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Developmental Status of Children of Teen Mothers: Contrasting Objective Assessments with Maternal Reports

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Abstract

Introduction—Descriptive study compared adolescent mothers' subjective perceptions of their children's development with objective developmental assessments.

Method—Volunteer sample of mother/child pairs was recruited from urban high school. Thirty-three mothers completed *Ages and Stages Questionnaire (A&SQ)*. Children were administered *Bayley Scales of Infant Development (BSID)*.

Results—On the *BSID*, group mean scores all fell within the normal range. However, almost 20% of individual children had one or more delays. Almost 73% of mothers accurately assessed their children's development on the (*A&SQ*) when compared to *BSID* results. Eighteen percent of mothers suspected delays when there were none objectively identified. A single mother identified delay in a different domain than that identified on the *BSID*.

Discussion—Findings that almost 20% of these children had developmental delays support other research that children of adolescent mothers are at risk for delays. Findings that teen mothers varied in their abilities to assess their children's development reinforce the need for education of teen mothers about child development. Further study needed to determine the best models of this education in school and community settings.

A Comparison of Adolescent Mothers' Perceptions of their Children's Development with Objective Measures of their Children's Development

Much has been written about factors that influence the parental competence of adolescent mothers and the subsequent developmental outcomes of their children. Age, education, value systems, economics, and personal life experiences have been cited as important determinants of the parenting skills of young mothers (Ateah, 2003; Diehl, 1997; Letourneau, Stewart, & Barnfather, 2004). Parental lack of accurate knowledge of child development has

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been cited as an important factor in determining the age-appropriate development of children of adolescents (Tamis-Lemonda, Shannon & Spellman, 2002; Whitman, Borkowski, Keogh & Weed, 2001). While studies have been conducted comparing maternal reports of developmental status to objective developmental assessments (Feldman et al., 2005; Marie, O'Connor, McLean & Robson, 1996; Pritchard, Colditz, & Beller, 2005), there were no studies located within the literature that specifically researched adolescent mothers' perception of their children's development compared to a formal objective developmental assessment. The current study describes a comparison of a sample of adolescent mothers' assessments of their children's development with standardized objective developmental assessments of the children. Information gained by comparing the differences in perception and actuality provides direction for programs and individual clinicians who educate teen parents about effective parenting including child behavior and development.

Background and Significance of the Clinical Problem: Knowledge of Child Development among Adolescent Mothers

The term "cognitive readiness to parent" includes attitudes about being a parent, understanding of good parenting practices, and knowledge required for parenting--including information about child development (Sommer, Whitman, Borkowski, Schellenbach, Maxwell, & Keogh, 1993). Many studies describe the dissonance among teen parents' parenting practices, their knowledge of age-specific development, and their expectations for their children's development. (Diehl, 1997; Sachs, Pietrukowicz, & Hall, 1997; Sommer et al. 1993; Thompson, Powell, Patterson, & Ellerbe, 1995; Whitman, et al., 2001). These factors are thought to be important as adolescent mothers experience the complex transition to parenthood which includes their own adolescent developmental tasks as well as those of their infants (Graber, Brooks-Gunn, & Petersen, 1996).

An understanding of the complex nature of child development is a critical factor in successful parenting. Adolescent mothers may have difficulty appreciating the long term nature of child development. A study of 60 adolescent mothers of children from birth through 28 months of life revealed that adolescent parents were knowledgeable about emerging developmental skills in their children in the areas of cognition, language, motor, play and socialization. They were less knowledgeable about the timing of these developmental milestones, especially after the first year of life (Tamis-Lemonda et al., 2002). Inaccurate knowledge of child development may affect parenting practices of adolescent mothers and may lead to parental feelings of detachment, frustration, or disappointment with their children's developmental achievements (Thompson, et al. 1995).

Developmental Outcomes of Children of Adolescents

Several studies have been conducted researching the developmental outcomes of children of adolescent parents. Thompson and colleagues (1995) conducted a small study to examine the developmental outcomes of 19 children of teen parents. The findings revealed that these children had appropriate development across all domains. They also found that the adolescent mothers were at risk for non-nurturing behaviors and had inappropriate expectations for behavior.

