THE EFFECTS OF SLEEP DEPRIVATION ON DECISIONAL CAPACITY IN THE PROFESSIONAL DOMAIN

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Abstract: Sleeping is the result of complex phenomena with two elements: a passive one and an active one. The passive element is a result of the interruption of the wakeful state due to the process of progressive tiredness of the permanently used neurons, which determines the decrease of their excitability, and as a consequence of sensorial flux of the cortex. The active element is based on a series of nervous formations which are in charge with maintaining as well as inducing sleeping.
Sleep deprivation represents the period in which a person cannot sleep constantly. The absence of a deep and good sleep is most probably, the biggest ignored cause when dealing with different behavioral changes.

Key words: sleep deprivation, decisional capacity, the clinic effects of sleep

Introduction

Sleeping is defined as a reversible physiological state, which has as characteristics the behavioral inactivity as well as the somatomotor inactivity, the abolition of consciousness, the diminution of reactivity to stimuli and the metabolism decrease. (Vintilă, 2007)

Sleep and dreams are neuropsychophysiological normal manifestations of each and every person. (Enăchescu, 1996). The comparative analysis of the two states, sleep and wakefulness, showed that they are opposed. Hence, during the wakeful state, the electric activity of the cortex, measured with the

electroencephalogram, presents frequent and small amplitude rhythms, whereas during sleep, the recorded rhythms are low and with a higher amplitude. There is an exception during deep sleeping, when the rhythms are relatively alike.

The wakeful state represents the cerebral functional state which is characterized by the increase of the RAAS tonus, simultaneous with the orientation of consciousness towards a certain activity. The wakefulness starts with the establishment of the conscious contact with the environment or with the self-thoughts and it ends when this connection stops. The alternative of the wakeful state is the sleep. The commutation from wakefulness to sleep and vice versa occurs through the stimulation or, on the contrary, the inhibition of RAAS.

Sleep represents a state of cerebral activity that is characterized by the temporary interruption of the conscious contact with our inner side as well as with the outside world. Sleep has a reversible character. The transitions from wakefulness to sleep is realized very easily, in few seconds.

The sleep – wakefulness rhythm (partially) overlaps over the night-day cycle; therefore, it is also called circadian or nictemeral rhythm.

The circadian biorhythm was formed throughout the phylogenetic history of species. It has endogenous mechanisms of production but it is strongly influenced by the exogenous stimuli. Depending on the adaptation to the environment, the coincidence sleep – night, consequently wakefulness – day time is inverted in some species (bugs, some birds and mammals).

A very important role in adjusting this biorhythm is played by the diencephalon and the brainstem reticular formation. Lesions of the hypothalamus or the interruption of the reticulo-cortical system determines continuous sleep (the sleep disease).

The duration of sleep varies upon age:

- 20 hours for new-born babies;
- 10 hours for young people;
- 7 hours for elderly people.

Usually during sleep, there is a diminution of both the vegetative functions (respiration, circulation, digestion) as well as the metabolic functions (the energogenesis and the oxygen consumption decrease). Thus, the respiration frequency and the ventilation debit decrease. On the other hand, bradycardia occurs and the there is a reduction of the cardiac debit and the blood pressure. The urinary system function is reduced and the secretory and motor activity of the digestive tube is diminished, it even ceases. During sleep, there also few somatic modifications: the muscular tonus is reduced, and the locomotor activity stops. (Vintilă, 2007)

Sleeping is the result of complex phenomena with two elements: a passive one and an active one. The passive element is a result of the

interruption of the wakeful state due to the process of progressive tiredness of the permanently used neurons, which determines the decrease of their excitability, and as a consequence of sensorial flux of the cortex. The active element is based on a series of nervous formations which are in charge with maintaining as well as inducing sleeping. Vintilă describes two behavioral types of sleeping: the slow sleep and the paradoxical one. (Vintilă, 2007)

Although there are considerable inter-individual variations concerning the necessary duration of sleep, humans usually need approximately 8 hours of sleep. That means that we spend a third of our life sleeping.

However, sleeping is not a passive state of unconsciousness. It is a dynamic process of the brain which is the result of two independent mechanisms: the circadian rhythm and the homeostatic induction of sleep.

The circadian rhythm originates in the suprachiasmatic nucleus of the anterior hypothalamus – the biological watch. It is set by the light – the tendency is to sleep in the dark, the decrease of body temperature, hormones – cortisol, prolactin, human growth hormones, TSH, melatonin.

