

A Survey of Pediatrics Resident Knowledge of Growth and Development

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Abstract

Objective

The primary objective of this study was to evaluate pediatric residents' knowledge about the milestones of growth and development in children.

Materials and Methods

Seventy-one pediatric residents from 3 main Children's Centers in Tehran were surveyed to evaluate their knowledge on growth and development of children. Included in the survey was based upon filling up a questionnaire containing questions about four different categories of development (motor, cognitive, speech and social interactions). The scores that the residents got from the test were summed up and were compared together.

Results

71 resident participants completed the questionnaire. The distribution of residents by year was 26 post graduate year 1 (PGY1), 26 PGY2, and 23 PGY3. The knowledge of 14 (19.7%) of the participants about child's development was ranked as "Less than expected", 47 (66.2%) as "Unacceptable", 10 (14.1%) as "Acceptable" and none (0%) as "Ideal", according to the total score they got from their correct answers to the questions.

Conclusions

This study describes that most pediatric residents lack the acceptable knowledge on children's growth and development. It seems that their knowledge did not improve through their years of residency.

Keywords: Education; knowledge; growth; development; pediatric.

Introduction

Neurodevelopmental delay is one of the most common problems of child health and is a frequent reason for the referral of a child to children medical centers or Pediatric Neurology Clinics. These children may suffer from speech delay, intellectual deficiency and behavioral disorder. Global developmental delay is defined as delay in two or more of the following developmental domain; Gross/ Fine motor, Speech/ Language, Cognition, Social/ Personal and Activity of Daily Living (ADL) (1,2,3,4). Significant delay is defined as performance two standard deviations or more below the mean on age-appropriate standardize norm testing. When a single domain, motor or speech, is affected, a gross motor delay or a developmental language delay exists (1). Global developmental delay affects one to three percent of all children under age 5. The term global developmental delay is usually reserved for younger children (typically less than 5 years of age), whereas the term mental retardation is usually

applied to older children when IQ testing is more valid and reliable (1).

In the outpatient setting, pediatric residents are the main and most of the times the first person who evaluate children. They are expected to detect the children who are having any delays or abnormalities in their process of growth and development. With this important responsibility, pediatric residents working in children's hospitals must have adequate knowledge of the milestones of growth and development. However, no specific educational program exists on this subject.

No previous research examining pediatric resident's awareness of growth and development has been conducted in Iran and we did not find such study being conducted in other international medical centers.

Materials and Methods

Participants were 71 postgraduate year (PGY) 1-3 from 3 major pediatric hospitals of Tehran, included 26 pediatric residents' postgraduate year (PGY) 1, 26 PGY2, and 23 PGY3.

To evaluate our hypotheses, we designed a questionnaire that included 40 multiple-choice questions about the milestones of a child's growth and development in four different categories including motor, speech, social interaction and cognitive development according to Nelson's text book of Pediatrics (5). There were 10 questions for each of the 4 knowledge domains. Validity of questionnaires for the two types of Content Validity and Face Validity was assessed. For this purpose a questionnaire to six people and professional experts (Expert) was given to assess the suitability and clarity of the questions and the amount of study objectives coverage by the questionnaire. The results showed that the suitability of the questionnaire for the purpose intended and fortunately there was consensus among judges. Also during a pilot study, reliability of the questionnaire, using Cronbach's alpha, was calculated as 71/0.

In the authors' review of the literature, there were no published assessment tools that could be used to test resident knowledge of milestones of development in hospitalized children. The questionnaire was filled up by them after the morning report class under the supervision of a pediatric neurology attending.

In assessing the questionnaires, the total number of correct answers was categorized under four titles including, Ideal (40-31), Acceptable (30-21), Unacceptable (20-11), Less than expected (10-0) and the number of correct answers in each one of the four mentioned topics was ranked as Good (10-6) and Bad (5-0). Means were calculated for continuous variables. Kolmogorov-Smirnov test and Levene's test were used to estimate the magnitude and significance of any association between total points given for correct answers to the questions and resident year, and the pediatric center in which the residents were being trained in. The linear coefficient and 95% confidence intervals (CI) are reported with a P value of < 0.05 considered significant.

