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Sleep Disorders Website

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Abstract

For this IQP, a website about sleep disorders was designed to inform WPI students of the health problems they might face with improper sleep; a problem that our web survey confirmed is common among WPI students. The site provides information about common sleeping disorders and related diseases, and also provides health links and self-help procedures to improve one's sleep health. The website is also being considered as an addition to the Health Center's website at WPI.

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1. Introduction

What's a sleeping disorder? A sleeping disorder is something that cannot be explained in a one-sentence answer. There's no, "Take two of these and call me in the morning" remedy. In some cases there is no medical treatment available or the causes are uncontrollable. However, understanding the causes of some sleeping disorders is important because it has been proven through cases studies and medical research that improper sleep habits affect you physically and mentally if not treated properly. The effects of sleeping disorders aren't always immediately obvious, but in some research studies it has been shown that improper sleep hygiene can cause long term effects with memory and health problems. The purpose of this project is to help inform and educate those who may or may not have a sleeping disorder of some kind. With the information we provide, you will see that some of the most common disorders can easily be corrected without seeking medical attention.

This IQP involves creating a website to be posted within the WPI server. The content of the website is directed toward students attending WPI; however the site contains enough general information that anyone experiencing problems sleeping may find it helpful. One might think, "why another website?" Our answer is that even though there are many websites about sleeping disorders and sleeping problems, few are directed toward college students. In addition, the websites that are directed toward college student are brief. WPI students are also in a unique situation, they have seven-week terms instead of the fourteen-week semesters that other colleges have. This circumstance may put added stress onto the WPI students.

While designing the website, the WPI student was be kept in mind. The concepts and tips that will best aid a WPI student in alleviating any sleeping problems were stressed. Once the website was constructed, a survey was performed to get feedback from the students who visited the site. The information collected in the survey included personal information, their comments on the website, and any suggestions. The results of the surveys were then posted on the website. Once the critiques were analyzed, the website was adapted to reflect any desired changes.

2. Sleeping Disorder Introduction

To start we will first look into the history of the field of sleeping disorders, which, since the 1970's has expanded rapidly in the United States and the world. The American Sleep Disorders Association increased from 400 individual members to more than 2,400 members in 1996 and even more since then in 2002 (sleepfoundation.org).

We will then talk about the relationship between the brain and sleep. We will break down the way the brain works in general, and then discuss how it affects sleep and the effects that sleep has on the functions of the brain. We will also discuss Rapid Eye Movement (REM) and Non-Rapid Eye Movement (NREM) along with the importance of breathing. And then we will discuss dreaming and the effects that it may have on sleep.

Next we will go into the Types of Sleeping Disorders and Difficulties section. Here the reader will receive general knowledge about many of the sleeping disorders and difficulties that exist. We will dig deep to find out what causes these sleep problems to occur and look at the effects they have.

The Causes of Sleeping Disorders section will discuss health and sleep and will give the reader a good understanding of what treatments are currently being used to help

aid the fight against sleep disorders, an illness which is troublesome for people with certain lifestyles. In this section, we will also present possible diet remedies one should try. We will also try and uncover information about diseases that may possibly create sleeping disorders.

Also in this section will be a subsection about lifestyles and sleep. We'll look at different sleep patterns and come up with a possible routine to help aid one to sleep well. We will also look at the possible effects of too much sleep in this section as well.

Then we will wrap up our discussion of sleep disorders with our Coping Strategies and Help section. Here we will mention tips that you should use, medicines that may be effective in battling possible sleep problems, and web resources you can use to help further your knowledge.

A sleep disorder is defined as a physical and psychological condition or disturbance of sleep caused by abnormalities that occur during sleep or by abnormalities of specific sleep mechanisms. Research on sleep disorders first began in 1913 when Scientist Henri Pieron authored a book entitled *Le Probleme Physiologique du Sommeil*, which was the first documented examination of sleep from a physiological perspective. Seven years later, American Dr. Nathaniel Kleitman, known as the "father of American sleep research," began work in Chicago questioning the regulation of sleep and wakefulness and of circadian rhythms. Kleitman's crucial work included studies of sleep characteristics in different populations, the effects of sleep deprivation, and the groundbreaking discovery of rapid eye movement (REM) in 1953.

Today, sleep research comprises many different areas such as: narcolepsy research, sleep and cardio-respiratory research, and studies of pain and sleep, circadian

rhythms, sleep deprivation, sleep and aging, and infant sleep. As of 1997 the International Classification of Sleep Disorders (ICSD) reported that there are approximately 84 defined sleep disorders. There are over 200 accredited sleep disorders centers and laboratories in the United States designed to recognize and treat all disorders of sleep. It is estimated that some 40 million Americans suffer from chronic, long term sleep disorders; and that another 20 to 30 million Americans suffer from sleep disorders on an irregular basis (sleepfoundation.org).

The field of sleep research is ever expanding. Organizations like the National Center on Sleep Disorders Research (NCSDR) continue to facilitate development of research, training, and educational programs across the National Institute of Health (NIH) and other federal agencies. Since 1995, the NIH has increased its budget for sleep research from 72.8 million dollars to the current $123.6 million, an increase of almost 70 percent. NSCDR also continues to work with the Sleep Disorders Research Advisory Board, other federal agencies, and professional and voluntary organizations in a wide range of collaborative projects including federal accounting of sleep research, opportunities for implementing and monitoring the National Sleep Disorders Research Plan, distribution of educational materials, and medical education on sleep.

2.1 The Function of Sleep

- **If sleep does not serve an absolutely vital function, then it is the biggest mistake the evolutionary process ever made- A. Rechtschaffen.**

For centuries, the purpose of sleep has been pondered and argued about. All have agreed, however, that sleep is essential for survival, thus being a necessary and vital

biological function. Complete understanding of sleep and its role is still being questioned, researched and pursued.

Once thought to be a daily passive process performed by the body, ongoing research has made it unmistakably clear that sleep is an active process desperately essential for life. Sleep affects the whole being - the physical, mental, and spiritual. Many theories and tenets have been created and sundry experiments have been performed to solve this enigma called sleep. All of these theories and ideas can be classified into three types- restorative, behavioral, and mental sleep functions.

2.2 Restorative Sleep Functions

Restorative functions refer to anything that results in the return to an optimal and ideal state, or an improvement of condition. Many scientists and researchers believe that restoration is the primary purpose of sleep. Sleep is viewed as a process that enables the body to reenergize and restore. Studies have shown that during sleep:

- Mitosis of epithelial cells of many body tissues occurs preferentially
- There's an increase in protein synthesis
- Healing of wounds is faster
- Bone growth is faster
- In the young, growth hormone is released in its highest levels
- The level of anabolic hormones is highest (prolactin, leutenizing, hormane, testosterone)
- Cellular energy stores increase
- There are synchronized circadian rhythms of the body

(Shneerson 2000)

2.3 Behavioral Sleep Functions

Behavioral sleep functions refer to sleep's adaptive non-responsive qualities, viewing sleep as a developed instinct. Some believe that sleep evolved simply as a clutch, a protective adaptation. At the end of the day, it is safer to be asleep. Also it is less feasible to gather food at night, thus less effective to be active during parts of the day when food is not available. Sleep may increase the chances of survival for an animal. Collected data that support this view:

- Animals usually go to specific sites and/or assume a specific position for safety and energy conservation
- An internal clock provokes and stimulates sleep during times of the day that are most beneficial for the animal.
- Unconsciousness tends to decrease body movements, keeping the animal in a quiet place until safe to proceed.
  (Shneerson 2000)

2.4 Mental Sleep Functions

Many theories highly support the belief that sleep primarily benefits the brain. Adequate sleep appears to result in better mental processing such as math calculations and concentration. It's believed that sleep:

- Stimulates the brain regions used in learning
- Gives the brain a chance to perform neuronal connections that cannot be carried out while awake.
- Enhances information processing
- Allows the brain to convert new learning into a stronger, permanent form. And translate and move information and experiences from short term memory to long term memory.
- Restores peace of mind or keeps a stable mood. It may also act as a mood regulator. Activity in parts of the brain that control emotions, decision making, and social interactions is drastically reduced, suggesting that sleep aids in maintaining emotional and social functioning while awake.
  (Shneerson 2000)

2.5 REM and NREM

REM and NREM sleep alternate through the night in cyclical fashion. REM sleep episodes generally become longer over the night. Sleep normally happens in multiple cycles at night. The average length of the first NREM-REM sleep cycle is about 70 to 100 min. Across the night, the average period of the NREM-REM cycle is approximately 90 to 100 min. (Poceta 1998).

There are five stages of human sleep. Four stages have non-rapid eye movement (NREM) sleep, with unique brain wave patterns and physical changes occurring. Dreaming occurs in the fifth stage, during rapid eye movement (REM) sleep.

2.5.1 NREM

Non-rapid eye movement (NREM) sleep consolidates memory and repairs neurological processes. NREM sleep is distinguished by high and slowly declining slow-wave activity (SWA). SWA is represented through electroencephalogram (EEG) readings and is related to prior sleep/wake activity. (Frey)

Sleep cycles vary with a person's age. Children and adolescents have longer periods of stage 3 and stage 4 NREM sleep than do middle aged or elderly adults. Because of this difference, when doctors perform sleep studies they must take into account the patient's age when evaluating a sleep disorder, as total REM sleep declines with age.

- Stage 1 of NREM sleep occurs when a person is falling asleep. It represents about 5% of a normal adult's sleep time. (Frey)
- At Stage 2 of NREM sleep the person's electroencephalogram (EEG) will show distinctive wave forms called sleep spindles and K complexes. 50% of sleep time is stage 2 REM sleep. (Frey)
- Stages 3 and 4 of NREM sleep are also known as delta or slow wave sleep, these stages are the deepest levels of human sleep and represent 10-20% of our sleep time. These stages occur during the first 30-50% of the sleeping period. (Frey)

2.5.2 REM

REM sleep is the state in which our most vivid dreams occur. It's known as paradoxical sleep, desynchronized sleep, active sleep, and dream sleep. Each term reflects a different emphasis on what its defining features are. In humans REM is identified by low voltage cortical EEG, an absence of activity in the atonia muscles, and periodic bursts of rapid eye movements. These bursts are often accompanied by changes in respiration and by twitching of the distal somatic musculature and face (Shneerson 2000).

The key brain structure for generating REM sleep is the brainstem. There are two main portions, the pons and adjacent portions of the midbrain. Both of these areas contain cells that are maximally active in REM sleep, called REM-on cells, and cells that are minimally active in REM sleep, called REM-off cells (howstuffworks.com). The interaction between the REM-on cells and the REM-off cells are what cause actual REM sleep.

Now that we have looked at why sleep is important and what sleep does for the body, we can look at what happens when one does not have the proper sleep patterns. There are a number of diagnosed disorders that one may have, and these will be looked at in the next section. There are also a number of people that go through life with irregular sleep patterns and their health is adversely affected. This situation will also be examined.

3. Types of Sleeping Disorders and Difficulties

There are many things that can make someone tired, but being tired does not constitute a sleeping disorder. There must be a distinction between a sleeping disorder and a sleeping difficulty. Some commonly diagnosed sleeping disorders include insomnia, narcolepsy and sleep apnea. However, the majority of sleeping problems are not actually medical conditions. Many sleeping problems that one may encounter are temporary and can be easily fixed if one knows what is causing the problem.

Actual sleeping disorders can be classified into two main categories: excessive sleep and not enough sleep. The specific diagnostic criteria for insomnia and other sleeping disorders can be found in the Diagnostic and Statistical Manual (DSM IV) of the American Psychiatric Association. The International Classification of Sleep Disorders (ICSD) developed by the American Sleep Disorders Association (ASDA) is much more extensive. The ICSD attempts to classify all current sleeping disorders as well as proposed sleeping disorders (ICSD 1990). There are four categories in this scheme: dissomnias, parasomnias, sleeping disorders associated with mental, neurologic, or other medical disorders, and proposed sleep disorders. According to this document, a dissomnia is a sleep disorder that occurs outside of a sleeping state such as insomnia or narcolepsy. A parasomnia is a sleep disorder that occurs while sleeping such as

nightmares or sleepwalking. Sleep disorders associated with mental, neurological, or other medical disorders are disorders that only occur in the presence of another medical condition. Proposed sleep disorders are disorders that do not actually qualify as a sleeping disorder yet, but do impact one's sleep health. In order to qualify as a disorder, the sleeping condition must impair the individual in one or more daytime functions. In addition, the problem must be present for at least a month (Poceta 1998).

3.1 General Sleeping Problems

Although sleeping disorders are relatively common in the general public, one does not have to have a sleeping disorder to have trouble sleeping. One in three American adults experiences sleep problems (Waffenschmidt 1995). A sleep problem can be anything from having trouble falling asleep to having trouble waking up to falling asleep during routine events. Many people feel that losing an hour or two of sleep per night is alright, but it has many adverse effects. The ability of the immune system is closely related to one's sleep health. If someone is not practicing good sleep hygiene, their immune system is adversely affected. Metabolism is also associated with sleep health. As a result of poor sleep health, one may encounter obesity and obesity related problem such as heart disease, diabetes and even sleep apnea (sleepdisorders.about.com). By practicing poor sleep habits, one can actually develop a sleeping disorder that takes much more effort to treat. Not getting enough sleep is much more serious than people think.

There are a variety of reasons that someone cannot fall asleep, wake up in the morning, or stay awake during the day. Some of these reasons include but are not limited to stress, anxiety, erratic sleeping patterns, environmental issues, family life and diet. Many of the sleeping problems encountered can be fixed easily by practicing good sleep

hygiene. This means following proven sleeping methods that will aid in achieving adequate sleep health. By practicing good sleep hygiene, one can improve their quality of life and even prolong their life. When a problem is not easily solve by following these guidelines, it is likely that a more serious problem is present, either a sleep disorder or another disorder. In this case, one should seek professional help.

3.2 Insomnia

By definition insomnia is the chronic inability to fall asleep or remain asleep for an adequate length of time. Insomnia covers a wide range of disorders from jet lag to depression to sleep apnea. The sleeping disorder may seem minor, but if it goes untreated the disorder may become far more difficult to manage even with the help of a doctor. The symptoms of this disorder are subjective and may vary with the person in question. To one person, 30 minutes may seem like an eternity to fall asleep, and to another person 30 minutes could be and average or even short period to wait. To determine if someone actually has insomnia more criteria must be met. Not only does the person have to have trouble sleeping at night, but they must also have daytime symptoms. These symptoms may include feeling unrefreshed or unrestored in the morning or throughout the day, feeling fatigued during the day, having poor concentration during the day, and/or having other neuro-congnitive complaints that may affect daytime performance (Poceta 1998).

There are many people in the society that experience insomnia-like symptoms. However, most of them never report their symptoms to a doctor. This may be due to the person thinking that their symptoms are not significant or feeling that there is nothing a doctor can do for them. People often feel that if they wait or that if they change their

lifestyle the problem will go away. Another reason for avoiding treatment may be that the patient fears the treatment may be harsher than the disorder. Many people are concerned about the side affects or addictive nature of sleeping pills (Poceta 1998). But the latest generation of sleeping pills is much safer and far more effective than ever before.

3.2.1 Causes

Almost all psycho physiological insomnias begin with a single factor that may be minor, but becomes more established over time. Jet lag is a common temporary sleep disorder that occurs after traveling across multiple time zones. Adjustment sleep disorder can be caused by a change in sleep patterns. The change in sleep patterns often occurs because of stress, conflict or an environmental change. This disorder is associated with marriage, divorce, job change, frightening events, financial problems, and so on. When the source of stress diminishes, normal sleeping patterns are resumed.

Insomnia can also be caused by improper sleep hygiene. This involves practices and habits in the person's life that disrupt sleep rhythms. Such habits include late night activity, large amounts of activity, too much light or noise and excessive high or low temperatures in the bedroom. Varying one's day-to-day sleep schedule also disrupts sleep rhythms.

Abusing stimulants and depressants may also play a vital role in one's sleep health. Alcohol consumption, coffee, over the counter medication, and prescription medication can all prohibit normal sleeping patterns. Several medical conditions can contribute to insomnia. Discomfort from conditions like arthritis, metastatic disease and

pruritis can all disturb ones sleep. Heart and stomach problems can also contribute to insomnia.

A wide range of psychiatric problems are also associated with insomnia. Anxiety and panic disorder can leave a person lying in bed for hours worrying about falling asleep. This not only prevents the person from falling asleep, it adds to the problem (Poceta 1998). Insomnia and depression are also closely linked; one disorder amplifies the other. According to emedicine online, as many as 40% of the people suffering from depression also suffer from insomnia (Bonds 2002). Schizophrenia is also closely related to sleeping disturbances. Patients with schizophrenia encounter a delayed sleep onset, sleep less than the average person and have abnormal REM sleep periods.

3.2.2 Treatment

Treatment of insomnia requires that the causes be identified and addressed, in the case of multiple causes, each one should be addressed separately. Combinations of behavioral changes as well as pharmacotherapy are often utilized. The treatment depends on the causes of the symptoms. The four main complaints are sleep initiation, sleep maintenance, early awakening, and nonrestorative sleep. Once the complaint is determined, the causes will be identified. The patient will also be examined for other conditions that may be causing the sleep disorder such as depression. If the patient meets the criteria of another disorder, the patient will be treated for that disorder. The patients' sleeping environment and sleep hygiene will also be examined.

There are a variety of approaches that can be taken to modify the behavior of the patient to make them sleep better. Some of the common strategies include relaxation techniques, self-hypnosis, and meditation. However these techniques do not always do

the trick. There are many tips that one can use to prepare themselves for better sleep. These include laying down only when one intends to go to sleep, using the bed only for sleep and sexual activity, avoid napping during the day, and establish a sleep schedule to follow everyday. Another important rule is do not lay in bed if unable to fall asleep for a period of longer than ten minutes, get up and do something and then return to bed. The bed should be associated with sleeping (Poceta 1998).

Another approach is to restrict sleep in order to provide more efficient sleep. The patient will keep a diary of their sleep patterns and calculate their sleep efficiency on a periodic basis. The sleep efficiency can be calculated by dividing the amount of time spent sleeping by the total time spent in bed. A threshold value of sleep efficiency can be set as a goal, and when that goal is reached, the patient can add to the time spent in bed. This sort of therapy requires that the patient be motivated to obtain a normal sleeping pattern.

It has been known for a long time that alcohol and opiates can induce sleep. In modern times, many over the counter and prescription medications have been developed that are much safer than before. However, when combined with other drugs, these sleeping aids can become dangerous (Poceta 1998). When a doctor recommends a sleeping aid, he must be aware of other medical conditions that might be present. In addition, these sleeping aids may become addictive or the patient may become dependant on them. There are also side effects associated with some of today's sleeping medications so any medication taken to treat a sleep disorder should be taken with care.

3.3 Excessive Daytime Sleepiness

Excessive daytime sleepiness is not a disorder, but a symptom common to many disorders. Someone that is experiencing excessive daytime sleepiness may be in a state of decreased arousal. This person may be in an active surrounding, but barely perceive what is happening around them. Drowsiness or sleepiness may be encountered during the day but may not necessarily lead to sleep. Excessive sleep is another characteristic of this symptom. The patient may wake up late and go to bed early or perhaps take midday naps. Micro sleeps may also be encountered. A micro sleep is a short episode of sleep lasting a few seconds. There may be no recollection of falling asleep, but the patient will remember having been asleep and will wake suddenly at the end of the micro sleep (Shneerson 2000).

Having excessive daytime sleepiness may lead to physical and psychological problems. When someone is extremely tired, extra effort is required to keep alert and concentrate. This extra effort is difficult to maintain throughout the day. A loss of vocabulary, creativity and attention span are typical signs of EDS. Hallucinations due to an altered perception of reality or an intrusion of REM sleep into wakefulness may also occur. Mood changes particularly to the more irritable side are common as well. EDS can affect physical performance too. Fatigue, lack of energy, automatic behavior, and inappropriate actions are all associated with this symptom (Shneerson 2000).

3.3.1 Causes

Excessive daytime sleepiness has a variety of causes. The most common cause is perhaps sleep deprivation. Neurological, psychiatric, circadian rhythmic and systemic disorders contribute as well as drug use and sleep fragmentation.

Sleep deprivation is often due to social or work pressures forcing the patient to choose between completing activities and obtaining sufficient sleep. Sleep deprivation can also be caused by circadian rhythmic disorders like delayed sleep phase syndrome and advanced sleep phase syndrome. These syndromes are caused by a truncated end or start of the sleep period in order to comply with social or cultural norms (Shneerson 2000). Drug use, either social or medicinal also impacts one's sleep health.

Many of the causes of insomnia also cause EDS. Insomnia decreases the amount of sleep the patient gets and thus the patient is more tired during the daytime.

3.3.2 Treatment

Since EDS is not a disorder itself, there is no specific treatment for it. Treatment for EDS depends on the disorder causing it. Excessive daytime sleepiness is most commonly associated with narcolepsy, sleep apnea, restless legs syndrome, and circadian rhythm disorder. For more information about treatment of EDS, one should determine what disorder is present.

3.4 Narcolepsy

Narcolepsy is a disorder characterized by sudden and uncontrollable, though often brief, attacks of deep sleep, sometimes accompanied by paralysis and hallucinations. These unwanted episodes of sleep can occur several times a day. In addition, these episodes will not only occur when expected like after a heavy meal or during a monotonous activity but also during an involved activity (Poceta 1998). The narcoleptic will often awake from the episodes feeling refreshed. Although they will feel refreshed, this doesn't prevent further attacks.

The sleeping attacks are not the only sign of narcolepsy though. The narcoleptic will feel abnormally drowsy at times and will often spend the day in a low level of alertness. This disorder leads to poor performance, memory lapses, and gestural or speech automatisms. Even the use of stimulant medication may not bring the narcoleptic out of this phase.

This disorder is tied to other sleep disorders as well. Narcolepsy shares some characteristics with insomnia. A narcoleptic can usually fall asleep within 5 minutes of going to bed but the sleep pattern over the night is rather unstable. The REM sleep episodes in a narcoleptic are shorter than a normal person and there is more time spent in the lighter stages of NREM sleep or awake. When a narcoleptic awakes in the morning they feel unrefreshed (Shneerson 2000). However, for a narcoleptic, the total time spent sleeping in a 24 hour period is only slightly higher than normal because the sleep lost at night is a little less than the time spent in sleeping during the day.

3.4.1 Causes

There is no obvious factor that triggers narcolepsy but there are many factors that contribute to the appearance of narcolepsy. Narcolepsy may be passed through genes from one generation to the next. There is some evidence in animals such as dogs and horses that narcolepsy has its own gene, but this has not been confirmed in humans yet (Shneerson 2000). Narcolepsy is also associated with conditions that alter the immune system and the brain. During pregnancy, the immune system of the mother is altered possibly allowing for narcolepsy to appear. Infections that alter the immunes system may also trigger narcolepsy to appear. Major head injuries and diseases that affect the brain can also trigger narcolepsy. Damage to the brain structures controlling REM sleep may

cause the disorder or possibly a change in the neurotransmitters or inflammatory response could also lead to narcoleptic symptoms.

3.4.2 Treatment

Treatment of narcolepsy is often delayed due to the fact that diagnosis is often missed for many years. The diagnosis may be delayed from seven to fourteen years depending on the symptoms that are present. Because of the delay, psychological responses to the problems of narcolepsy develop and may not be reversible (Sheerson 2000).

Understanding narcolepsy is important for the patient, family, friends, and coworkers. Narcoleptics are often viewed as depressed, lazy, or having a mental disorder. The narcoleptic attacks often generate anger, resentment and guilt causing harm in interpersonal relationships. Good sleep hygiene practices should be adopted, especially regular sleep-wake routines. By modifying one's daytime activities alertness can be increased. Exercise and bright lights can increase alertness, but exercise that may be dangerous if one falls asleep should be avoided. Alcohol and larges meals should also be avoided. Naps during the day should be planned to coincide with circadian rhythms and before events where it is important to be alert.

