

ERGONOMICS IN A RESTAURANT

Case study A How is the ergonomic situation in
Amarillo, Jyväskylä seen by its employees?

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Abstract <p>Restaurant Amarillo is popular restaurant in the centre of Jyväskylä city. The starting point of the thesis was suggested by Mr. Jari Leppänen: the number of sick leaves among the employees of the restaurant was higher than on average in the restaurant industry in general.</p> <p>The thesis concentrates on analyzing the ergonomic situation in Amarillo, Jyväskylä. The analysis is based on the results of an enquiry including a questionnaire given to the employees of the restaurant in spring 2009. The purpose of the questionnaire to objectively investigate the ergonomic situation in the restaurant as seen by its employees.</p> <p>The database for the thesis was collected through the Internet, literature, and the questionnaire with the qualitative research method as a tool. The potential areas of improvement were highlighted as based on the results of the questionnaire survey.</p>		
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Työn nimi ERGONOMIA RAVINTOLASSA Miten Amarillo Jyväskylän työntekijät kokevat ravintolan ergonomisen tilanteen?		
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Tiivistelmä Ravintola Amarillo Jyväskylä on suosittu seurusteluravintola Jyväskylän keskustassa. Lähtökohtana tälle opinnäytetyölle oli ravintolapäällikkö Jari Leppäsen ajatus, että ravintolan työntekijöiden sairaslomat ovat korkeat ravintola-alan keskiarvoon nähden. Tämä opinnäytetyö keskittyy ravintolan ergonomiseen tilanteeseen ja kyselyn kautta tehtyyn analyysiin, miten ravintolan omat työntekijät kokevat ergonomian työpaikassaan. Lähtökohta kyselylle on pysyä objektiivisena ja kerätä tietopohja ravintolan työntekijöiden näkökulmasta. Tietoperusta opinnäytetyöhön kerättiin alan kirjoista, Internetistä ja teettämällä kysely Amarillo Jyväskylän työntekijöille. Tämän kyselyn pohjalta mahdolliset parannusehdotukset ergonomiseen tilanteeseen nähden koottiin yhteen. Ratkaisumallit ja mahdolliset parannusehdotukset tarjoavat ehdotuksia ravintola Amarillo Jyväskylän ergonomisen tilan parannukseen sen työntekijöiden näkökulmasta nähtynä.		
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1. Introduction

Amarillo, Jyväskylä is part of the Amarillo restaurant chain Finland. The restaurant combines Mexican style food with lively music and offers big portions of food and youthful and enjoyable atmosphere. The first Amarillo restaurant was opened in 1989 in Tampere. After its success, other restaurants followed. The Amarillo restaurant, Jyväskylä opened its doors in 1994 and has since then successfully catered for locals and visitors alike. The Amarillo restaurants are part of the national S – chain the business of which ranges from accommodation to supermarkets.

Amarillo, Jyväskylä underwent a major renovation in spring 2007. The style of the restaurant was renewed and the number of customer seats more than doubled in this renovation.

Having undergone the renovation of the restaurant, Mr. Jari Leppänen, the restaurant manager felt that the ergonomics of the restaurant still was not optimal. According to him, the average number of sick leaves taken in the previous years, after the renovation, was higher than on average in the hotel and restaurant industry. Furthermore, most of the sick leaves taken in Amarillo, Jyväskylä were related to muscle infections, pain and stiffness, mainly in the back or shoulder areas of the employees.

This thesis studies restaurant Amarillo, Jyväskylä from the ergonomic point of view, as seen by its employees. A questionnaire was used as a research tool in order to acquire the required data. The purpose of the study was to determine whether the employees of Amarillo, Jyväskylä felt that the ergonomics of the restaurant could be improved. Another purpose was to determine the potential improvement areas and find the most suitable solutions to these areas as seen by the employees.

The study also introduces ergonomics and its possible connection to sick leaves and/or workplace injuries in the hotel and restaurant industry.

The responses of the employees included a few issues mentioned often. The main restaurant employees felt that some of the most urgent areas needing improving were in both the restaurant's bars, Mex and Tex. They felt that the beer taps were located too high for them to easily reach them. They also felt that the structure of the bars was somewhat messy and often slowed down their work and the service.

Furthermore, the kitchen employees said that the biggest concern for them was the location of some daily appliances. They felt that some of the devices could be moved around in order to create more functional working space for the employees.

2. Amarillo Jyväskylä

2.1 Physical environment

Amarillo Jyväskylä restaurant is situated in the heart of Jyväskylä city, on Puistokatu 2. It is situated in a shopping mall with other outlets such as a supermarket, a café and a gift shop. The restaurant has three different entrances, one of them being open only during summer months when the sun terrace is open.

The restaurant is open throughout the whole day from lunch until late night. The kitchen of the restaurant is open until very late as well, depending on the need and demand.

2.2 Organizational structure

The restaurant has a flat organizational structure. As the restaurant is part of the national S – chain, it has its own area manager for restaurant and accommodation. Mr. Jari Leppänen is the Amarillo Jyväskylä restaurant manager and responsible for the operations of the restaurant. The restaurant also has four supervisors that the different duties are divided between. Furthermore, there are head chef and two supervisors in the kitchen side of the business. In addition to these, there are several food servers and cooks working the restaurant. Altogether Amarillo Jyväskylä employs 29 employees.

3. Objective of the thesis

The idea for the thesis was suggested by Mr. Jari Leppänen in spring 2009. By then, the author had been working in Amarillo, Jyväskylä for over a year and was very interested in the subject. As agreed with Mr. Leppänen, the study would mainly concentrate on the employees and would study how they felt about the ergonomics in their workplace and if they felt there was something needing improvement. The study would determine whether there was need for improvement or not, as seen by the employees of the restaurant.

It was also decided that the author would conduct a questionnaire survey with the employees as the respondents. The questionnaire would be used as a tool to study the opinions of the employees with the respondents remaining anonymous.

The importance of the thesis lies in the results of the questionnaire. The results of the study will be broken down and analyzed thoroughly. Then, the results will be presented to Mr. Jari Leppänen, who then can decide what to do with them.

The term 'ergonomics' used in this study refers to the physical environment of the restaurant only.

4. Theory of ergonomics

Ergonomics developed greatly in the time of Second World War when the human sciences and technology were used systematically together for the first time. During the Second World War, the science was continuously used in the war industry, especially in Europe and in United States of America. The first national ergonomics association was founded in England in 1949 which was the same time as the word 'ergonomics' was taken into use. (Dul and Weerdmeeste 1998, 1)

4.1 Definition of ergonomics

The word 'ergonomics' derives from Greek words 'ergon (work) and 'domos' (law). According to the International Ergonomics Association (later referred as IEA) and Dul and Weerdmeester (1998, 1), the ergonomics as a science can be commonly divided into three different sub categories that are as follows:

- Physical ergonomics
This sub category is related to the physical activity such as safety, health, working postures and repeated body movements
- Cognitive ergonomics
This category includes the mental processes such as skilled performance, human reliability and human stress
- Organizational ergonomics
The sub category concerns the optimization of socio-technical systems, for example the organizational structures and policies

There are several different kind of definitions for ergonomics, some being very strict whilst others see ergonomics in wider perspective. Wilson and Corlett (1999, 3) define ergonomics as "the study of human abilities and characteristics which affect the design, systems and jobs...and its aims are to improve the efficiency, safety and...well-being".

However, more important than knowing the exact definition is to understand its meaning. It should be seen as an approach of 'designing people' and in this sense; ergonomics is more of a process than anything else (Wilson and Corlett 1999, 3)

IEA (<http://www.iea.cc>, 18/03/2009) sees ergonomics as 'the science of fitting the job to the worker'. This means that the workspace of an employee should be changeable depending on his measures, height and weight for example.

Dul and Weerdmeester (1998, 4) state that the standardization of ergonomics can be fitted only for 95% of the population, excluding very tall, short or overweight people as well as the young, the old, the handicapped and the pregnant.

Most of the international standards are made by ISO (International Standardization Organization).

Furthermore, Dul and Weerdmeester (1998, 1) say that ergonomics is sometimes known as 'human factor' and that ergonomics can be seen as a scientific field that relates to the comprehension of interplay among humans and other elements of a system.

Ergonomics can also be defined as "the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance".

What is an ergonomist?

Both Dul and Weerdmeester and IEA define an ergonomist as a person who has the knowledge and skills to analyze the human interaction and the design of the system so as to optimize the human welfare and the overall system performance.

4.2 Why is ergonomics important?

According to Dul and Weerdmeester (1998, 3) ergonomics have a great social significance. It is stated that many of work-related accidents are caused by an “inadequate relationship between operators and their task”. Many of the accidents can be also acclaimed to a human error.

Dul and Weerdmeester (1998, 3) claim that the two most common reasons for sick leaves from one’s workplace are lower back pains and psychological illnesses often caused by stress. Some of these can be partly caused by the poor ergonomics, such as poor design of equipment and tasks, for example. Additionally, well designed equipment and tasks and thus good ergonomics in one’s workplace may prevent the inconveniences occurring.

