Mothers’ knowledge of young child development in a developing country

I. O. Ertem,* G. Atay,† D. G. Dogan,* A. Bayhan,* B. E. Bingoler,* C. G. Gok,* S. Ozbas,‡ D. Haznedaroğlu‡ and S. Isikli§

*Developmental-Behaviour Pediatrics Unit, Department of Pediatrics, Ankara University School of Medicine
†Department of Pediatrics, Baskent University School of Medicine
‡Maternal Child Health and Family Planning Department, Turkish Ministry of Health, and
§Department of Psychology, Hacettepe University, Ankara, Turkey

Accepted for publication 3 February 2007

Abstract

Background Although interventions on child development target supporting mothers’ relationships with their children, little is known about maternal knowledge of child development in developing countries. The purpose of this study was to determine maternal knowledge about child development in Turkey.

Methods The Caregiver Knowledge of Child Development Inventory (CKCDI) developed for this study consisted of questions on when children begin to demonstrate developmental skills and when caregivers should provide opportunities for developmental stimulation.

Results In total, 1200 mothers of children aged ≤3 years chosen by random population-based sampling were administered the CKCDI in their homes. Of the 1055 mothers with complete data (88%), 64% had at most secondary school education and 11% were employed. The median CKCDI questionnaire score was 19 (highest possible score 40). Mothers believed that most developmental skills and activities should occur at later than normative ages and most mothers did not know that sight (52%), vocalization (79%), social smiling (59%) and overall brain development (68%) begins in the early months of life. In a linear regression model with CKCDI score as the dependent and age of child, number of children, maternal and paternal age and education as the independent variables, higher maternal education and lower number of children were found to be independent predictors of higher CKCDI scores ($P < 0.001$).

Conclusions These results illustrate the degree to which caregivers from Turkey may be lacking information on early childhood development and that caregiver knowledge needs to be further investigated so that culture-specific and effective interventions can be planned.

Introduction

As information on brain development in infancy and early childhood and its effects across the life span have increased (Dawson et al. 2000; Shonkoff 2003; Hertzman & Power 2004), efforts to improve the health and development of young children have proliferated in many parts of the world (Simeonsson 2000; Young 2002; Odom et al. 2003). Although most interventions target supporting mothers’ interactions and relationships with their young children, surprisingly little research exists on maternal knowledge and beliefs about the development of young children.
Studies in Western countries imply that what mothers know about the development of their infants and young children has important implications. Clinicians often rely on mothers’ knowledge about the health and development of their children for decision making, counselling and referrals (Glascoe & Dworkin 1995). Programmes that aim to enhance the health and/or development of children require baseline information on what caregivers know about and provide for their children so that the content and intensity of interventions can be individualized. Research in general has shown that mothers with more knowledge of child development are more likely to provide developmental stimulation to their children and that their children in turn have better developmental outcomes (Goodnow 1988; Miller 1988; Dichtelmiller et al. 1992). From a theoretical standpoint, however, factors that influence maternal knowledge, the effects of culture and whether increased maternal knowledge of child development actually translates to better mother–child interactions, more stimulating home environments, enhanced child development and decreased risks for child abuse need to be further explored. In addition, how mediators such as a mother’s mental health, self-efficacy, competence, perceptions about her child and her social support systems interact with knowledge to influence child outcomes is still an unanswered question (Miller 1995; Tamis-Lemonda et al. 1998; Wacharasin et al. 2003; Reich 2005).

Whether children around the world attain developmental milestones at similar ages may be relevant to when caregivers in different countries may perceive the age of attainment of these milestones. The largest multicultural study on when children acquire developmental milestones was conducted on a total of 28 139 children aged 0–6 years in urban and rural areas of China, India and Thailand (Lansdown et al. 1996). In this study, there were similarities in ages of attainment of most developmental milestones between and within countries, particularly those for younger children. Similarly in the World Health Organization (WHO) Multicentre Growth Reference Study conducted in Ghana, India, Norway, Oman and the United States, insignificant differences were found between countries and genders in attainment of key motor milestones (WHO 2006).

