

The Sleep Knowledge of Pediatricians and Child Neuropsychiatrists

Oliviero Bruni, M.D., Cristiano Violani, Ph.D., Anna Luchetti, M.D.,
Silvia Miano, M.D., Elisabetta Verrillo, M.D., Carlo Di Brina,
Donatella Valente, Ph.D., P.T.

Objective: To investigate the attitudes, practices and beliefs regarding children's sleep problems; their effect on the family; the actual treatment and beliefs of their efficacy; the basic knowledge of sleep and sleep disorders in children.

Methods: A two-page questionnaire was sent to a representative sample of 8050 pediatricians (PED) and 1515 child neuropsychiatrists (ChNP). Questionnaire consisted of several questions on estimation of prevalence of sleep disordered patients, on beliefs about children's sleep difficulties, on the prescribed treatments, on reported effectiveness and on the overall effects of sleep problems on the family. A second questionnaire named Sleep Knowledge Questionnaire (SKQ) consisted of 30 true/false questions on sleep issues concerning 6 areas: developmental issues, sleep hygiene, parasomnias, sleep apnea, narcolepsy and miscellanea.

Results: A total of 751 questionnaires were returned: 627 from PED and 120 from ChNP. PED indicated that 18.60% of their patients experienced sleep problems, a lower percentage than that indicated by ChNP (21.81%). Pharmacological treatment was prescribed by 58.54% of PED and by 61.21% of ChNP. Among non-pharmacological treatment, the majority of PED and ChNP recommended the establishment of a bedtime routine while a low percentage recommended Ferber's method. Both categories of physicians scored low in all areas of sleep knowledge investigated and particularly in questions about narcolepsy, sleep apnea and parasomnias.

Conclusions: Results of the present study supported the need for more education in sleep and sleep disorders among Italian physicians and the necessity to change the physicians' approach to childhood sleep problems. **(Sleep and Hypnosis 2004;6(3):130-138)**

Key words: *sleep knowledge, child, pediatricians, child neuropsychiatrists*

INTRODUCTION

About 20-30% of infants and children experience some type of sleep disturbance

From the Center for Pediatric Sleep Disorder Department Developmental Neurology and Psychiatry (Drs. Bruni, Luchetti, Miano, Verrillo, Valente, and Ottaviano) and Department of Psychology (Dr. Violani) University of Rome "La Sapienza," Italy

Address reprint requests to: Dr. Oliviero Bruni, Center for Pediatric Sleep Disorders Dept. Developmental Neurology and Psychiatry University of Rome "La Sapienza", Via dei Sabelli 108-00185 - Rome (Italy)
Phone: +39+06+44712257
Fax: +39+06+4957857
E-mail: oliviero.bruni@uniroma1.it

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which can be distressing to the children and to their parents and often affects parent-child, marital relationships, family life, cognitive and behavioural functioning and social interactions (1-4).

A recent study found that, during well-child visits for children in the first 5 years of life, sleep was the topic on which parents most often sought advice from others, exceeding eating and behavior problems and was as frequently discussed for 3 year old children as it was for

infants of 6 months, which indicated that the challenge of understanding and managing children's sleep did not simply get resolved during the opening months of the child's life (5).

Even though sleep disorders are very common and given their impact on quality of life, very little attention has been dedicated to educating physicians in this area. Recent studies showed that the time devoted to teaching students about sleep in medical school is very little and that physicians demonstrated a lack of knowledge about the diagnosis and management of specific sleep disorders (6-8). An early survey conducted in 1978 found that there was no systematic sleep teaching in U.S. Medical Schools: 46% of them offered no education or training in the area of sleep (9). An American Sleep Disorders Association (ASDA) task force found that 29% of 126 US medical schools reported no structured teaching time in sleep medicine and that only an average of 0.38 clinical teaching hours were devoted to pediatric sleep disorders, the least of any topic area surveyed (8).