It is often stated that good ergonomics saves money and that is usually the main incentive for the employers. However, it must be remembered that money is not the only reason for good ergonomics. Ergonomically designed workplace motivates the employee to work better and strengthen his/her performance. This results in higher job satisfaction and commitment to her/his work. (<http://www.restaurant.org> and <http://www2.worksafebc.com>)

4.3 Ergonomics in a workplace

When looking for directories for ergonomics in different workplaces and industries in Finland, it is noticeable that there are no existing procedures found on ergonomics in the hotel and restaurant industry, not to talk about bars and food/drink service areas. (<http://www.ttl.fi>)

Industrial safety and its legislation in Finland are poor in many industries according to the Federation of Trade Unions (SAK). Proactive development and occupational health care can prevent

and decrease the injuries and illnesses occurred at workplaces. According to the Finnish law, every workplace should have a clarification performed. This clarification should include, among others, all the hazards occurred at workplace. The Federation of Trade Unions also states that occupational health should also concentrate on proactive work with the employees that could prevent their injuries rather than just treating the illnesses (<http://www.sak.fi>)

Although ergonomics is becoming a bigger concern for employers, it still has not been widely looked into by many restaurateurs. Nevertheless, it is generally known that nowadays ergonomics is something that cannot be ignored. According to the data from the Bureau of Labor Statistics United States, the repetitive motion injuries occurred at one's workplace cost employers \$2.3 billion in 1998 in the United States.

According to the website <http://www.restaurant.org/>, the two most common injuries caused by repetitive-motion and poor ergonomics are hand and wrist injuries and a back strain caused by heavy lifting, often in an incorrect way. Many scientists believe that repeating the same motions all the time often in awkward positions is one source of the high costs of sick leaves and lower employee morale.

5. Research methods

"Research is an organized and systematic way of finding answers to questions"

Organized: in that there is a structure or method in going about doing research. It is a planned procedure, not a spontaneous one. It is focused and limited to a specific scope.

Systematic: because there is a definite set of procedures and steps which you will follow. There are certain things in the research process which are always done in order to get the most accurate results.

Finding answers: is the end of all research. Whether it is the answer to a hypothesis or even a simple question, research is successful when we find answers. Sometimes the answer is no, but it is still an answer.

Questions: are central to research. If there is no question, then the answer is of no use. Research is focused on relevant, useful, and important questions. Without a question, research has no focus, drive, or purpose. (<http://linguistics.byu.edu>)

5.1 Research tool

The research method used in this thesis was carefully chosen in order to find the most beneficial tool. Since the focal point of the thesis was to determine the ergonomic situation in the restaurant as seen by its employees, the research method used needed to be as objective as possible. Consequently, it was determined that conducting a questionnaire survey would give the best results.

What is a survey?

“A survey is a method of collecting information from people about their ideas, feelings, health...and social, educational, and financial background”. (Fink, Kosecoff 1998, 1)

There are many different ways to obtain information about people and their beliefs. Since the subject of the study is the employees of Amarillo restaurant, it is natural that the chosen research method was a questionnaire. Theme interviews were one possibility as well but since the aim of the thesis is to get the overall picture of the employees' opinions regarding the ergonomics of the restaurant, the interviews were excluded from the study. It is very important to set boundaries to the survey in order for it not to expand too much and become irrelevant. (Fink, Kosecoff, 1998, 9)

5.2 Research questions

As mentioned above, the aim of the thesis is to determine how the employees of Amarillo Jyväskylä see the ergonomic situation in their workplace. And even though, according the restaurant manager Mr. Jari Leppänen, the problem already existed, it was essential to stay objective. It had to be determined that, that the initial situation was that there was no existing problem. The study conducted would determine whether there was something to be improved or not.

5.3 Questionnaire

The method chosen for this thesis was a questionnaire (appendix 1). The form of the questionnaire varied between open and closed questions. Closed questions consisted of background information of the employees, such as their sex and age. It was agreed that using the open questions as a main type of the questionnaire would give the best outcome and would serve the desired end product the most. By using mainly open questions in the questionnaire, the respondents were not misled or guided to answer the questions in any other way than they desired. The method used in the questionnaire was chosen based on the framework of the thesis and to support the aim of the study in order to achieve the best possible results.

The advantage of the questionnaire compared to other research methods is that questionnaire enables wider sampling and more specific questions. This method is also effective and can give many new opinions on the matter in question (Hirsjärvi, Remes, Sajavaara 2000, 188). Furthermore, since all the questionnaires were conducted anonymous, it gave the respondents the freedom of speech without any hesitations or fear of possible disciplinary actions taken afterwards.

Qualitative method as part of a questionnaire

Qualitative method and using open questions mainly were chosen for questionnaire as the open questions let the respondents express their feeling and thoughts freely. As Hirsjärvi, Remes and Sajavaara (2000, 188) also explain, the open questions do not suggest any possible answers and thus give the most objective outcome.

There are some risks involved in creating and conducting questionnaires. It is quite often that some of the questions might be misinterpreted or misunderstood by the respondents. Making a good questionnaire requires time and knowledge from its creator. In addition to all these, it is impossible to tell how seriously the respondents take the questionnaire. (Hirsjärvi, Remes, Sajavaara, 2000, 188).

It was very important to use open questions as main method for the questionnaire in question. As the initial situation was to determine whether there are any improvement areas seen by the restaurant's employees, the respondents could have not been lead to answer to any of the questions. Open questions gave every respondent the possibility to answer freely and how they see the situation in the restaurant.

6. Conducting of the questionnaire

The questionnaire survey was conducted in April 2009. It was given to every employee of Amarillo, Jyväskylä, excluding Mr. Jari Leppänen, the restaurant manager. Everyone was encouraged to answer the questions. The employees had two weeks to fill in and return the questionnaires.

The possible suggestions for improvement to be raised will be based on the data collected through the questionnaire.

The questionnaire was designed keeping the framework and the aim of the thesis in mind. The questionnaire consisted of 21 questions. The number of the respondents was 11 with four of them representing the kitchen staff and the rest seven the food and drink service staff. The purpose of the questionnaire was to help to answer the research question 'How is the ergonomic situation in Amarillo Jyväskylä seen by its employees?'

When designing the questionnaire, the restaurant was divided into two sections; kitchen and main restaurant. The restaurant side includes the barmen, food runners and waiters and the kitchen side includes all the cooks and kitchen porters. This was essential in order to establish the potential areas to be improved in both the sections.

The first eleven questions were the same for both the restaurant and kitchen sides. These eleven questions determined the age and sex of the respondents including their work histories in the hotel and restaurant industry. The first part of the questionnaire also included questions about the respondents' tendency to exercise. Every question was thought through and formed in a way that it would serve the aim of the thesis and study. The second part of the questionnaire asked more specific questions regarding the ergonomics and the functionality of certain work areas and surfaces. These questions were not to lead any of the respondents

to answer in a certain way but give them a clear picture of what was asked.

In both the sections, the main restaurant and kitchen, there were a few terms only typical of Amarillo, Jyväskylä. These terms were used in the questionnaire for the employees to truly understand the questions. Next, the terms are explained.

Restaurant:

The restaurant is divided into two areas; Mex bar and Tex bar. The Mex bar is situated in front, next to the sun terrace whereas the Tex bar is at the back where the live bands usually play. Both the areas have their own entrances although the entrance to Tex bar is closed every night at 21.00, at the same time as the shopping mall closes. After 21.00, the customers can access to the Tex bar through the Mex bar. When the restaurant is open, it always operates with full capacity with both the bars open to customers.

- **Mex bar**

One of the restaurant's bars, generally known among the employees as 'Mex'. Includes a fully functioning bar with three pairs of beer taps, a glass washing machine and fridges.

- **Tex bar**

One of the restaurant's bars, generally known among the employees as 'Tex'. Includes full functioning bar with two pairs of beer taps, a glass washing machine and fridges.

- **Restaurant room**

The rest of the restaurant, excluding the kitchen and the bars, is called restaurant room in this questionnaire. By this, the questions are asked that are relevant to the rest of the restaurant such as the floors, customer tables, lay out of the restaurant as a whole and functionality of the restaurant room (including possible stairs, corners and corridors in the restaurant).

Kitchen:

- The grill

A person who works in the grill station uses the grill and the deep fryer in the kitchen.

- The plate station

A person who works in the plate section is responsible for putting everything together on a plate. This person finishes the plates off with the garnish and makes sure everything is correct on the plate.

- The bolillo station

A person who works in the bolillo section is responsible for cooking the bolillos, pizzas and pastas.

- The dish washer station

A person who mainly washes dishes, sorts out the washed dishes and puts them in their correct places. This person also functions as a 'back up person' in case it gets busy and extra help is needed.

- The stores

The stores are located beneath the restaurant; one can either take stairs or lift to the stores. There is no one to work in stores full time, therefore almost every member of staff needs to go to stores occasionally.

All the questions in the second part of the questionnaire are in connection with ergonomics and how ergonomics can affect on the employees differently depending on their health and work history. These questions were same for both sides of the restaurant; kitchen and restaurant room. Finally, the last question is left open for free word, where the employees were encouraged to write freely how they feel about the ergonomics situation in the restaurant.

7. Results of the questionnaire

Every question is separately numbered in order to avoid misunderstandings, and every diagram is also separately analyzed. First the restaurant side is analyzed followed by the kitchen side.

7.1 Restaurant

Seven of all the employees working in the restaurant service answered the questionnaire.

1. The age of the respondents

The percentage of the respondents to answer this question was 85,7 with one of the respondents leaving this question blank.

The average age of the employees working in the restaurant of Amarillo, Jyväskylä is 25,3 years, the youngest one being 23 years old and the oldest 28 years.

