



Sleep Disorder in relation to Health and Quality of life

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Abstract

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Abstract: Inadequate sleep has been recognized as a risk factor for health status and quality of life. Fatigue due to improper sleep is a major cause for the poor quality of life. Evidence show the quality of sleep affects all the parameters of quality of life assessment such as physical health, social health, functional health and psychological health. In general, assessing the global impact of sleep on health-related quality of life (HRQL) is necessary because this factor is always left behind in medical assessment and medical history of an individual. In general, this article is a review on sleep quality and its effect on health status, medical condition of people, psychiatric disorders and occupational status of individuals. The data is collected based on the internet search and papers submitted in PubMed and google scholar. Sleep status is vital to physical and mental health. Measuring the quality of sleep and its effect on individual's life is very much important in assessing the health status of people. According to our study in this article, we suggest the importance of sleep to be measured and evaluated by the health care system for the individuals whether in hospitals or institutes or any organization.

Keywords: Sleep, Quality of life, Health, Insomnia

Introduction

Measuring the “Quality of Life” (QoL) is useful and serves as an important supplement to traditional physiological or biological estimates for health status¹. This information brings together the healthcare professionals and the patients on a common understanding about the health condition. Medical personnel are interested in changes in objective physical measures due to treatment while patients are (and family members/caretakers) equally interested in a therapy that changes their symptoms, physical function, and social roles²⁻⁵.

The term Quality of Life is widely used in clinical studies, often without a clear definition. It is commonly linked to the World Health Organization's definition of health, which refers to a state of physical, emotional, and social well-being, and not just the absence of disease or infirmity⁵. In fact, QoL has superseded the concept of “well-being,” and serious attempts have been made to understand and define the meaning⁶. There is a general consensus that QoL is a multidimensional concept and that the dimensions can be grouped under the broad headings of physical, functional, psychological, and social health (Figure 1)⁷. Important concepts such as

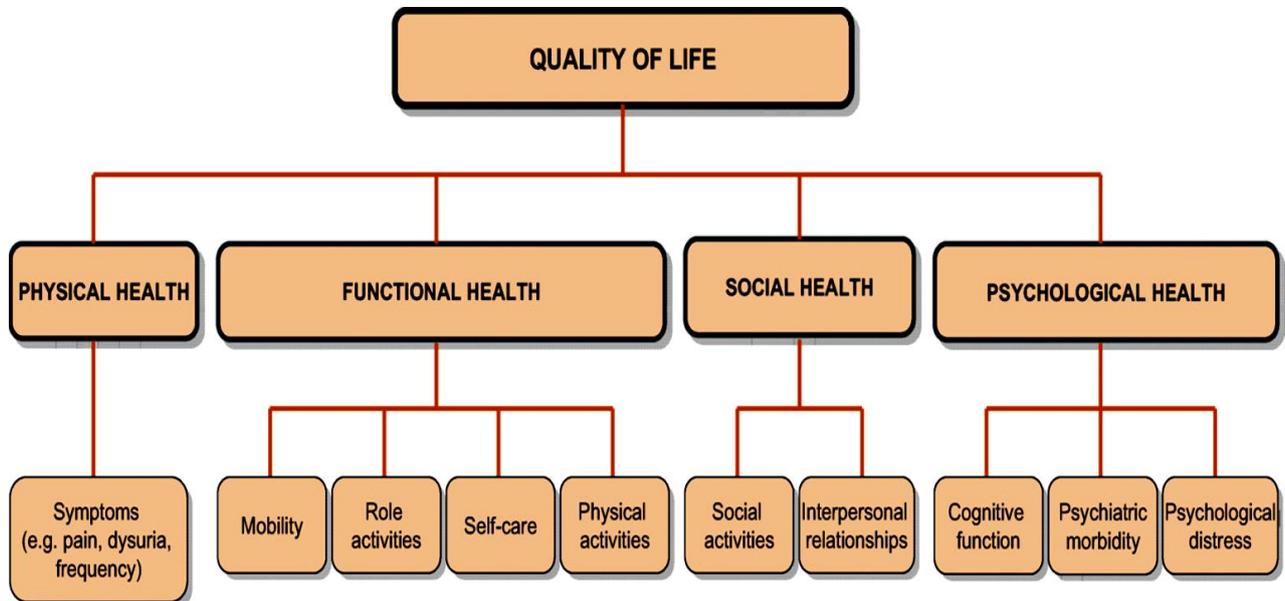
energy/vitality, pain, depression, and other cognitive functions are included within these broader headings.

