The Parenting Responsibility and Emotional Preparedness (PREP) Screening Tool

A 3-Item Screen That Identifies Teen Mothers at High Risk for Nonoptimal Parenting

Robin Gaines Lanzi, PhD, MPH; Sharon Landesman Ramey, PhD; Shannon Carothers Bert, PhD

Objective: To test the ability of a 3-item screening tool (Parenting Responsibility and Emotional Preparedness [PREP]) to detect adolescent mothers at elevated risk for nonoptimal parenting and poor child development outcomes at 2 years of age.

Design: A 4-site prospective cohort study conducted from December 2001 to August 2007 of adolescent mothers recruited in the third trimester of pregnancy and followed up at 4, 8, 18, and 24 months post partum.

Setting: Community clinics and home settings in Birmingham, Alabama; Kansas City, Kansas and Missouri; South Bend, Indiana; and Washington, DC.

Participants: A total of 270 first-time adolescent mothers (aged 15-19 years) and their infants (birth to 2 years of age).

Main Exposures: Naturalistic observations of parent-child interactions and quality of home environment during the first 2 years of life.

Outcome Measures: Maternal mental health and cognitive indicators, positive mother-child interactions, quality of home environment, child social-emotional development, and child cognitive development (Bayley scales).

Results: PREP scores identified adolescent mothers with significantly elevated depressive symptoms and childhood trauma and lower scores of knowledge of infant development and maternal IQ. PREP predicted significantly lower quality of home environments and higher levels of nonoptimal mother-child interactions at 4, 8, and 18 months. PREP also predicted significantly lower child outcomes at 2 years of age for cognitive scores and higher levels of depressive and withdrawal symptoms and dysregulation and negative emotionality.

Conclusions: PREP is a low-cost, easily administered, nonstigmatizing screening tool that identifies adolescent mothers who self-recognize that they need help to meet their infants’ social, emotional, and cognitive needs.


C HILD NEGLECT HAS BEEN labeled a “mostly silent epidemic,” estimated to affect more than 3 million children annually in the United States. A major challenge to primary prevention and early detection is the lack of easy-to-obtain, nonstigmatizing indicators that reliably identify a child at high risk for early neglect. Forms of early neglect include psychological (failure to receive responsive care and have social-emotional needs met), physical (inadequate daily care), medical (failure to receive routine and needed health care), and educational (inadequate opportunities provided to learn basic language and cognitive skills). Mounting evidence indicates substantial lifelong consequences of early neglect, particularly concerning social-emotional well-being, brain development, academic achievement, and future parenting. Children born to adolescent mothers and families living in poverty have the highest rates of suspected and confirmed early neglect; however, providing interventions for all teen parents and families in poverty would be excessively costly and likely ineffective. Therefore, we developed a low-cost, easily administered, nonstigmatizing, 3-item screening tool, Parenting Responsibility and Emotional Preparedness (PREP), for use during pregnancy. This study tests the ability of PREP to detect adolescent mothers at elevated risk for nonoptimal parenting and poor child development outcomes at 2 years of age.

Our 2-part hypothesis was that pregnant adolescents who provided self-appraisals that indicated they thought they

See Invited Commentary at end of article
might be limited in their ability to be a good parent or be unwilling to accept new parenting responsibilities. For adolescents in general, we hypothesized that accepting adultlike responsibilities or any new responsibilities that emanate from an external source might differ, depending on whether the questions probed a broad range of life experiences or focused directly on the brand-new upcoming event of becoming a parent. The parenting self-efficacy tool α values are .665, .710, and .663 at prenatal, 6 months, and 12 months, respectively. The total score for the PREP screen is the sum of the risk scores (maximum, 3).

**Observations of Mother-Child Interactions in the Home**

The Landry Scales were used to code observed mother-child interactions. Each mother-child dyad was videotaped during a 20-minute free play and 5-minute book read; a standard set of developmentally appropriate toys and books was provided. Raters were trained to a minimum of 80% concordance with an expert senior coder, an internal consistency coefficient of 0.81, and reliabilities ranging from 0.80 to 0.84. The Landry Scales have shown adequate reliability and predictive validity to children's social-emotional outcomes.

