



**TURUN AMMATTIKORKEAKOULU  
ÅBO YRKESHÖGSKOLA**

**Bachelors Thesis**

**EFFECTS OF IRREGULAR WAKE-  
SLEEP RHYTHM ON HEALTH,  
WELL-BEING AND SLEEP IN NIGHT  
SHIFT WORKERS**

**Kata Aaltonen**

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Author: Kata Aaltonen	
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<p>The research is about how irregular night shift work influence on sleeping an well being, and what kind of problems irregularity bring into one's life.</p> <p>The research was done in quantitative way as a questionnaire. Target group was chosen to be restaurant workers and the amount of answerers is small. The questionnaire consists mostly of closed questions but there is couple of open ones in the end.</p> <p>Literature review shows there are lots of sleeping problems related to shift work and especially irregularity. Questionnaire shows same things as literature, showing the same problems such as health- and mental issues. The biological side of the body restrains us and sleeping on day time is against the nature. There are also many disturbing things, such as noise and light. Bad quality of sleeping affects the mood and motivation. Night shift workers have more sleeping problems than average people, such as nightmares and sleep talking.</p> <p>Based on the results it can be said the questionnaire followed the line of the literature.</p>	
Keywords: shift work, day-wake rhythm, insomnia, problems in sleeping	
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## 1. Introduction

The name of the thesis is Effects of irregular wake-sleep rhythm on health, well-being and sleep in night shift workers. It is little bit unusual what comes to nursing career. Sleeping has always been close to my heart and I have been interested in it. Throughout the nursing education I have read articles about sleeping – problems and patterns and also made couple of school tasks about sleeping.

The topic comes close to everyone with irregular night shift work, but it is especially meant for restaurant workers. The difference between other professions is the irregularity of the work – only 1 to 3 shifts a week. That makes it hard to fit sleeping to normal every day life because there is no clear rhythm in it. After working one night there can be one to three free days before next shift. In theory it sounds it is easy to fit into it, but most of the employees have school or other work beside restaurant job requiring being awake early in the morning – sometimes even the next morning after night shift. Problems at work are the most common reason for lack of sleep (Härmä & Sallinen, 2004, 7).

When the whole life is jumping between two jobs it is not always easy to live healthy. When sleeping is disturbed, it has great effect on how they find their general health and how is the real situation. When day rhythm gets irregular it has an effect in eating habits, in getting sick and staying mentally happy and stable. Motivation towards job decreases.

I hope this research gives explanations and tools to irregular night shift workers to understand their situation and also helps outsiders to understand the pressure of irregularity. It creates an overall introduction to irregular sleeping and may give some answers to problems around this topic. It must be underlined also that the idea of the study is to give overall introduction, not concentrate on specific details of the topic.

It can also help nurses who work in occupational health service settings receiving patient from different fields of companies, for example.

## 2. Purpose and aims

The purpose of the study is to find out how target group finds out their general health what comes to sleeping. Target group was limited to be only restaurant workers, rather than some other profession. That is because there are not many researches done before. Group was chosen by the restaurant chain, mostly because the easy access to it.

In this research there are four research questions to be solved. Those questions go hand in hand with the main ideas of the topic and surround the area from many perspectives. The aim is to get overall idea what the topic is about and widen the scale of thinking. There are many different kinds of professions doing shift work and struggling with sleeping issues. Not too many have given a moment to think these things.

In the future the topic can be used as a source for bigger and larger researches. The purpose is to give the audience a hint of irregular sleeping and raise up conversation, thoughts and different opinions about sleeping problems and irregularity.

## 3. Research questions

The first question is to find out “Is there a problem of inadequate wake-sleeping rhythm among nightshift workers?”. The target is to find out is there, overall, existing problems among night shift workers.

Second question is tries to solve if irregular night shift causes any problems. It is formulated “Does night work cause problems to employees’ well-being and health?”.

Third question is “What are the physiological restrictions of daytime sleeping?”. It tries to explain the concrete things restricting sleep. Fourth question is “Causes of inadequate sleeping and irregular wake-sleep rhythm”. This is mostly covered by literature review but gets also support from the questionnaire.

## 4. Literature review

There is plenty of literature coming close to the topic but only couple of good sources exactly embracing it. To gather basic information I started by reading books about

sleeping itself. Sleeping is complex thing having many physiological and physical issues around it. Chapters below are trying to explain the basic elements of sleeping habits.

#### 4.1 The physiology of sleeping

Sleeping is part of every day life and maintains on the background the whole life of human being. When there are no problems with sleeping, we hardly notice it or make it an issue. The sleep keep also changing, it does not stay the same in all ages. New-borns sleep the most of the day, and children need a lot of sleep too. When growing older the need of sleep decreases little by little. In the late stage of life the sleeping becomes also more broken. Elderly people sleep more in short periods rather than long ones. (Dyregrov, 2001, 22; Iivanainen et. al, 2004, 161.)

Most of the researchers underline that it is very much individual how much sleep do we need, but most of the adults can manage with 6 to 9 hours in every 24h period. The average need for sleep is 7,5hours when talking about adults in Western world. (Dyregrov, 2001,23; Härmä & Sallinen, 2004, 10.)

Before the electricity became popular, people slept 2 h more on average than nowadays. This puts great effort to light and how does it affect to the time we sleep. Most of the activities of the body are more alert on a day time than night time. The need of sleep is genetic and cannot easily be changed. The change needs time and patience – and a lot of light placed in right time of the day. The quality of sleep is partly genetic too. (Härmä & Sallinen, 2004, 34; Stenberg, 2007, 13.)

#### 4.2 About sleeping rhythm

The biological rhythm in humans is set to 24 hours. If people would live in dark cave the day would be something between 24 and 25 hours but the society sets it to 24 hours. There is also certain wake-sleep rhythm which regulates when we sleep. It has also affected the biological processes in the body, such as temperature regulation, urine- and

hormone productions. (Dyregrov, 2001, 23; Härmä & Sallinen, 2004, 35; Partinen, 2007, 34.)

Biologically the sleeps attends to start 6 hours before the core temperature of the body goes down and continues 3 hours after the core temperature starts to increase to its normal level. The core temperature affects the sleeping more than the times spend awake before sleeping. This is based only a theory and the life itself make many exceptions to this rule. Fighting against biological rhythm causes body to be alerted and more vulnerable to diseases. (Partinen & Huovinen, 2008, 66-68; Laitinen & Porkka-Heiskanen, 1999, 568.)

Light has big effect on sleeping and day rhythm. It is possible to change the rhythm of day by using light as a tool (Stenberg, 2007, 27, 56).

As the core body temperature goes down at early morning hours, it will still never go as down as when sleeping. If a person stays in the bed for the whole day the temperature increase but not as much if the person would be active during the daytime. Due to core temperature, falling asleep is the most natural in the evening time or late afternoon. (Stenberg, 2007, 23.)

Rush, daytime activities and habits leave a mark to day-sleep rhythm bringing it very individual. The ideal situation is that people would go to sleep in the evening time and wake up quite early in the morning. There should be no variation in time what comes to sleeping; ideally people should go to bed same time every day and also wake up same time daily. The problems in sleeping among shift workers are consequence of irregular day rhythm. (Härmä & Sallinen, 2004, 137.)

#### 4.3 Phases of sleep

Very shallow aspect to sleeping is that when we close our eyes and lie down, we sleep. Deeper analysis to sleep shows that it is complex transaction. It is said there are five different phases in sleeping, called stages. Stage one brings the person to be tired and causes the tendency to lie down and be prepared to sleep. In stage one the person is not



asleep yet, but the alertness to environment decreases and causes muscle relaxation. Blood circulation decreased in some parts of the brain. Actions in sympathetic nervous system decrease and in parasympathetic nervous system increase. It seems like the sleep is taking the control over the body actions backing up all the necessities. The processes of brain decrease only 10% during the sleep. The first stage is short and person kind of a sinks deeper to the sleep. (Dyregrov, 2001, 26-28; Partinen & Huovinen, 2008, 43.)

In stage two the movements of the body slow down, the heart rate decreases and breathing becomes deeper and peaceful. The person is not conscious of the environment so much anymore, but is still easy to wake up. The stage lasts for 10-20 minutes. Almost half of the total amount of sleep is called stage two sleep. (Dyregrov, 2001, 26-28; Partinen & Huovinen, 2008, 36.)

Stage three starts 20 to 30 minutes after closing the eyes. During stage three heart rate, blood pressure and body temperature decreases (Partinen & Huovinen, 2008, 37).

Stage four is the deepest phase in sleep rhythm and the meaning of it is still partly unknown. It is said to be the most recovering phase of sleep for body collecting strength for next day. If person is waken up during phase three or four, it is not easy to return for alert state. It takes couple of moments to be totally orientated and they might feel confused and disorientated. (Dyregrov, 2001, 26-28.)

Fifth stage takes place 60 to 90 minutes after falling asleep and appears very differentially than other phases and is called REM (Rapid Eye Movement)-sleep. The first phase of REM-sleep lasts 1 to 10 minutes and is to be repeated every 1.5 hours again. During REM-sleep fast eye movements are seen and the person is dreaming. When talking about night time problems and activities such as sleep-walking or – talking, they take place in REM-stage. (Dyregrov, 2001, 27-28.)

During REM-stage all the muscles of the body are slackened and person is not able to move. This is a natural way to protect person from hurting him-/ herself during sleep.

Only heart muscle, muscles involved to breathing and eye muscles make the exception to that. (Stenberg, 2007, 19.)