A recent survey of 156 pediatric residency programs in the U.S.A. found that pediatricians receive a mean of 4.8 hours of instruction on sleep and sleep disorders, with a great variability across residency programs. In the same study the assessment of pediatricians' knowledge of sleep disorders showed that they are informed about sleep issues related to developmental areas and sleep hygiene but have a lack of knowledge about the diagnosis and management of specific sleep disorders such as narcolepsy and parasomnias (6). More recently, Owens et al. (7), assessing the general and specific sleep knowledge concerning clinical screening, diagnostic, and treatment practices for common pediatric sleep disorders, showed that pediatricians had the highest knowledge scores on items related to developmental and behavioral aspects of sleep and parasomnias, whereas the lowest scores were for items related to sleep disordered breathing, excessive daytime sleepiness, and sleep movement disorders.

However pediatricians felt confident about their own ability to screen, to evaluate and to treat sleep problems in children.

Most of these studies on knowledge and attitudes of pediatricians are conducted in American countries; since in the European countries there were no reports in this field, we conducted a study among Italian physicians to investigate the attitudes, practices and beliefs regarding children's sleep problems; their effect on the family; the actual treatment and beliefs of their efficacy; the basic knowledge of sleep and sleep disorders in children.

METHODS

We replicated and extended a study on sleep knowledge in two categories of physicians that are commonly involved in diagnosing and treating sleep problems in infancy: pediatricians (PED) and child neuropsychiatrists (ChNP) since they are the categories of physicians that are most involved in evaluating and treating pediatric sleep problems.

For the purpose of the study we used a set of two one-page questionnaires derived from Mindell et al. (6):

- the first questionnaire consisted of a section in which the physicians estimated the percentage of patients between 6 months and 4 years that experienced sleep difficulties and ranked a list of problems that parents are typically concerned about; the other section concerned the beliefs about children's sleep difficulties, the prescribed treatments, reported effectiveness and the overall effects of such problems on the family.

- the second questionnaire named Sleep Knowledge Questionnaire (SKQ) consisted of 30 true/false questions on sleep issues concerning 6 areas: developmental issues (questions 1-5), sleep hygiene (questions 6-11), parasomnias (questions 12-16), sleep apnea (questions 17-21), narcolepsy (questions 22-26) and miscellanea (questions 27-30). All questions concerned common sleep issues in

pediatric age and were based on basic and well-accepted facts. The original questionnaire, consisting of 50 true/false questions about various sleep issues, was initially pre-tested on 30 pediatricians. Following both qualitative and quantitative analyses concerning item reliability, inter-item consistency, and item discrimination, a final questionnaire was constructed consisting of 30 true/false questions, that identified the six above mentioned areas.

Knowledge was assessed through the percentage score (number of correct answers/number of questions *100) for each of the six areas and for the entire questionnaire.

The questionnaires were translated into Italian and a group of Italian sleep medicine experts analyzed the content of questions and their wording in order to ensure their accuracy. Face validity and item comprehension were tested on a small group of pediatric practitioners in Rome. With respect to the first translation, minor format modifications were made in order to improve intelligibility of questions.

Procedure

The two-pages questionnaire was sent to a representative sample of PED and ChNP chosen using the mailing lists of the respective National Societies. The questionnaires with pre-stamped and pre-addressed envelopes were sent to 8050 PED and 1515 ChNP. A cover letter which explained the aim of the study and emphasized the importance of the survey and the need for detailed responses by all participants was included in the mailing. Although basic demographic information was requested, the survey was otherwise anonymous. Due to limitation of budget and given the cost of pre stamped envelopes only one mailing was carried out.

Statistical analysis

All data were collected and entered into a

database. Data were then cross-tabulated and chi-square statistics were calculated in order to estimate differences between the two categories of physicians. T-test was also used to evaluate differences between the two independent groups. The significance level was $P < .05$. All statistical analyses were performed on a personal computer using the commercially available package program Statistica (TM) v. 5.5 (Statsoft Inc., Tulsa, OK).

RESULTS

Of a total of 9565 questionnaires, 822 (8.59%) returned back because of incorrect addresses or because persons were no more at the specified address.

A total of 751 questionnaires were returned: 627 (334 M; 293 F) from PED (return rate 7.79%) and 120 (68 M; 52 F) from ChNP (return rate 7.92%). Only four questionnaires (1 PED and 3 ChNP) were discarded because largely incomplete.