There is no cure for narcolepsy; it is a life long disorder. Someone dealing with narcolepsy must manage the disorder and integrate it into their lifestyle. Narcolepsy does not affect the intelligence level of the patient, but it does affect concentration and attention span. At school or at work, one should plan for short naps and regular breaks from tedious activities. The work area should also be well lit to promote alertness. When driving a car, one should take stimulant medication or take a nap prior to driving.

Depending on the degree of the symptoms of narcolepsy, different medications can be taken. Large doses of caffeine are helpful to fight against daytime sleepiness. However, sometimes a more powerful stimulant, like an amphetamine, is necessary to maintain alertness. Antidepressants are quite helpful to fight depression and nightmares in narcoleptics. If the patient is also encountering insomnia, sedatives or hypnotic medication may be used (Shneerson 2000).

3.5 Obstructive Sleep Apneas and Snoring

Obstructive sleep apneas are caused by the closure of the upper airway during sleep. This prevents air from entering the lungs and thus interrupts the continuous exchange of gas in the lungs. This disorder can range from a few obstructions to life threatening condition. This sort of condition is more common in elderly people as well as obese people. In addition, this disorder is four time more common in males than in females. Sleep apnea can also be inherited or acquired in a family through common eating habits or other behavioral factors. Some of the most common symptoms of obstructive sleep apnea are loud snoring, choking spells during the night, excessive daytime sleepiness, frequent visits to the bathroom during the night, mood swings, obesity, low sex drive, dry mouth and sore throat, lack of concentration and morning headaches (sleepdisorders.about.com). The excessive daytime sleepiness, mood swings and lack of concentration are due to the interrupted sleep at night.

3.5.1 Causes

The obstruction of the airway during sleeping may be due to genetic influences or soft tissue changes. The obstruction of the airway is what causes this disorder. Obesity

is a major risk factor for sleep apnea. The excess fat located around the airway tends to collapse it when there is not sufficient muscle tone. Too much muscle in the neck may also lead to airway obstruction.

Smoking tobacco products has also been shown to obstruct the airway. Hormones may also affect the airway. Hormones may change the respiratory drive, change the dimensions of the airway, or reduce the fat deposits in the neck. Sleeping position also has a lot to do with sleep apnea. The weight of the tongue and jaw may add to the airway obstruction or the position of the neck might change the shape of the airway making it more difficult for air to flow freely. Nasal obstructions lead to mouth breathing and may reduce the stability of the upper airway. Some important causes of nasal obstructions are nasal polyps, rhinitis, and a deviated septum.

The enlargement of the tonsil, adenoids, or both causes the pharynx to narrow. The enlargement of the tonsils or adenoids may be temporary due to illness, or permanent due to chronic enlargement. Enlargement of the tongue also has similar effects on breathing patterns (Shneerson 2000).

3.5.2 Treatment

Treatment of sleep apnea can relieve symptoms, prevent medical complications, and improve the quality of life. There are two types of treatment for sleep apnea, moderate and severe. In the moderate case, there is no need for surgery or any sort of sleeping aid, simple modifications in sleep hygiene and behavioral patterns adjustments can be made. In the more sever cases, surgery, medication, and/or mechanical devices might be necessary.

For the moderate cases of sleep apnea, there is no need for a sleep study. The treatment of such cases is aimed at relieving the factors that contribute to the obstruction. Losing weight is an important first step in treating sleep apnea. Weight loss is helpful in about 50% of obese subjects with this disorder. Reduced alcohol and hypnotics (Benzodiazepines and other similar medications) consumption and smoking cessation may also be helpful to patients with sleep apnea. Changing one's sleeping position to lie on one's side may reduce airway restriction. This allows the neck to be extended and thus increase the diameter of the pharynx.

The more severe cases of sleep apnea are treated with more severe measures. These measures are only taken if the more moderate previous attempts have failed. Modifying sleeping patterns to avoid REM sleep can be effective to eliminate sleep apnea only if the obstruction occurs only in REM sleep. Avoiding REM sleep is done through medications such as antidepressants and selective serotonin re-uptake inhibitors. Increasing the dimensions of the upper airway can also aid in the treatment of sleep apnea. This can be accomplished by mechanical devices, surgery, or with continuous positive airway pressure (Shneerson 2000). There are many types of mechanical devices and surgery that can be used to increase the size of the airway depending on the severity and location of the problem. The continuous positive airway pressure (CPAP) method involves a pump with a high flow capacity that delivers air at pressures that can be adjusted and maintained. This method forces the pharynx to expand like a balloon to a size that allows better airflow.

3.6 Restless Legs Syndrome and Periodic Limb Movements in Sleep

Restless legs syndrome (RLS) also called nocturnal myoclonus is closely associated with periodic limb movements in sleep (PLMS). Although patients with PLMS do not necessarily have RLS, the majority of patients with RLS have PLMS. Restless legs syndrome is a common cause of insomnia and is thus receiving more and more attention.

People with RLS or PLMS usually complain about unpleasant physical sensations in the legs, insomnia, daytime sleepiness and nonrestorative sleep, and restless sleep with nocturnal movements (Poceta 1998). The first three symptoms are subjective and difficult to quantify, making the diagnosis more difficult. Restless legs syndrome should be considered if any of these symptoms are present.

An unpleasant physical sensation in the legs refers to the feeling that makes one want to move their legs. There is often a sensation of tingling or itching which adds to the feeling of restlessness. By moving ones legs, the feeling will go away, sometimes there may even be an involuntary jerk or twitch. Sometimes, the patient will be unaware of the specific sensation but toss and turn for long periods of time while trying to initiate sleep. Once asleep, the patient may be awakened by an involuntary jerk of the legs. And their restlessness will not allow him or her to go back to sleep.

Sleep disruption caused by RLS and PLMS can lead to excessive daytime sleepiness. These disorders can produce brief arousals during the night that the patient may not be aware of. Thus patients with RLS or PLMS can be victim of nonrestorative sleep or daytime sleepiness based on insufficient sleeping time or poor quality sleep.

Restless sleep with nocturnal movements is often noticed by the bed partner. These movements may be so vigorous that the bed partner is kept awake. A patient with RLS or PLMS will often sleep best in unusual settings, such as on the floor, because they are unrestricted in movement.

3.6.1 Causes

There are no established causes of RLS or PLMS but some have been extrapolated over years of research. Such research has been able to associate RLS and PLMS with other diseases and disorders and prove the effectiveness of certain medications.

Reports indicate that one third to one half of the patients with RLS have a positive family history of RLS, however a specific gene or chromosome has yet to be discovered that causes RLS. Iron and magnesium deficiencies are proved to be causes of RLS and PLMS. Patients who are pregnant or have rheumatoid arthritis commonly show signs of RLS or PLMS. Both pregnancy and rheumatoid arthritis are commonly associated with iron deficiency.

Stimulant and dopamine antagonists also exacerbate the symptoms of RLS and PLMS. Such drugs include caffeine, glucocorticoids, MAOI, lithium, antihistamines, anti-psychotics, and calcium channel blockers.

3.6.2 Treatment

The treatment of RLS and PLMS are similar but differ slightly from one another. PLMS occurs only in sleep while RLS can occur at any point during the day. The treatment plan has five steps, some cases do not require all of the steps to be taken, but

the more severe cases require all of the steps. The steps are explanation and reassurance, practicing good sleep hygiene, treating the cause, avoiding relevant drugs, and treating with drugs (Shneerson 2000). RLS and PLMS are not curable but if treated properly, the symptoms may decline to an unnoticeable level.

3.7 Parasomnias

Parasomnias are disorders occur during sleep, and often affect the sleep of those around us. The most common types of parasomnias include but are not limited to sleepwalking, sleep talking, and nightmares.

Sleepwalking is most common in young children that have not yet gone through puberty. This disorder involves taking nocturnal trips during the night. The person that goes for a "sleepwalk" has no recollection of the trip. There is usually no need for treatment as this disorder is not too serious. However it is important to take precautions to protect the sleepwalker from potential dangers during the night.

Sleep talking is another parasomnia that is harmless to the afflicted person. There is no need to treat this disorder, it is harmless. The signs of sleep talking are obvious, someone talks in their sleep. The person will have no recollection of their sleep talking episodes and is normally temporary. This disorder is caused by stress, illness, sleep apnea or nightmares. The talking can range from a few words of gibberish to an entire conversation (sleepfoundation.org).

Sleep terrors or nightmares are indicated by the sudden awakening of the patient with intense fear. Screaming and fighting may also occur during such episodes. These episodes generally last about fifteen minutes and the person experiencing them may or may not remember them in the morning. This disorder is most common in children, but

may also occur in adults. There is no need for treatment unless the problem is persistent in which case psychiatric help should be sought.

4. Sleep Hygiene

To improve one's sleep health, clinical work is often not necessary. Many sleeping disorders can be managed through good sleep hygiene. By modifying one's daily routines, diet, environment, and drug intake, one can significantly better their quality of life. Most often, only slight changes are necessary to improve one's sleeping habits unless an actual sleeping disorder exists. In the case of a sleeping disorder, professional help should be sought, however prior to seeking the help of a professional the guidelines set forth in this section should be taken into advisement.

There are a variety of things that can be done during the day to promote high quality sleep. Regular exercise, about forty minutes per day, has been shown to help sleep hygiene. However, one should avoid exercising just prior to bedtime. Taking a bath before bedtime or having a hot beverage to increase the body temperature is also helpful. Too much or too little sleep has a negative effect, for the highest quality sleep, a consistent amount of sleep per night is recommended. Naps during the day are often detrimental, except for brief naps of fifteen to twenty minutes in duration after being awake for at least eight hours. In some cases, naps are important in treating sleeping disorders such as narcolepsy; a physician should be consulted in the case of a persisting sleeping problems.

Light has a great effect on sleep as well. Exposing oneself to bright light within a half hour of waking up has a positive effect on one's awareness during the day. On the other side, one should avoid exposure to bright lights prior to going to sleep and during

the night. Keeping a regular schedule promotes healthy sleep as well. By waking up and going to sleep at the same times every day, the body gets used to the cycle and will make it easier to wake up in the morning and fall asleep at night.

Eating prior to bedtime is not advised, heavy meals can lead to discomfort and night waking. After consuming a heavy meal it is recommended that one wait at least three hours before attempting to go to sleep (sleepdisorders.about.com). On the other hand, a light snack before bed may be part of the bedtime ritual and aid one in having a good night's sleep.

Cigarettes, ethanol (beverage alcohol) and caffeine have negative effects on sleep health and daytime performance. Nicotine from cigarettes, in low concentrations acts as a sedative, however in larger quantities can act as a stimulant. Ethanol as found in alcoholic beverages gives the feeling of drowsiness, so many people may thing it promotes healthy sleeping. On the contrary, ethanol causes problems with sleep maintenance. By consuming ethanol prior to going to sleep, one may fall asleep faster but find it more difficult to stay asleep during the night or achieve the quality of sleep desired. Obviously since caffeine is a stimulant it can inhibit the onset of sleep. During the sleep cycle, caffeine also lowers the quality of sleep and makes arousal easier. Sleeping pills are alright once in a while, but prolonged use may lead to dependence and even immunity.

The sleeping environment is important to getting a good night's sleep. The bed should only be used for sleep and sexual activity (Kryger 2000). Using the bed for other activities such as work or entertainment may lead one to associate the bed with arousal rather than sleeping. One should avoid sleeping in different places also, sleeping in

different places may lead to confusion. The sleeping environment should be kept quiet, dark, well ventilated and at a comfortable temperature. By adjusting the sleep environment to the most comfortable setting, arousal during the night can be avoided.

Medical conditions may exist that are detrimental to one's sleep health. Things like allergies or injuries may lead to discomfort and trouble sleeping. During certain parts of the year one may have difficulty sleeping due to allergies from pollen or grass or a variety of factors. Or perhaps the allergies are present year round and are due to other factors in the room. To aid a person with allergies, an air purifier or allergy medication could prove to be helpful. A person experiencing discomfort from an injury, disease or disability may find medication to ease the pain during the night useful

Stress is also a major factor the leads to sleeping problems (sleepdisorders.about.com). For someone that deals with stress during the day, stress management techniques should be adopted. Laying in bed thinking about problems will not help initiate sleep, it leads to more worrying. Instead of stressing, one should make a list of things to be done the following day to ease the mind. Trying to hard to sleep often prevents sleep. A good technique is to ease the mind and relax.

By creating a healthy pattern of living, one may be able to dramatically improve their sleep health. Sleeping and waking on a regular schedule is the most effective way of enabling the best quality of sleep. Avoiding things like nicotine, caffeine, and alcohol have also been shown to be very effective. Environment, mental health, and medical conditions are also factors that can prevent one from achieving the best sleep they can. By identifying the cause, many sleeping problems can be taken care of without medical treatment.

4.1 Lifestyles

Sleeping and lifestyles are closely related. People that work late nights or early mornings may be at risk of developing a sleeping disorder. College students have been known to have erratic sleeping patterns and thus develop sleeping problems. Medical conditions have also been known to lead to sleeping issues. Some people can live on only a few hours of sleep per night and some people need more than the suggested eight hours per night to function normally. Each person is unique and therefore there is no perfect solution to a sleeping problem.

Working the overnight shift plays with a person's internal clock. Light has a great effect on sleep. Humans are diurnal, meaning they are active during the day. The human body naturally adjusts itself to the light. When the surroundings are light, humans are active, and when it is dark humans sleep. Reversing this natural tendency leads to problems. However some people adjust to this lifestyle better than others and can easily cope with it. Others on the other hand cannot adjust and fall asleep at work and/or cannot fall asleep during the day.

College students live much different than most people. Living away from home for the first time, many students drastically alter their lifestyles (sleepdisorders.about.com). In college, new friends are made and new things are tried. Procrastination is very common in college, papers and projects are often left until the last minute. This leads to late and possibly even missed nights of sleep. While at college students will often stay out late partying as well. These late nights detract from their sleep health and encourage sleeping in. This behavior offsets the sleeping schedule and often leads to problems.

Adjusting to a new surrounding often plays a major role in causing a sleeping problem. Moving into a new house or moving to school can have a great impact. Aside from making new friends and adjusting one's lifestyle, one must get used to a new sleeping environment. Trying to fall asleep in a new environment can be difficult for some people (sleepdisorders.about.com). There are new things to think about, new surroundings, anxiety, and possibly new roommates all of which may lead to sleeping issues. Once one gets used to the new sleeping environment, sleeping often becomes easier. In some cases in may take longer to adjust than others, some modifications may be in order to achieve the best sleep hygiene.

The recommended amount of sleep per night is eight hours, however some people can live comfortably on more or less sleep. Most people, about 60% of adults, get between seven and eight hours of sleep per night. Around 8% get less than five hours per night and about 2% get more than ten hours per night (Shneerson 2000) and still wake feeling well rested. The ability of someone to wake feeling well rested depends on many factors such as health, diet, and sleep schedule. If someone maintains a constant sleep schedule, the proper amounts of REM and NREM sleep can be obtained. As long as these amounts of sleep are obtained, one can wake feeling refreshed independent of sleep duration.

Napping during the day is discouraged as it leads to dependence on naps. However napping can be helpful to some people encountering daytime sleepiness. The utility of a daytime nap depends entirely upon the duration of a nap. From the information gathered, the consensus is that a nap should last about ten to fifteen minutes and only after being awake for more than eight hours (sleepfoundation.org). If a longer

nap is taken, or a nap is taken prior to being awake for eight hours or more it is likely that the circadian rhythm can be upset making it harder to fall asleep at night (Kryger 2000).

5. Effects of Improper Sleeping

Abnormal sleeping can lead to more than being tired. Studies show that sleep deprivation can lead to more serious problems. Physical fatigue, smaller attention span, mood swings, and immune system problems have all been linked to lack of sleep and poor quality of sleep.

There are many psychiatric disorders that can be caused by or aggravated by sleeping disorders of sleeping problems. Anxiety and depression are exacerbated by sleeping problem and in turn these disorders cause more sleeping problems. To fix the problem, both disorders must be treated. Mood swings and irritability are also commonly associated with lack of sleep. Mood swings not only affect the person having them, but also the people that are around when they occur.

The immune system can be weakened by lack of sleep. If one's immune system is diminished, the rest of the body is left susceptible to a wide variety of disorders and diseases (sleepdisorders.about.com). These disorders and diseases can then make the sleeping problems worse and make life much more difficult. To stay healthy, the proper amount of sleep should be obtained. This may involve limiting one's daily activities, but the alternatives are much worse.

Sleep disorders may lead to other problems or other problems may look like a sleep disorder. Stress, pain, and anxiety are a few of the causes of sleep problems. Such feelings may be induced by other diseases such as the ones discussed in the next section.

6. Sleep and Other Diseases

6.1 Asthma

Asthma is best described by its technical name: Reversible Obstructive Airway Disease (ROAD). In other words, asthma is a condition in which the airways of the lungs become either narrowed or completely blocked, impeding normal breathing. However, in asthma, this obstruction of the lungs is reversible, either spontaneously or with medication (American Lung Association 2003).

Quickly reviewing the structure of the lung; air reaches the lung by passing through the windpipe (trachea), which divides into two large tubes (bronchi), one for each lung. Each bronchi further divides into many little tubes (bronchioles), which eventually lead to tiny air sacs (alveoli), in which oxygen from the air is transferred to the bloodstream, and carbon dioxide from the bloodstream is transferred to the air. Asthma involves only the airways (bronchi and bronchioles), and not the air sacs. The airways are cleaned by trapping stray particles in a thin layer of mucus which covers the surface of the airways. This mucus is produced by glands inside the lung, and is constantly being renewed. The mucus is then either coughed up or swept up to the windpipe (trachea) by cilia, tiny hairs on the lining of the airways. Once the mucus reaches the throat, it can again be coughed up or, alternatively, swallowed (American Lung Association 2003).

Although everyone's airways have the potential for constricting in response to allergens or irritants, the asthmatic's airways are oversensitive, or hyper-reactive. In response to stimuli, the airways may become obstructed by one of the following:

- constriction of the muscles surrounding the airway
- inflammation and swelling of the airway
- or increased mucus production which clogs the airway

Once the airways have become obstructed, it takes more effort to force air through them, breathing becomes labored. This forcing of air through constricted airways can make a whistling or rattling sound, called wheezing. Irritation of the airways by excessive mucus may also provoke coughing.

Because exhaling through the obstructed airways is difficult, too much stale air remains in the lungs after each breath. This decreases the amount of fresh air which can be taken in with each new breath, so not only is there less oxygen available for the whole body, but more importantly, the high concentration of carbon dioxide in the lungs causes the blood supply to become acidic. This acidity in the blood may rise to toxic levels if the asthma remains untreated (American Lung Association 2003).

For many people with asthma, a good night's rest may be a long-lost memory. A survey in England several years ago revealed that about 40 percent of the people with asthma queried had nocturnal symptoms every night and about 75 percent experienced symptoms at least one night a week.

You know you are experiencing nocturnal asthma if you awaken at night with a shortness of breath or feel that you can't catch your breath. You may also have other symptoms similar to heartburn. What produces these evening episodes? Circadian rhythm the term used to describe the approximate 24-hour cycle in which our bodies function seems to play an important role (Poceta 1998).

Within each cycle are peaks and lows of certain naturally occurring chemicals such as adrenaline and cortisol that can affect lung function and trigger asthma symptoms. For example, both cortisol and adrenaline levels are lowest during hours of sleep.

Along with chemical changes, nighttime air temperature or prolonged allergen exposure during the day may also trigger a late-phase reaction after you've gone to bed. Nocturnal asthma may also be linked with other chemical conditions you may have, such as sinusitis, gastroesophageal reflux and allergic rhinitis (American Lung Association 2003).

6.2 Cancer

Cancer is not just one disease but rather a group of diseases. All forms of cancer cause cells in the body to change and grow out of control. Most types of cancer cells form a lump or mass called a tumor. Cells from the tumor can break away and travel to other parts of the body where they can continue to grow. This spreading process is called metastasis. When cancer spreads, it is still named after the part of the body where it started (American Cancer Society 2003). For example, if breast cancer spreads to the lungs, it is still breast cancer, not lung cancer.

Malignant is another word for cancerous thus a cancerous tumor is often referred to as malignant. But not all tumors are cancer. A tumor that is not cancer is called benign. Benign tumors do not grow and spread the way cancer does. They are usually not a threat to life. A few cancers, such as blood cancers (leukemia), do not form a tumor.

Cancer patients are at great risk for developing insomnia and disorders of the sleep-wake cycle. Insomnia is the most common sleep disturbance in this population and is most often secondary to physical and/or psychological factors related to cancer and/or cancer treatment. Anxiety and depression, common psychological responses to the diagnosis of cancer, cancer treatment, and hospitalization, are highly correlated with insomnia (Shneerson 2000).

Sleep disturbances may be exacerbated by paraneoplastic syndromes associated with steroid production and by symptoms associated with tumor invasion, such as draining lesions, gastrointestinal (GI) and genitourinary (GU) alterations, pain, fever, cough, dyspnea, pruritus, and fatigue. Medications, including vitamins, administration of corticosteroids, neuroleptics for nausea and vomiting, and sympathomimetics for the treatment of dyspnea, as well as other treatment factors can impact negatively on sleep patterns (Shneerson 2000).

6.3 Epilepsy

Epilepsy is sometimes called a seizure disorder, which is a chronic medical condition produced by temporary changes in the electrical function of the brain, causing seizures which affect awareness, movement, or sensation (Epilepsy.org 2003).

Those with epilepsy are like anyone else, except they're just prone to recurrent seizures. A seizure is caused by a temporary change in the way our brain cells work. (The old name for a seizure was a 'fit') (Epilepsy.org 2003).

The brain is like a computer which consists of a vast network of nerve cells called neurons. Everyday in our lives billions of electrical messages are fired between these cells, controlling every single thing we think, feel, or do.

The body has its own inbuilt balancing mechanisms. These ensure that messages usually travel between nerve cells in an orderly way. However sometimes without warning an upset in brain chemistry causes the messages to become scrambled. When this happens the neurons fire off faster than usual and in bursts. This disturbed activity triggers off a seizure.

During a seizure people are known to black out or experience a number of unusual sensations or movements. The seizure usually lasts a matter of seconds or minutes, after which our brain cells return to normal. Some people with epilepsy have their seizures only while awake, some whilst asleep and some have a mixture of both (Epilepsy Foundation 2002).

Generalized epileptic events are increased in NREM sleep and decreased or abolished in REM sleep. Partial seizures may also be facilitated by sleep and sleep EEG recordings may show a second independent epileptic focus not present in waking recordings. This is because in REM sleep the generalized discharge may be suppressed, making the focal component evident (Poceta 1998).

Separate peaks of seizures occur about 1 - 2 hours after falling asleep and at 5 - 6 am. These can be understood as representing the most probable time of occurrence of the two most frequent seizure types generalized and temporal lobe seizures of hippocampal origins respectively.

Particular forms of epilepsy are especially activated by sleep. For example, in Lennox Gastaut Syndrome in children, seizures are markedly increased in NREM sleep. These may occur 50 - 200 times per night but may be interpreted as simple body movements, when in fact they are seizures (Epilepsy Foundation 2003).

It is important to know which sleep state produces a person's seizures, as this would enable the correct treatment to be prescribed. However, increases in seizures in the second half of the night may be due to lowered serum levels of anti-epileptic drugs.

No matter what the cause of the disorder, coping with the problem is never easy to do. Many times unwanted adaptations are necessary to remedy the problem. The next

section is focused on coping methods and strategies for people dealing with a sleep disorders.

7. Coping Strategies

Coping with a sleeping disorder is probably the hardest part of having a sleeping disorder. Not sleeping properly affects the entire body. Not enough sleep causes fatigue and sluggishness. When someone feels tired it makes it difficult to go on with everyday life, there is a constant desired to go back to bed. This is often not a good solution as discussed before. In addition, improper sleeping habits can in large doses impact the immune system. When someone is tired they also become irritable making it difficult for other people to be around them. Having sleeping problems not only impacts the person being afflicted, but also everyone they take it out on.