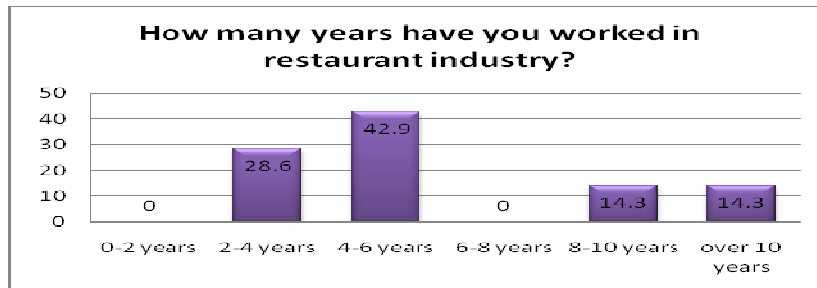
2. The sex of the respondent

One out of seven respondents was male, and six respondents were female.

3. Are you a full time or a part time employee?

The majority (seven) of the respondents work full time at Amarillo, Jyväskylä. Three of them were part time employees of the restaurant.

4. How many years have you worked in the restaurant industry



All the respondents have been working in the restaurant industry for two or more years. Three of the respondents have been working in restaurant industry between four and six years. One respondent has been working in the restaurant industry for more than ten years.

5. How many years have you been working at Amarillo Jyväskylä?

The majority of the respondents answered that they had been working atn Amarillo, Jyväskylä between one and three years. Two of the respondents told that they had been working there for more than six years.

6. How many hours do you work on average in a week?

This question was open. Therefore, the answers varied. The average weekly working time was 33.4 hours.

7. In your own opinion, how many days have you been on sick leave during the last year?

The answers spread evenly between the respondents. One of the respondents had not been on sick leave at all during the last year. On average, an employee had been on sick leave between six and ten days or over twenty days during the last year.

8. Do you think the reason(s) for your sick leave was caused by ergonomics in the restaurant?

Since one of the respondents had not been on sick leave at all during the last year, the percentage that answered to this question was 85,7 % (six out of seven respondents).

Half of the respondents felt that their sick leave was due to the ergonomics while two of the respondents answered that they did not think the ergonomics had anything to do with their sick leaves.

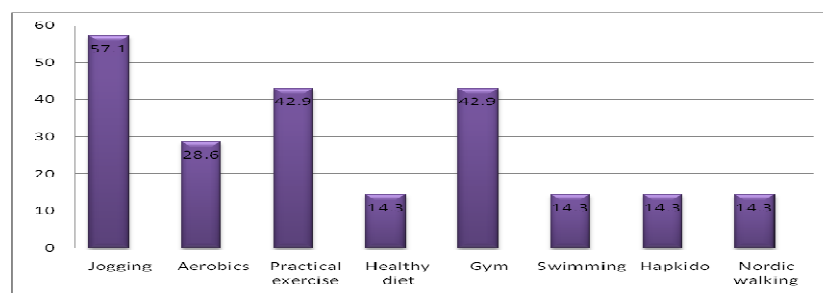
9. Have the reason(s) for the sick leave appeared already before working in Amarillo Jyväskylä?

Five out of seven respondents answered to this question.

Clear majority of the respondents felt that the reason behind their sick leaves had not appeared before they started working in Amarillo Jyväskylä. One of the respondents said that the reasons for the sick leave had already existed before Amarillo Jyväskylä.

10. How do you maintain your physical health?

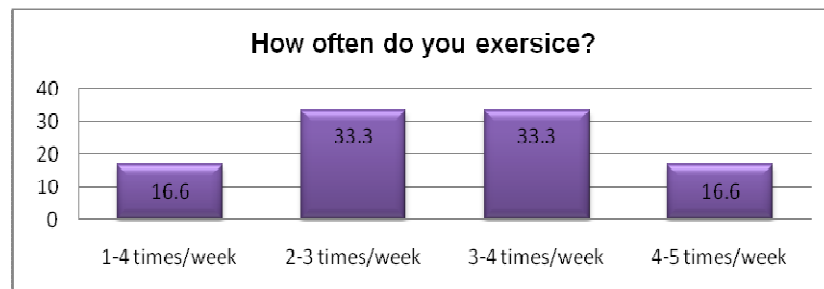
The overall percentage of the answers will go over 100 % since the respondents were able to answer as they felt.



All the respondents maintained their physical health in one way or another. The answers varied from Nordic walking and swimming to jogging and healthy diet. Jogging was clearly the most popular way of exercising among the respondents.

11. How often do you exercise?

This was an open question, therefore the answers differed slightly.

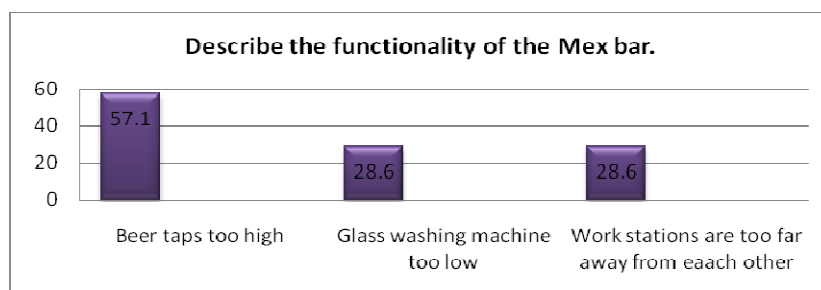


Majority of the respondents exercised between two and four times a week. Many of the respondents said that it depends on the week how much they exercise.

The next questions were open questions; therefore, the percentage of the answers goes above 100. The most popular answers have been put into paragraphs.

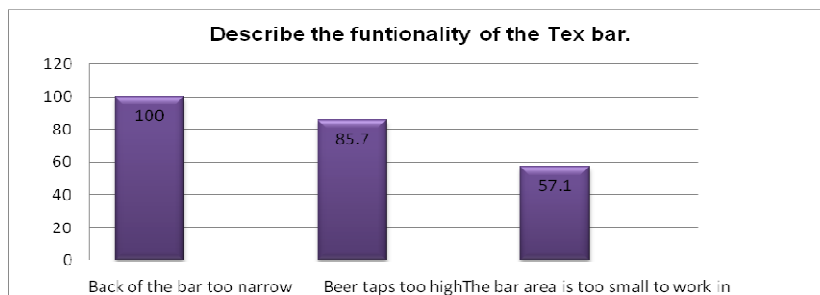
12. Describe the functionality of the following work stations

Mex bar



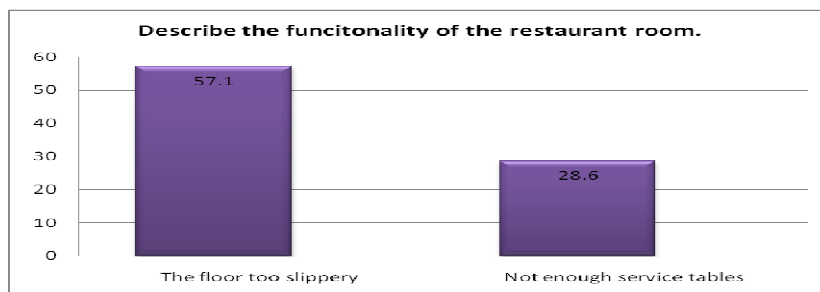
Majority of the respondents felt that the beer taps were too high in Mex bar. The most popular answers also included the glass washing machine being situated too low and the work stations being too far away from each other.

Tex bar



All the respondents felt that the Tex bar is very narrow. They answered that the bar is sometimes too small to work in, especially when there are more people working at once. Majority of the respondents also felt that also the beer taps in Tex bar are situated too high. Furthermore, as mentioned in the previous question, the respondents said that the Tex bar is very small and narrow to work in. In most cases this will cause extra turning and moving around the other employees.

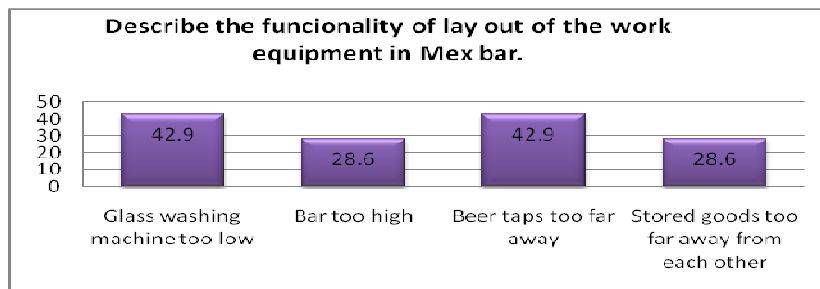
The restaurant room



Majority of the respondents said that the floors in the restaurant are very slippery and might cause falling over easily. Especially the floor in front of the kitchen is very slippery according to the respondents. Furthermore, the respondents felt that there are not enough service tables in the restaurant room that would help greatly when serving bigger tables for example. The respondents felt that the waiters could put the heavy trays on the service tables while serving the tables.