Later studies support the finding of age-appropriate developmental outcomes of children of adolescent mothers. A pilot study conducted at an on-site child care center at an urban high school found that 77% of the infant and toddler children (n=16) of adolescent mothers were within normal limits for five domains of development including perceptual-fine motor, language, cognitive, gross motor and self care (Sadler, Swartz, Ryan-Krause, 2003).

Longitudinal studies have not found continued age-appropriate developmental outcomes in children of young mothers. A longitudinal study by Whitman and colleagues (2001) examined several domains of development including the physical, intellectual, adaptive and social-emotional development of children of adolescent parents. The researchers found that the majority of children of adolescent mothers experienced normal development through 12 months of age. However by the age of three years, intellectual and other developmental delays began to emerge. When assessing intellectual development at the age of five years using the Stanford Binet Intellectual Scales (Thorndike, Hagen, & Sattler, 1985), the researchers found that 34% of the children scored within the normal range and 26% scored in the extremely low or borderline level of functioning. Receptive language functioning remained constant at the three and five year old evaluations with the majority of children (60%) scoring below the 10th percentile. On visual motor integration tests, the majority of five year olds fell within the lower end of the distribution.

Differences in the amount and quality of language used by adolescent mothers with their 13 month old children were found when compared to language used by older mothers. Teen mothers used more commands, less affectionate language and fewer total words (Culp, Osofsky, & O'Brien, 1996). The impact of limited parental language usage on later development was noted by Oxford and Spieker (2006) who described less developed language in preschoolers who had been raised in homes of adolescent mothers.

Much of the research into the developmental outcomes of children of adolescents suggests that there are notable differences between the developmental skills of children of young parents when compared with children of older parents. The cognitive and adaptive development of children of adolescents is delayed in a substantial number of children. This may be related to parenting knowledge and practices among adolescent parents, although there may be other confounding factors that account for these differences.

Method

Purpose of study—The aim of this cross-sectional descriptive study was to examine the developmental status of young children of adolescent mothers. An additional study outcome was to compare adolescent mothers' reports of their children's developmental status with an objective developmental evaluation, using a standardized developmental assessment. This study was part of a larger study examining the transition to motherhood of adolescents enrolled in a parent support program in an urban high school (Sadler et al., 2007).

Setting—The study was conducted at the Elizabeth Celatto Child Care center located within an urban high school in New England (name used with permission). The center serves children from 6 weeks of age through preschool during the school year while their mothers attend high school classes. All adolescent mothers who have children in the child care center are enrolled in a daily parenting course. Each mother spends at least one assigned hour each week in the child care center where she performs parenting activities under the support and direction of child care center staff. In addition to the parenting classes and child care program, a wide variety of supportive services such as counseling, legal aid, and housing assistance are available to the mothers and their children.

Sample—A volunteer consecutive sample of 45 adolescent mothers and their children was recruited and consented to join the study. The mean age of the adolescent mothers was 17.4 (+/- 1.1) years. Their mean grade level was 11.3 +/- .63. Nearly 71% of the adolescent mothers were in the appropriate grade and four percent attended special education classes. The majority of the sample was African-American (55%) followed by Latina (26%). Three percent of the sample was Caucasian and 16% were of diverse ethnicity. All participants

described themselves as unmarried. The current living situation was for these mothers was that 65% lived with a biological parent, 25% lived with a grandparent or other relative, and 10% lived by themselves or with their partner. All adolescent mothers and their children were receiving state assistance for their health care and living expenses.

The mean age of the children in the sample was 14.9 (± 7.7) months. Fourteen percent received child care from family members. Thirty one (86%) of the children in the sample attended the on-site child care center within the high school while the other 5 (14%) were cared for by family members at home. The mean number of months that children attended the on-site child care center was 7.0 (± 7.6 ; range 1–30) months.