The best way to cope with a sleep disorder or sleep problem have good sleep hygiene. By following daily routines, being healthy, and avoiding certain substances most sleeping issues can be handled. Some sleep disorders require special daily adaptations such as naps, physical activity, or medication (Poceta 1998). In these cases it is important that one's employer and fellow employees are notified. If the problem is managed properly, the patient's level of health will remain high. And the patient in turn will be much more pleasant to be around.

Many people look to the internet for help dealing with their problems. The internet is confidential (for the most part) and a great deal of information can be found if you look in the right place. Finding a good website however can be difficult; there is a lot of junk on web that you have to sort through. In the next section will we attempt to sort out the current websites.

8. Current State of the Web

There are many websites available to learn about sleep disorders. Websites can be found that specifically address certain types of sleep disorder or websites that address the entire subject of sleep disorders. The content within the various website that were visited for this project vary to both ends of the spectrum. Some sites had a large amount of technical information that was designed for obtaining a great amount of detail. Other websites had very limited amounts of information that only gave tips for a good night's sleep. Overall, the information that can be found on the internet is very robust if one knows where to look and how to search.

To find the websites that will be rated below, key phrases like "sleep disorders", "sleep problems", and "sleep disorders, college student" were typed into the search engine at http://www.google.com. A large number of websites came up for each of the searches done, but many were no suitable to get any information from. Many of the sites that came up were people's homepages talking about their own sleeping problems or clinics that help people with sleep problems but contained no information about actual sleep problems. To find the best and most helpful websites, the searches had to be sorted through.

Rating the websites was based on the information contained within the website, the ease of navigation through the website and the appeal of the website. To judge the websites, a scale of 1 to 5 was used to rate each category. Because some categories are more important than others, a weight was also assigned to each category. The table seen in table 1 shows the values assigned for each website and the relative weightings of each category. The websites in this table are not inclusive of all of the websites on the web,

nor are they inclusive of all the websites used for this report. The websites compared in the chart were chosen as a sampling of the sites visited to complete this report and cover sleep disorders in the more general sense.

Table 1: Website comparison

Handheld Mixers Value Analysis											
		Weight	Site 1		Site 2		Site 3		Site 4		Site 5	
	Criteria		Value point	Total	Value point	Total	Value point	Total	Value point	Total	Value point	Total
1	Information Content	3	4	12	3	9	4	12	3	9	5	15
2	Ease of Navigation	2	2	4	4	8	5	10	5	10	4	8
3	Visual Appeal	1	2	2	3	3	4	4	5	5	3	3
	Total			18		20		26		24		26
	Site 1: http://sleepdisorders.about.com/											
	Site 2: http://www.sleepfoundation.org/											
	Site 3: http://www.sleepnet.com/											
	Site 4: http://www.nlm.nih.gov/medlineplus/tutorials/sleepdisorders.html											
	Site 5: http://www.ninds.nih.gov/health_and_medical/pubs/understanding_sleep_brain_basic_.htm											

The information content criterion gets a weight of three because it is the most important. When someone goes looking on the internet, they are most likely after information. The ease of use got a weight of two because it is almost as important as the information that is provided. If the information on the website is organized in a way that makes it difficult to use, the website is not too helpful. Appeal got a weight of one because most people are only after information to aid them in coping with their sleep disorder. In some cases, the aesthetics of a website might make someone prefer it over another, but it is not nearly as important as the other criteria.

Site number one is http://sleepdisorders.about.com. Aside from the pop-up ads and large amount of other advertising that appear on the website, there is not a much other than text. On the left hand side of the site there is a series of hyperlinks that one can follow to find out more about a given category. In each category there is an index with a brief summary of the one page articles that talk about various aspects of sleep

disorders. These articles are interesting, but not too informative. Reading more than one article from each category becomes redundant.

Site number two is http://www.sleepfoundation.org. This website's homepage is made primarily of picture and text links that lead the user to the information provided on the website. Although, this website is easy to use and has aesthetic appeal, there is not an abundant amount of information on sleep disorders. There is a section that contains information about the various types of disorders, but the descriptions are brief.

The third site is http://www.sleepnet.com. This site is organized very well and contains a lot of useful information. The homepage has graphical links to break up the site into categories. Each category is then broken up further into subcategories on the next page. This site also contains sleep tests where the user can indicate what symptoms they experience and the possible disorders are returned to them.

http://www.nlm.nih.gov/medlineplus/tutorials/sleepdisorders.html is the fourth website evaluated. This website is an interactive guide to sleep disorders. There is a graphical interface that speaks to the user and displays pictures and words. The user is able to navigate through the presentation and answer question about sleep disorders. There is a fair amount of information provided in the presentation and the website is very easy to understand and use.

The last website evaluated for this section of the report is http://www.ninds.nih.gov/health_and_medical/pubs/understanding_sleep_brain_basic_.htm This website is developed by the government and contains a large amount of good information. On this site one can learn about sleep, what disorders exist, and how to cope

with the disorders. By far, this was the most informative website for someone just starting to research about sleep disorders.

Overall, the websites used to research about sleep disorders were quite helpful. Finding websites about sleep disorders geared toward college students proved to be much more difficult though. Most websites were general overviews of sleep disorders that could actually be diagnosed by doctor. However, after scouring the internet a couple helpful sites that were geared specifically toward college student were found and they are:

http://kidshealth.org/teen/your_body/take_care/sleep.html

http://www.barnard.columbia.edu/health/publications/sleep.htm

http://www.undstudenthealth.com/sleeplessness.htm

http://www.uwec.edu/counsel/pubs/sweetDreams.htm

http://www.mtroyal.ab.ca/healthservices/sleep.htm

Some of these sites are more helpful than others for a student experiencing a problem sleeping. For the most part, the general websites that were evaluated in table 1 are significantly more informative.

The kidshealth website gives tips and background information on sleep disorders. This website however is geared toward younger, high school students. A college student may find this site helpful, but they would not be able to get as much information as desired.

The Columbia website is a single page that offers some helpful information. It also provides a list of places to go for help in the area. This would be helpful for WPI

students only if they were close to Columbia University. Also, the site only provides minimal information to get a taste of sleep disorders.

The University of North Dakota Website is very brief and provides only basic information. They do offer a phone number for their student services though, which may provide more in depth information and help. The University of Wisconsin website is in the same boat. Their website provides only a short introduction to sleep disorders, and a student would have to look elsewhere for help. Mount Royal College's website has some tips on how to get a good night's sleep too.

The website developed for the students at Worcester Polytechnic Institute will go into much more depth about the specific problems college students face. This site will go even further to look at the possible sleeping problems facing WPI students specifically. Never the less the website will also include information for people of all walks of life experiencing problems sleeping. Currently there is not a site in the WPI network that is designed to help students cope with sleeping problems. Making this addition to WPI's system will provide more focused avenues for WPI students to seek help

9. Web Design

There are many things that make a good web page and many things that make a bad web page. A good web page is simple, easy to read, loads fast, and is easy to navigate. When a person navigates to a web page, they want to see something that is pleasing to the eye. If the page they are on is poorly organized, the user may leave and find another website. In addition, a website that takes a long time to load is very inconvenient. People who frequently use computers are after speed and if a website takes too long to load, viewers will be discouraged. Navigating a website is also very

important. If one cannot easily find what they are looking for; they may assume it is not there. Designing a website that people won't want to use is not a good idea. For this reason, designing the website is just as important if not more important than what is actually contained in the website (Castro 2003).

Over the years, many web browsers have been developed; some of the most popular include Internet Explorer, Netscape, Mozilla, and Opera. Due to the variety of browsers, operating systems and screen settings used, one must be careful when designing a website. Each browser is slightly different than the next. When testing the website on one browser it may look great, but on another browser it might not even be readable. This adds complexity to designing a website. There are many software packages on the market that will aid in the design of a website; however they are completely dependent on the system being used to design the website. Before finalizing a design, one should ensure that the website that is being designed is compatible with all browsers, operating systems, and screen formats (Castro 2003).

9.1 Methodology

The website for this project will be designed with the WPI student in mind but can be useful to anyone who may stumble upon it. The website will include a description of the various types of sleeping disorders and difficulties that exist. For each disorder or difficulty we will list the symptoms, causes, and treatments. We will also indicate what symptoms may appear to be a sleeping problem but may also be another possibly more serious problem.

To aid the users of our website in finding the best possible solution to their sleeping problem we will have a list of links to other useful website. The links will be to other

sleeping disorders websites ranging from commercial to personal to college websites. To make this site as easy to understand as possible, information will be presented in such a way that the user will not get bored. Explanations will be concise, pictures will be used when possible, and only pertinent information will be provided.

The website, while in its developmental stage, will be modified based upon user input. There will be a survey, or ratings page, that will allow users to easily submit feedback about their experience on the website. Because the website will constantly be changing, it is important to structure it in such a way that minor changes will not drastically alter the site's design. Before building the website, careful consideration will be given to structure, navigation, and placement of various items.

To keep track of the website's usage various internet tools will be implemented. When a user accesses the website, a counter will be incremented. When a user fills out a survey, their results will be sent to a log file. With these numbers the rate of return on the surveys can be calculated. The surveys will also indicate if traffic is coming from off campus or on campus. This may be a helpful indication if the website is successful or not.

9.2 Planning

Making a website takes a lot of planning. To make a successful website, one must consider the intended audience and plan around them. A good website will meet the needs of the user, keep their interest, and be easy to use and navigate. Such considerations will be taken into account when designing the sleep disorder website for this project. Before introducing the website to the public, it should be free of bugs and

errors. If the initial website is of poor quality, it makes for a bad name and chances are the traffic on the website will below what is desired (Lynch and Horton 2003).

9.2.1 Goals

Prior to any design work for the website, the goals should be clearly and concisely agreed upon. The design should be based upon the predetermined goals. Websites are highly dynamic, changing frequently as new information becomes available. Another reason for this is to keep the users coming back. A website would not gain repeat visitors if the content were always the same.

9.2.2 Audience

The design should keep the audience in mind. The people who are going to use the website may vary in computer skills so this should be taken into account. Power users hate to be patronized and novice users may get lost (Lynch and Horton 2003). The website should accommodate all levels of users and prevent any discrimination, as this reduces the success of the site.

The audience for this site is intended to be college students at WPI; however the site will be designed in such a way that anyone with difficulty sleeping will find the site helpful. In general, students at WPI are computer literate and can easily navigate websites. Since the website should also be helpful to the non-WPI student the navigation will be simplified such that anyone who can find the site in the first place will be able to easily access all of the content.

9.2.3 Promotion

When a website is made, it must be advertised in one way or another. There are a variety of ways to do this: newspaper ads, search engine registration, links from other websites, and word of mouth to name a few. One should be careful when advertising to make sure that the advertising is directed toward the intended audience. Advertising air conditioners at the North Pole wouldn't do much good.

To get the word out about the website for this project we will contact professors and students who will help in the process. From experience, many students fall asleep in their classes. If a professor was informed about the above mentioned website, he/she could direct the student to it for help. Mass emails may also be helpful to inform students about the website. They may stimulate their interest to find out more. However, replies from mass email (SPAM) are generally not a high percentage. The campus newspaper could be used for a text advertisement to get the word out as well. To get attention from non-WPI students, the website will be registered with various search engines. In this way, the traffic to the site will not be limited to WPI students.

9.2.4 Content

Determining what to include and what not to include is perhaps the most arduous task of web development. Too much information may lead the user to seek a simpler, easier to understand website. Not enough information may lead the user to find a website with better, more informative content.

The target audience for this website as previously mentioned is WPI students with sleeping disorders and to a lesser extent, people with sleeping disorders. It is safe to assume that the person visiting the website knows enough about sleeping disorders to

suspect that they might have one. This means that the information provided does not have to start at square one. Thus more room is made for other information.

9.2.5 Critique

As mentioned before, the content and design of a website is highly dynamic. As new information comes out and feedback is given from the users, changes will be made to the content, style, structure, and any other aspect. Constant improvements need to be done to please the target audience.

To get user feedback, this website will use an online survey. The results of the survey will be compiled and analyzed to determine what people like and what people dislike. From the surveys, the website can be shaped to fit the target audience.

9.3 Development

The development of a website involves many considerations. Prior to the design and development of the website, a list of specifications should be made and followed throughout the duration of the development.

- What is the mission?
- How will creating a Web site support this mission?
- What goals for the site?
- Who is the audience?
- How will you measure the success of your site?
- How will you maintain the finished site?

(Lynch and Horton 2003)

9.3.1 Structure

With these considerations in mind, the website must be constructed accordingly. The website should be constructed in a manner that is logical with a hierarchy. The separate pages should be linked by relevance and organized by importance. There are many different structures for organization such as sequence, hierarchy and web.

Figure 1: Sequential Web Structure

This is a sequential structure that allows the user to flow through the website in order. This however doesn't allow the user to skip parts or go into more detail about the information they are interested in.

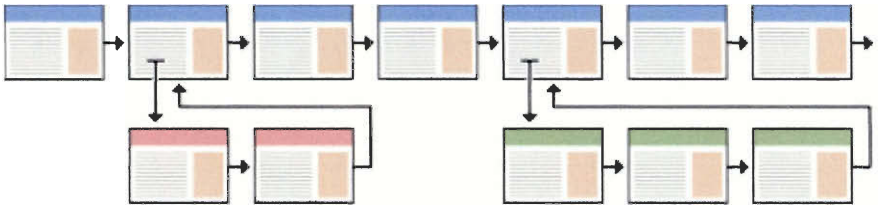

Figure 2: Subsequential Structure (Lynch and Horton 2003)

This allows the user to go into more detail about what they are interested in, but it still does not allow the user to skips sections that they do not want to see.

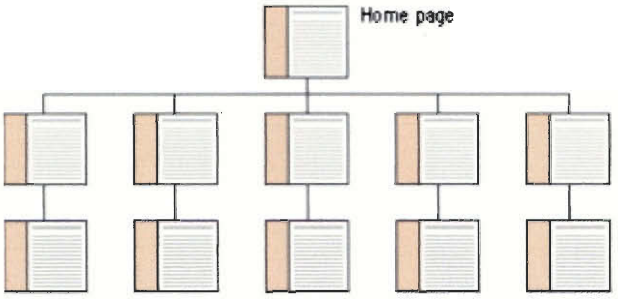

Figure 3: Hierarchical Structure (Lynch and Horton 2003)

This allows the user to choose what parts of the site to see, but does not really provide a good flow from one section to the next. Also, there is little ability to navigate from one branch to another.

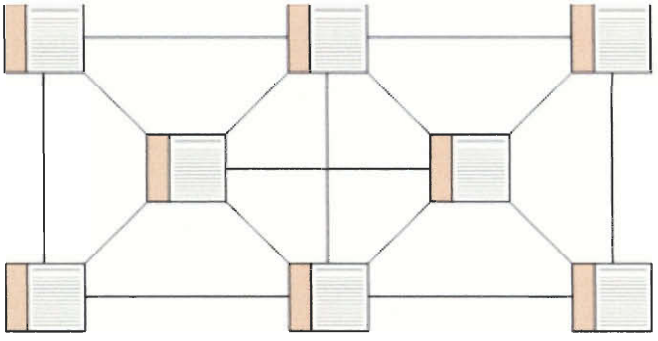

Figure 4: Web Structure (Lynch and Horton 2003)

The web structure allows the user to easily go to any part of the site they choose, but limits the logical flow of data.

The most practical, easy to use, and user friendly website will combine all of the above structures so that the user will be able to get the information they want to get. The site should present the content in logical order, but allow the user to skip any section they aren't interested in.

The sleep disorders website will combine these structures to provide the user with the best experience possible. An overview will be given, and the user can then choose where to navigate to based upon that information. Each sleep disorder will have its own branch, but have links to the other branches for fast switching.

9.4 Problems with Implementation

The initial design for the website had included a discussion board for students to post their own tips, stories, and feelings but it did not work out. The discussion board was installed and setup for use by the public. Then two days later WPI disabled the service that the discussion board needed to run for security reasons. In an attempt to make the discussion board work, the page was moved to another web server. This time it worked for about two weeks when WPI changed their security policy once again and the discussion board would not work.

For the short time in which the discussion board was in operation only two posts were submitted. Since the discussion board was being very problematic, we decided to use the survey results as a replacement. The results from the survey contained a lot more information and there is no need for constant monitoring.

9.5 Why we're special

From looking at the existing websites on the internet about sleep disorders, there is much to be desired. Many websites are brief in their content and do not provide a lot of information. Other websites are hard to navigate through and have pop-up ads which deter users from visiting. The information presented is often very general and not too helpful.

To make this website better than any existing website, the strong points of all the websites will be incorporated, and the weak points eliminated for the best experience. The user will be able to find information to help them deal with their sleep problems on their own or in a medical environment. There will also be a page that users can use to post their own tips, suggestions or remedies. By incorporating personal interaction, the users will feel more involved. This page can be constantly updated so the users can come back to see if any new information has been added.

Designing a website takes careful consideration and is not something that can be done haphazardly. The first draft may be good, but can always be reconfigured to be better. The person designing the website may have different ideas that the person using the website. For this reason, the website will be revised continually based on user feedback until it suits the needs of all the users.

10. Surveying

Surveys are wonderful tools for gathering information about human characteristics, thoughts, and behavior. But what you're researching and it's relation to the people you're questioning will determine if surveying is appropriate.

A good survey can determine whether a relationship occurs between two variables. It is good to conduct a good literature review because your project question might have already been answered by other researchers.

10.1 Methodology

When designing a survey there are some things to keep in mind. The first and most important question is what to put on it. The questions have to be easy to understand

so that people will not get frustrated and give up. The questions should also be limited to a reasonable number, yet the answers must provide a good deal of information to the person distributing the survey.

The method of distribution is also vital to take into account. If the survey is distributed off of the website, the people filling out the survey will most likely have gone to the site for a reason. If the person feels that they have a sleeping disorder they will most likely find the site helpful (because I can design a good website). However, this may introduce bias to the results of the survey. If the survey is distributed on paper or through email chances are that the response rate will not be as high as desired. When a survey is distributed, care must be taken to the method to ensure the maximum response rate and the minimum bias (Salant and Dillman 1994).

10.2 Sampling

It's ideal to survey the entire population in which information is being gathered upon, but it's sometimes unnecessary to do so. A highly accurate survey response rate of 1million people can be done only surveying 2000 people in the population through random sampling. Random sampling requires a group of people be randomly selected from the target group. But some of the most reliable lists may contain problematic errors for example; a telephone directory doesn't contain the information of people who don't have phones or people who moved out of that area. But once an acceptable list is chosen you can select possible survey participants randomly by way of a table from a statistics book or through a computer program which picks numbers randomly. Once you have determined the margin of error that you might encounter doing the survey the sample size

n can be calculated using the formula n = SD)2/(SE) 2, where SD is the standard deviation (the square root of the mean squared) (Salant and Dillman 1994).

10.3 Choosing the Right Survey Method

There are several different ways of administering a survey. The most common methods are sending written surveys through the mail, asking survey questions over the telephone, and conducting face-to-face interviews. But each one has its own unique set of strengths and weaknesses, and can possibly be ineffective. The choice of method for a particular project should therefore be made only after careful consideration of the following factors: 1. Available resources. Mail surveys require money to make copies and to buy stamps and envelopes but their implementation does not require much labor. Telephone surveys require a substantial time commitment from several people to conduct interviews but fewer monetary resources are needed. Face-to-face surveys require even more labor due to the travel time involved but again require little money unless large distances must be covered. Thus, the choice of which method to use often comes down to the relative availability of money and labor. When labor costs are high, mail surveys are sure to be the cheapest alternative. However, when money is tight and free labor is available, telephone or face-to-face surveys may be a better choice. In the case of the sleeping disorders project, a survey done on the website is labor free and would give immediate response and possibly provide an accurate response rate (Salant and Dillman 1994)..

10.4 Questionnaire Wording

When questioning on a survey you want to avoid over questioning, asking open-ended questions and asking attitude questions. You must also be careful about the wording of the survey. A professional looking survey shows that time and effort has been put in into creating the survey which produces a more honest response.

Before going into the survey it is important to tell the respondents that their answers to the questions will be kept confidential, provide statements on why the survey is so important, and giving an accurate estimated time of completions of the survey. This helps give the respondent more of an incentive of completing the survey, providing more accurate responses to the survey.

Organization is vital when designing a survey. Questions related to topics need to be grouped together into sections and placed under their appropriate headings. Each section should be placed in order from the most to the least important.

Introductions and transitional statements briefly explaining to the respondents the kind of questions they are going to get and why they are important should be included because it's easier to answer a survey when the structure of the survey is made apparent.

The first few questions are very important and should be chosen carefully for these questions will grab the respondents attention.

10.5 Pretesting

In a pretest a small, but representative sample of respondents are asked to complete the survey and are also interviewed either after each question or at the end of the survey to find out what they were thinking while answering the questions.

Researchers can also test questions for bias by asking respondents to guess what the researchers are predicting or expecting the survey results to show. If substantially more respondents than would be expected by random chance can guess the researchers' hypothesis, it is highly likely that the survey contains biased or leading questions (Salant and Dillman 1994).

10.6 Ethical Considerations

All social science researchers have an ethical obligation to protect the welfare of the people they study. Although survey studies tend to be relatively inoffensive compared to some alternate methodologies, there are three ethical principles that all survey studies should follow:

1. Participation is voluntary
2. Confidentiality of respondents must be maintained.
3. Promises must be kept. (Doyle 2001)

10.7 Reporting on Survey Methodology

It's necessary to convince readers and users of your study that your methodology was sound. This requires a methodology section which explains in detail what you did and how you went about doing it, readers can judge the quality of your work. The methodology section also provides an opportunity for researchers to explain the reasoning behind the methodological choices that they made and to anticipate and answer the questions that skeptical readers are likely to ask (Salant and Dillman 1994).

For survey projects, the methodology section of the project report typically contains the following five sections:

1. Respondents. This section includes data such at demographic information and response rate.

2. Sampling Design. This section describes how the sampling was done and how the sample was chosen.

3. Questionnaire Design. How was the survey designed? Was it pretested?

4. Procedure. How was the survey distributed? Were there any problems?

5. Limitations. What limitations were imposed by the survey? Was their sampling bias?(Doyle 2001)

10.8 Response Rate

High response rates are important to achieve for scientific research. The response rate of a survey is the number of completed, usable surveys divided by the number of people who actually completed the survey. If this fraction is too low, there is a strong possibility of "nonresponse error," that is, that estimates are biased because those who didn't respond to the survey have different characteristics or opinions than those who did respond.

Two things that will help get a better response rate for your survey are:

(1) Design a questionnaire introduction that makes it immediately clear to people that the survey is both important and easily accomplished. (2) Design an implementation plan that includes multiple mailings, if necessary, directed at each potential respondent. If these established techniques are employed, response rates of 60-70% or higher can be achieved. However, in some cases, in spite of a researcher's best efforts, the response rate turns out to be less than 60%. In such cases the researcher should investigate and attempt to determine if a valid window of respondents was achieved (Salant and Dillman 1994).

11. Results

11.1 Introduction

Designing the website was relatively straightforward; we simply turned the information contained within the report into an easy to navigate website. To make the page easy to navigate, we made a "web" linking every page to every other page. We also placed the links in order that would make the most sense if the person viewing the site wanted to get a complete picture. Along the way we came upon a couple of problems but a solution was worked out. There were security issues on the WPI server that required us to do some reshuffling of the web components and we had to completely redesign one page to fit our original model. The first thing that was done was a template. The template was based on the Academic Advising web page. The template was then used to design a page for each of the topics we wished to discuss.

A printout of the website can be seen in Appendix A at the end of this document. The topics included in the final version of the website are sleep disorders, effects of sleep disorders, other diseases, coping, sleep hygiene, links, survey, and survey results. The sleep disorders page included the most common sleep disorders, bullets explaining them and then a couple paragraphs about the disorder. The rest of the pages follow this pattern, bullets then more informative text. Each of the topics was included because it could add to the overall picture of a robust website that students can use to help themselves of find help from someone else.