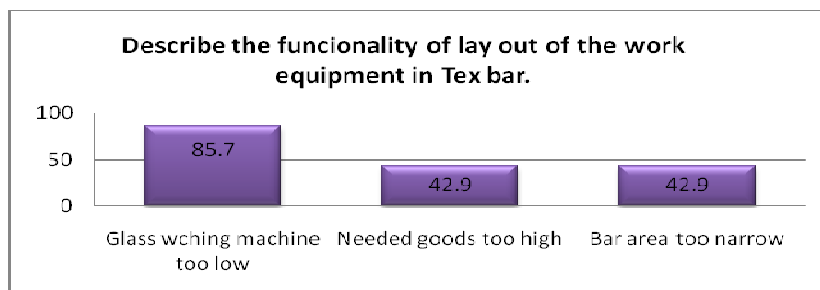
13. Describe the functionality of lay of the work equipment (e.g. the height, the location of the work equipment) in the following work stations

Mex bar



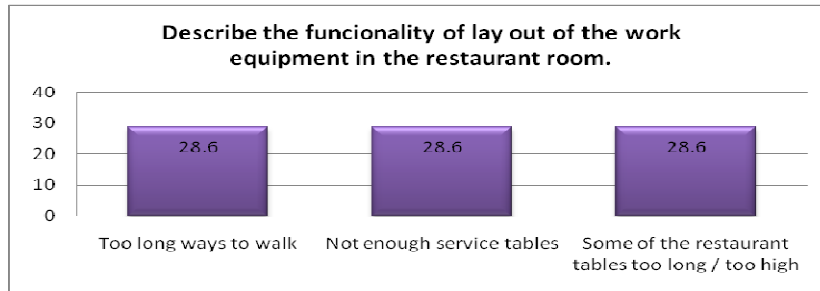
Almost half of the respondents felt that the glass washing machine in Mex bar is too low. Same percentage of the respondents also answered that the beer taps in Mex bar are too far away from each other. The respondents felt that the poor location of the equipment causes wrong working posture when working in Mex bar.

Tex bar



A majority of the respondents felt that the glass washing machine was situated too low also in Tex bar. Other popular answers included the Tex bar area being very narrow to work in as well as the needed goods, such as spirit bottles, being too high. It came clear that based on the answers, the respondents felt that most of the commonly used work equipment was situated poorly.

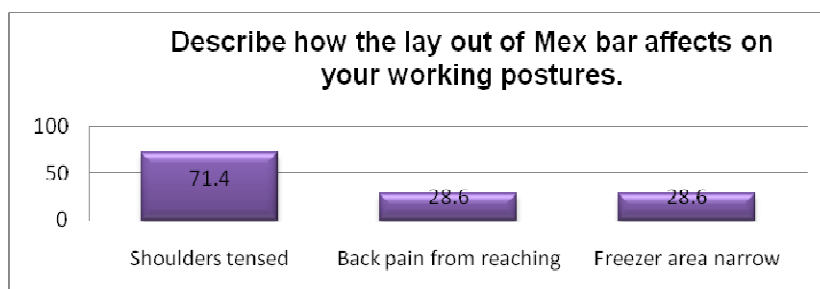
The restaurant room



The answers to this question spread evenly. Almost third of the respondents felt that the ways to the tables are too long with heavy trays, especially when there are not enough service tables in the restaurant room. Same amount of respondents also mentioned that some of the tables in the restaurant are either too long or high for waiters easily to serve them.

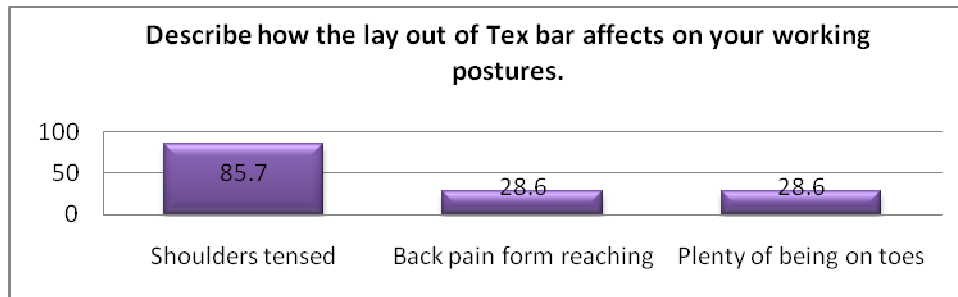
14. Describe how the lay out (the location and functionality of the work equipment) of the following work stations affect on your working postures (e.g. do you need to crouch, reach, and tense your shoulders?). Are you able to keep your natural posture when you are making drinks or using the till for example?

Mex bar



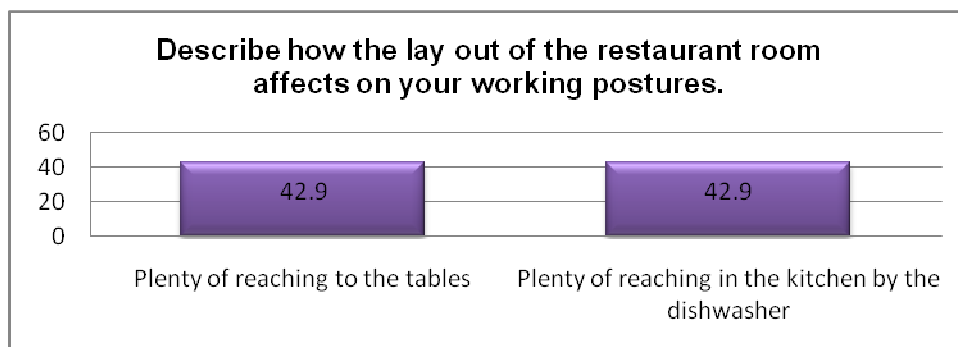
A clear majority of the respondents felt that their tense their shoulders continuously while working, for example when pouring a pint of beer. Almost third of the answers pointed out that the respondents were suffering from back pain from excessive reaching goods at all times. Equally same amount of the respondents answered that since the freezer area is very narrow in Mex bar, it complicates working and increases the circulation of the body according to the respondents.

Tex bar



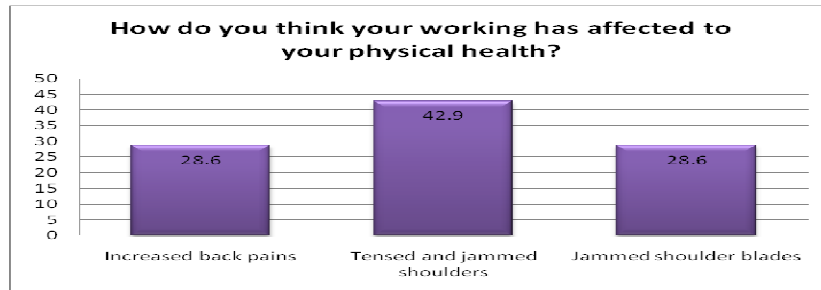
Majority of the respondents felt that working in Tex bar causes them tensing their shoulders most of the time while working. Almost a third of the answers said that the respondents got back pain from reaching unnecessarily while reaching the stored goods. Again, the same amount of the respondents felt that many of the stored goods are high in Tex bar that leads the respondents being on their toes often.

The restaurant room



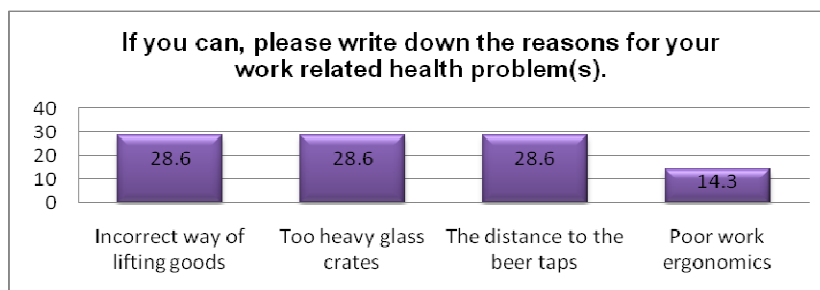
Almost half of the respondents felt that due to the situating of some of the tables in the restaurant, they have to reach to the tables. Additionally, same amount of the respondents felt that in the dishwasher area in the kitchen causes much of reaching.

15. How do you think your working has affected to your physical health?



Almost half of the respondents said that the most common problem they have had with their physical health is tensed and jammed shoulders. Almost of respondents felt that their back pains had increased. Same amount of respondents answered that their shoulder blades are often very tense and jammed due to working in the restaurant.

16. If you can, please write down the reason(s) for your work related health problem(s).



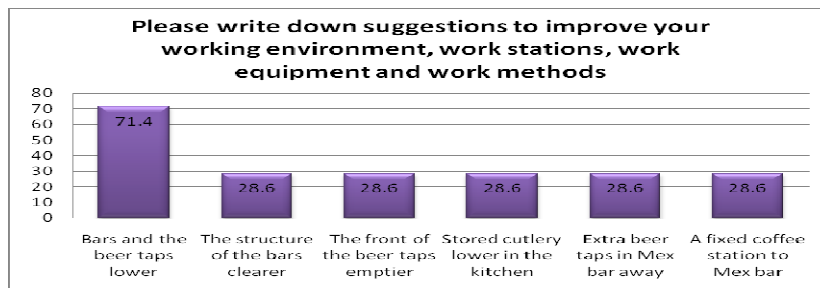
The answers the respondents spread very evenly. The most common reasons for the work related problems, according to the respondents were incorrect way of lifting goods, the glass crates being too heavy and the beer taps being too far away for the respondents to use them. One respondent also mentioned that poor work ergonomics is one of the reasons for work related health problems. The respondent felt that poor ergonomics in their work place causes tensing the shoulders.

17. How do you feel that other things related to ergonomics affect on your work well-being (e.g. the quality of the air, noise)?