Despite uniformity in children’s attainment of culturally independent developmental milestones, caregivers’ knowledge of when children acquire developmental skills appears to differ between cultures. Cross-cultural studies and studies of minority (Sistler & Gottfried 1990; Kolobe 2004; Huang et al. 2005) or immigrant (Pachter & Dworkin 1997; Bornstein & Cote 2004) populations in Western countries have shown that there may be large differences between and within cultures on maternal knowledge and beliefs of young child development. In non-Western countries where the state of the art information on child development is often not available to the general population (Black et al. 2000; Richter 2003), few studies have investigated what mothers know about the emergence of developmental skills (Frankel & Roer-Bornstein 1982; Grantham-McGregor et al. 1991; Kotchabhakdi 1993; Li et al. 2000; de Lourdes Drachler et al. 2005). Even less information exists on mothers’ knowledge about when it is appropriate to begin to provide opportunities for stimulation to infants and young children (Ninio 1979; Parush & Hahn-Markowitz 1997; Williams et al. 2000a,b). In some communities, infancy and young childhood are considered passive periods during which the child is nursed and fed without much communication or play (Ninio 1979; Kotchabhakdi 1993; Parush & Hahn-Markowitz 1997; WHO 1999; Li et al. 2000; Williams et al. 2000a,b; Richter 2003; de Lourdes Drachler et al. 2005). There is evidence that this lack of stimulation, particularly when coupled with nutritional deficiencies, may be a key element in developmental delay (Grantham-McGregor et al. 1991; WHO 1999).

To address the discrepancy between Western and developing countries related to the information available for caregivers on how to support their child’s development, the WHO Department of Child and Adolescent Health and Development and the United Nations Children’s Fund (UNICEF) have developed the Care for Development Intervention (CDI) (WHO 2001). The CDI aims to provide a cost-effective approach to enhancing the development of young children across public healthcare settings with resource limitations and is designed to be used when any child 2 years of age or under is seen for a healthcare visit. The CDI trains healthcare providers to conduct a standardized interview assessing how the caregiver plays and communicates with the child and to provide the caregiver with ideas for age appropriate stimulation. The CDI has been shown to be an effective method of supporting caregivers’ efforts to provide a more stimulating environment for their children (Ertem et al. 2006). In a controlled trial, the group of families that received the CDI counselling during one acute care visit, 1 month after the intervention, had significantly more optimal Home Observation for Measurement of the Environment scores, more homemade toys and more books for the children than the comparison group that received standard health care only. As such interventions are being promoted, more information will be needed to determine what mothers already know and provide for young children living in developing countries.

The Turkish Ministry of Health and UNICEF-Turkey recently have been interested in instituting programmes that enhance infant and early childhood development. One component of
these programmes trains primary healthcare professionals to provide information on child development to caregivers during regular healthcare encounters and to identify early developmental delays. The WHO CDI is used as a key component of this programme. However, in order to effectively target WHO CDI strategies, information on maternal knowledge of child development was needed prior to implementing the programme. It was important to know whether a mother’s experience with her previous children, parental age, educational level or cultural traditional factors such as living with extended family or consanguinous marriage were associated with maternal knowledge of child development so that interventions can be targeted for those in most need of information and support. The purpose of this study therefore was to assess maternal knowledge about infant and young child development in a representative group of mothers from two cities in Turkey. Based on informations obtained from anecdotal observations of professionals working with young children and parents, we hypothesized that: (1) mothers’ knowledge of young child development would be inadequate; (2) maternal knowledge of child development would be independent of 'experiential factors' such as the number of children and the index child’s age but would be associated with maternal education.

**Methods**

The study was conducted in two phases. First, an instrument was developed to assess caregiver knowledge of: (1) when basic developmental skills emerge; (2) appropriate ages to provide basic opportunities to stimulate child development. Second, the instrument was used in a field study in two studies in Turkey.