No differences for gender (chi-square=0.47; $p=0.49$, NS) and average year of graduation (PED=1974; ChNP=1976) were found between the two groups.

a) First questionnaire: prevalence of sleep problems and physicians' approaches

PED indicated that 18.60% of their patients experienced sleep problems, a percentage not significantly lower than that indicated by ChNP (21.81%; $X^2=0.66$; $p=0.42$).

On a list of typical parental concerns, sleep problems were placed at fourth place for PED after feeding, illness and growth and before motor development, language development, teething, behavior problems and toileting. ChNP ranked sleep problems at fifth place after feeding, language, illness and behavior problems and preceding motor development, growth, toileting and teething.

The question about factors that could affect childrens sleeping habits showed that

physicians considered mostly parental attention and handling at bedtime (PED 78.31% vs. ChNP 86.67%; $X^2=4.34$; $p<0.05$) and sleeping in the parent's bed (PED 64.43% vs. ChNP 70%; $X^2=1.38$; $p=0.24$). Less importance was given to feeding before bedtime (PED 28.07% vs. ChNP 16.67%; $X^2=6.77$; $p<0.01$) and to sharing a room with siblings or others (PED 22.33% vs. ChNP 17.50%; $X^2=1.39$; $p=0.24$).

The majority of physicians believed that children's insomnia has an impact on family happiness (PED 85.01% vs. ChNP 89.17%; $X^2=1.42$; $p=0.23$), parental depression (PED 46.73% vs. ChNP 59.17%; $X^2=6.24$; $p<0.05$) and work performance (PED 49.76% vs. ChNP 29.17%; $X^2=17.17$; $p<0.0001$), while marital satisfaction was considered to be less affected (PED 25.36% vs. ChNP 24.17%; $X^2=0.08$; $p=0.78$).

Several differences regarding the treatment of disorders of initiating and maintaining sleep were found between the two categories of physicians (Table 1). The majority of PED and ChNP recommended the establishment of a bedtime routine while a low percentage

recommended Ferber's method of letting the child cry with parental checks. A high percentage of physicians recommended modification of nap schedule, rocking the child, keeping the child up and avoiding intervention.

Pharmacological treatment was prescribed by 58.54% of PED and by 61.21% of ChNP; for PED's, antihistamines were prescribed most frequently, followed by herbal teas and phytotherapies (significantly different from ChNP) while benzodiazepines are prescribed more often by ChNP (significantly different from PED).

Almost all of the physicians believed that a treatment of the disorders of initiating and maintaining sleep is useful in the majority of cases (PED 92.03%; ChNP 90.83%; $X^2=0.19$; $p=0.66$) and they preferred behavioral approaches (PED 83.73% vs. ChNP 68.33%; $X^2=15.68$; $p<0.0001$). Pharmacological treatment was suggested in about 35% of cases (PED 36.20% vs. ChNP 36.67%; $X^2=0.01$; $p=0.92$) while psychotherapy was proposed by 13.72% of PED vs. 42.50% of ChNP ($X^2=55.72$; $p<0.0001$). A further question

Table 1. Kinds of treatment suggested by physicians.

| | PED | Ch NP | Chi-square | p |
|---|--------|--------|------------|--------|
| a. parental intervention | | | | |
| 1. ignore the child | 2.23% | 0.83% | 1,0 | NS |
| 2. graduated extinction | 35.57% | 20.83% | 9.86 | <.005 |
| 3. establish a bedtime routine | 83.41% | 76.67% | 3.15 | NS |
| 4. try to keep the child up prior to bedtime | 20.10% | 16.67% | 0.75 | NS |
| 5. change duration or number of naps during the day | 49.76% | 47.50% | 0.21 | NS |
| 6. soft music/rocking at bedtime | 44.34% | 57.50% | 7.01 | <.01 |
| b. pharmacological treatment | 58.54% | 61.21% | 0.22 | NS |
| Antihistamines | 52.31% | 44.17% | 2.67 | NS |
| Benzodiazepines | 4.63% | 21.67% | 42.89 | <.0001 |
| Imidazopiridines | 3.67% | 5.83% | 1.22 | NS |
| Neuroleptics | 2.07% | 4.17% | 1.88 | NS |
| Phytotherapics | 19.62% | 17.50% | 0.29 | NS |
| Herb teas | 52.79% | 35.00% | 12.75 | <.0005 |
| Other | 9.25% | 14.17% | 2.70 | NS |
| c. change the child's feeding schedule | 17.54% | 16.67% | 0.05 | NS |
| d. no intervention | 6.70% | 3.33% | 1.97 | NS |
| e. other | 11.64% | 24.17% | 13.40 | <.001 |

asked whether physicians told parents that their child will outgrow their sleep problem: PED's answered "usually or always" in 77.89% of cases while ChNP only in 28.45% of cases ($\chi^2=117.24$; $p<0.0001$).