Almost half of the respondents felt that the restaurant is sometimes very cold and one of the respondents added that the tensing the shoulders is probably caused by the cold air coming through the doors. Almost third of the respondents said that the noise level is very high, especially on weekends and nights when there is a live band playing. One of these respondents also added that his hearing had most likely deteriorated because of this.

Moreover, one respondent said that he has not had any problem with other issues related to ergonomics.

18. Please write down your suggestions to improve your working environment, work stations, work equipment and work methods



Majority of the respondents said that the beer taps in both bars should be lowered. They also said that both of the bar counters are very high and it would benefit the employees to get them lower as well. They also felt that their back and shoulder pains would reduce by doing this.

A fixed coffee station was suggested to replace the extra beer taps in Mex bar to create more space and more feasible working environment. Altogether the respondents felt that both of the bars should be cleared out from excessive goods and to be organized in

order to achieve more practicable work stations. This would also reduce the needless circulation of the back.

19. Free word

Only one of the respondents answered to this saying that they hoped that some improvement would happen.

7.1 Kitchen

Four employees of all kitchen employees answered to the questionnaire.

1. The age of the respondent

The average age of the respondents was 27 years old; the youngest person being 24 years old and the oldest 29 years old.

2. The sex of the respondent

Half of the respondents is female, half being male

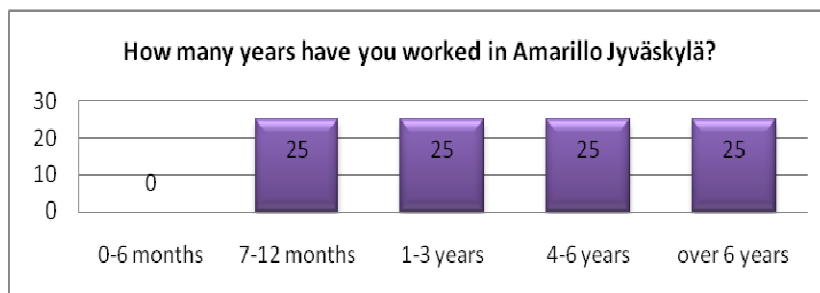
3. Are you a full time or a part time employee?

All the respondents are full time employees in Amarillo Jyväskylä

4. How many years have you worked in restaurant industry?

Half of the respondents have worked in restaurant industry between four and six years, other half having worked between six and eight years in restaurant industry

5. How many years have you worked in Amarillo Jyväskylä?

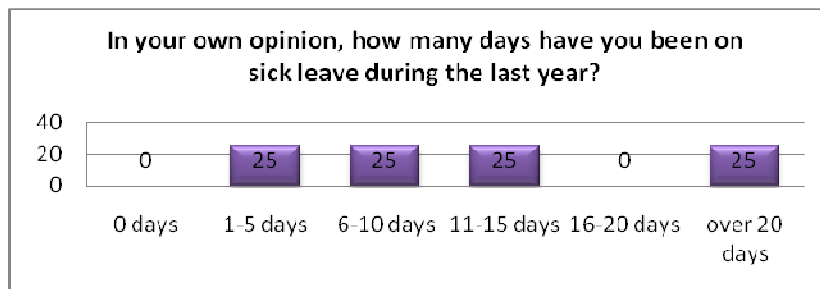


The length the respondents have worked in Amarillo Jyväskylä varied. Every respondent has worked in the restaurant different period of time; one respondent has worked between seven and twelve months, one worked between one and three years, one having worked between four and six years, leaving one respondent having worked over six years in Amarillo Jyväskylä.

6. On average, how many hours do you work in a week?

The respondents worked 34,5 hours in an average week.

7. In your own opinion, how many days have you been on sick leave during the last year?

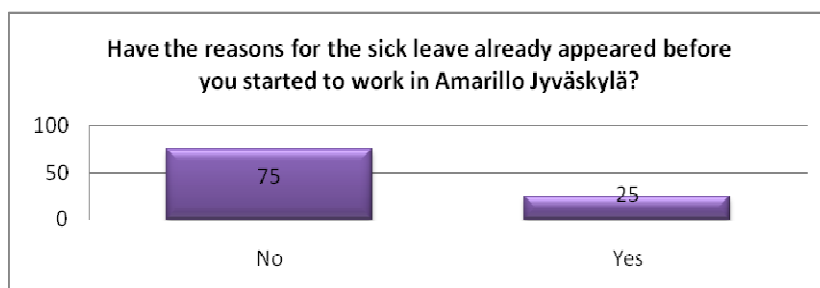


Again, the answers varied from one day to over 20 days being on sick leave. All the respondents have been on sick leave at least for a day during the last year. One of the respondents has been on sick leave over 20 days during the last year.

8. Do you think the reason(s) for your sick leave was caused by ergonomics in the restaurant?

Half of the respondents felt that ergonomics of the restaurant might have caused their sick leave whereas half of the respondents said that the ergonomics of the restaurant did not have anything to do with their sick leave.

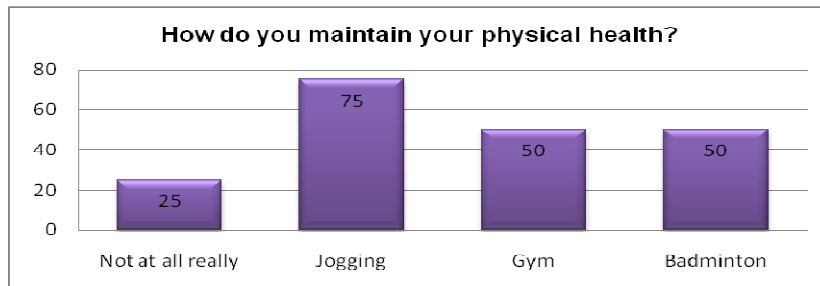
9. Have the reasons for the sick leave already appeared before you started to work in Amarillo Jyväskylä?



Three out of four respondents answered that the reason(s) for their sick leave have not appeared before they working in Amarillo Jyväskylä. One of the respondents said that the reason(s) for their

sick leave had already started before his career in Amarillo Jyväskylä.

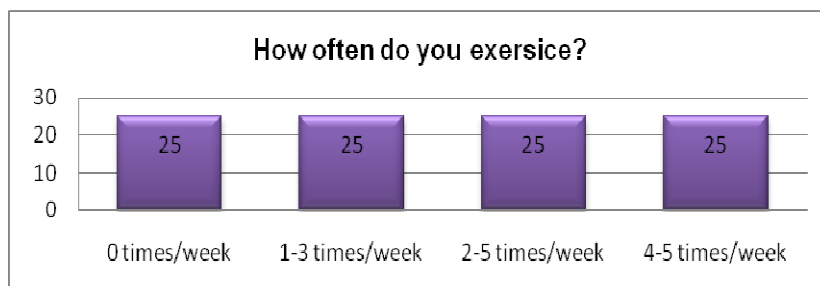
10. How do you maintain your physical health?



Since this was an open question, the answers varied.

The most common way of maintaining one's physical health was jogging. One of the respondents said that they do not exercise at all really. Gym and badminton were among the most popular ways to maintain their physical health; both being mentioned by half of the respondents.

11. How often do you exercise?



Three quarters of the respondents exercised at least once a week, depending on the week. One of the respondents said to exercise four to five times a week whilst one of the respondents said that they do not exercise at all.

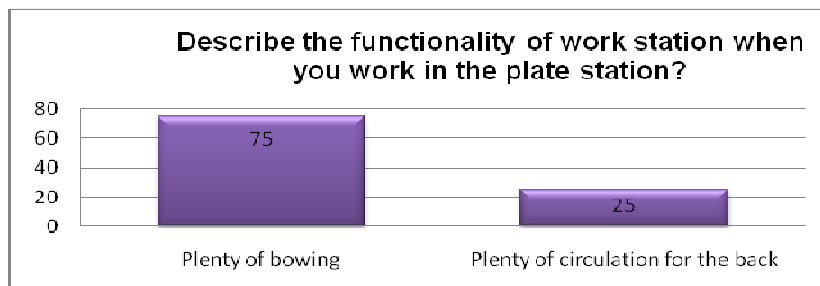
The next questions were open questions; therefore, the percentage of the answers goes above 100. The most popular answers have been put into paragraphs.

12. Describe the functionality of the work equipment in the following work stations

The grill (grill, deep fryer):

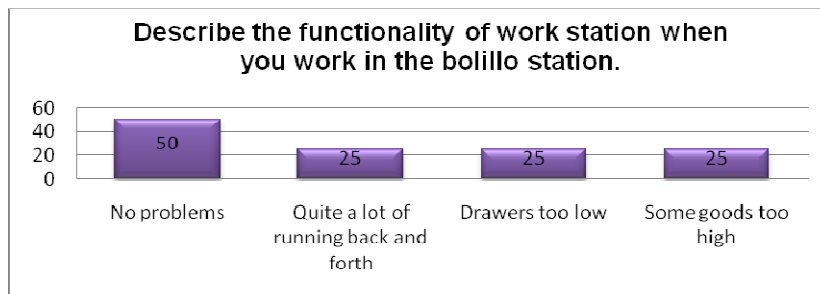
The respondents thought that this station works rather well; one respondent saying that working with the deep fryer causes excessive circulation to one's back since the goods are stored in the opposite sides of the kitchen. Additionally, one of the respondents felt that some of the heights are not correct in the station; the grill is too high for some whereas the drawers are too low for the others.

