, de 2000 a 2011. Os termos usados para pesquisa foram: vigilância de desenvolvimento infantil, intervenção precoce, triagem de desenvolvimento e testes de triagem de desenvolvimento. Foram encontrados dez textos referentes ao tema em estudo. Artigos originais, de revisão e teses foram revisados, bem como as listas de referências das publicações sobre o assunto.

Síntese dos dados: Os estudos sobre a prática do monitoramento do desenvolvimento infantil no Brasil apontam uma importante falha, desde a formação do médico pediatra até a prática clínica, em relação a este tema.

Conclusões: Há necessidade urgente, principalmente frente a uma população emergente de prematuros, que os pediatras façam uma reciclagem do conhecimento sobre o desenvolvimento infantil.

Palavras-chave: desenvolvimento infantil; puericultura; educação médica.

RESUMEN

Objetivo: Revisar la literatura científica para verificar cómo la vigilancia del desarrollo infantil viene siendo realizada en Brasil.

Fuentes de datos: Investigación en las bases de datos (Pubmed, Medline, SciELO y Base de Tesis CAPES) sobre

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estudios de las prácticas médicas respecto a la vigilancia y monitoración del desarrollo infantil en Brasil de 2000 a 2011. Los términos usados para la investigación fueron: *vigilancia de desarrollo infantil, intervención temprana, screening de desarrollo y pruebas de screening de desarrollo*. Se encontraron 10 textos relativos al tema en estudio. Artículos originales, de revisión y tesis fueron revisados, así como las listas de referencias de las publicaciones sobre el tema.

Síntesis de los datos: Los estudios sobre la práctica de la monitoración del desarrollo infantil en Brasil señalan una importante falla desde la formación del médico pediatra hasta la práctica clínica respecto a este tema.

Conclusiones: Hay necesidad urgente, principalmente frente a una población emergente de prematuros, que los pediatras realicen un reciclaje del conocimiento sobre el tema desarrollo infantil.

Palabras clave: desarrollo infantil; cuidado del niño; educación médica.

Introduction

According to Marcondes *et al*⁽¹⁾, development is the increase in an individual's capacity to perform increasingly complex functions. Child development is a process that begins in intrauterine life and involves physical growth, neurological maturation and the construction of behavior-related skills, with the aim of making the child more competent to answer to her own needs and to her environment's needs⁽²⁾.

Human development is dynamic, involving biological and psychological changes that allow the child to acquire new behaviors and to modify old ones^(3,4). Thus, neuropsychomotor development corresponds to the progressive acquisition of motor and psycho-cognitive capacities in an orderly and sequential way, progressing in the cephalocaudal direction and from proximal to distal⁽⁵⁾.

Development surveillance is a preventive intervention that comprises activities related to the promotion of normal development and the detection of problems inherent to primary child care⁽⁶⁾. Acknowledgement of the surveillance of the child's growth and development process began a little over half a century ago, in social pediatrics⁽⁷⁻⁹⁾.

In Brazil, technical guides were published by the Ministry of Health in 1984 and 2002, intended to monitor child growth and development. The purpose of these guides was to offer a Development Monitoring Form that could act as a script for the observation and identification of children

with probable developmental problems. In the most recent version, besides the marks for maturation, motor and social development, a psychological mark or indicator was added in each age group correspondent to the time of the appointment^(10,11). The Child Health Booklet (Caderneta de Saúde da Criança – CSC) is an essential surveillance instrument, since it is the document where data are recorded and it can transit through the different services and attention levels demanded in exercising health care⁽¹²⁾.

There are few studies on the medical practices related to monitoring child development in Brazil. This article aims to review scientific literature on how monitoring/surveillance of child development has been performed in Brazil.