The SF-36 is a 36-item, short-form version of a questionnaire recommended by WHO and is scored in eight subscales: i.e., physical functioning, role-physical, bodily pain, general health perceptions, energy/vitality, social functioning, role-emotional, and mental health. It is probably the most popular generic instrument to measure the mental health and general health components of QoL. Some studies use only one or more subscales of the SF-36 survey. The vitality subscale can be used to evaluate the energy level and fatigue. This subscale consists of four items, each rated on a six-point Likert scale. Two items are worded positively (“did you feel full of pep”; “Did you have a lot of energy”), and two items are worded negatively (“Did you feel worn out”; “Did you feel tired”). Scores range from 0–100, with higher scores reflecting less fatigue and more energy^{8,9}. The SF-36 instrument is ideally used in combination with disease-specific questionnaires¹⁰.

The consequences of insomnia are multidimensional affecting individual's health¹¹. The relationship between insomnia and health-related quality of life (HRQOL) is multifaceted and extensive, and the literature shows a correlation of experiencing insomnia and decreased the

quality of life^{12,13}. It is evident that insomnia frequently co-morbid with both physical and psychiatric disorders, especially depression^{12,14}. One of the greatest health risks associated with insomnia is the increased occurrence of industrial and vehicle accidents^{15,16}. The adverse effects associated with insomnia extend to decreased work

productivity and greater activity impairment. Studies among specific populations have shown an association between insomnia and decreased work productivity, increased absenteeism, and poorer job performance^{17,18}.



A study by Linton and Bryngelsson reports not only increased absenteeism but also decreased the ability to concentrate and make decisions¹⁹.

Disturbed sleep reduces the patient's vitality and concentration negatively affects his/her mood and ultimately impairs the patient's overall QoL. Sleep deprivation also increases the patient's risk of accidents at work, on the road and at home²⁰.

Furthermore, sleep deprivation has also been associated with reduced natural immune responses and cytokine levels in the blood, resulting in an increased risk of infections²¹.

Psychiatric disorders

Insomnia is a very common feature of psychiatric disorders²². Prevalence rates of insomnia are greatly increased among persons with psychiatric illnesses. A European epidemiologic sample of 1,536 people found that significant insomnia was present in 71 percent, 69 percent, 61 percent, and 32 percent of those with dementia, depressive disorders, anxiety disorders, and alcoholism, respectively²³. Furthermore, on the basis of epidemiologic studies, up to 40 percent of adults in the general population with insomnia have a diagnosable psychiatric disorder²⁴. Associations between insomnia and psychiatric disorders, particularly depression, are even higher in clinical samples. Approximately three-quarters of patients with insomnia attending to sleep

clinics or primary medical clinics meet diagnostic criteria for psychiatric disorders²⁵. Conclusively, insomnia is more strongly associated with depression than it is with any other medical disorder in the primary care setting²⁶. Symptoms of anxiety and depression were also strongly associated among children with insomnia in a pediatric clinic sample^{27,28}.

Psychiatric patients present multiple and varied sleep symptoms on objective measures. Sleep EEG studies demonstrate significant decrements in sleep continuity, prolonged sleep latency, decreased sleep efficiency, and decreased total sleep across the night, in most groups of psychiatric patients compared with patients without psychiatric disorders the best studied co-morbid psychiatric condition of insomnia is depression. Objective measures demonstrate loss of slow-wave (stage 3 and 4) sleep, frequent nocturnal awakenings, and frequent arousals, all of which may lead to the perception of non-restorative sleep^{29,30}. Many of these symptoms are consistent with sleep maintenance problems. There is also evidence of disturbed rapid eye movement (REM) sleep architecture in mood disorders, with a reduced latency from sleep onset to REM sleep onset and an increased proportion of REM sleep³⁰. Also, insomnia associated with psychiatric conditions frequently lasts for the duration of the illness, and, more important, sleep symptoms have been found to persist despite remission of depression³¹.



Evidence also suggests that insomnia may lead to the development of depression and an associated risk for suicide in depression^{32,33} and resistance to cognitive-behavioral therapy³⁴. Finally, the strongest evidence for a causal relationship between insomnia and subsequent illness is in bipolar disorder, where sleep loss has been demonstrated to precipitate or exacerbate episodes of mania³³.