11.2 Survey

In order to find out if the website would be beneficial for the students at WPI to use, we devised a short survey for them to fill out. The survey was web based and contained twenty-six questions. Some of the questions were open ended where the user could give any input they wanted and the other questions were multiple choice. There were four sections to the survey. The first section was designed to find out if WPI students had problems sleeping. The second section was designed to find out if the 7 week term had any effect on the students. The third section asked the users to rate the site, give suggestions, and point out any problems they may have had.

To get people to fill out the survey, an email was sent out to the undergraduate students of WPI. This email can be seen in Appendix C. The email was concise and informative and simply asked the students to fill out the survey. There are roughly 2,800 undergraduates (http://www.wpi.edu/About/facts.html) that received the email. For a decent sample to be collected, two percent of the students need to return the surveys for analysis. The number of surveys returned was 207 meaning that the return on surveys was about 7%. The return on the surveys was higher than needed, but this was good as it provides a better window to judge by. Using the statistical information that WPI generates, we discovered that 310 people visited the page that was designed for this project. This means the more than two thirds of the people that visited the page filled out and submitted a survey. However, after examining the demographic information, it can be seen that 37% of the surveys were returned by females. This does not correspond with

the population actual demographic information; there is only a 23% female population at WPI.

This leads information leads us to believe that their may be some bias in the survey results. Some of the people taking the survey may have only taken the survey because they feel they have a sleep disorder. Another problem is time, a lot of people may not have taken the survey because they did not have time due to their workload. It was also mentioned in the survey results that more people may have filled out the survey if the link provided in the email had directed them directly to the survey. Since people were not directed to the survey immediately, they may have given up after seeing the home page.

There are advantages and disadvantages to a web survey. With a web survey, all of the results are placed in one file already organized for analysis. Time is also saved in the collection process; an email notified everyone about the survey and relieved us of going out into the school to gather the results. The web is also convenient, people can fill out the survey any time of the day without having to worry about being in a rush to get to class or finishing an assignment. Students could also use the survey as means of procrastination too, a very common trait among college students. The web also offers anonymity which allows people to discuss any problems freely without having to worry about people judging them.

The disadvantages are mainly selection bias and faux results. Selection bias was discussed earlier. The people filling out the survey may have filled out the survey to be funny and included ludicrous answers in their survey. This survey was conducted anonymously so anyone could put anything they feel like into the survey and not have to

worry about us finding out who they were. Luckily, there were no such results in our survey, just a few unanswered questions.

11.2.1 Sleep Habits

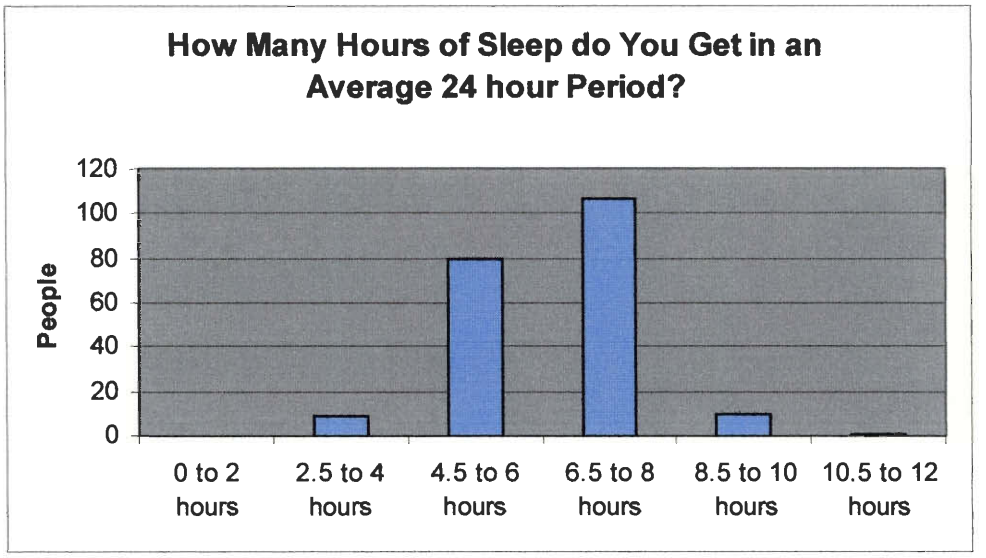

Figure 5

For the question "How much sleep do you get in an average 24 hour period (in hours)" the results can be seen in the figure above. The graph shows that the majority of the students get between 6.5 to 8 hours of sleep, which is the recommended amount needed for proper sleep health. One can also notice that a large quantity of the surveys indicate that people do not receive adequate sleep approximating between 4.5 to 6 hours, which indicates improper sleep health. The graph also shows that very few individuals acquire more sleep than necessary which is also detrimental to one's health. Looking at the graph we can conclude that roughly half of the WPI population obtains the proper amount of sleep whereas the other half gets too much or too little.

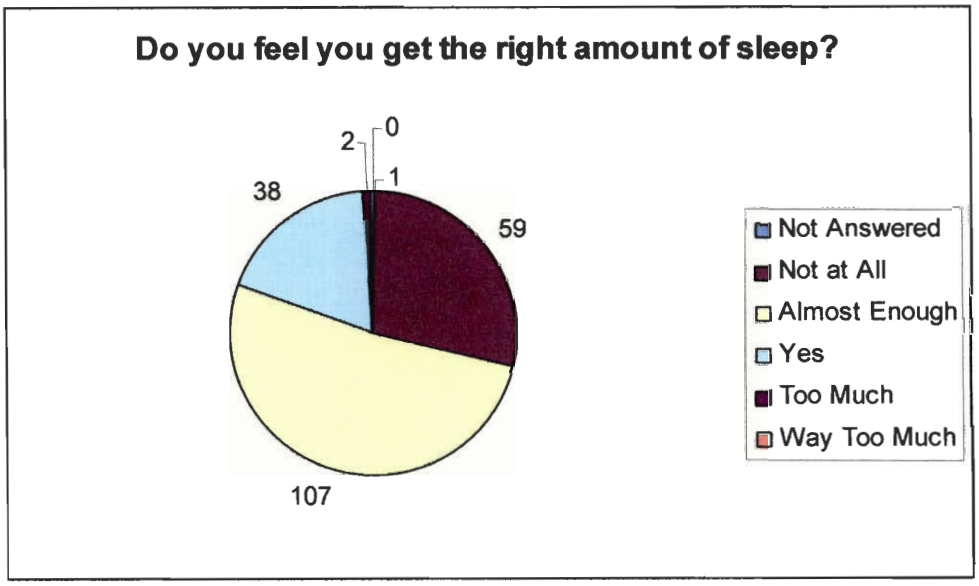

Figure 6

The majority of surveys indicate that people do not feel they get the right amount of sleep per night. 18% of the surveys indicated that people do feel they get the right amount of sleep per night and 82% feel they don't get the right amount of sleep per night. Overall out of the 207 surveyed 166 people want to get more sleep, while only 3 people indicated that they get too much sleep.

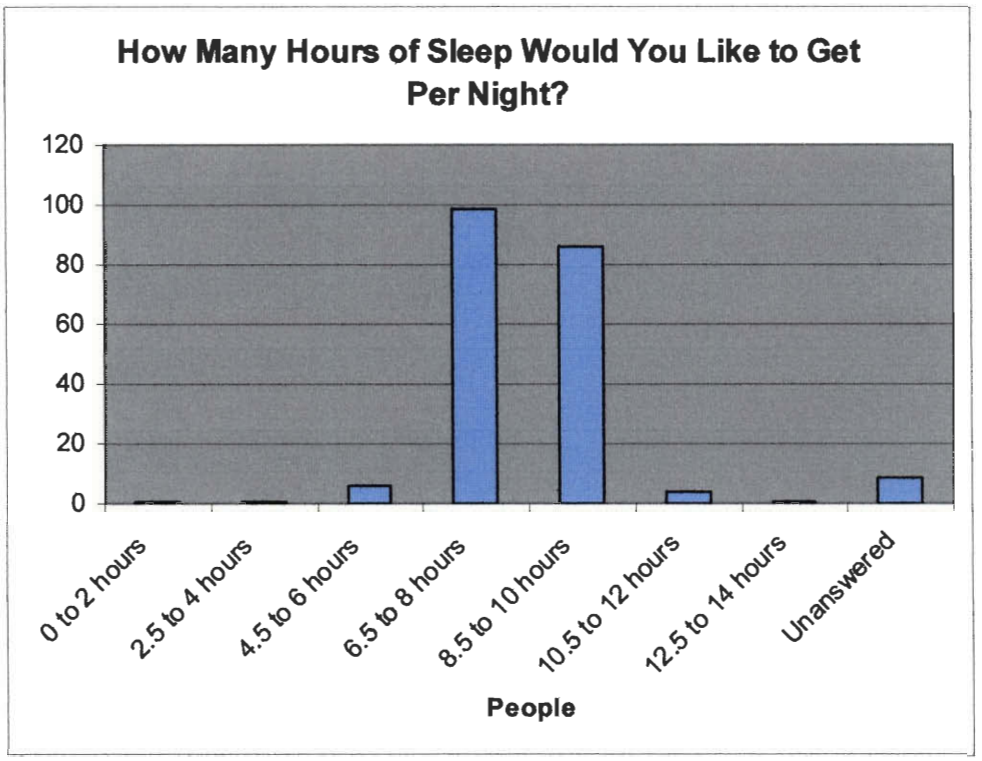

Figure 7

When asked how much sleep they would like to get 89% desire to get 6.5 to 10 hours of sleep. Very few people wanted more than 10 hours or less than 6 hours. This information indicates that in an ideal situation most people will be getting the right amount of sleep per night, but circumstances may prevent them from doing so.

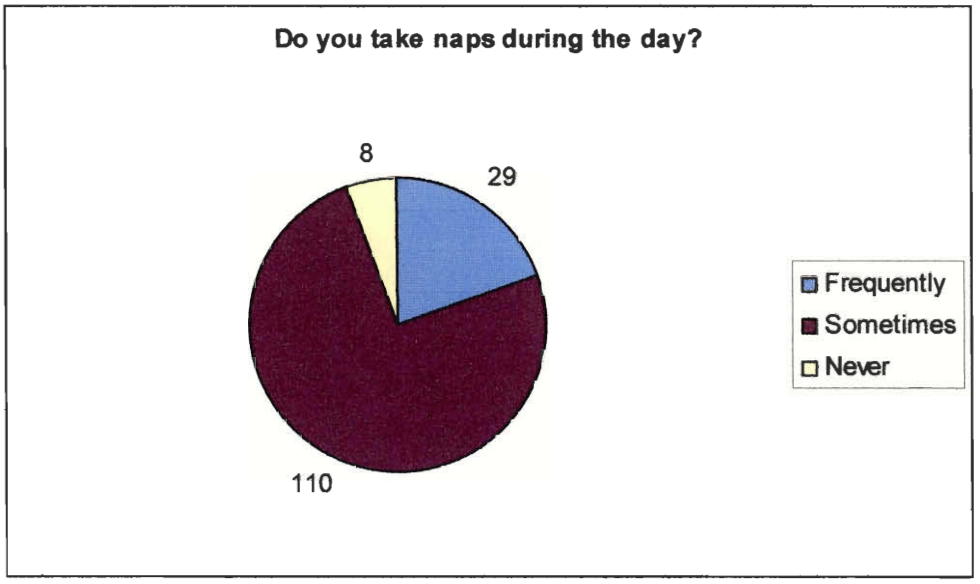

Figure 8

The results demonstrated in this graph show naps are typical amongst the population surveyed and an explanation for this phenomena will be discovered in our statistical graph showing the effects of the 7 week term. As indicated by the survey very few people refrain from taking naps through out the day.

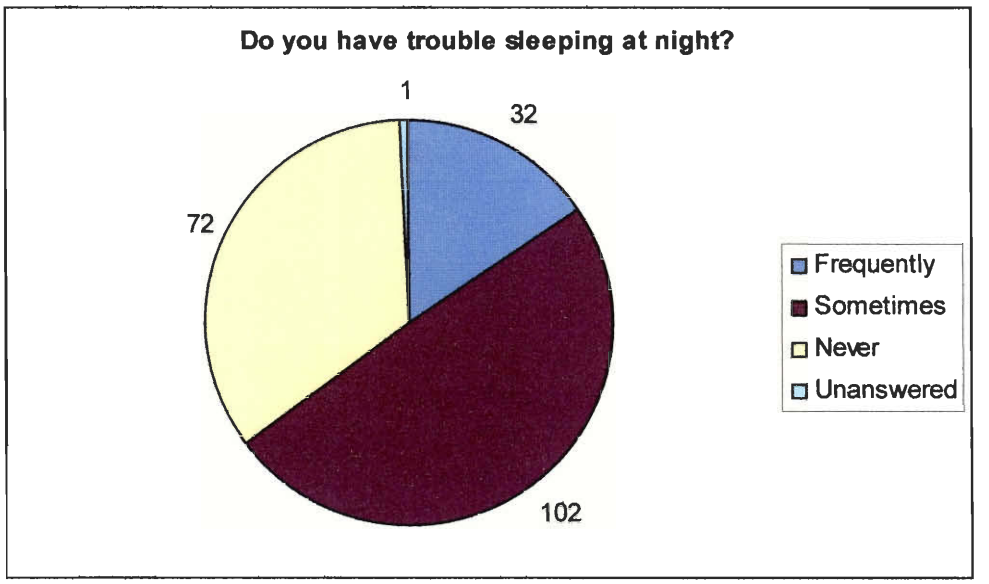

Figure 9

50% of the individuals surveyed have trouble sleeping at night sometimes. 35% never have trouble sleeping, and 15% frequently have trouble sleeping at night. This data will help explain why there may be an explosion of sleeping disorders among college students.

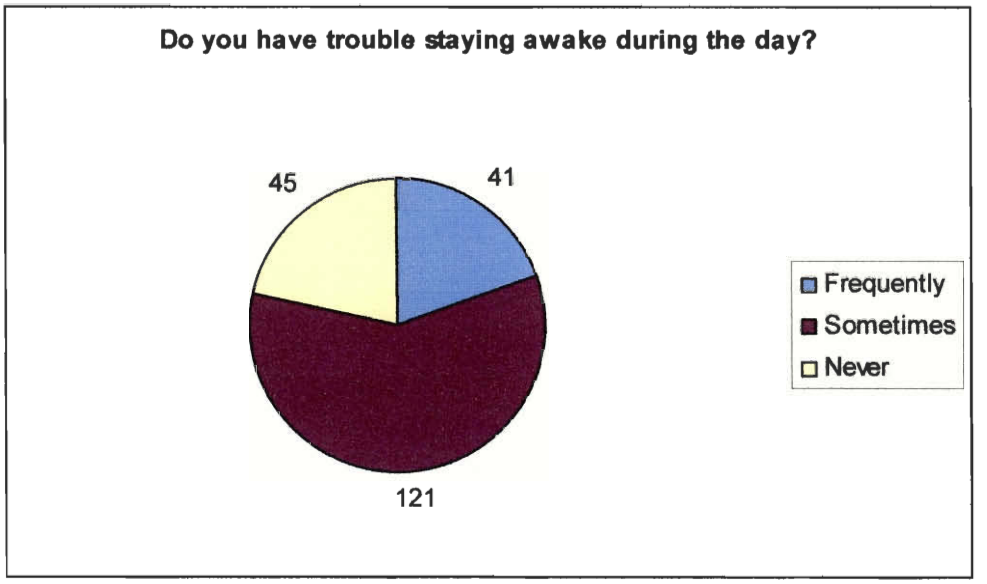

Figure 10

This graph is very similar to the previous one because there's a correlation between people having trouble sleeping at night and people having trouble staying awake during the day. However more people have trouble staying awake during the day than falling asleep at night

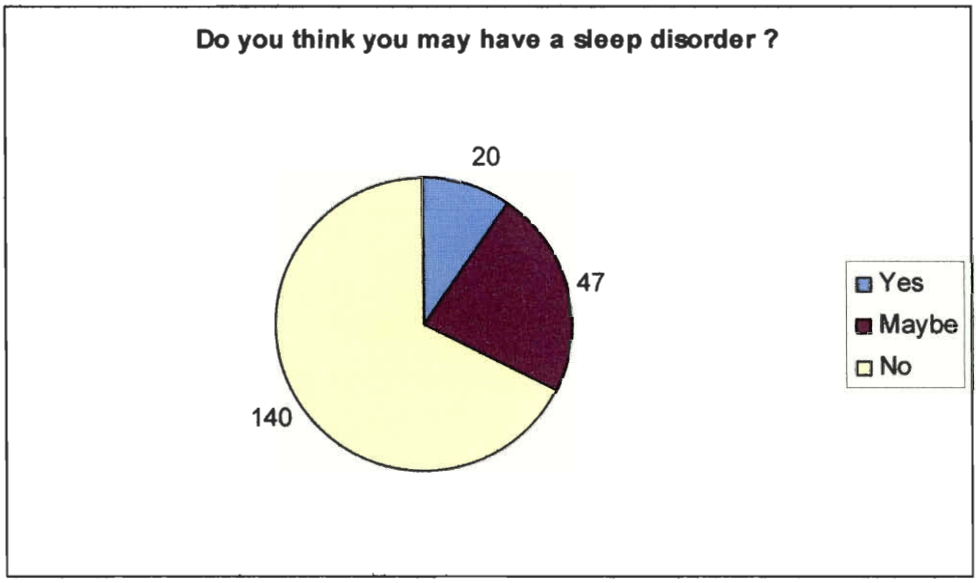

Figure 11

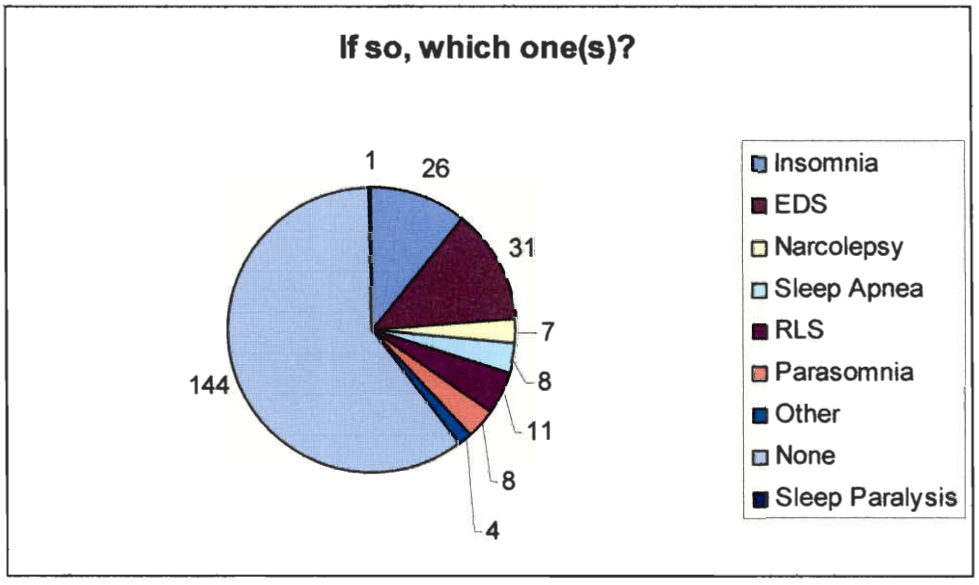

Figure 12

Although many people indicated that they have trouble staying awake during the day or falling asleep at night, most people do not feel their problem is significant enough to consider it a sleeping disorder. This is a common occurrence and often exacerbates the severity of the disorder. We do not insist people are not seeking help, but with so many people having problems there is a good chance. The discrepancy between the groups

indicates this may be the case. More than likely there is an individual among this group that does have a sleeping disorder but is not seeking help.

When the people being surveyed were asked if they were a college student, 204 out of 207 replied with a yes and the remaining 3 did not answer the question. Of the 204 people that did answer the question, 202 of them were WPI students while one attends University of San Diego and the other attends University of San Antonio. It is unknown whether the people who did not answer the question are WPI students or not.

11.2.2 WPI Students

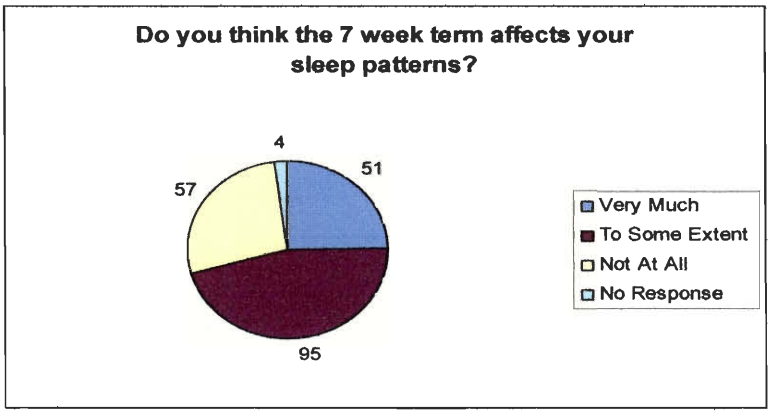

Figure 13

When asked if the 7 week term at WPI has an affect on one's sleep patterns, nearly 75% of those surveyed felt it had an impact. 51 people felt it had a major effect, 95 people felt it had some effect, and 57 people felt there were not effected at all by the seven week system. There was also an open ended question following this question asking people to provide there opinion on the seven week term. The results were very informative. The responses can be seen in the appendix at the end of this document.

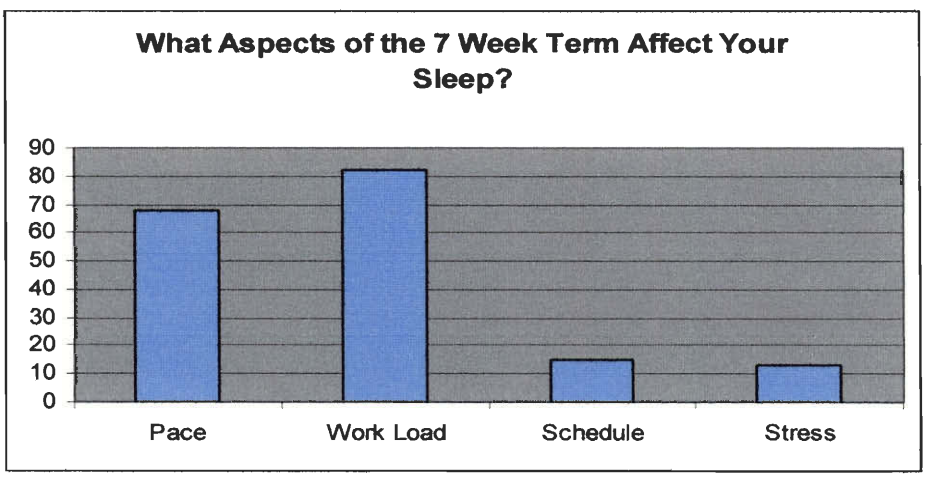

Figure 14

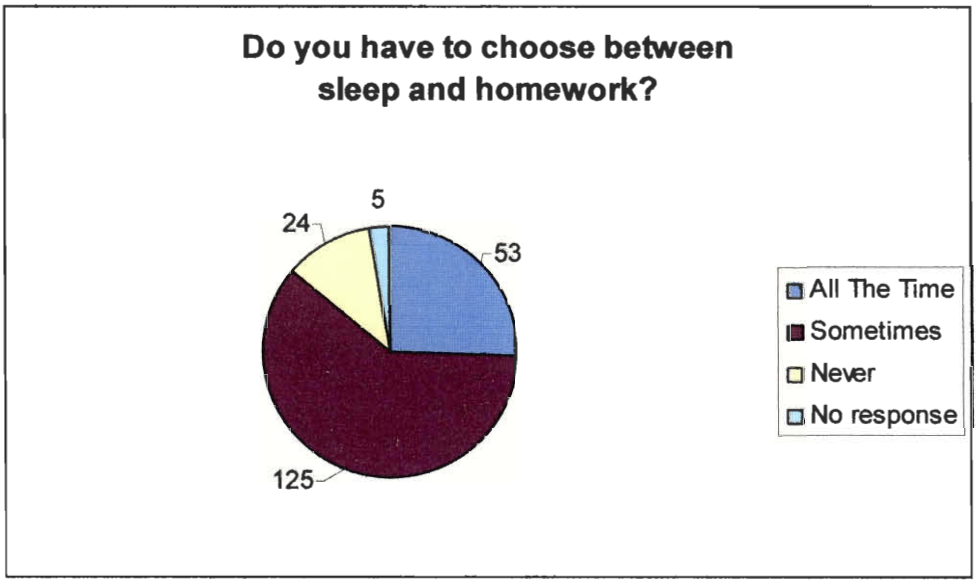

Figure 15

This graph does not correspond to the previous one as much as expected. We expected a nearly one to one correspondence but many of the people who indicated that the 7 week term does not affect their sleep patterns also indicated that they have to choose between sleep and homework.