The homeostatic evolution towards sleeping is determined by the anterior quantity of sleeping and by the state of awakening. Reducing or increasing the time for sleep may alter this homeostasis.

Sleep deprivation leads to both the increase of cortisol level, of thyroid activity, of catecholamine turnover, as well as to irritation, lack of attention, cognitive abilities and performance. Risks compared to those determined by alcohol consumption appear.

The clinic effects of sleep fragmentation versus sleep deprivation: the phases of rapid movements sleep and of slow waves sleep are lost. (Bonnet, Arand, 2003, apud Tudose, 2011). The balance between the independent nervous system and sleep is favored by the decrease of the activity of the sympathetic system as well as by the increase of the parasympathetic system's activity. The sympathetic activity appears in anxiety, coffee, alcohol and nicotine consumption, during stressful periods, which leads to the increase of cortisol and adrenocorticotropic hormones. All of these extend the waking state, and inhibit the recovery sleep with slow waves. Spontaneous waking is associated with the increase of the level of adrenocorticotropic hormones. (Tudose, 2011)

Sleep deprivation represents the period in which a person cannot sleep constantly. The absence of a deep and good sleep is most probably, the biggest ignored cause when dealing with different behavioral changes.

The absence of a good sleep may also generate emotional changes. Anxiety is one of the possibilities. "Usually, people become anxious because they cannot sleep, or they cannot sleep well because they are anxious", says Dr. Fabiny. "Both situations have the same result". Every individual needs to sleep,

but this necessary varies depending on age, health condition, as well as on other factors. When a person does not have an appropriate level of vigilance, performance and health condition, one of the causes could be insufficient sleep.

Few hours of sleep during the night time or a bad sleep could have serious effects on human body. There could be different causes, such as:

A chaotic schedule:

We all have a biological watch that informs us when we are tired and helps us synchronize the thousands of body cells with the circadian rhythm (cycle of approximately 24 hours of biochemical, physiological and behavioral processes, belonging to living entities).

The main factor of synchronization is the light. The eyes react to light and darkness, even when closed. The day light determines the brain to reduce the production of melatonin, the sleep hormone. The body becomes more alert and the waking sensation appears.

In case there is not enough sleeping during the night, there is a high possibility that either "deep sleeping" stage or a representative part of the next stage – REM (rapid eye movement), that phase of sleeping when we dream the most, do not emerge.

Stimulators – coffee, alcohol, food

Caffeine is a stimulant that may remain in the body for many hours. Drinks that are rich in caffeine retain us from falling asleep fast and may lead to many hours of superficial sleeping, in the detriment of profound sleep.

Alcohol usually makes us snore, therefore we experience difficulties while breathing and we are tensed. Although initially alcohol helps us sleep faster, when in big quantities, it affects our sleep. A big quantity of alcohol before going to bed leads straight to profound sleeping, consequently missing the first phase of sleeping cycle.

As the alcohol leaves our body, we enter the REM stage, from which we can wake up easier.

During one night we usually have six or seven cycles of REM sleeping, which gives us the sensation of being fresh. But after a drinking night, we only have one or two cycles, and as a result we wake up exhausted.

Certain types of fat or spicy food may cause heartburns, which prevent us from falling asleep and cause discomfort during the night. Certain food items which contain a chemical substance called tyramine (e.g. bacon, cheese, walnuts or red wine) could keep us awake at night, due to the fact that they generate the production of noradrenaline, a brain stimulus.

The carbohydrates, such as bread or pasta, have the opposite effect. They facilitate the production of serotonin, which makes us sleepy.

Inadequate temperature

Body's temperature decreases while we sleep. It is controlled by the biological watch, which starts dilating the blood vessels of our hands, feet and face, in order to lose heat, as it feels that we should sleep.

However, if the room in which we sleep is too hot, the body cannot lose heat, and as a consequence, we become tensed. The body temperature must be only half degree lower compared to the temperature of the body during the day. We are tensed when we are cold.

A busy mind

Stress is the enemy of sleep. In bed, our mind feels free to "fly" and when we are nervous thinking we won't get enough sleep, we become even more stressed. When in this state, people tend to lose track of time. It is possible to snooze and wake up feeling you didn't sleep at all. This has as result a fragmented sleep and less hours of deep sleeping.

Sleep experts recommend that we get out of bed and undertake an activity that can distract as from worrying – for example a puzzle – before trying to fall asleep again.