**Development of the instrument**

Instruments on maternal knowledge of child development that were used in developed (Epstein 1979; MacPhee 1984; Rickard et al. 1984; Anderson & Fulton 1986; Larsen & Juhasz 1986; Rice & Slater 1997; Field 2006) and developing countries (Ninio 1979; Parush & Hahn-Markowitz 1997; Li et al. 2000; Williams et al. 2000a,b) between 1960 and 2005 were reviewed. Unpublished instruments were obtained by corresponding with the authors. A whole instrument or an item of an instrument was considered appropriate for adaptation if it involved: (1) developmental skills infants and young children achieve; (2) basic activities caregivers can provide for their children to stimulate their development, similar to those activities that are suggested by the WHO CDI. Five experts in child development reviewed the existing instruments. Most instruments were in English and were not translated as the reviewers had excellent level English. One instrument (Parush & Hahn-Markowitz 1997) that was in Hebrew was translated and back translated into Turkish. No single existing instrument was suitable for our purposes because either the instrument as a whole or items in it were culture-specific and difficult for mothers in Turkey to understand; focused on older children or did not include knowledge of stimulation activities. Questions from the Knowledge of Infant Development Inventory (MacPhee 1984), Knowledge Attitudes and Practices Questionnaire (Parush & Hahn-Markowitz 1997), Child Health and Development Questionnaire (Rice & Slater 1997) and the High Scopes Inventory (Epstein 1979) were selected and adapted for use. De novo items were developed to determine whether mothers knew when to begin activities that are recommended by the WHO CDI. Two questions on early reading and the use of paper and pencils were included because most households in Turkey have access to children’s books, paper and pencils. We used open-ended questions to obtain dimensional data on the full range of answers, to minimize test taking anxiety and to minimize the tendency for socially appropriate responses.

In order to determine the level of knowledge of caregivers, criteria for correct responses were developed. A panel of Turkish experts including four with backgrounds in developmental-behavioural paediatrics, two in child development, two in early intervention and two in developmental psychology and three international experts on young child development with expertise in cross-cultural studies decided the age ranges for the correct answers. The panel decided that the construct for the correct answer would be the age range for which mothers would need no further counselling if they answered within this range. A modified Delphi method (Brooks 1979) was used to establish the age ranges. This process consisted of one round of anonymous ratings, a face-to-face panel discussion and a second round of anonymous ratings immediately after the discussion. Finally, consensus was sought on items that did not result in similar age ranges. Initially, the instrument included 15 questions on when children first begin to demonstrate key developmental skills (referred to as the Developmental Skills Component) and 15 questions on when caregivers should begin to provide opportunities for children to stimulate their development (referred to as the Developmental Stimulation Component). Consensus agreement could not be reached on the correct ranges for six items and these were removed. The remaining items were pilot tested on a sample of 50 mothers with similar sociodemographic characteristics as the study sample. Four items were removed because they could not be understood consistently by the mothers. The age ranges of the...
final items were reviewed again in the scientific literature. Six of
the 10 Developmental Skills items that were found in the
Denver II standardization for Turkish children (Durmazlar et al. 1998) had the correct developmental age ranges within the 10th and 90th percentiles on the Denver II. Five of the 10 items were also found in the WHO multinational study on monitoring child development (Lansdown et al. 1996) and the age ranges were similar. As ranges in attaining milestones normally increase with child age, ranges for correct ages also increased. For example, the correct age range for the question ‘when do children begin to smile socially, that is smile into the face of another person?’ was from birth to 2 months, whereas the correct age range for ‘when do children begin to say single meaningful words?’ was 9–14 months. Following the establishment of the age ranges, a scoring system was developed. Answers that fell within the correct range were given 2 points. Answers that fell 1 month below or above these correct ranges were given 1 point; all other answers were considered incorrect and received 0 points. The same scoring system was used throughout the instrument for questions related to all age groups.

Table 1 shows the final instrument and the age ranges that were considered as correct by the expert panel. The instrument hereby referred to as the Caregiver Knowledge of Child Development Inventory (CKCDI) consists of 10 questions in the Developmental Skills Component and 10 questions in the Developmental Stimulation Component. The range of scores is 0–40 with higher scores indicating more knowledge.

Field study
This cross-sectional observational study was conducted in two cities in Turkey. Izmir on the Aegean coast is the most westernized and the third largest city in Turkey with a population of 3.3 million and Mersin on the Mediterranean coast is the eighth largest city with a population of 1.6 million and a large influx.