Factors associated to child development

Human development suffers the continuous influence of intrinsic (genetic) and extrinsic (environmental) factors, which present variations from one individual to another and make each child's course of development unique⁽¹³⁾. The most important factors, especially in the perinatal and neonatal periods, are: prematurity, high-risk pregnancy, negative relationship between mother and fetus, maternal age, poor prenatal care, low birth weight, birth length less than 45cm, perinatal asphyxia, intracranial hemorrhage, congenital infections, breastfeeding period of less than 6 months and low school education of the mother.

The first years of life are very important due to intense brain activity, result of the interaction between biological characteristics and individual's experience opportunities. The intense neuroplasticity in this period is also responsible for better prognosis if intervention is precocious⁽¹⁴⁾.

Several studies show the influence of social condition, malnutrition and family relation as risk factors for delayed neuropsychomotor development (DNPM). A study performed in the municipality of Pelotas, Brazil, reinforces development's multifactorial characteristic and the concept of cumulative risk effect. In the studied population, the disadvantaged accumulated factors (social, economic and environmental) that led to a higher chance of delays in children's development⁽¹⁵⁻¹⁹⁾.

In a study conducted at the Center for Family Health (Núcleo de Saúde da Família) in the municipality of Ribeirão Preto, 33% of children enrolled were at risk of developmental disorder, associated to low paternal education and underweight in the first six months of life⁽²⁰⁾. Another study, conducted in the municipality of Catanduva with 113 children

in a daycare center, showed an association between changes in nutrition and anemia with suspected developmental delay through the Denver Developmental Screening Test⁽²¹⁾. In the municipality of Recife, an analysis of 108 children from seven municipal kindergartens, from 4 to 24 months of age using the Bayley scale, found that development was still in the normal range, but fell short compared to reference populations in developed countries⁽²²⁾.

Identification of delay in child development and development marks

The supervision of child growth and development is an important task that is part of the pediatrician's routine. The main purpose of the identification and early diagnosis of developmental delay in a child, and the consequent, usually multidisciplinary, early intervention, is to help each child to reach their maximum individual potential, which is the aim of pediatrics⁽³⁻⁵⁾.

The monitoring of children and of the development process combines different assessment methods, which include parents, teachers, pediatricians and other professionals in the assessment. In the process, methods used include anamnesis, observation of the child in her environment, the practice of activities, or the application of screening instruments⁽²³⁾.

Not having a standardized instrument makes it difficult to assess development. This has contributed for disorders to go unnoticed and to become apparent only much later, when the child is in elementary school. A U.S. study published in 2005 showed that only 23% of pediatricians, asked about development assessment, used standardized tests⁽²⁴⁾.

Some studies indicate that the most used screening technique to detect developmental disorders is informal clinical assessment during primary care. However, clinical assessment alone identifies less than 30% of children with developmental disorders. Some instruments, on the other hand, have standardized screening sensitivity and specificity of 70 to 90%⁽²⁵⁾. In 2001, the American Academy of Pediatrics issued a memorandum recommending the application of development tests on all infants and preschool children in pediatric appointments⁽²⁶⁾.

The Denver Developmental Screening Test (DDST), published in 1967⁽²⁷⁾ and revised in 1990 under the name Denver II⁽²⁸⁾, has been widely used and has already been standardized in many countries such as Japan, Wales, Turkey, Singapore, Saudi Arabia and Brazil⁽²⁹⁻³²⁾. The Brazilian guide of developmental assessment⁽¹¹⁾, which follows the Denver II scale⁽²⁸⁾, allows a reading of the child's development. Its

function is not to diagnose, but to warn and indicate the need for more careful and thorough investigation.

The biggest criticism of screening tests is the cutoff point that distinguishes positive from negative cases with overlapping of cases between those ill and those not. The unnecessary referrals to specialized services leads to family concerns and the lack of referral may deprive the individual of rehabilitation and treatment⁽¹⁹⁾.

Every screening instrument has advantages and disadvantages. The choice of the instrument depends on the population and the targets to be achieved by the health professional. The scarcity of Brazilian standardized instruments highlights the importance of Brazilian studies to verify the adequacy and validation of instruments for local parameters.

