

Mental Health as a Public Health Issue: Mental Health and Sleep

This list of journal articles focuses on the multi-faceted connections between mental health and sleep. While many of the articles focus specifically on children, adolescents, and maternal-child dyads, others are broader population studies and research reviews. Because there has been a lot published on this topic, this list includes only a cross-section of articles published since 2000. Literature reviews appear first, followed by individual studies from the U.S. and other places in the world. *This list is offered as a supplemental resource to the video located at z.umn.edu/cmhpbh.*

Literature Reviews

Citation: Alfano, C. A., & Gamble, A. L. (2009). **The role of sleep in childhood psychiatric disorders.** *Child Youth Care Forum*, 38(6), 327-340.

Link: <http://link.springer.com/article/10.1007/s10566-009-9081-y>

Summary: This article summarizes existing research on the role of sleep in youth with psychiatric diagnoses, including early sleep problems as a risk for later pathology—identifying possible mechanisms and implications of early sleep problems. The authors present recommendations for practice for those involved in assessing and treating children and adolescents with psychopathology and sleep disorders.

Citation: Astill, R. G., Van der Heijden, K. B., Van Ijzendoorn, M. H., & Van Someren, E. J. W. (2012). **Sleep, cognition, and behavioral problems in school-aged children: A century of research meta-analyzed.** *Psychological Bulletin*, 138(6), 1109-1138.

Link:

https://www.researchgate.net/profile/Rebecca_Astill/publication/224869362_Sleep_cognition_and_behavioral_problems_in_school-age_children_A_century_of_research_meta-analyzed/links/0c96053830eec29d8a000000.pdf

Summary: This meta-analysis summarizes existing research on sleep, behavioral problems, and cognition in healthy children, ages 5 to 12 years. A total of 86 studies, representing 35,936 children. The findings for children on these factors are different than prior findings with adult populations, likely representing both differences in methodology and brain development. Shorter duration of sleep is associated with both more internalizing and externalizing behavioral problems. Insufficient sleep was also associated with deficits in cognitive functioning in the areas of higher-order thinking and complex cognitive functions.



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<http://www.extension.umn.edu/family/cyfc/>

Citation: Beebe, D. W. (2011). Cognitive, behavioral, and functional consequences of inadequate sleep in children and adolescents. *Pediatric Clinics of North America*, 58(3), 649-665.

Link: <http://www.sciencedirect.com/science/article/pii/S0031395511000186>

Summary: This article reviews literature on the correlations between the daytime functioning of children and adolescents and the quality and quantity of sleep they experience. Research findings are integrated into a model of developmental psychopathology. The authors make a call for policy and practice changes to improve children's and adolescents' sleep.

Citation: Chorney, D. B., Detweiler, M. F., Morris, T. L., & Kuhn, B. R. (2008). **The interplay of sleep disturbance, anxiety, and depression in children.** *Journal of Pediatric Psychology*, 33(4), 339-348.

Link: <http://jpepsy.oxfordjournals.org/content/33/4/339.full>

Summary: This article reviews literature on the association between sleep disturbance, depression, and anxiety in children. The authors found this area of intersectionality to be a small but growing research base indicating that there is significant overlap in symptoms between the three conditions. They include a number of recommendations for future study to grow the research base.

Citation: Ivanenko, A., & Johnson, K. (2008). **Sleep disturbances in children with psychiatric disorders.** *Seminars in Pediatric Neurology*, 15(2), 70-78.

Link: <http://www.sciencedirect.com/science/article/pii/S1071909108000326>

Summary: This article reviews literature on the epidemiology, clinical presentation, and treatment of sleep disturbances in children with common psychiatric diagnoses. Literature on co-occurring sleep disturbances with attention-deficit hyperactivity disorder (ADHD), anxiety disorders, mood disorders, bipolar disorder, and autism spectrum disorders (ASD) is reviewed.

Citation: Ohayon, M. M. (2002). **Epidemiology of insomnia: What we know and what we still need to learn.** *Sleep Medicine Reviews*, 6(2), 97-111.

Link: [http://www.smrj-journal.com/article/S1087-0792\(02\)90186-3/abstract](http://www.smrj-journal.com/article/S1087-0792(02)90186-3/abstract)

Summary: This article reviews literature on insomnia, including prevalence estimates, definitions, and co-occurring mental disorder-particularly major depressive illness. Suggestions for future research are made.