<table>
<thead>
<tr>
<th>Questions (correct age ranges receiving 2 points)</th>
<th>Rotated component*</th>
<th>% incorrect answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When does a child’s brain begin to develop and learn? (inutero or birth)</td>
<td>1 (0.31)</td>
<td>67.7</td>
</tr>
<tr>
<td>2. When do children begin to see? (inutero or from birth)</td>
<td>1 (0.46)</td>
<td>52.2</td>
</tr>
<tr>
<td>3. When do children begin to follow a moving person or toy, with their eyes? (birth to 2 months)</td>
<td>1 (0.64)</td>
<td>30.3</td>
</tr>
<tr>
<td>4. When do children begin to vocalise in response to someone talking to them? (birth to 2 months)</td>
<td>1 (0.62)</td>
<td>78.8</td>
</tr>
<tr>
<td>5. When do children begin to smile socially, that is smile into the face of another person? (birth to 2 months)</td>
<td>1 (0.71)</td>
<td>58.8</td>
</tr>
<tr>
<td>6. When do children begin to say single meaningful words? (9–14 months)</td>
<td>2 (0.41)</td>
<td>31.9</td>
</tr>
<tr>
<td>7. When do children begin to play imaginary play like feeding a doll or driving a toy car?</td>
<td>2 (0.47)</td>
<td>20.7</td>
</tr>
<tr>
<td>(12–24 months)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. When do children begin to reach for a toy in front of them? (4–5 months)</td>
<td>3 (0.47)</td>
<td>19.3</td>
</tr>
<tr>
<td>9. When do children begin to grasp tiny things like raisins, with their fingertips? (7–9 months)</td>
<td>3 (0.30)</td>
<td>35.3</td>
</tr>
<tr>
<td>10. When do children begin to walk alone with good co-ordination? (10–15 months)</td>
<td>3 (0.31)</td>
<td>11.0</td>
</tr>
<tr>
<td>11. When should mothers begin to talk to children? (inutero or birth)</td>
<td>1 (0.39)</td>
<td>50.0</td>
</tr>
<tr>
<td>12. When should mothers begin to show colourful objects to children to help them practise reaching? (0–4 months)</td>
<td>1 (0.33)</td>
<td>34.4</td>
</tr>
<tr>
<td>13. When should mothers begin to teach children to count? (12–24 months)</td>
<td>2 (0.69)</td>
<td>25.8</td>
</tr>
<tr>
<td>14. When should mothers begin to teach children colours? (12–24 months)</td>
<td>2 (0.72)</td>
<td>37.4</td>
</tr>
<tr>
<td>15. When should mothers start to give children a spoon or a fork to let them eat by themselves? (9–12 months)</td>
<td>2 (0.47)</td>
<td>60.3</td>
</tr>
<tr>
<td>16. When should mothers begin to give children paper and crayons to draw and colour? (12–24 months)</td>
<td>2 (0.61)</td>
<td>40.8</td>
</tr>
<tr>
<td>17. When should mothers begin to let children sit with support? (3–4 months)</td>
<td>3 (0.54)</td>
<td>64.7</td>
</tr>
<tr>
<td>18. When should mothers begin to give children clean and safe objects or toys which they can mouth? (4–6 months)</td>
<td>3 (0.53)</td>
<td>29.3</td>
</tr>
<tr>
<td>19. When should mothers begin to look at childrens’ books with their children? (4–6 months)</td>
<td>3 (0.31)</td>
<td>95.2</td>
</tr>
<tr>
<td>20. When should mothers begin to give children clean and safe household items to play with? (4–6 months)</td>
<td>No factor loading</td>
<td>76.1</td>
</tr>
</tbody>
</table>

*Component 1: cognitive and social-emotional development of young infants; component 2: cognitive and social emotional development of toddlers; component 3: gross and fine motor development.
from the least developed parts of the country. These two cities were chosen because they were the piloting sites for the Turkish Ministry of Health Early Childhood Development Training Program. For representative sampling, the local health departments in both cities provided census street maps of districts that were served by the healthcare stations. The homes to be visited were determined by random sampling of building numbers. In each city, a random sample of 600 mothers was selected. Thirty-two home visiting nurses at 12 different healthcare stations blinded to study hypotheses were trained in administering the instruments and visited homes that were selected. All mothers that were at home at the time of the visit and had a child aged 36 months or under were included in the sample. After oral consent to participate in the study was obtained, the CKCDI and questions on socio-demographic characteristics were read to the mothers and recorded immediately by the interviewers. The study was approved by the Ethics Committee of Ankara University.

