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DETERMINATION OF SHIFT WORK IMPACTS OVER BEVERAGE SHIFT WORKERS

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

HAMDİ ERDİ EMEKLİ

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
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IN
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Approval of the thesis:

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submitted by **HAMDİ ERDİ EMEKLİ** in partial fulfillment of the requirements for the degree of **Master of Science** i**n Occupational Health and Safety, Middle East Technical University** by,

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ABSTRACT

DETERMINATION OF SHIFT WORK IMPACTS OVER BEVERAGE SHIFT WORKERS

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Working life has been an inevitable piece of human history since ancient times. Following Industrial Revolution, industries searched for more resources for their productions and more time to work in order to produce. At the end, shift work systems were developed for continous production and many people around the world have been working in this system since then. However, human body is designed to live in cooperation with circadian rhythm and it has many effects over the body once the rhythm is diminished. Beverage industry is also one of those industries that has to produce continuously. This study aims to observe possible impacts of shift working on workers of a beverage factory based on their age, marital status, work experience and shift work experience. To achieve the aim of this research, the Survey of Shiftworkers (SOS) was used. This survey, shared with employees via Google Forms, was completed by 118 people and the survey results were evaluated with SPSS 22.0 program. The survey results showed that age, marital status and duration of shift work are the dominant determinants, especially on health and social-familial effects of shift work.

Keywords: Shift work, occupational health and safety, beverage, survey of shiftworkers

ÖZ

İÇECEK SEKTÖRÜNDE VARDİYALI ÇALIŞANLARDA VARDİYALI ÇALIŞMANIN ETKİLERİNİN BELİRLENMESİ

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Eylül 2022, 130 sayfa

Çalışma hayatı, antik çağlardan beri insanlık tarihinin kaçınılmaz bir parçası olmuştur. Sanayi Devrimi'nin ardından endüstriler, üretimleri için daha fazla kaynak ararken, üretmek içinse daha fazla çalışma zamanı aramışlardır. Bu arayışın sonucunda vardiyalı çalışma sistemleri geliştirilmiştir ve dünyada birçok insan o zamandan beri bu sistemde çalışmaktadır. Bununla birlikte, insan vücudu sirkadiyen ritimle işbirliği içinde yaşamak üzere tasarlanmıştır ve bu uyum azaldığı zaman vücut üzerinde birçok etki yaratır. İçecek sektörü de sürekli üretim yapmak zorunda olan sektörlerden birisidir. Bu çalışma, bir içecek fabrikasının vardiyalı çalışanları üzerinde vardiyalı çalışmanın olası etkilerini yaş, medeni durum, iş deneyimi ve vardiyalı iş deneyimine göre gözlemlemeyi amaçlamaktadır. Bu araştırmanın amacına ulaşmak için Vardiyalı Çalışanlar Anketi (SOS) kullanılmıştır. Google Forms üzerinden çalışanlarla paylaşılan anket 118 kişi tarafından tamamlanmış olup, anket sonuçları SPSS 22.0 programıyla değerlendirilmiştir. Anket sonuçları, vardiyalı çalışmanın özellikle sağlık ve sosyal-ailesel etkileri üzerinde yaş, medeni durum ve vardiyalı çalışma süresinin belirleyici olduğunu göstermiştir.

Anahtar Kelimeler: Vardiyalı çalışma, iş sağlığı ve güvenliği, içecek endüstrisi, vardiyalı çalışanlar anketi

To My Family,

Beloved Grandmother and Grandfather

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ABBREVIATIONS

FMCG: Fast Moving Consumer Goods

LBP: Low Back Pain

SOS: Survey of Shiftworkers

SSI: Standard Shiftwork Index

CHAPTER 1

INTRODUCTION

Working life has begun within the first human-being on the earth and people has been working since then. The main aim behind the working was to provide basic human needs to make living at the very beginning. Later on, human started to search for more and more to provide their food and housing needs. Then, they started to hunt, make agricultural activities, mining and similar daily duties at the end. The ruins of old civilizations, ancient cities, epigraphs of kings and queens shows that working all day and night was inevitable during the ancient times as well. Whether the name of their work is called as shift work or not, they learned a lot to shape nature according to their needs and started to use the animal power and create tools to make things much easier. Following that, people searched for alternative ways to process excessive amount of food, material and mines to produce and gain more and this bringed the humanity to the point where steam power was found and Industrial Revolution begun.

The Industrial Revolution brought shift work term into the modern life dictionary. It became possible to run factories and extend the work hours beyond the day by the time use of bright artificial lighting in factories was started (Hamermesh, 1998). Since then, shift work became a strong need for today's society. The intensity of the work has been increasing since several decades and this causes an increase in studies of annually paid working hours, the enlargement of 24/7 time interval around the clock work arrangements, dual-earner society and speed and working quality. It is not only an interest for researchers but also a prominent issue for the employers who faces an increasing competition with their rivals and challenging new variety of working arrangements with the aim of production increase.

As like the rest of the world, shift work is considered as very mutual type of work in Turkey. The traditional type of working among 9.00 am and 5.00 pm for 5-days is

now evolving to more flexible types within the impact of COVID-19 pandemic. In this way, flexible working options, less working hours and organizational changes are inevitable for some sectors. Yet, the need of shift work in many types of sectors is still maintained due to continuity and production increases of related parts.

Many factors which are affecting health and safety of employees are related with shift working. One of the most important headlines of occupational health and safety is health problems related to the shift working. In an ordinary working schedule, it is aimed to work during the day and have rest and get sleep during the night. However, it is just the opposite when it is talked about night shifts. Employees who work night shifts are continuosly working during the time they need to have rest and they sleep when they need to get socialized and spend time with their family and friends. This brings some adverse effects over people and facilities. People who works with night shifts are exposed to some possible physical problems such as insomnia, chronic fatigue, cardiovascular diseases, digestive disorders and other health related problems. Besides, night shift is also affecting employees well-being in a way that creates depression, anxiety and stress due to the lack of sleep and having less time on socializing.

Shift work is directly related to some industries such as medicine, transportation or security. However, shift working is also a core part for most of Fast-Moving Consumer Goods (FMCG) companies, too. FMCG operations are highly busy and include lots of employees. Therefore, it is chosen as a good representation of showing the relation among shift work and employee experience with other factos. For this purpose, one of the most important beverage company's field is chosen to conduct this research. The research question of this thesis is searching the answers of what the relation is between the age, marrital status, work experience and shift work experience and physical, psychologic and social and familial experiences of shift workers.

The research is based on a survey which is called as SOS which is considered as one of the most important equipment for understanding main impacts of shift work over shift workers. These impacts are categorized as physical, physchologic, social and

familial and effects of those will be understood based on age, marrital status, work experience and shift work experience. The survey was applied on all shift workers that works for the chosen company in beverage industry and 118 shift workers were participated. The coming data is analyzed in SPSS and results are discussed.

Although there are many studies related to the shift work and worker relations in Turkey on different sectors, this study has an importance of being the very first one in beverage industry. Also, because there is no similar study conducted related to this topic in the beverage industry, this study will contribute to the national and international research studies which are interested in similar topics, too.

The impacts of shift work could really differ from one employee to another. While some people tend to define themselves as the day person, some could define as the night person. Based on different habits or characteristics, shiftwork might have positive or negative impacts over people. It is also expected that shift work tolerance decreased with increasing age or experience of shift workers. Therefore, the tolerance for the shift work is researched among the shift workers with different ages. Thus, one of the aims of this research is to examine the relationship between impacts of shift work with workers age, marital status, experience and shift work experiences in beverage industry.

The shift work system comes in sight as one of the most important types of work that many companies need in order to ensure their continuity in production and not to stay ahead of their competitors in the global competitive environment. It is also known that the shift work system, which is an inevitable way of working types for production facilities, has benefits as well as some perks on employees and businesses. Today, the adverse effects of shift works on workers are even more important. Shift working styles, especially for night shifts, has gained more and more important place within the light of the studies that are carried out on this area. While researchers have conducted various types of studies about the impacts of shift work on workers, these studies have generally been limited to one dimension in terms of problems assessment. Therefore, there is a strong need of reassess the topic within multidimensional perspective. The physical, psychological and social and familial

dimensions of shift work could easily be changed with different ages, marital status or work and shift work experiences. For this reason, the relationship between these are tried to be explained in this research.

Current researches generally consider the shift work in terms of different dimensions by only focusing on one of those dimensions such as impacts of shift work on sleeping habits or chronic fatigue. The researches are also mostly done on different industry sectors other than FMCG. There are only a few studies dealing with the effects of the shift work in all its dimensions. With this study, it is aimed to consider the effects of the shift work over the workers in a multidimensional way. Therefore, it is aimed to examine the physical, psychological and social-familial dimensions separately and to reveal the relations of these dimensions with each other. At the same time, to examine the relation between of these with age, work and shift work experience, marital status and other demographical factors is another aim of the study.

The data which is obtained as a result of the research is extremely important in terms of reflecting the effects of shift work in detail, and it is thought that it will be a pioneer for the measures that can be taken to prevent these effects and make important contributions to the literature. Therefore, it will be the first contributer for developing the shift work experience in beverage shift workers in Turkey in terms of lowering the impacts. In addition, this study is important with being one of the few studies conducted in the beverage industry, both in Turkey and in the world. Here, it is important to explain that beverage industry is different from others in a few aspects. Firstly, the high seaosan for this industry is summer and new year eve due to higher consumption rates. Also, the production rates could easily be increased within climate conditions, social condition, economical conditions and health related conditions such as Covid-19 period. Therefore, there is a need of shift working system to compensate all different conditions. Also, most of the production and filling systems are designed to work continuously in order to obtain the maximum effiencies related to water and energy consumptions. The beverage industry has also

many third parties inside the field for transport and maintenance activities. Therefore, there is a strong need of employees that work 7/24.

The introduction of the thesis above will be followed by four chapters in the following parts. An overview related to the shift work will be given in Chapter 2. In this chapter, shift work term and its various definitions, the types of shift work systems and schedules, shift work in the world and Turkey, national and international agreements about shift work and physical, psychological and social and familial impacts of shift work over workers will be examined. Chapter 3 will explain the methodology of the research. The method for finding out the shift workers and the impacts that they are exposed will be given in this part. For this purpose, a questionnaire was carried out between shift workers of a beverage industry to check how their responses for the shift work are figured out based on their own experiences. Chapter 4 will provide the results and discussions of the methodology that are obtained by SPSS and finally all of these will be concluded and in Chapter 5.

CHAPTER 2

LITERATURE REVIEW

2.1 Shift Work Term and Definitions

The general definition of shift work could be mentioned as “a system in which different groups of workers work somewhere at different times of the day and night” according to the “Cambridge Dictionary”. Shift work may involve morning, afternoon or night shifts with either fixed or rotating schedules. Furthermore, the shift work term is broadly used to mention the arrangement of the work-hours which are different compared to the typical day-light time interval.

The International Labour Organization (ILO) states shift working as “a method of organization of working time in which workers succeed one another at the workplace so that the establishment can operate longer than the hours of work of individual workers” for particular day and night hours (ILO, 1990). The European Council Directive 93/104 in 1993 defines the shift work as “concerning certain aspects of the organization of working time, shiftwork shall mean any method of organizing work in shifts whereby workers succeed each other at the same work stations according to a certain pattern. Shift worker shall mean any worker whose work schedule is part of shiftwork.”

In various researches, shift work definitions are mentioned differently, too. Shift work is mentioned as the practice of employment which is arranged for providing services, 24 hours of every day during a week which is also known as 24/7 (Mustafa et al., 2017).

According to the EU Parliament Directive, shift work is described as “any method of organizing work in shifts that workers succeed each other at the same work stations according to a certain pattern, including a rotating pattern, and which may be continuous or discontinuous, entailing the need for workers to work at different times over a given period of days or weeks” (EU Council Directive, 2003).

The shift work system is also defined as the order in which different groups of workers work in the workplace at different times of the day, uninterruptedly and within the same day, on all days of the week in organizations that are constantly active due to the characteristics of the work and the workplace (Değirmencioglu, 2019).

Shift working is one of the most common type of work and it makes 24-hours working possible for not only certain technologies such as chemistry or energy industry but also social works (such as hospitals, telecommunication, security and others) and economical activities (such as textile, food, banking). It also includes any kind of arrangement of working hours different than standard daily working hours. Shift working aims extending the 8-hour work to 24-hour work per day (Costa, 2010).

2.2 Shift Work Systems and Schedules

In the operations where the work or service is continuous, it is necessary to ensure the continuity of the work and the employees have to work at different times of the day in order to maintain the production. While the shift work system is being widely practiced in the whole world, the number of shift workers is increasing in today's industrial societies as a result. It has been reported that in the majority of developed countries, approximately 20% of the workers work in different shifts and 5-10% of workers work continuously in the night shifts. It has been also reported that the rate of working in shifts reaches up to 70% and the rate of night shifts reaches 20% in some sectors (Çakmak & Kızıl, 2018).

The system and schedules of shift work might vary based on type of industries or activities. A certain rule related to define shift work time interval cannot be given. Tasks or duties could be changed time to time in different kind of industries. Some might be very busy on day time while the others might be very low work loads during the day and busy at nights. Based on these, the impacts of shift work might change, too. According to Costa's study, working schedules could be very different from each other (Costa, 2010):

1) Duration of duty period (i.e. from 6 to 12 hours)

2) Presence and extension of night work (i.e. between 24.00 (12 p.m.) and 05.00–06.00 (5–6 a.m.))

3) Permanent or rotating shift schedules (i.e. people work regularly on one shift or alternate periodically on different shifts)

4) Continuous or discontinuous shift systems (i.e. all days worked or interruption on weekend)

5) Start/finish time of the work periods (i.e. between 04.00 (4 a.m.) and 07.00 (7 a.m.) in the morning, between 20.00 (8 p.m.) and 24.00 (12 p.m.) at night)

6) Number of workers who change during the related working day (i.e. two, three or more shifts)

7) Speed (i.e. 'fast', every one–two or three days, or 'slow', more than 14 days) and direction of shift rotation (Clockwise refers morning–afternoon–night and counterclockwise refers afternoon–morning–night)

8) Number and position of resting days that workers have between their shifts

9) Length of shift cycle (i.e. from six to nine days until six months or more than this)

10) Regularity/irregularity in shift schedules

A distinction could be made between fixed and rotating shift systems by considering the extensive category of shift work. In fixed shift systems, two or three shifts could

be organized as the early, late and night shifts. In this system, a group of employees work during morning and afternoon time while the second one continue work during later afternoon time and evening and the third one works for the night time. However, shifts of a rotating shift system are varied regularly and employees might be assigned for these varying shifts. The reason why these are called as “rotating shifts” is the rotations of shifts around the clock which is from morning shift to the afternoon and to the night. Continous shift work could be said to define a non-stop production for 24/7. There could be many numbers of possible shift work patterns (ILO, 2004). The workers are more likely to adapt fixed shift schedules by getting used to adjust their sleeping patterns, family life, eating behaviour, social life and other routine human duties. It is expected to put the rhythms of work and out-of-work life into alignment to minimize the adverse effects of the shift work. However, rotating shifts which are done by weekly or monthly basement could decrease contingency of a worker to become sufficiently adjusted to a particular shift. On the other hand, rotating shifts might evade some of the problems due to the fixed night schedule.

2.3 Shift Work in The World and Turkey

Shift work is one of the essential part of working time since Industrial Revolution. Now, although business life faces with a breakthrough and sudden change within working hours due to COVID-19 pandemic, shift work is still inevitable for most of the industries in both developed and developing countries.

Shift work is a rooted method for working time organization of companies that makes extending the operating hours away from standard operating hours of any workers around the world. It could also not be limited for the services that are essential such as health, heavy-industry or public safety. In addition, it is also occurring in different type of goods or services in productions. Up to 18 to 20% of workers in the USA and Europe are estimated to be involved in shift work (Brum et al., 2020).

Another study shows that 20% of workers located in the US works in shift work. Also, 18 to 26% of them start their shifts between 2.00 pm and 6.30 am. Shift work is also very common in different continents such as 22% of employees work in shift work schedule in the United Kingdom while Greece and Finland has the amount of 25%, Czech Republic as 24%, Chile as 15%, China as 17.5% and Senegal as 20% (Wickwire et al., 2016).

In their review in 2017, Kurt et al. stated that 13% percent of Australian, 15% of American, 22% of United Kingdom and 25% of Greece and Finland working population work on shifts. What is more, based on the same review, according to a research that is conducted by Eurofund about Working Conditions in Participating and Candidate Countries for EU in 2003 showed that 8% of Turkish working population work on shifts (Kurt et al., 2017). The percentage of Turkish shift workers could be researched in future studies because there is only limited information related to this topic on the literature. Therefore, latest data related to this could only be given based on 2003 statistics for Turkey.