These five stages formulate sleeping rhythm. When stage five is ones reached, the person does not return to stage one anymore. The cycle starts from stage two and continues until REM-sleep as long as the person stays asleep, though one third of the sleep is formulated by stage three and –four. During night or sleeping period people usually reach 4 to 5 times REM-sleep, which means the whole cycle. The cycle usually lasts for 90 minutes. (Partinen, 2007, 17.)

The longer the person sleeps, the longer are the periods spend in REM-sleeps. It seems that body tries to gather all the necessary deep sleep before there is a risk of waking up, because that is the most needed sleep.

If the stages of sleep are interrupted, the sleep does not give the same recreation as the non-interrupted sleep (Stenberg, 2007, 20). If person has stayed awake longer than normally or if the daytime activities have been more stressed than normal, also the sleep is deeper and longer. This is called compensation or rebound sleep. (Partinen, 2007, 22.)

#### 4.4 Affects of inadequate amount of sleep

There are many causes due to inadequate sleeping in human body and mind. The most seeing cause of lack of sleep is of course being tired. Being tired especially in daytime is sign of inadequate amount of sleep, sleeping at wrong time or having the rhythm messed up. Being tired at night may cause problems at work when person should be alerted and active. More then one out of ten of Finnish people are suffering from serious lack of sleep which is said to be more than 2 hours per day. The fact gives an explanation also to accidents at work, which are more common what comes to shift workers. (Härmä & Sallinen, 2004, 11.)

When tiredness comes, that body temperature goes down causing chills. People gather more to wear on them. In long term lack of sleep the body's ability to fight against diseases is decreased and the ability to manage demanding tasks is lowered. Tiredness and lack of sleep causes feelings of powerlessness; the person does not manage as effectively as before. It is hard to concentrate and the memory does not function as it should do. Motivation decreases. Logical ability for thinking is decreased and people take more risks and do mistakes. Nature has decided now it is good time to go to bed and try to sleep; during ancient times in human history this was crucial sign to start sleeping. If the person has not sleep for a long time there might be some audiovisual hallucinations. In this situation the lack of sleep has gone to very bad level already. The first sign of not sleeping enough is being tired on a daytime. It can, of course, be caused from many different reasons though, such as depression, powerlessness and other reasons. (Partinen 2007, 21-22.)

If person tries to stay awake forever, it causes death. The longest time being awake is registered to be 264 hours, which means 11 days and some hours. There are also some examinations done with rats. The defence system of the body goes down first causing infection/inflammation which causes death for sure. (Partinen, 2007, 22.)

Long period of sleeplessness are shown in changes in the body functions. Lack of sleep for a long time has more serious affects, such as changing in mood, mostly depression (Stenberg, 2007, 72).

The defence system of the body is having also hard time when not sleeping regularly. Body prepares to gather more energy to function and stores calories, which causes the energy need to increase. People who do not sleep regularly are more often sick than the ones whose sleeping is near to normal. The CPR-value is higher too. (Stenberg, 2007, 78.)

There are various other causes for body, such as increased blood pressure and other problems in heart function. When tired, it becomes harder to control the feelings and control life itself. It is said that after one sleepless night affects the ability to cope the

same way as alcohol does. Reaction time increases putting person more vulnerable for accidents. (Härmä & Sallinen 2004, 76; Partinen & Huovinen, 2008, 65.)

In the long run people become more vulnerable to diseases. It is said that one cause of night work is increased risk of breast cancer (Kolstad, 2008, 34). There is also higher risk of getting high blood pressure and coronary artery diseases (Sjöblom, 1997, 16).

It is not possible to store sleep beforehand, but 'paying it back' later is possible. It is called rebound sleep. It is said to sign from the body, because sleeping is so important function. After long period of staying awake the sleep is deeper due the fact that body is recovering. (Stenberg, 2007, 21.)

#### 4.5 Shift work

Shift work has become more and more popular since last 30 years. The society changes and is function 24 hours a day. Finland is one of the top countries what comes to amount of shift workers. One fourth of workers in Finland are influenced by shift work which causes sleeping problems. (Stenberg, 2007, 85.)

Almost 80% of night shift workers have experienced some kind of problems in sleeping during their career. When talking about traditional shift workers their shifts are rolling changing between morning-, evening- and night shifts. In this research we concentrate only to those whose work is irregular; only couple of nights a week. (Partinen, 2007, 54.)

The risk for heart problems is higher among shift workers than among regular workers. They also suffer more from stomach problems and are more vulnerable to accidents at work. (Laitinen & Porkka-Heiskanen, 1999, 570.)

It is not clear whether only irregular sleeping rhythm causes problems to health, or is it the sum of other problems related to irregular life style.

Disturbed sleeping rhythm shows easily problems which would be otherwise hidden. Sleep is sensitive meter showing the health state of the body. As the mental functions correlate with body temperature, mental capacity is on its highest on daytime when body's temperature is high. This causes problems at night time working. Concentration is poor making night time workers more vulnerable for accidents. Young people less than 40 years can stand variations in sleeping better than the older ones. (Laitinen & Porkka-Heiskanen, 1999,570; Partinen 2007, 54.)

In theory it is possible to change the whole rhythm of day to fit for night time working. The body needs couple of months get use to new rhythm. This changes the body temperature to the right direction. In this case person would be as effectively working at night time than he/she used to be at day time. Seriously talking that is not an option, because most of the people like to take part to activities in society and live 'normal' life whenever they have free time. This is the main reason why it is not possible totally adapt to irregular night shift work. It is also very essential to sleep after night shift to give the body time to adapt and recovery. (Härmä & Sallinen, 2004, 79.)

#### 4.6 Sleeping too much

When sleeping and working is irregular it is easy to sleep too much when there is chance for that. Some people are able to sleep around the clock and obviously it is not healthy. Sleeping too much messes up the biological sleeping rhythm and makes it irregular. It is impossible to store sleep for the future. In the questionnaire many people mentioned as bad thing that they suffer from oversleeping. When there is no routine in sleeping times and is not so called scheduled, the body is confused on when to sleep. It also causes physical symptoms, such as head ache. This is complex thing, because many of the symptoms due to irregular sleeping are the same as oversleeping. However, all those symptoms can be related to irregular sleeping.

#### 4.7 Barriers for good night sleep in shift work

As written before there are many problems in sleeping on wrong time. It is too noisy to sleep in the mornings, the light disturbs and temperature of the environment (and body) is not right. The period of sleep is shorter than normally and there are some breaks in sleep. Nicotine, caffeine and some medicines have an effect to good sleep. When body is functioning normally according to day rhythm, urine output is bigger during day time and goes down for night. (Stenberg, 2007, 57; Oswald & Adam, 1983, 75-77.)

Sleeping t “wrong time” is also highly mental issue; is the person stressing about sleep or not. Some people just adapt to irregular sleeping rhythm better than others.

#### 5. Methods

In this bachelor’s thesis quantitative research method was used. The questionnaire was mostly lead from the literature review, especially from the book Partinen & Huovinen, Terve Uni, 2008. Quantitative method was used because the target group is big - it would have taken too much time to use qualitative method and e.g. interview the same amount of people with open questions. Quantitative method gives reliable results, if the questionnaire is well done meaning the questions are formulated well. In quantitative questionnaire there are clear options to answer. If person did not know the answer, did not want to answer or did not understand, there was option called “Do not know” in use.

There are some bad sides in quantitative questionnaire method too. When analyzing big amount of data, there is no possibility to pick up or analyze single answer or person. This is why this research only gives broad lines of the topic. On the other hand this also protects the anonymity.

##### 5.1 Data collection

The questionnaire was mailed to three cities, three different restaurants around Finland. With the questionnaires there were envelopes where employees could enclose the questionnaire to prevent it to be read by someone else. In each restaurant there was one person gathering the envelopes together and sending them back. Answering time was

one month, and all but one restaurant returned the questionnaires within that time. That restaurant returned envelopes after reminding of the task. Questionnaire was sent to target group in January 2009 and by the beginning of March all were returned.

Analyzing of the data took place in September 2009 due the schedule problems. All questionnaires are strictly confidential and that was told on the first page of each paper. It was fully based on free choice whether to answer at all and the papers will be destroyed afterwards. The results of the study were promised to be sent to the restaurants after finishing the thesis.

## 5.2 Sample

In total there were 55 copies of the questionnaire sent. 48 of the questionnaires returned, making the final answering percent to be 87,3 %. The average age of answerers was 25,5 years, varying between 19 years and 46 years. The average age for women was 23 years and for men 26 years. Employees have been working 4,2 years on the average in night job. There was great variation; some of them have just started and some have been doing it for 10 years. Workers did shifts from only 1 to 5 shifts per week, the most common amount of shift was 2,5 shifts per week. Shifts were not very long, only 4 to 6 hours but there were some answerers who worked the whole night up to 10 hours.

## 5.3 Instrument

As a base of the research was questionnaire. Each question has a connection to literature, mostly to Partinen & Huovinen, 2008. The rare base of the questionnaire was done based on literature read for the thesis. The final questions were formulated by using books and lead from several chapters.

There were eight different sectors in the questionnaire, each sector trying to find out different issues and perspectives around topic. First some basic information was asked to clear out the material of what kind of people were answering. Questionnaire was done anonymous way and no single answers are able to be found later on from the text,

just simple things like gender, age, how many years of night work they have behind and how often they do work at nights.

Section two cleared out the basic life habits and way of living, such as are they interested in health, how they eat etc. Knowing these things give information to the research about general life habits of the target. It is important because e.g. smoking and alcohol consumption have effect to the sleeping habits. It was also asked because it is commonly known that restaurant workers may not have the healthiest lifestyle. Sector two also gathered information about stressing and mood fluctuations as well as day napping.