According to the specialists, a natural resting cycle correlated with periods of physical activity influences all the biological functions of human body. When the biological rhythm is disrupted, metabolic, hormonal, and blood pressure disorders appear.

The main effects of sleep deprivation are:

Thinking process slowdown. Scientists who analyzed lack of sleep, discovered that this leads to the deficit of attention and concentration, and the harder it is to focus and pay attention to a certain activity, the more confuse you feel. All these affect the capacity of fulfilling tasks that involve logic and complex thinking.

Also, people who do not sleep enough could experience difficulties in making decisions, because it is harder for them to evaluate the situation and to choose accordingly the suitable behavior.

Memory impairment. The lack of sleep determines a slowdown of brain neurotransmitters' activity, which associates with concentration and memory difficulties. Memory is based on a series of nervous connections, which are formed and reinforced during sleeping. Sleep is involved in the memory cognitive processes, therefore, when we wake up, we manage to better understand the information accumulated before sleeping.

Moreover, during sleeping, the useless information is deleted, and the important one is better stored, resulting the long term memory. "Sleeping makes the experiences and information accumulated during the day to be stored in the short-time memory", dr. Avelino Verceles, Assistant Professor at the Medical Collage of Maryland University,

explains.

Longer time of reaction. Insufficient sleep leads in time to chronic tiredness throughout the entire day, lack of concentration and decrease of reaction ability. Researchers demonstrated that insufficient and poor sleep increases the reaction time, and a person that doesn't sleep starts losing the self-control and is less attentive.

Affecting the state of mind. Sleep deprivation may cause frustration, anger, and may diminish the ability of managing stress. The tired persons are more likely to cause incidents and to create conflicts. Furthermore, they may experience difficulties at work, as they have a low and inefficient performance.

Depression. A study conducted in 2005 by the University of North Texas researchers showed that the people who suffer of insomnia are with 10% more susceptible to develop a form of depression and 17 times more predisposed to anxiety, in comparison to the people who have a healthy sleep.

Sleep deprivation and depression are so connected that specialists can never say which one appeared first. "Sleeping and the state of mind are influencing each other", says Professor Verceles. "It is not unusual that people who do not sleep enough to suffer from depression, neither for the persons suffering from depression to not have enough sleep".

High blood pressure. Several studies have shown that sleep deprivation (even the lack of half sleep night) leads to a high blood pressure. During sleep, the heart rests and slows its activity on a significant period of time. Diminishing the sleep period means that the heart must work more. Moreover, sleep deprivation may stop the brain's ability of controlling stress hormones production, which leads to high blood pressure

Increased appetite. Research indicate that severe sleep loss activates that part of the brain that triggers the pleasure of eating.

High risk of cardiac morbidity. There is a series of factors that may lead to a high risk of heart attack, and sleep deprivation is one of them. The healthy people who experienced sleep deficiency presented a high level of inflammation associated with the development of cardiovascular diseases.

Weight fluctuations. Sleep deficiency may also be the cause of obesity. According to some studies, people who sleep less than six hours per night are more likely to be overweight. When our body is forced to stay awake, it experiences difficulties in processing the blood sugar and leptin (the protein that regulates the appetite and metabolism). Over time, bad sleeping can cause type 2 diabetes and overweight, as a

consequence of the body's low capacity of processing sugar and suppressing high appetite.

A weak immune system. The lack of sleep has been associated with the weakening of the immune system. In order to strengthen the immune system, it is recommended a sleep of minimum seven hours per night and healthy meals. Consequently, our body becomes stronger when facing diseases.

In the long term, the clinical consequences of sleep deprivation, unmanaged on time, are numerous and can endanger our life. They are associated with a high number of medical disorders, such as:

- High blood pressure;
- Heart attack;
- Heart failure;
- Stroke;
- Obesity;
- Psychiatric disorders (depression, behavior disorders, etc.)

Objectives

The purpose of this study was to identify the impact of working hours on the ability of making decisions, in case of sleep deprivation during night time. Moreover, we wanted to identify the main consequences of sleep deprivation on our body, on long term as well as on short term.

The lack of sleep considerably influences the aging process; the persons who sleep less than six hours per night are more likely to suffer from viral infections, stroke or heart failure, in a percentage up to 50%.

Without sleep, the body becomes vulnerable, weak, and the immune system is weakened, hence increasing the risk of cardiovascular diseases and slow brain activity.