Citation: Palagin, L., & Rosenlicht, N. (2011). **Sleep, dreaming, and mental health: A review of historical and neurobiological perspectives.** *Sleep Medicine Reviews*, 15(3), 179-186.

Link: [http://www.smrj-journal.com/article/S1087-0792\(10\)00069-9/abstract](http://www.smrj-journal.com/article/S1087-0792(10)00069-9/abstract)

Summary: This article reviews literature on the history of theories relating to the function and origin of dreams and the relationship between dreams and mental illness as perceived across times and religious views.

Citation: Sadeh, A., Tikotzky, L., & Scher, A. (2010). **Parenting and infant sleep.** *Sleep Medicine Reviews*, 14(2), 89-96.

Link: <http://www.sciencedirect.com/science/article/pii/S108707920900046X>

Summary: This article reviews literature looking at the links between infant sleep, parental factors (e.g., behaviors, thoughts, emotions), and psychopathology. It addresses the literature within a transactional (parent-child/child-parent) framework. The authors conclude by outlining an agenda for future research and practice tips for professionals.

Citation: Stores, G. (2001). **Sleep-wake function in children with neurodevelopmental and psychiatric disorders.** *Seminars in Pediatric Neurology*, 8(4), 188-197.

Link: <http://www.sciencedirect.com/science/article/pii/S1071909101800267>

Summary: This article reviews literature about sleep disturbances in children with neurodevelopmental and psychiatric disorders. Sleep disturbances may originate within the neurodevelopmental or psychiatric disorder, from the child's circumstances, or be a comorbid condition along with the neurodevelopmental or psychiatric disorder. The author concludes that there is much research left to be done on sleep disorders in childhood, though there is enough known to better prepare professionals to recognize and manage sleep disturbances.

United States

Citation: Alfano, C. A., Ginsburg, G. S., & Kingery, J. N. (2007). **Sleep-related problems among children and adolescents with anxiety disorders.** *Journal of the American Academy of Child & Adolescent Psychiatry*, 46(2), 224-232.

Link: <http://www.sciencedirect.com/science/article/pii/S089085670961830X>

Summary: This study looked at sleep-related problems (SRPs) in children and adolescents with anxiety disorders and the impact of pharmacological treatment (fluvoxamine) to reduce SRPs in youth with anxiety disorders. The sample was comprised of 128 youth with anxiety disorders, ages 6 to 17 years, from across the country. Results indicated that SRPs were very common, with 88% experiencing at least one SRP, 55% experiencing three or more SRPs, and a positive association was evident between number of SRPs, severity of anxiety, and disruption in family functioning. The pharmacological treatment was found effective for reducing SRPs, with a significantly larger drop in SRPs for those on the medication than for those on the placebo.

Citation: Alfano, C. A., Zakem, A. H., Costa, N. M., Taylor, L. K., & Weems, C. F. (2009). **Sleep problems and their relation to cognitive factors, anxiety, and depressive symptoms in children and adolescents.** *Depression and Anxiety*, 26(6), 503-512.

Link: <http://onlinelibrary.wiley.com/doi/10.1002/da.20443/full>

Summary: This study looked at sleep problems and their association with symptoms of depression and anxiety, gender, and age. The sample included 175 urban children and adolescents, 6- to 17-years-old, of varied ethnic backgrounds. Results indicated that significant associations between sleep problems and symptoms of depression and anxiety existed, though varied by age with association between sleep problems and anxiety holding across ages and between depression and sleep problems most significant during adolescence.

Citation: DeVincent, C. J., Gadow, K. D., Delosh, D., & Geller, L. (2007). **Sleep disturbance and its relation to DSM-IV psychiatric symptoms in preschool-age children with pervasive developmental disorder and community controls.** *Journal of Child Neurology*, 22(2), 161-169.

Link: <http://jcn.sagepub.com/content/22/2/161.short>

Summary: This study looked at the relationship between psychiatric symptoms and sleep problems in children ages 3 to 5 years. The sample was comprised of 112 children with a diagnosis of pervasive developmental disorder and 497 children without a reported disability. Results indicated that both children with and without pervasive developmental disorder who had sleep disturbances exhibited more severe behavioral symptoms indicative of oppositional defiant disorder and attention-deficit hyperactivity disorder when compared to peers without sleep problems, suggesting commonalities in etiology.

Citation: Goldberg, W. A., Lucas-Thompson, R. G., Germa, G. R., Keller, M. A., Davis, E. P., & Sandman, C. A. (2013). **Eye of the beholder? Maternal mental health and the quality of infant sleep.** *Social Science & Medicine*, 79, 101-108.