The data that is obtained by European Union Labour Force Survey represents that the rate of shift workers in the EU up to 2009 was descending. But then, a small growth was shown with the rates are seemed to go to the same levels in 2015 as was during 2005. Crotia, Slovenia and Slovakia are top three countries in terms of employees working shifts while Denmark, Belgium and France are the countries with lowest rate of shift work (Eurofound, 2017).

After researching on several resources about the countries' shift work rates, current resources on the literature could said to be insufficient for obtaining rates of shift work in Turkey. Although, a recent study that is conducted by Bilgin et al. mentioned the rate of shift workers as 8 % among all workers, this information is coming from earlier 2000's (Kolaç, 2021). Making new surveys and researches that are related to the shift work in Turkey based on sex, type of shifts and sector could be really beneficial for shift-work related studies in the future.

2.4 National and International Agreements On Shift Work

Shift work schedules are usually arranged by national and international collective agreements in most of the nations. Also, these systems are shaped and controlled within the frame of legal base of working time design of countries. More particularly, the design of shift work system is characterized by limitations about the length and duration working hours. Collective agreements are also one of the driving forces for regulating the shift systems in most of the countries. What is more, the working time is stated in countries' legal frameworks. Therefore, regulations on the overtime; maximum allowance for daily and weekly working time, overtime, night work, weekend work and working during national and international holidays are other critical parameters for the design of different type of shift systems.

Employers became organizations that provides services continuously for 7 days 24 hours due to retrench and meeting demands within industrialization. Shift work system was born as a need for modern working system but it naturally brings not only various health problems but also psychological and social problems. Therefore, it became a strong need that making new national and international legal regulations and various international directives that points the need of well-organized shift and night work and health protection of shift workers. European Union, United Nations and International Labor Organization take shift workers under protection through various legislations and directives while shift working is regulated with different legislations in Turkey.

Numerous international conventions and rules formed under the umbrella of "International Labor Law" in response to studies done on night work. These are Conventions adopted by United Nations. The "Convention on Economic, Social, and Cultural Rights" and "Conventions and Recommendations of the International Labor Organization" are two of these conventions. "International Labor Organization Convention No. 171 on Night Work" and "Recommendation No. 178 of the International Labor Organization on Night Work" are among the conventions and recommendations of the ILO.

In their Fundamental Convention, ILO mentions the arrangement of working time by looking at the protection-of-worker perspective based on different working relations and hours of different countries. Daily and weekly working hours are also mentioned among the conditions which are needed to be regulated based on emphasizing the existence of working conditions of injustice, misery and poverty for a large number of people which may leads to a discontent that will endanger world peace and harmony (ILO, 2003).

The first convention that was adopted by ILO is C001 - Hours of Work (Industry) Convention, 1919 (No. 1) which proposes application of the principle of the 8-hours day or of the 48-hours week. While this convention is the first one that sets rules for working hours, it is one of those conventions that are not admitted by Turkey (ILO, 2017).

ILO C171 Night Work Convention mentions the "night work" as "all work which is performed during a period of not less than seven consecutive hours, including the interval from midnight to 5am," and describes "a night worker" as "an employed person whose work requires performance of a substantial number of hours of night work which exceeds a specified limit, fixed by the competent authority. This convention applies to all employed persons except those employed in agriculture, stock raising, fishing, maritime transport and inland navigation. (International Labour Organization, 1990a)".

ILO R178 Night Work Recommendation which supplements the Night Work Convention C171 covers the working hours in much detail. It mentions that the standard working hours for a night shift worker should be maximum 8 hours for the period of 24-hour that include the night work. There is an exception in some cases such as working that contains considerable periods of mere attendance or stand-by. Another case is given as alternative working schedules that provide shift workers not less than equivalent protection over different periods. Exceptional circumstances that are defined by collective agreements or the competent authority could also be exceptional. The standard hours for night shift workers should not exceed the

average working hours of the day workers who make the same work. In some kind of works which involves special hazards or causes heavy physical or mental strain, no overtime should be performed by night workers before or after a daily period of work which includes night work, except in cases of force majeure or of actual or imminent accident. In shift work systems that include night work could be performed with providing following conditions (ILO, 1990b):

(a) in no case should two consecutive fulltime shifts be performed, except in cases of force major accident

(b) a rest period of at least 11 hours between two shifts should be guaranteed as far as is possible.

European Directive on Working Time which is known as the EU Council Directive No 93/104/EC concerns the major features of organizing the working time. In the specified Directive, the "night time" is defined as "any period of not less than seven hours, as defined by national law, and which must include in any case the period between midnight and 5 am"; and "night worker" as follows:

"Any worker who, during night time, works at least three hours of his/her daily working time as a normal course", and

"Any worker who is likely during night time to work a certain proportion of his/her annual working time, as defined at the choice of the Member State concerned either by national legislation or by collective agreements".

Additionally, shift work means "any method of organizing work in shifts whereby workers succeed each other at the same work stations according to a certain pattern, including a rotating pattern, and which may be continuous or discontinuous, entailing the need for workers to work at different times over a given period of days or weeks"; consequently, "shift worker shall mean any worker whose work schedule is part of shift work". It also forces Member States of the Directive to take all precautions that are essential to provide that "normal hours of work for night workers do not exceed an average of 8 hours in any 24-hour period for normal work activities, but not more

than 8 hours in any 24-hour period in case of work involving special hazards or heavy physical or mental strain; every worker is entitled to a minimum daily rest period of 11 consecutive hours per 24-hour period; where the working day is longer than 6 hours, every worker is entitled to a rest break; per each seven-day period, every worker is entitled to a minimum uninterrupted rest period of 24 hours plus the 11 hours daily rest; and it should preferably include Sunday; the average working time for each seven-day period, including overtime, does not exceed 48 hours; every worker is entitled to paid annual leave of at least four weeks in accordance with the conditions for entitlement to, and granting of, such leave laid down by national legislation and/or practice; the minimum period of paid annual leave may not be replaced by an allowance in lieu, except where the employment relationship is terminated". Implementing such directive at national level, some European countries added the quantitative criterium of 80 night shifts worked per years as minimum level for establishing the compulsory periodical medical surveillance for night workers. This limit appears as a mere technical compromise among social parties (i.e. one third of the total working days), being not supported by any evidence based on the scientific literature (European Council Directive, 1993).

The night period is defined as "not shorter than seven hours, as specified in national law, and in any case between midnight and morning hours" in Article 1 of "Directive 2003/88/EC of the European Parliament and of the Council on Specific Matters Concerning the Regulation of Working Hours," which went into effect on 4 November 2003. Here, the definition of a night worker is mentioned as "the worker who works during the night for at least three hours of the daily working time, or who works during the night in a part of the annual working time where the annual working time is determined in consultation with the social partners in the national legislation of the relevant member state or based on the rate defined in the national or regional collective agreements concluded by the social partners. According to Article 8 of the Directive's subparagraphs a and b, "member states shall ensure that the night shift does not exceed an average of 8 hours in each 24-hour period and that night workers engaged in work involving heavy physical and mental strain or special hazards are

performing their night work during any 24-hour period and should take the required actions to stop people from working longer than eight hours. The 9th article of the regulation also defines rules for night employees' health evaluations. As a result, "these employees receive complimentary health monitoring at the beginning of their job and on a regular basis. If possible, a worker who is deemed unfit for this type of work is moved to daytime work. In Article 10 of Directive 2003/88/EC, the protections offered for the night workers are mentioned (Kazancı, 2016).

In Turkey, shift work is mostly mentioned in Labor Law No: 4857 and Regulation on Special Procedures and Principles Regarding Working in Jobs Conducted by Employing Workers in Shifts. In Article 69, Labor Law No: 4857 states “night" as the period that starts at 20:00 at the latest and ends at 06:00 at the earliest and ends for a maximum of eleven hours in any case. Also, due to the needs or nature of some work, the beginning of the "night" of work time could be set back or the summer and winter times can be adjusted. More regulations may be prepared to determine the way in which working period is implemented, to impose an overpayment procedure at any rate for some night work, or to prohibit workers from working at night in workplaces where there is no economic obligation in night operations. The Law also defines that the duration of night work cannot exceed seven and a half hours. Yet, in some sectors such as tourism, private security and health services are carried out, night work for more than seven and a half hours might be applied provided that the written consent of the worker is gotten (Labor Law No: 4857, 2003).

The main detailed regulation over this subject is given in Regulation on Special Procedures and Principles Regarding Working in Jobs Conducted by Employing Workers in Shifts. This regulation mentions that as they work continuously due to their qualifications and job’s need, it is necessary to arrange at least three shift workers to be employed within a 24-hour period (one-day time period) in works that are operated by employing workers in shifts one after the other, or in shifts of workers which work by turns. That means at least three shifts are required in a 24-hour period. In shift work other than these types, the number and duration of the shifts must not exceed the daily working time specified in the Working Hours

Regulation on the Labor Law. In the said Regulation, it is stated that working time during the day cannot exceed 11 hours in any way. In addition, it should be noted that work exceeding 45 hours per week will be included in the scope of overtime and it is not allowed to work more than 270 hours per year. In such cases that increasing the number of shifts in the workplace or shortening the shift work duration, no reduction can be applied on the wages of the workers due to the decrease in working hours. Also, it is forbidden for workers to work night shifts for more than 7.5 hours except the specified works.

The shifts during which more than half of the working time coincides with the night period are considered night shifts. In jobs that are operated during the day and night and in which shifts are applied, the shifts should be put in order by working the workers at night one week and working during the day the following week. Considering the nature and execution of the work together with occupational health and safety, the change in day and night shifts could also be applied for two weeks. Unless there is a necessity, the shifts of the workers cannot be changed before their turn comes (Regulation on Special Procedures and Principles Regarding Working in Jobs Conducted by Employing Workers in Shifts, 2004). Only the workers which proves with a medical report that states their health is deteriorated by shift work could be given another duty during day shift based on Labor Law No: 4857.

The worker whose shift will be changed, that is, from day shift to night shift, from night shift to day shift, must rest for at least 11 hours without interruption. The worker cannot be employed in the other shift without resting for at least 11 hours. In works which are carried out by employing workers in shifts, workers must be given a break in accordance with the principles in Article 68 of the Labor Law No. 4857. If all the workers in the same part of a workplace could not be given a break at the same time due to the nature of the job, this break is given to the workers in groups, starting from the middle of the consecutive working period, in accordance with the Labor Law and the principles in this Regulation on Special Procedures and Principles Regarding Working in Jobs Conducted by Employing Workers in Shifts. Also, in works carried out by shifts, it is obligatory to give the workers a week's vacation, not

less than 24 hours a day, and by rotation. What is more, Article 104 of the Labor Law No. 4857 states that an employer who employs workers for more than seven and a half hours at night and who does not change the night and day shifts as specified in the relevant regulations is subject to a high amount of administrative fine which is mentioned in the related regulation.

All in all, the studies show that the legal basis of shift work in the world varies according to the ILO Conventions and the domestic legal regulations of the countries. Turkey, on the other hand, implements some of the ILO conventions and the domestic legal arrangements created in line with the European Union Council Directives.

2.5 Impacts of Shiftwork Over the Workers

Shift working is a widespread working type especially in FMCG, law enforcement, fire fighting, customer service, transportation and health sectors. Shift working also became inevitable when the production came into prominence with increasing consumption through the industrialization. Although this situation has benefits and drawbacks in terms of production, employers and employees, it definitely and naturally ends with some negative impacts over the workers in terms of health and safety.

Some of the most typical problems which are caused by rotating shift work could be about job satisfaction, work performance, social life, employee health, sleep and other parameters. Yet, dependency of society on shift work is inevitable. By looking from the impacts perspective, effects of rotating-shift work seem very diversified. Many types of health disorders, declines in productivity and safety, poor relations of shift workers with their families and lower social abilities could be linked to shift work. According to the results of Costa's study, the risk factors of shift work over human health and well being at both psychological and social levels are stated as disorders in biological circadian rhythms and sleep/wake cycle that ends with various

psychosomatic troubles, cancer, lower work performance and decrease in the quality of family and social life (Costa G., 2010).

Likewise, Seixas et al. stated that night shifts causes disorders over circadian rhythm due to the changing of sleep schedule. They also mentioned that disruption of sleep quality and quantity, gastrointestinal disturbances, diabetes mellitus, different types of cancer, psychological disorders like stress, anxiety, burnout syndrome and depression could be among the impacts as well as other issues like work safety, personal and social life (Seixas et al., 2019). Although most of the effects are observed under same categories for different type of industries, the effects could change between different factors such as age, marrital status, work experience and shift work experience. The area of this research is about observing the relation between these and rotating-shift experience and aims to demonstrate the links between workers' age, marrital status, work experience and shift work experience and their rotating-shift work experiences in physical, psychologic and social and familial aspects. In this way, there could be made suggestions for decreasing the negative impacts of rotating-shift work over the by looking occupational health and safety perspective.

2.5.1 Physical Impacts

The organism of human has its own order of being awake during the day and staying in the rest and sleep during the period at night. The human body is programmed into various type of situations according to the night and day periods such as sleep and wake periods, high and low body temperatures and high and low digestive efficiency. Therefore, human body gives itself rhythmic changes in terms of its psychological and physical functions.

The circadian rhythm is a mental and physical phenomenon that occurs in a 24-hour day and it controls the daily sleep and wake cycle of the human body. It could also be mentioned as the regular changes of mental and physical characteristics in 24-hour period. The circadian rhythm is driven by the biological clock of the body. The

biological clock is set by a region in the brain and it adjusts the body rhythm according to the cycle of light and dark. Some hormonal changes are also experienced during this process. In parallel with these hormonal changes, the human organism experiences awake and sleep periods. Although sleep periods and sleep physiology are not fully understood yet, it is accepted that sleeping 6-9 hours a day is enough for a person under normal conditions. In addition, as the body temperature reaches its highest value in the evening, heart rate, blood pressure, body temperature, respiratory rate and mental efficiency are synchronized. Therefore, activity levels are highest during the day and lowest at night. These fluctuations are important elements for memory-related functions that require attention. The body temperature, which is low in the morning, also increases continuously in the afternoon and becomes low again at night (Yıldız et al., 2012).

Working in shifts has been associated with adverse effects on employees' safety, health, and well-being on many different researches. Particularly, shift works that involves night shifts could lead to low back pains. A recent research indicates a direct connection between pain and sleep issues. Low Back Pain (LBP) is one type of musculoskeletal discomfort that could cause sleeplessness. On the other hand, it has been found that poor sleep increases the occurrence of LBP in healthy workers and is linked to a subsequent rise in LBP intensity in patients. A long night shift that interferes sleep can cause higher back pain later on. This relationship is possible because sleep disturbance can affect the autonomic, neuroendocrine, and neuroimmunological systems to provoke an inflammatory response, delay healing of tissue damage, and trigger increased pain sensitivity. Also, high level of low back pain is likely to disrupt sleep due to physical and mental work load during long shifts (Takahashi et al., 2015). Cerebrovascular diseases, coronary artery diseases, hypertension, diabetes, muscle pain and other health problems are very common among workers who work at night in the shift system compared to those who work regularly during the day. One out of every five employees in Europe works in a shift system, and one out of every five people working in the shift system quits their shift work jobs due to the difficulties that comes by this working system. In a study which

was conducted by the World Health Organization (WHO) on 5438 patients in 14 countries and 15 centers, it was observed that somatic symptoms and emotional discomfort were highly correlated. They reported that somatic symptoms such as headache and back pain accompany chronic fatigue complaints in individuals who work at night. From this point of view, it is seen that chronic fatigue caused by impaired sleep-wake rhythm and inadequate sleep quality, and difficult emotional processes lead to somatic symptoms and physical disabilities, especially pain, in sensitive individuals (Selvi et al., 2010).

Complaining about the digestive system in workers who work at night shifts it is a very common phenomenon. Indigestion type complaints are more common in shift workers than those of daytime workers. Researches today shows that indigestion, diarrhea, constipation, abdominal tension and pain, loss of appetite could be observed on shift workers. What is more, the incidence of stomach ulcers is also high among shift workers (Chang & Peng, 2021). These effects on the digestive system could also be related to psychosocial factors like stress and workload. However, it is also very possible that the dietary habits of the shift workers may cause such problems to worsen, too. Another research which is conducted as a cross-sectional study in which 343 automobile workers were involved showed that shift workers reported more gastrointestinal problems than day time workers (Caruso et al., 2004). One of the reasons of this problem could be that workers who work in shifts might have difficulties to reach healthy food during the non-daytime shifts. Therefore, they tend more to snacks or fast food and complaints like indigestion, loss of appetite, diarrhea or constipations are very likely to be observed on these workers.