Statistical analysis

The internal consistency of the CKCDI was computed with Cronbach $\alpha$ and construct validity was examined by using factor analysis. The first hypothesis that most mothers’ knowledge of child development would be low was determined by examining the descriptive statistics of each item and percentages of mothers that reported correct answers. For the analysis of the second hypothesis, in a linear regression model, we examined the independent effects of sociodemographic variables on CKCDI scores. The variables that were included in the initial analysis were maternal and paternal age, education, employment status, living with nuclear versus extended family, number of children in family, child age and city of residence. For all analyses, spss 10.0 was used (SPSS 1997).

Results

Sociodemographic characteristics of the families

A total of 1200 homes of children aged ≤3 years and living in the Child Development Program area were visited for the study. Eighty-six mothers and children were not at home at the time of the visit and 20 declined to participate. Of the 1094 mothers administered the CKCDI in their homes, 39 had key missing data such as the age of the child or mother and these were excluded from the study. Of the 1055 mothers with complete data (87.9%), 539 resided in Mersin (51.1%) and 516 in Izmir (48.9%). As shown in Table 2, the sample was evenly split in gender, the median age of the children was 15 months and most families had two or more children (54%). Most mothers (98%) were above 20 years of age, had at most secondary school (8 years) education (64%) and did not work outside the home (89%). More than half of the fathers had at most secondary school education (52%) and were employed (95%). Most families had health insurance (67%), all had a television in their homes and 40% owned a private car. Traditional cultural practices of living with extended family (10%) and consanguineous marriages (18%) were present. Caregivers identified preferred sources of information related to child development as healthcare professionals (79.0%), family and friends (7.2%), television and radio (5.2%), and books and magazines (3.8%).

Psychometric properties of the CKCDI

The CKCDI was easy to administer, understandable and well accepted by the mothers. The instrument took approximately 5 min to complete. Table 1 shows the number of mothers that received a score of ‘0’ by providing answers that were more than 1 month earlier or later than the expert age ranges and also the
rate of ‘late answers’. The principal factor analysis of the 20 items with Varimax rotation and Kaiser normalization, shown in Table 1, revealed three factors. All items except one (number 20, Table 1) had a loading of $\geq 0.30$. These factors were determined to be (1) cognitive and social-emotional development of young infants (seven items in Table 1 pertaining to the development of infants under 6 months of age); (2) cognitive and social-emotional development of toddlers (six items in Table 1 pertaining to the development of toddlers aged 1 year or over); (3) gross and fine motor development (six items in Table 1). The Cronbach $\alpha$ of the components were 0.60, 0.60 and 0.38 for factors 1, 2 and 3 respectively. One item, ‘when mothers should begin to give children clean and safe household items to play with’, did not belong to any of the factors. This item was kept in the instrument because it did not affect internal consistency and the practice of using household materials such as pots and pans was a key component of developmental stimulation suggested by the WHO CDI. The internal consistency of the total 20-item scale was $\alpha = 0.61$.

**Knowledge of developmental milestones**

The mean CKCDI questionnaire score was 19.2 ($\pm 5.6$), with a median of 19.0 (range 1–35, 25th quartile 15; and 75th quartile 23). More than 50% of mothers believed that all except two developmental skills (grasping small objects with fingers and walking) and all developmental stimulation activities should occur at later than normative ages. Most mothers did not know that sight (52%), vocalization (79%), social smiling (59%) and overall brain development (68%) begin in the early months of life or that they should begin to talk to their children early (50%). There were nine items (45% of the instrument) that $\geq 50\%$ of mothers answered incorrectly. Four of these items were developmental skills and five were opportunities for developmental stimulation. Only one item ‘walking with good coordination’ was answered correctly by $\geq 80\%$ of the mothers. The timing of the developmental skill that was known correctly by the least number of mothers (21%) was ‘vocalizing in response to someone talking’. The timing of the activity that was known correctly by the largest number of mothers (74%) was ‘when to begin teaching children how to count’. The timing of the activity that was known correctly by the least number of mothers (4.8%) was ‘when to begin looking at books with children’.

The Spearman correlation coefficient between the Developmental Skills Component total score and Developmental Stimulation Component total score was $r = 0.28$ ($P < 0.001$). In a linear regression model that included the CKCDI score as the dependent variable and age of index child, number of children in family, maternal and paternal age, education, employment status, living with extended versus nuclear family, consanguinity, city of residence as independent variables, higher maternal education and lower number of children were found to be the significant independent predictors of higher CKCDI scores ($P < 0.001$). The model explained only 0.04% of the variance in CKCDI scores.