Hypothesis

1. It is presumed that there are significant differences between the reaction time in choosing the option and the gender variable.
2. It is presumed that there are significant differences between reaction time, decisional capacity between the 3 categories of groups (day schedule, afternoon schedule and night schedule).

Lot of participants

In our study, we investigated three groups of people, enrolled in three working schedules:

-Day schedule: 100 persons, 57 men and 43 women between 18 and 35 years old;

-Afternoon schedule: 100 persons, 60 men and 40 women between 21 and 35 years old;

-Night schedule: 100 persons, 59 men and 41 women between 19 and 32 years old.

Methods/instruments

In order to collect the data concerning the reaction time to different actions and the capacity of making decisions, we applied two tests (Miclea,M., 2009):

The ability of processing information – the speed of reactions. The term "reaction time" (RT) means, broadly, the minimum time that elapses between presenting a stimulus and the answer given by the subject.

The reaction time is one of the most used independent variables in experimental psychology, ever since the beginning. The term is used both for indicating the time that the subject needs in order to respond in a specific task, as well as for the experimental procedure itself. There are more procedural alternatives of the reaction time:

- The simple reaction time
- The associative reaction time
- The discriminative reaction time
- The decisional reaction time
- The memory reaction time, etc.

A *high score* to the RT tests suggests that the person has a high level of intelligence, and in the same time, he / she has high indicators of other abilities, such as spatial, verbal, logical-mathematic, etc. Therefore, this result recommends the person for professions in which superior performance depends on the speed of processing information, and thus, on giving the right answer. A **low** score to the RT tests emphasizes low levels of the IQ, as well as of other cognitive abilities (spatial, verbal, logical-mathematic); as a consequence, the result contraindicates the person for professions in which the performance depends on high values of such abilities.

*The decisional capacity – Evaluation test of decisional capacity***.** The objective of this task is the evaluation of the decider's rationality. This means a sensitivity reduced to the decisional cognitive bias, emphasized by the empirical research that approached the problematic of the limited rationality of the human decider. The tests comprises 14 items describing decisional situations and presents the alternatives that the subjects have, as situations with options to choose from.

Results and discussions

1. *It is presumed that there are significant differences between the reaction time in choosing the option and the gender variable.*

Group Statistics					
	Gen	N	Mean	Std. Deviation	Std. Error Mean
Reaction Time in choosing	Feminine	124	3.48	1.005	.201
	Masculine	176	2.67	.994	.182

By analyzing the t Test for independent samples, we notice that there are significant differences between the reaction time in choosing and the gender variable, at a significance level of p=0.004, for which we have obtained t=3.006, representing the fact that women manifest a higher level of reaction time, compared to men. The average for the analyzed sample of the reaction time in choosing is 3.48 for women, and 2.67 for men. Although it is commonly believed that men and women are equal from all points of view, it appears that there are few differences between sexes. Women are more capable of accomplishing more tasks at the same time and manifest a higher level of the reaction time in choosing, compared to men, because women are encountering more situations that involve choosing what is best, either for themselves, family, career or simplest decisions. Being gifted by the family, women manifest a higher level of the reaction time in choosing, compared to men, they are in control of the situations, women know exactly what are the tasks they are given and how to get them done. Furthermore, women are very receptive when it comes to accomplishing more tasks simultaneously.

2. *It is presumed that there are significant differences between RT, decisional capacity between the 3 categories of groups (day schedule, afternoon schedule and night schedule).*

The ANOVA analysis reveals the following data:

- There is at least one difference between the employees working schedule and the simple reaction time, because F=4.698, statistically significant on a level p=0.013.
- There is at least one difference between the employees working schedule and the reaction time in accessing memory, because F=8.142, statistically significant on a level p=0.011.
- There is at least one difference between the employees working schedule and the decisional capacity, because F=5.624,

statistically significant on a level p=0.006.

In order to see in which group of the working schedule there are significant differences, we calculate the post-hoc comparisons.