The third sector gave information about the quality of sleep and about the problems during the sleep, if any. This was also asked in the last sector with open questions.

Fourth sector was dedicated to work and sleeping and how do these two topics correlate and co-operate together– how do the workers find their work and is there conflict in being tired at work or day time, motivation and how does night work fit to them.

In sector five the purpose was to research concrete, physical things. There was a question about the hours slept during work nights and free days, how much workers do need sleep per day and is that more or less than they sleep now. This gives the basic framework and idea on what it is to sleep while working irregularly.

Falling asleep is essential phase in sleeping process and those issues were cleared out in sector number six. The process was researched through out. The purpose was to find out the habits and activities of going to sleep; what do they do before going to bed and how long is the delay in falling to sleep when decided so.

In the end of the questionnaire there was a list of open questions. That was mostly experimentation, because it is commonly known those questions commonly do not work very well.



#### 5.4 Data Analysis

The data was analyzed by using SPSS program at school. The questionnaire was separated question by question. Options to answer were put the same way as in the original questionnaire. When the base for answer sheet was ready, questionnaires were added there one by one. There was no differentiation made within three cities; all the questionnaires were treated like single answer.

After the information was in SPSS, single reports of chosen topics were taken out. Some areas were better covered by comparing them with some other area. Paragraphs and charts were formulated automatically by chosen topics. The outlooks of the tables are chosen the way they explain topic the best. All of the charts and paragraphs are explained under or before the picture. Some of the topics were closely related to each other and those topics were put next to each other.

#### 6. Results

Results are mostly covered up by using a chart or paragraph as a tool to explain them. The main idea was to find out how night shift workers find themselves suiting to irregularity.

Difference between the tolerances of how they found themselves suiting to night shifts varied only a little bit. The long-term workers suited well to irregularity while the people who have not been working at nights for more than 1 to 2 years complained more about the problems arising. 77 % of the workers find night shifts suiting them well, 18 % quite well and 2 % not at all. One of the employees (2,1 %) did not answer at all.

The alcohol consumption and smoking has increased in target group if compared to people working at day time. Paragraphs from alcohol consumption (Chart 1a) and smoking (Chart 1b) of the answerers' show how alcohol is used among target group and what are their smoking habits.

Chart 1 a

Alcohol consumption

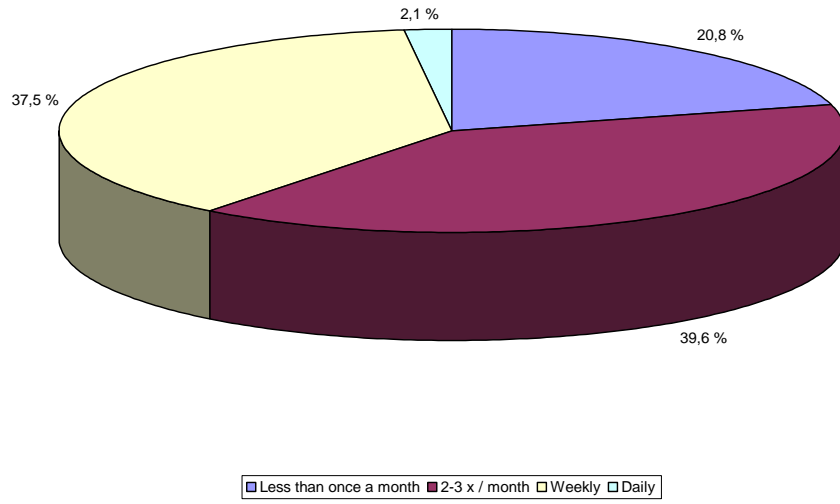
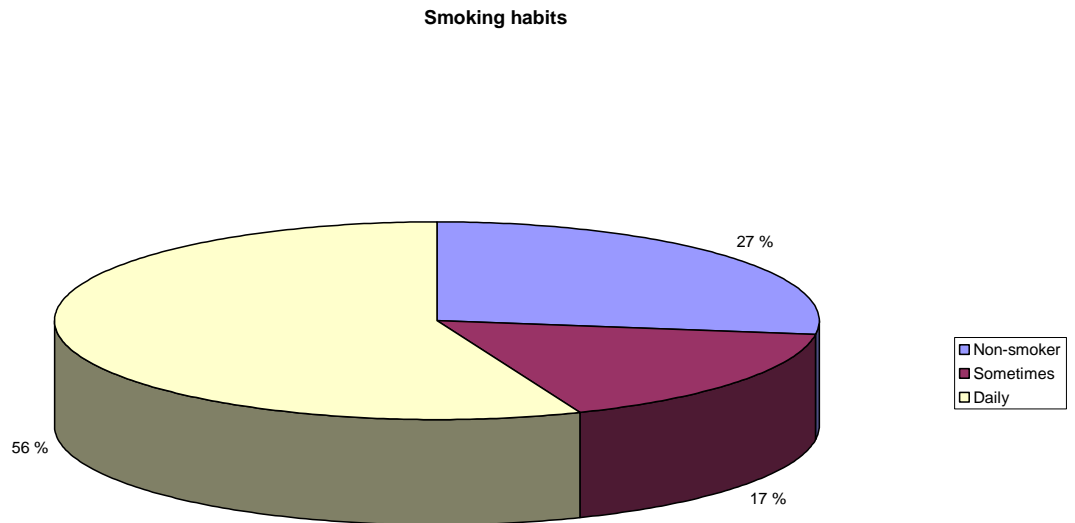


Chart 1 b



Target group do not exercise too much. 31% of answerers said they are doing sports only every once in a while or almost never, 45% exercises weekly and only 18% do some exercise daily.

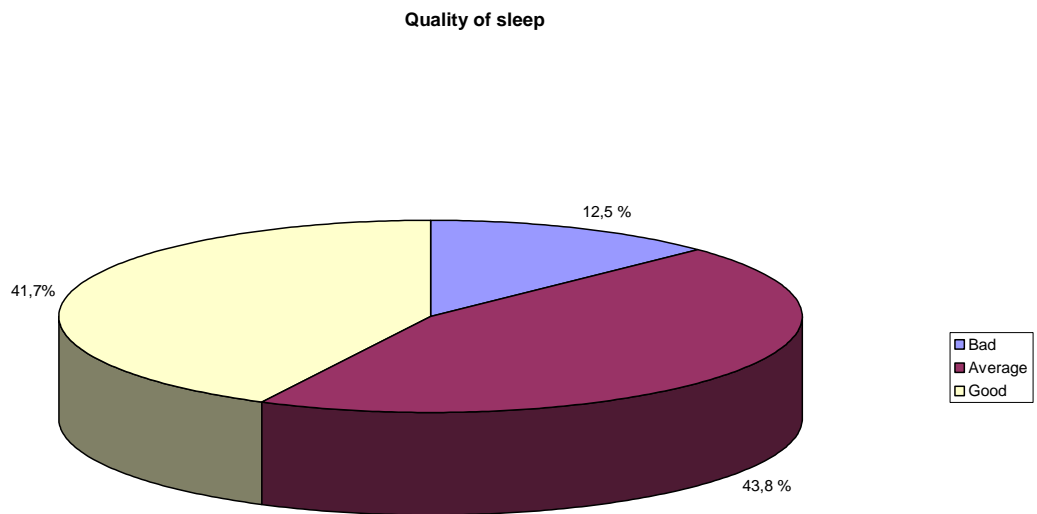
The group is not homogeneous what comes to working and other activities in life. Three out of four of the workers had something else going on in their lives beside restaurant work; school or other job or both. For one out of four this was only job and those were also the ones who are full-time workers doing five shifts a week.

There was a question which asked for the quality of sleep and the quality of overall health and well being. The scale varied from minimum grade 4 to maximum 10. The mean value for overall health and wellbeing was 8 while the mean grade for quality of sleep was 7,7. The same question about the quality of sleep was set in words and the answers differentiated a little bit.

Chart 3 shows the variation in the quality of sleep.

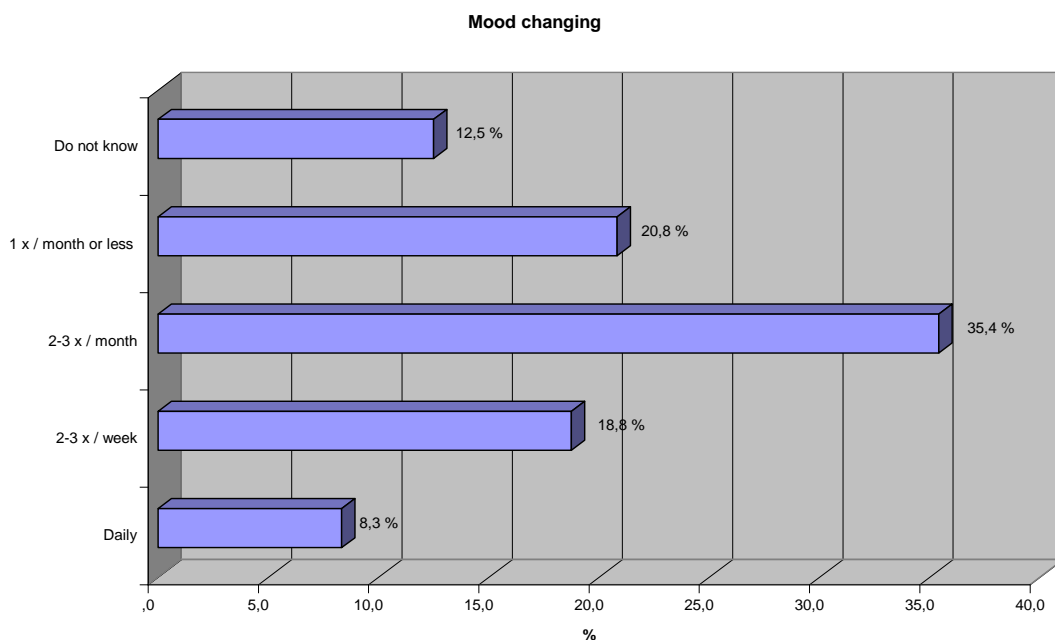
41,7 % of the target groups finds their quality of sleep good and 12,5 % find it bad. The rest of the people (43.8 %) are situated somewhere between these two answers. The main point in this chart is to notice the small amount of the people finding their quality of sleep bad.