The plate station:



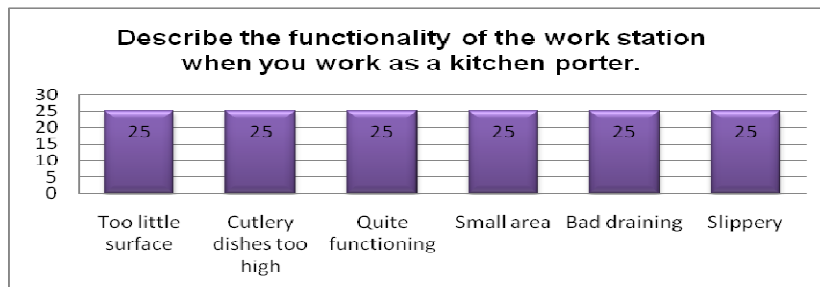
Three out of four respondents felt that working in the plate station causes a lot of bowing due to the location of the drawers. They felt that the drawers were situated too low. One of the respondents said that they would like to have the goods stored on same side in avoidance of the back circulation.

The bolillo station:



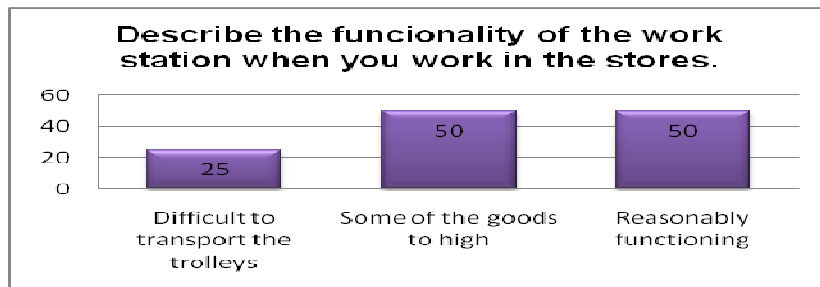
The answers to this question were divided; half of the respondents felt that the bolillo station works well and that there are no problems at all. Furthermore, other half of the respondents said that there were some things to be improved. One of the respondents felt that the drawers are too low whereas one of the respondents said that some goods are stored too high. Additionally, one of the respondents said that working in this station causes a lot of running around in order to acquire all the needed things.

The dish wash station:



All the answers were spread evenly among the respondents. The answers included, among the others, that there is too little surface to put any of the dishes down and the station is very small for the size of the restaurant. Also, the cutlery dishes are too high and some of the employees do not reach them properly. The floor is slippery and the station has a bad draining that might occasionally cause over flooding. One of the respondents also said that the station rather functioning, with only little faults.

in stores:

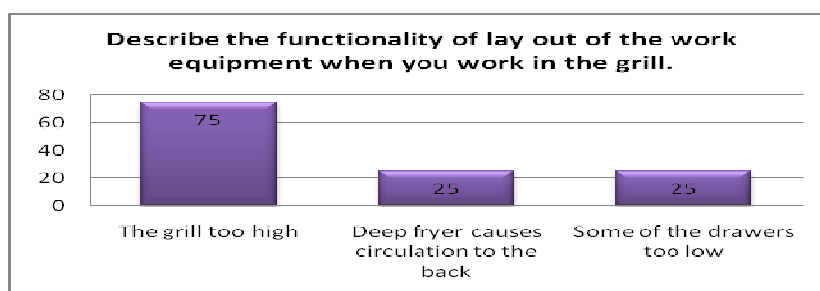


Half of the respondents felt that especially in the stores downstairs the shelves are very high and it is very hard to reach them whereas the other half of the respondents said that the stores function quite well as they are now. They also said that working in the stores does not cause any kind of problems physically.

In addition to this, one of the respondents felt that since they work in the stores very rarely, it does not cause any problems.

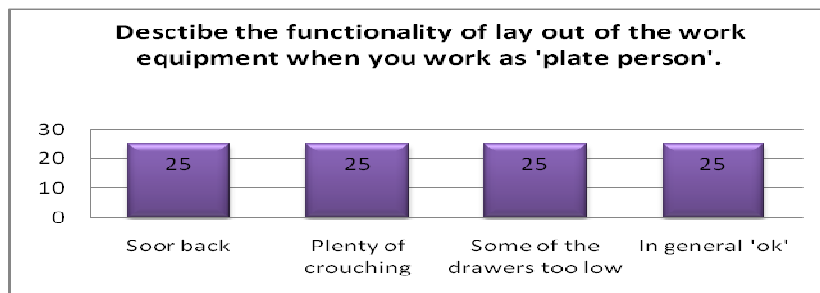
13. Describe the functionality of lay out of the work equipment (e.g. the height, the location of the equipment) when you work in the following stations

The grill



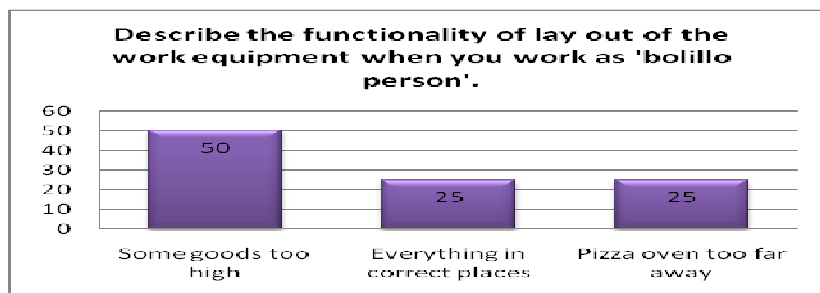
Three out of four respondents said that the grill is too high which causes tensing the shoulder / neck area when working. One of the respondents felt that working in this station causes circulating the back too much. Additionally same amount of respondents said that the drawers are situated too low that causes a lot of crouching.

The plate station



All the respondents felt slightly different from each other about the functionality of the plate station, thus all the answers differed. Three out of four respondents agreed that since the drawers are too low, it causes crouching that again leads to sore back. One of the respondents felt that everything was generally speaking fine.

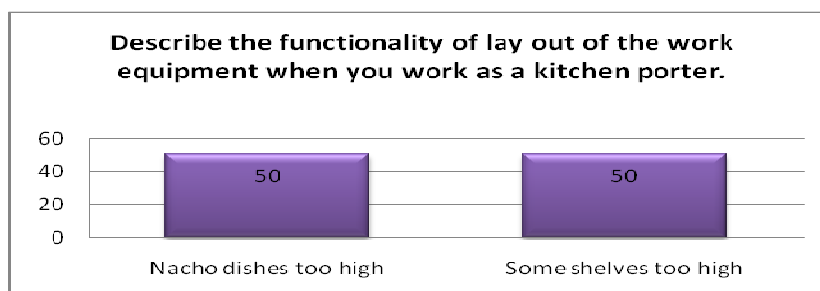
in Bolillo station



Half of the respondents felt that some of the stored goods are too high and that cleaning some parts of the station (e.g. microwave oven) is rather difficult due to its location. One of the respondents said that pizza oven is too far away from the rest of the kitchen thus causes running back and forth and affects on the functionality of this station.

The dish wash station

Only two out of four respondents answered to this question



One of the respondents said that the nacho dishes are situated too high and the other respondent agreed saying that some of the shelves are very high in this station.

in stores

Only half of the respondents answered to this question

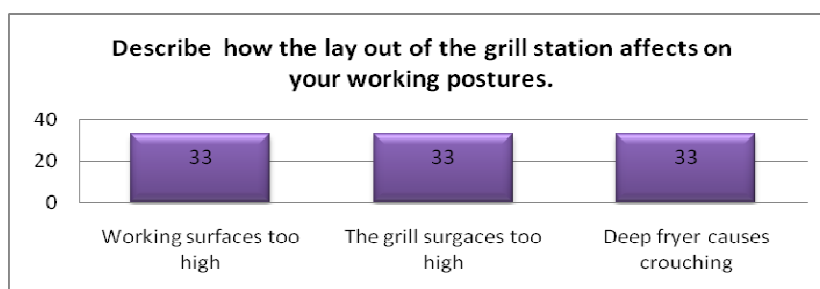


All the answers to this questions agreed that the shelves are too high in stores. Additionally one person said that the location of stores (the stores being located downstairs) causes extra work for the employees.

14. Describe how the lay out (the location and functionality of the work equipment) of the following work stations affect on your working postures (e.g. do you need to crouch, reach, and tense your shoulders?). Are you able to keep your natural posture when you are making drinks or using the till for example?

Three out four respondents answered to this question, one respondent left it empty.

The grill



One out of three respondents answering to this question said that the working surfaces in the whole kitchen are too high. The

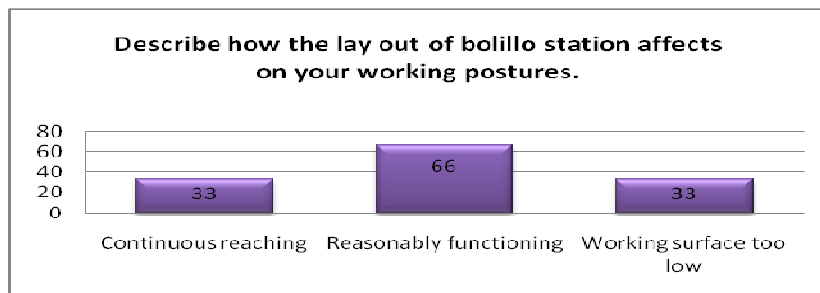
employee felt that this increases the tension on shoulders and neck area.

