

clinical presentation was respiratory distress (97%), followed by hemodynamic instability (83%). C-reactive protein was elevated (>5 mg/L) in 71% neonates [7]. Highest antimicrobial sensitivity was observed for cotrimoxazole (95%), followed by meropenem (49%), ceftazidime and minocycline (31% each) and levofloxacin (27%). Case fatality rate was 17% (**Table I**).

An earlier study from Chandigarh noted an increase in the proportion of neonatal sepsis due to NFGNB, subsequently identified as BCC from 0% in 1998 to 30% in 2006 [2]. Although 59% neonates in our series had early onset sepsis with BCC, only 29% had maternal risk factors. This supports the claim that majority of early-onset infections in hospital-born neonates in the developing world may be hospital-acquired, rather than of maternal origin [8]. Microbiological reports often identify both *Pseudomonas* species and *Burkholderia cepacia* as NFGNB, but their antimicrobial susceptibility and treatment options are different. BCC is intrinsically resistant to aminoglycosides, polymyxin (Colistin), and often to piperacillin-tazobactam, while these drugs are useful for infection with *Pseudomonas* [9].

The limitations of our study include its retrospective design and potential inaccuracy in differentiating neonates truly infected with BCC from contaminants.

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## Parents' Evaluation of Developmental Status (PEDS) in Screening for Developmental Delay in Thai Children Aged 18-30 Months

The PEDS-Thai is a developmental screening tool. We studied its diagnostic performance among 137 Thai children (48.9%) aged 18-30 month. It had a sensitivity of 92.8% and a specificity of 49.2%. The positive and negative likelihood ratios were 1.82 and 0.14 when compared with clinical diagnosis and diagnostic tool, the Mullen Scales of Early Learning.

**Keywords:** *Developmental delay, Early diagnosis, Mullen scale of early learning*

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A national health survey of Thai children in 2010 found 30.3% of children aged 1-5 years with delayed development [1]. An early detection of delayed development is crucial for early intervention and a better outcome. Parents are the key source for developmental screening information [2]. The Parents' Evaluation of Developmental Status - Thai version has previously been validated by developmental-behavioral pediatricians, but the only study [3] that compared PEDS-Thai to Denver-II showed a sensitivity of 57.1% and a specificity of 97.6%, but no study has compared it to the standard developmental diagnostic test.

From children attending the Well Child Clinic at our center, 137 children aged 18-30 months whose parents were willing to participate were enrolled. Chronically ill

children, or who had known developmental delays were excluded. The PEDS was completed by parents, PEDS divides children into three groups at risk of disabilities: high (Path A), moderate (Path B) and low risk group (Path C, D, and E). The Mullen Scales of Early Learning [4], a standardized instrument to evaluate overall developmental level, was administered to all children, as well as a clinical diagnosis made by the developmental behavioral pediatrician to confirm the diagnosis of typically developing children and children with developmental delays. The study received prior approval of the Institutional Ethics Committee.

Baseline characteristics of participants are shown in **Web Table I**. The PEDS result was positive for 77 children, from which 13 were found to have developmental delays (**Table I**). PEDS had 92.9% sensitivity, 49.2% specificity, a positive predictive value of 17.1%, and a negative predictive value of 98.4%. The positive and negative likelihood ratio were 1.8 and 0.1, respectively. The accuracy level of the test was 53.3%.

At least one significant concern was shown by 55% parents. The most common concern was behavioral problems ( $n = 88, 64.2\%$ ) followed by expressive language development ( $n = 66, 48.2\%$ ), which is a significant concern for this age group, as shown in **Web Fig. 1**.

**TABLE I** PEDS RESULTS COMPARED TO THE DIAGNOSIS BY THE MULLEN SCALES OF EARLY LEARNING AND THE DEVELOPMENTAL-BEHAVIORAL PEDIATRICIAN

PEDS results	No. of case (%) (N = 137)	Children with developmental delay* (%) (N = 14)
Test Positive <sup>#</sup>		
High risk group		
Path A	31 (22.6)	6 (42.8)
Moderate risk group		
Path B	46 (33.6)	7 (50)
Test Negative <sup>§</sup>		
Low risk group		
Path C	45 (32.8)	–
Path D	–	–
Path E	15 (11)	1 (7.2)

\*The final diagnosis by clinical and MSEL were globally delayed development ( $n=8$ ) and developmental language delay ( $n=6$ , expressive type 4 children and mixed expressive and receptive type in 2 children); <sup>#</sup>The positive screening test were children in the high and moderate risk groups, which were defined as Path A and B. Path A were children with 2 or more significant concerns while Path B were those with 1 significant concern; <sup>§</sup>The negative screening test result were children in the low risk group (Path C, D, and E), which were defined as children with 1 or more non-significant concern.