Procedures—The larger study received approval from the university research review committee and from the institutional review boards of the high school, the school system administration and the school-based child care center and parent support program. All teen mothers attending the parent support program were invited to join the study. Mothers 18 years or older provided their own written consent for themselves and their children. Mothers less than 18 years of age provided written assent and their parents/guardians provided written consent. Developmental assessments were performed with each child using the *Bayley Scales of Infant Development* (Bayley, 1993) which were administered by an experienced examiner in a quiet room with the mothers present. Mothers' self-reports of their children's development were assessed with the *Ages and Stages Questionnaire* (A&SQ) (Squires & Bricker, 1996) which was read to teen mothers in a private setting during a free class period at school.

Research Instruments—The *Bayley Scales of Infant Development (BSID)*, Second Edition (Bayley, 1993) were used to assess the current developmental status of the children of teen parents. *BSID* is a well-known research instrument, which assesses mental and psychomotor functioning of children from 1 to 42 months of age through the presentation of specific developmental tasks and the incidental observation of developmental skills during the assessment. The Scales require 45–60 minutes and must be administered by a trained evaluator. The *BSID* were standardized on a national sample of 1262 infants and children and correlates ($r=.57$) with the *Stanford-Binet Intelligence Scale* (Thorndike et al., 1985) reported for children aged 24–30 months. The mean scores on each of the *BSID* Mental Developmental Index (MDI) and Psychomotor Developmental Index (PDI) are 100 with a standard deviation of 16. The split half reliability coefficients are reported as ranging from .81 –.93 on the MDI and .68 – .92 on the PDI (Bayley).

The *BSID* also includes a Behavior Rating Scale (BRS). This scale enables the examiner to assess the child's response to the testing situation after asking the parent if the child's performance during the evaluation was typical. It provides important information about a child's attention/arousal, orientation/engagement, emotional regulation, and motor qualities. Children scoring above the 25th percentile are considered to be within the normal range. Children scoring between the 11th and 25th percentiles are considered to be in the questionable range and those scoring in the 10th percentile or below are in the non-optimal range. All of the components of the *BSID* have been used for assessment of normally-developing children as well as children at risk for developmental problems (Bayley, 1993).

The *Ages and Stages Questionnaire (A&SQ)* is a parent-report instrument which screens a child's progress in five developmental domains at regular intervals through the first 60 months of life (Squires & Bricker, 1996). It has been found to be an accurate, cost-effective method of monitoring development and thus identifying delays early so that early clinical intervention may be implemented. The questionnaires are written at a 4th to 6th grade reading level. Each age level contains 30 questions about the child's everyday activities,

grouped into communication, gross motor, fine motor, problem-solving, and personal-social skills. Each of these developmental domains contains six questions for the parent, which are scored and then summed for each domain. Scores are compared to an empirically derived cut-off score for each domain (Squires & Bricker). The *A&SQ* is useful in identifying which children are reaching their appropriate developmental milestones and which children should be referred for further evaluation.

The questionnaire's concurrent validity was determined to be 83% overall when results of *A&SQ* were compared to standardized developmental assessments such as *Revised Gesell Developmental Schedules* (Knoblock, Stevens & Malone 1980), *Bayley Scales of Infant Development* (Bayley, 1993), *Stanford-Binet Intelligence Scale* (Thorndike et al., 1985), *McCarthy Scales of Children's Abilities* (McCarthy, 1972), and the *Battelle Developmental Inventory* (Newborg, 1984). Reliability was found to be 90% and sensitivity ranges from 38–91% while specificity ranged from 81% to 91% when tested with a normative sample as well as samples of medically at-risk and environmentally at-risk children (Squires & Bricker, 1996).

Data Analysis—All data from this study were initially analyzed descriptively with measures of central tendency. For purposes of the comparison between mother's reports of development and the developmental assessment findings, children were classified by maternal report as delayed or within normal limits and also by the *BSID*, as delayed or within normal limits. The statistical comparison was performed with t-tests, the kappa statistic, and correlations. All data were analyzed with SPSS, version 10.

Findings

Thirty-six children completed the *Bayley Scales of Infant Development (BSID)*. There were 33 children who were administered the *BSID* and whose mothers completed the *Ages and Stages Questionnaire (A&SQ)*. An additional nine children had only *A&SQ* data completed.

