

## SLEEP-OBESITY INTERACTION

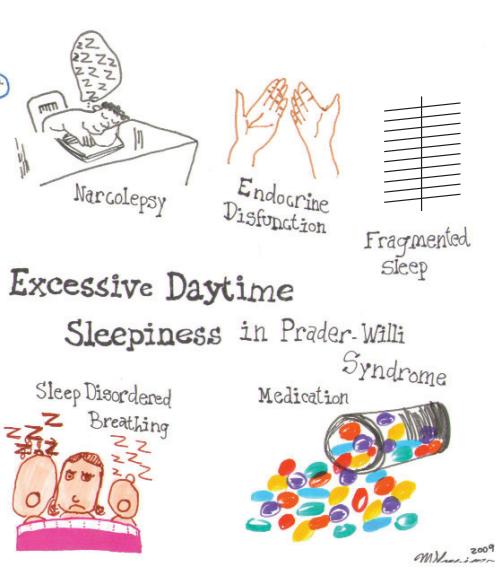
By Shery Goril and Colin Shapiro

*T*has almost become a cliché to observe that there is an obesity epidemic/ pandemic in the Western world. In many countries, diets are shifting and the change in the weight curve has numerous medical and social consequences. A well known news magazine, Newsweek recently gave a top ten list of factors leading to obesity. While the first two factors, overeating and decrease of exercise are well recognized and extensively researched, the third factor on the list was reduction of sleep, which has only very recently been a focus of research

Notably, 7 of 11 comprehensive studies in children aged 2 to 20 years reported a significant association between short sleep duration and obesity.

There are many suggested pathways for the relationship between sleep disorders, weight gain, and even diabetes. The current literature shows suggests alterations in glucose metabolism, up-regulation of appetite and decreased energy expenditure. Furthermore, it has long been known that the control of sleep and eating is closely regulated in the brain. The rare condition of Kleine-Levin syndrome is a neurological disorder resulting in the malfunction of a portion of the brain that regulates functions such as sleep and appetite. In this condition, teenagers in particular develop a pattern of extreme excessive sleepiness along with periodic hyperphagia and dramatic fluctuations in libido. Earliest reports of this condition were made following the occurrence of heat stroke in young sailors. Recently, a more sophisticated understanding of this anatomical proximity in the hypothalamus was advanced with the discovery of neurochemicals which are responsible for the regulation of appetite and sleep. A recent review by Ganjavi and Shapiro describes the role of the neurotransmitter, hypocretin that regulates sleep, appetite and energy consumption (the full report is provided on our website [www.sleepontario.com](http://www.sleepontario.com).)

It is also interesting to note that the research on the other end of the spectrum, namely anorexic patients, in relation to sleep is much older than that of obesity. About thirty years ago, it was shown that as young women with anorexia regain weight, the hormonal cascade that normally occurs during menarche reoccurs particularly with an early indication being the increased secretion of prolactin during the sleeping period. Much as such discoveries have been made in the past for eating disorders, there is now an emergence of new evidence regarding the association between obesity and sleep.



attention. For most sleep specialists, the interface with obesity is through the condition of sleep apnea but excessive sleepiness, for example, in the rare condition of Prader Willi syndrome can be for a variety of reasons, not only a sleep related breathing disorder. The careful assessment of all patients with obesity in relation to sleep is well merited, as there may be underlying sleep problems which, if corrected may help not only with the sleep disorder but have knock-on benefits in relation to weight control and the myriad of other health related issues that a sleep disorder would impact on.

The association between obesity and sleep has been receiving increasing attention in the news. A number of research studies have shown that people who sleep less than six hours a night, or have disturbed sleep, are to be more likely to be obese.

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# PUBLICATIONS FROM OUR CLINIC

## Sleep Abnormalities and Prader-Willi Syndrome

**Joseph Barbera, Inna Voloh, Glenn Berall, Colin Shapiro**

(2009) In Sleep Abnormalities and Prader-Willi Syndrome, In. Pandi-Perumal SR, Kramer M (eds.). Sleep and Mental Illness, Cambridge, England: Cambridge University Press

### Abstract

The Prader-Willi syndrome (PWS) is a rare complex, multisystem genetic disorder. Characteristic features include neonatal hypotonia, short stature, facial dysmorphia, hypogonadism, hyperphagia with morbid obesity, suggestive of the presence of hypothalamic dysfunction.

Sleep disturbances, in the form of excessive daytime sleepiness (EDS), sleep apnea, were initially listed as a minor diagnostic criterion in the diagnosis of PWS, based on earlier case reports. However in the last two decades the prominence of excessive daytime sleepiness in PWS patients has become increasingly more recognized.