**Discussion**

This is the first population-based study to examine maternal knowledge of child development in urban environments in a developing country. We have shown that a large number of mothers living in two cities in Turkey were lacking in knowledge of when basic developmental skills of infants and young children emerge and when they should begin to provide simple opportunities that support child development. Mothers believed that most developmental skills and activities occur at later than normative ages. Most mothers did not know that sight, vocalization, social smiling and overall brain development begin very early in life or that they should begin to talk to their children early. Although the association was weak, maternal education and the number of children were the two sociodemographic factors that were significantly related to maternal knowledge of child development. Mothers with higher education and fewer children had higher scores on the CKCDI.

The CKCDI was developed after an extensive review of existing instruments on measuring maternal knowledge of child development. This instrument identifies whether caregivers are aware of when infants and young children begin to acquire basic developmental skills and when caregivers should begin to provide children with basic opportunities for developmental stimulation. The instrument parallels ‘Care for Development’ an intervention that the WHO is promoting worldwide and can be used in conjunction with this intervention (WHO 2001). Maternal knowledge of when children begin to acquire developmental skills and their knowledge of when mothers should begin to provide opportunities for stimulating development were significantly correlated and did not appear in the factor analysis as separate constructs. Rather, knowledge of both when skills emerge and when stimulation should be provided for the social, emotional and cognitive development of young infants, toddlers and motor skills appeared as three separate factors in the factor analysis.

Cross-cultural studies and research on minority and immigrant populations in Western countries have shown that mothers from different cultures have different patterns of knowledge of child development (Sistler & Gottfried 1990;
There are few studies conducted in developed countries about maternal knowledge of children’s developmental skills and when mothers believe they should begin to provide opportunities for the developmental stimulation of young children. A study conducted in the 1970s in Israel found that lower class mothers of Asian or African origin perceived infants to attain developmental skills later and they provided later ages to begin caregiving activities that support child development. These mothers were less likely than those of European decent and higher socio-economic status to believe that it was possible to influence child development (Ninio 1979). In the villages in north-eastern Thailand, only 2% of mothers of children aged 2 years were found to be aware that infants could see after birth (Kotchabhakdi 1993). Our sample of more educated and prosperous urban women, only 25% of mothers knew that newborns could see. A study in rural China showed that 52% of infants were placed in swaddling clothes and were given little opportunity for movement or stimulation (Li et al. 2000).

The ‘timing’ of mothers’ knowledge and beliefs has important implications. Studies have found that if mothers incorrectly believe that developmental skills should be acquired unrealistically early, they may be less tolerable of infantile behaviours and that this may constitute a risk factor for child abuse (Dukewich et al. 1996). If mothers believe that developmental skills emerge at a later age than normal, they may be less likely to expect these skills from their own children. This ‘later attribution’ found in our study has two important consequences. First, mothers may not provide adequate stimulation to help these skills emerge. The second consequence of not knowing that developmental skills emerge at a later age than normal, they may be less likely to expect these skills from their own children. This ‘later attribution’ found in our study has two important consequences. First, mothers may not provide adequate stimulation to help these skills emerge. The second consequence of not knowing that developmental skills emerge at earlier months is the missed opportunity for the detection of developmental delay. In countries where health services are not readily providing developmental surveillance, it falls on the family to identify developmental delay or disability in their children. In Brazil, in a population where most mothers had less than 8 years of education, it has been shown that the sensitivity and positive predictive value of the mother’s report of developmental concerns was low (de Lourdes Drachler et al. 2005). Based on this study, the use of developmental surveillance based on caregiver report has been questioned (Lagerberg 2005). The link between caregiver knowledge of child development and the identification of developmental delays needs to be further investigated in developing countries.