Results

71 resident participants completed the questionnaire. The distribution of residents by year was 26 PGY1, 26 PGY2, and 23 PGY3.

The mean number of correct answers was 15.83, and the mean score that the residents got in each category was 3.35 in cognitive development, 5.14 in motor development, 3.01 in social interactions and 4.32 in speech development.

The knowledge of 14 (19.7%) of the participants about child's development was ranked as "Less than expected", 47 (66.2%) as "Unacceptable", 10 (14.1%) as "Acceptable" and none (0%) as "Ideal", according to the total score they got from their correct answers to the questions (Figure 1). Overall performance differences between PGY 1, 2 and 3 were not statistically significant (P value = 0.0695).

The number of residents who answered the questions correctly enough to be ranked as "Good" in each of the four topics was 52.1% in motor development, 8.5% in social interactions, 39.4% in speech development and 7% in cognitive development. As before there was no statistically significant difference between the residents of three years (Figure 2, 3, 4, & 5).

Discussion

Pediatric growth and development is one of the most important subjects that pediatric residents are ought to have comprehensive understanding about, and usually such difficulties are faced even by the senior residents to

assess a child's normal growth and development and also to detect the abnormalities in the process. We assume that the residents get less opportunity in their training courses to complete their knowledge on the mentioned subject, and consequently they are prone to make errors in managing their patients. The potential impact of this knowledge deficiency is considerable. Residents who do not possess the sufficient knowledge may trouble parents whose child is developing normally or falsely reassure parents whose child should be evaluated for potential problems and simply miss an infant who is developmentally delayed. Having made this mistake, starting treatments and preventing the progression of the problem would be delayed and the complications might be irresolvable.

Growth and development includes not only the physical changes that will occur from infancy to adolescence, but also some of the changes in emotions, personality, behavior, thinking, and speech that children develop as they begin to understand and interact with the world around them (5). Understanding children's changing and emerging growth and development is important. As infants and children progress through a series of growth stages, they may encounter physical and emotional challenges and some relatively common problems during these years (6). Early intervention for a young child with developmental delay can and does make a difference in optimizing the health and quality of life of that child. The sooner a child receives needed services such as physical, occupational and speech and language therapy, the more beneficial to the child. Not only can early intervention potentially improve functional outcomes, but it may also improve the psychological and emotional well-being of both the child and family. With early intervention, families are more able to set realistic expectations and cope with the issues related to raising a child with special needs (7).

The pediatric resident plays a vital role, therefore, not only by being aware of the risk factors for developmental delay, but also through vigilance for the manifestations of motor dysfunction in infants who present without obvious risk factors (8). Assessing all these needs organized training programs for the residents, considering that they are mostly the first references who assess infants and children.

Cost to society of less than optimal development is enormous and far-reaching. Children who grow up having developmental problems are at an increased risk for compromised health and safety, and learning. Failure to invest time and resources during children's early years to detect the problems may have long term effects on the health care, and education systems (9).

Therefore, it is in the public's interest to ensure that children's development is assessed accurately and by aware physicians.

To our knowledge, this is the first study to demonstrate a lack of knowledge by pediatric residents about growth and development in Iran. The lack was consistent across years of training. The objective of this study was to pinpoint the professional deficiencies of the pediatric residents in the category of pediatric growth and development. Our results revealed that pediatric residents who participated in this study lacked the necessary and optimal knowledge in growth and development. It seems that their knowledge does not improve through their years of residency.

In a study conducted in North Carolina assessing pediatric residents' knowledge of breastfeeding and infant growth, only 5% of the participants knew that breastfed infants grew at a slower velocity than formula-fed infants after 4 months of age and this knowledge was not significantly related to year of training (10).

Conversely, in a study in which forty-six pediatric residents from the Johns Hopkins Children's Center were evaluated for their ability to interpret ECGs and factors affecting that ability, ECG interpretation significantly improved from PGY 1 to PGY 3 (11).

In our study, comparing the different fields of development, we found that the residents' knowledge in motor and speech development is significantly higher than what it is in social interactions and cognitive development, although the overall performance was weak.

