Maternal Insomnia and Children’s Family Socialization Environments

Alice M. Gregory, PhD\(^1\); Terrie E. Moffitt, PhD\(^2\); Antony Ambler, MSc\(^3\); Louise Arseneault, PhD\(^3\); Renate M. Houts, PhD\(^3\); Avshalom Caspi, PhD\(^3\)

\(^1\)Goldsmiths, University of London, London, UK; \(^2\)Duke University, Durham, NC; \(^3\)King’s College London, London, UK; \(^4\)University of Otago, Dunedin, New Zealand

**Study Objectives:** To examine concurrent associations between maternal insomnia and different aspects of the family socialization environment.

**Design:** Mothers reported on their symptoms of insomnia in a private standardized interview and interviewers evaluated the family socialization environment using the Coder’s Inventory.

**Setting:** Assessments were conducted in participants’ homes within the U.K.

**Patients or Participants:** One thousand one hundred sixteen mothers of British children enrolled in the Environmental Risk (E-Risk) study were invited to participate when their children were aged 12 years.

**Interventions:** N/A.

**Measurements and Results:**

- After controlling for family socioeconomic status (SES), mothers’ relationship status, and maternal depression, maternal insomnia was associated with a poorer family socialization environment ($\beta = -0.10$, [95% confidence intervals (CI) = -0.16, -0.04], $P < 0.001$).
- When family socialization environment subscale scores were examined, after controlling for family SES, mothers’ relationship status, and maternal depression, maternal insomnia was associated with greater chaos ($\beta = 0.09$, [95% CI = 0.03, 0.15], $P = 0.002$), greater child neglect ($\beta = 0.13$, [95% CI = 0.07, 0.18], $P < 0.001$), less happiness ($\beta = -0.13$, [95% CI = -0.18, -0.07], $P < 0.001$), less child stimulation ($\beta = -0.06$, [95% CI = -0.11, 0.00], $P = 0.043$), but not poorer state of the home, such as orderliness ($\beta = -0.04$, [95% CI = -0.10, 0.02], $P = 0.182$).

**Conclusions:** Maternal insomnia is associated with the family socialization environment. This finding emphasizes the need to consider insomnia in the family context.

**Keywords:** Environment, E-Risk, family, home, insomnia, maternal, socialization

**Citation:** Gregory AM; Moffitt TE; Ambler A; Arseneault L; Houts RM; Caspi A. Maternal insomnia and children’s family socialization environments. SLEEP 2012;35(4):579-582.

**INTRODUCTION**

Sleep is an important aspect of family life. When sleep is disturbed and insomnia occurs, the impact of this problem can extend beyond the sufferer to the wider family. Indeed, adults suffering sleep disturbance and insomnia may experience difficulties in areas that can be central to family life, including relationships and employment. The family socialization environment provided for children, such as the predictability of the daily schedule and the level of noise experienced in the home, is an important feature of home life as this is a known predictor of child development. Given that sleep disturbance is associated with difficulties in various aspects of life, but that the links between maternal insomnia and the family socialization environment provided for children have not been well established, this was our focus. As insomnia is typically more common in females than males, we targeted a sample of 1116 mothers and examined concurrent links between insomnia and different aspects of the family socialization environment.

**METHOD**

**Participants**

Participants were mothers of children in the Environmental Risk (E-Risk) Longitudinal Twin Study. The base sample of the E-Risk Study was formed in 1999-2000, when 1116 mothers with 5-year-old twins (93% of eligible families) participated in home-visit assessments. Participants represented the full range of socioeconomic status in the general population of Britain, and more than 90% were Caucasian. The mean number of children in each family was 3.6 (range 2 to 14). This paper focuses on an assessment conducted in 2007-2008 (96% participation rate; mean age = 40 years; range 26-55 years; SD = 5.8 years) during which insomnia symptoms were assessed for the first time in these women. Participants gave written informed consent before participating. The Maudsley Hospital Ethics Committee approved each phase of the study.

**MEASURES**

**Family Socioeconomic Status**

Family socioeconomic status was assessed by means of a composite of parental income, education and occupation as asked in the British Social Attitude survey series. This measurement considered the family as a whole, by assessing total household income (from all sources) and the highest social class and education of the mother or father. This composite score was split into tertiles prior to analyses.