A recent study which is conducted in Japan with 12.000 workers from various industries about peptic ulcers showed that the relative risk for the peptic ulcer in shift workers doubles the regular workers who are working day time. Also, some studies showed that the Helicobacter Pylori infection (an infection of a bacteria that results with ulcers or cancer) is more common among shift workers and that could be a proof that natural gastric defense system of shift workers might be hampered (Costa, 2010).

These researches shows the importance of shift work as a tendency of gastrointestinal problems in potential individuals who works in shifts. Therefore, it is important to point these problems and solve them as they carry the potential of more serious illnesses in the future such as chronic gastritis, peptic ulcers or cancers. Hence, it is important for shift workers to be careful with their diet for a better shift work experience in terms of their digestion system.

Cardiovascular diseases are disorders of the heart and blood vessels. Some of these diseases are coronary heart disease, cerebrovascular disease, rheumatic heart disease and so on. Cardiovascular diseases are seen as one of the primary causes of death in the world. From the studies, it is clear that shift workers have some sleeping disorders and their circadian rhythms are disrupted. This causes that shift workers are having a higher risk of cardiovascular and coronary heart diseases and this risk is thought to be increased with shift work experience. A researched showed that cardiovascular disease in men who work in shifts is 1.5 times higher than those of regular day workers. What is more, the working hours at which the shift workers might have cause to the more risk of potential cardiovascular disease by increasing tendency on poor eating habits, obesity, high caffeine and tobacco consumption (Silva et al., 2020). Another study found that the risk of cardiovascular disease mortality is high for shift workers. Compiling different studies, this research showed that there is a relationship between shift work and insomnia and heart diseases. Within this research, 79 studies in this era were checked and it is found that mortality rate due to cardiovascular illnesses is 1 out of 3 of these studies. It also showed that the occupations with the highest risk of cardiovascular disease due to the shift work system was found to be health workers and factory workers (Kolaç, 2021). This also shows the importance of analyzing heart risks in beverage or other FMCG industries.

Blood pressure is another important factor to regulate the human body. As it was mentioned earlier, blood pressure could also be changed with the disruptions in circadian rhythm. Changes in blood pressure might cause to hypertension in shift workers. A research conducted with more than 25.000 workers in an automobile company in Germany showed that that incidence of hypertension is higher in rotating

shift workers and night shift workers. Also, night shift workers had very negative lipid profile in which the highest mean total cholesterol and triglyceride levels were observed (Ohlander et al., 2015).

A different research indicated that shift work might have impact on blood pressure levels in a long term because shift work was associated with hypertension in the study which is conducted with more than 26.000 Chinese workers in an automobile industry (Guo et al., 2013). Another research conducted by University of Tampere showed different type of important results within this perspective by adding the noise factor. In the study, they assessed the relationship of shift work and occupational exposure to noise with the blood pressure of 331 shift workers of a rubber industry company. The results indicate that the highest hypertension and average systolic and diastolic blood pressure were observed among shift workers with exposure to the noise. Therefore, it is understood that the noise has an additive impact on hypertension on shift workers (Virkkunen et al., 2006). Therefore, it is important to consider noise factor for further studies which will be conducted on beverage or FMCG sectors.

Ageing has been a crucial factor that is related with shift work tolerance for shift workers since years. In a study conducted in 1996, shift workers who are more than 40-45 year-old were told to sleep worse after their night shift. Yet, it does not affect their sleep quality after their morning shift. Also, the same study showed that sleepiness of the shift workers is decreased when the age is older after consecutive night shifts because it is thought that they could tolerate acute loss of sleep more due to the experience. Change of circadian rhythms into being much morning type causes altered sleep and wakefulness among the shift workers which are older. Also, it is mentioned that need for the sleep might reduce with age and that results with differences in the length of sleep among different ages of shift workers. The study mentions that physical fitness could be a factor for a better tolerance on shift work so physical training might have positive impacts on increasing sleep length and alertness during night (Härmä, 1996).

Sleep quality with reduced levels, less duration of sleep or excessive sleepiness are told to be common effects among shift workers and it is mostly related to the confliction among working times and circadian systems of shift workers. According to a study, distinct insomnia symptoms and sleepiness with increased amount during daytime are experienced in 20-30% of shift workers. In this study, 58 studies related to impairments with sleep which is linked to shift work that includes less sleep quality and duration and more sleepiness in day time among health care shift workers were reviewed. The results showed that shift workers with older age, being married or having children and morning typed are tend to get higher scores on neuroticism and lower scores on hardiness. These are mentioned to be related to increased risk of sleep impairments for the shift workers. Also, the study proposes physical activity as a protective factor against the sleep-related impairments (Booker et al., 2018).

Effects of abnormal working types haven't been very clear for years. In their research, Institution of Occupational Safety and Health summarizes that the changes in biological rhythms for a long period of time could led to negative long-term impacts. These impacts could continue even after retirement. The main disruptions of shift work could be related to body clock, sleeping time and sleep quality, family and social life. Those disruptions also cause acute impact over mood, performance, mental health and workplace safety, too. In the related research, researchers collected a data from the shift workers and non-shift workers from different occupations and social background for a 10-year period. The study, at the end, gave results for 1,257 participants and they completed a survey related to their working conditions in the past and now at the end. They were also asked about their life outside the work like social life. Finally, they were given some medical and psychological tests by occupational physicians. Results showed that workers who never worked in shift work had normal sleep patterns. Also, some of the respondents who were worked in shift work order till their middle ages (52 and later) improved their sleeping pattern after giving up shift work. Yet, shift workers who gave up shift work before 52-year old had still poor sleep problems like shift workers who still work on shift. Working in shifts for a long period in working life gives shift workers more tolerance and the

negative impacts over sleep for those are not experienced. They also showed that sleep quality is decreasing with increasing age. In terms of life quality, the results show that shift workers had more chronic fatigue (feeling tired all the time) and it continuous until changing the shift work pattern. However, emotional reactivity, social isolation (difficulties forming and maintaining relationships), stress and overall health could still continue after changing the shift work pattern. The research showed that former and current shift workers have some of metabolic syndrome symptoms such as obesity, cardiovascular disease, blood sugar levels, ulcer and gastrointestinal problems (Tucker et al., 2010).

2.5.2 Psychological Impacts

For continuity of the production, shift work is a must in most of the FMCG industries. Especially, the night shift is considered as one of the most important reasons for the changes of circadian rhythm of the body. This led to many important alterations in the sleeping and biological habits of the body. Therefore, it has certain impacts over the physical and psychological well-being as well as negative feeling of work performances. The most common impacts include; depression and anxiety disorders; and cognitive disorders such as sleepiness, fatigue, memory and concentration disorders. What is more, inner restlessness, nervousness, development of fears, sexual problems, depressive mood and psychomatic disorders are also observable in shift workers (Bacak & Kazancı, 2014).

One of the psychological effects of shift work is mentioned as depressive personality disorder which means a pessimistic, lack of pleasure, duty-free, insecure and chronically unhappy personality type. Unhappiness, dejection, self-contempt, hopelessness, thoughtful and anxious nature, pessimism, tendency to regret, and overthinking about events are among the main features of depressive personality (Sayın and Aslan, 2005).

Anxiety and depression are also very common impacts of shift working. The most important reason for the emergence of this situation is that the individual adjustment of the balance in working hours in the direction of sleep by the circadian system, and changes the sleep hours in the direction of wakefulness. Disruptions in the sleep-wake cycle that occur due to working conditions also bring psychological problems (Dittner et al., 2004).

A research that is conducted by Ferri et al. in 2016 aims to show how night shift workers are effected by the negative consequences of shift work over job satisfaction and health conditions compared to the day workers. 273 shift workers participated in the study and Standard Shiftwork Index was applied on them as a survey. The results of the survey showed that shift workers have the lowest mean results in part of chronic fatigue, psychological symptoms, job satisfaction quality of sleep and cardiovascular system very significantly (Ferri et al., 2016).

Shift work could be a very strong stress factor over the shift workers due to the reasons mentioned above. Within the last years, there is an increase in applying validated surveys like Standard Shiftwork Index (SSI) and general health questionnaire SSI which is created by Barton and Folkard has a significant impact on improving the capability of characterizing and quantifying impacts of shift work in mental health perspective. These contributions in the area showed us that there are two key adverse effects for the mental health of people who works in shifts and long working hours which are anxiety and depression. Increasing neuroticism would also be another psychologic effect that increases with shift work experience (Harrington, 2001).

Another research analysed the effects of shift work in health industry with 477 shift workers. The results showed that 87.4% of the shift workers, who joined the survey which is designed for this research, had one or more negative effects on their social and family lives. The distribution of these effects is on their psychological health with the percantege of 87.2%, on their physical health with 95.2% percentage and on their own safety with 77.6% percentage. 33.1% of the nurses who stated that they

experienced psychological effects were quick to anger, sensitivity, low tolerance, agitation; while 32.0% of them have psychological burnout and lack of motivation and 26.2% of them stated that they experienced anxiety and restlessness (Yeşilçiçek et al., 2015).

2.5.3 Social and Familial Impacts

The concepts of work and family are the ones that people give the most importance in their lives. It represents two separate areas. One of the factors affecting today's working life is the conflicts that employees experience between their work and family lives. Job stress has also a critical importance in terms of performance, productivity, job satisfaction, health and social relations of employees.

Shift workers or workers who are working for long hours could experience important disruption with their family and social activities. One of the main reasons behind this situation could be the flow of general population which is mostly oriented around the day time. Weekend work may also interfere with participating in sports activities or taking part in other weekend activities. Therefore, shift workers are more likely to be socially marginalized. What is more, family and marital responsibilities could also be seriously damaged by shift work or long working hours. Not being part of childcare, shopping activities, housework and partner being alone might also cause troubles on marriage and family. Yet, on the positive side, shift workers who like to spend their free time relatively alone or do not like crowds often find that shift scheduling provides them greater opportunities to do what they want to do in their free time.

In their study on 2020, Silva et al. mentions that shift work made several implications on shift workers' social and family life. The implications in the social part are strains in socializing and their access to the public services which are given by the society. On the other side, the aspects of family shows difficulties related to following the life of relatives, problems of children, spending time with the children, supervising

children, supporting and following the education of children, obstacles in communucating between partners and organizing household tasks. Also, some behavioural changes due to the shift work like annoyance, irritability and emotional reactions could possibly have an impact on workers' mood and these mood changes might affect social and family related relationships (Silve et al., 2020).

A research about analyzing the effect of stress sources in organizations on work-family conflict of employees was conducted among 440 workers and they were give a survey (Work-Family Life Conflict Scale) to measure work-family conflict levels with shift work The results of the survey showed that shift workers experience more work-family conflict than permanent day workers. The reason for this has been interpreted as the constant change of working hours of shift workers (Özafşarlıoğlu and Kılıç, 2013).

Another study shows a different perspective on the impacts of shift work in terms of familial life. Most of the studies are looking from the worker's perspective while Arlinghaus et al. in 2019 covers shift workers's children perspective. It mentions that childrens with earlier ages living with parents who work in shifts are under harmful impacts of this. Low socioeconomic levels and single parent families are mostly affected from these impacts such as substance use or delinquency. Also, the probability of divorce or separation is increased with shift work 6 times more than day workers. Yet, in terms of child care, shift work could be advantageous for the parents who work in different shifts, too. Therefore, it would be very beneficial to make more studies related to the social and familial impacts of shift work with different exposured parts (Arlinghaus et al., 2019).

CHAPTER 3

METHODOLOGY

In the previous sections, the concepts of the shift working system were examined theoretically. The effects of the shift work, which forms the basis of the study, on both workers and businesses have been tried to be explained since a few years. In recent years, the adverse effects caused by the shift working system, especially the night shift, in the physical, psychological and social-familial lives of the workers have become extremely important. In this section, in accordance with the theoretical framework, the links between physical, psychological and social impacts of shift work and workers' age, marrital status, work and shift work experiences are tried to be explained with a field study. This chapter also discusses procedures that were used for the experiment, subjects, data collection and the methods used for statistical analysis of data.

3.1 Shift System of Beverage Factory

The beverage factory which is selected for the questionnaire has 3 shifts for the operators who work under technical directorate. Three shift workers, who work in morning shifts from 08.00h to 16.00h, evening shifts from 16.00h to 00.00h and night shifts from 00.00h to 08.00h. The shift workers working for 3 shifts have duties under following departments:

- Filling and Packaging
- Production
- Utilities (includes Energy, Electrical and Mechanical Maintenance, Wastewater Treatment Factory)
- Quality
- Warehouse and Logistics

Except unusual situations, the production continues for 7 days and 24-hours. The work is also continuous during official holidays also if there is no exception. The work load in each shift could vary from each other but the busiest time for the factory is morning shift because blue collar, white collar and visitors are together only in morning shifts. During the research period, there are 229 workers in total and 180 of them are shift workers which are also called as blue collar. 12 of 229 workers are women and they all work as white collar.

3.2 Scope and Limitations of the Research

This research is designed to be conducted on beverage shift workers in beverage factories. Therefore, the population of the research is beverage shift workers. However, due to the limitations of time, cost and accessibility, this research was being carried on a beverage company that operates in Ankara, Turkey and other beverage companies could not be included. In other words, the sample group is chosen as 180 shift workers of the mentioned beverage factory.

The research covers all shift workers that works for the related company in beverage factory. 118 of shift workers voluntarily participated the survey which was planned to apply for 180 shift workers. Some of the studies that are mentioned in literature review and some other studies are both performed with at least 90 shift workers up to more than thousand. Therefore, around 100 shift workers are considered enough to be evaluated and the survey invitations were shared with 180 shift workers. As a result, 118 shift workers answered the survey and this is mainly because annual leaves and lack of hardware devices for a minority. It would be very beneficial if the survey was completed for 180 employers because some age intervals are very dominant while some of them are having only a few number of people which makes it more difficult to comment on.

Another limitation of this study is the gender that is researched here is male because all shift workers in the factory is male. Therefore, this research is limited with males

and does not include female workers in the shift work industry. This situation causes to keep the women shift workers of beverage industry out of this research. In shift working literature, it is very important to include womens in such studies because health and marital status of women could be very important topic to research. Women's health is really different than men's. Hence, the impacts could vary more. Also, being mother, children's care, house work and family relations are key concerns for women role in the society, so it is very important for such a research to measure the relations of these with shift working.

3.3 Research Method

Standart Shiftwork Index was chosen as a survey to be applied on shift workers for this research. Standard Shiftwork Index (SSI; Barton et al., 1995) was designed by Barton et al in 1995 and it is the most useful equipment in the literature to cover the main impacts of shift work over shift workers. However, it is also very difficult to be used because of its length and number of questions. While organizing the survey process, it is understood that the average answering duration of the survey is about 1,5-hour and getting shift workers' attention on a survey for such a long time is very difficult. Hence, a shorter and modified form of Standart Shiftwork Index which is called as "Survey of Shiftworkers (SOS)" was administered. This survey (together with SSI) is mostly used for nurses, doctors, firefighters and security personel. Since other surveys mostly look only one impact of shift work over the workers, SOS is still mostly used in literature because it gives scales to measure shift work view, sleep disorders, chronic fatigue, feelings and social and familial impacts at the same time. The survey could be seen in Appendix A and B in applied language (Turkish) and original language (English), respectively. Necessary permissions about using the survey and making changes on it are taken directly by Simon Folkard on May, 2021 through an e-mail.

This questionnaire is applied on Google Forms by omitting some parts. For example, time durations of shift works are common. Therefore, starting and finishing time for

the shifts are not covered again. Also, all shift workers who filled the survey are males and gender part of the survey is not given. The general information such as type of work, weekly hours contracted for works and so on is given in this chapter. Hence, the questions that aim to get these types of information are excluded from the survey.

The survey has three parts and consists of eight pages in length and it takes approximately 15 minutes to complete. In the first chapter of the survey, the overall information about the schedule of shifts and workload of different shifts were included together with demographic information such as age, work and shift work experience and domestic situation. The second part of the survey includes questions related to the quality and flexibility of sleeping habits, pacing of job and advantages of shiftwork system. In the last part, questions related to physical, psychological and social problems were directed.

Cronbach's alpha coefficient was used to evaluate the reliability of the questionnaire. Cronbach alpha reliability analysis is a type of analysis introduced by Lee Cronbach in 1951. When items are not coded as binary (true/false, yes/no etc.), it is an appropriate internal consistency analysis to be used in likert type scales.

Statistical data which is obtained by application of survey is taken from Google Forms as an excel table and these are evaluated by using SPSS package program.