**Assessments of Home Environments**

We assessed home quality with the Infant/Toddler Home Observation for the Measurement of the Environment (IT-HOME) and a supplemental home quality rating for families living in poverty (the Supplement to the Home Scale for Impoverished Families [SHIF]), which combine semistructured interviews and direct observations in the family's home. They are highly reliable and predict children’s later development, with good discrimination among families living in poverty.

**Developmental Assessments**

The Mental Development Index of the Bayley Scales of Infant Development measures sustained attention, comprehension, expressive language, and problem solving. Coefficient α values range from .78 to .92; the test-retest reliability is 0.83. The Preschool Language Scale assesses children’s language development. Internal consistency for 1- to 5-year-olds ranges from 0.72 to 0.97; test-retest stability ranges from 0.82 to 0.97. The Infant-Toddler Social and Emotional Assessment, a 166-item tool, assesses the following 4 broad domains of behavior in 12- to 36-month-olds on a 3-point scale: externalizing, internalizing, dysregulation, and competencies. We focused on the following 3 subscales within these domains: aggression/defiance (externalizing), depression/withdraw (internalizing), and negative emotionality (dysregulation). Test-retest reliability ranges from 0.82 to 0.90 for domains and 0.69 to 0.85 for scales.

**Maternal Demographic and Mental Health Data**

Maternal demographic data were obtained using a Family and Life History Questionnaire developed for the study. Mental health data were obtained using the Beck Depression Inventory, a 21-item questionnaire that classifies depressive symptoms from no to severe symptoms across the previous 2 weeks. For adolescents, the
The Beck Depression Inventory internal consistency is between 0.80 and 0.90, with good test-retest reliability. The Childhood Trauma Questionnaire is a 28-item retrospective measure of childhood abuse or neglect. Each question begins, “When I was growing up...” and then asks about different types of abuse or neglect; each is rated in terms of frequency of occurrence. The Childhood Trauma Questionnaire has a test-retest reliability of 0.88, good convergent validity, and nonsignificant correlations with social desirability. The abbreviated Child Abuse Potential Inventory is a 25-item measure that assesses parental rigidity (attitudes about children’s behavior), was administered. The test-retest reliability index was 0.90.

Maternal Knowledge of Infant Development and IQ

The Knowledge of Infant Development Inventory, which contains 75 items, addresses parents’ factual knowledge about infant norms of behavior and parenting practices. The Cronbach α was 0.82; the 2-week test-retest reliability was 0.92. The Wechsler Abbreviated Scale of Intelligence Vocabulary and Matrix Reasoning subtests provide a brief reliable measure of intelligence (full-scale IQ score).

RESULTS

The PREP score reflects the number of risks (0-3) self-reported during pregnancy. Table 1 lists the specific patterns of PREP risk variables. Nearly 2 of 5 teen mothers (39.3%) had at least 1 risk. Specifically, 33.3% had a PREP score of 1, 5.6% had a score of 2, and 0.4% had a score of 3. The single item identifying the most teen mothers at risk was the novel question related to willingness to accept new responsibilities (27.8% denied willingness). Because just 1 risk was the most prevalent pattern (PREP score of 1), we created a dichotomous overall score: no risk or PREP risk (≥1 risks). We conducted separate analyses to determine whether any single item or any pair predicted the key outcomes of mother-child interactions, maternal mental health, and child outcomes, as well as the overall score. Any 1 item or pair predicted, on average, less than half of the statistically significant relationships obtained using the 3-item composite score.

Table 2 indicates no significant differences in age, race/ethnicity, and income between adolescents with a PREP risk score and no risk. PREP risk, however, was significantly associated with multiple maternal mental health and cognitive variables. Specifically, teen mothers with PREP risk had significantly higher maternal depression scores and child abuse potential scores during pregnancy and 6 months post partum, higher rates of self-reported abuse when they were children, and lower IQ scores. PREP risk also identified mothers with significantly lower levels of knowledge about infant development.