Link: <http://www.sciencedirect.com/science/article/pii/S027795361200545X>

Summary: This study looked at concurrent and longitudinal associations between infant sleep and mothers' mental health during infants' first year of life. The sample included 171 culturally and economically diverse families in Southern California. Results indicated that mothers with poorer mental health reported being more bothered by their infants' sleep issues and that the association between maternal mental health and infant sleep were moderated by multiple factors such as culture, low family income, and high parenting stress.

Citation: Goyal, D., Gay, C., & Lee, K. (2009). **Fragmented maternal sleep is more strongly correlated with depressive symptoms than infant temperament at three months postpartum.** *Archives of Womens Mental Health*, 12(4), 229-237.

Link: <http://link.springer.com/article/10.1007/s00737-009-0070-9>

Summary: This study looked at what infant temperament may contribute to the relationship between maternal depressive symptoms and disturbed sleep. The sample include 112 couples who had been recruited from childbirth education courses. Results indicated that while infant temperament was associated with maternal sleep, it was not a significant predictor for maternal depressive symptoms. The authors suggest that postpartum doctor visits should include questions on maternal sleep so that interventions can be used, as needed, to help mothers get sufficient sleep, thereby reducing the risk for postpartum depression.

Citation: Gregory, A. M., & O'Connor, T. G. (2002). **Sleep problems in childhood: A longitudinal study of developmental change and association with behavioral problems.** *Journal of the American Academy of Child and Adolescent Psychiatry*, 41(8), 964-971.

Link: <http://www.sciencedirect.com/science/article/pii/S0890856709610777>

Summary: This study looked at the relationships between sleep and behavioral problems over time—their order of appearance, specificity, and developmental changed. The sample included 490 youth, 4- to 15-years-old, who were part of a longitudinal study of children growing up in adoptive and non-adoptive families. Results indicated that in general sleep problems decreased across time, though individual differences had modest stability, and that after accounting for a variety of variables (e.g., sex, adoptive status) sleep problems at 4 years predicted emotional/behavioral problems in mid-adolescence. Significantly increased correlation was note between sleep problems and anxiety/depression between 4 years of age and mid-adolescence.

Citation: Ivanenko, A., Barnes, M. E., McLaughlin, V., & Gozal, D. (2004). **Psychiatric symptoms in children with insomnia referred to a pediatric sleep medicine center.** *Sleep Medicine*, 5(3), 253-259.

Link: <http://www.sciencedirect.com/science/article/pii/S1389945704000474>

Summary: This study looked at the nature and frequency of psychiatric symptoms in children seeking evaluation for insomnia. The sample included 46 children who had been referred to a pediatric sleep center. Results indicated that half of the children with insomnia already had a diagnosis for another psychiatric disorder and of the half that didn't have an existing diagnosis, 40% displayed significant psychiatric symptoms. The authors suggest that findings suggest that a comprehensive psychometric assessment is warranted for children presenting with insomnia.

Citation: Ivanenko, A., Crabtree, V. M., O'Brien, L. M., & Gozal, D. (2006). **Sleep complaints and psychiatric symptoms in children evaluated at a pediatric mental health clinic.** *Journal of Clinical Sleep Medicine*, 2(1), 42-48.

Link:

https://www.researchgate.net/profile/David_Gozal2/publication/6280324_Sleep_complaints_and_psychiatric_symptoms_in_children_evaluated_at_a_pediatri_c_mental_health_clinic/links/0912f5102e4d180733000000.pdf

Summary: This study looked at the association between psychiatric symptoms and sleep problems in children receiving outpatient psychiatric evaluation. The sample included 174 children whose parents completed measures and were compared to a control group of 174 community children without reports of psychiatric problems. Results indicated significantly more widespread sleep problems in the focus population being evaluated for psychiatric disorders when compared to controls. Patterns of sleep disturbances differed for different psychiatric symptoms and diagnoses (e.g., ADHD, mood disorders, aggression).

Citation: Lee, S. Y., & Hsu, H. C. (2012). **Stress and health-related well-being among mothers with a low birth weight infant: The role of sleep.** *Social Science & Medicine*, 74(7), 958-965.