Medical disorders

Individuals with insomnia have higher rates of medical illnesses than those without sleep problem. Mellinger and colleagues determined that 53 percent of adults with serious insomnia had two or more health problems, compared with only 24 percent of those with no sleep difficulties²².

People with insomnia report more days of limited activity, more days in bed due to illness, greater health care costs, and a higher incidence of moderate-to-severe occupational role disability than people without insomnia³⁵. In addition, Ford and Kamerow's study found that patients with insomnia used general medical services more frequently, and higher rates of insomnia have been documented among primary care patients than in the general population^{24,36}. There is also evidence that greater severity of sleep disturbance is correlated with worse outcomes among patients who experience pain, further patients with pain, insomnia is correlated with the development of depression; the presence of both depression and insomnia contributes to highest pain severity^{37,38}.

Insomnia is also correlated with worse outcomes in a number of medical illnesses, including an increased risk of mortality among institutionalized elderly people, greater disability among stroke patients, and increased risk of mortality among patients with cardiovascular disease³⁹⁻⁴¹.

Effect of Insomnia on Work

In the occupational realm, absenteeism is among the primary concerns about the effects of insomnia on work. Insomniacs are more likely to request sick leave from work and are predicted to be absent about twice as often as those without sleep disorders^{17,42,43}. Leger, Massuel, and Metlaine (2006) found this to be true in a cross-sectional study of workers in which researchers paired an insomniac with a good sleeper to analyze any difference in work-related outcomes. Results from his study and those reported in other similar studies indicate that workers with insomnia more likely to be absent from work, but they are also at a higher risk for involvement

in work-related accidents, report low job satisfaction, and exhibit decreased levels of efficiency at work¹⁷. Doi and Minowa (2002) investigated daytime sleepiness among Japanese workers in an occupational setting and found that a lack of nocturnal sleep and irregular sleep-wake patterns were the primary predictors of excessive sleepiness during work. The researchers suggest a ban on overtime work hours as one solution to diminishing excessive daytime sleepiness on the job. Work-related effects of insomnia inevitably carry financial repercussions. When accounting for the financial losses incurred due to absenteeism, decreased productivity/efficiency, accidents, and corresponding healthcare costs, the monetary expense associated with the disorder is calculated to be between \$30 and \$35 billion per year. Researchers report that this estimate of direct, indirect and related costs of insomnia is actually conservative. Despite their social and economic weight, sleep disorders have been offered little attention from social scientists. One sociologist estimates that human beings spend roughly a third of their lives sleeping⁴⁴. Although this may be a liberal estimation more accurately reflecting what humans should be sleeping instead of what they actually are, social scientists have largely neglected this significant chunk of time in human life and thus a potentially significant social problem^{45,46}.

Effects of Work on Insomnia

Risk factors for insomnia are often categorized as "predisposing," "precipitating," or "perpetuating," with each classification indicating a different impact on the disorder at different times throughout its course⁴⁷. Predisposing factors reflect a heightened susceptibility to the disorder and are usually identified as hereditary, physiological or psychological. Precipitating factors are associated with triggering the onset of insomnia and perpetuating factors promote the continuation of the disorder, encumbering possible recovery⁴⁷. More often than not, work is considered a precipitating factor at best, and rarely is it regarded as a predisposing one. In the category of precipitating factors of insomnia, the most powerful factors appeared to be stress in the workplace and shift-work, while the less powerful factors were "change of employment and retirement". Stress on the job originates from sources such as "conflicts with a supervisor, interpersonal relationship difficulties, workload and financial strain"⁴⁸.

Links between Sleep and Learning

Of the current hypotheses on the function of sleep, one of the most exciting is that of sleep and its relationship to

learning, memory and brain plasticity⁴⁹. A substantial body of evidence now supports this “sleep-dependent memory processing” role of sleep¹⁵. Behavioral and associated neuroimaging studies describing the relationships between learning and sleep show that sleep after learning consolidates and enhances the learning process and memory. The neural basis for this appears to be a subsequent neural reorganization or plastic consolidation of memory during sleep. Studies have also demonstrated the essentiality for sleep before learning in preparing the brain for next-day memory formation/encoding. Although much is still to be learned, what is now clear is that sleep plays an important role in memory formation, with sleep before learning being required for initial memory encoding and sleep after learning necessary for memory consolidation¹⁵.

Occupational Stress

Occupational stress has become one of the most serious health issues in the modern world (Lu et al., 2003), as it is reported to occur in any job and become prominent in the present era than decades ago.