3.4 Statistical Analysis of Data

While evaluating the findings obtained in the study, SPSS (Statistical Package for Social Sciences for Windows) 22.0 program was used for statistical analysis. Shapiro Wilk-W test, Kolmogorov Smirnov test, Skewness and Kurtosis values were used to show the normality distribution of the data. Descriptive statistics for continuous variables are expressed as mean and standard deviation while descriptive statistics for categorical data are given as frequency and percentage. Chi-square test was used to compare categorical data. In the comparison of quantitative data, Independent

Samples-T Test and One-Way Anova tests were used for those that met the assumption of normal distribution. Mann Whitnet U test and Kruskall Wallis test were used for those that did not meet the normal distribution assumption.

3.5 Data Collection Procedure

The aim and scope for this research is shared with human resources managers and necessary permissions were taken. Following the permission step, all shift workers were informed about the study by Occupational Health and Safety Engineer. An information message was shared in an inside messaging platform with all workers stating that all information will be anonymous and inviting link of the survey was shared.

In this study, age, marital status, number of people living in the household excluding themselves, number of dependents in the household, total working years, working years at the current workplace, years of shift work, weekly paid overtime hours, commuting time, and daily sleep need were asked. In addition to demographic questions such as workload, control, fatigue, advantage-disadvantage, sleep disturbance, behavior-emotional style, social life, health effects and feeling scales were applied to the participants. The survey was applied to 180 shift workers and replied by 118 shift workers in total. No specific sampling method was used and whole shift worker population of the factory is tried to be reached.

3.6 Approval of Human Subjects Ethical Committee

This research is approved by Human Subjects Ethical Committee of Middle East Technical University on 27.10.2021 with the protocol number 418-ODTU-2021.

3.7 Research Model and Hypotheses

The key variables were assessed according to the research model and the relationships between them were tried to be explained. It was assumed that there is a relationship between the dependent variables (shift work view, physical, psychological and social impacts) and the independent variables (age, marital status, work experience, shift work experience) in the model.

In this research, it is assumed that independent variables (age, marital status, work experience, shift work experience) have a relation with dependent variables (health effects, sleep disorder, chronic fatigue, behavioural mood, feeling, social-familial impacts and shift work opinion). It is also assumed that dependent variables are observed in negative way with increasing age, being married and more work and shift work experience.

The hypotheses established for the differences in the scale scores applied to the participants according to the demographic variables are given below.

H1a: Health Effects Scale scores significantly changes with the age variable.

H1b: Sleep Disorder Scale scores significantly changes with the age variable.

H1c: Chronic Fatigue Scale scores significantly changes with the age variable.

H1d: Behavioral Mood Scale scores significantly changes with the age variable.

H1e: Feeling-1 Scale scores significantly changes with the age variable.

H1f: Feeling-2 Scale scores significantly changes with the age variable.

H1g: Social-Familial Scale scores significantly changes with the age variable.

H1h: Shift work opinion scores significantly changes with the age variable.

H2a: Health Effects Scale scores significantly changes with the marital status.

H2b: Sleep Disorder Scale scores significantly changes with the marital status.

H2c: Chronic Fatigue Scale scores significantly changes with the marital status.

H2d: Behavioral Mood Scale scores significantly changes with the marital status.

H2e: Feeling-1 Scale scores significantly changes with the marital status.

H2f: Feeling-2 Scale scores significantly changes with the marital status.

H2g: Social-Familial Scale scores significantly changes with the marital status.

H2h: Shift work opinion scores significantly changes with the marital status.

H3a: Health Effects Scale scores significantly changes with the work experience.

H3b: Sleep Disorder Scale scores significantly changes with the work experience.

H3c: Chronic Fatigue Scale scores significantly changes with the work experience s.

H3d: Behavioral Mood Scale scores significantly changes with the work experience.

H3e: Feeling-1 Scale scores significantly changes with the work experience.

H3f: Feeling-2 Scale scores significantly changes with the work experience s.

H3g: Social-Familial Scale scores significantly changes with the work experience.

H3h: Shift work opinion scores significantly changes with the work experience.

H4a: Health Effects Scale scores significantly changes with the shift work experience.

H4b: Sleep Disorder Scale scores significantly changes with the shift work experience.

H4c: Chronic Fatigue Scale scores significantly changes with the shift work experience.

H4d: Behavioral Mood Scale scores significantly changes with the shift work experience.

H4e: Feeling-1 Scale scores significantly changes with the shift work experience.

H4f: Feeling-2 Scale scores significantly changes with the shift work experience.

H4g: Social-Familial Scale scores significantly changes with the shift work experience.

H4h: Shift work opinion scores significantly changes with the shift work experience.

CHAPTER 4

RESULTS AND DISCUSSIONS

In this chapter, statistical analyses of the data obtained as a result of the research and the interpretations of the analyses are given.

4.1 Descriptive Statistics for Continuous Variables

Descriptive statistics for the continuous variables of all participants participating in the study are given in Table 1.

Here, the mean and standard deviation values of the continuous variables of the participants were calculated based on the questions asked. These numbers shows the overall mean results of scores for the shift workers who answered all of the questions based on the related scales of question types. For example, the mean value for the shift work view about being advantageous or disadvantageous is 3.00 and this meets "in between" in the Survey of Shiftwork. Each one of these categories have questions under itself and these could be seen in SOS in Appendix A.

Feeling good in the early morning and tired earlier in the evening has mean value of 6.43±2.43 out of 9 and this result shows that most of the participants are more likely to feel good in the early morning while they feel tired in the earlier evening.

Ease of sleeping in unusual times or places has mean value of 4.11±2.75 out of 9 and that means it is not very easy to show such a sleeping habit for most of the participants.

Workload in each shift has the mean value of 3.29±0.66 out of 5 and this shows participants find the workload on each shift as averag

Table 1: Descriptive Statistics of Continuous Variables

	Mean.±S.D.	*Median (Min.-Max.)*
Feeling Good in The Early Morning And Tired Earlier in the Evening	6.43±2.43	7.00 (1.00-9.00)
Ease Of Sleeping in Unusual Times or Places	4.11±2.75	3.50 (1.00-9.00)
Workload	3.29±0.66	3.00 (1.00-5.00)
Control	3.44±1.08	3.67 (1.00-5.00)
Fatigue and Sleeping in An Unusual Place	5.27±1.72	5.50 (1.00-9.00)
Advantage-Disadvantage	3.01±1.46	3.00 (1.00-5.00)
Amount of Sleep Thought	3.20±0.84	3.00 (1.00-5.00)
Sleep Quality Thought	3.16±0.74	3.00 (1.50-5.00)
Feeling Rested After Sleep	3.08±0.81	3.00 (1.00-5.00)
Early Waking Up	3.05±0.87	3.00 (1.00-5.00)
Difficulty on Falling Asleep	2.95±0.92	3.00 (1.00-5.00)
Sleep - Overall	3.09±0.59	3.10 (1.80-4.35)
Chronic Fatigue Scale	2.98±0.52	3.00 (1.00-4.33)
Awake Sleepy Hours Morning Shift	4.44±1.33	4.67 (1.17-9.00)
Awake Sleepy Hours Afternoon Shift	4.58±1.26	4.67 (1.00-9.00)
Awake Sleepy Hours Night Shift	5.43±1.81	5.54 (1.00-9.00)
Awake Sleepy Hours General	4.83±1.31	5.03 (1.05-9.00)
Behavior Emotion Style	2.31±0.54	2.17 (1.00-3.83)
Social	3.26±1.02	3.33 (1.00-5.00)
Health	2.11±0.48	2.07 (1.00-3.33)
Feelings – 1	2.22±0.57	2.00 (1.00-4.00)
Feelings – 2	1.94±0.79	1.67 (1.00-4.00)
Feelings - Overall	2.08±0.62	1.96 (1.00-4.00)

Having control over the work of shifts has a mean value of 3.44±1.08 out of 5 and it shows participants have control of work on each shift as almost average.

Fatigue and sleeping in an unusual place has a mean value of 5.27±1.72 out of 9 and it means participants answered this question as average.

Advantage-disadvantage view of shift work has the mean value of 3.01±1.46 out of 5 and that shows half of the participants are more likely to find the shift works as advantageous while the other half is more likely to find disadvantegous. The main reasons behind this could be overtime payments for advantageous part and sleeping and social-familial habit for disadvantagous part.

Thought on the amount of sleep that shift workers have a mean value of 3.20±0.84 out of 5 which is on average and thought on the sleep quality of shift workers have a mean value of 3.16±0.74 out of 5 as like amount of sleep and that is on average, too. Feeling rested after sleep has a mean value of 3.08±0.81 out of 5 and it shows participants give the average choice for this question, too.

Waking up earlier has a mean value of 3.05±0.87 out of 5 and difficulty on falling asleep has a mean value of 2.95±0.92 out of 5. Sleep in overall has a mean value of 3.09±0.59 out of 5.

Chronic fatigue scale has a mean value of 2.98±0.52 out of 5 and that means participants are less likely to have chronic fatigue due to shift work.

Awake and sleepy hours represents how awake the shift workers feel during related shift in certain hours and it generally answered as average. This question is one of the longest questions to be answered in SOS and shift workers might tend to give a general answer which is neither alert nor sleepy. It has a scale of 9 and the means values are as follows:

- Awake and sleepy hours in morning shift: 4.44±1.33
- Awake and sleepy hours in afternoon shift: 4.58±1.26
- Awake and sleepy hours in night shift: 5.43±1.81
- Awake and sleepy hours (general): 4.83±1.31

Behavior and emotion style has a mean value of 2.31±0.54 out of 5 and it considered as average.

Social scale has a mean value of 3.26±1.02 out of 5 and it is a bit more than average which shows that more than half of the participants have some problems with the impacts of shift work over the social and familial balance of their life.

Health impacts of the shift work on participants have the mean value of 2.11±0.48 out of 4 and most of the problems are about shoulder, neck and back pain

Feelings-1 represents the first part of the SOS in which feelings are asked and it has a mean value of 2.22±0.57 out of 4 and Feelings-2 has a mean value of 1.94±0.79 out of 4 and Feelings in overall has the mean value of 2.08±0.62 out of 4.

4.2 Descriptive Statistics for Categorical Variables

Distribution of ages of the participants are given in Figure-1. Age of majority of participants are varied between 25 and 34 and it represents 33% of the participants. On the other hand, only 2% of the participants' ages are 55 and above.

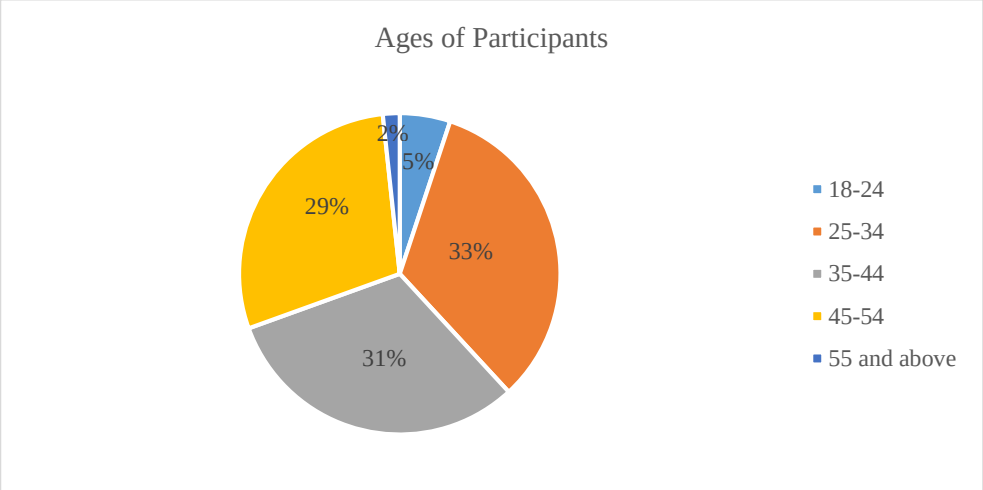

Figure 1: Age of Participants

Table 2 shows the descriptive statistical values of categorical variables of the participants.

Table 2: Descriptive Statistical Values of Categorical Variables

		n (%)
Age	18-24	6 (5.08%)
	25-34	39 (33.05%)
	35-44	37 (31.36%)
	45-54	34 (28.81%)
	55 and more	2 (1.69%)
Marital Status	Married	84 (71.19%)
	Separated/divorced	7 (5.93%)
	Widowed	2 (1.69%)
	Single	25 (21.19%)
Person Living in The Household Other Than Himself	1	24 (20.34%)
	2	25 (21.19%)
	3	42 (35.59%)
	4 and more	16 (13.56%)
	Noone	11 (9.32%)
Dependent Person in The Household	1	14 (11.86%)
	2	21 (17.8%)
	3	30 (25.42%)
	4 and more	18 (15.25%)
	Noone	35 (29.66%)
Work Experience	Less than 1 year	4 (3.39%)
	2-5 year	18 (15.25%)
	6-10 year	23 (19.49%)
	11-15 year	17 (14.41%)
	16-20 year	12 (10.17%)
	More than 20 year	44 (37.29%)
Work Experience in Current Workplace	Less than 1 year	11 (9.32%)
	2-5 year	31 (26.27%)
	6-10 year	14 (11.86%)
	11-15 year	16 (13.56%)
	16-20 year	10 (8.47%)
	More than 20 year	36 (30.51%)
Work Experience in Shift Work	Less than 1 year	17 (14.41%)
	2-5 year	31 (26.27%)
	6-10 year	9 (7.63%)
	11-15 year	17 (14.41%)
	16-20 year	10 (8.47%)
	More than 20 year	34 (28.81%)
Average Weekly Overtime Hours (Paid)	0	42 (35.59%)
	0-5	41 (34.75%)
	More than 5	35 (29.66%)
Daily need for sleep, regardless of shift	6 hours and less	16 (13.56%)
	7	49 (41.53%)
	8	48 (40.68%)
	9 hours and more	5 (4.24)

The results for the marital status of the participants are given in Figure 2.

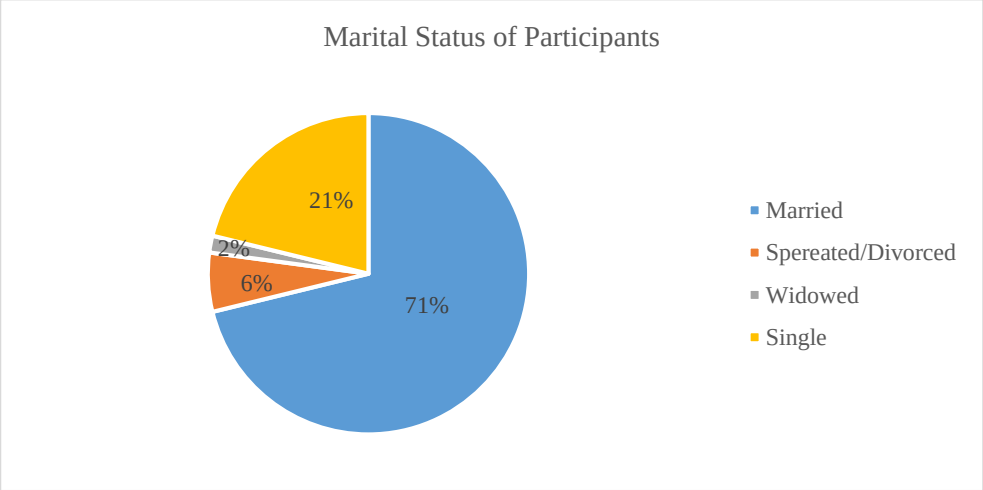

Figure 2: Marital Status of Participants

The results for the number of people living in the household excluding the participants shows that 20.34% of them are living with 1 person while 21.19% of them are living with 2 people and 35.59% of them are living with 3 people. 13.56% of the participants are living with 4 or more people and 9.32% of them are living alone.

The results for the number of dependents that participants have in the household is distributed as 11.86% are having only 1 dependent while 17.8% are having 2 dependents and 25.42% are having 3 dependents. 15.25% of the participants are having 4 and above dependents and % 29.66 of them are having no dependents.

Total working experiences of participants are given in Figure 3 and total shift work experiences of the participants are given in Figure 4. Majority of the participants have more than 20 years of working experience and shift work experience.