**Relationship Status**

Mothers’ relationship status was determined by means of an interview. Responses were categorised into 2 groups (0 = married/cohabiting with a partner, 77%; 1 = single).

**Maternal Insomnia**

Mothers reported on their symptoms of insomnia in a private standardized interview. A diagnosis of insomnia was made.
based largely on the criteria outlined by the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV). Specifically, mothers were asked if they experienced difficulty falling asleep, difficulty staying asleep, or problems waking too early. Answers were provided on a 5-point scale (0 = none; 1 = mild; 2 = moderate; 3 = severe; 4 = very severe). Mothers were also asked “how much do sleep problems interfere with your daily functioning?” (1 = not at all to 5 = very much). If mothers reported a sleep difficulty that they considered to be “severe” or “very severe” and reported an interference score ≥ 3, they were considered to have insomnia. Based on these criteria, 9.6% of mothers reported insomnia.

Maternal Depression

Mothers’ depression was assessed using the Diagnostic Interview Schedule® according to DSM-IV® criteria. The past year prevalence of maternal major depressive disorder (MDD) was 13.7%.

The Coder’s Inventory: Family Socialization Environment

The Coder’s Inventory was designed for the purposes of this study in order to gain an in-depth understanding of the home environment and interfamilial relationships. The inventory uses the skills and knowledge of the interviewers who evaluate aspects of the home and family at the end of their 2- to 3-hour home visit. Interviewers underwent 4 days of training to ensure that results were consistent. Two interviewers visited each family: one interviewed the mother, the other tested the twins, and both rated the family environment. Their agreement exceeded 80%. The Coder’s Inventory is based largely on the criteria outlined by the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) and (2) observational techniques used by the University of Washington Parenting Clinic. Each item on the Coder’s Inventory was coded on a 3-point scale (0 = no; 1 = a little/somewhat; 2 = yes). The inter-rater reliability of the Coder’s Inventory scales was substantial (negative correlations from -0.81 to -0.64; positive correlations from 0.44 to 0.57). A principal component analysis revealed one factor with an eigenvalue of 3.16, accounting for 63% of the total variance. All socialization environment scales loaded onto this factor well (negatively [-0.81 to -0.83] and positively [0.73 to 0.80]). We calculated a composite children’s family socialization environment score as the sum of the 5 subscales (reverse coding subscales, so that higher scores represented a richer family socialization environment). The internal consistency for the composite scale was α = 0.84.

State of the home

State of the home was evaluated by 3 questions: “Is visible rooms of the house clean?”; “Is the interior of the house or flat dark or perceptually monotonous?”; “Are the rooms overcrowded and overly cluttered?” The mean of the items was obtained (M = 1.46; SD = 0.41). The inter-rater reliability of the state of the home scale was r = 0.89.

Child stimulation

Child stimulation was evaluated by 6 questions: “Are the children’s room(s) decorated in a way which is appealing to a child of that age?”; “Do the children have age appropriate toys and puzzles?”; “Do the children have books?”; “Do children have a radio, tape recorder or musical instrument?”; “Is the children’s art work displayed in home?”; “Does the family encourage the children to develop or sustain hobbies or sports?” The mean of the items was obtained (M = 1.67; SD = 0.50). The inter-rater reliability of the child stimulation scale was r = 0.76.

Statistics

Regression analyses were used to examine the associations between the composite children’s family socialization environment score (dependent variable) and maternal insomnia (independent variable) after adjusting for family SES, mothers’ relationship status, and maternal depression. Maternal depression was controlled in analyses, given the known associations between sleep difficulties and depression (see DSM-IV). Indeed, within our sample, 26% of depressed mothers also suffered insomnia, whereas only 7% of non-depressed mothers suffered insomnia (χ² = 50.62, P < 0.001). We conducted the analyses separately for the 5 family socialization environment scales to see whether maternal insomnia is associated with cer-
previous research, has demonstrated a dose-response relation-
environment (such as a chaotic, noisy, or unhappy home) could
vision of a poor home environment. Conversely, a poor living
are bidirectional and complex. Insomnia could lead to the pro-
We consider it likely that the associations between variables
informative about the direction of effects between variables.
has only been examined at one time-point so this study is not
-
-1.12 and 2.08). We repeated all regression analyses using these
transformed variables and observed a similar pattern of results.
-1.69 and 2.84). They were therefore transformed using a log
-1.07, \( P < 0.001 \) ), and lower levels of child stimulation
\( \beta = -0.06, [95\% \text{ CI} = -0.11, 0.00], P = 0.0433 \), but not with the
state of the home (\( \beta = -0.04, [95\% \text{ CI} = -0.10, 0.02], P = 0.182 \)).