Link: <http://www.sciencedirect.com/science/article/pii/S0277953612000615>

Summary: This study looked at characteristics of sleep and the role of sleep in relation to depression, fatigue, and health-related quality of life (H-QOL). The sample of 55 first time mothers had preterm low-birth-weight babies in neonatal intensive care. Results indicated that mothers' self-reported poor sleep quality was significantly associated with fatigue, stress, and poor physical and mental H-QOL. The model showed that maternal stress was a contributor to poor quality sleep and depression, which were contributors to poor mental H-QOL. The authors conclude with discussion implications for prevention and intervention.

Citation: Mick, E., Biederman, J., Jetton, J., & Faraone, S. V. (2004). **Sleep disturbances associated with attention deficit hyperactivity disorder: The impact of psychiatric comorbidity and pharmacotherapy.** *Journal of Child and Adolescent Psychopharmacology*, 10(3), 223-231.

Link: <http://online.liebertpub.com/doi/abs/10.1089/10445460050167331>

Summary: This study looked at risk for sleep problems in youth with attention deficit hyperactivity disorder (ADHD), comorbid psychopathology, and pharmacotherapy. The survey sample included 122 youth with ADHD and 105 comparison youth without ADHD. Results indicated that after controlling for the impacts of stimulant medications and psychiatric comorbidity, few risks of sleep problems for youth with ADHD remained. Sleep disturbance was significantly associated with treatments using stimulant medications and comorbid anxiety and behavioral disorders.

Citation: Moore, P. J., Adler, N. E., Williams, D. R., & Jackson, J. S. (2002). **Socioeconomic status and health: The role of sleep.** *Psychosomatic Medicine*, 64(2), 337-344.

Link:

http://journals.lww.com/psychosomaticmedicine/Abstract/2002/03000/Socioeconomic_Status_and_Health_The_Role_of_Sleep.18.aspx

Summary: This study looked at sleep's potential role in mediating the connection between socioeconomic status (SES) and physical and mental health. The data used for analysis came from the Detroit Area Study (DAS), an interview study with a sample size of 1,139 adults ages 18- to 89-years-old. Results indicated that sleep quality may be a mediator between SES and physical and mental health. Also income seemed to be a mediator between education level and sleep quality and, by extension, physical and mental health.

Citation: Roberts, R. E., Roberts, C. R., & Duong, H. T. (2009). **Sleepless in adolescence: Prospective data on sleep deprivation, health and functioning.** *Journal of Adolescence*, 32(5), 1045-1057.

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2735816/>

Summary: This study looked at the incidence and persistence of sleep deprivation and its impact on interpersonal relations, psychological health, and somatic health within an adolescent population (11- to 17-years-old) from the Houston metropolitan area. Data came from the Teen Health 2000 survey. Results indicated that after controlling for a variety of factors, a low amount of sleep on weeknights was associated with low self-esteem and poor academic performance and a low amount of sleep all week (weeknights and weekends) was associated with an increased risk of depression and had a negative impact on academic functioning.

Citation: Roth, T., Jaeger, S., Jin, R., Kalsekar, A., Stand, P. E., & Kessler, R. C. (2006). **Sleep problems, comorbid mental disorders, and role functioning in the National Comorbidity Survey replication.** *Biological Psychiatry*, 60(12), 1364-1371.

Link: [http://www.biologicalpsychiatryjournal.com/article/S0006-3223\(06\)00767-0/abstract](http://www.biologicalpsychiatryjournal.com/article/S0006-3223(06)00767-0/abstract)

Summary: This study looked at the association between sleep problems, role impairments, and comorbid mental illnesses. The sample surveyed was nationally-representative group of 9,282 adults ages 18+. Results indicated that 36.3% of the sample reported at least one of the four sleep problem assessed and that the sleep problems were significantly correlated with both mental disorders (anxiety disorders, mood disorders, impulse-control disorders, and substance use disorders) and role impairment.

Citation: Stein, M. A., Mendelsohn, J., Obermeyer, W. H., Amromin, J., & Benca, R. (2001). **Sleep and behavior problems in school-aged children.** *Pediatrics*, 107(4), 1-9.

Link: <http://pediatrics.aappublications.org/content/pediatrics/107/4/e60.full.pdf>

Summary: This study looked at the prevalence of childhood sleep problems and associations between childhood sleep problems, psychopathology, and medical history. The sample included 472 children, ages 4 to 12 years, living in multiple settings (urban, suburban, rural). Results indicated that 10.8% of children experienced sleep problems in the past 6 months, global reports of sleep problems were associated with medical history (allergies, ear infection, hearing problems), and some sleep problem factors (insomnia, parasomnias, tiredness) were strongly correlated with internalizing and externalizing behavioral scores.