b) Second questionnaire: Sleep Knowledge Questionnaire (SKQ)

The SKQ showed good internal consistency with a global Cronbach's alpha of 0.58 for PED and of 0.61 for ChNP.

T-test showed statistical differences between the two categories of physicians (Table 2) in the areas of sleep hygiene (PED scored better than ChNP), sleep apnea (PED scored better than ChNP) and narcolepsy (ChNP scored better than PED). Both PED and ChNP failed to achieve percentage score higher than 70 in all

To better understand the areas in which there was a need for more education we analyzed the questions that yield the highest percentages of incorrect answers: PED and ChNP made more than 50% mistakes on items 8 ("Rocking an infant to sleep before placing him/her in the crib is likely to be an effective strategy to improve sleep ability"), 11 ("An otherwise healthy teenager who sleeps until noon on the weekends is likely to be chronically sleep deprived") related to sleep hygiene; on item 13 ("Children who experience night terrors usually have emotional problems") related to parasomnias; on item 17 ("Like adults, most children with obstructive sleep apnea are obese males") related to sleep apnea and on items 23 ("Narcolepsy is a rare, sporadic condition that has no genetic implication") and 25 ("Some children will outgrow narcolepsy") related to narcolepsy.

Table 2. Comparison of percentage score* of the SKQ in PED and ChNP

| Category | PED | | | Ch NP | | | t-value | p |
|----------------------|-------|-------|--------|-------|-------|--------|---------|-------|
| | Mean | SD | Median | Mean | SD | Median | | |
| Developmental issues | 60.55 | 21.51 | 60 | 60.74 | 22.45 | 60 | -.087 | NS |
| Sleep Hygiene | 57.89 | 20.31 | 50 | 52.00 | 19.64 | 50 | 2.911 | .0037 |
| Parasomnias | 50.69 | 23.78 | 60 | 48.52 | 27.20 | 40 | .893 | NS |
| Sleep apnea | 52.69 | 23.58 | 60 | 46.71 | 24.55 | 50 | 2.515 | .0121 |
| Narcolepsy | 28.87 | 26.87 | 20 | 39.15 | 31.10 | 40 | -3.719 | .0002 |
| Miscellaneous | 70.67 | 23.54 | 75 | 72.34 | 21.45 | 75 | -.717 | NS |
| Total | 55.57 | 10.66 | 56 | 54.23 | 11.16 | 53 | 1.252 | NS |

* Percentage score= number of correct answers / number of questions *100

areas, except for Miscellaneous.

The SKQ results were also analyzed by splitting the sample into groups based on the years of experience and different kinds of practice. PED's in practice for more than 20 years scored lower than the younger ones with significant differences in Total ($F=5.21$, $p<0.005$), Sleep Apnea ($F=6.63$, $p<0.005$) and Miscellaneous ($F=4.98$, $p<0.005$) average scores, while no significant differences have been found among ChNP. Moreover, PED's with ambulatory practice scored significantly higher in the sleep hygiene area ($F=5.37$, $p<0.005$), while no differences have been found in ChNP's.

c) Face-to-face interview to a randomly selected group of pediatricians

Because of the low response rate we tested the validity of the results of the mail survey administering the questionnaire in face-to-face interview to a randomly selected group of 77 pediatricians in the urban area of Rome. The pediatricians were contacted by telephone and asked to participate in the survey, 10/77 (13%) refused the interview. The 67 pediatricians (CONT) that accepted to participate were then directly interviewed at their offices. Comparing the data of the interviews (CONT) with those of