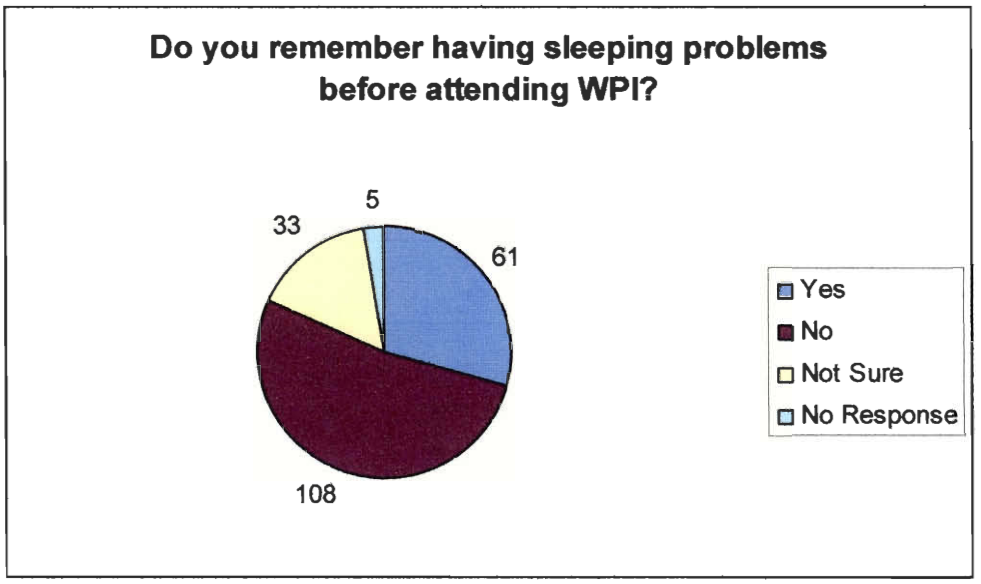

Figure 16

61 people said that they had problems sleeping before coming to WPI. From the questions asking if people had trouble staying awake during the day or falling asleep at night the responses were much higher. This leads one to believe that sleep problems may be due to the WPI environment or just the college environment in general. The results of this question may be a little skewed, because people may have had the problems but never noticed or possibly forgot about them.

From the survey results we can conclude that the either the WPI environment or the college environment in general has had an impact on the sleep habits of students. 72 students said they do not have trouble sleeping at night and 45 students said they do not have trouble staying awake during the day. However, 108 students said that they did not remember having sleeping problems before attending WPI. The difference between these numbers is 36, about 17% of the surveys. This means that at least 17% of the people who filled out the survey did not have sleeping problems coming into WPI but do now.

Either WPI life or college life affects the sleeping patterns of students. The social life, workload, and procrastination lead to abnormal sleep problems. Looking back, a good question to add to the survey might be something asking what hours of the night people sleep. This would give much more insight to the abnormality of the sleep patterns here at WPI.

11.2.3 Rating the Site

To find out what people thought of the website, we asked people a series of questions. The results of these questions can be seen below.

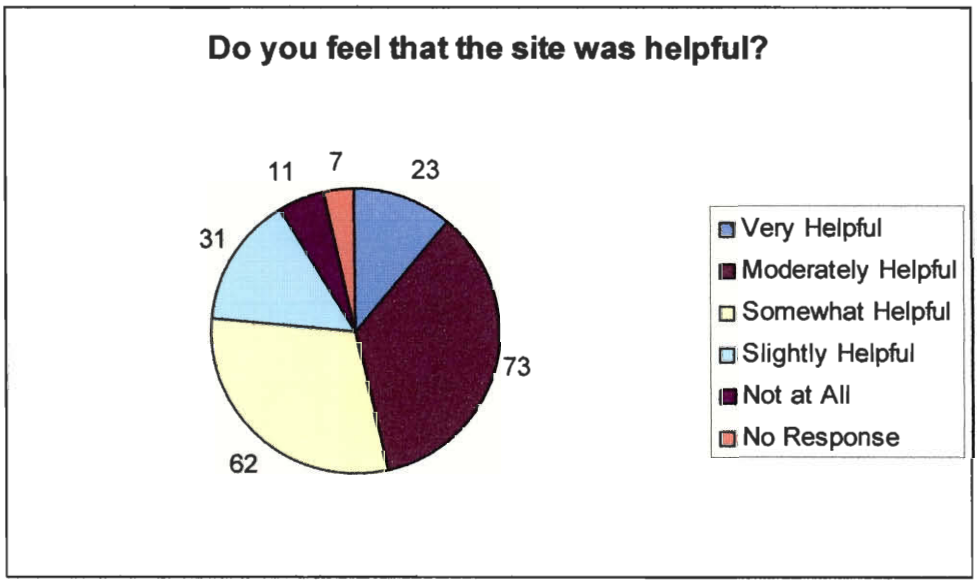

Figure 17

We asked if people thought the site was helpful. The results of this question may be biased though. People may have found the site helpful if they had a problem sleeping or not at all if they had no problems sleeping. For the most part, the people taking the survey found the site helpful.

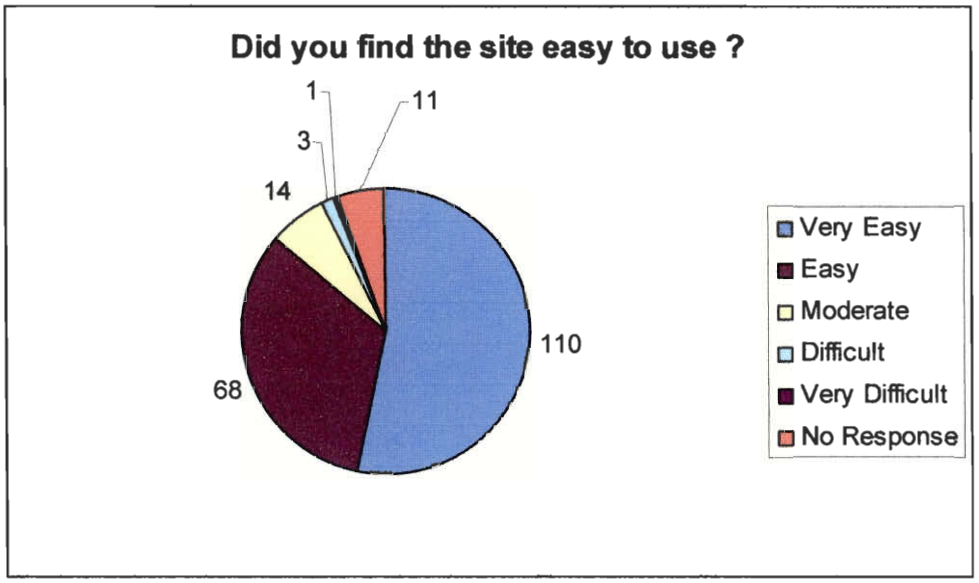

Figure 18

People also found the site very easy to use as more than 50% rated it such. Only 4 people found it difficult and 11 people didn't respond to this question.

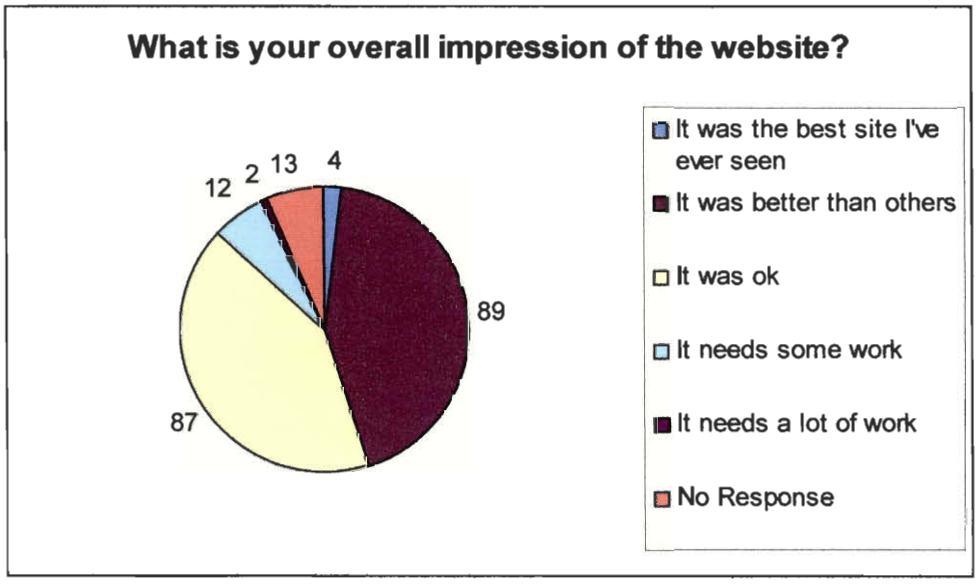

Figure 19

People's overall impression of the website was fairly positive. 4 people even rated it as the best site they had ever seen. The most common response indicated that the

website was better than others. The second most popular response was that it was ok. However, it left a lot to be desired from a few people.

There were also a couple of open ended questions to get more feedback from people. We gave them the opportunity to suggest any improvements we may not have thought of or tell us about anything they did not like. A majority of the responses for suggestions asked for bulleted text instead of the paragraphs that were provided. There were also suggestions for more interactivity. Because of these responses, we have made some changes to the website to correspond to what the users want. We have added more bullets, corrected some grammar mistakes, reworded things that may have been confusing and fixed a broken link. The other question asked users to point out any problems they had. There were very few responses to this question and all of the problems were fixed. The complete list of suggestions and problems can be seen in Appendix E.

The site was helpful easy to use and rated at least "OK" by a majority of the students who were surveyed. The problems people had have been fixed, and suggestions were taken into account. If the survey was done over with these new changes, the ratings would probably be higher.

11.2.4 Demographic Information

The demographic information provided had little or no correlation to sleep problems or disorders. Through inspection, the percentage of males and females with sleeping problems was the same. There were few people outside the age range of 15 to 24 years old and the vast majority of the people surveyed were Caucasian/non-Hispanic.

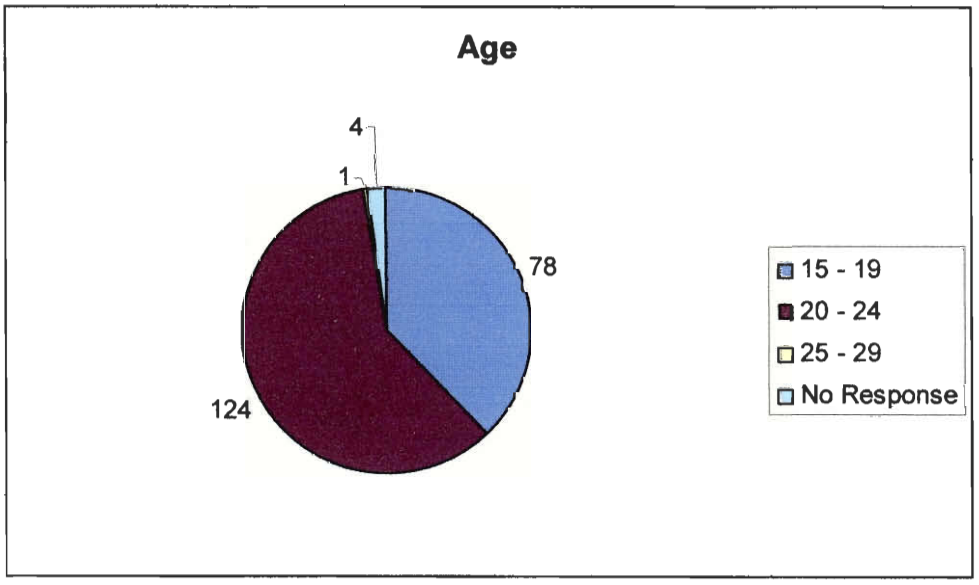

Figure 20

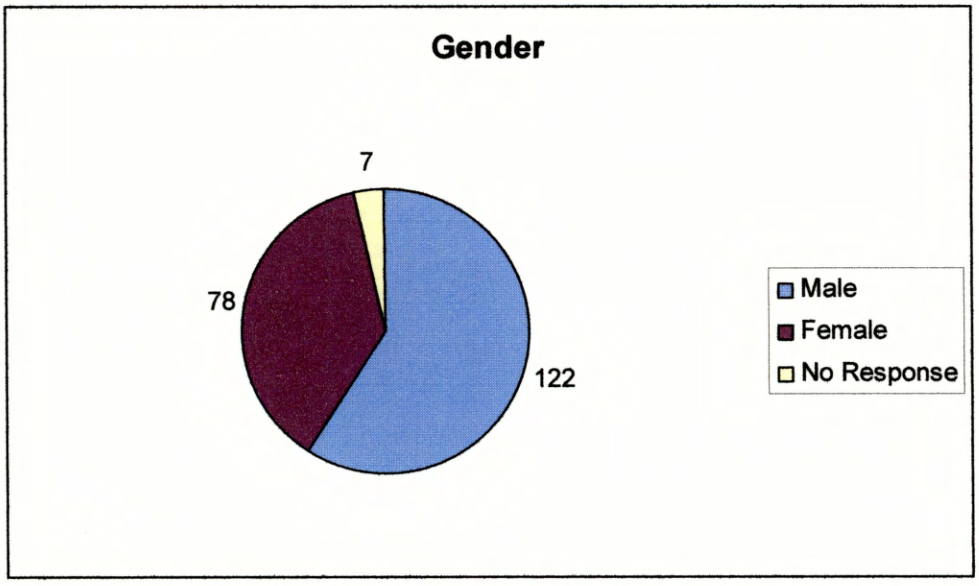

Figure 21

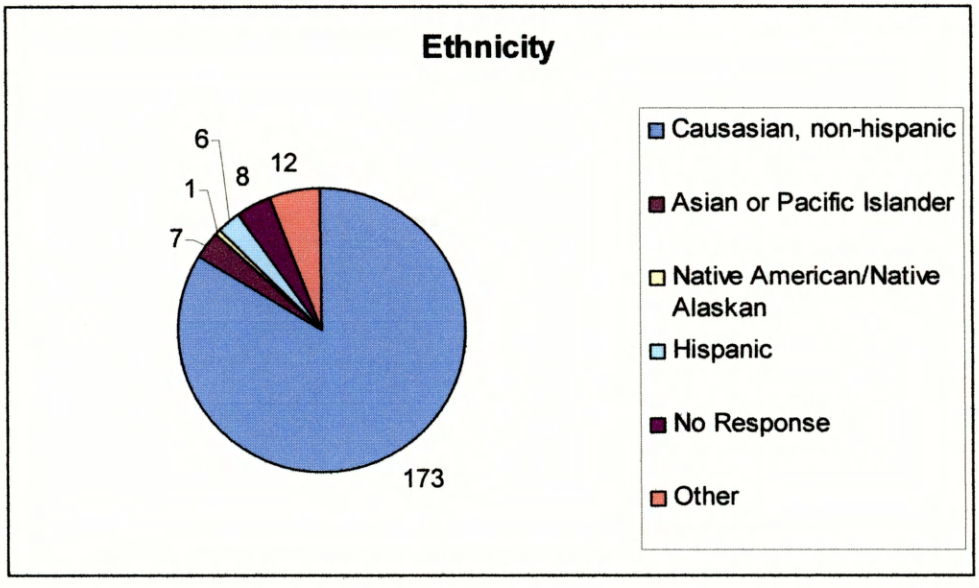

Figure 22

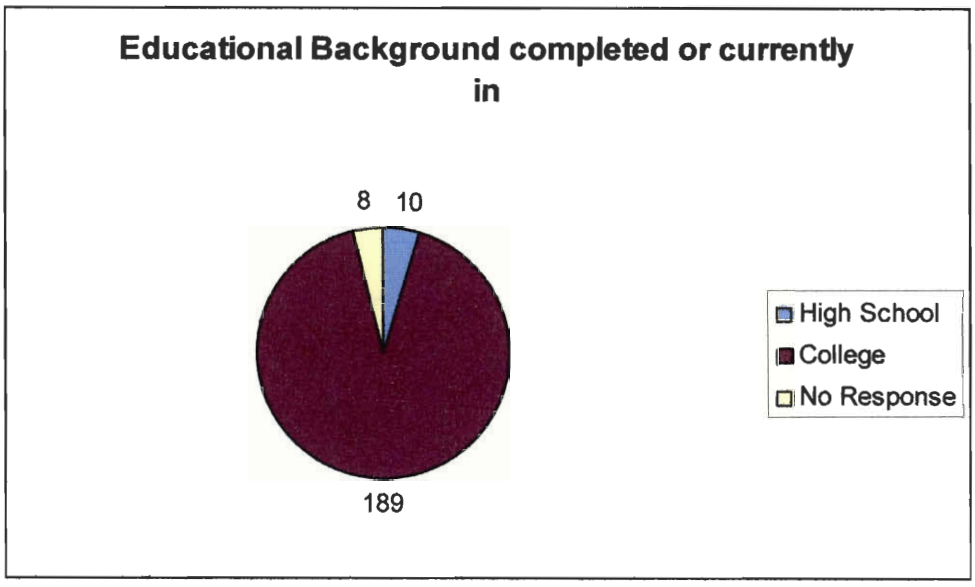
Educational Background completed or currently in
8
10
189
High School
College
No Response

Figure 23

12. Conclusion

For proper sleep we as humans require, on average, 8 hours of each 24 hour day cycle. The consequences of sleep deprivation and sleep disorders are almost certainly increasing in westernized societies. Greater public education about the needs for sleep and the main components of good sleep hygiene is greatly required.

It is also important that doctors and other health-care workers become aware of the impact of sleep disorders and that these become a regular part of their training program. Regular hours of sleep are required to promote a state of well-being during wakefulness. Once aware of this, it becomes the responsibility of each individual to select his or her own combination of sleep and wakefulness by choosing between the opportunities that present themselves everyday.

WPI has an accelerated program that uses 7 week terms instead of the 14 or 15 week semesters that a lot of other schools use. We feel that this condition forces students to make choices between schoolwork and sleep. Doing this disrupts the circadian rhythms and can lead to long term sleep problems. The purpose of this project is to help students before it is too late; catch the problem before it becomes a big problem.

Since WPI is technically oriented, we decided to construct a website to get the word out about sleep disorders and how to help fix and/or prevent them. The first thing done was the literature review and background research. Once armed with knowledge about sleep disorders and sleep problems, we began constructing the website. To fit into the WPI's site, we used the template from the Office of Academic Advising with permission from Dale Snyder.

Once the site was constructed, we designed a survey to get information about WPI students and sleeping problems they might be facing, what their impression of the 7 week term is, and to rate the site. An email was sent out to the undergraduate students at WPI to let them know about the site and ask them to fill out the survey.

From the survey we discovered that a large number of people believe they have sleeping problems of one sort or another. Many people have trouble falling asleep and/or waking up in the morning. Most people do not feel that they have a sleep disorder but do notice a definite problem with their sleep habits. Overall, the people found the site to be helpful and easy to use. The question that asked for a rating of the site gave us the impression that people liked the site but were not completely excited about it. From these data, we can rate the IQP as a general success. With more work and more knowledge about web design the site could be made to be more interactive, impressive, and exciting.

We were not able to do everything that we wanted with the site because of limited knowledge about web design. This was the first big web design project for both of us. We were also limited with time; we had other courses to worry about instead of focusing full time on this IQP. With a few more weeks we could improve the website, do another round of surveys, and learn a lot more ourselves.

To improve the site there is a lot that could be done. Adding interactivity would be a nice addition. Either adding the discussion board that was originally designed or a chat feature would be nice. More pictures would also make the site more appealing, but finding public domain pictures is not the easiest thing. Original artwork could be added if either of us had the skills. More bullets could also be helpful for more information at the fingertips of the visitors. We made a large number of bullets, but you can never have

too many. This site would also have to be moved from student user space to the Office of Health Services' web space. A link could also be added from WPI's "services" page to our site.

The 7 week term at WPI has an impact on students along with many of the other pressures of college life. To remedy this situation, there are a number of solutions. There could be a class that WPI students have to take like "WPI 101" where students learn the importance of time management among other circumstances unique to WPI. This could be done in place of or in addition to orientation. Many people do not attend orientation or blow it off as if it was unimportant. WPI could also change their format to semesters instead of terms. This would have a huge impact on the WPI plan so it is very unlikely. Professors often take the 7 week term into account when assigning homework, projects, and tests. Some professors don't care though. A rule could be made to force professors to take other classes into consideration to deal with such time conflicts. There is an unlimited possibility but by far, the most important thing to do is preach time management.

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Purpose

The purpose of this website is to aid WPI students who may be having trouble sleeping. This website is different from other websites designed to help people with sleep disorders because it is designed specifically with the WPI student in mind. WPI students face a unique situation with seven week terms. The seven week term forces students to be organized from the start, leaving no time to catch up if one falls behind schedule. Often, missing one day of classes causes students to stay up late, choosing between sleep and finishing school work on time. And when finals occur on the same day this leaves very little time for studying and getting the proper rest.

This web page is being built as part of an Interactive Qualifying Project. While under development, we are conducting a survey to gain input from our views so we can be more informative and helpful for you. A bulletin board is also included so students can submit their own personal experiences about the 7 week term, WPI, and problems sleeping.

This website is not a means to treat sleep disorders, but it's a source for you to use and gain further knowledge from if you feel you may possibly have a sleeping problem. One can also get tips on ways to fall asleep easier, wake up easier, and stay awake during class. By no means should the information contained within this website be considered proof of a sleeping disorder. If you think that you have a sleeping disorder, you should seek a professional opinion. At WPI you can see the Health Center or the Student Development and Counseling Center. If you'd rather seek outside help this is a way to find regional health offices.

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Sleep Disorders

Symptoms

- Sleepiness
- Anxiety
- Inability to concentrate
- Irritability
- Snoring
- Waking up unrefreshed
- Waking up sweating
- Waking up with headaches

Take Sleepnet.com's Sleep Test

Introduction

There are many things that can make someone tired, but being tired does not constitute a sleeping disorder. There is a distinction between a sleeping disorder and a sleeping difficulty. Some commonly diagnosed sleeping disorders include insomnia, narcolepsy and sleep apnea. However, the majority of sleeping problems are not actually medical conditions. Many sleeping problems a person may encounter are temporary and can be easily fixed if one knows what is causing the problem.

Actual sleeping disorders can be classified into two main categories: excessive sleep and inadequate

sleep. The specific diagnostic criteria for insomnia and other sleeping disorders can be found in the Diagnostic and Statistical Manual (DSM IV) of the American Psychiatric Association. The International Classification of Sleep Disorders (ICSD) developed by the American Sleep Disorders Association (ASDA) is much more extensive. The ICSD attempts to classify all current sleeping disorders as well as proposed sleeping disorders (ICSD 1990). There are four categories in this scheme: dissomnias, parasomnias, sleeping disorders associated with mental, neurologic, or other medical disorders, and proposed sleep disorders. According to this document, a dissomnia is a sleep disorder that occurs outside of a sleeping state such as insomnia or narcolepsy.

A parasomnia is a sleep disorder that occurs while sleeping such as nightmares or sleepwalking. Sleep disorders associated with mental, neurological, or other medical disorders are disorders that only occur in the presence of another medical condition.

Proposed sleep disorders are disorders that do not actually qualify as a sleeping disorder yet, but do impact one's sleep health. In order to qualify as a disorder, the sleeping condition must impair the individual in one or more daytime functions. In addition, the problem must be present for at least a month.