Citation: Strine, T. W., & Chapman, D. P. (2005). **Associations of frequent sleep insufficiency with health-related quality of life and health behaviors.** *Sleep Medicine*, 6(1), 23-27.

Link: [http://www.sleep-journal.com/article/S1389-9457\(04\)00107-8/abstract](http://www.sleep-journal.com/article/S1389-9457(04)00107-8/abstract)

Summary: This study looked at the association between insufficient sleep and health behaviors and health-related quality of life (HRQOL). The sample was comprised of 79,625 non-institutionalized adults (≥ 18) who participated in the Behavioral Risk Factor Surveillance System random-digit phone survey. Results indicated that 26% of the sample had experienced insufficient sleep at least 14 days in the past month and that those who had had insufficient sleep were significantly more likely to report negative health indicators such as frequent physical and mental distress, anxiety, depressive symptoms, fair or poor general health, obesity, and smoking.

Citation: Vgontzas, A. N., Fernandez-Mendoza, J., Bixler, E. O., Singareddy, R., Shaffer, M. L., Calhoun, S. L., Liao, D., Basta, M., & Chrousos, G. P. (2012). **Persistent insomnia: The role of objective short sleep duration and mental health.** *Sleep*, 35(1), 61-68.

Link: https://www.researchgate.net/profile/Julio_Fernandez-Mendoza/publication/51981512_Persistent_insomnia_The_role_of_objective_short_sleep_duration_and_mental_health/links/09e414fabf21674bc9000000.pdf

Summary: This study looked at the role of sleep disordered breathing (SDB), short sleep duration, and physical and mental health in insomnia's persistence. The study took place in a sleep laboratory with an initial sample of 1741, 1395 of whom were followed-up with 7.5 years later. Results indicated that having mental health problems at baseline was strongly associated with insomnia persistence and that short sleep duration also significantly increased the odds of persistent insomnia.

Citation: Willette-Murphy, K., Toderro, C., & Yeaworth, R. (2006). **Mental health and sleep of older wife caregivers for spouses with Alzheimer's disease and related disorders.** *Issues in Mental Health Nursing*, 27(8), 837-852.

Link: <http://www.tandfonline.com/doi/abs/10.1080/01612840600840711>

Summary: This study looked at caregiver responsibilities, mental health, and sleep in the wives who care for their spouses with dementia. The sample included 37 wife caregivers and 37 age-matched controls. Results indicated that both sleep and mental health were poorer for wife caregivers and that sleep efficiency was a good predictor of mental health in the sample.

ASIA

Citation: Kaneita, Y., Ohida, T., Osaki, Y., Tanihata, T., Minowa, M., Suzuki, K., Wada, K., Kanda, H., & Hayashi, K. (2007). **Association between mental health status and sleep status among adolescents in Japan: A national cross-sectional survey.** *Journal of Clinical Psychiatry*, 68(9), 1426-1425.

Link: <https://www.psychiatrist.com/ICP/article/Pages/2007/v68n09/v68n0916.aspx>

Summary: This study looked at the association between different sleep statuses and mental health in Japanese adolescents. 99,668 surveys were analyzed and results indicated that the mental health was best for those teens who slept between 7-9 hours each night, there was a linear association between mental health status and subjective sleep assessment (better sleep status associated with better sleep assessment), and better mental health was reported in those who reported the fewest symptoms of insomnia.

Citation: Kaneita, Y., Yokoyama, E., Harano, S., Tamaki, T., Suzuki, H., Munezawa, T., Nakajima, H., Asai, T., & Ohida, T. (2009). **Associations between sleep disturbance and mental health status: A longitudinal study of Japanese junior high school students.** *Sleep Medicine*, 10(7), 780-786.

Link: [http://www.sleep-journal.com/article/S1389-9457\(08\)00270-0/abstract](http://www.sleep-journal.com/article/S1389-9457(08)00270-0/abstract)

Summary: This study took a prospective longitudinal approach to look at the association between adolescents' sleep disturbance and mental health status. The sample used for analysis included 516 students from private junior high schools who completed the Pissdburfg Sleep Quality Index and the General Health Questionnaire. Results indicated that over a 2-year period, onset of poor mental health status was significantly related to lasting sleep disturbance and onset of sleep disturbance and lasting poor mental health status was significantly associated with onset of new sleep disturbance.