Table 3 presents findings about PREP risk, the home environment, and mother-child interactions. At all times, the PREP risk group had significantly lower scores for quality of home environment and mother-child interactions compared with the no-risk group. To help clarify observed differences in outcomes, 2 types of analyses were performed. First, a parametric t test was conducted to examine mean differences on outcomes as a function of risk status. Independent t tests indicated that IT-HOME and IT-HOME plus SHIF quality of the home environment scores for the PREP risk group were significantly lower than those for the no-risk group at 4 and 8 months post partum. Repeated-measures analysis of variance conducted for 8-month outcomes, controlling for 4-month scores, found that risk status continued to predict scores on the IT-HOME (t = 6.97, P < .01) and IT-HOME plus SHIF (t = 8.25, P < .01). At 18 months, IT-HOME plus SHIF quality of the home environment scores for the PREP risk group were significantly lower than those for the no-risk group; significance remained even after controlling for 4-month (t = 3.17, P < .01) and 8-month (t = 3.80, P < .01) IT-HOME plus SHIF scores.

We relied on the Landry Scales and IIT-HOME scores as proxies for optimal parenting because these tools tap a range of parenting behaviors known to influence child development, including maternal responsiveness, provision of age-appropriate language and cognitive stimulation, positive engagement with environment, and avoidance of harshness or intrusiveness by the mother. Optimal parenting thus is defined along a multidimensional continuum using items from multiple tools. Teen mothers with PREP risk showed significantly less optimal scores on one-third of the items (6 of 18) theoretically linked to optimal parenting than those with no PREP risk. These differences appeared early: by 4

Table 1. Risk Variable Profiles on the PREP Screening Tool Among 270 Adolescent First-Time Mothers

<table>
<thead>
<tr>
<th>No. of Risks</th>
<th>PREP Item</th>
<th>N (%) of Mothers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No risks identified</td>
<td>164 (60.7)</td>
</tr>
<tr>
<td>1</td>
<td>Not anticipating having any new parenting responsibilities</td>
<td>63 (23.3)</td>
</tr>
<tr>
<td></td>
<td>Uncertain about ability to provide emotional support</td>
<td>9 (3.3)</td>
</tr>
<tr>
<td></td>
<td>Uncertain about overall ability to be a good parent</td>
<td>18 (6.7)</td>
</tr>
<tr>
<td>2</td>
<td>One risk identified</td>
<td>90 (33.3)</td>
</tr>
<tr>
<td></td>
<td>Not anticipating having any new parenting responsibilities and uncertain</td>
<td>4 (1.5)</td>
</tr>
<tr>
<td></td>
<td>about ability to provide emotional support</td>
<td>7 (2.6)</td>
</tr>
<tr>
<td></td>
<td>Uncertain about ability to provide emotional support</td>
<td>4 (1.5)</td>
</tr>
<tr>
<td></td>
<td>Uncertain about overall ability to be a good parent</td>
<td>15 (5.6)</td>
</tr>
<tr>
<td>3</td>
<td>Two risks identified</td>
<td>1 (0.4)</td>
</tr>
</tbody>
</table>

Abbreviation: PREP, Parenting Responsibility and Emotional Preparedness.
months post partum, mothers with PREP risk displayed significantly lower levels on mother’s sensitivity, contingent responsiveness, and general speech toward the infant. By 8 months, significant differences appeared in infant warmth-seeking behavior and maternal responsiveness, with moderate significant differences in maternal sensitivity, physical intrusiveness, and general verbalness. Repeated-measures analysis of variance conducted on 8-month outcomes, controlling for 4-month scores, found that maternal PREP risk continued to predict lower infant warmth-seeking (t = 1.94, P < .05) By 18 months, mothers in the PREP risk group displayed significantly more negative verbal content interacting with infants and lower maternal general speech levels (moderate significance) than mothers in the no-risk group.

Because of the possible dependent nature of the sample, a nonparametric Wilcoxon signed-rank test was used to evaluate whether median differences existed between risk groups for measures of home environment and interactions (Table 3). Significant median differences were documented for the IT-HOME and IT-HOME plus SHIF at 4 and 8 months post partum. Teen mothers with PREP risk had a mean ranking significantly lower than those with no PREP risk. Significant median group differences were found for 4-month maternal sensitivity toward the infant (t = −2.04, P < .05) and 8-month warmth-seeking from the infant (t = −2.15, P < .05). For each outcome, teen mothers in the PREP risk group had significantly lower rankings on these measures of mother-child interactions than those in the no-PREP risk group. A comparison of findings from the parametric and nonparametric analyses resulted in the conclusion that because of a sufficient sample size (n = 270), examining risk groups as independent of one another was a stronger predictor of outcomes.