Chart 3



Changing of moods is normal. Chart 4 shows how often people experience changing of moods in this target group. 8,3 % experience that their mood is fluctuating every day and 18,8 % couple of times a week. The majority (35,4 %) answered they have mood changes monthly and more than 20% that their mood changes only occasionally, less than once a month. There were also some people (12,5 %) who did not know the answer.

Chart 4



In shift work it is not always easy to eat regularly and healthy way.

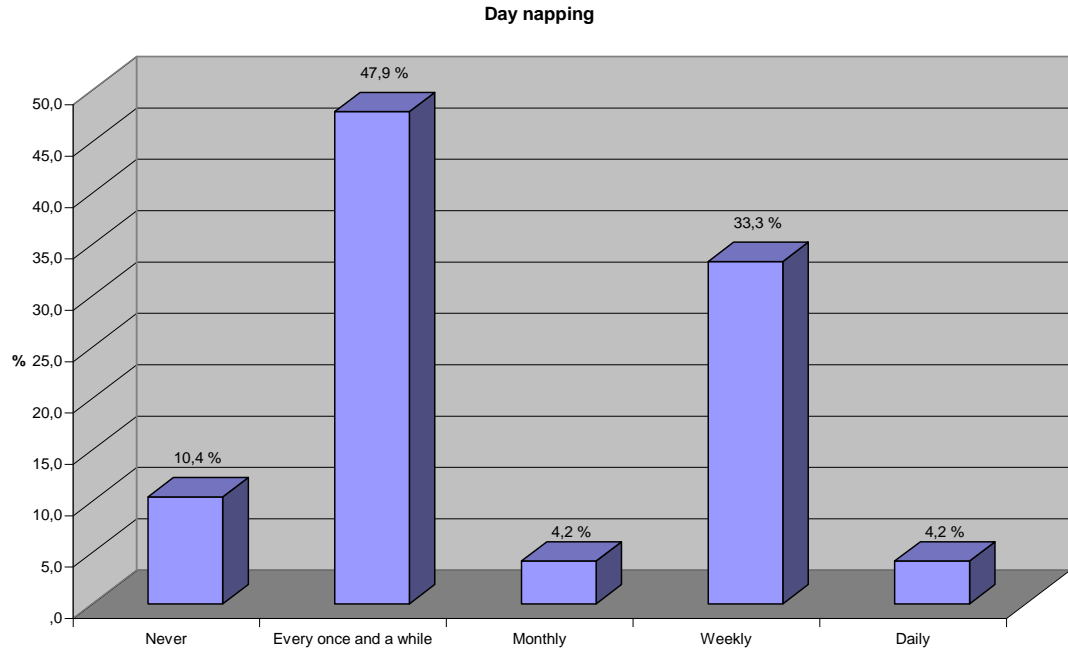
44% of the workers tried to eat regularly always. The same amount of people answered they eat regularly only occasionally. 6 % answered that they do not eat regularly at all while 6 % did not know what to answer.

When asking about healthy eating styles, 31% answered that they eat always healthy, 60% eat healthy sometimes and 8% said they do not eat healthy.

Day napping means sleeping shortly at day time, which is not part of the night- or main sleep. The habits of day napping were asked in three questions; first do they take naps (chart 5a) and secondly how long do they sleep (chart 5b) if they are napping. The last part of the question found out at what time (chart 5c) they do sleep.

Chart 5 a shows that almost 90 % of the target group is napping sometimes.

Chart 5a



In chart 5b it is shown that most of the people (50 %) taking naps like to sleep one to two hours in a row rather than less.

Chart 5b

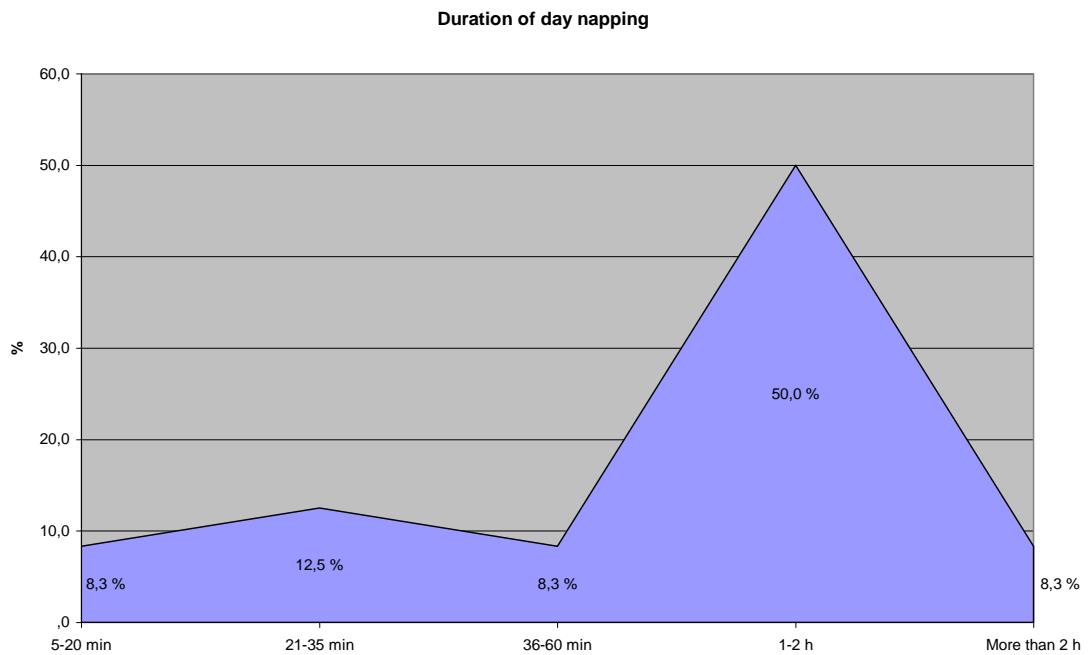


Chart 5c

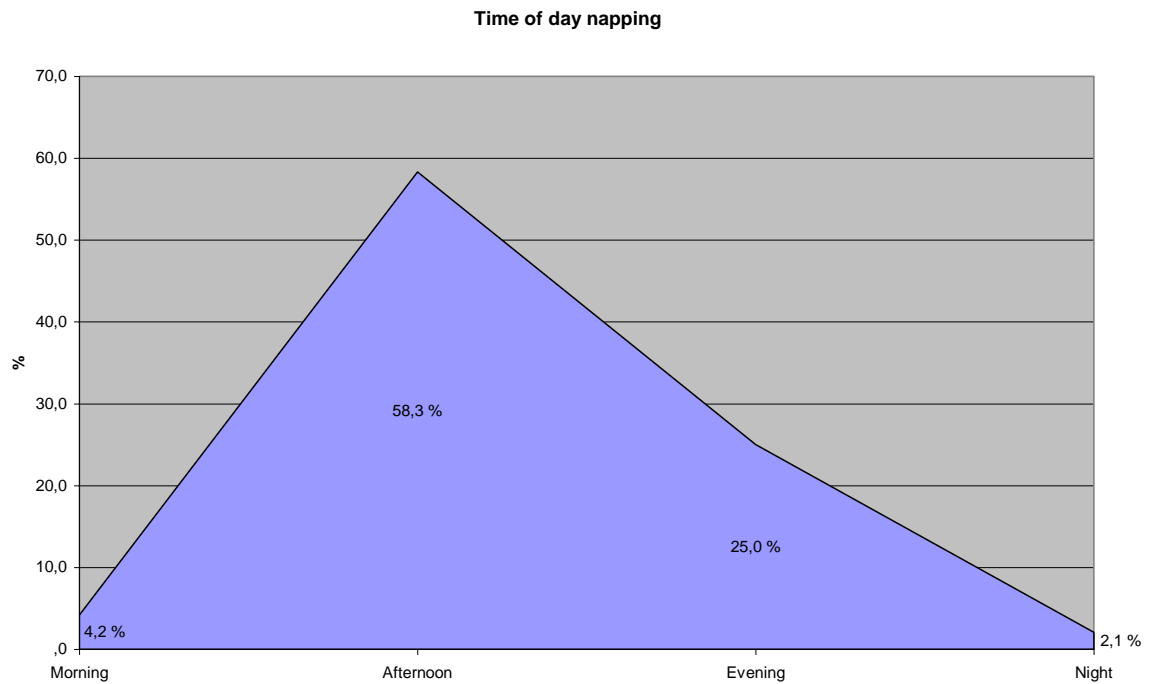


Chart 5 c shows the variation between answers when asked at what time do they are usually napping. The majority (58,3%) is napping in the afternoon time, while 25% takes naps in the evening time.

