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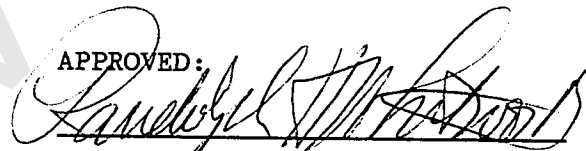
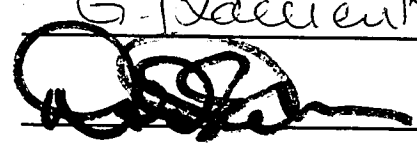
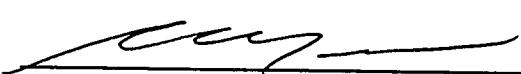
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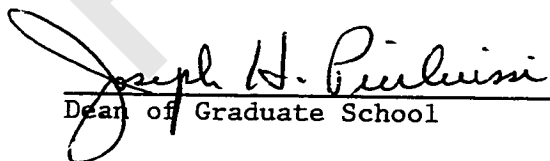
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PREVIEW

A CROSS-SECTIONAL STUDY OF SLEEP DISTURBANCE
IN THE FIRST YEAR OF LIFE

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Abstract

While there is a great deal of literature concerning sleep disturbance in adults and older children, very little is known about sleep problems occurring in early infancy. The present study examined the relationships between several aspects of infant and parent behavior, the diurnal patterns of sleep-wake behavior and their relationship to night waking in infants. A sleep questionnaire was mailed to parents of a cross-sectional sample of infants at the ages of 2 weeks, 3, 6, 9 and 12 months. Results showed a significant developmental trend in the frequency of night waking with a sharp decrease in waking from 2 weeks to 3 months of age increasing toward the end of the first year. Wakers also showed a tendency toward decreased amounts of sleep during the day. Differences in the waking behavior of breast-fed and non-breast-fed infants were observed with nursing infants waking significantly more at 3, 6, 9 and 12 months. Increased waking was also related to the presence of a recent stressful event in the family. The developmental pattern of waking behavior was found to differ between males and females with males waking more at 3 and 6 months while, at 9 and 12 months of age, females were found to wake significantly more than their male cohorts. Finally, comparisons of the previously applied definitions of waking revealed clear differences in the frequency of waking. The present methodology resulted in the strongest association with a measure of parental concern regarding their infant's sleep behavior.

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A Cross-Sectional Study of Sleep Disturbance in the First Year of Life

With the increasing awareness of the prevalence of various sleep disturbances and disorders within the population, researchers have begun to realize the importance of sleep in human functioning and well-being. Thus, current sleep research has turned to the study of clinical disorders and disturbances of sleep. These include the hypersomnias or disorders of excessive sleepiness, the insomnias or disorders of maintaining sleep, and the parasomnias or arousal disorders. Studies typically examine daytime sleepiness, waking behavioral functioning, and nighttime sleep state organization (Anders, 1982).

Although there is a great deal of literature concerning sleep disturbances in adults and older children, there are a limited number of studies which have investigated sleep problems in younger infants. The most prevalent sleep problems at this early age are problems of settling the infant to bed and night waking (Anders, 1982). In a study investigating night waking or sleep disruption, Moore and Ucko (1957) observed that, although 70% of the infants in a Central London sample had begun sleeping through the night by 3 months of age, approximately 50% of these infants reverted to waking for a period of at least four weeks during the second half of the first year. In a much later study, Carey (1974) reported results indicating that as many as 25% of infants between 6 and 12 months of age awakened regularly during the night. Bernal (1973) reported that, in a sample of infants followed longitudinally from birth to 14 months, 20% woke regularly enough during the night to be of concern to the parents. In addition to the evidence indicating the significant frequency with which sleep disruption occurs in very young infants, there is also evidence that a significant number of preschool children demonstrate this same disturbance. In a study investigating the sleep characteristics of one and two year old infants, Richman (1981) reported that 20% of the children at this age woke five or more nights a week. In a study of the sleep of 3-year-olds, Richman,

(1957) reported results showing a strong positive relationship between night waking and shifts and stresses in the environment. Other evidence supporting this theory was reported by Richman (1981) in her study of sleep disturbance in older infants. In this study, results showed that mothers of wakers had higher rates of psychiatric disturbance as defined by clinical criteria (i.e., scores on the Malaise Inventory). These mothers were also more likely to feel irritable. In-home interviews revealed increased signs of family tension for these mothers.