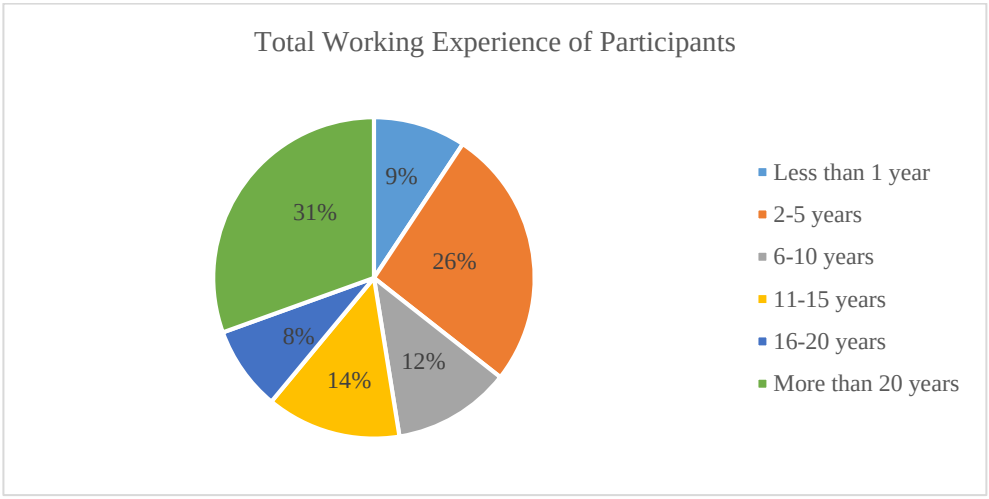

Figure 3: Total Working Experience of Participants

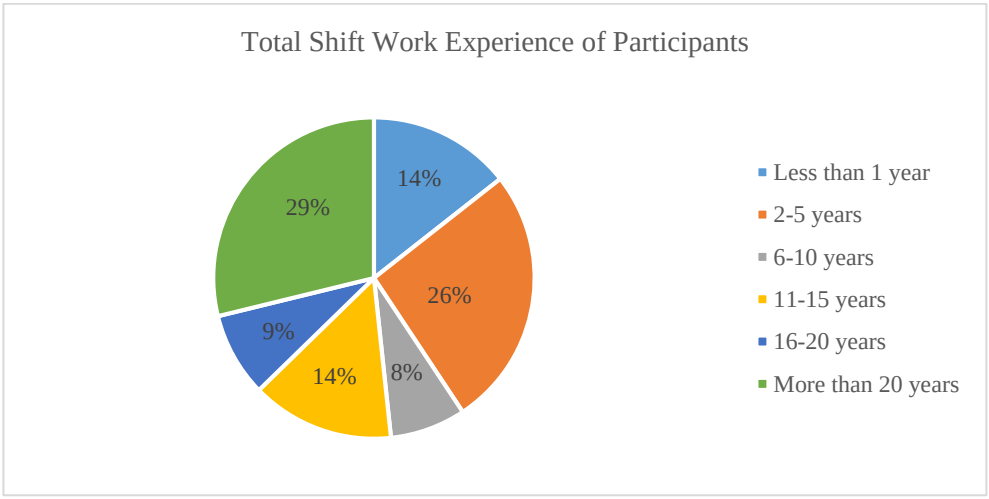

Figure 4: Total Shift Work Experience of Participants

The average weekly paid overtime working hours of the participants were found to be as 0 hours for 35.59% and 0-5 hours for 34.75% of the participants. On the other hand, 29.66% of participants are working 5-hours of overtime.

The daily sleep needs of the participants, independent of the shift were found to be 6 hours or less for 13.56% of participants and 7 hours for 41.53% of them. 40.68% of the participants need 8 hours of sleep whike only 4.24% of them need 9 hours and more.

4.3 Cronbach's Alpha Values of Scales

Cronbach's Alpha values, which represents measure of consistency, for the scales of this survey are quite reliable and highly reliable based on the article that Kılıç released in 2016. The Cronbach Alpha Coefficient investigates whether k questions in the scale form a whole to explain a homogeneous structure or not.

Cronbach's alpha coefficient is the coefficient that best reflects the general reliability structure compared to other coefficients, since it is calculated by taking into account all questions and consistent statistical foundations.

Cronbach's Alpha Coefficient is a coefficient that reveals the similarity and closeness of the questions to each other when the individual scores are found by adding the answers given to the questions on a scale containing k questions.

The higher the alpha, it is understood that the items in the scale are consistent with each other and test the same feature. The range of 0.6-.0.8 is considered quite reliable and the range of 0.8-1.00 is considered highly reliable (Kılıç, 2016).

Cronbach's Alpha values of the scales and the number of questions in each scale are given in Table 3.

Table 3: Cronbach's Alpha Values of Scales

	Cronbach's Alpha	*Number of Questions Asked*
Workload	0.692	3
Control	0.886	3
Amount of Sleep Thought	0.687	4
Sleep Quality Thought	0.662	4
Feeling Rested After Sleep	0.743	4
Early Waking Up	0.790	4
Difficulty on Falling Asleep	0.789	4
Sleep - Overall	0.865	20
Awake Sleepy Hours Morning Shift	0.888	12
Awake Sleepy Hours Afternoon Shift	0.865	12
Awake Sleepy Hours Night Shift	0.938	13
Awake Sleepy Hours General	0.954	37
Behavior Emotion Style	0.733	6
Social	0.722	3
Health	0.879	21
Feelings – 1	0.870	6
Feelings – 2	0.767	3
Feelings - Overall	0.877	9

4.4 Distribution of Workload Scale Responses

The distribution of the participants' responses to the workload scale is given in Table 4:

Table 4: Distribution of Workload Scale Responses

Workload of Shift	*Extremely Light*	*Quite Light*	*Average*	*Quite Heavy*	*Extremely Heavy*
Morning Shift (1st Shift)	1 (0.85%)	10 (8.47%)	58 (49.15%)	39 (33.05%)	10 (8.47%)
Afternoon Shift (2nd Shift)	2 (1.69%)	11 (9.32%)	73 (61.86%)	27 (22.88%)	5 (4.24%)
Night Shift (3rd Shift)	3 (2.54%)	22 (18.64%)	46 (38.98%)	33 (27.97%)	14 (11.86%)

The distribution shows us the workload for the night shift is not light or heavy. Workers who assessed morning shift as quite heavy might have reasons related to be controlled by a supervisor during the day time. The results of extremely heavys shows that night shift is assessed as the heaviest shift. Yet, those who chose morning shift as extremely heavy is closed to them, so it might be a good research area to understand differences between morning and night shifts in terms of workload in the future studies.

4.5 Distribution of Control Status Scale Responses

The distribution of the participants' responses on the control status scale is given in Table 5.

Table 5: Distribution of Control Status Scale Responses

Control	*Entirely outside my control*	*Somewhat outside my control*	*In between*	*Somewhat under my control*	*Entirely under my control*
Morning Shift (1st Shift)	8 (6.78%)	20 (16.95%)	28 (23.73%)	35 (29.66%)	27 (22.88%)
Afternoon Shift (2nd Shift)	6 (5.08%)	*17* (14.41%)	33 (27.97%)	37 (31.36%)	25 (21.19%)
Night Shift (3rd Shift)	9 (7.63%)	21 (17.8%)	30 (25.42%)	31 (26.27%)	27 (22.88%)

This question is searching for how much shift workers feel that they have the control on their duties in each shift.

Normally, it is expected that shift workers are more likely to have control over their duties during the night shift. However, according to the results, control feeling is mostly observed during afternoon shift and morning shift with more than 60% in total for somewhat and entirely under control. This might depend on the charachteristics of shift workers and supervisors of the workplace. Some shift workers might be experiencing that supervisors let them the responsibility and do not interfere them during the morning and afternoon shifts.

4.6 Advantage-Disadvantage Distribution of the Shift System

The distribution of the answers given by the participants to the question of whether shift work is advantageous or disadvantageous is given in Table 6.

Table 6: Advantage-Disadvantage Distribution of the Shift System

Do you feel that overall the advantages of your shift system outweigh the disadvantages?	*Definitely not*	*Probably not*	*In between*	*Probably yes*	*Definitely yes*
	25 (21.19%)	23 (19.49%)	23 (19.49%)	20 (16.95%)	27 (22.88%)

Results showed that 39.83% of the participants find shift work more advantageous and 19.49% of them are in between. On the other hand, 40.68% of participants are more likely to find the shift work disadvantageous. The reasons for those who find it advantageous might be varied around having control, not working with supervisors, getting more paid, being night type person or being introverted. Each of these could be a research topic to study the relations of these factors with shift work view.

Yet, shift workers who find shift work disadvantageous is also having a high amount of percantage among all and this might show that they are exposed to many negative impacts to be assessed for the future studies.

4.7 Distribution of Responses to Sleep Disturbance Scale Questions

The distribution of the answers given by the participants to the sleep disturbance scale questions is given in Table 7.

In this part of the survey, sleep characteristics of the participant are asked for different shifts.

Table 7: Distribution of Responses to Sleep Disturbance Scale Questions

Sleep Amount View	*Get plenty*	*Get the right amount*	*Could do with a bit more*	*Could do with a lot more*	*Nowhere near enough*
Between successive morning shifts	7 (5.93%)	42 (35.59%)	31 (26.27%)	21 (17.8%)	17 (14.41%)
Between successive afternoon shifts	3 (2.54%)	38 (32.2%)	34 (28.81%)	28 (23.73%)	15 (12.71%)
Between successive night shifts	3 (2.54%)	15 (12.71%)	31 (26.27%)	32 (27.12%)	37 (31.36%)
Between successive days off	14 (11.86%)	40 (33.9%)	24 (20.34%)	17 (14.41%)	23 (19.49%)
Quality Sleep Rating	*Extremely badly*	*Quite badly*	*Moderately well*	*Quite well*	*Extremely well*
Between successive morning shifts	6 (5.08%)	34 (28.81%)	34 (28.81%)	33 (27.97%)	11 (9.32%)
Between successive afternoon shifts	4 (3.39%)	37 (31.36%)	42 (35.59%)	26 (22.03%)	9 (7.63%)
Between successive night shifts	1 (0.85%)	12 (10.17%)	28 (23.73%)	34 (28.81%)	43 (36.44%)
Quality Sleep Rating	*Extremely badly*	*Quite badly*	*Moderately well*	*Quite well*	*Extremely well*
Between successive days off	16 (13.56%)	44 (37.29%)	30 (25.42%)	20 (16.95%)	8 (6.78%)
Degree of rest after sleep	*Almost always*	*Frequently*	*Sometimes*	*Rarely*	*Almost never*
Between successive morning shifts	9 (7.63%)	41 (34.75%)	34 (28.81%)	25 (21.19%)	9 (7.63%)
Between successive afternoon shifts	4 (3.39%)	34 (28.81%)	41 (34.75%)	31 (26.27%)	8 (6.78%)
Between successive night shifts	5 (4.24%)	11 (9.32%)	33 (27.97%)	38 (32.2%)	31 (26.27%)
Between successive days off	14 11.86%)	42 (35.59%)	34 (28.81%)	16 (13.56%)	12 (10.17%)

Table 7 (cont'd): Distribution of Responses to Sleep Disturbance Scale Questions

Active getting up from the desired time	*Almost never*	*Rarely*	*Sometimes*	*Frequently*	*Almost always*
Between successive morning shifts	10 (8.47%)	22 (18.64%)	47 (39.83%)	28 (23.73%)	11 (9.32%)
Between successive afternoon shifts	12 (10.17%)	24 (20.34%)	49 (41.53%)	26 (22.03%)	7 (5.93%)
Between successive night shifts	10 (8.47%)	17 (14.41%)	37 (31.36%)	39 (33.05%)	15 (12.71%)
Between successive days off	17 (14.41%)	28 (23.73%)	33 (27.97%)	27 (22.88%)	13 (11.02%)
Having trouble falling asleep	*Almost never*	*Rarely*	*Sometimes*	*Frequently*	*Almost always*
Between successive morning shifts	11 (9.32%)	37 (31.36%)	38 (32.2%)	17 (14.41%)	15 (12.71%)
Between successive afternoon shifts	10 (8.47%)	29 (24.58%)	44 (37.29%)	20 (16.95%)	15 (12.71%)
Between successive night shifts	14 (11.86%)	16 (13.56%)	37 (31.36%)	29 (24.58%)	22 (18.64%)
Between successive days off	20 (16.95%)	39 (33.05%)	33 (27.97%)	16 (13.56%)	10 (8.47%)

Distribution of answers to sleep disturbance scale questions shows that most of the shift workers finds the sleep amount they have is nowhere near enough during the successive night shifts. Also, the same situation is valid for their sleep quality views, too.

Most of shiftworkers answered their feeling of rested after sleep as rarely for the successive night shifts period. 39 % of shift workers get up earlier than they desire during successive night shifts. When they are asked whether they have difficulties with falling asleep, shift workers are mostly having this during afternoon and night shipts. The main reasons behind this could be disturbances on circadian rhythm as well as their social and familial needs.

4.8 Distribution of Responses to Chronic Fatigue Scale Questions

The distribution of the responses of participants to the chronic fatigue scale questions is given in Table 8.

Table 8: Distribution of Responses to Persistent Fatigue Scale Questions

Chronic Fatigue	*Not at all*	*A little bit*	*Some-what*	*Much*	*Very much so*
I generally feel I have plenty of energy	10 (8.47%)	25 (21.19%)	40 (33.9%)	38 (32.2%)	5 (4.24%)
I feel tired most of the time	7 (5.93%)	44 (37.29%)	30 (25.42%)	30 (25.42%)	7 (5.93%)
I usually feel lively	7 (5.93%)	25 (21.19%)	47 (39.83%)	36 (30.51%)	3 (2.54%)

The results for chronic fatigue is centering around somewhat for most of the participants. This could mean there is no meaningful relation of shift work with chronic fatigue for the beverage shift workers who joined in this research.

However, the question that measures feeling tired for most of the time is giving a little clue. The answers for this question is principally around “a little bit” for 37% of the respondents. Yet, these results may vary with increasing number and variety of shift workers in the future studies.

4.9 Distribution of Responses to Behavior Style Scale Questions

The distribution of the answers given by the participants to the behavior style scale questions is given in Table 9:

Table 9: Distribution of Responses to Behavior Style Scale Questions

Behaviour	*Almost never*	*Rarely*	*Frequently*	*Almost always*
Does your mood go up and down?	5 (4.24%)	67 (56.78%)	40 (33.9%)	6 (5.08%)
Do you feel 'just miserable' for no good reason?	16 (13.56%)	72 (61.02%)	25 (21.19%)	5 (4.24%)
When you get annoyed do you need some-one friendly to talk to?	14 (11.86%)	34 (28.81%)	53 (44.92%)	17 (14.41%)
Are you troubled about feelings of guilt?	29 (24.58%)	52 (44.07%)	24 (20.34%)	13 (11.02%)
Would you call yourself tense or 'highly strung'?	33 (27.97%)	54 (45.76%)	23 (19.49%)	8 (6.78%)
Do you suffer from sleeplessness?	13 (11.02%)	53 (44.92%)	37 (31.36%)	15 (12.71%)

The results show that the mood of participants goes up and down rarely and they rarely feel just miserable for no good reason. On the other handa, the majority with 44.92% need someone to talk when they get annoyed. 44.07% of the participants are rarely troubled about feeling guilt and 45.76% of participants call themselves as tense or highly strung. 44.92% of participants rarely suffer from sleeplessnes and this is mostly accordable with sleep disturbance scale results.

4.10 Distribution of Responses to the Sociality Scale Questions

The distribution of the answers given by the participants to the sociality scale questions is given in Table 10.

Table 10: Distribution of Responses to the Sociality Scale Questions

Social	*Almost never*	*Quite seldom*	*Sometimes*	*Quite often*	*Almost always*
How much does your shift system interfere with your leisure time?	9 (7.63%)	24 (20.34%)	23 (19.49%)	28 (23.73%)	34 (28.81%)
How much does your shift system interfere with your domestic life?	6 (5.08%)	24 (20.34%)	25 (21.19%)	31 (26.27%)	32 (27.12%)
How much does your shift system interfere with your non-domestic life? (e.g. going to doctor, library, bank, hairdresser, etc.)?	18 (15.25%)	38 (32.2%)	26 (22.03%)	18 (15.25%)	18 (15.25%)

According to the results, shift working system mostly interfere the leisure time with 28.81% percentage. Also, the results showed that shift system mostly interferes domestic life of shift workers. On the other hand, shift system interferes non-domestic life of shift workers quite seldomly for 32.2% of participants. This is because afternoon and night shifts allow shift workers to do their non-domestic duties during the day time.

4.11 Distribution of Responses to Health Effects Scale Questions

The distribution of the answers given by the participants to the health effects scale questions is given in Table 11

None of the health effects is seen extremely common among shift workers. However, there are still a few health impacts to be considered.

52 % of shift workers answered as being watched what they eat to avoid stomach upsets as quite often and almost always. This result is coherent with the information which have previously been mentioned from the given studies related to physical impacts in the literature review part.