This review shows that the cause of sleepiness in PWS is not a straightforward matter and there appears to be multiple causes for sleepiness in this condition (see figure on page one). While sleepiness in the PWS patient poses particular challenges to the treating physician, it may also provide significant insights into the basic mechanism regulating sleep and wakefulness.

### SLEEP-OBESITY INTERACTION

*Continued from page 1*

Clearly there are many factors that will influence obesity both in adults and in children. Understanding the sleep related issues better may be a significant component that will facilitate healthy changes and greater productivity. Our sleep program has embarked on projects concerning children with obesity and children with large tonsils (both projects by undergraduate students), as well as a more long-term project relating to sleep problems and treatments for patients with Prader Willi. We will soon commence a project on patients with type 2 diabetes, which will further highlight the relationships between sleep, obesity, and specifically diabetes. This would be spearheaded by Dr. Lilach Kamer who is a research fellow and Masters student.

*Sleep Medicine 2008; 9: 906-910.*

## Historical Issues in Sleep Medicine

### Sleep and dreaming in Greek and Roman philosophy

**Joseph Barbera**

### Abstract

Theories as to the function of sleep and dreaming have been with us since the beginning of recorded history. In Ancient Greece and Rome the predominant view of dreams was that they were divine in origin. This view was held not only in theory but also in practice with the establishment of various dream-oracles and dream interpretation manuals (*Oneirocritica*). However, it is also in the Greek and Roman writings, paralleling advances in philosophy and natural science, that we begin to see the first rationalistic accounts of dreaming. This paper reviews the evolution of such rational accounts focusing on the influence of Democritus, who provides us with the first rationalistic account of dreaming in history, and Aristotle, who provides us with the most explicit account of sleep and dreaming in the ancient world.

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# INTERNATIONAL ABSTRACTS OF INTEREST

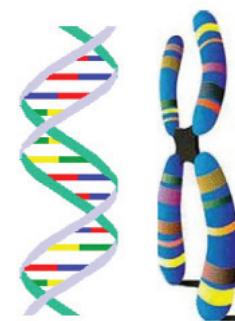
J Sleep Res. 2008 17(4):395-405.

## Chronic sleep reduction, functioning at school and school achievement in preadolescents.

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This study investigates the relationship between chronic sleep reduction, functioning at school and school achievement of boys and girls. To establish individual consequences of chronic sleep reduction (tiredness, sleepiness, loss of energy and emotional instability) the Chronic Sleep Reduction Questionnaire has been developed. A total of 436 children (210 boys, 214 girls, 2 missing; mean age = 11 years and 5 months) from the seventh and eighth grades of 12 elementary schools participated in this study. The inter-item reliability (Cronbach's alpha = 0.84) and test-retest reliability ( $r = 0.78$ ) of the Chronic Sleep Reduction Questionnaire were satisfactory. The construct validity of the questionnaire as measured by a confirmative factor analysis was acceptable as well ( $\text{CMIN}/\text{DF} = 1.49$ ;  $\text{CFI} = 0.94$ ;  $\text{RMSEA} = 0.034$ ). Cronbach's alpha's of the scales measuring functioning at school (teacher's influence, self-image as pupil, and achievement motivation) were 0.69, 0.86 and 0.79. School achievement was based on self-reported marks concerning six school subjects. To test the models concerning the relations of chronic sleep reduction, functioning at school, and school achievement, the covariance matrix of these variables were analysed by means of structural equation modelling. To test for differences between boys and girls a multi-group model is used. The models representing the relations between chronic sleep reduction - school achievement and chronic sleep reduction - functioning at school - school achievement fitted the data quite well. The impact of chronic sleep reduction on school achievement and functioning at school appeared to be different for boys and girls. **Based on the results of this study, it may be concluded that chronic sleep reduction may affect school achievement directly and indirectly via functioning at school, with worse school marks as a consequence.**



## PRADER-WILLI SYNDROME AND SLEEP DISORDERS

This leaflet is available at [www.sleepontario.com](http://www.sleepontario.com)

Med Arh. 2008;62(1):30-3.

## Quality of life in children with obstructive sleep apnea after adenotonsillectomy

(This article was originally in Bosnian and has been edited slightly)