Multiple Comparisons Tukey HSD

Dependent Variable	(I)Working schedule	(J)Working schedule	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Simple reaction time	Morning 10:00-18:00	Dupa-amiaza; 16:00-00:00	.436	.384	.496	-.49	1.36
		Noaptea; 22:00-06:00	.919*	.300	.010	.20	1.64
	Night 22:00-06:00	Dimineata; 10:00-18:00	-.919*	.300	.010	-1.64	-.20
		Dupa-amiaza; 16:00-00:00	-.483	.381	.420	-1.40	.44
Reaction time in accessing memory	Morning; 10:00-18:00	Dupa-amiaza; 16:00-00:00	.136	.365	.926	-.74	1.02
		Noaptea; 22:00-06:00	1.093*	.285	.001	.40	1.78
	Afternoon 16:00-00:00	Dimineata; 10:00-18:00	-.136	.365	.926	-1.02	.74
		Noaptea; 22:00-06:00	.957*	.362	.029	.08	1.83
	Night; 22:00-06:00	Dimineata; 10:00-18:00	-1.093*	.285	.001	-1.78	-.40
		Dupa-amiaza; 16:00-00:00	-.957*	.362	.029	-1.83	-.08
Decisional capacity	Morning; 10:00-18:00	Dupa-amiaza; 16:00-00:00	.109	.392	.958	-.84	1.06
		Noaptea; 22:00-06:00	.974*	.307	.007	.23	1.71
	Night; 22:00-06:00	Dimineata; 10:00-18:00	-.974*	.307	.007	-1.71	-.23
		Dupa-amiaza; 16:00-00:00	-.865	.390	.077	-1.81	.08

*. The mean difference is significant at the 0.05 level.

Analyzing the table of comparisons, we notice that there are significant differences concerning the working schedule between the morning shift group

and the night shift group, for the simple reaction time variable. Hence, we obtained the average of the differences 0.0919, statistically significant on a significant level p=0.010.

The lack of night sleep affects the body's health. The reaction time of a person who didn't sleep is the same as of a person with 0.08 blood alcohol concentration (high enough to get convicted for driving under the influence). The high reaction time involves a delay in reaction, in making decisions and in the capacity of making decisions. The fatigue reduces the power of concentration and negatively influences physical and intellectual efficiency.

The individuals in the study, those who work night shifts have a low ability of reaction speed as well as of attention, due to the fact that there is a delay in their activity, they respond reluctantly to commands, they experience problems in focusing on the quality of services and they are confused when it comes to completing tasks.

*There are significant differences concerning the working schedule between the morning shift group and the night shift group, for the reaction time in accessing memory. Hence, we obtained the average of the differences 1.093, statistically significant on a significant level of p=0.001***.** The lack of sleep leads to a slowdown of brain neurotransmitters' activity, which can be associated with concentration and memory disorders. Memory is based on a series of nervous connections, which regenerate and consolidate during sleep. Sleeping is involved in cognitive processes of memory and therefore, when we wake up, we are able to better understand the information we had accumulated before going to sleep. Furthermore, during sleeping, the useless information is deleted, and the important is better stored, as the long-term memory develops.

The persons who work night shifts experience trouble in focusing and memorizing, often forgetting the received tasks and their proper completion.

There are significant differences concerning the working schedule between the morning shift group and the night shift group, for the Decisional capacity variable. Hence, we obtained the average of the differences 0.974, statistically significant on a significant level of p=0.007.

The insufficient sleep has a very strong impact on the decisional process. Sleep deprivation leads to the increase of cortisol level, of thyroid activity, of catecholamine turn-over and of increase of irritability, as well as to the decrease of attention, cognitive abilities and efficiency. Due to fatigue, there is a tendency of making the wrong, risky and fast decisions, without considering the advantages and disadvantages of certain situations.

The lack of night sleep draws nervousness, lack of efficiency at work, weakness of the body and minimizes productivity, and the decisions are not entirely coherent.

People who work night shifts experience difficulties in decisional capacity, are

not able to make fast decisions, cannot focus enough on their tasks and are liable for making the wrong decisions. They evaluate incorrectly their duties and often make mistakes in completing their tasks and in the quality of the services they offer.

Conclusions

By comparing and analyzing the data, the result indicates that there are significant differences between the day schedule and the night schedule, and that sleep deprivation leads to behavioral changes, slowdown of thinking process, memory disorder, increase of reaction time, affects the state of mind, leads to depression, high blood pressure, and risk of cardio morbidity.

The analyzed comparisons revealed *significant differences concerning the speed of reactions and the reaction time in various situations and the gender variable,* showing that women manifest a higher level of reaction, in comparison to men. This phenomenon is caused by the fact that the modern woman has known a continuous and welcomed change throughout time, being strongly motivated by her previous inferior status, hence successfully managing, with noticeable efforts, to overcome men's specific performance and mentality, harmoniously incorporating the masculine type of culture between their values and being at the edge of producing real revelations both cultural and political, as well as social, in the near future.