60% of shift workers answered the question of having shoulder and/or neck pain positively and 65% of them having back and/or lower back pain while 55% of them having leg and/or knee pain. This is also another expecting results for the studies as it is discussed in the physical impacts part of the literature review, too.

4.12 Distribution of Responses to the Feeling-1 Scale Questions

The distribution of the answers given by the participants to the Feeling-1 scale questions is given in Table 12.

The questions related to Feeling-1 are given in the first column of the Table 12.. Most of the answers for the questions of Feeling-1 scale are responded as “same as usual”. This shows that most of shift workers do not have any disorder related to their feelings on concentration, being useful, making decisions, enjoying day to day activities, facing up with problems and feeling reasonably happy. Yet, 26.27% of them stated that they have been able to enjoy normal day to day activities less than usual. Likewise, 22.88% of respondents have been feeling reasonably happy less than usual. These two results might have more importance if the same study could conduct with more sample size.

Table 11: Distribution of Responses to Health Effects Scale Questions

	Almost never	*Quite seldom*	*Quite often*	*Almost always*
How often is your appetite disturbed?	25 (21.19%)	57 (48.31%)	25 (21.19%)	11 (9.32%)
How often do you have to watch what you eat to avoid stomach upsets?	23 (19.49%)	43 (36.44%)	36 (30.51%)	16 (13.56%)
How often do you feel nauseous?	41 (34.75%)	51 (43.22%)	17 (14.41%)	9 (7.63%)
How often do you suffer from heartburn or stomach-ache?	25 (21.19%)	47 (39.83%)	31 (26.27%)	15 (12.71%)
How often do you complain of digestion difficulties?	24 (20.34%)	49 (41.53%)	28 (23.73%)	17 (14.41%)
How often do you suffer from bloated stomach or flatulence?	17 (14.41%)	57 (48.31%)	28 (23.73%)	16 (13.56%)
How often do you suffer from pain in your abdomen?	26 (22.03%)	64 (54.24%)	17 (14.41%)	11 (9.32%)
How often do you suffer from constipation or diarrhoea?	25 (21.19%)	63 (53.39%)	21 (17.8%)	9 (7.63%)
How often do you suffer from heart palpitations?	39 (33.05%)	52 (44.07%)	21 (17.8%)	6 (5.08%)
How often do you suffer from aches and pains in your chest?	41 (34.75%)	54 (45.76%)	16 (13.56%)	7 (5.93%)
How often do you suffer from dizziness?	37 (31.36%)	60 (50.85%)	16 (13.56%)	5 (4.24%)
How often do you suffer from sudden rushes of blood to your head?	51 (43.22%)	48 (40.68%)	12 (10.17%)	7 (5.93%)

Table 11 (cont'd): Distribution of Responses to Health Effects Scale Questions

	Almost never	*Quite seldom*	*Quite often*	*Almost always*
Do you suffer from shortness of breath when climbing the stairs normally?	39 (33.05%)	40 (33.9%)	28 (23.73%)	11 (9.32%)
How often have you been told that you have high blood pressure?	72 (61.02%)	30 (25.42%)	9 (7.63%)	7 (5.93%)
Have you ever been aware of your heart beating irregularly?	43 (36.44%)	49 (41.53%)	21 (17.8%)	5 (4.24%)
How often do you feel "tight" in your chest?	51 (43.22%)	47 (39.83%)	14 (11.86%)	6 (5.08%)
How often do you suffer from minor infectious diseases, e.g. colds, flu, etc.?	27 (22.88%)	70 (59.32%)	18 (15.25%)	3 (2.54%)
I have shoulder and/or neck pain	25 (21.19%)	33 (27.97%)	41 (34.75%)	19 (16.1%)
I have back and/or lower back pain	15 (12.71%)	38 (32.2%)	43 (36.44%)	22 (18.64%)
I have arm and/or wrist pain	37 (31.36%)	37 (31.36%)	30 (25.42%)	14 (11.86%)
I have leg and/or knee pain	20 (16.95%)	43 (36.44)	41 (34.75%)	14 (11.86%)

4.13 Distribution of Responses Given to the Feeling-2 Scale Questions

The distribution of the answers given by the participants to the Feeling-2 scale questions is given in Table 13. The questions related to Feeling-2 are given in the first column.

Table 12: Distribution of Responses to the Feeling-1 Scale Questions

Feeling-1	*Better than usual*	*Same as usual*	*Less than usual*	*Much less than usual*
been able to concentrate on what you are doing?	11 (9.32%)	85 (72.03%)	14 (11.86%)	8 (6.78%)
felt that you are playing a useful part in things?	12 (10.17%)	82 (69.49%)	14 (11.86%)	10 (8.47%)
felt capable of making decisions about things?	23 (19.49%)	80 (67.8%)	10 (8.47%)	5 (4.24%)
been able to enjoy your normal day to day activities?	12 (10.17%)	64 (54.24%)	31 (26.27%)	11 (9.32%)
been able to face up to your problems?	12 (10.17%)	76 (64.41%)	22 (18.64%)	8 (6.78%)
been feeling reasonably happy all things considered?	10 (8.47%)	65 (55.08%)	27 (22.88%)	16 (13.56%)

Table 13: Distribution of Responses to Feeling-2 Scale Questions

Feeling-2	*Not at all*	*Same as usual*	*More than usual*	*Much more than usual*
lost much sleep over worry?	27 (22.88%)	45 (38.14%)	32 (27.12%)	14 (11.86%)
felt constantly under strain?	35 (29.66%)	46 (38.98%)	23 (19.49%)	14 (11.86%)
felt you could not overcome your difficulties?	52 (44.07%)	44 (37.29%)	15 (12.71%)	7 (5.93%)
been feeling unhappy and depressed	44 (37.29%)	37 (31.36%)	22 (18.64%)	15 (12.71%)
been losing confidence in yourself?	69 (58.47%)	27 (22.88%)	15 (12.71%)	7 (5.93%)
been thinking of yourself as a worthless person?	69 (58.47%)	24 (20.34%)	14 (11.86%)	11 (9.32%)

The results for Feeling-2 scales are mostly shaped around “not at all” and “same as usual” answers. 27% of the participants lost much sleep over worry and the result is also compatible with sleep disturbances scores. The scores might be changed if the sample size increases or different type of industries are taken into the consideration.

4.14 Comparison of Health Impacts Scale Scores

Comparison of participants' health impacts scale scores according to demographic variables is given in Table 14.

Results shows that there is a statistically significant difference between the Health Effects Scale scores of the participants according to age (F=3.546, p=0.009).

As a result of the Post Hoc analysis, which is made to determine the differences between groups, showed that differences are observed between the following groups:

18-24 (1.72±0.60) and 55 and above (2.74±0.10)

25-34 (1.98±0.47) and 55 and above (2.74±0.10)

35-44 (2.16±0.38) and 55 and above (2.74)

45-54 (2.23±0.51) and 55 and above (2.74±0.10).

There is a statistically significant difference between the Health Effects Scale scores of the participants according to the work experience (F=2.727, p=0.023). As a result of the Post Hoc analysis, the difference is observed between the 1-5 years (1.80±0.42) and more than 20 years (2.25±0.50) groups.

There is also a statistically significant difference between the Health Effects Scale scores of the participants with respect to the shift work experience (F=3.572, p=0.005). As a result of the Post Hoc analysis, a difference is observed between the groups who have work experiences with 1-5 years (1.94±0.43) and more than 20 years (2.30±0.50).

In general, Table 14 shows that shift workers with the age of 55 and more expose to the health impacts of shift work more than other groups. This could be related directly to the shift work or age itself. Therefore, seperating and comparing of shift work impacts and age impacts could be beneficial in the future studies.

Table 14: Comparison of Health Impacts Scale Scores

		Health Impacts			
		Mean±S.D.	*Median (Min.-Max)*	*F*	*p*
H1a: Age	18-24 (a)	1.72±0.60	1.57 (1.14-2.81)	3.546	0.009 p^{ae}= 0.041 p^{be}= 0.007 p^{ce}= 0.033 p^{de}= 0.024
	25-34 (b)	1.98±0.47	2.00 (1.00-3.00)		
	35-44 (c)	2.16±0.38	2.14 (1.43-3.00)		
	45-54 (d)	2.23±0.51	2.14 (1.33-3.33)		
	55 and more (e)	2.74±0.10	2.74 (2.67-2.81)		
H2a: Marital Status	Married	2.16±0.49	2.14 (1.00-3.33)	1.214	0.308
	Separated/divorced	2.10±0.39	2.10 (1.38-2.57)		
	Widowed	1.81±0.07	1.81 (1.76-1.86)		
	Single	1.97±0.48	1.90 (1.00-2.90)		
H3a: Work Experience	Less than 1 year	2.19±0.52	2.14 (1.67-2.81)	2.727	0.023 p^{bf}= 0.009
	2-5 year	1.80±0.42	1.81 (1.00-2.81)		
	6-10 year	2.04±0.51	2.10 (1.00-3.00)		
	11-15 year	2.05±0.39	1.90 (1.33-2.90)		
	16-20 year	2.21±0.38	2.24 (1.52-2.86)		
	More than 20 years	2.25±0.50	2.31 (1.33-3.33)		
H4a: Shift Work Experience	Less than 1 year	1.93±0.57	2.00 (1.00-2.81)	3.572	0.005 p^{bf}= 0.022
	2-5 year	1.94±0.43	1.90 (1.14-3.00)		
	6-10 year	1.99±0.23	2.00 (1.62-2.33)		
	11-15 year	2.09±0.34	2.10 (1.43-2.57)		
	16-20 year	2.41±0.48	2.43 (1.48-3.00)		
	More than 20 years	2.30±0.50	2.38 (1.33-3.33)		

No meaningful relation was observed for the health impacts with marital status. Work experience of 11-15 years and shift work experience for 16-20 years are exposed to health impacts of the shift work. This result is also competible with other researches mentioned in physical impacts part in the literature review.

4.15 Comparison of Sleep Disturbance Scale Scores

The comparison of the sleep disturbance scale scores of the participants according to the demographic variables is given in Table 15.

There seems a statistically significant difference between the sleep disturbance scale scores of the participants according to age (F=3.203, p=0.016). As a result of the Post Hoc analysis, differences are observed between the 18-24 (2.68±0.58) and 35-44 (3.21±0.64), and 18-24 (2.68±0.58) and 45-54 (3.25±0.53) groups.

There is also a statistically significant difference between the sleep disturbance scale scores of the participants according to marital status (F=5.092, p=0.002). As a result of the Post Hoc analysis, differences are observed between married (3.21±0.56) and widowed (2.48±0.04) and single (2.88±0.60) groups.

Another statistically significant difference between the sleep disturbance scores of the participants is seen on work experience (F=2.667, p=0.026). As a result of the Post Hoc analysis, differences are seeming between 1-5 years (2.78±0.61) and 16-20 years (3.32±0.63); 1-5 years (2.78±0.61) and more than 20 years (3.25±0.54) groups. The results showed that there is a meaningful relation of sleep disturbances due to shift work with age, marital status and work experience. The group with the age of 45-54 have more sleep disturbances aand it is less for 55 and more. This might be due to the theory of having less sleep is enough for older ages which is mentioned in the literature review part

Married shift workers are exposed to the sleep distubance more than singles. This is also competible with other researches mentioned in literature review and may be caused because of familial responsibilities.

Table 15: Comparison of Sleep Disturbance Scale Scores

		Sleep Disturbance			
		Mean±S.D.	*Median (Min.-Max)*	*F*	*p*
H1b: Age	18-24 (a)	2.68±0.58	2.65 (1.95-3.60)	3.203	0.016 p^{ac}= 0.024 p^{ad}= 0.021
	25-34 (b)	2.90±0.55	2.80 (1.80-4.35)		
	35-44 (c)	3.21±0.64	3.20 (2.00-4.25)		
	45-54 (d)	3.25±0.53	3.35 (2.25-4.10)		
	55 and more (e)	2.70±0.28	2.70 (2.50-2.90)		
H2b: Marital Status	Married	3.21±0.56	3.23 (1.80-4.25)	5.092	0.002 p^{ac} <0.001 p^{cd}= 0.015
	Separated/divorced	2.57±0.54	2.45 (2.10-3.65)		
	Widowed	2.48±0.04	2.48 (2.45-2.50)		
	Single	2.88±0.60	2.75 (1.95-4.35)		
H3b: Work Experience	Less than 1 year	3.29±0.64	3.53 (2.35-3.75)	2.667	0.026 p^{be}= 0.035 p^{bf}= 0.041
	2-5 year	2.78±0.61	2.80 (1.80-4.35)		
	6-10 year	2.91±0.47	2.85 (2.10-3.90)		
	11-15 year	3.01±0.70	2.85 (2.10-4.00)		
	16-20 year	3.32±0.63	3.30 (2.30-4.25)		
	More than 20 years	3.25±0.54	3.35 (2.00-4.10)		
H4b: Shift Work Experience	Less than 1 year	3.04±0.59	2.90 (2.20-4.35)	2.202	0.059
	2-5 year	2.85±0.51	2.85 (1.80-3.90)		
	6-10 year	2.93±0.72	2.50 (2.10-3.90)		
	11-15 year	3.17±0.68	3.15 (2.10-4.20)		
	16-20 year	3.20±0.59	3.25 (2.40-4.25)		
	More than 20 years	3.29±0.54	3.38 (2.00-4.10)		

4.16 Comparison of Chronic Fatigue Scale Scores

Table 16 represents the results for the comparison of chronic fatigue scale scores.

No significant difference was observed between chronic fatigue scale scores with respect to any demographic variable of the participants.

No meaningful impact was found between the chronic fatigue anda ge, marital status, work experience and shift work experience of the shift worker. This could also change with different industries and number of participants.

4.17 Comparison of Behavior Emotion Style Scale Scores

Comparison of the participants' behavior emotion style scale scores according to demographic variables is given in Table 17.

No significant difference was observed between the behavior emotion style scale scores with respect to any demographic variable of the participants.

4.18 Comparison of Feeling-1 Scale Scores

Comparison of the participants' Feeling-1 scale scores according to demographic variables is given in Table 18. No significant difference was observed between the Feeling-1 scale scores with respect to any demographic variable of the participants.