Table 4 summarizes child outcomes at 24 months. Children in the PREP risk group had significantly lower mental scores on the Bayley scales and less optimal scores on the depression/withdrawal and emotional/dysregulation subscales of the Infant-Toddler Social and Emotional Assessment but did not differ on aggression/defiance. Children’s language scores, averaging approximately 10 points below the national average, did not differ significantly as a function of maternal PREP risk.
ably identified young mothers who themselves were more likely to report depressive symptoms and have lower IQ scores. Because health care professionals in prenatal care clinics do not routinely assess maternal intelligence or administer a standardized clinical tool to detect depression, PREP offers a very low-cost, simple method. By using the brief, nonstigmatizing PREP prenatal screening tool, prenatal care staff may be able to initiate interventions and perhaps encourage communication with the clinic staff that will be providing well-child care. For many communities, many teen mothers are routinely referred to home visiting programs and Early Head Start programs. Strategies to have the PREP score included in the child’s medical records might be worth exploring.

Pregnant adolescents appear to recognize or self-identify that they may have other challenges coexisting in cognitive and mental health domains. These coexisting maternal conditions are likely to affect aspects of"
munication and the provision of optimal prenatal and postpartum health care. These adolescents who readily self-report their own doubts and unwillingness to accept responsibility may be receptive to offers of practically helpful information about how to meet their children’s needs and address the realities of becoming a responsible and “good” parent. We hypothesize that pregnancy is a time when the rapid biological and psychosocial changes experienced may predispose teens to be receptive to assistance from professionals and adults knowledgeable about parenting. Pregnant teens with PREP risk could then be further evaluated for depression and appropriately referred for timely treatment. Concerning parenting challenges associated with lower maternal knowledge about infant development and low IQ, clinical staff could address these by acquiring more skillful communication strategies with these young mothers, with the goal of promoting positive parenting practices (eg, responsive parenting, age-appropriate expectations of their infants, and health promotion activities). Effective communication strategies to increase comprehension include asking questions in simple nontechnical terms, repeating instructions with supporting concrete examples, using picture guides, and having the mother summarize the important messages in her own words.27

In summary, the PREP risk screening tool identifies adolescents before the birth of their children who are at significantly elevated risk for providing less stimulating home environments, nonoptimal maternal interaction, and increased risk for child neglect. If used widely, PREP screening could allow pregnant adolescents to share their reluctance about accepting new responsibilities and their self-doubts about becoming a good parent. This serves as a window of opportunity to engage in primary prevention of early child neglect, starting before an infant is born. Those with PREP risk could be targeted for enrollment in evidence-based home visiting and parenting programs and monitored more frequently after the child’s birth (eg, during well-child visits). This dovetails nicely with the “anticipatory guidance” component required for reimbursement of the Early Periodic Screening, Diagnosis, and Treatment Program to provide education and support. Furthermore, mothers who self-identify with PREP risk could also benefit by receiving mental health and cognitive support themselves. We propose that the findings of the PREP tool with teen mothers indicate that it may also serve as a means to identify mothers from older age groups and a wider range of social, economic, and educational backgrounds who also are at elevated risk for nonoptimal parenting and who may have unaddressed mental health needs. Further empirical testing of its sensitivity for these other populations would be vital to evaluate its utility.