Our results indicate that maternal education was an independent factor associated with maternal knowledge of child development. The link between maternal education and knowledge of child development although seemingly logical merits reflection in its interpretation. The Turkish education curriculum does not include teaching child development. We speculate that maternal education increases knowledge of child development in more indirect ways than providing information. Higher education in women in developing countries may be associated with increased trust that they have power to change the environment, increased alertness and observational skills, increased modernization and decreased reliance on traditional views. A study in Israel on two generations of Yemenite and Kurdish Jews in the 1980s found that modernization was associated with an attribution of greater competence to the young infant, as well as increased recognition of the psychological characteristics and needs of the infant (Frankel & Roer-Bornstein 1982). Further research is needed on the mechanism by which maternal education increases knowledge of child development and how this effect can be maximized. Interestingly, the number of children in a family was inversely related to maternal knowledge of child development. Although most of the answers to the questions on the CKCDI can be learned by observing children, mothers with higher number of children were less knowledgeable about child development than mothers with fewer children. In Turkey, traditional families have higher numbers of children. Independent of maternal education, the choice for fewer children may be related to increased modernization and also to the desire of the mother to give more time to her children and influence their development. In the linear regression model, although lower number of children and higher maternal education were the variables predicting higher CKCDI scores, only a small percentage of the variance was explained by this model. Variables including mothers’ cognitive abilities, mental health, previous experiences with child rearing such as caring for other siblings, cultural factors related to place of origin, religion and ethnicity that were not questioned in this study and may be associated with CKCDI scores.

Maternal depression is increasingly identified as an important risk factor for child health and development (Patel & Prince 2006; Rahman et al. 2007; Sohr-Preston & Scaramella 2006) and the treatment of maternal depression has been shown to improve behavioural and developmental problems in children (Weissman et al. 2006). As the strong link between maternal depression and child health and development increasingly is being investigated, the association between maternal depression and maternal knowledge of child development also merits study.

We reviewed year 2003 census data (Turkey Demographic & Health Survey 2003) to determine limitations in the generalizability of our results. Our study employed a method of population-based random sampling, but because of the differ-
ences in the demographic characteristics of the two cities, our results can not be fully generalized to the country as a whole. Although we oversampled mothers who did not work outside the home, our sample is similar to census data related to maternal employment. Marked differences exist, however, in other important parameters. Only 9% of mothers in our sample had less than primary school education, whereas this rate is 22% in Turkey. The educational and employment status of the fathers was also higher than the overall Turkish population. These findings indicate that maternal knowledge of child development may be even lower in the less educated general population in Turkey.

The results of our study draw attention to the need for counselling caregivers on child development in Turkey. We sampled from two developed urban settlements in Turkey, where most of the population has some years of schooling, can read and write and have access to media. Even under these circumstances that are more advanced than other developing countries, most mothers were in need of being informed about when basic developmental skills of infants and young children emerge and when to begin providing opportunities that stimulate child development. There are a few controlled studies of interventions that aim to increase maternal knowledge of child development in developing countries. A study evaluating the effect of a parenting programme in Israel found that the intervention was successful in enhancing maternal knowledge of infant developmental skills and activities that mothers can do to support these skills (Parush & Hahn-Markowitz 1997). A seminal study of malnourished infants in Jamaica demonstrated that the developmental stimulation mothers provide can be increased and this can result in improvement of child development (Grantham-McGregor et al. 1991). Mothers in our study identified healthcare professionals as the number one resource that they would like to turn to about their child’s development. The simple intervention of the WHO CDI that delivers basic information on infant and young child development through acute healthcare encounters has also been found to be successful in enhancing the opportunities for stimulation of children in their home environments (Ertem et al. 2006). This evidence implies that caregivers are open to new information about young child development and can be stimulated through interventions to enhance their children’s development.

In conclusion, maternal knowledge, beliefs and attitudes related to child development and factors that are associated with maternal knowledge need to be further investigated so that culture-specific, focused and effective interventions can be planned for families of young children living in Turkey. The CKCDI may be adapted as an instrument to determine caregiver knowledge of child development in other developing countries as well, so that caregivers who are in greater need for information and support can be targeted.

Acknowledgements

This study was supported by a grant from the National Institute of Health (NIH R21 TW006678-01; CFDA Number 93.9899 ‘Promoting Child Development: Yale-Ankara Collaboration’ Project) and support from the Turkish Ministry of Health and UNICEF-Turkey. We would like to thank Drs John M. Leventhal, Sarah M. Horwitz, Brian Forsyth and Linda Mayes for their suggestions in the development of the CKCDI analysis of the data and their comments on the manuscript the Izmir and Mersin Maternal Child Health Department for assisting in data collection and Nermin Sezer for data entry.

References


Maternal knowledge of child development

SPSS (1997) For Windows Production Facility Release 10.0, Copyright SPSS Inc.