

## Chapter 21

# Development of an Online Sleep Diary

**Jacqui Blake**

*University of the Sunshine Coast, Australia*

**Don Kerr**

*University of the Sunshine Coast, Australia*

### ABSTRACT

*Sleep disorders causing excessive daytime sleepiness are estimated to affect six percent of the population and has traditionally been under diagnosed. Sleep disorders symptoms may lead to an increased likelihood of suffering work and vehicle related accidents as well as affecting the physical and mental well being of the sufferer. A sleep diary documenting sleep hygiene habits over a period of time is an important tool in the diagnoses of sleep disorders. This project was to develop an online sleep diary, bringing benefits of presenting the information earlier to the physician in a format which allows the quick assimilation of information from the diary. The information is also in an electronic format facilitating the transmission to an electronic health record and the building of a database of sleep patterns. An online sleep diary allows a patient to self-monitor their condition allowing them to assess treatment and lifestyle changes on sleep patterns.*

### INTRODUCTION

This project is to implement an online sleep diary, a sleep diary is used to record sleep patterns usually for fourteen nights. The person notes the parameters of their nights sleep day-by-day building up a picture of sleep habits known as sleep hygiene. A sleep diary is used by a number of health professionals, including psychologists, physicians and sleep specialists

and is the primary diagnostic tool for insomnia and an aid to the diagnosis of other sleep disorders. An online sleep diary has a number of benefits; the data contained within the diary is presented in a summarized readily accessible format available in real time, while building a database of sleep patterns. This Chapter will discuss the importance of sleep, sleep hygiene, the construction of the online diary and its importance.

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## THE IMPORTANCE OF SLEEP

Sleep pattern disturbances are common in adult populations. Access Economics Pty Limited (2004) estimated that six percent of the Australian population experience a sleep disorder but only twenty per cent of those affected by sleep disorders are diagnosed. In a study carried out in the United Kingdom on a sample of 2000 patients by Groeger et al (2004) it was found that 58% of respondents reported sleep problems during the previous fortnight, with 18% stating that the sleep they received was insufficient on the majority of nights. Other international studies state sleep disruptions may occur in ten to thirty five per cent of the population (Foresman, 2000; Groeger et al, 2004; Morin et al, 1999; Ohayon & Partinen, 2002). For between 3.2 and 5.5 percent of the population these sleep disruptions result in the problem of excessive day time sleepiness (Akerstedt & Nilsson, 2003; Engleman et al, 1997).

In the Groeger et al (2004) study those respondents which reported that they had gained sufficient sleep believed they had more energy, life satisfaction and success than those not gaining sufficient sleep. The sleep patterns of healthy people aged between 20 and 50 years were studied; 266 respondents filling in a sleep diary for two weeks. The study found that the average time in bed was seven hours 35 minutes during the week and eight hours two minutes in the weekends with no significant gender differences. This relatively small difference between time in bed on weeknights and weekends showed that there was only a slight sleep deficient. Average sleep latency was 10.5 minutes with an average of one awakening per night. Sleep deprivation causes a sleep deficient, this deficit is reduced by sleeping longer than normal, perhaps during days off work. These normal sleep patterns can be contrasted with the sleep patterns of those people with a sleep disorder who have a larger sleep deficit. The sleep diary of these people may show they wake more often for longer and have shorter sleep latency (Arand, 2006).

McFadyen et al (2001) found that Obstructive Sleep Apnea (OSA) patients and partners reported increased material satisfaction as the result of compliant treatment of Continuous Positive Airways Pressure (CPAP). Treatment of narcolepsy, which is a sleep disorder characterized by excessive daytime sleepiness and abnormal rapid eye movement sleep patterns (Billiard, 2007) can be made by using drugs (Niederhofer, 2006), whereas treatment for a disorder such as insomnia may be undertaken using psychology (Morin et al, 1999). The most common sleep disorder is OSA (Access Economics Pty Limited, 2004; Foresman, 2000; Kramer et al 1999; Mulgrew et al, 2007; Young et al, 2002) and the most common treatment for this is by CPAP (Hsu & Lo, 2003; Young et al, 2002). CPAP works by holding open the upper airway during sleep with continuous flow of air preventing collapse and therefore sleep apnea this allows refreshing sleep to occur (Hsu & Lo, 2003).

When a patient is suspected of having a sleep disorder by a primary care physician they may be referred to a Sleep Investigation Unit (SIU). A study by Kramer et al. (1999) found that primary care physicians may under diagnose sleep disorders. They found that the majority of patients referred to a SIU did have OSA, however the percentage of patients referred to a SIU was very small at 0.13 per cent with all patients referred being very symptomatic. This study suggests that support may be necessary for primary care physicians to recognize patients at risk of having a moderate sleep disorder, as well as those at severe risk.

The Boston Consulting Group (2003) believe that sleep is under represented as a health priority, but note that to increase awareness of the importance of restorative sleep and sleep disorders a education program is necessary for the public and for general practitioners. However, as awareness of sleep disorders increases it is likely that there will be a shortage of sleep specialists. If there is a shortage, the sleep specialist's ability to see patients will need to be maximized, and general

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