By 24 months of age, children whose mothers had PREP risk show the cumulative toll of less stimulating home environments and less positive mother-child interactions in terms of their overall cognitive development,28 with mean IQ scores just below 82, placing them in the 12th percentile nationally. We also note, however, that even the children in the no-risk group also earned relatively low Bayley scores (mean, 86). In addition, the PREP risk children displayed poorer social-emotional regulation at an early age. Unfortunately, we did not collect medical records on mothers to ascertain whether their depression was diagnosed and/or treated, although our experiences would suggest that few, if any, received timely, effective mental health treatment.29

Health care and social service practitioners face increasing demands to screen for many potential conditions and problems. The risk of child neglect often is overlooked and historically has not been included as part of prenatal care. Legitimate concerns are that prenatal screening be performed in ways that are efficient and not stigmatizing. We conclude that the PREP screen offers a quick, conversational-style screening approach that displays good correlational and predictive utility that could be widely used in clinical and community settings and even adapted for personal self-evaluation via a variety of media and Internet-supported strategies. Research on larger samples and application in routine clinical and community service sites are warranted because our data were obtained through individual interviews administered by research staff.

Accepted for Publication: February 10, 2012.

Correspondence: Robin Gaines Lanzi, PhD, MPH, Department of Health Behavior, School of Public Health, University of Alabama at Birmingham, 1665 University Blvd, 227 RPHB, Birmingham, AL 35294 (rlanzi@uab.edu).

Author Contributions: Study concept and design: Lanzi and Ramey. Acquisition of data: Lanzi, Ramey, and Bert. Analysis and interpretation of data: Lanzi, Ramey, and Bert. Drafting of the manuscript: Lanzi, Ramey, and Bert. Statistical analysis: Bert. Obtained funding: Lanzi and Ramey. Study supervision: Lanzi and Ramey.

Financial Disclosure: None reported.

Funding/Support: This research was supported by grants K01 HD42173 and HD39456 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development; cosponsor groups include the Centers for Disease Control and Prevention, National Institute on Drug Abuse, and the Department of Education, as well as Robert Wood Johnson Foundation grant 037224. Cell phones and service were provided by generous donations from Cingular and Centennial Wireless Corporations. Senior members of the Centers for the Prevention of Child Neglect include John Borkowski, PhD, Judy Carta, PhD, Bette Keltner, PhD, Lorraine Klerman, DrPH, Susan Landry, PhD, Robin Lanzi, PhD, Craig Ramey, PhD, Sharon Ramey, PhD, and Steve Warren, PhD.

REFERENCES

5. Bert SC, Guner BM, Lanzi RG; Centers for the Prevention of Child Neglect. The
Is There a “Bright Future” for Another Screening Test in Pediatrics?

In this issue of the Archives, Lanzi et al. present a 3-question screening tool (the PREP) that, when given to pregnant adolescents, identifies those whose infants are at increased risk for a host of adverse socio-emotional and cognitive outcomes. These findings are timely and relevant to the aims of pediatrics. Improving the socioemotional outcomes of young children and preventing toxic stress has been recently promoted in a policy statement by the American Academy of Pediatrics.2 An ingenious and effective part of the PREP question set is the indirect question “Now that you are pregnant, are there some new areas in which you are accepting responsibility or want to become responsible in?” A “no” answer to this question detected the most risk.

Another commendable aspect of this tool is that the PREP is brief. Brevity is a critical quality of screening tools vying for a place in an overburdened primary care practice.3 Already, pediatricians are covering less than half of the recommended Bright Futures agenda during well-child visits.4 Of course, physicians themselves do not need to do every screening test that is recommended. Other office staff could be assigned this job. This would in turn allow physicians to spend more time “working up to their license”—interpreting and acting on the results of screening instruments and prescribing therapy. However, in most practices (I know), the nonphysician staff has no more free time than the physicians. In economic terms, the marginal increase in revenue associated with hiring administrative personnel to do this work does not cover its costs.

Screening tests must have a low false-negative rate and a low false-positive rate and be able to identify a treatable condition. In the case of the PREP, while we know that the infants of at-risk mothers fare worse, we do not know these basic test characteristics of the tool. Targeted screening of teenage mothers instead of universal screening for parenting preparedness would leave a substantial number of at-risk children undetected. On the other hand, infants of adolescent mothers are rarely raised solely by their mother; often the infant’s maternal grandmother and other female members of the family are involved. How actively the infant’s other relatives “step up” is highly deterministic of the infant’s outcome. So, it seems unlikely that only asking the mother about her own preparedness without including some estimate of support from the extended family would be highly predictive of outcome.

Even if the PREP performs well as a screening test, are we then able to improve the long-term socioemo-