Research has shown that men use almost seven times more grey matter compared to women, whereas women use nine times more white matter, compared to men.

The two hemispheres of the woman's brain are more efficiently and strongly connected, compared to men's, which explains why women are better at multitasking, while men are generally focusing on a single thing, at a certain time.

Furthermore, there are significant differences between the day shift and the night shift. The individuals who work day shift have the night free, they can rest and can do their job the next day without any problems. But those who work night shifts, skip the most important hours of sleep, and when there is not enough sleep during the night, it is highly possible not to reach the level of "profound sleep" or sufficient sleep from the following stage – REM (rapid eye movement), sleep phase when we dream the most.

The lack of sleep leads to a slowdown of the brain neurotransmitters, which can be associated with concentration difficulties and low speed of reactions, meaning that the affected person hardly responds to commands.

Insufficient sleep has a strong impact on the decisional process. Sleep deprivation leads to the increase of cortisol level, and to the increase of irritability, as well as to the decrease of attention, cognitive abilities and

efficiency.

Due to fatigue, there is a tendency of making wrong, risky and short-term decisions, without considering the advantages and disadvantages of certain situations.

The lack of nocturne sleep draws nervousness, lack of efficiency at work, weakness of the body and minimizes productivity, and the decisions are not entirely coherent.

People who work night shifts experience difficulties in decisional capacity, are not able to make fast decisions, cannot focus enough on their tasks and are liable for making the wrong decisions. They evaluate incorrectly their duties and often make mistakes in completing their tasks and in the quality of the services they offer.

The analysis of the results of the four general hypothesis shows that the night schedule affects the person's decisional capacity, limits the optimal hours of rest, and sleep deprivation leads to the decrease of attention and focusing abilities, and the harder it is to focus and pay attention to a certain activity, the more confusing it gets. All these affect the ability of completing tasks that involve logic and complex thinking.

Sleep deprivation leads to a slowdown of the brain neurotransmitters, which can be associated with concentration and memory. Sleep is related to the cognitive processes of memory, and therefore, when we wake up, we are able to understand better the information that we had accumulated before going to sleep. Likewise, the lack of sleep can draw irritability, anger and can decrease the ability of coping with stress. The tired individuals are more likely to cause incidents and create conflicts.

Once circadian rhythm dysfunctionality appears, such as during shifts, the night shift, disorientation, and fatigue along with the need of sleep appear. Either insomnia, or sleepiness, the excessive sleeping during the day or the extension of the sleeping time, with two up to five hours, appear.

In most of the cases, sleep disorders emerge, insomnia being very common. It represents the inability to sleep or to maintain the sleeping state during night time; patients suffering from insomnia supplement the night sleep with the day sleep; some forms of insomnia can allow sleeping during the night, but patients wake up much earlier than other people, as the morning sleep is not restful. For a healthy sleep, it is recommended a hygiene of sleep, as well as several rules, such as:

Maintaining a regular sleeping schedule, respecting a constant interval of sleeping, going to bed at the same time each evening, waking up at the same time, every day. This regular rhythm gives the body the base on which it can built a good sleep.

The circadian rhythm naturally adjusted, and a relaxing atmosphere

inside the bedroom. Inside the sleeping room, it should be silence, fresh air, approximately 18 C degrees, comfortable bed. This represents a room entirely designated to relaxation. Before falling asleep, a relaxation ritual is recommended, like reading a book, listening to slow music or an audio book, or a hot bath.

A balanced diet and physical activity are also important for a good sleep. It is recommended that dinner should be served early and the consumption of fat products or spices must be avoided minimum two hours before sleep.

Exercising during the day is also very important, at least 20 – 30 minutes per day, which could be divided according to the individual tolerance in sessions of 5 – 10 minute of walking fast, gardening, and home activities. The physical effort should be made morning or lunch time, preferably not evening time, because exercising stimulates the body and increases the temperature.

Avoiding anxious situations and stress. The anxious, stressed, angry persons usually experience difficulties in falling asleep and frequently wake up during the night. This is a sign that stress and anxiety must be controlled. It is necessary that the reasons of being concerned are known. The relaxation techniques for sleep improvement could be beneficial for everyone, especially for the people suffering from sleeping disorders. Practicing certain relaxation techniques before sleep represents an excellent way of relaxing, calming the thoughts, and preparing for sleep.

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