One question was made to find out do shift workers have stress. 98% of the answerers were stressing on things sometimes and the rest 2% answered they do not stress about things at all. Results are divided pretty equally for all of the choices: Daily 21%, weekly 27%, monthly 10% and only occasionally 40%.

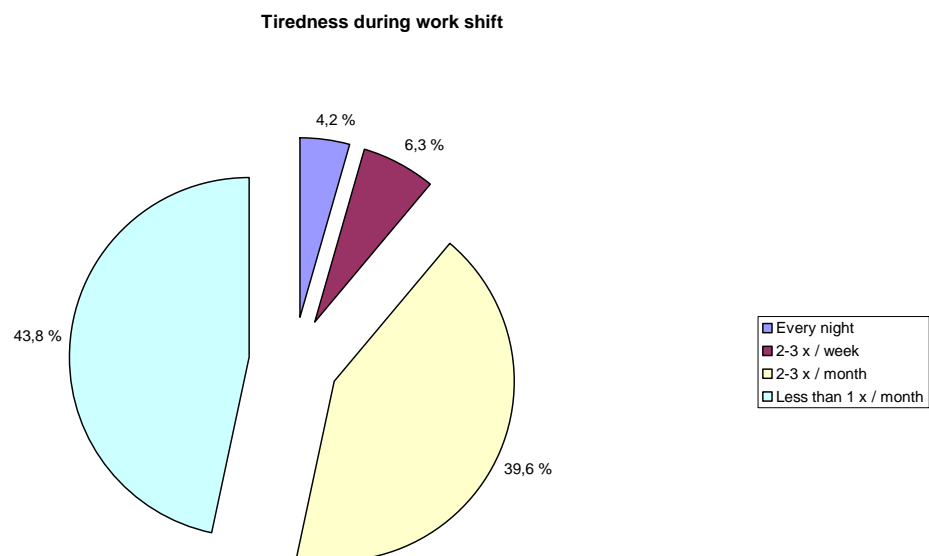
Sleeping problems are not unusual thing among the target group. Answers of the questionnaire shows that 79,2 % of the workers had sleeping problems. The following problems were arising: Snoring (18), grinding of teeth (10), cramps in the feet (7), nightmares (14), so called 'horror attack' at night (6), sleep talking (14), and sleep walking (2).

Well-being was asked the following way: “Do you think irregular night work has an influence on how well-being you feel yourself?”

78% of the workers said that night work is not hindering their well-being, while 22 % thinks that night shift has negative effect to their well-being.

Below there are paragraphs on three things. The first one (chart 6a) shows how often workers feel tired at work during shift. The second paragraph (chart 6b) shows whether tiredness has an influence on how well workers do their job. Third one (chart 6c) shows if being tired has an influence on motivation towards work.

Chart 6 a



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Chart 6 a shows that 4,2 % of the workers feel tired at night at work daily, 6,3 % feels tired weekly and the rest of the people less than weekly. Nearly 40 % feels tired only couple of times a month and nearly 44 % seldom, less than once a month.



Chart 6 b

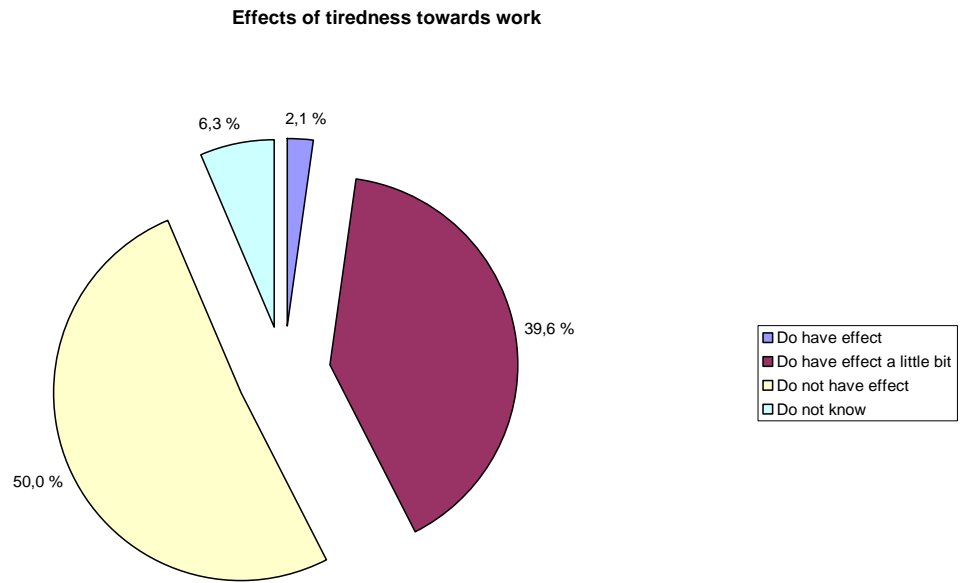


Chart 6 b shows results which should correlate the ones shown in the chart 6a. In chart 6b, 2,1 % answered that tiredness have effect towards their work. 39,6 % says tiredness have effect a little bit and half (50%) of the answerers think tiredness have only a little effect on how they work. There was also a group (6,3 %) who did not know the answer.

Chart 6 c

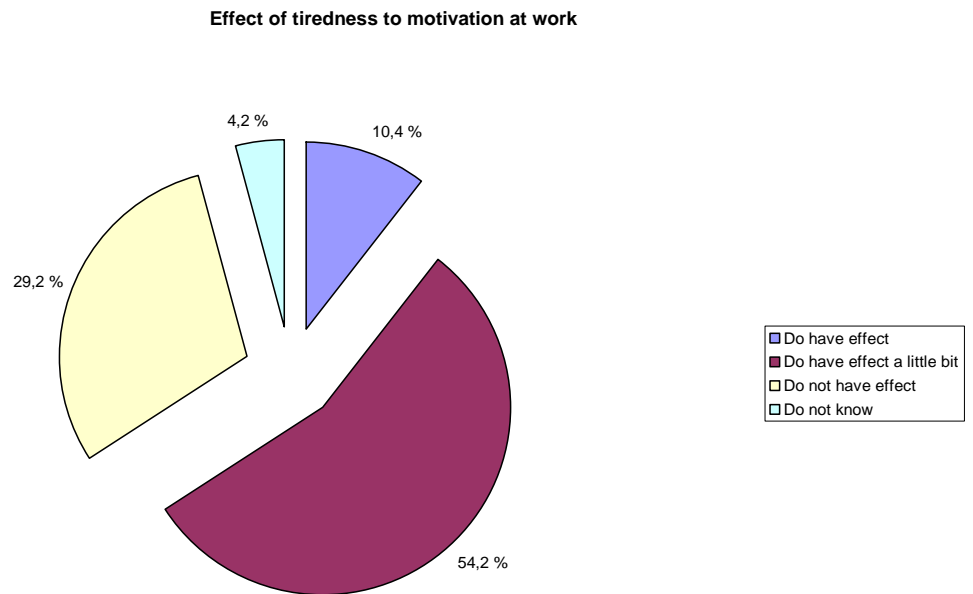


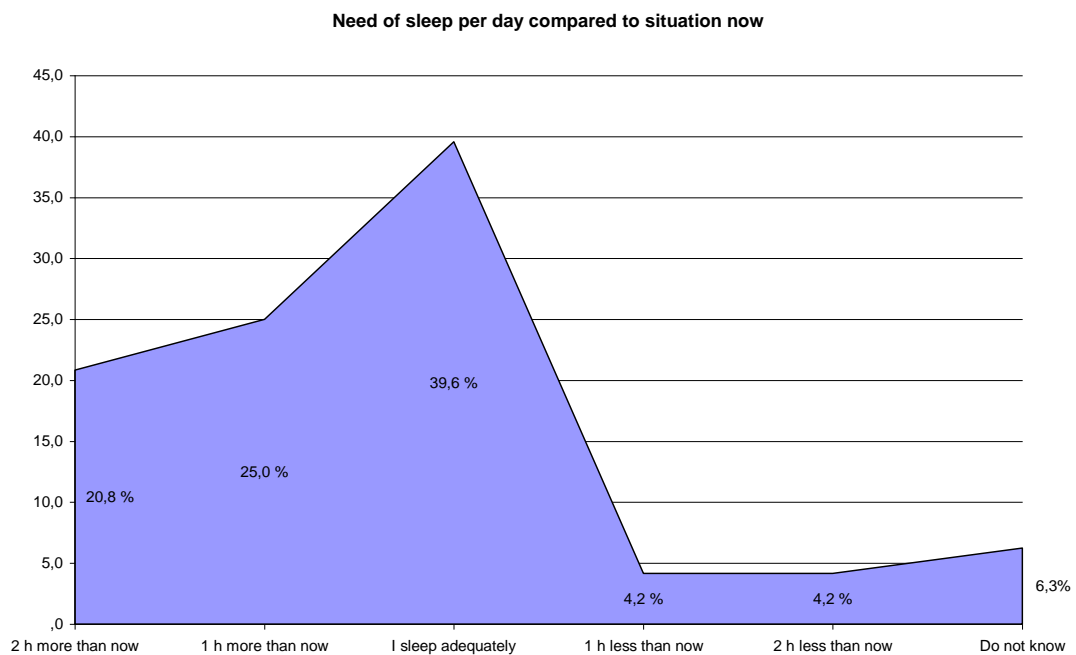
Chart 6 c shows that tiredness has an influence on motivation at work in 64,6 % of the people. One third experiences that tiredness does not have effect to their motivation and 4,2 % said they do not know the answer.

