Maternal Insomnia and Children's Family Socialization Environments

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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 (β = -0.10, [95% confidence intervals (CI) = -0.16, -0.04], P < 0.001). When family socialization environment subscales were examined, after controlling for family SES, mothers' relationship status, and maternal depression, maternal insomnia was associated with greater chaos (β = 0.09, [95% CI = 0.03, 0.15], P = 0.002), greater child neglect (β = 0.13, [95% CI = 0.07, 0.18], P < 0.001), less happiness (β = -0.13, [95% CI = -0.18, -0.07], P < 0.001), less child stimulation (β = -0.06, [95% CI = -0.11, 0.00], P = 0.043), but not poorer state of the home, such as orderliness (β = -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
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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[1] and employment.[2] 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.[3] 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,[2] 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.[4] 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.[5] 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.[6] 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).[7] 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[8] according to DSM-IV[7] 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 two main sources: (1) the Home Observation for Measurement of the Environment (HOME)[9] and (2) observational techniques used by the University of Washington Parenting Clinic.[10] 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 established by having 2 interviewers visit 29 randomly selected families and independently evaluate the home following the assessment. There were ongoing analyses of the coder's results to maintain reliability and validity.

Chaos

Chaos was evaluated by 3 questions: "Is the house chaotic or overly noisy?"; "Is the use of the TV appropriate; used judiciously, not left on continuously?"; "Do children have a predictable daily schedule?" We recoded some items; thus higher scores indicated greater chaos. The mean of the items was obtained (M = 0.31, SD = 0.42). The inter-rater reliability of the chaos scale was r = 0.86.

Happiness in the home

Happiness in the home was evaluated by 3 questions: "Is this a happy home?"; "Do you think the parent is a good parent?"; "Does the parent enjoy parenting?" A mean of the items was obtained (M = 1.67, SD = 0.50). The inter-rater reliability of the happy home scale was r = 0.82.

Child neglect

Child neglect was evaluated by 5 questions: "Do you think the child has been neglected (basic needs)?" "Is the child well nourished?" "Did the child lack grooming and attention to personal hygiene?" "Was the parent aware of the children's needs? (i.e., requests for food, drink, attention. Took into account children's needs when making arrangements for the interview and during interview?")"; and "Do you think the parent is emotionally supportive of the child?" We recoded some items so that higher scores indicated greater neglect and the mean of the items was taken to produce a scale score. The family-level variable used in analyses was the mean of the scores for the 2 children in each family (M = 0.15, SD = 0.29). The inter-rater reliability of the child neglect scale was 0.78.

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 = 1.46; SD = 0.41). The inter-rater reliability of the child stimulation scale was r = 0.89.

State of the home

State of the home was evaluated by 3 questions: "Are 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?" We recoded some items, so that higher scores indicated that the home was in a better state. A mean of the items was obtained (M = 1.67; SD = 0.50). The inter-rater reliability of the state of the home scale was r = 0.76.

Children's family socialization environment: composite score

The correlations between the 5 socialization environment scales were substantial (negative correlations from -0.50 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.

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).[7] Indeed, within our sample, 26% of depressed mothers also suffered insomnia, whereas only 7% of non-depressed mothers suffered insomnia (χ^2 = 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-

Table 1—Associations between children's family socialization environment scores and maternal insomnia (after adjusting for family SES, relationship status, and maternal depression)

	Children's Family Socialization Environment Dependent Variable					
Independent Variable	**Composite** **β (95% CI)**	**Chaos** **β (95% CI)**	**Child Neglect** **β (95% CI)**	**Happy Home** **β (95% CI)**	**Child Stimulation** **β (95% CI)**	**State of the Home** **β (95% CI)**
Family SES	0.39 (0.32, 0.44)[d]	-0.35 (-0.40, -0.28)[d]	-0.23 (-0.28, -0.16)[d]	0.22 (0.16, 0.27)[d]	0.43 (0.37, 0.48)[d]	0.28 (0.22, 0.34)[d]
Relationship Status	-0.02 (-0.08, 0.03)	0.01 (-0.05, 0.06)	0.05 (-0.01, 0.10)	-0.06 (-0.11, 0.00)[a]	0.01 (-0.05, 0.06)	0.01 (-0.05, 0.07)
Maternal Depression	-0.14 (-0.19, -0.08)[d]	0.12 (0.06, 0.18)[d]	0.12 (0.06, 0.18)[d]	-0.18 (-0.24, -0.12)[d]	-0.06 (-0.12, 0.00)[b]	-0.05 (-0.11, 0.01)[a]
Maternal Insomnia	-0.10 (-0.16, -0.04)[d]	0.09 (0.03, 0.15)[c]	0.13 (0.07, 0.18)[d]	-0.13 (-0.18, -0.07)[d]	-0.06 (-0.11, 0.00)[b]	-0.04 (-0.10, 0.02)

For each model, the socialization environment variable is the dependent variable and maternal insomnia, family SES and maternal depression are the independent variables. [a]$P < 0.10$; [b]$P < 0.05$; [c]$P < 0.01$; [d]$P < 0.001$. Children's family socialization environment composite score, higher score = richer environment. Chaos, higher score = greater chaos. Child neglect, higher score = greater neglect. Happy home, higher score = happier home. Child Stimulation, higher score = greater stimulation. State of home, higher score = better state. Maternal insomnia coded as 0 = no sleep disturbance to 1 = sleep disturbance; Family SES coded from 1 = low to 3 = high; Relationship status coded as 0 = married/cohabiting with a partner; 1 = single; Maternal depression coded as 0 = no depression to 1 = depression.

tain aspects of the socialization environment to a greater extent than others.

RESULTS

As shown in Table 1, after controlling for family SES and maternal depression, maternal insomnia was associated with a poorer family socialization environment (β = -0.10, [95% confidence intervals (CI) = -0.16, -0.04], P < 0.001).

In separate regression models, after controlling for family SES and maternal depression, maternal insomnia was associated with greater chaos (β = 0.09, [95% CI = 0.03, 0.15], P = 0.002), greater child neglect (β = 0.13, [95% CI = 0.07, 0.18], P < 0.001), less happiness (β = -0.13, [95% CI = -0.18, -0.07], P < 0.001), and lower levels of child stimulation (β = -0.06, [95% CI = -0.11, 0.00], P = 0.043), but not with the state of the home (β = -0.04, [95% 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 environments. 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 provision 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 account 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 advantageous (females are more likely than males to experience insomnia[2] and play a more central role in providing their children's socialization environment), additional information about paternal sleep would be informative.

The final limitation concerns measurement issues with regards 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 designed to tap into ongoing sleep patterns rather than transient incidents. Second, interviewers who assessed maternal insomnia also completed the Coder's Inventory to report on the family 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 important in adding to a body of literature highlighting negative 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 positive implications beyond helping the sufferer and could potentially 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 difficulties 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.

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