4.19 Comparison of Feeling-2 Scale Scores

Comparison of the participants' Feeling-2 scale scores according to demographic variables is given in Table 19. No significant difference was observed between the Feeling-2 scale scores with respect to any demographic variable of the participants

Table 16: Comparison of Chronic Fatigue Scale Scores

		Chronic Fatigue			
		Mean±S.D.	*Median (Min.-Max)*	*F*	*p*
H1c: Age	18-24 (a)	3.11±0.46	3.17 (2.33-3.67)	0.185	0.946
	25-34 (b)	2.97±0.48	3 (2-4)		
	35-44 (c)	2.95±0.49	3 (2-3.67)		
	45-54 (d)	2.98±0.62	3 (1-4.33)		
	55 and more (e)	3.17±0.24	3.17 (3-3.33)		
H2c: Marital Status	Married	2.95±0.55	3 (1-4.33)	0.693	0.558
	Separated/divorced	3.24±0.37	3.33 (2.67-3.67)		
	Widowed	3±0	3 (3-3)		
	Single	3±0.46	3 (2-3.67)		
H3c: Work Experience	Less than 1 year	3.08±0.32	3.17 (2.67-3.33)	0.380	0.862
	2-5 year	3.11±0.47	3.33 (2.33-3.67)		
	6-10 year	2.94±0.46	3 (2-4)		
	11-15 year	2.9±0.51	3 (2-3.67)		
	16-20 year	3±0.43	3 (2.33-3.67)		
	More than 20 years	2.95±0.61	3 (1-4.33)		
H4c: Shift Work Experience	Less than 1 year	2.96±0.6	3 (2-4)	0.548	0.740
	2-5 year	3.03±0.36	3 (2.33-3.67)		
	6-10 year	3±0.47	3 (2.33-3.67)		
	11-15 year	2.84±0.61	3 (2-3.67)		
	16-20 year	2.83±0.39	3 (2-3.33)		
	More than 20 years	3.04±0.6	3.17 (1-4.33)		

Table 17: Comparison of Behavior Emotion Style Scale Scores

		Behavior Emotion Style			
		Mean±S.D.	*Median (Min.-Max)*	*F*	*p*
H1d: Age	18-24 (a)	2.36±0.43	2.33 (1.83-3)	0.742	0.565
	25-34 (b)	2.3±0.49	2.33 (1.33-3.33)		
	35-44 (c)	2.38±0.54	2.33 (1.67-3.83)		
	45-54 (d)	2.27±0.61	2.17 (1-3.5)		
	55 and more (e)	1.75±0.35	1.75 (1.5-2)		
H2d: Marital Status	Married	2.37±0.58	2.33 (1-3.83)	1.032	0.381
	Separated/divorced	2.12±0.21	2.17 (1.83-2.5)		
	Widowed	2.17±0.24	2.17 (2-2.33)		
	Single	2.19±0.42	2.33 (1.33-3.17)		
H3d: Work Experience	Less than 1 year	2.42±0.29	2.5 (2-2.67)	1.423	0.221
	2-5 year	2.09±0.4	2 (1.33-3)		
	6-10 year	2.5±0.55	2.5 (1.67-3.67)		
	11-15 year	2.21±0.32	2.17 (1.67-2.83)		
	16-20 year	2.4±0.48	2.25 (1.83-3.33)		
	More than 20 years	2.31±0.65	2.17 (1-3.83)		
H4d: Shift Work Experience	Less than 1 year	2.35±0.61	2.5 (1.33-3.33)	0.868	0.505
	2-5 year	2.26±0.39	2.33 (1.67-3.33)		
	6-10 year	2.65±0.5	2.5 (2.17-3.67)		
	11-15 year	2.26±0.55	2.17 (1.67-3.83)		
	16-20 year	2.22±0.47	2.08 (1.5-3)		
	More than 20 years	2.29±0.63	2.17 (1-3.5)		

Table 18: Comparison of Feeling-1 Scale Scores

		Feeling-1			
		Mean±S.D.	*Median (Min.-Max)*	*F*	*p*
H1e: Age	18-24 (a)	2.22±0.51	2.08 (1.67-3.17)	0.949	0.438
	25-34 (b)	2.35±0.54	2.33 (1-4)		
	35-44 (c)	2.14±0.62	2 (1-4)		
	45-54 (d)	2.17±0.58	2 (1-3.67)		
	55 and more (e)	1.92±0.59	1.92 (1.5-2.33)		
H2e: Marital Status	Married	2.23±0.58	2 (1-4)	1.032	0.381
	Separated/divorced	1.88±0.45	2 (1.17-2.33)		
	Widowed	2±0	2 (2-2)		
	Single	2.29±0.58	2.17 (1-4)		
H3e: Work Experience	Less than 1 year	2.33±0.67	2 (2-3.33)	1.976	0.088
	2-5 year	2.24±0.35	2.17 (1.67-3.17)		
	6-10 year	2.49±0.55	2.33 (1.67-4)		
	11-15 year	1.95±0.67	2 (1-4)		
	16-20 year	2.25±0.67	2 (1.5-4)		
	More than 20 yeasr	2.15±0.56	2 (1-3.67)		
H4e: Shift Work Experience	Less than 1 year	2.5±0.61	2.33 (2-4)	2.198	0.059
	2-5 year	2.12±0.45	2 (1-3.33)		
	6-10 year	2.5±0.66	2.33 (2-4)		
	11-15 year	1.97±0.63	2 (1-4)		
	16-20 year	2.17±0.44	2 (1.5-3)		
	More than 20 years	2.23±0.59	2.17 (1-3.67)		

Table 19: Comparison of Feeling-2 Scale Scores

		Feeling-2			
		Mean±S.D.	*Median (Min.-Max)*	*F*	*p*
H1f: Age	18-24 (a)	2.06±0.98	1.75 (1.33-4)	0.542	0.706
	25-34 (b)	1.98±0.76	1.83 (1-4)		
	35-44 (c)	2.03±0.81	1.83 (1-4)		
	45-54 (d)	1.83±0.82	1.42 (1-3.67)		
	55 and more (e)	1.42±0.35	1.42 (1.17-1.67)		
H2f: Marital Status	Married	1.93±0.77	1.67 (1-4)	0.422	0.737
	Separated/divorced	1.74±0.48	1.5 (1.17-2.33)		
	Widowed	1.75±0.35	1.75 (1.5-2)		
	Single	2.07±0.96	1.83 (1-4)		
H3f: Work Experience	Less than 1 year	2.38±1.36	2.17 (1.17-4)	0.381	0.861
	2-5 year	1.94±0.8	1.67 (1-4)		
	6-10 year	2.02±0.72	2 (1-4)		
	11-15 year	1.81±0.65	1.67 (1-4)		
	16-20 year	1.97±0.82	1.83 (1-3.67)		
	More than 20 year	1.91±0.84	1.5 (1-3.67)		
H4f: Shift Work Experience	Less than 1 year	2.13±1.09	1.67 (1-4)	0.425	0.830
	2-5 year	1.82±0.54	1.67 (1-3.5)		
	6-10 year	2.07±0.87	1.83 (1.33-4)		
	11-15 year	2.02±0.76	2 (1.17-3.67)		
	16-20 year	1.92±0.75	1.83 (1-3.17)		
	More than 20 year	1.91±0.85	1.5 (1-3.67)		

4.20 Comparison of Social-Familial Scale Scores

The comparison of the participants' social-familal scale scores with respect to demographic variables are given in Table 20.

4.21 Comparison of Advantages and Disadvantages View of Shift Work

The comparison of the advantages-disadvantages view of the participants according to the demographic variables is given in Table 21.

There is a statistically significant difference between the advantages and disadvantages of the shift working system according to the shift working year of the

participants (F=2.986, p=0.014). As a result of the Post Hoc Analysis, differences are observed between less than 1 year (2.29±1.16) and 6-10 years (3.67±1.5); less than 1 year (2.29±1.16) and 11-15 years (3.65±1.37); 6-10 years (3.67±1.5) and more than 20 years (2.56±1.62); 11-15 years (3.65±1.37) and more than 20 years (2.56±1.62) groups.

Only meaningful result was observed among the groups of shift work experience. The experience of more than 6 years are prone to find shift work disadvantageous. These results can vary with the number of shift workers in each of the age category. Therefore, the future surveys which included high number of participants would be more guiding for understanding the shift work experience in years and the view related to the shift work of the shift workers

4.22 Overall Results of Hypotheses

The results for the defined hypotheses are given in Table 22

Table 20: Comparison of The Social-Familial Scale Scores

		The Social-Familial Scale			
		Mean±S.D.	*Median (Min.-Max)*	*F*	*p*
H1g: Age	18-24 (a)	1.44±0.46	1.33 (1.00-2.00)	8.349	<0.001 p^{ab}<0.001 p^{ac}<0.001 p^{ad}<0.001 p^{ae}=0.002 p^{be}<0.001 p^{ce}<0.001 p^{de}<0.001
	25-34 (b)	3.18±0.98	3.33 (1.00-5.00)		
	35-44 (c)	3.22±1.04	3 (1.33-5.00)		
	45-54 (d)	3.67±0.74	3.83 (2.00-5.00)		
	55 and more (e)	4.33±0.00	4.33 (4.33-4.33)		
H2g Marital Status	Married	3.48±0.98	3.67 (1.00-5.00)	4.700	0.004 p^{ac}<0.001 p^{ad}=0.018
	Separated/divorced	2.62±0.73	2.67 (1.33-3.33)		
	Widowed	3.00±0.00	3.00 (3.00-3.00)		
	Single	2.75±1.04	2.67 (1.00-5.00)		
H3g: Work Experience	Less than 1 year	3.00±1.52	2.67 (1.67-5.00)	4.166	0.002 p^{bf}<0.001
	2-5 year	2.43±1.03	2.50 (1.00-4.67)		
	6-10 year	3.26±0.99	3.33 (1.00-5.00)		
	11-15 year	3.18±0.87	3.00 (1.33-5.00)		
	16-20 year	3.36±1.12	3.33 (2.00-5.00)		
	More than 20 years	3.64±0.85	3.83 (2.00-5.00)		
H4g: Shift Work Experience	Less than 1 year	2.80±1.32	2.67 (1.00-5.00)	4.405	0.001 p^{af}=0.011 p^{bf}=0.004
	2-5 year	2.88±0.88	2.67 (1.00-4.67)		
	6-10 year	3.81±0.78	4.00 (2.67-4.67)		
	11-15 year	3.10±0.95	3.00 (1.33-5.00)		
	16-20 year	3.27±1.11	3.17 (2.00-5.00)		
	More than 20 years	3.77±0.79	4.00 (2.00-5.00)		

Table 21: Comparison of Advantages and Disadvantages of Shift Work Opinion

		Advantages and Disadvantages View of Shift Work			
		Mean±S.D.	*Median (Min.-Max)*	*F*	*p*
H1h: Age	18-24 (a)	2.67±1.21	2.5 (1-4)	1.487	0.211
	25-34 (b)	2.87±1.3	3 (1-5)		
	35-44 (c)	3.46±1.48	4 (1-5)		
	45-54 (d)	2.79±1.63	2.5 (1-5)		
	55 and more (e)	2±0	2 (2-2)		
H2h Marital Status	Married	3.04±1.53	3 (1-5)	0.386	0.763
	Separated/divorced	3.43±1.72	4 (1-5)		
	Widowed	2.5±0.71	2.5 (2-3)		
	Single	2.84±1.21	3 (1-5)		
H3h: Work Experience	Less than 1 year	2.5±1.29	2.5 (1-4)	0.366	0.871
	2-5 year	2.89±1.13	3 (1-5)		
	6-10 year	3.13±1.42	3 (1-5)		
	11-15 year	3.18±1.51	3 (1-5)		
	16-20 year	3.33±1.56	3.5 (1-5)		
	More than 20 years	2.89±1.62	3 (1-5)		
H4h: Shift Work Experience	Less than 1 year	2.29±1.16	2 (1-5)	2.986	0.014 p^{ac}=0.0271 p^{ad}=0.029 p^{cf}=0.042 p^{df}=0.045
	2-5 year	3.32±1.22	4 (1-5)		
	6-10 year	3.67±1.5	4 (1-5)		
	11-15 year	3.65±1.37	4 (1-5)		
	16-20 year	3.1±1.52	3.5 (1-5)		
	More than 20 years	2.56±1.62	2 (1-5)		

Table 22: Overall Results of Hypotheses

H1a	Health Effects Scale scores significantly increases with the age variable.	Confirmed
H1b	Sleep Disorder Scale scores significantly decreases with the age variable.	Confirmed
H1c	Chronic Fatigue Scale scores significantly increases with the age variable.	Rejected
H1d	Behavioral Mood Scale scores significantly increases with the age variable.	Rejected
H1e	Feeling-1 Scale scores significantly increases with the age variable.	Rejected
H1f	Feeling-2 Scale scores significantly increases with the age variable.	Rejected
H1g	Social-Familial Scale scores significantly increases with the age variable.	Confirmed
H1h	Shift work opinion scores significantly increases with the age variable.	Rejected
H2a	Health Effects Scale scores significantly increases with the marital status.	Rejected
H2b	Sleep Disturbance Scale scores significantly increases with the marital status.	Confirmed
H2c	Chronic Fatigue Scale scores significantly increases with the marital status.	Rejected
H2d	Behavioral Mood Scale scores significantly increases with the marital status.	Rejected
H2e	Feeling-1 Scale scores significantly increases with the marital status.	Rejected
H2f	Feeling-2 Scale scores significantly increases with the marital status.	Rejected
H2g	Social-Familial Scale scores significantly increases with the marital status.	Confirmed
H2h	Shift work opinion scores significantly increases with the marital status.	Rejected
H3a	Health Effects Scale scores significantly increases with the work experience.	Confirmed
H3b	Sleep Disturbance Scale scores significantly increases with the work. experience.	Confirmed
H3c	Chronic Fatigue Scale scores significantly increases with the work experience.	Rejected

Table 22 (cont'd): Overall Results of Hypotheses

H3d	Behavioral Mood Scale scores significantly increases with the work experience.	Rejected
H3e	Feeling-1 Scale scores significantly increases with the work experience.	Rejected
H3f	Feeling-2 Scale scores significantly increases with the work experience.	Rejected
H3g	Social-Familial Scale scores significantly increases with the work experience.	Confirmed
H3h	Shift work opinion scores significantly increases with the work experience.	Rejected
H4a	Health Effects Scale scores significantly increases with the shift work. experience.	Confirmed
H4b	Sleep Disturbance Scale scores significantly increases with the shift work. experience.	Rejected
H4c	Chronic Fatigue Scale scores significantly increases with the shift work. experience.	Rejected
H4d	Behavioral Mood Scale scores significantly increases with the shift work. experience.	Rejected
H4e	Feeling-1 Scale scores significantly increases with the shift work experience.	Rejected
H4f	Feeling-2 Scale scores significantly increases with the shift work experience.	Rejected
H4g	Social-Familial Scale scores significantly increases with the shift work. experience.	Confirmed
H4h	Shift work opinion scores significantly decreases with the shift work. experience.	Confirmed

11 out of 32 hypotheses are confirmed with the the analysis and these are given below:

- Health Effects Scale scores increases with increasing age variable:
- Sleep Disturbance Scale scores mostly decreases with increasing age variable.
- Social-Familial Scale scores increases with increasing age variable.
- Sleep Disturbance Scale scores mostly increases with being married.
- Social-Familial Scale scores increases with with being married.
- Health Effects Scale scores increases with increasing work experience
- Sleep Disturbance Scale scores mostly increases with the work experience.
- Social-Familial Scale scores increasess with increasing work experience.
- Health Effects Scale scores mostly increases with the shift work experience.
- Social-Familial Scale scores increases with increasing shift work experience.
- Shift work opinion scores mostly decreases with increasing shift work experience.

CHAPTER 5

CONCLUSION

5.1 Principal Outcomes of the Study

Shift working is inevitable for FMCG industries. However, the impacts of shift work over the shift workers could vary in many ways. These variations are different than each other on different age, marital status, work and shift work experience of shift workers. Thus, it is important to show these differences and take necesarry precautions differently.

There is no research in the literature conducted in beverage industry in this topic. Therefore, this study is important to be a basement for conducting new researches in this area to implement the findings on FMCG industries and get benefits of that.

This studys shows some possible impacts of shift work over the shift workers with different ages, marital status, work experience and shift work experience. Some of the results that shows these relations are meaningful while some of them are not intense enough.

The results of this research showed that there is an increase in impact scores of health, sleep disturbance and social-familial with increasing age, being married and increasing work and shift work experience. The only exception is that sleep disturbances are more likely to decrease with increasing age. Additionally, it is seen that shift work opinion scores mostly decreases with increasing shift work experience.

5.2 Recommendations

Shift work might result different risks for the work places. Most of the shift workers have less sleeping hours and lower quality of sleep compared to day workers. Shift workers with rotating shifts are even in more danger than only morning or only night shift workers. This situation may result with workplace accidents which could led to lost days and unrecoverable injuries. To avoid all these negative impacts of the shift work, employers should keep successive night shifts at minimum and avoid shift changes in a short time. Free weekends are mentioned better than single day off for the workers. Also, rotating forward (as morning-afternoon and then night) is seem to be much easier to be adapted than rotating backwards. One another important tip for the employers is avoiding schedule of more than one shift a day as possible

Survey of Shiftworkers is a powerful device to measure many kind of impacts of shift work and it is widely used in health, security and aviation industries. This study is very important with its uniqeness in FMCG sector, especially the beverage industry.

The results coming from health impacts showed us there is a strong relation of dieatry habits of shift workers to avoid from stomach upsets. Therefore, it is important to provide adequate and balanced nutrition opportunities in the workplace, including night shifts, against complaints related to the digestive system. Arrangements should be made to reach a warm and nutritious food, and a 24-hour cafeteria could be established when necessary. Regular meals should be scheduled, fast and ready-to-eat foods should be avoided, and nutritious foods should be brought from home if necessary. Salty foods should be avoided, caffeine and alcohol consumption should be limited. Those, working on the afternoon shift, should eat their meals in the

middle of the day instead of in the middle of their shift; night shift workers should consume light food, have a moderate breakfast and drink plenty of water. They should also avoid excessive use of acid neutralizing pills (antacids), tranquilizers and sleeping pills during the shift working schedule.

What is more, it is clear that shift workers have pain problems with their shoulder, neck, back, lower back, leg and knee. Providing a physiatrist during annual periodic health examinations might be beneficial to check the musculoskeletal system and reccomend necesarry exercises for the related pain. Occupational physicians together with occupational health and safety responsibles of the workplace should also check the working style of each shift worker and assess the situation related to working on stand or sitting on the risk analysis. Based on these risks, some ergonomic countermeasures can be very useful for decreasing the risk of pains.