Shift work has an influence on how tired the workers feel when they are having free time. More than 10 % of answerers feel themselves tired every day on while having free time, 29 % feel tiredness couple of times a week and 42 % couple of times a month. 2 % did not answer the question and 2 % answered that they do not know.

There was also question about the first shift of the week. 60% of the workers were not more tired than usual during the first shift, 18% were a little bit more tired compared to other shifts and 10 % said they feel more tired during the first shift.

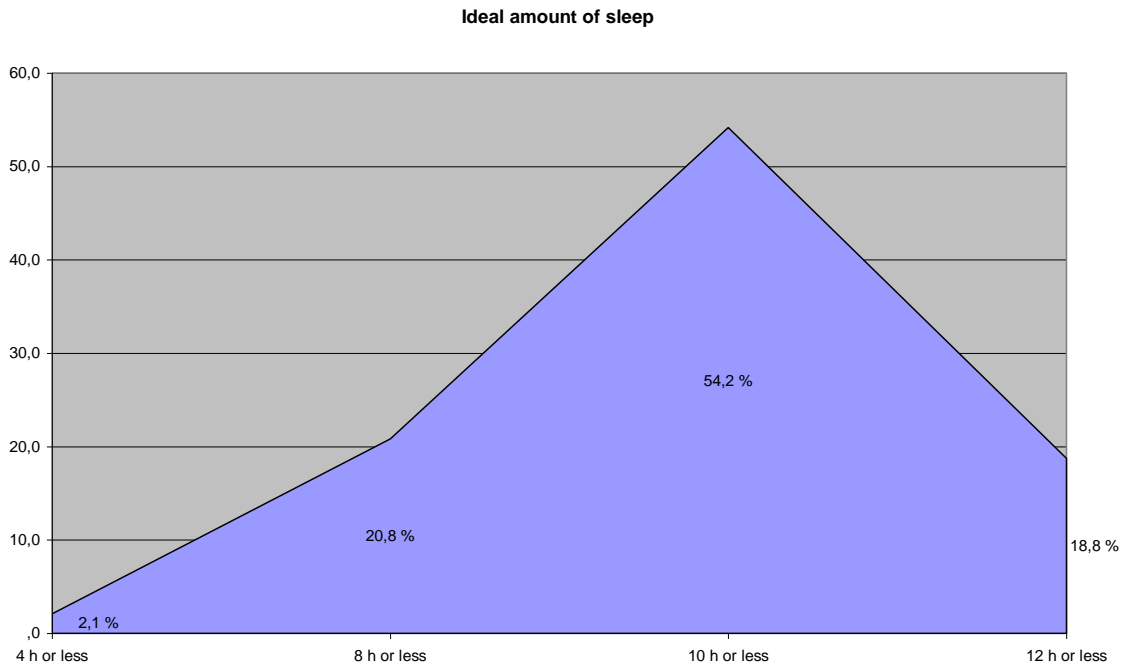
Chart 7 a and b are the paragraphs about the need of sleep per day. The first paragraph (chart 7a) shows how many hours more or less people would like to sleep compared to situation now, if possible.

Chart 7 a



The second paragraph (chart 7b) shows how much would be the ideal amount of sleep per day. It seems that more than half (54,2 %) of the target group would need 10 hours sleep daily.

Chart 7 b



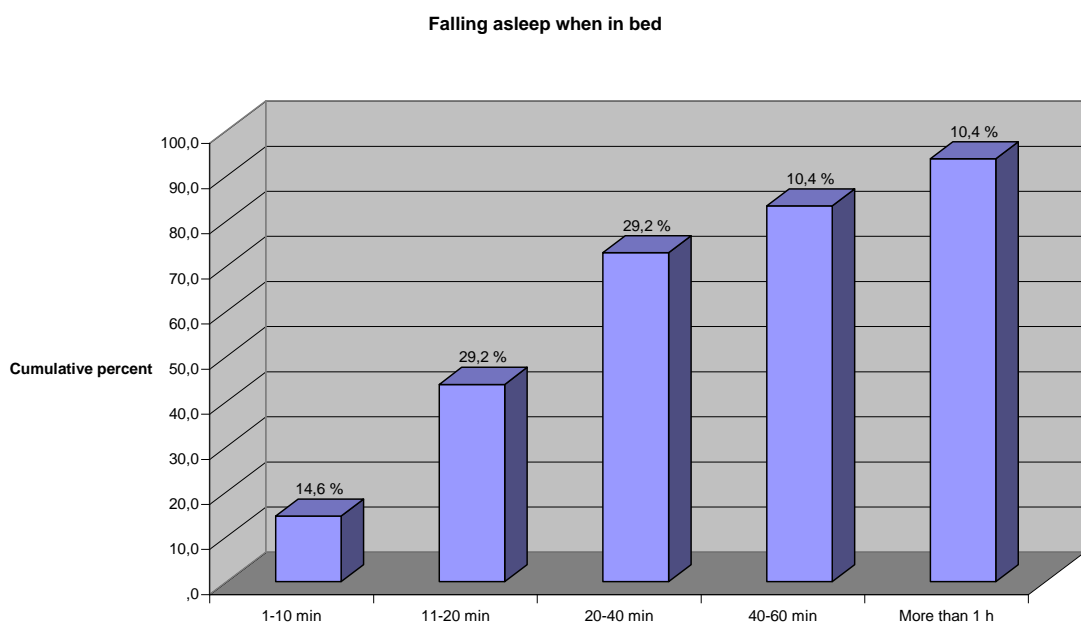
Habits after night shift vary. When the night shift ends approximately at 4:30 am people stay awake different time. 19 % goes straight to bed and stay awake for less than one hour. Less than two hours awake spent 44 % of the workers, while 29% spent 2 to 4 hours awake. More than four hours awake stayed only 6 % of the answerers.

When they do go to bed, also falling asleep takes time different time.

In chart 8 time is shown in x-line and it is growing as the time goes up to one hour.

Y-line shows cumulative how many percent of the people has fallen asleep compared to the time. In every chart bar there are the amounts of people in percentages who have answered according to the times. For example 29,2 % answered it takes 11-20 minutes to fall asleep in bed, while 10,4 % said it takes more than one hour.

Chart 8



Workers have sometimes problems to fall asleep after night shift. 15 % said they have this problem every night, 21 % suffers from it couple of times a week , 18% do not fall asleep easily couple of times a month and 37,5% do not have the problem of falling asleep or are suffering from it seldom.

79 % wake up in the middle of the sleep sometime, 25 % of them daily.

## 7. Discussion

The results of the questionnaire were pretty much the same as regarded in literature review and previous knowledge of the topic. This shows there is problem existing what comes to inadequate wake-sleeping rhythm.

Night shift causes problems to employees' well-being as well as tiredness and many health problems. Physiological restrictions for day time sleeping are more concentrated in chapter 4.7 and causes of inadequate sleeping in chapter 4.4.

### 7.1 Results compared to literature

Results of the questionnaire are mostly following the line of literature review. As good example there was a question on how many percentage of the target group are suffering from sleeping problems. From the answerers 79,2 % experienced some kind of problems, while in the literature the amount is also around 80%.

The main lines are equal but there were some exceptions too. It is said that after long period of being awake the sleep is deeper and lasts longer. This did not come up from the results; more it was said that sleeping is disturbed. This is partly due the fact that sleeping in daytime is harder than at night time, because there are so many factors hindering good sleep, such as noises and other stuff mentioned in literature review.

### 7.2 Ethics

Research was done anonymous way and no single answerer was able to identify based on the results. The results are to be destroyed and no one else but the researcher is able to see them. Papers are stored in safe place until destroying them.

Answering the questionnaire was based on free will and target group had an option not to answer the questionnaire at all. There were no explanations needed and no

consequences for those who decided not to answer; they are only shown as numbers in the results. The questionnaire was done following good manners and the laws of Finland.

### 7.3 Limitations and reliability

The thing mostly rejecting the liability of this research was the small sample of the study (n=55). 48 of the questionnaires returned, making the final answering percent to be 87,3 %. It may be lowered because I was not sure how many employees they have in each restaurant, making the true percent close to 100%.

Small target group gives good knowledge about the certain group which is chosen. This questionnaire only shows the nature of 48 people chosen particularly to be part of this small research. To make larger summaries about the topic, the amount of people involved in research should be much bigger. This is why this research can not generalize information; it only gives a small hint about the direction. In the future if someone makes similar research, the questions should be more specific and more concentrated on certain problem.