A pilot study was undertaken to evaluate the hypotheses that there are differences in pediatric pain management (PPM) knowledge across resident specialties (pediatric residents, orthopedic residents and anesthesiology residents) in Columbia University Medical Center, New York. This study showed that pediatric and orthopedic residents performed significantly poorer than

a comparison group of anesthesiology residents when answering questions related to their knowledge of acute pain management in hospitalized children (12). This may call for further studies in order to compare the impact of different residency training curriculums on residents' knowledge.

While most pediatric university hospitals do not currently emphasize growth and development in their core curriculum, an attempt to integrate teaching the growth and development process is highly needed throughout the pediatric residency programs.

In conclusion, In pediatric medicine, physical growth and physical examination have more attentive than development and neurodevelopmental examination. Therefore pediatricians in monthly visit have more attention to physical growth like weight, height and

physical examination than developmental examination or history of child developmental milestone.

This management is the result of pediatric educational rules. It seems these rules cause limitation of diagnosis in cases of mild developmental delay.

Global developmental delay is the most common problem of children with developmental delay, improving their developmental conditions is therefore of great importance. Early detection of developmental delay and early intervention has the good effect on improving of status such patients.

Thus for early detection we need more attention to development and history of developmental milestone of children. For this purpose we suggest prominent attention to developmental evaluation and related chapters in pediatric education. To conclude, this study describes this lack of knowledge in pediatric residents.

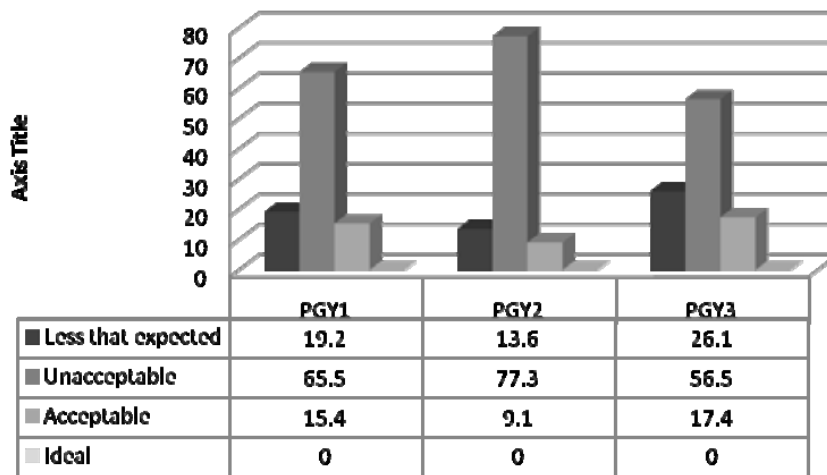


Fig 1: The number of residents who answered the questions correctly in development

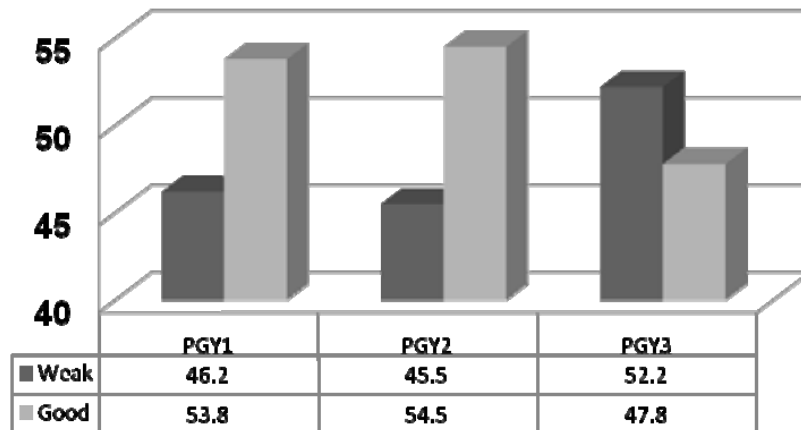


Fig 2: The number of residents who answered the questions correctly in motor development