There are a variety of reasons that someone cannot fall asleep, wake up in the morning, or stay awake during the day. Some of these reasons include but are not limited to stress, anxiety, erratic sleeping patterns, environmental issues, family life and diet. Many of the sleeping problems encountered can be fixed easily by practicing good sleep hygiene. This means following proven sleeping methods that will aid in achieving adequate sleep health. By practicing good sleep hygiene, one can improve their quality of life and even prolong their life. If the problem is not easily solved by the guidelines previously stated, it is likely that a more serious problem is present, either a sleep disorder or another disorder. In this case, one should seek professional help.

Insomnia

- Difficulty falling asleep
- No problem falling asleep but difficulty staying asleep (many awakenings)
- Waking up too early

By definition insomnia is the chronic inability to fall asleep or remain asleep for an adequate length of time. Insomnia covers a wide range of disorders from jet lag to depression to sleep apnea. The sleeping disorder may seem minor, but if it goes untreated the disorder may become far more difficult to manage even with the help of a doctor. The symptoms of this disorder are subjective and may vary with the person in

question. To one person, 30 minutes may seem like an eternity to fall asleep, and to another person 30 minutes could be and average or even short period to wait. To determine if someone actually has insomnia more criteria must be met. Not only does the person have to have trouble sleeping at night, but they must also have daytime symptoms. These symptoms may include feeling unrefreshed or unrestored in the morning or throughout the day, feeling fatigued during the day, having poor concentration during the day, and/or having other neuro-congnitive complaints that may affect daytime performance.

There are many people in the society that experience insomnia-like symptoms. However, most of them never report their symptoms to a doctor. This occurs when people feel if they wait or if they change their lifestyle the problem will go away. In some cases some people feel there is nothing a doctor can do for them. Another reason for avoiding treatment may be that the patient fears the treatment may be harsher than the disorder. Many people are concerned about the side affects or addictive nature of sleeping pills (Poceta 1998). But the latest generation of sleeping pills is much safer and far more effective than ever before.

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EDS - Excessive Daytime Sleepiness

- Feeling drowsy and tired; having an overwhelming desire to sleep when you should be wide-awake.
- Falling asleep at times when you need to be alert such as driving.
- Falling asleep in the daytime even after a normal night's sleep.

Excessive daytime sleepiness is not a disorder, but a symptom common among many disorders. Someone that is experiencing excessive daytime sleepiness may be in a state of decreased arousal. This person may be in an active surrounding, but barely perceive what is happening around them. Drowsiness or sleepiness may be encountered during the day but may not necessarily lead to sleep. Excessive sleep is another characteristic of this symptom. The patient may wake up late and go to bed early or perhaps take midday naps. Micro sleeps (falling asleep in class) may also be encountered. A micro sleep is a short episode of sleep lasting a few seconds. There may be no recollection of falling asleep, but the patient will remember having been asleep and will wake suddenly at the end of the micro sleep.

Having excessive daytime sleepiness may lead to physical and psychological problems. When someone is extremely tired, extra effort is required to keep alert and concentrate. This extra effort is difficult to maintain throughout the day. A loss of vocabulary, creativity and attention span are typical signs of EDS. Hallucinations due to an altered perception of reality or an intrusion of REM sleep into wakefulness may also occur. Mood changes particularly to the more irritable side are common as well. EDS can affect physical performance too. Fatigue, lack of energy, automatic behavior, and inappropriate actions are all associated

with this symptom.

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Narcolepsy

- Excessive sleepiness.
- Temporary decrease or loss of muscle control, especially when getting excited.
- Vivid dream-like images when drifting off to sleep or waking up.
- Waking up unable to move or talk for a brief time.

Narcolepsy is a disorder characterized by sudden and uncontrollable, though often brief, attacks of deep sleep, sometimes accompanied by paralysis and hallucinations. These unwanted episodes of sleep can occur several times a day. In addition, these episodes will not only occur when expected like after a heavy meal or during a monotonous activity but also during an involved activity. The narcoleptic will often awake from episodes feeling refreshed. Although they feel refreshed, this does not prevent further attacks.

The sleeping attacks are not the only sign of narcolepsy though. The narcoleptic will feel abnormally drowsy at times and will often spend the day in a low level of alertness. This disorder leads to poor performance, memory lapses, and gestural or speech automatisms. Even the use of stimulant medication may not bring the narcoleptic out of this phase.

Narcolepsy shares some characteristics with insomnia. A narcoleptic can usually fall asleep within 5 minutes of going to bed but the sleep pattern over the night is rather unstable. The REM sleep episodes in a narcoleptic are shorter than a normal person and there is more time spent in the lighter stages of NREM sleep or awake. When a narcoleptic awakes in the morning they feel unrefreshed. However, for a narcoleptic, the total time spent sleeping in a 24 hour period is only slightly higher than normal because the sleep lost at night is a little less than the time spent in sleeping during the day.

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Sleep Apnea

- Loud Snoring
- Waking up non refreshed and having trouble staying awake during the day
- Waking up with headaches
- Waking up during the night sometimes with the sensation of choking
- Waking up sweating

Obstructive sleep apneas are caused by the closure of the upper airway during sleep. This prevents air from entering the lungs and thus interrupts the continuous exchange of gas in the lungs. This disorder can range from a few obstructions to life threatening condition. This sort of condition is more common in elderly people as well as obese people. In addition, this disorder is four times more common in males than in females. Sleep apnea can also be inherited or acquired in a family through common eating habits or other behavioral factors. Some of the most common symptoms of obstructive sleep apnea are loud snoring, choking spells during the night, excessive daytime sleepiness, frequent visits to the bathroom during the night, mood swings, obesity, low sex drive, dry mouth and sore throat, lack of concentration and morning headaches. The excessive daytime sleepiness, mood swings and lack of concentration are due to the interrupted sleep at night.

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RLS - Restless Legs Syndrome and PLMS - Periodic Limb Movements in Sleep

Will occur while:

- Riding in a car
- Watching TV
- Reading
- Inactivity, sitting (in a movie theater for example)
- Lying in bed trying to fall asleep

Restless legs syndrome (RLS) also called nocturnal myoclonus is closely associated with periodic limb movements in sleep (PLMS). Although patients with PLMS do not necessarily have RLS, the majority of patients with RLS have PLMS. Restless legs syndrome is a common cause of insomnia and is thus receiving more and more attention.

People with RLS or PLMS usually complain about unpleasant physical sensations in the legs, insomnia, daytime sleepiness and nonrestorative sleep, and restless sleep with nocturnal movements. The first three symptoms are subjective and difficult to quantify, making the diagnosis more difficult. Restless legs syndrome should be considered if any of these symptoms are present.

An unpleasant physical sensation in the legs refers to the feeling that makes one want to move their legs. There is often a sensation of tingling or itching which adds to the feeling of restlessness. By moving ones legs, the feeling will go away, sometimes there may even be an involuntary jerk or twitch. Sometimes, the patient will be unaware of the specific sensation but toss and turn for long periods of time while trying go initiate sleep. Once asleep, the patient may be awakened by an involuntary jerk of the legs. And their restlessness will not allow him or her to go back to sleep.

Sleep disruption caused by RLS and PLMS can lead to excessive daytime sleepiness. These disorders can produce brief arousals during the night that the patient may not be aware of. Thus patients with RLS or PLMS can be victim of nonrestorative sleep or daytime sleepiness based on insufficient sleeping time or poor quality sleep.

Restless sleep with nocturnal movements is often noticed by the bed partner. These movements may be so vigorous that the bed partner is kept awake. A patient with RLS or PLMS will often sleep best in unusual settings, such as on the floor, because they are unrestricted in movement.

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Parasomnias

- A sudden episode of intense terror during sleep
- difficulty in arousing the patient during an episode
- Long sleep periods
- Excessive sleepiness or excessively deep sleep

- The onset is insidious (gradually, so you are not aware of it at first)
- Typically appears before age 25

Parasomnias are disorders which occur during sleep, and often affect the sleep of those around us. The most common types of parasomnias are sleepwalking, sleep talking, and nightmares.

Sleepwalking is most common in young children that have not yet gone through puberty. This disorder involves taking nocturnal trips during the night. The person that goes for a "sleepwalk" has no recollection of the trip. There is usually no need for treatment as this disorder is not too serious. However it is important to take precautions to protect the sleepwalker from potential dangers during the night.

Sleep talking is another parasomnia that is harmless to the afflicted person. There is no need to treat this disorder, it is harmless. The signs of sleep talking are obvious, someone talks in their sleep. The person will have no recollection of their sleep talking episodes and is normally temporary. This disorder is caused by stress, illness, sleep apnea or nightmares. The talking can range from a few words of gibberish to an entire conversation.

Sleep terrors or nightmares are indicated by the sudden awakening of the patient with intense fear. Screaming and fighting may also occur during such episodes. These episodes generally last about fifteen minutes and the person experiencing them may or may not remember them in the morning. This disorder is most common in children, but may also occur in adults. There is no need for treatment unless the problem is persistent in which case psychiatric help should be sought.

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Mental

- Stress
- Anxiety
- Mood Swings
- Smaller Attention Span

Physical

- Damaged Immune System
- Fatigue

Abnormal sleeping can lead to more than just feeling tired. Studies shown that sleep deprivation can lead to more serious problems such as: physical fatigue, smaller attention span, mood swings, and immune system problems, all having been linked to lack of sleep and poor quality of sleep.

Many psychiatric disorders are caused or aggravated by sleeping disorders of some kind. Anxiety and depression are exacerbated by poor sleeping habits and in turn cause more sleeping problems. Mood swings and irritability are also commonly associated with lack of sleep.

The immune system can be weakened by lack of sleep also. If one's immune system is diminished, the rest of the body is left susceptible to a wide variety of disorders and diseases. Diseases make sleeping problems worse and life much more difficult. To stay healthy, the proper amount of sleep should be obtained. This may involve limiting one's daily activities so the right amount of sleep is achieved. Remember, the alternatives for not receiving the right sleep are much worse.

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Other Diseases and Sleep Disorders

Introduction

Sleeping disorders are often attributed to stress, illness, and drug treatment. With any disease there is often anxiety, pain and drug treatment. Stress can keep someone's mind racing as they try to fall asleep. Instead of relaxing and falling asleep, one gets more worked up. Pain can keep a person up or wake a person up during the night. Pain can come from an injury or a disease/illness. Drugs for treating such problems often have side effects. For example, a drug may relieve pain but keep you awake or make you very tired.

Asthma and Allergies

Asthma and allergies can have effects on one's sleep very similar to sleep apnea. Airway obstruction during the night can prevent one from either falling asleep or may wake them up during the night. Ironically pillows and blankets are a major contributor to allergies.

For a closer look take a look at this article from mydoctor.com

Cancer

Cancer often leads to insomnia-like symptoms. Cancer causes a great deal of pain in the person afflicted by the disease. The side effects of the medication may even be more painful that the effects of the disease itself. Besides the physical effects, the psychological effects of the disease are quite heavy. The patient's life is turned upside-down by the disease. Medication may even induce insomnia; patients are often treated with stimulants and amphetamines. Patients are also given sedatives and hypnotics for treatment. They are even given depressants as treatment. In addition to all of this, the hospital environment is not a good place to sleep. There are a lot of people around, machines are beeping, and it is an unfamiliar place to most people.

For more information take a look at this article

Epilepsy

Many epileptics have seizures exclusively at night, while many others have seizures throughout the day. A person with epilepsy is also more likely to have a seizure if they are sleep deprived. A seizure also reduces the amount of REM sleep and can lead to daytime drowsiness. Certain sleeping medications also can have a negative effect on epilepsy, increasing seizures.

Depression

Depression and sleep disorders can lead to one another causing a downward spiral. The more depressed one gets, the more they want to sleep. But on the other hand, sleep deprivation means more depression. Sleep medications can interfere with depression, and depression medication can lead to sleep problems. Often the only way to fix this cycle is a major disruption to the sleep schedule.

For more information see this article from bipolar.about.com or this one from pennhealth.com

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Coping with Sleep Disorders

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There are many sleeping problems that a college student may encounter such as, inability to fall asleep at night, trouble getting up in the morning, or trouble staying awake in class. Each case requires a different strategy for coping with the problem.

Coping with a sleeping disorder is probably the hardest part of having a sleeping disorder. Not sleeping properly affects the entire body. Not enough sleep causes fatigue and sluggishness. Too much sleep is also detrimental to one's health. When someone feels tired it makes it difficult to go on with everyday life, there is a constant desired to go back to bed. This is often not a good solution, it only feeds the problem. In addition, improper sleeping habits can in large doses impact the immune system. When someone is tired they also become irritable making it difficult for other people to be around them. Having sleeping problems not only impacts the person being afflicted, but also everyone they take it out on.

The best way to cope with a sleeping disorder or any sleep problem is practicing good sleep hygiene. By following daily routines, eating right, exercising, and avoiding certain substances most sleeping issues can be handled. Some sleep disorders require adaptations to daily life such as naps, physical activity, or medication. In these cases it is important that one follow a strict daily pattern. If the problem is managed properly, the patient's level of health will remain high. And the patient in turn will be much more pleasant to be around.

Here is a link to a website with some good relaxation techniques.

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Sleep Hygiene

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Tips

For getting to bed

- Get into a daily routine
  - Go to bed and wake up at the same time every day
  - Get a consistent amount of sleep every night
  - Perform a "nightly ritual" to prepare for bed
  - Take a bath or shower before bed
  - Avoid Daily Naps, unless necessary
- Be Healthy
  - Perform exercise daily
  - Don't eat heavy meals before bed
- Sleep in a dark room
- Avoid cigarettes, beverage alcohol, and caffeine
- Only use sleeping pills when necessary
- Associate the bed with sleep
  - Only use the bed for sleep
  - Always sleep in the same place
  - Make the bed comfortable
- Try not to think about stressful topics in bed
- If allergies are a problem, try to eliminate anything that might aggravate them from the sleeping area
- If you can't stop thinking while you try to sleep, try writing a note about it so you can let your mind rest and think about it later

For waking up

- Introduce bright lights soon after waking up

- Get enough sleep
- Once awake, stay awake
- Place the alarm clock in a place that makes you get out of bed to turn it off
- Get two alarm clocks
- Drink water before bed (You will have to go to the BR in the morning)
- Sleep in a warm room, getting out of a nice warm bed to go into a cold room is not too motivating
- Try alternating radio stations and/or the buzzer
- Have a reason for waking up, class or work is often not motivating, try looking forward to breakfast

For staying awake

- Get your mind working, do something that takes thought
- Don't eat heavy meals before you have to sit down for something "boring"
- Get some exercise during the day
- Drink coffee, tea or ice water
- Eat non-filling snacks
- Avoid sedatives like cold medication (and turkey)

To improve one's sleep health, clinical work is often not necessary. Many sleeping disorders can be managed through good sleep hygiene. By modifying one's daily routines, diet, environment, and drug intake, one can significantly better their quality of life. Most often, only slight changes are necessary to improve one's sleeping habits unless an actual sleeping disorder exists. In the case of a sleeping disorder, professional help should be sought, however the information provided on this page may be enough to solve the problem.

There are a variety of things that can be done during the day to promote high quality sleep. Regular exercise, about forty minutes per day, has been shown to help sleep hygiene. However, one should avoid exercising just prior to bedtime. Taking a bath before bedtime or having a hot beverage to increase the body temperature is also helpful. Too much or too little sleep has a negative effect, for the highest quality sleep, a consistent amount of sleep per night is recommended. Naps during the day are often detrimental, except for brief naps of fifteen to twenty minutes in duration after being awake for at least eight hours. In some cases, naps are important in treating sleeping disorders such as narcolepsy; a physician should be consulted in the case of a persisting sleeping problems.

Light has a great effect on sleep as well. Exposing oneself to bright light within a half hour of waking up has a positive effect on one's awareness during the day. On the other side, one should avoid exposure to

bright lights prior to going to sleep and during the night. Keeping a regular schedule promotes healthy sleep as well. By waking up and going to sleep at the same times every day, the body gets used to the cycle and will make it easier to wake up in the morning and fall asleep at night.

Eating prior to bedtime is not advised, heavy meals can lead to discomfort and night waking. After consuming a heavy meal it is recommended that one wait at least three hours before attempting to go to sleep . On the other hand, a light snack before bed may be part of the bedtime ritual and aid one in having a good night's sleep.

Cigarettes, ethanol (beverage alcohol) and caffeine have negative effects on sleep health and daytime performance. Nicotine from cigarettes, in low concentrations acts as a sedative, however in larger quantities can act as a stimulant. Ethanol as found in alcoholic beverages gives the feeling of drowsiness, so many people may thing it promotes healthy sleeping. On the contrary, ethanol causes problems with sleep maintenance. By consuming ethanol prior to going to sleep, one may fall asleep faster but find it more difficult to stay asleep during the night or achieve the quality of sleep desired. Obviously since caffeine is a stimulant it can inhibit the onset of sleep. During the sleep cycle, caffeine also lowers the quality of sleep and makes arousal easier. Sleeping pills are alright once in a while, but prolonged use may lead to dependence and even immunity.

The sleeping environment is important to getting a good night's sleep. The bed should only be used for sleep and sexual activity. Using the bed for other activities such as work or entertainment may lead one to associate the bed with arousal rather than sleeping. One should avoid sleeping in different places also, sleeping in different places may lead to confusion. The sleeping environment should be kept quiet, dark, well ventilated and at a comfortable temperature. By adjusting the sleep environment to the most comfortable setting, arousal during the night can be avoided.

Medical conditions may exist that are detrimental to one's sleep health. Things like allergies or injuries may lead to discomfort and trouble sleeping. During certain parts of the year one may have difficulty sleeping due to allergies from pollen or grass or a variety of factors. Or perhaps the allergies are present year round and are due to other factors in the room. To aid a person with allergies, an air purifier or allergy medication could prove to be helpful. A person experiencing discomfort from an injury, disease or disability may find medication to ease the pain during the night useful

Stress is also a major factor the leads to sleeping problems. For someone that deals with stress during the day, stress management techniques should be adopted. Laying in bed thinking about problems will not help initiate sleep, it leads to more worrying. Instead of stressing, one should make a list of things to be done the following day to ease the mind. Trying to hard to sleep often prevents sleep. A good technique is to ease the mind and relax.

By creating a healthy pattern of living, one may be able to dramatically improve their sleep health.

Sleeping and waking on a regular schedule is the most effective way of enabling the best quality of sleep. Avoiding things like nicotine, caffeine, and alcohol have also been shown to be very effective. Environment, mental health, and medical conditions are also factors that can prevent one from achieving the best sleep they can. By identifying the cause, many sleeping problems can be taken care of without medical treatment.

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WPI

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Phone: (508) 831-5520 - Fax: (508) 831-5953 - healthcenter@wpi.edu

Sleep Disorders Links

Home
Sleeping Disorders
Effects
Other Diseases
Coping
Sleep Hygiene
Links
Survey
Survey Results

General Sleep Disorder Websites

Sleepdisorders.about.com - This website has a lot of information but is distributed into a number of articles. Each article addresses a specific topic having to do with sleep disorders. The main drawback to this site is the large number of advertisements and the popup ads.

Sleep and the Brain - is a government website from the National Institute of Neurological Disorders and Stroke. It goes into depth on how sleep works, what happens in sleep, and what sleep disorders exist.

Emedicine - is a medical website with a host of articles written by doctors about sleep. There are also links contained within the site that get more specific about certain sleep disorders. One can also find information here about other diseases and how they are related to sleep.

CNN - an article from CNN about how sleep affects someone. Includes many good statistics and focuses mainly on sleep deprivation

Sleep Tutorial - A flash module that explains about sleep. There are also narrations so that you don't even have to read.

National Sleep Foundation - This is the homepage of the National Sleep Foundation. From this site you can find out a lot of information about sleep disorders and sleep awareness. They also have a "Sleep Services" section that can be used to find places that can help diagnose and treat sleep disorders.

Sleepnet.com - This site have a "Sleep Test" that one can use to determine what possible sleep disorders they may or may not have. It has a series of check boxes that are analyzed and return a list to the user. They also have a very extensive "Sleep Forum" where people can go to talk about their disorder.

Psychohelp - This site takes a psychological approach to explaining sleep disorders.

Teen/College Websites

TeensHealth - A website that is focused mainly on teenagers and the issues that teenagers face. One can find information about sleep disorders as well as stress, health, and peer pressure here.

Columbia University - A website designed to help the students at Columbia University

University of North Dakota - A website designed to help the students at the University of North Dakota

University of Wisconsin - A website designed to help the students at the University of Wisconsin

Mount Royal College - A website designed to help the students at Mount Royal College

These sites are focused on college aged people. Many issues that students face are addressed and many possible solutions are suggested.

Sleep Disorder Related Links

Depression - This website talks about the relationship between Depression and Sleep Disorders. It addresses the biological, social, and genetic factors of depression and sleep.

Cancer - This website examines the relationship between sleep and cancer.

Asthma - This website takes a look at how asthma affects sleep patterns

Epilepsy - This website has information about how epilepsy and sleep affect one another

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WPI

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Phone: +1-508-831-5381 - Fax: +1-508-831-5846 - academic-advising@wpi.edu

Home
Sleep Disorders
Effects
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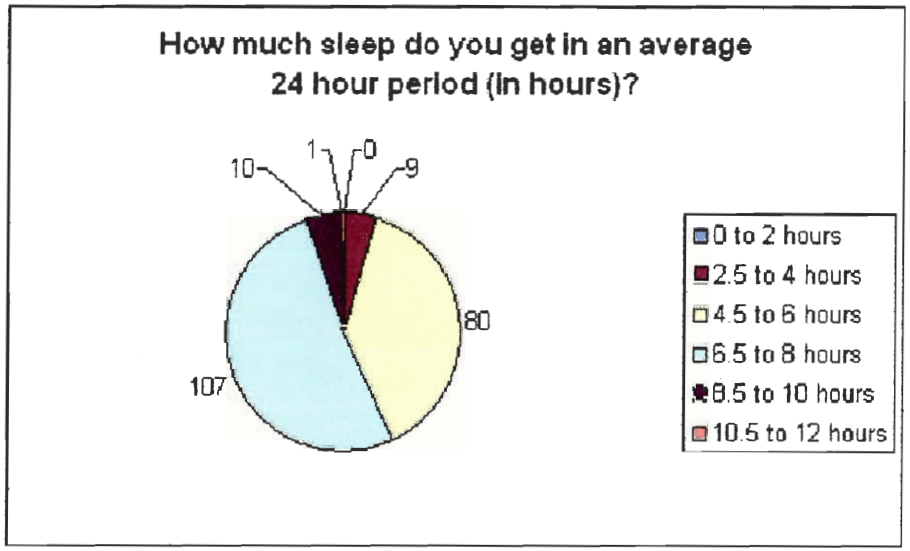
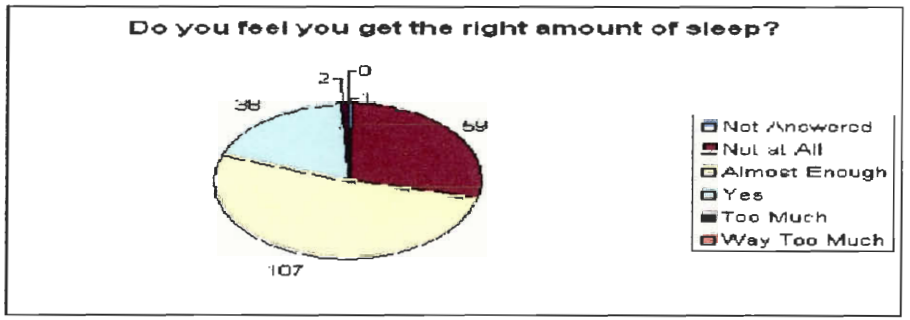
Sleep Hygiene
Links
Survey
Survey Results

Survey Results

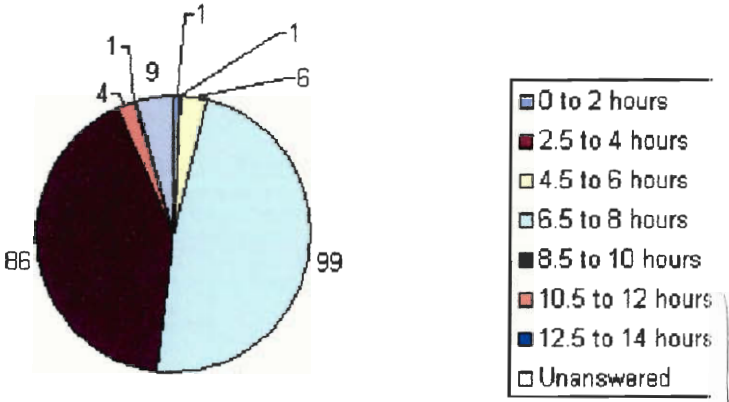
An email was sent out to the undergraduate mailing list and 207 surveys were returned. The following graphs show the results of the surveys. At the bottom of the page, you can see what WPI students think of the 7 week term.