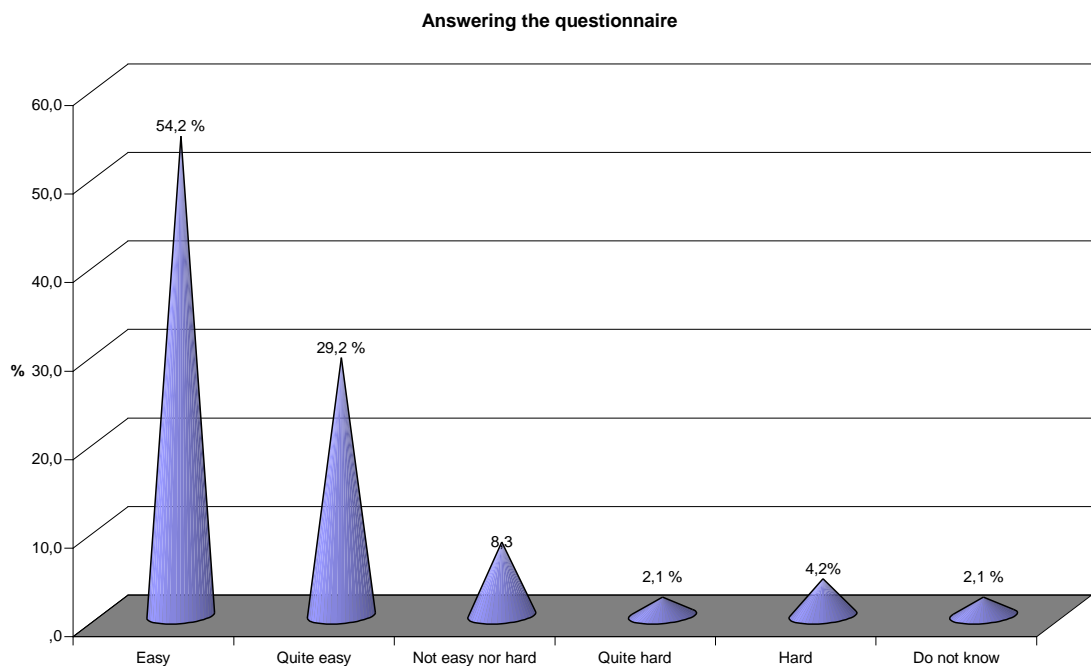
There is always also the risk that answerer does not understand the questions or do not know the answer making person to tick what ever comes in their mind first. These matters decrease the liability of the study and make it less beneficial. All of the people answering to questionnaires may not have been Finnish although they all speak and understand Finnish. Cultural diversity and background differences are not taken into consideration in the questionnaire. Sleeping rhythm is also highly culturally bounded.

As sources there were not enough scientifically proved researches used and that decreases the reliability of this research. The information was mostly based on books and electronic material.

The questionnaire seems to be quite good, while 85 % of the answerers think the length of the questionnaire is convenient. 56% found the topic interesting, 35 % answered that

the topic is not interesting nor boring and only 6 % answered it to be boring. Chart 9 shows the easiness of answering:

Chart 9



## 8. Conclusion

People doing shift work, especially irregular night shift, do not adapt any regular day-night rhythm. They suffer from physical and physiological symptoms related to sleeping. It is individual how badly those consequences effects on person's life and how well does he/she adapt on irregular sleeping.

There are many sources of what comes to physiological sleeping rhythm, how shift workers are managing and what kind of diseases or illnesses working at night time brings into the picture.

Using this topic as a title for thesis was very interesting. The questionnaire proves there is correlation of the results between this small sample and literature.



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Appendix 1  
Cover sheet for questionnaire

Hei!

Olen 24-vuotias sairaanhoitajaopiskelija Turun Ammattikorkeakoulusta Salosta töissä Salon Onnelassa. Teen opinnäytetyötä tutkien yötyöläisten unirytmää, unen ja unenpuutteen vaikutusta hyvinvointiin sekä mahdollisia ongelmia, joita epäsäännöllinen unirytmä tuottaa.

Ohessa on kasa kyselyitä, kirjekuoria sekä palautuspostipaketti.

Pyydän sinua jakamaan kyselyt henkilökunnalle ja täyttämään kyselyn. Kyselyn täyttämisen jälkeen henkilökunta sulkee oman vastauspaperinsa kirjekuoreen ja palauttaa sinulla olevaan postipakettiin.

Kyselyyn voi osallistua koko henkilökunta (Vp:t, baarimestarit, blokkarit, lipunmyyjät ja portsarit). Toivon, että vastaat myös itse kyselyyn.

Kyselyyn vastaaminen on vapaaehtoista ja vie 10-15 minuuttia. Vastaukset käsitellään nimettöminä ja luottamuksellisesti. Yksittäisen vastaajan tunnistaminen opinnäytetyöstä on mahdotonta.

Kun henkilökunta on palauttanut kyselyt sinulle, sulje ne vastauskirjukuoreen ja laita kuori postiin. Postimaksu on maksettu valmiiksi.

Lähetän aikanaan kyselyn tulokset jokaiseen ravintolaan, ja toivon niistä olevan apua henkilökunnalle epäsäännölliseen nukkumiseen liittyvissä asioissa tulevaisuudessa.

Lisätietoja tutkimukseen tai lomakkeeseen liittyvistä asioista voit soittaa numerosta 0440280784 tai kysellä sähköpostilla [kata.aaltonen@sk-ravintolat.fi](mailto:kata.aaltonen@sk-ravintolat.fi)

Kiitos vaivannäöstäsi!

Terveisin

Kata Aaltonen

## TUTKIMUS LIITTYEN EPÄSÄÄNNÖLLISEEN UNIRYTMIIIN JA VUOROTYÖHÖN

### Hyvä vastaaja!

Olen 24-vuotias sairaanhoitajaopiskelija Turun Ammattikorkeakoulusta Salosta ja töissä Salon Onnelassa. Teen opinnäytetyötä tutkien yötyöläisten unirytmia, unen ja unenpuutteen vaikutusta hyvinvointiin sekä mahdollisia ongelmia, joita epäsäännöllinen unirytmio tuottaa.

Olen keskittänyt kyselyt SK-Ravintoloiden kolmeen Onnelaan: Saloon, Rovaniemelle ja Turkuun. Täytä tutkimuslomake itsenäisesti. Vastaa kysymyksiin rastittamalla mielipidettäsi parhaiten kuvaava vaihtoehto tai kirjoita mielipiteesi sille varattuun vastaustilaan. Rastita vain yksi vaihtoehto jokaisesta kysymyksestä, ellei otsikossa toisin mainita. Pyri vastaamaan jokaiseen kysymykseen.

Kyselyyn vastaaminen on vapaaehtoista ja vie 10-15 minuuttia. Vastaukset käsitellään nimettöminä ja luottamuksellisesti. Yksittäisen vastaajan tunnistaminen opinnäytetyöstä on mahdotonta.

Lisätietoja tutkimukseen tai lomakkeeseen liittyvistä asioista voit soittaa numerosta 0440280784 tai kysyä sähköpostilla [kata.aaltonen@sk-ravintolat.fi](mailto:kata.aaltonen@sk-ravintolat.fi).

Opinnäytetyötä ohjaavat Turun Ammattikorkeakoulusta Heikki Ellilä ja Seija Alho. Hekin antavat mielellään lisätietoja tutkimukseen liittyen emaililla, osoite etunimi.sukunimi@turkuamk.fi.

Täytettyäsi kaavakkeen, sulje se mukana olevaan kirjekuoreen ja palauta kuori ravintolapäälliköllä olevaan postipakettiin. Tulokset tutkimuksesta lähetetään ravintolapäällikölle kevään 2009 aikana.

Kiitos ajastasi, vastauksesi on tärkeä!

### PERUSTIEDOT

Ikä:
Sukupuoli
Työtehtävä
Kuinka monta vuoroa teet viikossa keskimäärin?
Kuinka monta tuntia työvuorosi yleensä kestää?
Kuinka kauan olet tehnyt yötyötä?
Teetkö yötyön lisäksi toista työtä tai opiskeletko?
Onko sinulla perussairauksia? Jos, mitä?
Minkä kouluarvosanan asteikolla (4-10) antaisit hyvinvoinnistasasi?

### ELINTAVAT

Käytätkö alkoholia? <input type="checkbox"/> En ollenkaan <input type="checkbox"/> Kerran kuukaudessa tai harvemmin <input type="checkbox"/> 2-3 kertaa kuukaudessa	Tupakoitko? <input type="checkbox"/> En tupakoi <input type="checkbox"/> Silloin tällöin <input type="checkbox"/> Päivittäin
--	---

<input type="checkbox"/> Viikoittain <input type="checkbox"/> Päivittäin	
---	--

<p>Kuinka usein harrastat liikuntaa?</p> <input type="checkbox"/> En koskaan <input type="checkbox"/> Satunnaisesti <input type="checkbox"/> Kuukausittain <input type="checkbox"/> Viikoittain <input type="checkbox"/> Päivittäin	<p>Heittelehtivätkö mielialasi?</p> <input type="checkbox"/> Ei koskaan <input type="checkbox"/> Satunnaisesti <input type="checkbox"/> Viikottain <input type="checkbox"/> Kuukausittain <input type="checkbox"/> Päivittäin <input type="checkbox"/> En osaa sanoa
---	---

<p>Pyritkö syömään säännöllisesti?</p> <input type="checkbox"/> En <input type="checkbox"/> Silloin tällöin <input type="checkbox"/> Aina <input type="checkbox"/> En osaa sanoa	<p>Pyritkö syömään terveellisesti?</p> <input type="checkbox"/> En <input type="checkbox"/> Silloin tällöin <input type="checkbox"/> Aina <input type="checkbox"/> En osaa sanoa
---	---

<p>Nukutko päiväunia?</p> <input type="checkbox"/> En koskaan <input type="checkbox"/> Satunnaisesti <input type="checkbox"/> Kuukausittain <input type="checkbox"/> Viikoittain <input type="checkbox"/> Päivittäin	<p>Stressaatko asioista?</p> <input type="checkbox"/> En koskaan <input type="checkbox"/> Satunnaisesti <input type="checkbox"/> Kuukausittain <input type="checkbox"/> Viikottain <input type="checkbox"/> Päivittäin <input type="checkbox"/> En osaa sanoa
<p>Jos, kuinka kauan keskimäärin kerrallaan?</p> <input type="checkbox"/> 5-20 min <input type="checkbox"/> 21-35 min <input type="checkbox"/> 36- 60 min <input type="checkbox"/> 1-2 h <input type="checkbox"/> Enemmän kuin 2 h	<p>Heittelevätkö mielialasi</p> <input type="checkbox"/> Päivittäin <input type="checkbox"/> 2-3 kertaa viikossa <input type="checkbox"/> 2-3 kertaa kuukaudessa <input type="checkbox"/> Kerran kuukaudessa tai harvemmin <input type="checkbox"/> En osaa sanoa
<p>Mihin aikaan vuorokaudesta päiväunesi yleensä sijoittuvat?</p> <input type="checkbox"/> Aamuun/aamupäivään <input type="checkbox"/> Iltapäivään <input type="checkbox"/> Iltaan <input type="checkbox"/> Yöhön	

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## UNEN LAATU

Koetko, että unenlaatusi on:

- Huono
- Keskinkertainen
- Hyvä
- En osaa sanoa

Onko sinulla seuraavia uniongelmia: (Voit rastittaa useampia)

- Unissakävely
- Kuorsaaminen
- Unissapuhuminen
- Painajaiset
- Hampaiden narskuttelu
- Yökastelu
- Suonenveto jaloissa
- Yölliset kauhukohtaukset

Jos rastitit edelliseen kysymykseen joitakin vaihtoehtoja, kuinka usein kärsit vaivoista?