Sensitivity Analyses

Dependent variables were skewed (initial skew between
-1.69 and 2.84). They were therefore transformed using a log
or square transformation as appropriate (final skew between
-1.12 and 2.08). We repeated all regression analyses using these
transformed variables and observed a similar pattern of results.
These sensitivity analyses strengthen confidence in our results.

DISCUSSION

These results are novel in demonstrating a link between
maternal insomnia and children’s family socialization environ-
ments. Indeed, even after adjusting for family socioeconomic
status and maternal depression, maternal insomnia was associated
with all of the interviewer-rated socialization environment
variables (except for state of the home).

Three limitations must be considered. First, maternal sleep
has only been examined at one time-point so this study is not
informative about the direction of effects between variables.
We consider it likely that the associations between variables
are bidirectional and complex. Insomnia could lead to the pro-
vision of a poor home environment. Conversely, a poor living
environment (such as a chaotic, noisy, or unhappy home) could
cause or exacerbate symptoms of insomnia. Indeed, our own
previous research, has demonstrated a dose-response relation-

ship between family conflict during childhood and insomnia
experienced at 18 years of age.\(^{11}\) A third, unmeasured variable
(such as a highly demanding job) could lead to both maternal
insomnia and poor socialization environments—and could ac-
count for the associations reported here. Longitudinal data will
be vital in elucidating mechanisms underlying associations.

A second limitation is that this study focused on insomnia
in mothers exclusively. While the focus on mothers is advanta-
geous (females are more likely than males to experience insom-
nia\(^2\) and play a more central role in providing their children’s
socialization environment), additional information about patern-
alsleep would be informative.

The final limitation concerns measurement issues with re-
gards to the key variables. First, no duration information was
collected with regards to insomnia symptoms. Nonetheless, the
wording used to assess insomnia (e.g., “How much do your
sleep problems interfere with your daily functioning?”) was de-
dsigned to tap into ongoing sleep patterns rather than transient
incidents. Second, interviewers who assessed maternal insom-
nia also completed the Coder’s Inventory to report on the fam-
ily socialization environment, which means that associations
between the key variables may have been artificially inflated.
Finally, interviewers completing the Coder’s Inventory had
spent a relatively short time in the family home (up to 3 h), so it
may have been difficult to form impressions of certain aspects
of the family socialization environment (e.g., predictability of
the daily schedule).

Despite these limitations, the results reported here are im-
portant in adding to a body of literature highlighting nega-
tive correlates of insomnia and emphasizing the importance
of considering this common difficulty in the family context.
Indeed, it is possible that treating insomnia could have posi-
tive implications beyond helping the sufferer and could po-
tentially influence the socialization environment provided for
other members of the family. This study also suggests that
when assessing insomnia, it may be worthwhile addressing
whether those with children feel able to work within their
means to provide the optimal familial environment for their
children. When providing those experiencing sleep difficul-
ties with tips on improving the sleeping environment, it may
be valuable to provide additional information on improving
the family socialization environment more generally. Finally, finding that maternal insomnia is associated with the family socialization environment even after adjusting for depression, adds to the notion that insomnia should not always be considered as a symptom of depression—but has negative correlates independent of depression and so may warrant independent consideration in its own right.

ACKNOWLEDGMENTS

The authors are grateful to the Study mothers and fathers, the twins, and the twins’ teachers for their participation. Our thanks to members of the E-risk team for their dedication, hard work, and insights. This work was performed at the Social, Genetic, Developmental Psychiatry Centre (from which data collection was organized) and Goldsmiths (from which the analyses were run and the manuscript was prepared). Financial support was provided by the Medical Research Council (UK-MRC Grants G9806489, G1002190), the Economic and Social Research Council (RES-177-25-0013), and NICHD (HD061298).

DISCLOSURE STATEMENT

This was not an industry supported study. Dr. Gregory is currently supported by a Fellowship from the Leverhulme Trust. Dr. Caspi is a Royal Society-Wolfson Research Merit Award holder. The other authors report no conflicts of interest.

REFERENCES