The grill causes a lot of reaching according to one of the respondents whereas one said that working with the deep fryer causes a lot of bowing since many of the drawers are situated low.

in plate station

Two out of three respondents said that working in the plate station causes plenty of crouching and bowing. One said that the working surface is too low in order to able to work well.

in bolillo station



Two out of three respondents felt that the bolillo station is reasonably functioning and they felt that there were not big issues to be improved. One of the respondents felt that working in this station causes a lot of reaching for goods that are stored in difficult way. They also said that the working surfaces are too low for them.

in the dish wash station

Only one respondent answered to this by saying that the dish wash station works fine and that there is nothing major to improve.

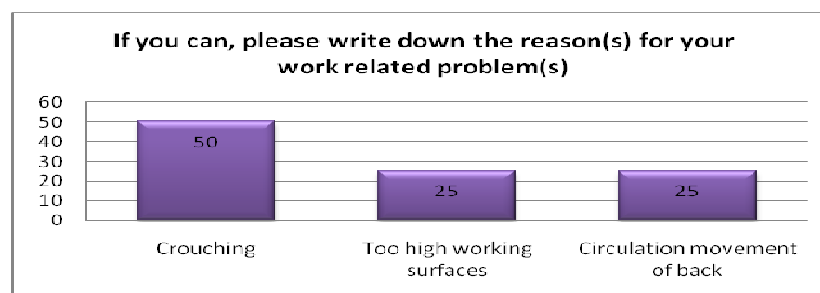
in the stores

Only two out of four answered to this question. One of the respondents felt that some of the goods are situated in an incorrect way in the stores and this causes reaching and crouching. One said also that lifting the heavy goods affects on their back when working in the stores.

15. How do you think your working has affected your physical health?

Three out of four respondents felt that working causes mainly back pains for them, and one of these respondents also felt that their back problems have increased since they started to work in Amarillo Jyväskylä. One of the respondents said that their shoulder and neck area is continuously tensed after work.

16. If you can, please write down the reason(s) for your work related health problem(s).



The respondents felt that the too high working surfaces cause tensing of the shoulders and neck area. Additionally, half of the respondents said that continuous crouching is the biggest reason for their work related problem(s). One said that the circulation movement of their back whilst working has increased their back pains.

17. How do you feel that other things related to ergonomics affect on your work well-being (e.g. the quality of the air, noise)?

Half of the respondents felt that the noise is sometimes very loud, especially on the evenings when there is live band performing. They also wished to be able to have their break in peace and quiet in order to relax. One of the respondents felt that the air is very dry and that had caused them sore throat and dryness of their nose.

18. Please write down your suggestions to improve your working environment, work stations, work equipment and work methods

The respondents suggested several different things; they felt that the working surfaces should be adjustable in order for all heights of employees to work ergonomically. Additionally the pizza oven should be lower. They wished they would get sharper knives that would ease the cutting and slicing of the ingredients. The kitchen floor is also very slippery and the respondents felt that something should be done for it.

The respondents also mentioned that the potatoes that are used for deep frying should be on the same side as the deep fryer in order to avoid the extra circulation movement to the back.

All in all, the respondents felt that the stored goods and the plates should be as close to each other as possible in order to get a kitchen that would function better.

19. Free word

None of the respondents replied to this question.

8. Summary of the results

8.1 Restaurant (Mex bar, Tex bar, restaurant room)

The demographic and the geographical background of the respondents

Half the respondents were full time employees of Amarillo, Jyväskylä. Almost half the employees had been working in the restaurant either between four and six years or between one and three years. The average number of hours worked per week was 33.

Sick leaves

There was some deviation in sick leaves among the respondents. Almost a third of the respondents had been on sick leave over twenty days during the last year. The same number of respondents had been on sick leave between six and ten days.

Half of the respondents that had been on sick leave felt that the ergonomics of the restaurant was one of the reasons for their sick leave whereas a third of the respondents said that the ergonomics had nothing to do with their sick leaves. Furthermore, the majority of the respondents said that the reasons for their sick leaves were related to the time after they had started their careers at Amarillo, Jyväskylä.

Physical health

All the respondents exercised at least once a week. Jogging was clearly the most popular way of maintaining one's physical health besides practical training and going to gym.

Mex bar

The biggest issue raised in the Mex bar was the location of the beer taps. Most of the respondents felt that the beer taps were either too far away or too high for them to reach the taps properly.

Additionally, the respondents felt that the glass washing machine was situated too low. The respondents felt that these factors affected their backs whilst working and therefore resulted in back pain.

Moreover, the respondents felt that the Mex bar was untidy and unorganized; many of the stored goods were spread everywhere in the bar, far away from each other, which the respondents said caused plenty of running back and forth.

Tex bar

All the respondents felt that the Tex bar was too small and narrow especially when there were many people working at the same time. They also said that the beer taps were situated too high for them to reach them properly. Additionally, the glass washing was placed too low according to the answers. The incorrect location causes plenty of unnecessary lifting leading to back pain. The respondents also felt that many of the goods, such as spirit bottles for example, were stored too high. This complicates the work in the bar.

The restaurant room

The biggest issue the respondents felt that occurred in the restaurant room was the slipperiness of the restaurant floors. According to the respondents, the floors are very slippery, especially in the front of the kitchen area. Additionally, the respondents felt that there should be more service tables in the restaurant room enabling the employees to put down heavy trays when serving particularly larger tables.

The respondents also felt that some of the tables in Mex bar side of the restaurant room are difficult to reach to which then leads to excessive reaching to the tables.

Physical problems

The most common problems the respondents have had with their physical health were sore back and tensed and jammed shoulders. They felt that these have increased, or started; when they began their career in Amarillo Jyväskylä. They felt that main reasons for these problems were lifting too heavy goods in incorrect way and straining their shoulders and back, especially when using the beer taps. Almost half of the respondents experienced the restaurant room being very cold and this causing tensing their shoulders. Additionally the level of noise was experienced somewhat too high, particularly during the weekends and live band nights.

8.2 Kitchen

The demographical and the geographical background of the respondents

Half of the respondents in the kitchen side were female, half being male. The average age for kitchen employees is 27 years. All the respondents were full time employees of Amarillo Jyväskylä. On average, the respondents work 34,5 hours in a week. The length of each employees work history in the restaurant differed from under one year to over six years.

Sick leaves

All the respondents had been on sick leave at least one day during the previous year. Half of the answerers felt that the one of the reasons for their sick leave was the ergonomics of the restaurant whilst half of the respondents did not feel there was any connection between these two. Three quarters of the respondents said that

their physical problems started after they began their career in Amarillo Jyväskylä.

Physical health

One of the respondents said that they do not exercise at all. Among the other respondents, jogging was clearly the most popular way of maintaining one's physical health. Apart from the one respondent, each employee exercised at least once a week, the amount varying from one time to five times a week.

The grill

The respondents felt that the drawers are situated too low and this causes plenty of bowing and crouching therefore results in sore backs. Additionally, the grill was said to be too high for some of the employees and they felt that this strains the neck and shoulder area.

Majority of the respondents also mentioned that many of the needed goods are stored on the opposite side of the deep fryer and thus increases the circulation movement of their backs.

Plate station

As mentioned with the grill station, the respondents felt that the drawers were on too low level. Again, this causes plenty of crouching and bowing and hence increased back pains.

Bolillo station

The respondents experienced many of the stored goods being at incorrect level for them to work easily; the goods being either too low or too high. They felt that the employees need to reach or bow in order for them to acquire the needed goods. They felt that this strains their backs.

The dish wash

Majority of the respondents felt that there is not enough surfaces to put dishes down in the dish wash station. They also mentioned the

floor of the kitchen being very slippery, especially by the dish washer, partly because of poor draining system. Some of the respondents said that some of the shelves are situated too high and it makes it almost impossible for them to reach the shelves.

The stores

The biggest issue raised regarding the stores was the location of it. The answerers felt that the stores are too far away, that made particularly the transportation of the heavy and big goods more difficult. Additionally the respondents experienced the shelves in the stores being situated too high for them to reach the stored goods.

Physical problems

The respondents from the kitchen side said that they mostly experience back and neck/shoulder pains whilst/after working in the restaurant. They felt that the incorrect height of many of the stored goods and shelves causes them unnecessary reaching and bowing and hence the increased back and neck/shoulder problems. Additionally as mentioned before, the increased circulation movement of the employees' backs caused sore backs.

The employees also experienced the noise level being somewhat too high sometimes. One respondent also mentioned that it would be nice to be able to have their break in quiet environment, rather than in the restaurant room.

9. Suggestions for improvement

The chapter is divided into the restaurant side and the kitchen side in order to avoid any misunderstandings.

9.1 Restaurant (Mex bar, Tex bar, restaurant room)

The most common continuous problem the respondents experienced was the incorrect location of many items or goods. For example the beer taps were mentioned several times in both the Mex and Tex bar answers. The taps should be lowered to a level reachable by any employee of the restaurant.

Additionally, it would be essential to have adjustable working surfaces in order for the employees to work in a more ergonomic way. It can be hazardous for the employee's physical health to repeat the incorrect way of working every day.

Furthermore, the storing of many goods in both the bars, Mex and Tex, could be organized better. It could be advisable to check the arrangement of the bars, to see that goods needed at the same time would be stored close to each other. In addition to this, the goods that are needed on a daily basis should be stored on an easily reachable level.