Practices and knowledge of professionals on child development in Brazil

The devaluation of developmental assessment as a fundamental part of the pediatric appointment, the lack of professional training and the technical ignorance of medical professionals regarding this issue have been highlighted in scientific publications in different countries^(24,33-35).

In Brazil, the situation indicated by the few studies conducted, both in the North and Northeast, and in the South and Southeast, is worrying. The following are the results of some studies published or reported in the past 10 years on practices and knowledge of professionals working in health care in relation to child development in Brazil. This review relates to the monitoring practices of child development, assessing papers published from 2000 to 2011 in the databases Pubmed, Medline, SciELO and CAPES Dissertation Database (Banco de Teses Capes). Ten articles reporting practices and knowledge of professionals were found, and are described below.

Della Barba assessed in 2003 the curriculum of the first and second year of pediatric residency in the state of São Paulo and the knowledge of 65 residents about surveillance of child development, using two questionnaires. The general data from the analysis of pediatrics teaching showed that the Brazilian Ministry of Education (MEC) curricular guidelines on subjects that should address the issue of monitoring development in pediatric residency were general and unspecific. Curricula presented superficial content on the approach of developmental surveillance and were not clear enough to allow the discerning of actions related to this issue. Only one course participant in the research met the requirements for the identification of factors related to the subject⁽³⁶⁾.

A Master's thesis from the state of Santa Catarina, presented in 2006, addressed the knowledge of a sample of Brazilian pediatricians about child development and behavior. Of the 1,730 pediatricians present at a pediatric update congress, 1,358 completed the questionnaire, of which 983 (80.2%) had pediatric residency. The data were analyzed and presented through descriptive analysis and, to examine associations between independent variables and the outcome, bivariate and stratified analyses were performed. The results showed that 66% of respondents considered their training on child development adequate, although 60% of them did not feel qualified to assess specific topics on this area. Questions on fine motor skills and language acquisition showed low rates of correct answers⁽³⁷⁾.

In 2006, Zocoli *et al* investigated pediatricians, which were on average 21 years after graduation, and who worked in public and private hospitals and/or private clinics in a city in the hinterland of the state of Santa Catarina. 46 questionnaires were sent out and 24 returned duly completed (51% response). Results show that 62% of pediatricians reported undergraduate training on hearing impairment. Of the 24 respondents, 92% would refer high-risk cases (92%), 55% reported not knowing the types of hearing loss, only 25% reported knowing the degree of hearing loss and 42% believed that a child can make use of hearing aids before six months of life⁽³⁸⁾.

A study using a Test for Child Development consisting of 19 questions included 40 doctors and 40 nurses of municipal basic health units and an equal number of doctors and nurses from the municipality's family health program (Programa de Saúde da Família, PSF), working in primary health care in the municipality of Belém, state of Pará. A questionnaire on practices related to Child Development Surveillance was applied and interviews with mothers on the same theme were performed. Regarding the knowledge of professionals about child development, there was a low level of accuracy on all professional categories, but the best performance was among the doctors of the basic units in relation to PSF. The percentage of correct answers in the questionnaire was 64% for doctors from municipal basic health units and 57% for PSF doctors. In the assessment of practices, performed by interviewing the mothers after medical appointments, only 22% of them reported having been asked about the development of their children and 14% received guidance on how to stimulate them. Of the 113 professionals who routinely

assessed child development, 36 (32%) used some type of scale and 77 (68%) assessed without the aid of systematized instruments⁽³⁹⁾.