Numerous studies have explored stress, primarily from the psychological, sociological, and medical perspective. From the business perspective, researchers dealt with the issue of occupational stress, as job/work causes a great deal of stress to contemporary employees⁵⁰. As well, there is a vast amount of research on individual differences involved in the work-stress process⁵¹. Occupational stress, in particular, is the inability to cope with the pressures in a job, because of a poor fit between someone’s abilities and his/her work requirements and conditions⁵². It is a mental and physical condition which affects an individual’s productivity, effectiveness, personal health and quality of work as well as quality of life⁵¹.

Main components of the work-stress process are potential sources of stress (stressors), factors of individual differences (moderators/ mediators), and consequences of stress (strain), as Figure 2 reveals. Stressors (job-related and extra-organizational) are objective events, stress is the subjective experience of the event, and strain is the poor response to stress. Accordingly, the nature and effects of stress might be best understood by saying that some environmental variables (stressors), when interpreted in a negative way by the individual (cognitive interpretation), may lead to stress⁵³.

Consequences of Occupational Stress

Stress produces a range of undesirable, expensive, and debilitating consequences, which affect both individuals

and organizations. In organizational setting, stress has become a major contributor to health and performance problems of individuals, and unwanted occurrences and costs for organizations⁵⁴.

Consequences of occupational stress can be grouped into those focusing individual and those at the organizational level. At the individual level, there are three main subgroups of stress.

- 1) *Unwanted feelings and behaviors* – such as job dissatisfaction, lower motivation, low employee morale, less organizational commitment, lowered overall quality of work life, absenteeism, lower productivity, poor quality of work, inability to make sound decisions sabotage and work stoppage, occupational burnout, alienation, and indulging into smoking and alcoholism.
- 2) *Physiological diseases (poor physical health)* – such as increased blood pressure and pulse rate, cardiovascular diseases, high cholesterol, high blood sugar, insomnia, headaches, infections, skin problems, suppressed the immune system, injuries, and fatigue.
- 3) *Psychological diseases (poor emotional and mental health)* – psychological distress, depression, anxiousness, passiveness/ aggressiveness, boredom, loss of self- confidence and self-esteem, loss of concentration, feelings of futility, impulsiveness and disregarding of social norms and values, dissatisfaction with job and life, and emotional fatigue.

Consequences of occupational stress, both on individual and organizational level add a burden to organizations. Because of its significant economic implications, stress is not only a huge burden but one of the fastest growing concerns to contemporary organizations, especially given the high levels of competition and environmental turbulence, which do not allow organizations to bear costs such as those caused by stress^{53,55}. However, costs which are a consequence of stress are hardly ever assessed or calculated either in human or financial terms. Despite the apparent need for measuring costs of stress, it seems that to date relatively limited number of organizations estimated those enormous indirect costs. Large employers that pay for the health care costs of their employees and retirees are as concerned about the indirect costs of insomnia as they are about the direct expenditures. Considering the impact of insomnia in the workplace, the indirect costs of major importance to employers are impaired job performance that might result in decreased productivity or a work product defect, and



injury to an employee or to other employees, particularly in the setting of a dangerous job.

Concern about the work-product defect or decreased productivity caused by untreated insomnia is a health concern. Insomnia has been estimated to cost the American workplace \$41 billion in lost productivity, which could be viewed as a 4 percent reduction in productivity for 42 million American workers. Reduced productivity is especially a concern in this era of increasing health care costs and foreign manufacturing competition. Data show that insomnia affects all facets of a worker's life and well-being. A recent National Sleep Foundation Poll showed that insomnia affects many

aspects of a worker's daily routine, resulting in such negative outcomes as loss of concentration, difficulty with decision making and problem solving, reduced ability to relate to coworkers, occupational accidents, absenteeism, substance abuse, psychological and physiological disorders, and motor vehicle accidents to and from work (NSF 2005). All of these untoward results of insomnia potentially have varying levels of effects on productivity, and they all affect an employee's well-being in a way that engenders concern for the employer⁵⁶.