- Joka yö
- 2-3 kertaa viikossa
- 2-3 kertaa kuukaudessa
- Kerran kuukaudessa tai harvemmin
- En osaa sanoa

## UNI JA TYÖ

Koetko, että yötyön tekemisestä on haittaa hyvinvoinnillesi?

- Paljon
- Melko paljon
- Melko vähän
- Ei ollenkaan
- En osaa sanoa

Tunnetko itsesi väsyneeksi työvuoron aikana?

- Joka yö
- 2-3 kertaa viikossa
- 2-3 kertaa kuukaudessa
- Kerran kuukaudessa tai harvemmin
- En osaa sanoa

Jos, millä tavalla?

--

<p>Vaikuttaako väsymys työpanokseesi?</p> <p><input type="checkbox"/> Kyllä</p> <p><input type="checkbox"/> Vaikuttaa hieman</p> <p><input type="checkbox"/> Ei</p> <p><input type="checkbox"/> En osaa sanoa</p>	<p>Vaikuttaako väsymys työmotivaatioosi?</p> <p><input type="checkbox"/> Kyllä</p> <p><input type="checkbox"/> Vaikuttaa hieman</p> <p><input type="checkbox"/> Ei</p> <p><input type="checkbox"/> En osaa sanoa</p>
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<p>Sopiiko yötyö sinulle mielestäsi:</p> <p><input type="checkbox"/> Hyvin</p> <p><input type="checkbox"/> Hieman</p> <p><input type="checkbox"/> Ei yhtään</p> <p><input type="checkbox"/> En osaa sanoa</p>	<p>Tunnetko itsesi väsyneeksi vapaa-ajalla?</p> <p><input type="checkbox"/> Päivittäin</p> <p><input type="checkbox"/> 2-3 kertaa viikossa</p> <p><input type="checkbox"/> 2-3 kertaa kuukaudessa</p> <p><input type="checkbox"/> Kerran kuukaudessa tai harvemmin</p> <p><input type="checkbox"/> En osaa sanoa</p>
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<p>Oletko yleensä väsyneempi viikon ensimmäisen yövuoron aikana verrattuna muihin vuoroihin?</p> <p><input type="checkbox"/> Kyllä</p> <p><input type="checkbox"/> Hieman</p> <p><input type="checkbox"/> En</p> <p><input type="checkbox"/> En osaa sanoa</p>	<p>Tunnetko itsesi väsyneeksi päivisin?</p> <p><input type="checkbox"/> Päivittäin</p> <p><input type="checkbox"/> 2-3 kertaa viikossa</p> <p><input type="checkbox"/> 2-3 kertaa kuukaudessa</p> <p><input type="checkbox"/> Kerran kuukaudessa tai harvemmin</p> <p><input type="checkbox"/> En osaa sanoa</p>
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## UNIRYTMII JA UNEN MÄÄRÄ

Kuinka monta tuntia vuorokaudessa nuket keskimäärin, mukaan lukien päiväunet

a) Työvuorokausien aikana \_\_\_\_\_

b) Vapaavuorokausien aikana \_\_\_\_\_

Paljonko unta koet tarvitsevasi vuorokaudessa?

- 2 h enemmän kuin nyt
- 1 h enemmän kuin nyt
- Nukun sopivasti
- 1 h vähemmän kuin nyt
- 2 h vähemmän kuin nyt
- En osaa sanoa

Jos saisit vapaasti nukkua rajattoman määrän vuorokaudessa, paljonko se olisi?

- 4 h tai alle
- 6 h tai alle
- 8 h tai alle
- 10 h tai alle
- 12 h tai alle
- Muu, paljonko? \_\_\_\_\_
- En osaa sanoa

Onko unirytmisi samanlainen vapaavuorokausina ja työvuorokausina?

- Kyllä
- Ei
- En osaa sanoa

Jos ei, miten ne eroavat toisistaan?

Nuketko vapaapäivinä

- Enemmän
- Vähemmän kuin työpäivien jälkeen?

Koetko, että sinulle kasaantuu univelkaa?

- Työvuorokausien aikana
- Vapaavuorokausien aikana
- Molempien aikana
- Ei ollenkaan
- En osaa sanoa

Kärsitkö ajoittain unettomuudesta?

- Joka yö
- 2-3 kertaa viikossa
- 2-3 kertaa kuukaudessa
- Kerran kuukaudessa tai harvemmin
- En osaa sanoa

## NUKAHTAMINEN

<p>Kuinka kauan yötyövuoron päättymisen jälkeen vietät aikaa yleensä hereillä ennen nukkumaanmenoa?</p> <p><input type="checkbox"/> alle tunnin <input type="checkbox"/> alle 2 tuntia <input type="checkbox"/> 2-4 tuntia <input type="checkbox"/> yli 4 tuntia <input type="checkbox"/> En osaa sanoa</p>	<p>Pyörivätkö mielessäsi päivän asiat ennen nukahtamista?</p> <p><input type="checkbox"/> Joka yö <input type="checkbox"/> 2-3 kertaa viikossa <input type="checkbox"/> 2-3 kertaa kuukaudessa <input type="checkbox"/> Kerran kuukaudessa tai harvemmin <input type="checkbox"/> En osaa sanoa</p>
<p>Kuinka kauan nukahtaminen kestää sänkyyn mentyäsi, kun olet päättänyt nukahtaa?</p> <p><input type="checkbox"/> 1- 10 min <input type="checkbox"/> 11-20 min <input type="checkbox"/> 20-40 min <input type="checkbox"/> 41- 60 min <input type="checkbox"/> Yli tunnin <input type="checkbox"/> En osaa sanoa</p>	<p>Onko sinulla vaikeuksia saada unta työvuoron jälkeen?</p> <p><input type="checkbox"/> Joka yö <input type="checkbox"/> 2-3 kertaa viikossa <input type="checkbox"/> 2-3 kertaa kuukaudessa <input type="checkbox"/> Kerran kuukaudessa tai harvemmin <input type="checkbox"/> En osaa sanoa</p>
<p>Heräiletkö kesken unen?</p> <p><input type="checkbox"/> Monta kertaa yössä <input type="checkbox"/> Kerran yössä <input type="checkbox"/> 2-3 kertaa viikossa <input type="checkbox"/> 2-3 kertaa kuukaudessa <input type="checkbox"/> Kerran kuukaudessa tai harvemmin <input type="checkbox"/> En osaa sanoa</p>	<p>Jos heräät, onko sinulla vaikeuksia nukahtaa uudelleen?</p> <p><input type="checkbox"/> Yleensä on <input type="checkbox"/> Joskus on, joskus ei ole <input type="checkbox"/> Yleensä ei ole <input type="checkbox"/> En osaa sanoa</p>



## AVOIMET KYSYMYKSET

Voit tarvittaessa jatkaa kääntöpuolelle.

Minkä kouluarvosanan (asteikolla 4-10) antaisit unesi laadusta?
Mitä hyvä yöuni sinulle merkitsee?
Onko epäsäännöllisestä työstä mielestäsi haittaa terveydellesi? Perustele.
Mitkä asiat vaikuttavat negatiivisesti uneen aamupäivällä nukuttaessa?

## MIELIPITEESI KYSELYSTÄ

<p>Oliko kysely pituudeltaan mielestäsi:</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Liian lyhyt</li><li><input type="checkbox"/> Hieman liian lyhyt</li><li><input type="checkbox"/> Sopiva</li><li><input type="checkbox"/> Hieman liian pitkä</li><li><input type="checkbox"/> Liian pitkä</li><li><input type="checkbox"/> En osaa sanoa</li></ul>	<p>Oliko aihe mielestäsi:</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Mielenkiintoinen</li><li><input type="checkbox"/> Siltä väliltä</li><li><input type="checkbox"/> Tylsä</li><li><input type="checkbox"/> En osaa sanoa</li></ul>
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<p>Oliko kyselyyn vastaaminen mielestäsi</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Helppoa</li><li><input type="checkbox"/> Melko helppoa</li><li><input type="checkbox"/> Ei helppoa eikä vaikeaa</li><li><input type="checkbox"/> Melko vaikeaa</li><li><input type="checkbox"/> Vaikeaa</li><li><input type="checkbox"/> En osaa sanoa</li></ul>
--

**KIITOS VASTAUKSISTASI!**