



REVIEW ARTICLE



The Pain of sleep loss and Cognitive neuroscience: descriptive review

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Abstract

Background

Sleep Loss increase sensitivity and hence increases the experience of pain. Tension of Sleep loss is also painful. One of the reason of sleep loss on pain shows the association between sleep and pain.

Material and Method

Lot of statistical data is available on various arthertic webpage. Peer reviewed research papers and survey results has taken into account. Tedfalk and webinar discussion are important for searching guidelines. Workshop and symposium published papers are also part of the discussion we have taken book chapters as a working guideline

Result

The sleep loss and pain, in language of mathematics, not function but functional.

Revision

We have two different types of studies results are available

1. In hospital and laboratory, results of patients test and its analysis.
2. On paper or online serve results many researchers try hard to analogize successfully.

Conclusion

There is strong function relation between loss of sleep and pain brain mechanism also proved in laboratory fram and patient's serves and opinions. Medication, physiotherapy can give result but it varies from person to person.

The pain of sleep loss, psychotherapy, physiotherapy, functional

Keywords: The pain of sleep loss, psychotherapy, physiotherapy, functional

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1 | INTRODUCTION

I am uncomfortable because, “lack of sleep”. This is common statement what we heard in routine life. Are you experiencing pain? Study indicates underlying brain and behavioral mechanism explaining this common co-occurrence (1)

It is not clear that, it changes night to night or day to day for individuals whether or not. Research shows acute sleep deprivation amplifies pain reactivity.

A clinically apparent phenotype of prodromal neurodegenerative disease comprises the rapid-eye-movement (REMI Sleep Behavior disorder (RBD). (2, 3)

The physical activity like house work gardening, sports occupation, physical workout, leisure etc. are important factor for the quantities assessment of motor function and sleep pahern. Should be some association with stress level with work function.

Sleep is an essential to survival as food and water. It is Important to a number of brain function. Our body and brain stay active while we sleep.

Nerve cells (neuron) communication with each other while we sleep. Sleep is like housekeeping role. That remove toxins in our brain. It affects all types of system in our body (4)poor quality of sleep causes disorder as shown in Table ??

We all dream but most of the drams we do not remember at any stage of sleep. One many dram but most vivid in REM (4)

Sleep Neurology

The Entire sleep neurology is not known but several structure in brain plays important role in sleep.

1. Hypothalamus: A peanut size brain part inside the brain, it affects sleep arousal and emotions. Suprachina smutic and nucleus (SCN) receives information about light from the eyes and hence control sleep. Most blind people have some ability to sense light.

2. The Thalamus: It is acts as realy, thalamus become quite during sleep but during REM sleep, the thalamus is active.

3. Cerebral Cortex: Interpret and processes short term to long term memory .External word’s informa-

tion could be process by it.

4. The Brain stem : It is base of the brain which communicates with hypothalamus

5. The Pineal Glad: It is between brain’s two hemispheres. SCM Signals to increase the production of harmonies melatonin. Which help us to sleep when light go down.

6. The basal fore brain: It is near front and bottom of the brain which enhance the sleep. It release of adenosine.

7. The part amygdala: It is the almond shaped part of brain. It becomes increasingly active during REM sleep.

8. The Somatosensory cortex. It is the region of the brain which is responsible for receiving and processing sensory information from across the body such as pain.

2 | DISCUSSION

The sleep loss, itself is painful and sleep loss amplifies the experience of pain. In sort, sleep deprivation is caused by consistent lack of sleep or reduction in quality of sleep .Sleep deprivation lives your brain exhausted and it cannot perform its function well .A loss of sleep can also trigger mania in patient of bipolar disorder. Selective sleep deprivation increase pain (5) . It also lower of pain threshold (6) . Though the pain perception is unknown due to impact of sleep loss (1) .

Neuroimaging studies in case of loss of sleep have established a pattern of MRI activity in regions responsive to pain (7, 8) . Appropriate cortical estimation of pain in brain is not limited to respresentation with in primary somatosensory strip but involves

Supplementary information The online version of this article ([10.52845/IJMHS/2021-11-4-11](https://doi.org/10.52845/IJMHS/2021-11-4-11)) contains supplementary material, which is available to authorized users.

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further lighter order cortical evolution. Within region of insula and cingula. There is a change in pain threshold caused by sleep deprivation detected by pain –related brain activity.

Current model as pain as a homeostatic emotion which creates viscerosensory and viscerosensory chemical changes in body state.

Finally a decline in sleep go quality and sleep quality is associated with multifold increase in risk of devel-oping a pain condition.