AUSTRALIA

Citation: Bayer, J. K., Hiscock, H., Hampton, A., & Wake, M. (2007). **Sleep problems in young infants and maternal mental and physical health.** *Journal of Paediatrics and Child Health*, 43(1-2), 66-73.

Link: <http://onlinelibrary.wiley.com/doi/10.1111/j.1440-1754.2007.01005.x/full>

Summary: This study looked at the prevalence of infant sleep problems, the relationship between infant sleep problems and maternal physical and mental health, and the possible mediating effect of maternal quality of sleep on maternal physical and mental health. A cross-sectional sample of 692 mothers of 3- to 6-month-old infants was administered different survey measures. Results indicated that, overall, 34% of the sampled mothers had infants with sleep problems, mothers of infants with sleep problems had poorer mental and physical health than mothers of infants without sleep problems, and no relationship was found between SES and infant sleep problems.

Citation: Hiscock, H., Bayer, J., Gold, L., Hampton, A., Ukoumunne, O., & Wake, M. (2006). **Improving infant sleep and maternal mental health: A cluster randomised trial.** *Archives of Disease in Childhood*, 12(1).

Link: <http://adc.bmj.com/content/early/2006/12/07/adc.2006.099812.short>

Summary: This study looked at whether a community intervention focused on infant sleep problems improved maternal wellbeing and infant sleep. The sample included 328 mothers who reported that their 7-month-olds had sleep problems and were then randomized for the intervention trial. Results indicated that infant sleep problems were less common in the intervention group when checked at ages 10 and 12 months and maternal mental health scores indicated between health for mothers in the intervention group at these time points.

Citation: Hiscock, H., Bayer, J. K., Hampton, A., Ukoumunne, O. C., & Wake, M. (2008). **Long-term mother and child mental health effects of a population-based infant sleep intervention: Cluster-randomized, controlled trial.** *Pediatrics*, 122(3), e621-e627.

Link: <http://pediatrics.aappublications.org/content/122/3/e621.short>

Summary: This study looked at the long-term effects of an infant sleep problem intervention on maternal parenting style and depression as well as the child's sleep and mental health at two years of age. The sample included 174 infants with the intervention condition and 154 with the standard well-child care control. Results indicated that when the children were two-years-old, mothers in the intervention group were less likely to symptoms of clinical depression and the children in the intervention group were less likely to have a sleep problem.

Citation: Martin, J., Hiscock, H., Hardy, P., Davey, B., & Wake, M. (2007). **Adverse associations of infant and child sleep problems and parent health: An Australian population study.** *Pediatrics*, 119(5), 947-955.

Link: <http://pediatrics.aappublications.org/content/119/5/947.full-text.pdf>

Summary: This study looked at the relationship between young children's sleep problems and paternal and maternal mental health and wellbeing. The cross-sectional surveyed sample, including 5107 parents of infants and 4983 parents of preschool-aged children, came from the Longitudinal Study of Children. Results indicated that infant sleep problems were associated with poor general health for both mothers and fathers and that preschool sleep problems were associated with poor general health for mothers. Infants sleep problems had the greatest effect on severe psychological distress in mothers with no prior history of depression.

Citation: Sung, V., Hiscock, H., Sciberras, E., & Efron, D. (2008). **Sleep problems in children with attention-deficit/hyperactivity disorder: prevalence and the effect on the child and family.** *Archives of Pediatrics & Adolescent Medicine*, 162(4), 336-342.

Link: <http://jamanetwork.com/journals/jamapediatrics/fullarticle/379359>

Summary: This study focused on children with attention deficit/hyperactivity disorder (ADHD), looking at such things as the prevalence of sleep problems they experienced, associations with quality of life (QOL), mental health of caregivers, and family functioning. The survey sample included 239 families. Results indicated that 73.3% of children had sleep problems and that those children with moderate or severe sleep problems (44.8% of the sample) were more likely to have poorer psychosocial QOL and daily functioning and that their caregivers experienced poorer mental health.

CANADA

Citation: Dennis, C. L., & Ross, L. (2005). **Relationships among infant sleep patterns, maternal fatigue, and development of depressive symptomatology.** *Birth Issues in Perinatal Care*, 32(3), 187-193.