In basic health units in the municipality of Embu, in the state of São Paulo, in 2008, 31 doctors were analyzed to assess their knowledge and practices about child development. The data of the study also included a convenience sample of 154 companions (mothers or caregivers) of children aged less than or equal to 36 months in six basic health units (average of 25 consultations per unit). These six units were responsible for providing care to approximately 75% of the municipality population. A multiple choice test was applied to doctors (with 20 questions) and an interview was made with mothers/caregivers. The mean score was 14.8 for doctor's questions, with seven questions with errors greater than 30% (sensory development, language acquisition, nervous system physiology, clinical and laboratory diagnosis of congenital infections, and inborn errors of metabolism). Regarding the practices of pediatricians, in 69 (45%) consultations the doctor asked the opinion of the mother/caregiver about the child's development, in 80 (52%) cases, the mother/caregiver said the doctor made some question and/or assessed the development, and in 64 (42%) cases the doctor advised on how to stimulate the child⁽⁴⁰⁾.

In the state of Pernambuco, the monitoring of growth and development was assessed in a sample of 1,669 children under five years old in 120 public health service units in the state. In 70% of the units there were no guidelines on the monitoring of child growth and development. Over 80% of caregivers received no information on the growth and development of their children. Development records were found in 1.2% of Child Cards (*Cartão da Criança*) and in 5.9% of medical records⁽⁷⁾.

There are four publications that assess the quality of completion of the Child Health Booklet (CSC) and few assess its predecessor, the Child Card. Although rare, studies indicate considerable flaws in the use of these instruments. The correct and complete record of the information and dialogue with the family on the notes taken are basic requirements for the CSC to fulfill its role as an instrument of communication, education, surveillance and child health promotion⁽⁴¹⁻⁴⁴⁾.

In the municipality of Feira de Santana, during 2001's "National Immunization Day" (Dia Nacional de Vacinação), an analysis of 2,319 Child Cards of under one year children found that, although almost all of the mothers carry the CC,

most of the cards were not fully completed. There were gaps in the record of developmental marks in 78% of Cards and less than 8% had complete development records⁽⁴¹⁾.

In the state of Minas Gerais, Goulart *et al* assessed 797 mothers in 2005 who had received the CSC in maternity wards of different regions of the municipality of Belo Horizonte in order to verify the filling of data on pregnancy, childbirth and the newborn on CSCs and to know the mothers' perception of the function of this instrument. Several data records were incomplete or not filled. Only 33% of mothers received information on the CSC in motherhood. For 313 mothers, the CSC was related to the growth and/or development of their children⁽⁴⁴⁾.

By way of comparison, in France, where 50 years ago the *Carnet de Santé de l'Enfant* was adopted, a cross-sectional multicenter study of 1,680 children was performed to assess the information capacity of the instrument. The values of the Apgar score in the first and fifth minutes after birth were chosen as indicators of health status at birth. At least one Apgar score, in the first or the fifth minute, is recorded in 96% of the *Carnets*. It is worth mentioning that the record of neuropsychomotor development marks in the French child *Carnet* ranged from 74 to 93%, depending on age, which shows a distinct cultural difference in relation to health aspects considered relevant⁽⁴⁵⁾.

One can conclude that surveillance of child development is a form of preventive intervention that includes activities related to the promotion of normal development and detection of developmental problems. It is, thus, one of the main objectives of primary health care for children. However, in practice, this is an issue undervalued by the government and the medical education centers. This result is reflected on the lack of preparation of medical professionals, especially pediatricians, to recognize risk factors, detect developmental disorders and ensure timely interventions.

Published studies, Master's theses and doctoral dissertations on practices and knowledge regarding monitoring and surveillance of child development in different regions of Brazil showed worrying results and point out flaws both in pediatrician's medical training and in clinical practice.

It is necessary to include child development and behavior themes in the core curriculum of undergraduate courses in medicine and in pediatrics and family health residencies. It is also necessary to provide better training for professors, with training courses in this area, continuing education for pediatricians working in primary health care, and investment in the promotion and distribution of the Ministry of Health guide on child development. Most important of all is to combat malnutrition, poverty, lack of healthcare and education assistance, which are important risk factors for developmental delays.

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