Table 3. Comparison between PED and Control group

| Category | PED | | CONT | | t-value | p |
|----------------------|-------|-------|-------|-------|---------|----|
| | Mean | SD | Mean | SD | | |
| Developmental issues | 60.55 | 21.51 | 55.35 | 22.43 | 1.873 | NS |
| Sleep Hygiene | 57.89 | 20.31 | 56.99 | 21.40 | .342 | NS |
| Parasomnias | 50.69 | 23.78 | 46.84 | 23.69 | 1.260 | NS |
| Sleep apnea | 52.69 | 23.58 | 47.74 | 22.40 | 1.640 | NS |
| Narcolepsy | 28.87 | 26.87 | 34.83 | 31.55 | -1.692 | NS |
| Miscellaneous | 70.67 | 23.54 | 65.05 | 24.54 | 1.849 | NS |
| Total | 55.57 | 10.66 | 53.92 | 10.09 | 1.211 | NS |

the postal questionnaires it was found that there were statistical differences only concerning the attitude toward a pharmacological approach (PED 36.20% vs. CONT 16.42%; $p < 0.05$) and in particular the use of the antihistamines (PED 52.31% vs. CONT 32.84%; $p < 0.005$). The comparisons between the CONT group and the PED group did not show statistical differences also for the SKQ categories (Table 3).

DISCUSSION

This study represented the first attempt to evaluate the knowledge that pediatricians and child neuropsychiatrists have about sleep and related problems in a European country. Furthermore, it is the first study that compares sleep knowledge, attitudes and beliefs in two different categories of physicians.

The limited response rate of the mailing survey with pre-stamped and preaddressed answering envelopes might be due to the losses with a second class mailing and to the lack of a second mailing.

The low response rate could affect the interpretation of our findings, due to self-selection of the respondents, as we would expect that those who responded are likely to be those who know something about sleep or think that they do. Therefore, our results could be an overestimate of the knowledge in general population. Although this bias should be taken into account, administering the questionnaire through personal interviews to a sample of

pediatricians (CONT), with a high percentage of respondents, we found minimal differences limited to the attitude towards a pharmacological approach. We can explain this unique discrepancy by hypothesizing that, when directly interviewed, pediatricians had difficulty in admitting the large use of drugs and particularly of the antihistamines (the most widely used drugs for this kind of problem in Italy).

In fact, a review about the mail surveys published in medical journals (10) stated that "surveys with a very low response rate may provide a representative sample of the population of interest, and surveys with a high response rate may not", and that as long as one has sufficient cases for statistical analyses, the non response to surveys is only a problem when the respondents differ in a meaningful way from non-respondents.

Very few studies have been carried out on the evaluation of primary physicians or specialists in neurology and psychiatry awareness and their approaches to sleep disorders. Some papers analyzed the role of primary care in the management of insomnia (11,12) while others analyzed the sleep education of medical and psychology students (13-14).

Surveys underlined the crucial role of primary care physicians in the first management of insomnia and the related risks, such as non recognition of treatment-seeking patients, neglect of causal treatment, insufficient use of non-pharmacological therapy or inadequate dosage and/or duration of

hypnotic treatment (11). However, family physicians are best positioned to actively inquire into sleep habits and concerns about sleep; also, through education about sleep hygiene and appropriate use of hypnotic agents, most cases of insomnia can be managed effectively by primary care physicians without referral to a sleep specialist (15). Although pediatricians are the child's primary care physicians and should therefore be in the best position to provide initial management of this type of problem, the results of our study indicate that a substantial increase of their education in sleep medicine is necessary in order to provide adequate care.

In our study physicians interviewed reported that about 20% of their patients experience some type of sleep problem. This percentage is in agreement with different epidemiological studies showing a similar prevalence of sleep disorders (1,16) and also with recent survey on pediatricians showing that 22.8% of the respondents estimated that the overall percentage of sleep problems in their practice was between 26% and 50% (7).

The clinical relevance of sleep problems is confirmed by the fact that they were at fourth place for pediatricians and at fifth place for child neuropsychiatrists in a list of ten typical parental concerns.

Consistent with Adair et al.'s report (17) which found that parental presence at bedtime is associated with a higher rate of nighttime waking, physicians gave the greatest relevance to parental attention/handling at bedtime and to sleeping in parent's bed as the factors affecting the children sleeping habits.