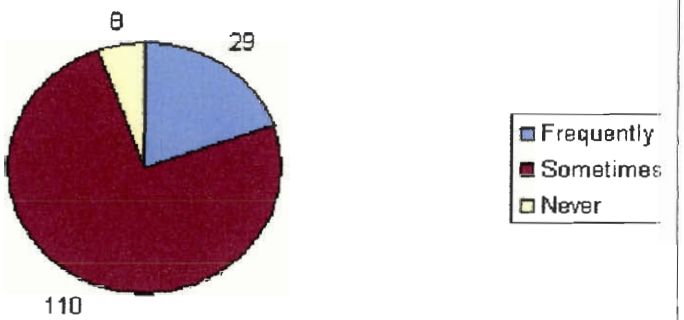


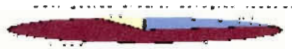
Do you feel you get the right amount of sleep?

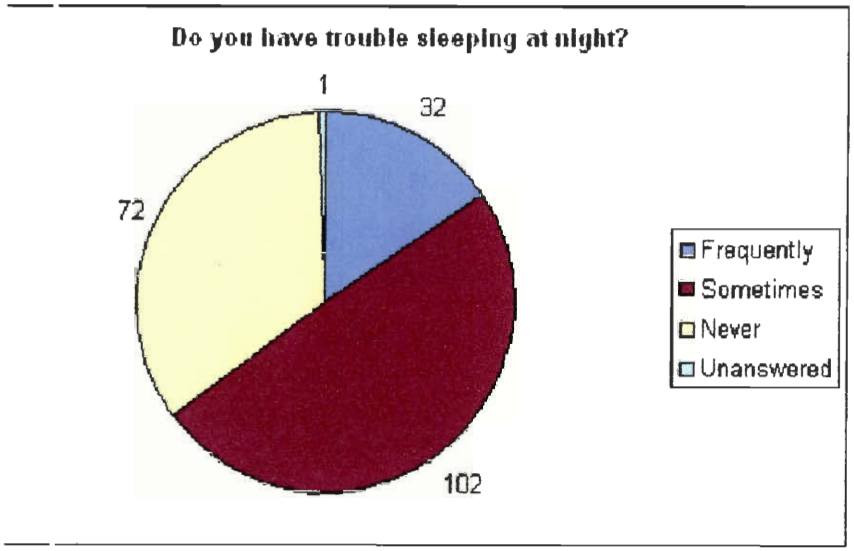
How many hours of sleep would you like to get?

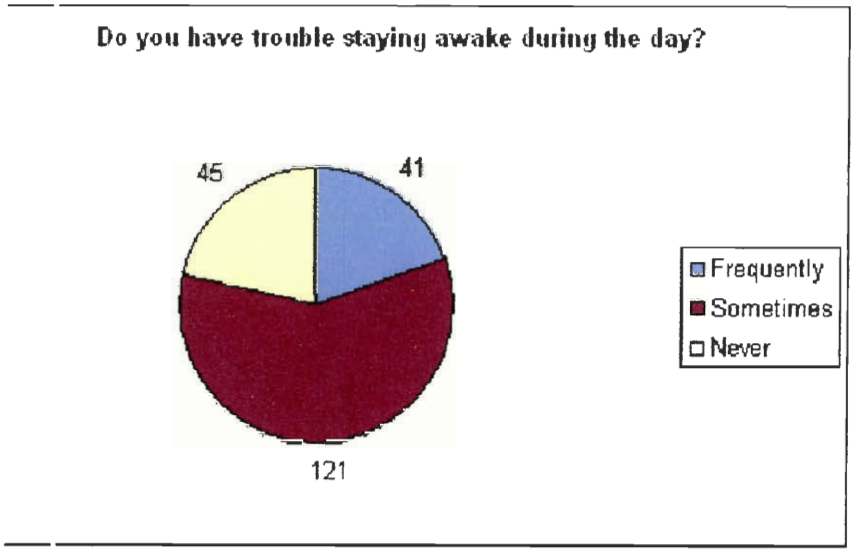


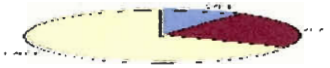
Do you take naps during the day?

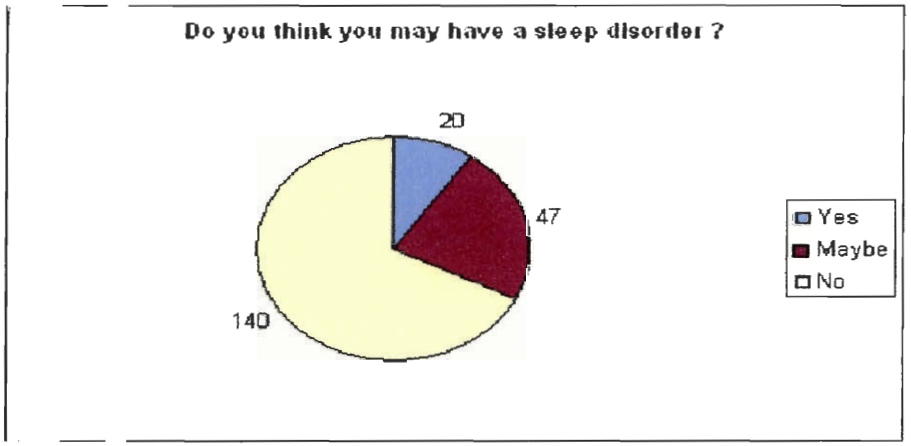


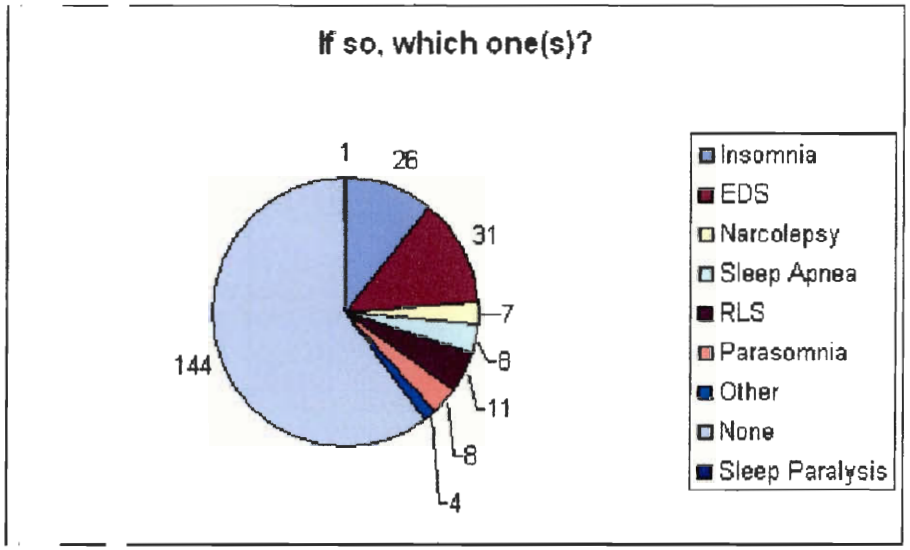


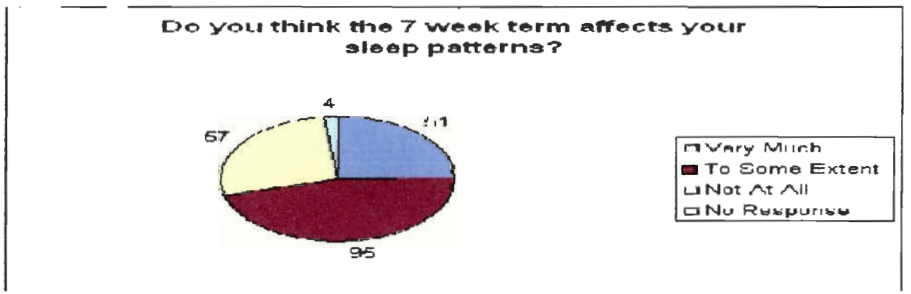

Do you have trouble sleeping at night?
1
32
72
102
Frequently
Sometimes
Never
Unanswered

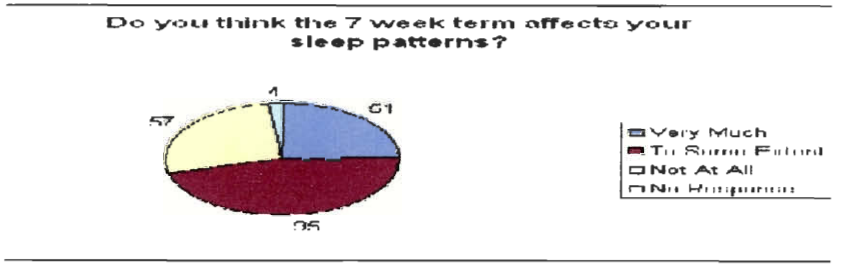

Do you have trouble staying awake during the day?
45
41
121
Frequently
Sometimes
Never

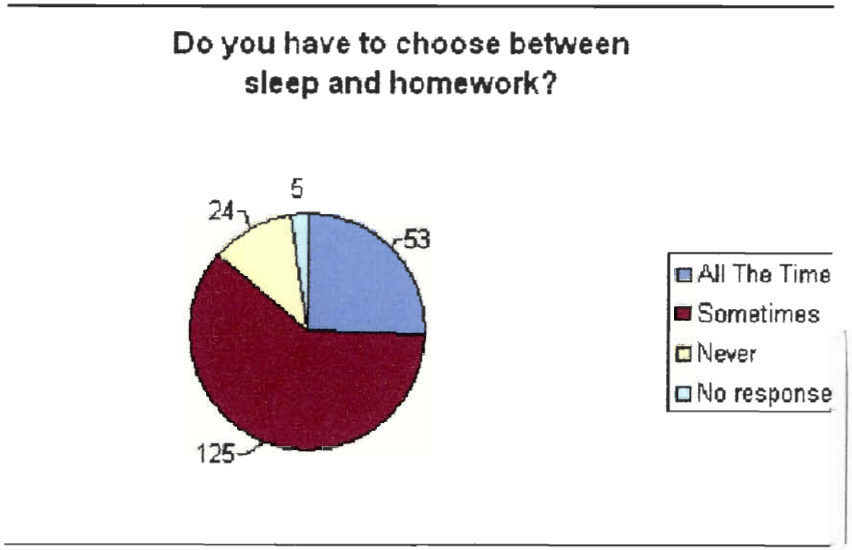


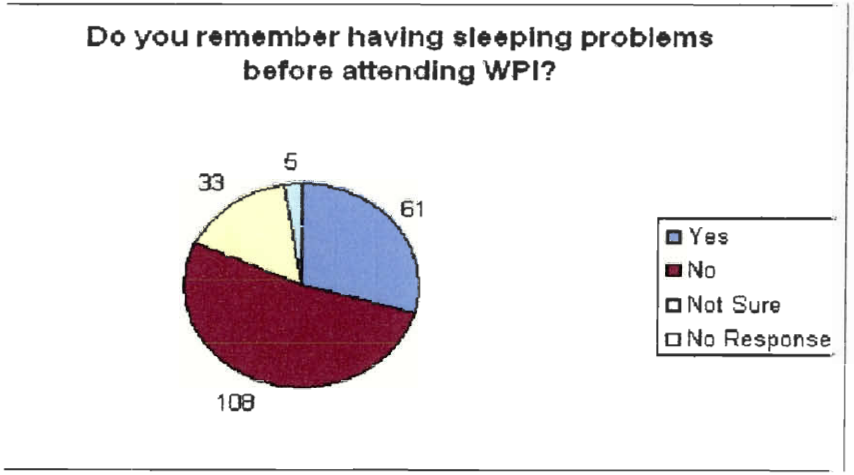

Do you think you may have a sleep disorder ?
20
47
140
Yes
Maybe
No


If so, which one(s)?
1
26
31
7
8
11
8
4
144
Insomnia
EDS
Narcolepsy
Sleep Apnea
RLS
Parasomnia
Other
None
Sleep Paralysis

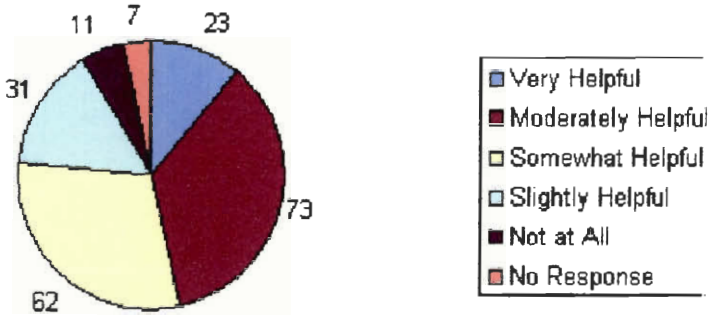

Do you think the 7 week term affects your sleep patterns?
4
67
95
Very Much
To Some Extent
Not At All
No Response


Do you think the 7 week term affects your sleep patterns?
57
61
Very Much
Not At All

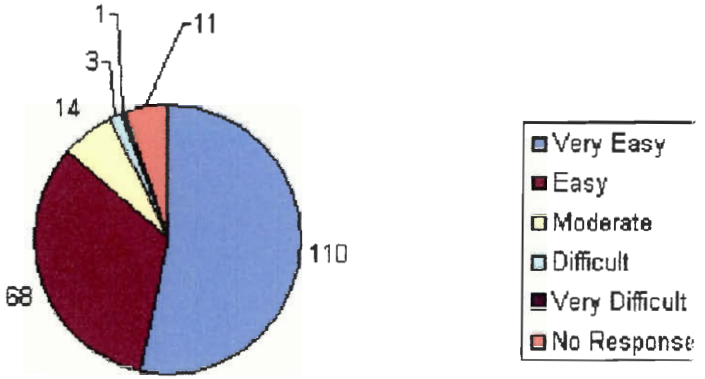

Do you have to choose between sleep and homework?
5
24
53
125
All The Time
Sometimes
Never
No response

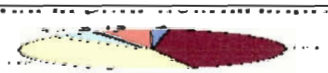

Do you remember having sleeping problems before attending WPI?
5
33
61
108
Yes
No
Not Sure
No Response

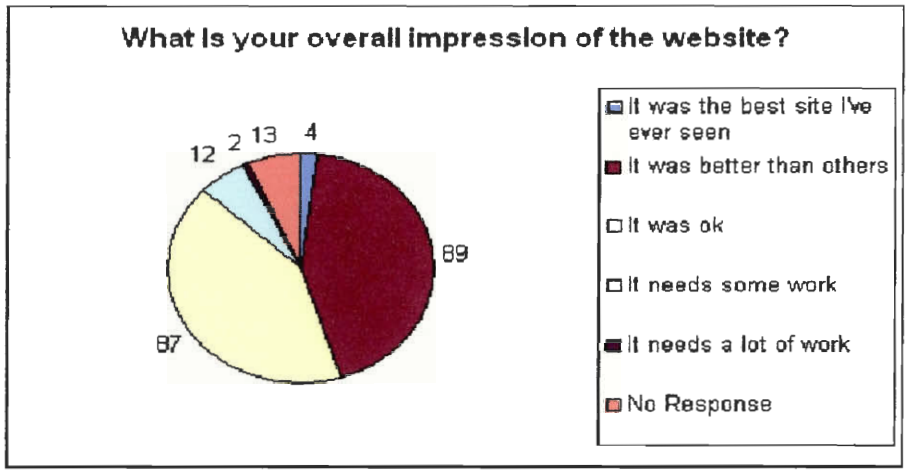
Do you feel that the site was helpful?



Did you find the site easy to use ?







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MISC

- Since we have to do things so rushed, often time's large projects are assigned with very little time given. Take EE 2799 for example. This class requires that you put in 40 hours for that class a week at least. This doesn't include your other two classes which WPI recommends 3 hours for every hour in class.

- ECE courses- assignments are back to back so often you can't do large assignments until the last minute. A typical week in my signals class is either an exam and a big project (the last one I did was 40 pages) or two difficult hw assignments (other ee courses are comparable). Time management only works when you have time to manage. Sometimes when I only have enough time left in the night for an hour or so of sleep after finishing my hw, I find it's better to just stay awake. Because I would have a lot of trouble waking up after just one hour of sleep.

- The amount of work and effort that has to be put into one term along with balancing outside activities is immense. College isn't just about doing your work and then sleeping; it is about doing your work but still having time to have a social life.
- I hardly ever stay up late to finish a project or homework, unless it's a group project. However, sometimes my anxiety over not understanding something and not having enough time to talk to anyone about it keeps me from getting to sleep.
- I think that anyone who blames school for their lack of sleep either does not know how to budget their

time or is too busy for their own good. Too busy? Quit some useless resume-padding activities, and you'll do better in your classes too.

- The fact that if I fall behind in a class, I have a very hard time catching up, leading to excessive amounts of stress, which makes me lay in bed, mind racing, for hours before falling asleep. Having huge tests every week is also difficult to prepare for, leading to more stress and less sleep.
- School and social pressures
- The body not being able to adjust quickly enough to my changing schedule.
- The weeks go by really fast, and so a lot of time is spent doing last minute projects and studying for midterms/finals
- The intensity of the term makes for rigorous work and therefore less sleep. At the same time, with only 3 classes there is more time to focus on specific projects. The only time sleep really becomes an issue is during the last week of the term.
- procrastination in term-long projects
- Roommate keeps me up
- Towards the end of the term I either stay up late studying or stay up late partying because it's done.
- The problem with the 7 week term is that the professors don't have much flexibility in terms of assigning projects. Almost all of the classes I've taken here have two or three exams and two or three projects. Usually, the exams and projects all fall in the same week. I'll go for a week or two without any work (except reading assignments) and then get hit with two or three projects due within a few days of each other. That really affects my sleep patterns. I supposed if I really made an effort to start projects early, I probably wouldn't get hit so hard near the due date. However, that's not always possible. Realistically though, I don't think WPI's schedule is all that bad. If you aren't getting enough sleep because of homework, then you're probably doing something wrong. Even when I overloaded with CS, EE, PH, ID2050, PQP, and gym, I was getting more sleep than my IQP partners who were only taking two classes. The fact is that most people waste a ridiculous amount of time during the day. The problem really is lack of time management, not anything to do with 7 week terms, in my opinion at least.
- There is always studying and homework to do; there is no respite until the weekend.

- Having to wake up at a certain time for 7 weeks, then waking up at a different time may cause problems
- Shorter terms are more stressful, and many times one must stay awake later and wake up earlier to complete assignments on time, which makes it hard to get into a normal sleep schedule.
- Demanding schedules, traveling from home to class, lack of quietness in computer labs to work efficiently during the day. No good studying areas at school to sit upright and comfortable in-between classes.

PACE

- Since the terms are so short and intense the amount of sleep is inversely proportional to the amount of homework (for good students). More homework = less sleep. This is true at other schools, but because they have 14 week simesters the work can be put off for longer.
- Programming assignments keep me up on many a night, since there is usually one due every week.
- You need to do a lot of work over a short period of time. Sleeping a full night every night is tough when you have a ton of work
- It is intense, and there are periods of sleep and then times when you have to cram and there is no sleep.
- SO much work so fast, i have a problem with putting things off, and I have to stay up late to finish them, the 7 week term makes this even worse
- The fact that there is no rest period between classes & exams
- The large amount of homework to be completed in such a short time causes excess stress.
- It is difficult to get into a steady routine. By the time a comfortable routine is set the term is over, and you have to get used to a whole new schedule.
- With only 7 weeks to study a subject, I often find myself running out of time to study material before a test or to finish homework, so I need to stay up late to study.
- Quicker class movement, short periods of very heavy homework loads.

- Everything thing is crunch often one needs to make up for the lack of hours in the day by not sleeping at night

- We dont have time to fall behind in classes because of the pace.

- The faster study pace, more things must be done in shorter time.

- The faster pace makes me feel like sleep may be a loss of time which could otherwise be spent getting work done.
- Fast paced, little time to catch up if you fall behind, lots of work outside the classroom for self teaching and group work.

- Everything comes pretty quick and you need to stay on top of things which usually results in not sleeping.

WORKLOAD

- Having several things due at once but not learning the material required for it until right before it is due, making it hard to do ahead of time

- Homework assignments and stress induced by tight schedules and deadlines.

- Work comes in waves; not too bad sometimes, really bad other times.

- Too much work...so I just don't do it and play games all night instead. but it's just hanging over my head so I feel like I should be up doing it instead of sleeping.

- More work in any given time, easier to fall behind, causing people to pull more "all-nighters"
- Regular reports, papers, hw, etc. due weekly requires too much work during week if a student is involved in sports and activities, and does not spend the weekend doing homework. Basically you have lots of work due in a short amount of time which more then likely doesn't get done

- The work load keeps me from getting to bed at a reasonable time. And when I do get to bed early, I can't fall asleep anyways.

- As the term goes on, there is less time for sleep because of all the exams.
- Having to cram a lot of work in and therefore spending less time sleeping.
- The last two weeks of the term. Almost all classes ask for "extra" effort to complete a final project or study for an exam. This extra effort multiplied by the 3 classes severely affects one's sleep.
- The heavy load of work causes you to miss some sleep so you can finish it.
- Stress, worrying about projects and exams
- Midterms and finals, but I think that's true of every college or university. However, I think the fact that these two events are so close to each other, greatly affects my ability to recover from a few sleepness nights.
- Lots of work all at the same time; i.e. - IQP, MQP, etc.
- Too much work to be done for 3 courses within a 7-week term period
- Too much work, not enough time, too many activities
- The sheer amount of homework, and preparation required for tests hurts sleeping patterns. Social life here sometimes affects sleep patterns as well.
- Homework due on Friday means Thursday nights are terrible
- Shorter term = more intense course load = less sleep
- The work load is so much that I don't have enough hours in a day to do everything I need to get done. Therefore, I find that everynight I need to stay up until 12 or 1am in order to get everything done.
- Classes every day, many projects.

- Being overloaded with work at the same time for all three classes Having a social life
- the intense homework that I have to do and having to work full time in order to pay bills is very stressful and time demanding
- Homework/Projects all due at the same time
- There's always something due, no procrastination allowed. But if you do procrastinate; you are most likely cutting your sleep in half in advance.
- I have never gotten enough sleep during Midterm and Finals weeks in my 4 years here. There is always too much work to be done.
- I'll often have so much work to do in a week that the only way to finish it is to deprive myself of sleep.

SCHEDULE

- Classes that are normally offered in 15 week semesters being squeezed into a 7 week term. There are simply some classes that just can not be taken in 7 weeks without incredible amounts of effort on both the teachers and the students parts. Unfortunately, the work does impede on the amount of sleep that I get on a nightly basis.
- Classes every day; no chance except weekends to catch up on sleep
- During the term itself I get very little sleep, then during breaks I do nothing but sleep. This happens three times a year, and messes with my sleeping patterns.
- The fact that I have classes in the morning makes me have to get up earlier, but I still stay up late, so I get less sleep
- Not enough time to get everything done and still sleep adequately.
- Not having enough time and cramming to get work done. Sleep gets sacrificed.
- Having 8am labs

- There is a gap between each 7 week term where people are home or off campus, and during that week, may get an extra amount of sleep, or even go out too much and get no sleep. So, we have to re-adjust our sleep schedule every 7 weeks, as opposed to other normal semester based colleges.