A closely related theory for the cause of night waking states that parental responses have a strong influence upon an infant's waking behavior. Bernal (1973) reported that night waking in infants was positively associated with maternal over-responsiveness. Similar findings are reported and it has been suggested that such over-responsiveness develops in order to cope with children who are difficult to pacify (Blurton-Jones et al. 1978). Other explanations for sleep disruption in infants include high activity levels in waking infants, the need for smaller amounts of sleep (Blurton-Jones et al. 1978), and breast-feeding (Carey, 1975). Breast-feeding has recently received a great deal of attention as a possible significant contributing factor in infant sleep disruption. Early studies reported that there were no differences in the frequency of night waking for breast-fed and bottle fed infants (Bernal, 1973; Moore et al., 1957). As a result of these early reports, breast-feeding was largely disregarded as a possible contributing factor to the problem of night waking. However, Carey (1975) reported results showing that, at 6 months of age, as many as 52% of breast-fed infants were categorized as night wakers, while only 20% of bottle fed infants showed the disturbance. For those infants nursed until 12 months and beyond, the frequency of waking increased to 66%. Two more recent studies also show conflicting results. In an investigation of the relationship between night waking and mother infant interactions, Paret (1983) reported no differences in the night waking of nine-month-old bottle fed infants. In contrast to this finding, Wright, Hamish, Macleod & Cooper (1983) reported highly significant

differences in the night waking of preschoolers ranging in ages from 2 to 4 years of age based on their feeding style during infancy (i.e. breast vs. bottle fed).

Researchers who have identified a relationship between breast-feeding have speculated on the underlying dynamics of this relationship. Carey (1975) points out that the nutritional value of breast milk is more than adequate. He hypothesizes that the differences in the waking behavior of breast and bottle fed infants may be the result of differences in mother-infant interaction. A nursing mother may be more likely to pick up and nurse her fussing baby who will in turn learn to expect such attention when he or she experiences any discomfort or awakening. Wright et al. (1983) also point out that the compositional differences of modern day formula and breast milk are small enough that nutrition and clearance through the infant digestive tract should not be considered significant factors in the relationship between breast-feeding and night waking. Their theory, which is essentially an expansion of Carey's, states that breast-feeding mothers are much less likely to perceive night waking as a problem in view of early breast-feeding experiences and are, therefore, more likely to be more tolerant of waking behavior at a later age.

Despite the current research effort to identify the causative factors of night waking in infancy, several studies have produced conflicting results. In a community survey of the sleep characteristics of infants ranging in age from one to two years, Richman (1981) reported that 13% of the sampled infants were waking five or more nights a week. However, in an earlier study, Bernal (1973) reported the frequency of the problem to be as high as 20% in the same age group. A similar discrepancy has occurred in the study of young infants. Moore and Ucko (1957) reported that approximately 20% of a sample of 160 infants were waking three or more nights a week at 9 months of age. In contrast, however, Carey (1974), utilizing somewhat stricter criteria, reported the frequency of sleep disruption to be as high as 25% for infants between 6 and 12 months of age. Although it is possible that the increased frequency

reported by Carey is due to the inclusion of a wider range of ages, one would expect a decrease in frequency due to the application of stricter criteria.

Although all the above mentioned studies reported significant numbers of infants demonstrating sleep disturbance, discrepancies in the reported results suggest that one should consider interpretations and conclusions regarding factors associated with night waking as tentative. The discrepancies in results regarding the association between breast-feeding and night waking have been previously discussed. However, results regarding the association between infant temperament and night waking are also inconclusive. Carey (1974) reported no significant differences between wakers and non-wakers in eight of nine measures of temperament, including adaptability. In contrast to this finding, Richman (1981), utilizing a similar version of the Carey temperament scale, reported significant differences in both malleability and rhythmicity in waking and non-waking infants.

These inconsistencies are most likely due to the lack of a standardized definition of what constitutes the disturbance of night waking. Several definitions of night waking have been applied. Moore and Ucko (1957) defined night waking as an infant in the first year of life waking and crying one or more times between midnight and 5 a.m. Carey (1974) utilized a similar definition, but, in order to be identified as a waker, an infant must also have been waking four out of seven nights for four consecutive weeks. Still a third definition identifies an infant as a waker if the problem has existed for more than three months, and he or she was waking five or more times a week (Richman, 1981). Richman also identified infants with severe waking disturbances using this same definition along with one or more of the following criteria: The infant must have been (a) waking three or more times a night, (b) waking for more than twenty minutes during the night, or (c) going into the parent's bed.

A second shortcoming of studies investigating sleep disturbance in early infancy is the lack of data regarding daytime sleep-wake behavior and its relation to sleep disruption. Although a few studies have examined the role of infant temperament in sleep

degree constitutes a problem if it does not distress the parents (Anders, 1981). Finally, the study sought to examine a number of infant and parent behaviors surrounding sleep and waking episodes throughout the diurnal cycle. These analyses include such variables as feeding, use of transition objects, and infant and parent behavior during a waking episode. Data regarding the general sleep environment were also collected. These analyses allowed a reexamination of key issues such as parent-infant interaction patterns, environmental stresses and breast-feeding based on the daytime as well as night behaviors.

It was expected that results would show a strong relationship between sleep disturbance and perinatal and environmental stresses just as Richman (1981) reported in her study of older infants. Breast-feeding in the first three months was predicted to show a strong relationship to night waking at all ages. Maternal responsiveness at waking was also expected to be related to increased waking. Although such relationships have not yet been examined, it may be, as Carey (1975) and Wright et al. (1983) suggest, that nursing mothers are more likely to respond to a waking infant than bottle feeding mothers. If this is the case, then one would expect to find, at some point early in the first year, bottle feeding infants waking as often as nursing infants but experiencing decreased parental response to those wakings.