The question about the treatment of disorders of initiating and maintaining sleep indicated that PED and ChNP often suggest treatments and interventions (such as nap schedule, rock child, keep the child up and avoid intervention) that could potentially worsen the problems. Further, we found some interesting differences between physicians about the use of behavioral techniques:

pediatricians are more prone to suggest the Ferber method and less prone to suggest the soothing techniques (e.g. rocking at bedtime).

Even though some studies showed the limited utility of pharmacological treatment of childhood sleep problems (18-19), a high percentage (about 60%) of the two classes of physicians recommended pharmacological treatments: antihistamines were the most widely suggested drugs, but pediatricians also suggested the use of herbal teas while child neuropsychiatrists more often suggested benzodiazepines. This result could be related to the selection of child neuropsychiatrists' patients. Also, the greater tendency of PED compared to ChNP to reassure parents that the child will outgrow the sleep problem could be due to the difference in their patients' population. However, pediatricians may be misinforming parents and ignoring the behavioral consequences of non-treated sleep problems (3-4).

The most relevant differences between Mindell's findings and the present study concerned the use of behavioral techniques and of pharmacological treatments: American pediatricians recommended more frequently the Ferber method (84.6% vs. 35.57%) and less frequently drug treatment (14.8% vs. 58.54%). The SKQ indicates that physicians are more informed about sleep issues related to development and miscellaneous than in areas related to sleep hygiene practices and to diagnosis and management of specific sleep disorders, such as narcolepsy, sleep apnea and parasomnias. The latter results are similar to those reported by Kales et al. (20) who showed that knowledge about parasomnias and narcolepsy was lacking in a high percentage of primary care physicians. In the same study, physicians overemphasized the significance of psychological factors in the etiology of childhood sleep disorders.

Comparing with American Pediatricians (6), both categories of Italian physicians had lower knowledge scores in all the different areas

surveyed and particularly in sleep apnea and narcolepsy. Also in Owens' recent survey, sleep apnea and excessive daytime somnolence were the areas with the lowest mean percentage of correct answers (7).

This lack of knowledge has also been confirmed in other physician's categories. A recent study aimed to determine attitudes and knowledge about sleep medicine among chest physicians showed that, although their performance on questions about sleep-disordered breathing was good, they performed very low on questions about "non-pulmonary" sleep disorders (21).

From our study it is evident that physicians in Italy are undereducated about sleep problems. This outcome could be due to the little attention paid to sleep education in medical schools and in residency programs in Italy. The attempt to investigate what sleep education that medical students receive in Italy was frustrating, since the decision about the subjects taught is left to the Lecturer. As of today data about sleep education in medical schools in Italy is not available and unofficial data showed that at the University of Rome "La Sapienza" less than half an hour of teaching is devoted to sleep during a typical degree in medicine and during the following residency. This problem is also common in other countries. A survey in all UK medical schools showed that the median total time given to sleep and its disorders in undergraduate teaching was five minutes; in USA (8) the mean number of teaching hours on sleep was 1.16 in

preclinical years and 0.90 in clinical years; regarding pediatric sleep disorders, medical schools devoted an average of 0.38 clinical teaching hours. Since in Italy there is scarce formal academic education on sleep disorders and treatment during medical graduation studies and residency, sleep knowledge is probably acquired through pharmaceutical booklets, informal medical and psychological sources and clinical experience. Finally this lack of knowledge is influenced by common sense and cultural practices. This has been confirmed by cross-cultural studies that showed that when sleep knowledge was not adequate, pediatricians tended to share many cultural assumptions with mothers and therefore were in agreement with several of their beliefs about sleep (5).

The results of this study supported the need for more education in sleep and sleep disorders in Italy and the necessity to change the physicians' approach to childhood sleep problems. The treatment of a sleep disorder in the pediatrician's office could start with educating caretakers about normal sleep according to the child's age and by providing information regarding the cause and the natural course of the problem.

Considering the explosive growth of basic and clinical research in sleep, the lack of clinical teaching in this area is problematic and despite the increasing evidence of the role of sleep in patient health and well-being it appears that the physician's education in this field is largely inadequate.

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