- I'm always trying to get up early to get things done. I never feel that I have enough time in the day to do all my assignments and work.

- Most class meet 4 or 5 days a week, so the ones at 8am meet everyday limiting the amount of sleep one can get.

- We have so many hours per week of class, that I have to wake up early and stay awake all day basically. And obviously, it's not easy falling asleep early in a dorm.

- My time of sleeping tends to revolve around my schedule. Afternoon classes mean staying up late. Morning classes mean going to bed early. And it tends to change

- Exam and due dates are closer in a 7 weeks schedule, more stuff needed to be accomplished so for some of the time, I need to work all night

- It only affects my sleep when I have class at 8 in the morning.

- Changing schedules alters my sleep patterns as the time for my first class changes.

- When you go from an 11:00 class to an 8:00 class, yeah, that can screw you up a little

- Exams and project deadlines always seem to fall on the same day.

- 50 % of work load is done in last 2 weeks

- Deadlines. During any given school day at WPI there are due dates, meetings to prepare for and deadlines to meet. Time organization is critical, and unfortunately "bedtime" is usually the most available work time for most students.

WPI

Student Health Center - Worcester Polytechnic Institute - 100 Institute Road, Worcester, MA 01609-2280
Phone: (508) 831-5520 - Fax: (508) 831-5953 - healthcenter@wpi.edu

Sleep Disorders Survey

Home
Sleeping Disorders
Effects
Other Diseases
Coping
Sleep Hygiene
Links
Survey
Survey Results

Thank you for coming to the WPI sleep disorders website. We hope that you found this site informative and useful. This site is an IQP that was created by Evan Boron and Rodney Waters, two fellow undergrad students here at WPI.

Now that you have viewed the website, please take a couple minutes to fill out the survey below. The information provided is strictly confidential and will only be used for statistical purposes. The information being provided is very helpful in understanding sleep habits and college students. Please take your time in completing the survey as the results are very important to improving the website.

Sleep Habits

How much sleep do you get in an average 24 hour period (in hours)?

Do you feel you get the right amount of sleep? -Choose-

How many hours of sleep would you like to get?

Do you take naps during the day? -Choose-

Do you have trouble sleeping at night ? -Choose-

Do you have trouble staying awake during the day? -Choose-

Do you think you may have a sleep disorder ? -Choose-

If so, which one(s)? (To choose more than one hold the control key while clicking the disorder.)

None
Insomnia-Unable to fall asleep or remain asleep
Narcolepsy-Sudden, uncontrollable attacks of sleep

If Other, please specify

Are you a College Student? -Choose-

If yes, where?

If you are a WPI student, please complete the next section, if not please skip to the ratings section.

WPI Students Only

Do you think the 7 week term affects your sleep patterns? -Choose-

What aspects of the 7 week term affect your sleep?

Do you have to choose between sleep and homework sometimes? -Choose-

Do you remember having sleeping problems before attending WPI? -Choose-

Rating the site

Do you feel that the site was helpful? -Choose-

Did you find the site easy to use ? -Choose-

Can you suggest any improvements for the site? Was anything missing that you expected to see? If so please list in the box provided.

Suggestions?

Did you encounter any problems while using the site? If so please indicate what the problem was.

Any problems?

What is your overall impression of the website?

-Choose-

Demographic Information

Age -Choose-

Gender -Choose-

Ethnicity -Choose-

Location (State or Country)

Educational Background completed or currently in -Choose-

Occupation if any

Activities

eg: Sports, theater, clubs, etc....

Submit Survey Clear Form

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Appendix C

To our fellow undergraduates,

We invite you to take a few minutes and evaluate our IQP about sleep disorders. To take a look at it go to this website http://www.wpi.edu/~eboron/IQP/ On this website you will find symptoms of common sleep disorders, ways to improve one's quality of sleep, and links to other helpful websites about sleep. In addition, there is a discussion board where you can talk about anything sleep related.

After browsing through the website, please fill out the short survey that can be found by clicking on the link on the left hand side of the page that says "survey". The survey has two main parts, statistical information and the ratings section. All information gathered from the survey will be kept confidential. The statistical information will be used to get a sense about WPI's undergraduate students and how they may be affected by sleep disorders. The ratings section will be used to help us make the site better and more useful for students to get information or help. Any suggestions will be greatly appreciated. If you have any friends that you think could benefit from this website, please let them know. Although this website is designed with the WPI student in mind it may be helpful to anyone with sleep problems.

Thank You
Evan Boron
Rodney Waters

Appendix D

What aspects of the 7 week term affect your sleep?

1. Faster pace, makes one feel like sleep may be a loss of time which could otherwise be spent getting work done.
2. There is more work to do in a week.
3. lot of work, miss some sleep to finish work
4. Stress
5. The amount of stress/things to do prevents some sleep
6. worrying about projects and exams
7. Midterms and finals, but I think that's true of every college or university. However, I think the fact that these two events are so close to each other, greatly affects my ability to recover from a few sleepness nights.
8. Lots of work all at the same time; i.e. - IQP, MQP, etc.
9. too much work to be done for 3 courses within a 7-week term period
10. Frequent homeworks that are due
11. Faster pace study means more things must be done in shorter time.
12. The sheer amount of homework, and preparation required for tests hurts sleeping patterns some. Social life here sometimes affects sleep patterns as well.
13. During the term itself I get very little sleep, then during breaks I do nothing but sleep. This happens three times a year, and messes with my sleeping patterns.
14. The fact that I have classes in the morning makes me have to get up earlier, but I still stay up late, so I get less sleep
15. Pressure
16. i sleep more on break, i dont sleep much during the middle and end of the term
17. Regular reports, papers, hw, etc. due weekly requires too much work during week if a student is involved in sports and activities, and does not spend the weekend doing homework. Basically, lots of work due in a short amount of time.
18. Not enough time to get everything done and still sleep adequately.
19. The problem with the 7 week term is that the professors don't have much flexibility in terms of assigning projects. Almost all of the classes I've taken here have two or three exams and two or three projects. Usually, the exams and projects all fall in the same week. I'll go for a week or two without any work (except reading assignments) and then get hit with two or three projects due within a few days of each other. That really affects my sleep patterns. I supposed if I really made an effort to start projects early, I probably wouldn't get hit so hard near the due date. However, that's not always possible. Realistically though, I don't think WPI's schedule is all that bad. If you aren't getting enough sleep because of homework, then you're probably doing something wrong. Even when I overloaded with CS, EE, PH, ID2050, PQP,

and gym, I was getting more sleep than my IQP partners who were only taking two classes. The fact is that most people waste a ridiculous amount of time during the day. The probl

20. The work load keeps me from getting to bed at a reasonable time. And when I do get to bed eaarly, I can't fall asleep anyways.
21. As the term goes on, there is less time for sleep because of all the exams.
22. Having to cram a lot of work in and therefore spending less time sleeping.
23. I think that anyone who blames school for their lack of sleep either does not know how to budget their time or is too busy for their own good. Too busy? Quit some useless resume-padding activities, and you'll do better in your classes too.
24. too much work in small amount of time. Must work late.
25. Classes that are normally offered in 15 week semesters being squeezed into a 7 week term. There are simply some classes that just can not be taken in 7 weeks without incredible amounts of effort on both the teachers and the students parts. Unfortunately, the work does impede on the amount of sleep that I get on a nightly basis.
26. Not having enough time and cramming to get work done. Sleep gets sacrificed.
27. too much work, too little time, no time for sleep.
28. the fact that if i fall behind in a class, i have a very hard time catching up, leading to excessive amounts of stress, which makes me lay in bed, mind racing, for hours before falling asleep. having huge tests every week is also difficult to prepare for, leading to more stress and less sleep.
29. last two weeks of the term. almost all classes ask for "extra" effort to complete a final project or study for an exam. This extra effort multipled by the 3 classes severly affects one's sleep.
30. Compact work load
31. tests, homework, etc.
32. Less at the end
33. having all exams at one time, needing to keep up in classes
34. Lots of work in not a long period of time!
35. 8am labs
36. The weeks go by really fast, and so a lot of time is spent doing last minute projects and studying for midterms/finals
37. Not enough time to do anything....always working.
38. Fast paced, little time to catch up if you fall behind, lots of work outside the classroom for self teaching and group work.
39. There is a gap between each 7 week term where people are home or off campus, and during that week, may get an extra amount of sleep, or even go out too much and get no sleep. So, we have to re-adjust our sleep schedule every 7 weeks, as opposed to other normal semester based colleges.
40. Everything comes pretty quick and you need to stay on top of things which usually results in not sleeping.
41. Too much work, not enough time, too many activities
42. A lot of homework is crammed into every day.

43. the end
44. It is difficult to get into a steady routine. By the time a comfortable routine is set the term is over, and you have to get used to a whole new schedule.
45. Homework due on Friday means Thursday nights are terrible.
46. Classes every day; no chance except weekends to catch up on sleep.
47. With only 7 weeks to study a subject, often I find myself running out of time to study material before a test or to finish homework, so I need to stay up late to study.
48. Quicker class movement, short periods of very heavy homework loads.
49. Everything thing is crunch often one needs to make up for the lack of hours in the day by not sleeping at night
50. The work load
51. shorter term = more intense course load = less sleep
52. The body not being able to adjust quickly enough to my changing schedule.
53. late nights doing work
54. We dont have time to fall behind in classes because of the pace.
55. The work load is so much that I don't have enough hours in a day to do everything I need to get done. Therefore, I find that everynight I need to stay up until 12 or 1am in order to get everything done.
56. Intensity of courses, coursework
57. I hardly ever stay up late to finish a project or homework, unless it's a group project. However, sometimes my anxiety over not understanding something and not having enough time to talk to anyone about it keeps me from getting to sleep.
58. Programming assignments keep me up on many a night, since there is usually one due every week.
59. Excessive work
60. Homework assignments and stress induced by tight schedules and deadlines.
61. not enough learned in class, and the only time I can concentrate enough to learn the required amount of material is at night to early morning when there are less interuptions
62. Work comes in waves; not too bad sometimes, really bad other times.
63. It helps me stay on a regular schedule, but the fact that that schedule only last for 7 weeks wears on me the first two weeks of the next term.
64. Fast paced classes that require a lot to be done in a short amount of time
65. I can push myself more in the end because I know I have a week break coming, which happens 4 times a year.
66. Too much work...so i just don't do it and play games all night instead. but it's just hanging over my head so i feel like i should be up doing it instead of sleeping.
67. the quickness of the classes, and all of the homework is assigned at the same time for all the classes!!!
68. increased amount of work per day, less time to sleep between having classes and homework.
69. More work in any given time, easier to fall behind, causing people to pull more "all-nighters"

70. I'm always trying to get up early to get things done. I never feel that I have enough time in the day to do all my assignments and work.
71. Most class meet 4 or 5 days a week, so the ones at 8am meet everyday limiting the amount of sleep one can get.
72. I always attend my 8am classes and I always stay up late to complete all assignments. On weekends I go out to destress. Basically it's a never ending cycle of not enough hours in the day and I still feel like I hardly have enough time for myself.
73. It is intense, and there are periods of sleep and then times when you have to cram and there is no sleep.
74. We have so many hours per week of class, that I have to wake up early and stay awake all day basically. And obviously, it's not easy falling asleep early in a dorm.
75. You need to do a lot of work over a short period of time. Sleeping a full night every night is tough when you have a ton of work
76. My time of sleeping tneds to revolve around my schedule. Afternoon classes mean staying up late. Morning classes mean going to bed early. And it tends to change every term.
77. AS soon as the term begins, one must stay on a constant schedule, and plan time correctly to be able to accomplish all the work and studies in a successful manner, and sometimes sleep has to sacrificed.
78. The work load is very intense here, because the trems are only 7 weeks long. There is a test in one subject or another every week, and there is a lot of homework to do. Often times, I am up late studying or working on projects.
79. lots fo material and work in just 7 weeks
80. exam and due dates are closer in a 7 weeks schedule, more stuff needed to be accomplished so for some of the time, i need to work all night
81. I try not to sacrifice sleep for work or other activities, as I think sleeping is important to a sound and stable mind, however in the 7 week term creates a lot of stress. It is exhausting to be running about so much, as well as wanting to be social and enjoy your friends' company. Sometimes one gets less sleep for the trade off of being social or doing work.
82. the fact that there is no rest period between classes & exams
83. It only affects my sleep when I have class at 8 in the morning.
84. Having several things due at once but not learning the material required for it until right before it is due, making it hard to do ahead of time
85. The large amount of homework to be compleated in sucha short time causes excess stress.
86. Changing schedules alters my sleep patterns as the time for my first class changes.
87. There is always studying and homework to do; there is no respite until the weekend.
88. Having to wake up at a certain time for 7 weeks, then waking up at a different time may cause problems
89. amount of work

90. The idea of having all of your tests and homeworks due in the same week, as well as work load leads to my not going to bed very early. As someone in the forum mentioned, it has more to do with my time management skills then it does the 7 weeks system.
91. amount of work, stress
92. Too much HW
93. Classes every day, many projects.
94. Exams and project deadlines always seem to fall on the same day.
95. SO much work so fast, i have a problem with puting things off, and i have to stay up late to finish them, the 7 week term makes this even worce
96. Since we have to do things so rushed, often times large projects are assigned with very little time given. Take EE 2799 for example. This class requires that you put in 40 hours for that class a week at least. This doesn't include your other two classes which WPI recommends 3 hours for every hour in class.
97. The Work load.
98. ECE courses- assignments are back to back so often you can't do large assignments until the last minute. A typical week in my signals class is either an exam and a big project (the last one i did was 40 pages) or two difficult hw assignments (other ee courses are comparible). Time management only works when you have time to manage. Sometimes when I only have enough time left in the night for an hour or so of sleep after finishing my hw, I find it's better to just stay awake. Because I would have a lot of trouble waking up after just one hour of sleep.
99. The amount of work and effort that has to be put into one term along with balancing outside activities is emmense. College isn't just about doing your work and then sleeping, it is about doing your work but still having time to have a social life.
100. multiple exams, HWs, and project in a same day.
101. i ONLY HAVE WED. off so i party on tuesday because i have class everyday
102. There is more work that needs to be done and more stress.
103. Being overloaded with work at the same time for all three classes Having a social life
104. Shorter terms are more stressful, and many times one must stay awake later and wake up earlier to complete assignments on time, which makes it hard to get into a normal sleep schedule.
105. what time my classes are and what time i have to be at MQP
106. Gotta sacrifice something to keep up the pace here...
107. When you go from an 11:00 class to an 8:00 class, yeah, that can screw you up a little
108. Class and my daily schedule, there are many things to do in a day and still have to do homework. Also because a priority is to keep up with classes.
109. Demanding schedules, traveling from home to class, lack of quiteness in computer labs to work efficiently during the day. No good studying areas at school to sit upright and comfortable inbetween classes.

110. All the fuckin homework. The biggest problem is PQP actually.
111. Since the terms are so short and intense the amount of sleep is inversely proportional to the amount of homework (for good students). More homework = less sleep. This is true at other schools, but because they have 14 week simesters the work can be put off for longer.
112. Just the fast paced nature of it
113. density of schedule
114. Towards the end of the term I either stay up late studying or stay up late partying because it's done.
115. 50 % of work load is done in last 2 weeks
116. Roommmate keeps me up
117. the intense homework that I have to do and having to work full time in order to pay bills is very stressful and time demanding
118. There's a lot to do in too little time - also - living in a freshman dorm, where a lot of people go out Tuesday nights does not help. If I wasn't living in a dorm setting, getting enough sleep would be easier - my roommates and I have completely different schedules.
119. Homework/Projects all due at the same time
120. Deadlines. During any given school day at WPI there are due dates, meetings to prepare for and dealines to meet. Time organization is critical, and unfortunately "bedtime" is usually the most available work time for most students.
121. NOT ENOUGH SLEEP!!!
122. There's always something due, no procrastination allowed. But if you do procrastinate, you are most likely cutting your sleep in half in advance.
123. I have to manage my time (to allow for sleep) more carefully towards the end of the term.
124. I have never gotten enough sleep during Midterm and Finals weeks in my 4 years here. There is always too much work to be done.
125. lots of stuff to do, too little time
126. Intensity and short deadlines
127. constant work
128. same as said in introduction, that falling behind often leaves the choice to "sleep or work", and often work is more important
129. Stress and 8am classes
130. The biggest aspects are reading assignments (our reading assignments for one night, would be a 2-3 day assignment in other schools). reading is also a problem as that late at night (after midnight) i am usually so sleepy that I can't concentrate on the reading anymore. One good think about WPI is that I can catch up sleep on Wednesday, as I don't have any lab's in the morning and this gives me a chance to sleep in
131. The intensity of the term makes for rigorous work and therefore less sleep. At the same time, with only 3 classes there is more time to focus on specific projects. The only time sleep really becomes an issue is during the last week of the term.

132. I'll often have so much work to do in a week that the only way to finish it is to deprive myself of sleep.
133. procrastination in term-long projects
134. The work load is to great for this period...
135. WPI is a very intense engineering program that requires students to complete a lot of work.
136. finals week = no sleep
137. its hard to keep up with the work and do extra curricular activities, and some activities demand that you have to stay out of school, which causes me to fall behind, so normally I sleep very little depending on when assignments are due

Appendix E

Suggestions

1. more bulletted lists instead of paragraphs of text could help make the flow of the information smoother.
2. Add in the options for Frequently and Rarely. Sometimes and rarely are not the same thing. Nor are frequently and always
3. Good idea using the familiar WPI layout.
4. Sleep Hygene makes me think of takig a shower while I sleep. Perhaps "Sleep tips" would be a better title.
5. A bit more on ways to reduce stress and alternative lifestyles or cultures that aren't so competitive, stressful and demanding. Provide alternatives to get out of such a stressful culture rather than just a section on, "coping."
6. This is a pretty sharp looking webpage. Did you get permission from someone to use this design? WPI went kind of nuts with the lawyers, so I wouldn't be surprised if they had rules against using their design and logos. Also, in the little select box about overall impression of the website, you spelled "ever" incorrectly ("evern").
7. have stress reduction strategies listed on a page instead of a link, more people will read a page then click a link
8. i think a quiz would help. There is a lot of text about each disorder. A quiz that asked you a variety of questions and then gave you results saying you may or may not have certyain disordrers would be faster and more interactive. Also, it would make the material on each disorder easier to pick thyrougha nd give guidance to people whoi may need to seak more medical assistance.
9. site almost expects people to have sleep disorders, if you plan your time accordingly wpi 7 week terms are no problem
10. More about sleeping pills, should u use them or not, etc
11. Under the question: What is your overall impression of the website, there is a typo. You might want to change it to say 5-The best site I've EVER seen...just a thought.
12. Very good website, very complete, good links
13. too much in the form of paragraphs, no pictures and nothing interactive. Kind of boring, but it was informative
14. Shorter sections, maybe as a review, so a person looking for information doesn't have to spend time reading the long sections if they don't want to.
15. Ask when you sleep.
16. My disorder is actually diagnosed and I own books about sleep habits. I found your website vague, the information the exact same as any book would generalize and some sections incomplete. For example maybe you should specify that some sleep disrders are not usually diagnosable until late teen age years and describe some initial symptomes and how doctors diagnose them. Having more graphs, statistical data comparing WPI students amount of sleep to students at other

schools would be beneficial. Or you should reference the studies done relating how long one should be awake/alert to maximize the part of the brain used for analytical problem solving ie math & some science fields(it's 10am or later in a regular 8am-2pm HS day). A suggestion to help stay awake without caffeine is chew gum or suck on candy (the constant chewing or sucking maintains natural stimulation.) You could also show a visual relating how many hours one is expected to study (2hrs out of class/ 1 hr in class) and how many hours is ideal for a student around age 20. I think this site could be incredibly useful for students however I was disappointed with it's current information. The Introduction says the goal was to discuss sleep problems specifically for the WPI student. Either you should leave out the part about your focus group or show more information which relates directly to them.

17. Very nice job. Very easy to use. Very informative. Thanks! (I liked the pictures too!)
18. for the link to artcile, instead of putting article, can also include the name of author and the title of the article (make it more attractive).
19. Better grammar would lend to the site's credibility.
20. Something easier and quicker to read. More bullet points and highlighted passages to break up long text, (similar to magazine articles that pull out important quotes and such). However, I like the clear, organized structure of the site, and the cross referencing among topics.
21. nope... looks good evan, it is well done you should get an A, you deserve it. you have been throught enough getting here.
22. You should include a guide to staying awake. I have yet to find a really good stay awake aid. I use NoDoz (caffeine pills availible at Price Chopper) and coffee, but both eventually give me anxiety after using them for extended periods. Maybe a posting of the results to this survey as well.
23. What is your overall impression of the website? Best site I've ever(N)seen. (has that extra N in there)
24. Usually, the word "website" is in reference to an individual host name, www.whatever.com versus www.somethingelse.com, not www.wpi.edu/~mypage versus www.wpi.edu/~yourpage. Those are webPAGEs, not webSITEs. So basically, most references to the words website or site should be replaced with webpage or page.
25. The site was well written, but it felt like I was just wandering from part to part. If these pages are meant to be viewed for specific information, it might make sense to put a brief "roadmap" on the home page so that one can see where the information they want is.
26. nope - nice job!!!
27. Soooooooo many words. Try some bullets.
28. In the menu "What is your overall impression of the website?" there is a spelling error.
29. Check your grammar and spelling in the sleep disorder description page and other parts of the site (the drop down menu rating overall impression, for instance).
30. you guys rock ...maybe some more pictures. you know, make it look like you don't come from a tech school.

31. I think that there are people that don't necessarily have to have a disorder just because they are having difficulties sleeping. It could just be their own neglect to their body. If you don't mention that then many people especially hypochondriacs will believe that these will all apply to symptoms that they have. YOu should clarify that there are symptoms that people can have that don't mean that they have a disorder as well.
32. A section that reports the results of the survey might be informative. It'd be nice to know how many hours a night the average WPI student sleeps, or how other students have commented on their sleeping patterns... just to compare to my own habits.
33. I believe the sleep test site has problems... It says I have narcolepsy. I seriously don't think i have this disorder.
34. The difference between "Somewhat Helpful" "Moderately Helpful" is too slight, but the difference between "Sometimes" and "Never" is huge. I think you could have tested your survey more so that this stuff would not be getting in the way of me giving meaningful answers now. You should specify whether to answer for completed education, or current education. Also, distinguishing between Undergraduate and graduate college students would be telling.
35. are these your pictures that you made,they are kind of cool. Is this going to be a WPI website, I'm not sure I see the point of this at our school. when people look for information on our school they dont look for information on sleep disorders. It's my impression that the part about other problems isnt related to your purpose. So few people have cancer and such, it seems like your trying to fill space. Good job though.
36. Less text, it was too much to read. Maybe just add some more bulleted info so that I can get the facts quickly and read further if I want more in-depth info.
37. Something interactive would be really nice, people with no time don't like to read so much ;)
38. Should ask the hours when you want to sleep vs. the hours you do sleep. Also an important question is to ask if the person finds sleep "important". Some people I know find sleep annoying because it consumes a large portion of your day. So, they try to sleep as little as possible.
39. It was just so extensive, that I don't have the time to read all the material. It's either read the material, or get sleep.
40. Way too much text, this thing is boring with so much detail. The ideal site is to look at it, easy to read and quick to get through, if they want to read more they can read your writeup

Problems

1. A couple of typos
2. typo - On the "Coping" page, first paragraph, second sentence, "they may have getting up in the morning" should be "they may have >>trouble<< getting up in the morning". The links relating to other diseases were not as helpful as I

thought they would be (I thought they would talk more about how the disease caused/related to sleep problems)

3. When I scroll down to the bottom of a page, the left-hand menu goes away, which is kind of annoying.
4. Not in the website itself... (except for the comments above). However, you probably would get more results if the link provided in the e-mail went right to the survey, instead of making us click the link.
5. Other Diseases, link to "sleep apnea" broken
6. Yeah, I wanted to take a nap. I had trouble concentrating.