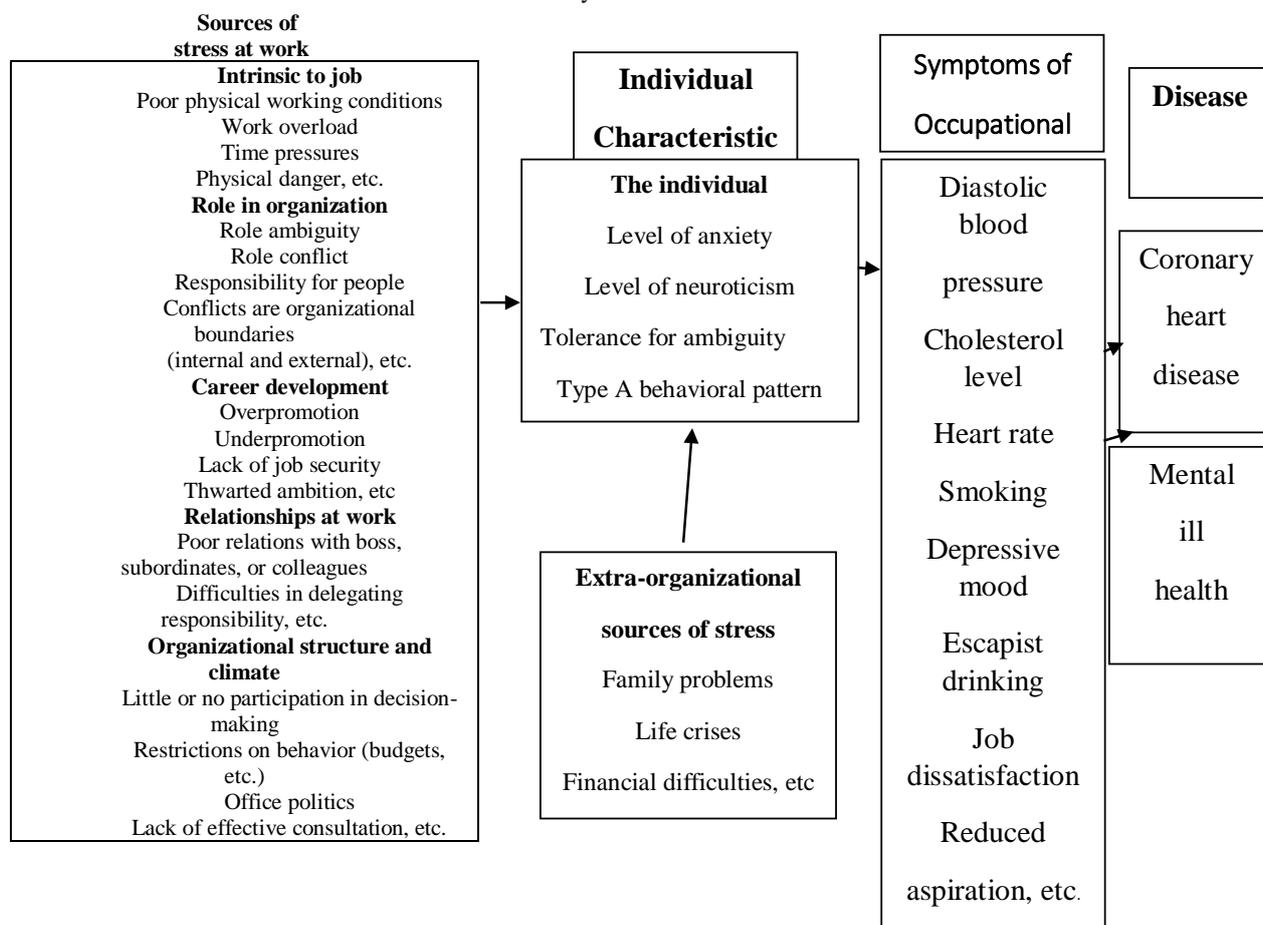


Figure 2: A model of stress at work, Cooper, C. L., Marshall, J. (1976), Occupational sources of stress: a review of the literature relating to coronary heart disease and mental ill health, Journal of occupational psychology, Vol. 49, No. 1, pp. 12

Depression in the workplace

The link between insomnia and other diseases, particularly depression, is as much a concern for employers as underlying insomnia itself. Depression has an impact on several elements of a worker's daily routine that ultimately affects the employer in the form of direct medical and pharmaceutical costs, increased disability and workers' compensation costs, absenteeism,

decreased productivity, and a negative impact on coworkers, family, and workplace culture⁵⁷. Depression is such a major concern that many employers have disease management (DM) programs in place that focus on depression through various mechanisms, such as pharmacy benefit management providers or their human resources departments. However, these DM programs do not focus on insomnia and its relation to depression and

are not as robust as programs that focus on managing other chronic diseases, such as diabetes.

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