Developmental Assessment and Screening (n=36)—For those children assessed with the *BSID* (n=36), the mean scores fell within the average range. Table 1 lists the results of the *BSID*. Although the total group mean scores of all children were within the normal range, there were seven children who were identified as having delays. Of those seven children (19.4% of total group), three were identified with delays on both the Mental Developmental Index (MDI) and the Psychomotor Developmental Index (PDI) subscales of the *BSID*; one was delayed on the MDI scale only; and three showed delays on the PDI scale only. Six of the seven children with identified delays were referred for early intervention services and one child with a mild delay was referred to the pediatric primary care clinician for follow-up. Of those children who were found to have a delay, four were in the family care group and three attended the on-site child care center.

On the Behavior Rating Scale (BRS) of the *BSID*, the children enrolled in the child care center scored significantly higher than the children cared for by family members (115.0 vs. 101.3, $t=2.0$, $df=32$, $p=.05$). Three children in the sample received non-optimal (n=2) or questionable scores (n=1) on the BRS. All of these children had significant delays on the PDI scale of the *BSID*, and one had a significant delay on the MDI scale as well.

Maternal Reports of Developmental Status (n=45)—Forty-five adolescent mothers completed the *Ages and Stages Questionnaire*. Eight adolescent mothers reported suspected delays in their children. Five adolescent mothers reported delays in a single developmental domain and three mothers suspected delays in multiple areas. Table 2 lists the areas in which the mothers reported delays

Contrasting Bayley Assessment Data with Maternal Report (n=33)—This section reports the results of 33 children with both *BSID* and *A&SQ* scores available. Of the 33 children with both scores available, 24 (72.7%) adolescent mothers were able to accurately gauge their children's development compared to the scores received on the *BSID*. Nine adolescent mothers (27.3%) differed in their assessment of their children's development when comparing the scores they reported on the *A&SQ* with the *BSID*. Eight mothers (18%) suspected delays. One mother whose child was delayed on *BSID* (PDI =82) reported a delay on the *A&SQ* in the problem-solving domain while the child was actually delayed in the motor area and not the mental area of the *BSID*. When looking for agreement among the maternal report *A&SQ* scores and the observed *BSID* scores, the kappa statistic was .014 indicating that there was basically no agreement between observed scores and maternal report scores.

“Dose Effect” of Attending Child Care Center—There was a “dose effect” of children who attended the on-site child care center. There was a positive significant correlation between the amount of time that children were enrolled in the child center and *BSID* BRS scores ($r=.35$, $p=.04$). A trend was noted that those children who were enrolled in the child care center longer were less likely to be delayed (MDI and PDI) on the *BSID*.

Discussion

This study sheds light on the developmental status of children of adolescent mothers from both objective assessments and subjective evaluations. The findings that almost 20% of this small sample had high rates of developmental delays on the *BSID* support other research that suggests that children of adolescent mothers are at increased risk for developmental delays (Brooks-Gunn & Chase-Lansdale, 1995; Coley & Chase-Lansdale, 1998; Culp et al., 1996; Moore, Morrison & Greene, 1997; Oxford & Spieker, 2006; Whitman et al., 2001). The children in this study were able to be identified early and referred for monitoring, further developmental assessment or early intervention services.

The adolescent mothers in this sample varied in their abilities to accurately depict their children's development on *A&SQ* since only one teen mother whose child had a delay on the *BSID* suspected a delay on the *A&SQ* and in a different developmental domain. The finding that 18% of mothers suspected delays when there were none on the *BSID* is consistent with other research findings that teen mothers often have unrealistic expectations and inaccurate information about child development. This finding supports the need for reinforcement of developmental content in daily parenting classes and in informal teaching within child care centers and in other settings that serve young children of teen parents.

It is an important finding that the children cared for at the on-site child care center scored significantly higher on the Behavior Rating Scale than the group of children cared for in other settings. The higher scores on this measure of neurobehavioral integrity reflect the fact that the center-based children were more easily engaged both with the *BSID* materials and with the examiner. The higher scores perhaps suggest that the nurturing and stimulating teacher-child interactions which these children have experienced in the child care center have made them more ready to learn and more able to respond to adult interaction. It is also possible that the young mothers have seen the staff at the center modeling good child-adult interactions and have incorporated this into their interactions with their children. Previously published findings from the larger study indicated that teen mothers with children attending the child care center had very positive scores on measures of observations of a maternal-child teaching interaction (Sadler et al., 2003).