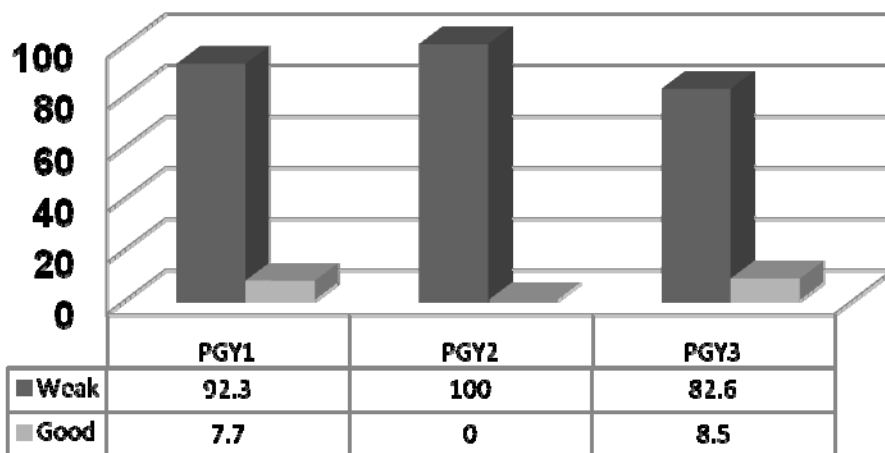


Fig 3: The number of residents who answered the questions correctly in social interaction development

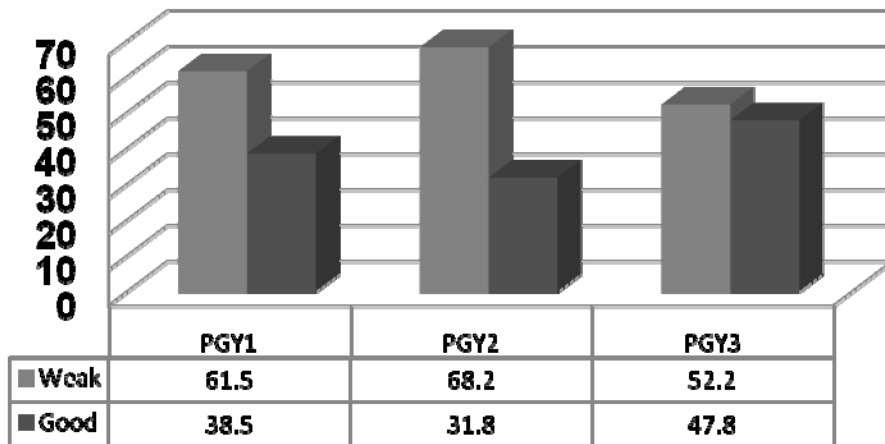


Fig 4: The number of residents who answered the questions correctly in speech development

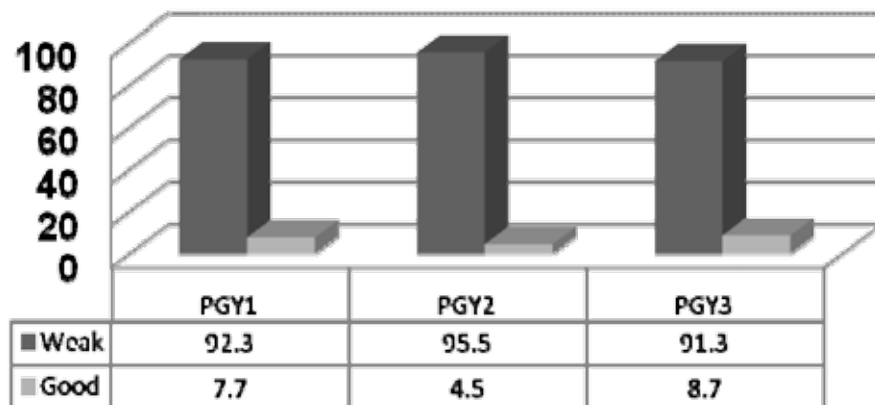


Fig 5: The number of residents who answered the questions correctly in cognitive development

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