9.2 Kitchen (grill, plate and bolillo stations, dish wash, stores)

There were a few things that clearly were mentioned many times by the respondents. One of the most common issues the employees seem to deal with is the working surfaces; either they are too low or too high. It would be advisable to organize adjustable working surfaces for the employees, especially in the kitchen since the employees are required to use the working surfaces at all times during their working day.

The drawers in the kitchen were mentioned by majority of the respondents. They felt that they are situated too low level and that increases tensing the back and thus the back pains. Additionally, the answerers said that the items that are used with the deep fryer should be put to the same side of the kitchen to avoid excessive circulation movement of the back.

9.3 Ergonomics directory

As it was mentioned several times by the respondents, heavy lifting, bowing and reaching do affect on the back and shoulder area. Additionally, it must be remembered that restaurant industry has its specific needs and requirements and therefore it is important to keep in mind that everything cannot be avoided whilst working in restaurants; the waiter still has to carry a tray and the cook still has to slice and cut ingredients.

Having said this, however, it would be very beneficial for the restaurant to create an ergonomics directory. This directory would give the present and the future employees instructions on how to carry heavy items, how to lift goods in correct way and in general how to work better in more ergonomics way. The incorrect lifting and its techniques can cause unnecessary back strain for the employees. Therefore the employees should be taught the correct lifting techniques among the others. The following samples were taken from Dul and Weerdmeester (1998, 31-33) to give an example of the correct lifting techniques.

- “consider using the help of others if possible
- make sure that the feet are in a stable position
- use the whole hand when lifting, not just the fingers
- hold the load as close as possible to the body while lifting
- move the feet if needed”

It must also be taken into account that even the smallest changes in working environment can have a major effect on the ergonomics

of the workplace and thus the well-being of an employee. In addition to this it is important to keep in mind that the possible cost effects and savings do not necessarily show at once. These might be seen in a few years time.

10. Discussion

The thesis process started in January 2009 after the author was approached by Mr. Jari Leppänen, the restaurant manager. Since the author had been working in the restaurant Amarillo Jyväskylä for over a year at the time, the idea seemed very interesting.

Initially, the purpose of the thesis was to survey the ergonomics situation of the restaurant since Mr. Jari Leppänen was concerned about the high percentage of sick leaves among the restaurant's employees. He wanted to know if there was something to be done in order to decrease the number of sick leaves. He was also interested in knowing if there was a connection between the sick leaves and the ergonomics in the restaurant. But since the statistics of the sick leaves, and more importantly, the reasons for the sick leaves in the restaurant are confidential, it would not have been possible to relate the number of sick leaves to the restaurant ergonomics.

Shortly after this, it was also realized that a much more thorough study should take place preferably conducted by ergonomics specialists. After a conversation with Mr. Jari Leppänen, it was decided that the thesis would study the perception and feelings of the employees regarding the ergonomics situation. The questionnaire would be the most suitable research method to get as large a sample as possible. Additionally, using the qualitative method as part of the questionnaire process, in the form of open questions, would ensure that the respondents were not led to answer in any particular way.

Once the questionnaires have been studied and analyzed, improvement suggestions would be made. Jari Leppänen can then, as he sees best, share this information with his employees and

make the possible improvements in the restaurant. The thesis can be very beneficial to the restaurant and its employees. It does not only study the perception of ergonomics in the restaurant by its employees but also it gives an insight into the ideas and opinions of the employees themselves.

The sample of the questionnaire was not as large as it could have been. Only eleven out of 29 employees took the questionnaire. It can only be questioned whether the remaining 18 employees did not feel the need to answer the questionnaire possibly due to their positive opinions of ergonomics. Nevertheless, this cannot be confirmed, and therefore the results drawn from this questionnaire should be seen as an important part of the future plans in the restaurant.

It can be assumed that since the employees daily face these physical problems, they presumably affect the number of sick leaves. The areas highlighted in this study could be researched by a specialist to determine if something needs to be done.

Writing the thesis was both an exhilarating and exhausting experience. A lot of unnecessary writing was done in order to succeed in finding the correct outline for the thesis. The timeframe of the thesis was not accurate enough, which considerably slowed down the process after the author had moved abroad. In January 2010 the continuation of the thesis process was agreed on with a new timeframe accordingly completed.

One of the challenges when writing the thesis was for me to stay outside the process. Since having worked in the restaurant for over a year at that time, it was very challenging at times to stay objective and not to interfere my own feelings with the thesis. However, I do believe that since I had worked in the restaurant, it strengthened the thesis and the outcome of it.

The questions for the questionnaire were rather difficult to generate. It was essential to stay objective since the initial starting-point was how the employees see the ergonomics in the restaurant, given that there might not be anything that needed improving. In addition to this, it was difficult to determine whether to use open or closed questions, or whether to create statements for the respondents to agree or disagree with. This however, would have suggested that there already was something to be improved in the restaurant and that did not serve the purpose of the thesis.

All in all, I feel that the thesis does serve its purpose and its aim that was decided in the beginning of the process. I, however, feel that if I had had more expertise and knowledge on this specific field, even greater outcomes could have been drawn. If I could change something to the process of the thesis, I would make a clearer and more feasible schedule with exact dates and times when everything needs to be achieved by. I would also clarify the topic from the beginning to avoid misunderstandings and to save time.

11. Conclusion

The aim of the improvements suggested is to make a better working environment for the employees of Amarillo, Jyväskylä. Some of the potential improvements are not costly, which makes them feasible to carry out in the restaurant. Also, the suggested ergonomics directory would serve the restaurant employees well. This could possibly result in healthier employees with fewer physical problems.

According to Occupational Safety and Health Administration (OSHA), even the smallest changes in a working environment can have a major effect on the ergonomics of the workplace thus promoting the well-being of an employee. It is also important to keep in mind that the possible cost effects and savings do not necessarily show at once but only in a few years time.

The biggest issues raised from the questionnaire results were the incorrect location of many stored goods and the non-adjustable working surfaces in the kitchen. Also, the beer taps were mentioned several times by all the respondents in the restaurant. The taps should be lowered in order for everyone to properly reach them.

12. References

Websites

The date when the website has been referred to is in brackets

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- http://www.iea.cc/browse.php?contID=what_is_ergonomics (18.3.2009)
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13. Appendix

13.1 Questionnaire for employees in food and drinks service and for employees in food preparation

I am currently writing my thesis appointed by the restaurant manager Jari Leppänen. The aim of my study is to determine the ergonomics situation in the restaurant as seen by its employees and gather possible improvement suggestions to the possible problems. In this questionnaire, the word ergonomics refers to the physical environment of the restaurant, for example its work equipment and the location and the functionality of the equipment. Please, read the questions carefully and write down all the possible thoughts and suggestions.

1. The age of the respondent? _____
2. Sex of the respondent:

<input type="checkbox"/> female	<input type="checkbox"/> male
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3. Are you a full time or a part time employee?

<input type="checkbox"/> full time	<input type="checkbox"/> part time
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4. How many years have you worked in restaurant industry?

<input type="checkbox"/> 0 – 2 years	<input type="checkbox"/> 2 – 4 years
<input type="checkbox"/> 4 – 6 years	<input type="checkbox"/> 6 – 8 years
<input type="checkbox"/> 8 – 10 years	<input type="checkbox"/> over 10 years
5. How long have you worked in Amarillo Jyväskylä?

<input type="checkbox"/> 0 – 6 months	<input type="checkbox"/> 7 – 12 months
<input type="checkbox"/> 1 – 3 years	<input type="checkbox"/> 4 – 6 years
<input type="checkbox"/> over 6 years	
6. How many hours do you work on average in a week? _____ hours
7. In your own opinion, how many days have you been on sick leave during the last year?

<input type="checkbox"/> 0 days (continue to question 10)	<input type="checkbox"/> 1 – 5 days
<input type="checkbox"/> 6 – 10 days	<input type="checkbox"/> 11 – 15 days
<input type="checkbox"/> 16 – 20 days	<input type="checkbox"/> over 20 days
8. Do you think the reason(s) for your sick leave was caused by ergonomics in the restaurant?

<input type="checkbox"/> yes	<input type="checkbox"/> no
<input type="checkbox"/> I don't know	

9. Had the reason(s) for the sick leave appeared already before working in Amarillo Jyväskylä?

yes

no

I don't know

When? _____

10. How do you maintain your physical health?

11. How often do you exercise? _____ /week

12. Describe the functionality of the following work stations

Mex bar/ The grill

Tex bar/ The plate station

Restaurant room / The bolillo station / The dish wash station / The stores

13. Describe the functionality of lay of the work equipment (e.g. the height, the location of the work equipment) in the following work stations

Mex bar/ The grill

Tex bar/ The plate station

Restaurant room / The bolillo station / The dish wash station / The stores

14. Describe how the lay out (the location and functionality of the work equipment) of the following work stations affect on your working postures (e.g. do you need to crouch, reach, and tense your shoulders?). Are you able to keep your natural posture when you are making drinks or using the till for example?

Mex bar/ The grill

Tex bar/ The plate station

Restaurant room / The bolillo station / The dish wash station / The stores

15. How do you think your working has affected to your physical health?

16. If you can, please write down the reason(s) for your work related health problem(s).

17. How do you feel that other things related to ergonomics affect on your work well-being (e.g. the quality of the air, noise)?

18. Please write down your suggestions to improve your working environment, work stations, work equipment and work methods

19. Free word

Please return the questionnaire to the envelope situated in Tex bar!

Thank you 😊