Link: <http://onlinelibrary.wiley.com/doi/10.1111/j.0730-7659.2005.00368.x/full>

Summary: This study looked at the relationships between infants' sleep patterns, fatigue in their mothers, and later development of postpartum depression. The data came from a longitudinal study, of which a sample of 505 was used for the present study. Results indicated that women who displayed depressive symptoms at 4 and 8 weeks postpartum were significantly more likely to have received fewer than 6 hours of sleep in a 24-hour period, to be woken at least 3 times per night, to report that their baby cried often and did not sleep well, and to believe that their baby's sleep pattern prevent them from getting a reasonable amount of sleep. The authors concluded that there is a strong association between infants' sleep patterns and mothers' fatigue and that this pairing is associated with new onset of postpartum depressive symptoms.

EUROPE

Citation: Aronen, E. T., Paavonen, E. J., Fjallberg, M., Soininen, M., & Torronen, J. (2000). **Sleep and psychiatric symptoms in school-age children.** *Journal of the American Academy of Child & Adolescent Psychiatry*, 39(4), 502-508.

Link: <http://www.sciencedirect.com/science/article/pii/S0890856709661943>

Summary: This study looked at the associations between the quality and quantity of children's sleep and their psychiatric symptom. The sample included 49 medically healthy Finnish children, ages 7-12, who wore activity monitors day and night and had parents and teachers report on psychiatric symptoms. Results indicated that there was a significant association between low sleep time and teacher report of externalizing symptoms and there was an association between delayed sleep latency and parent-report of some externalizing symptoms.

Citation: Dorheim, S. K., Bondevik, G. T., Eberhard-Gran, M., & Bjorvatn, B. (2009). **Sleep and depression in postpartum women: A population-based study.** *Sleep*, 32(7), 847-855.

Link:

https://www.researchgate.net/profile/Gunnar_Bondevik/publication/26702622_Sleep_and_depression_in_postpartum_women_A_population-based_study/links/0c96052d44cbdb319c000000.pdf

Summary: This study sought to identify prevalence of and risk factors for postpartum maternal depressive symptoms and sleep problems, identify factors with independent association to either condition, and look at associations between postpartum depression and specific components of sleep. The cross-sectional sample of 4,191 women had all delivered at a Norwegian hospital and responded to survey measures. Results indicated that the prevalence of depression was 16.5% and the prevalence of sleep problems was 57.7% and that poor sleep was associated with depression after adjusting for other significant risk factors. Self-reported sleep quality and sleep disturbances had the strongest association with depression.

Citation: Meijer, A. M., Habekothe, R. T., & Van Den Wittenboer, G. L. H. (2001). **Mental health, parental rules and sleep in pre-adolescents.** *Journal of Sleep Research*, 10(4), 297-302.

Link: <http://onlinelibrary.wiley.com/doi/10.1046/j.1365-2869.2001.00265.x/full>

Summary: This article from the Netherlands proposes a model for the relationship between mental health, parental bedtime rules, and the quality of sleep for pre-adolescents. The model is based on survey data from 448 youth with a mean age of 11-years-old. Survey results were analyzed using a structural equation model and results indicated that restorative sleep was strongly related to mental health and having a youth lying awake prior to sleep was related to their having their own bedroom.

Citation: Paavonen, E. J., Almqvist, F., Tamminen, T., Moilanen, I., Piha, J., Rasanen, E., & Aronen, E. T. (2002). **Poor sleep and psychiatric symptoms at school: An epidemiological study.** *European Child & Adolescent Psychiatry*, 11(11), 10-17.

Link: <http://link.springer.com/article/10.1007/s007870200002>

Summary: This study looked at associations between sleep problems at home and manifestation of psychiatric problems at school. The sample was comprised of 5,813 Finnish children, ages 8 to 9 years. Results indicated that severe sleep problems were significantly related to multiple behavioral manifestations at school-emotional problems, behavioral problems, hyperactivity, and problems with school attendance. The authors note the importance of including children's report of sleep problems in diagnosing sleep disorders, as children's reports were more frequent than parent reports in this study.

Citation: Paavonen, E. J., Porkka-Heiskanen, T., & Lahikainen, A. R. (2009). **Sleep quality, duration and behavioral symptoms among 5-6-year-old children.** *European Child & Adolescent Psychiatry*, 18, 747-754.

Link: <http://link.springer.com/article/10.1007/s00787-009-0033-8>

Summary: This study looked at whether behavioral symptoms (as assessed by parents and teachers) and parent report of short sleep duration are related for preschool children. The sample is a population-based random sample of 297 families. Results indicated that parent report of a short duration of sleep related to a higher likelihood of children exhibiting internalizing, inattention, and total psychiatric symptoms. Difficulties with children's sleep were related to parent report of all subtypes of psychiatric symptoms and to teacher report of externalizing behavioral symptoms.