Limitations—The subjects in this study represented a small paid convenience sample of adolescent mothers who were all enrolled in a parenting class at an urban high school and some of whose children also attended the high school-based child care center. The required attendance at the parenting class assured that these young women had some exposure to appropriate parenting techniques and had gained some knowledge of child development. Participation in the child care center provided even more education and modeling for the teens and more opportunities for developmentally appropriate experiences for the children. Even with these opportunities, there was a somewhat high percentage of young mothers who did not accurately assess their children's development and a high proportion of children with some developmental issues.

The results of the study are not generalizable to all adolescent mothers since there will be differences among mothers who are unable to remain in school and those who attend high school with and without a parenting class. There will also likely be differences among those adolescent mothers who have the advantage of stable child care and those who must make various child care arrangements based on the availability of family and friends.

Clinical Implications

The findings from this small study suggest a discrepancy between adolescent parents' perceptions of their children's development and the actual developmental status of these children. The more accurate knowledge a parent has about the process of normal child development, the more likely the parent is to provide the environment and opportunities for optimum development thereby raising a child who maximizes social, emotional and cognitive potential. This is important for all health care and early childhood professionals to consider when implementing educational and support programs for adolescent mothers. Pediatric nurse practitioners (PNPs) caring for teen families in office-based settings and schools can expand anticipatory guidance about child development at all visits. This education may help mothers to have appropriate developmental expectations of their children. Other professionals who work with adolescent mothers and their children in child care and other community settings also have the opportunity to reinforce developmental information through formal programs and through informal modeling of appropriate child-adult interactions.

Future Research

Much still needs to be understood about how to assist adolescent parents in raising healthy and well-developed children. There are many social, economic, and educational variables that extend beyond the scope of this current study. The finding that children who attended the child care center for longer periods of time were less likely to be delayed is important in that it supports the need for the continued development of these kinds of services for children of young parents. Continued research to determine best models of effective early childhood education in child care settings serving teen parents is indicated. Along with the curricular elements of these programs, study needs to be directed to the components of high school programs that are effective in promoting the successful transition to parenthood for the teen parents.

The additional finding that children enrolled in the daycare setting received higher scores on the *BSID* Behavior Rating Scale than those children cared for in community settings suggests that there may be unique aspects of this learning environment. Children at the center demonstrated greater neurobehavioral integrity, interacted effectively both with adults and with play materials and demonstrated important emotional regulation. It is important to investigate those factors which promote these kinds of learning and behavior whether they be structured environments, specific materials, or interaction styles. Ways to impart this

essential information to teen parents as their children grow and change is an important area of research since it has been found that teens may have a more difficult time effectively parenting active toddlers than young infants.

Conclusion

Adolescent parents encounter many obstacles in their efforts to become effective parents. The results of this small cross sectional, descriptive study agree with previous research indicating that many children of adolescent parents have or are at risk for developmental and behavioral delays and suggests that there is a lack of knowledge about the process of child development. Additional results of this study indicate that children cared for in a supportive, teen-focused child care center made better developmental progress and were more engaged with adults and with learning materials than those children cared for in other settings. These findings have implications for the continued development of interventions in which there is an emphasis on child development knowledge as well as on effective parenting strategies for children throughout their early years. Further research with larger groups of children, their adolescent mothers and child care and health care providers will better elucidate the effectiveness of enhanced knowledge about child development and parenting skills on the developmental outcome of children of teen mothers.

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Table 1Mean *BSID* Scores

Developmental Domain	Mean	Standard Deviation
MDI	93.2	11.4
PDI	95.7	14.8
BRS	113.4	7.7

Table 2

Areas of Delays Reported by Adolescent Mothers

Area of Delay	(n)
Communications	1
Fine Motor	2
Gross Motor	3
Problem Solving	5
Personal Social	3