3 | CONCLUSION

Pain Associated with sleep can be divided into three part (A) Pain due to lack of sleep in this case pain and its types are as shown Figure 1 chart-1 and important points normal sleep hours are as shown in Figure 2 graph-1

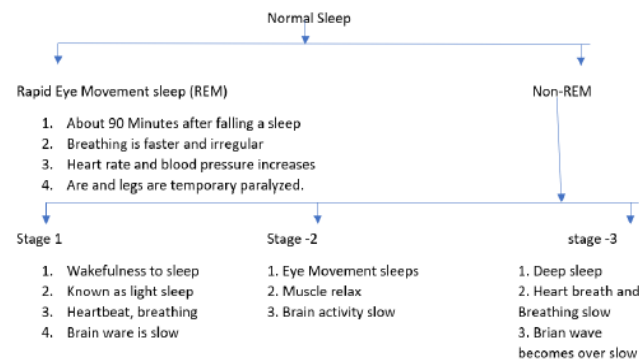


FIGURE 1: SleepStage: Each is related to specific brain waves and neuronal acvity

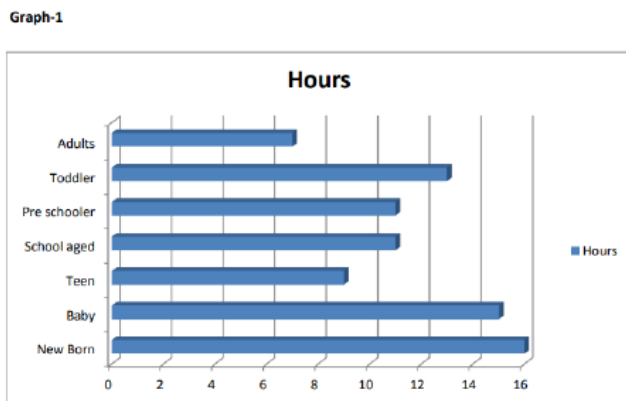


FIGURE 2: Importantpoints normal sleep hours

(B) Lack of sleep cases more severe than existing pain. Its threshold is also decrease as sleep pattern.

(C) Lack of sleep several adverse effect as shown inTable 1 .This adverse effects are painful Relation between pain and lack of sleep is function and relation is bilateral. They depends on each other and hence than what is anticipated.

Sr no.	Good sleep or Sufficient sleep	Poor sleep or Insufficient sleep
1	Control the weight gain	Increase weight and obesity in both children and adults
2	Eat fewer calories	To poor appetite regulation
3	Improve mental health and concentration and control emotions	Impair brain function
4	Improve physical function (athletic function)	Physical function is negatively
5	Greater risk of heart disease and stroke decreases risk of heart diseases and stroke	Greater risk of heart disease and stroke
6	Good metabolism	Poor metabolism
7	Good mental health	Causes depression
8	Strong immune function	Decrease immune function Increases Infirmation

TABLE 1: Lackof sleep several adverse effect

IMPORTANT POINT

1. Lack of sleep may end up experiencing micro sleep during which one will fall asleep for moments without realizing it. It is extremely dangerous if you are driving, operation heavy machinery.
2. Certain cytokines help one to sleep. While one sleep, his/her immune system produces protective substance like cytokines. Once break in chain it will be continue to harm one’s immune system and sleep.
3. Especially in children and adolescents sleep interruption can effect hormone production. It can effect adversely to endocrine system.
4. Breathing disorder is known as OSA (Obstructive sleep apnea) can lower sleep quality and sleep deprivation makes vulnerable to respite infection (common cold or flu or interapted breathing)
5. Sleep deprivation is common in modern life style. A new stay has found that 10 days of deprivation .7 day recovery is not enough to recover .(Nancy Schimepleting 1 Sep .2021)
6. It has long term neurobehavioral effect like depressed mood.

REFERENCES

1. Schripf M, Liegl G, Boeckle, Leitner A, Geisler P, Piech C;.
2. Jenny Nisser, Steffen Derlien, peter Bublak, Mathias Schwab, Otto w. wite, karl kesper-Torten Schultze, sven Rupperecht. Systematic quantitative assessment of motor function in clinically isolated REM sleep behavior disorders. A diagnostic window into early alpha-synucleinopathies. *Journal of sleep research* 30 August 2011/doi.org/10.1111/jsr13-459;.
3. ; 2010.
4. The pain of sleep loss: A brain characterization in humans. *Journal of Neuroscience*. 2300;.
5. Lents MJ Landis CA ,Rothermel J Shaver JL Effects of Selective Slow-wave sleep disruption on musculoskeletal pain and fatigue in middle aged women 26, 1586-1992 *J Rheumatol* 1999;.
6. Krause AJ, Prather A, Wager TD, Lindquist M, Walker M;.
7. Brown JE, Chatterjee N., Younger J Mackey s. Toward Physiology –based measure of pain: patterns of human brain activity distinguish painful from non-painful thermal stimulation *PLOS ONE* 13 sept 2011;.
8. Wager TD Atlas LY, Lindquist M Roy M, Woo W, Kross EA fMRI based Neurological signature of physical pain .*The New England Journal of Medicine* April 11.2013, *N Eng. / J. Med* .2013, 368:1388-97;.

How to cite this article: Yagnik K. **The Pain of sleep loss and Cognitive neuroscience: descriptive review** . *Innovative Journal of Medical and Health Science*. 2021;1880–1882. <https://doi.org/10.52845/IJMHS/2021-11-4-11>