Citation: Paavonen, E. J., Solantaus, T., Almqvist, F., & Aronen, E. T. (2003). **Four-year follow-up study of sleep and psychiatric symptoms in preadolescents: relationship of persistent and temporary sleep problems to psychiatric symptoms.** *Journal of Developmental & Behavioral Pediatrics, 24*(5), 307-314.

Link:

http://journals.lww.com/jrnldb/Abstract/2003/10000/Four_Year_Follow_Up_Study_of_Sleep_and_Psychiatric.1.aspx

Summary: This study looked at the course of sleep disturbances over a 4-year period as well as associated psychiatric problems. The representative sample included 1,290 Finnish children, ages 8 to 12 years. Results indicated that over the 4-year period, there was a decrease in parentally-reported sleep problems from 23.4% to 9.1% while children's reports of sleep problems remained consistently at 18%. Teacher reports of children's mental health problems correlated with both current and persistent sleep problems, though multivariate modeling suggest that current sleep problems are more significantly associated with psychiatric problems.

Citation: Schmitt, J., Chen, C. M., Apfelbacker, C., Romanos, M., Lehmann, I., Herbarth, O., Schaaf, B., Kraemer, U., von Berg, A., Wishmann, H. E., Heinrich, J., & The LISA-plus Study Group. (2011). **Infant eczema, infant sleep problems, and mental health at 10 years of age: The prospective birth cohort study LISA-plus.** *Allergy, 66*(3), 404-411.

Link: <http://onlinelibrary.wiley.com/doi/10.1111/j.1398-9995.2010.02487.x/full>

Summary: This study looked at the relationship between infant eczema and sleep problems (taking place within the first two years of life) and the development of mental health problems at 10-years-old. The analysis was done on a sample of 1,578 children who were followed to 10 years of age. Results indicated that concurrent sleeping problems and eczema in the first two years of live predicted children's emotional and conduct problems at age 10.

Citation: Smedje, H., Broman, J. E., & Hetta, J. (2001). **Associations between disturbed sleep and behavioural difficulties in 635 children aged six to eight years: A study based on parents' perceptions.** *European Child & Adolescent Psychiatry, 10*(1), 1-9.

Link: <http://link.springer.com/article/10.1007/s007870170041>

Summary: This study looks at associations between sleep problems and behavioral problems as well as the associations between different kinds of emotional and behavioral difficulties and specific sleep features. The survey sample was comprised of 635 Swedish children, ages six to eight years. Results indicated that different emotional and behavioral challenges were associated with different characteristics of sleep problems. For example, hyperactivity was associated with sleepwalking and tossing and turning during sleep, emotional symptoms were associated with difficulty falling asleep and night terrors, and peer problems were associated with a shortened total sleep time.

Citation: van Geijlswijk, I. M., Mol, R. H., Egberts, T. C. G., & Smits, M. G. (2011). **Evaluation of sleep, puberty and mental health in children with long-term melatonin treatment for chronic idiopathic childhood sleep onset insomnia.** *Psychopharmacology, 216*(1), 111-120.

Link: <http://link.springer.com/article/10.1007/s00213-011-2202-y>

Summary: This study looked at whether melatonin use over extended periods of time influenced development in puberty, quality of sleep, and mental health development of Dutch children. The sample came from follow-up of the Meldros trial of children who had used melatonin for at least six months, with final analysis completed on 57 children ages 8.6 to 15.7 years. The results indicated that melatonin usage for extended periods of time (between 1 and 4.6 years) at dosages of 0.3mg to 10mg did not result in statistically significant deviations in adolescent development, sleep quality, or mental health.

NEW ZEALAND

Citation: Gregory, A. M., Caspi, A., Eley, T. C., Moffitt, T. E., O'Connor, T. G., & Poulton, R. (2005). **Prospective longitudinal associations between persistent sleep problems in childhood and anxiety and depression disorders in adulthood.** *Journal of Abnormal Child Psychology*, 33(2), 157-163.

Link: <http://link.springer.com/article/10.1007/s10802-005-1824-0>

Summary: This prospective study looked at associations between persistent sleep problems during childhood and anxiety and depression in adulthood. The primarily white and socioeconomically diverse cohort sample of 980 individuals were tracked from childhood through 26 years of age. Findings indicated that after controlling for a number of variables (e.g., childhood internalizing problems, socioeconomic status), persistent sleep problems predicted adulthood anxiety disorders but not depression in adulthood.