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Obstructive sleep apnea (OSA) caused by enlarged tonsils and adenoids is common in paediatric population. The prevalence of paediatric obstructive sleep apnea syndrome has been estimated to be between 1% and 3% in pre-school and school-aged children. The aim of this study was to examine quality of life in children before and after adenotonsillectomy. Subjects and methods: This study was prospective and it was carried out in the period from mid-November 2005 to end-June 2006. Specific exclusion criteria were: no pre-existing OSA, neuromuscular disorders, constitutional maxillofacial anomalies, septal deviation, mental retardation, obesity ( $\text{BMI} > 30$ ). Anamnesis was taken from parents or caregiver, each child was examined from by an ENT specialist, Paediatrician and Anaesthetist. The adenoid size was estimated by palpation or/and X-ray examination of nasopharynx. The tonsils size was estimated by Brodsky scale. OSA-18 quality of life survey was used to estimate improvement of quality of life after adenotonsillectomy. The children that had symptoms of OSA by OSA-18 quality of life survey, were analysed by this survey 5 weeks after surgery. The results before and after surgery were compared. The adenotonsillectomy was done with standard operation technique at our ENT department (cold dissection using termocauter), and comprehensive removal palatal tonsils and adenoids, that are removed under a uniform anaesthesiology protocol. RESULTS: For 13 patients (43.3%) who had an adenotonsillectomy, OSA had a small impact on quality of life, 11 (36.7%) patients had a moderate impact and 6 (20%) patients had large impact. Statistical significant improvement of quality of life after adenotonsillectomy was found in all domains using OSA-18-QOL survey, viz.: sleep disturbance ( $P < 0.0001$ ), physical suffering ( $P < 0.0001$ ), emotional distress ( $P < 0.0001$ ), daytime problems ( $P = 0.0081$ ) and caregiver concerns ( $P < 0.0001$ ). The mean OSA-18-QOL total change score showed significant improvement of quality of life in patients suffering from OSA who undergone adenotonsillectomy. CONCLUSION: Adenotonsillectomy improves quality of life in children suffering from OSA caused by adenotonsillar hypertrophy.

# CREATIVE CORNER

Extract from:

## Artist: Barenaked Ladies Song: Who Needs Sleep

Now I lay me down not to sleep  
I just get tangled in the sheets  
I swim in sweat three inches deep  
I just lay back and claim defeat

Chapter read and lesson learned  
I turned the lights off while she burned  
So while she's three hundred degrees  
I throw the sheets off and I freeze

Lids down, I count sheep  
I count heartbeats  
The only thing that counts is  
that I won't sleep  
I countdown, I look around

Who needs sleep?  
well you're never gonna get it  
Who needs sleep?  
tell me what's that for  
Who needs sleep?  
be happy with what you're getting  
There's a guy who's been awake  
since the Second World War

My hands are locked up tight in fists  
My mind is racing, filled with lists  
of things to do and things I've done  
Another sleepless night's begun

Lids down, I count sheep  
I count heartbeats  
The only thing that counts is  
that I won't sleep  
I countdown, I look around

Who needs sleep?  
well you're never gonna get it  
Who needs sleep?  
tell me what's that for  
Who needs sleep?  
be happy with what you're getting  
There's a guy who's been awake  
since the Second World War

Who needs sleep?  
well you're never gonna get it  
Who needs sleep?  
tell me what's that for  
Who needs sleep?  
be happy with what you're getting  
There's a guy who's been awake  
since the Second World War

By Deena Sherman

Florence during the Renaissance was a dynamic artistic and business centre which provided a stimulating atmosphere for artist Botticelli (born 1445). When he was thirty Botticelli began an advantageous relationship with the ruling Medici family that lasted even after the Medicis were ousted from Florence in 1495. While he became the most sought after painter in Florence, his fame was not limited to the city. In 1481 he received the honor of being commissioned by Pope Sixtus to paint three frescoes in the Sistine Chapel in Rome. In spite of the massive amount of work involved, Botticelli completed the frescoes and was back in Florence the following year.

His huge reputation eventually declined with the emergence of younger artists, notably Michaelangelo and Raphael. From 1500 until his death at age 65 in 1510, Botticelli was viewed as outmoded and outdated and he received few commissions during this time. Interestingly, Botticelli remained unpopular – even forgotten – for four hundred years, until he was rediscovered and declared a master painter in the twentieth century.

Botticelli lives on through his art. In "Agony of the Garden", depicted on this page, Jesus and an angel are shown in the Garden of Gethsemane while three of Jesus' disciples, Peter, James and John, sleep. Though, like all the painters of his time, Botticelli's work had a religious theme, he was the first painter since ancient times to treat mythological works seriously. In their book on the artist, husband and wife art historians L.D. and Helen S. Ettinger describe the artist as a master painter known "for his clarity of composition, subtlety of line, brilliance of color and above all an extraordinary ability to translate complex narrative of abstract ideas into visual terms."

### Sources

*Botticelli* by L.D. and Helen S. Ettinger published in 1977 by New York Oxford University Press

*Botticelli* by Barbara Deimling published in 1994 by Benedikt Taschen

*Botticelli – Gramercy Great Masters* published in 1996 by Random House

*The Complete Paintings of Botticelli* by Michael Levey and Gabriele Mandel published in 1967 by Penguin Books

## Botticelli



*Agony of the Garden, 1500*

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