Our study of PEDS compared with standardized direct assessment showed high sensitivity and moderate accuracy, which was similar to previous studies [5,6]. The most significant parental concern in this study was language which is an emerging development in this particular age group and is easily noticed by parents [7,8]. The relatively low specificity of PEDS seen here may be because of the excessive concern of parents regarding their child's development, especially who are in relatively high socioeconomic status. Due to a parental lack of knowledge in terms of child development or misinterpretation of the questions, we found that the content of the comment in developmental concerns did not match the question's interest [9], which can also explain the low specificity of PEDS in our study. Major limitation of this study was a selection bias of convenient participants which tend to have relatively high socioeconomic status, and was not nationally representative.

To conclude, PEDS is a promising developmental screening tool with a high sensitivity but moderate accuracy among a high socio-economic status population. Future studies need to have a representative sample of population to better evaluate its diagnostic performance.

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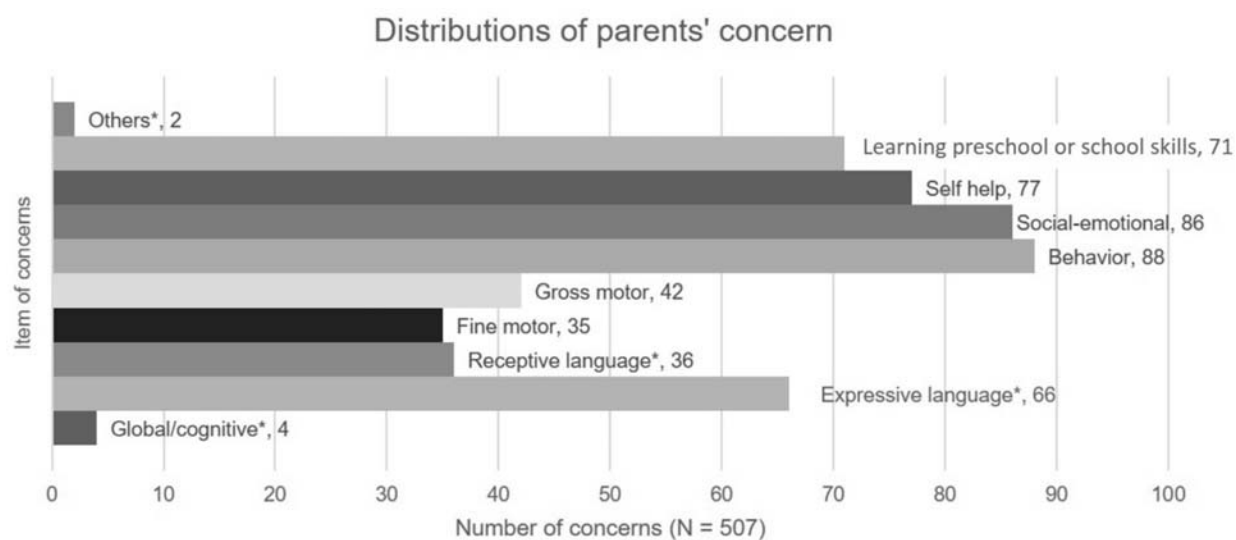
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**WEB TABLE I** BASELINE CHARACTERISTICS OF STUDY PARTICIPANTS (N=137)

Variable	Participants
Age (mo), mean (SD)	24.3 (3.4)
Gender, male (%)	48.9
GA (wk), mean (SD)	37.7 (2.3)
Birth weight, mean (SD)	3,053 (540.7)
Family history of delayed development (%)	12.4
<i>*Paternal education</i>	
Less than bachelor degree	17.1 %
Bachelor degree	54.2 %
>Bachelor degree	28.8 %
<i>*Paternal income (Baht/mo), %</i>	
<50,000	2.1 %
>50,000	97.9 %
<i>Maternal education, (%)</i>	
Less than bachelor degree	16.7 %
Bachelor degree	53.6 %
> Bachelor degree	32.7 %
<i>*Maternal income (Baht/mo), %</i>	
<50,000	18.8 %
>50,000	81.2 %



\*Significant item of concern in 18-30 month-age-group.

**WEB FIGURE I** The distributions of PEDS parental concern.