The results of sleep disturbance scale showed that sleep disturbance is affected by age, marital status and work experience. Results of this study shows that the more age becomes, the less shift workers need for the sleep. This also supports the same for longer work experiences. However, number of people in older age categories might give better results in further studies. Most shift workers who have others to live with at the same house are complaining about the noise at home during the day. Therefore, it is important to have a comfortable and quiet atmosphere for sleeping after a night shift. Sunlight is also another factor that affects circadian rhythm and make difficulties on sleeping mechanism of the body. Hence, ear plug and good blinds use might be useful for falling asleep and better sleeping quality. Avoidig extreme exercises before sleep and keeping minimizg the exposure to electronical screens may also have positive impacts on sleep.

Setting a schedule to build a sleeping routine, a short warm shower, listening a quiet music and reading a book could also help to a better sleep experience.

Social-Familial scale evaluation showed us there is highly remarkable connection of sociabilty with age, marital status, work and shift work experience. Social and familial life is a crucial part for most of the workers. Therefore, it is one of the most important motivators for shift workers to keep social and familial relations as strong as possible. Scheduling at leats one of the meals with the family or friends, keeping the connection with friends, having a child specifies time like going on cultural activities or helping with homeworks, paying attention and being part of sports activities, organizing activities with partner and things to reduce stress such as yoga or meditation might have positive impact for a better social –familial experience during shift work. Employers may also provide social areas to make the shift work environment better. A resting place, a game room or a gym at the workplace might have very positive impacts on wellbeing of shift workers. Also, employers can organize social activities such as nature walkings and trips.

5.3 Limitations and Future Research

As a result of this study, it has been revealed that working in shifts and variable hours has phsical, psychological and social effects on shift workers, as well as negative effects for the employer and workplaces. However, reducing these negative effects or minimizing will be possible with a rational arrangement of working conditions such as arranging working hours, selecting individuals suitable for shift working and so on. In line with these results, it is necessary to review the shift work systems that threaten the health of the employees, and to create shorter adaptation systems for the employees in the risk group.

Confirmed hypotheses and related results of the survey on shift workers of beverage industry are very competible with similar studies from different type of industries which were mentioned in the literature review part. Therefore, it is very crucial to research the hypotheses which are rejected in future studies to check if they are valid when the survey is applied on large population of shift workers in beverage or FMCG industries.

There is definitely a need for new studies as like this study, which have done for the correct definition of the problems caused by the shift work system in order to take more precautions. Hence, it is recommended to conduct studies in FMCG industries with larger sample groups, comparing day-night and rotating shifts and including women shift workers in the future.

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APPENDICES

A. Survey of Shiftworkers

Yaşınız:

( ) 18-24

( ) 25-34

( ) 35-44

( ) 45-54

( ) 54 ve üstü

Medeni durumunuz:

( ) Evli

( ) Ayrı/boşanmış

( ) Dul

( ) Bekar

Hanenizde kendiniz hariç kaç kişi yaşıyor?

( ) 1

( ) 2

( ) 3

( ) 4 ve üzeri

( ) Hiçkimse

Hanenizde bakmakla yükümlü olduğunuz kaç kişi yaşıyor?

( ) 1

( ) 2

( ) 3

( ) 4 ve üzeri

( ) Hiçkimse

Toplam kaç yıldır çalışıyorsunuz?

( ) 1 yıldan az

( ) 1-5 yıl

( ) 6-10 yıl

( ) 11-15 yıl

( ) 20 yıldan fazla

Bu işyerinde kaç yıldır çalışıyorsunuz?

( ) 1 yıldan az

( ) 1-5 yıl

( ) 6-10 yıl

( ) 11-15 yıl

( ) 20 yıldan fazla

Vardiyalı çalışma düzeninizde kaç yıldır çalışıyorsunuz?

( ) 1 yıldan az

( ) 1-5 yıl

( ) 6-10 yıl

( ) 11-15 yıl

( ) 20 yıldan fazla

Haftada ortalama kaç saat fazla mesai ödemeli çalışıyorsunuz?

( ) 0

( ) 0-5

( ) 5 ve üzeri

Genel olarak işe gidiş gelişiniz ortalama olarak kaç dakika sürer?

( ) 0-30 dakilka

( ) 30-60 dakilka

( ) 60-90 dakilka

( ) 90 dakikadan fazla

Lütfen çalıştığınız her bir vardiyadaki iş yükünüzü derecelendirin:

	Çok Hafif	**Hafif**	**Ortalama**	**Ağır**	**Oldukça Ağır**
1. Vardiya (Gündüz)	1	2	3	4	5
2. Vardiya (Öğleden Sonra)	1	2	3	4	5
3. Vardiya (Akşam)	1	2	3	4	5

	Çok Hafif	**Hafif**	**Ortalama**	**Ağır**	**Oldukça Ağır**
Lütfen 1.vardiya için kontrol durumunuzu işaretleyin:	1	2	3	4	5
Lütfen 2.vardiya için kontrol durumunuzu işaretleyin:	1	2	3	4	5
Lütfen 3.vardiya için kontrol durumunuzu işaretleyin:	1	2	3	4	5

	Kesinlikle hayır		**Hayır**		**Bazen**		**Evet**		**Kesinlikle evet**
Sabahın erken saatlerinde iyi hisseden ve akşamları daha erken yorgun hisseden biri misiniz?	1	2	3	4	5	6	7	8	9
Alışılmadık zamanlarda veya yerlerde uyumak sizin için kolay mıdır?	1	2	3	4	5	6	7	8	9

Vardiya Sisteminiz

	Kesinlikle hayır	**Muhtemelen hayır**	**Kararsızım**	**Muhtemelen Evet**	**Kesinlikle Evet**
Vardiyalı çalışma sisteminizin avantajlarının dezavantajlarına göre ağır bastığını düşünüyor musunuz?	1	2	3	4	5

İlgili vardiyalarda hangi saatte uykuya dalıp hangi saatte uyandığınızı seçiniz:

İki gündüz vardiyası arası uykuya dalma:

( ) 21.00 ve öncesi

( ) 21.00 – 22.00

( ) 22.00 – 23.00

( ) 23.00 – 00.00

( ) 00.00 ve sonrası

İki gündüz vardiyası arası uykudan uyanma:

( ) 4.00 ve öncesi

( ) 4.00 – 5.00

( ) 5.00 – 6.00

( ) 6.00 – 7.00

( ) 7.00 ve sonrası

İki öğleden sonra vardiyası arası uykuya dalma:

( ) 2.00 ve öncesi

( ) 2.00 – 3.00

( ) 3.00 – 4.00

( ) 4.00 – 5.00

( ) 5.00 ve sonrası

İki öğleden sonra vardiyası arası uykudan uyanma:,

( ) 6.00 ve öncesi,

( ) 6.00 – 7.00

( ) 7.00 – 8.00

( ) 8.00 – 9.00

( ) 9.00 ve sonrası

İki akşam vardiyası arası uykuya dalma:

( ) 9.00 ve öncesi

( ) 9.00 - 10.00

( ) 10.00 - 11.00

( ) 11.00 – 12.00

( ) 12.00 ve sonrası

İki akşam vardiyası arası uykudan uyanma:

( ) 15.00 ve öncesi

( ) 15.00 - 16.00

( ) 16.00 – 17.00

( ) 17.00 – 18.00

( ) 18.00 ve sonrası

Vardiyanızdan bağımsız olarak günlük uyku ihtiyacınız kaç saattir?

( ) 6 saaten az

( ) 7

( ) 8

( ) 9 saatten fazla

Normalde uyku miktarınız hakkında ne düşünüyorsunuz? (Her biri için bir rakamı işaretleyiniz.)

		Yeterli Değil	Çok Fazlası Olabillir	Daha Biraz daha fazla olabilir	Yeterli miktarda	Oldukça yeterli
(a)	Birbirini izleyen gündüz vardiyaları arasında	1	2	3	4	5
(b)	Birbirini izleyen öğleden sonra vardiyaları arasında	1	2	3	4	5
(c)	Birbirini izleyen akşam vardiyaları arasında	1	2	3	4	5
(d)	Birbirini izleyen tatil günleri arasında	1	2	3	4	5

Normalde ne kadar kaliteli uyursunuz? (Her biri için bir rakamı işaretleyiniz.)

		Oldukça Kararsızım	Kalitesiz	Kaliteli	Oldukça	Oldukça
(a)	Birbirini izleyen gündüz vardiyaları arasında	1	2	3	4	5
(b)	Birbirini izleyen öğleden sonra vardiyaları arasında	1	2	3	4	5
(c)	Birbirini izleyen akşam vardiyaları arasında	1	2	3	4	5
(d)	Birbirini izleyen tatil günleri arasında	1	2	3	4	5

Normalde uykunuzdan sonra ne kadar dinlenmiş hissedersiniz?

		Neredeyse hiç	Seyrek	Bazen	Çoğunlukla	Neredeyse her zaman
(a)	Birbirini izleyen gündüz vardiyaları arasında	1	2	3	4	5
(b)	Birbirini izleyen öğleden sonra vardiyaları arasında	1	2	3	4	5
(c)	Birbirini izleyen akşam vardiyaları arasında	1	2	3	4	5
(d)	Birbirini izleyen tatil günleri arasında	1	2	3	4	5

Hiç kalkmak istediğinizden daha erken saatte kalktınız mı? (Her biri için bir rakamı işaretleyiniz.)

		Neredeyse hiç	Seyrek	Bazen	Çoğunlukla	Neredeyse her zaman
(a)	Birbirini izleyen gündüz vardiyaları arasında	1	2	3	4	5
(b)	Birbirini izleyen öğleden sonra vardiyaları arasında	1	2	3	4	5
(c)	Birbirini izleyen akşam vardiyaları arasında	1	2	3	4	5
(d)	Birbirini izleyen tatil günleri arasında	1	2	3	4	5

Uykuya dalmakta güçlük çekiyor musunuz? (Her biri için bir rakamı işaretleyiniz.)

		Neredeyse hiç	Seyrek	Bazen	Çoğunlukla	Neredeyse her zaman
(a)	Birbirini izleyen gündüz vardiyaları arasında	1	2	3	4	5
(b)	Birbirini izleyen öğleden sonra vardiyaları arasında	1	2	3	4	5
(c)	Birbirini izleyen akşam vardiyaları arasında	1	2	3	4	5
(d)	Birbirini izleyen tatil günleri arasında	1	2	3	4	5

Aşağıdaki maddeler, yeterince uyumanıza veya çok çalışmanıza bakılmaksızın, genel olarak ne kadar yorgun veya enerjik hissettiğinizle ilgilidir. Bazı insanlar dinlenme günlerinde ve tatillerde bile kalıcı yorgunluktan şikayetlenirken, bazılarınınsa sınırsız enerjisi varmış gibi görünür. Lütfen aşağıdaki ifadelerin kendiniz duygularınız için ne derece geçerli olduğunu belirtiniz.

	Neredeyse hiç	Seyrek	Bazen	Çoğunlukla	Neredeyse her zaman
Genelde çok enerjim olduğunu hissederim	1	2	3	4	5
Çoğu zaman yorgun hissederim	1	2	3	4	5
Genellikle canlı hissederim	1	2	3	4	5

Lütfen ortalama bir Gündüz (1. Vardiya), Öğleden Sonra (2. Vardiya) veya Akşam vardiyasından (3. Vardiya) önce, bu vardiyalar sırasında ve sonrasında 2 saatlik aralıklarla kendinizi ne kadar uyanık veya uykulu hissettiğinizi uygun sayıları daire içine alarak değerlendirin. (Örneğin Gündüz Vardiyası sorusu için; saat 08:00 için uykulu hissederim, saat 11:00 için dinç hissederim gibi)

GÜNDÜZ VARDİYASI

	Oldukça uyanık	Çok uyanık	Uyanık	Biraz uyanık	Ne uyanık ne uykusuz	Biraz uykulu	Hafif uykulu	Oldukça uykulu	Aşırı uykulu
04:00	1	2	3	4	5	6	7	8	9
06:00	1	2	3	4	5	6	7	8	9
08:00	1	2	3	4	5	6	7	8	9
10:00	1	2	3	4	5	6	7	8	9
12:00	1	2	3	4	5	6	7	8	9
14:00	1	2	3	4	5	6	7	8	9
16:00	1	2	3	4	5	6	7	8	9
18:00	1	2	3	4	5	6	7	8	9
20:00	1	2	3	4	5	6	7	8	9
22:00	1	2	3	4	5	6	7	8	9
24:00	1	2	3	4	5	6	7	8	9
02:00	1	2	3	4	5	6	7	8	9

ÖĞLEDEN SONRA VARDİYASI

	Oldukça uyanık	Çok uyanık	Uyanık	Biraz uyanık	Ne uyanık ne uykusuz	Biraz uykulu	Hafif uykulu	Oldukça uykulu	Aşırı uykulu
04:00	1	2	3	4	5	6	7	8	9
06:00	1	2	3	4	5	6	7	8	9
08:00	1	2	3	4	5	6	7	8	9
10:00	1	2	3	4	5	6	7	8	9
12:00	1	2	3	4	5	6	7	8	9
14:00	1	2	3	4	5	6	7	8	9
16:00	1	2	3	4	5	6	7	8	9
18:00	1	2	3	4	5	6	7	8	9
20:00	1	2	3	4	5	6	7	8	9
22:00	1	2	3	4	5	6	7	8	9
24:00	1	2	3	4	5	6	7	8	9
02:00	1	2	3	4	5	6	7	8	9

AKŞAM VARDİYASI

	Oldukça uyanık	Çok uyanık	Uyanık	Biraz uyanık	Ne uyanık ne uykusuz	Biraz uykulu	Hafif uykulu	Oldukça uykulu	Aşırı uykulu
04:00	1	2	3	4	5	6	7	8	9
06:00	1	2	3	4	5	6	7	8	9
08:00	1	2	3	4	5	6	7	8	9
10:00	1	2	3	4	5	6	7	8	9
12:00	1	2	3	4	5	6	7	8	9
14:00	1	2	3	4	5	6	7	8	9
16:00	1	2	3	4	5	6	7	8	9
18:00	1	2	3	4	5	6	7	8	9
20:00	1	2	3	4	5	6	7	8	9
22:00	1	2	3	4	5	6	7	8	9
24:00	1	2	3	4	5	6	7	8	9
02:00	1	2	3	4	5	6	7	8	9

Hangi yanıt seçeneğinin, her zamanki davranış veya duygu tarzınızı temsil ettiğini işaretleyiniz:

	Neredeyse hiç	Nadiren	Genellikle	Her zaman
Ruh haliniz yükselir ve alçalır mı?	1	2	3	4
Bir sebep yokken 'sadece mutsuz' hisseder misiniz?	1	2	3	4
Sinirlendiğinde konuşmak için bir dosta ihtiyacınız olur mu?	1	2	3	4
Suçluluk duygularınız konusunda endişeli misinizdir?	1	2	3	4
Kendinizi "çok sinirli" olarak nitelendirir misiniz?	1	2	3	4
Uykusuzluk çeker misiniz?	1	2	3	4

	Neredeyse hiç	Seyrek	Bazen	Çoğunlukla	Neredeyse her zaman
Genel olarak, vardiyalı çalışma boş zamanlarınızda yapmak isteyeceğiniz türden şeyleri (örn. Spor aktiviteleri, hobiler vb.) ne kadar aksatır?	1	2	3	4	5
Vardiyalı çalışma ev hayatınızı ne kadar aksatır?	1	2	3	4	5
Genel olarak vardiya sisteminiz, iş dışındaki zamanlarda yapmanız gereken ev dışı işleri (örneğin doktora, kütüphaneye bankaya, kuaföre gitmek vb.) ne kadar aksatır?	1	2	3	4	5

Aşağıdakileri ne sıklıkta yaşadığınızı uygun rakamı işaretleyerek belirtiniz:

	Neredeyse hiç	Oldukça nadir	Oldukça sık	Neredeyse her zaman
İştahınız ne sıklıkla bozulur?	1	2	3	4
Mide rahatsızlıklarından kaçınmak için ne sıklıkta yediğinize dikkat etmeniz gerekir?	1	2	3	4
Ne sıklıkla mideniz bulanır?	1	2	3	4
Ne sıklıkla mide ekşimesi veya mide ağrısı çekersiniz?	1	2	3	4

Sindirim güçlüklerinden ne sıklıkla şikayet edersiniz?	1	2	3	4
Ne sıklıkla mide şişkinliği veya şişkinlik çekersiniz?	1	2	3	4
Ne sıklıkla karın ağrısı çekersiniz?	1	2	3	4
Ne sıklıkla kabızlık veya ishal sorununuz olur?	1	2	3	4
Ne sıklıkla kalp çarpıntınız olur?	1	2	3	4
Ne sıklıkla göğüs ağrınız olur?	1	2	3	4
Ne sıklıkla baş dönmeniz olur?	1	2	3	4
Ne sıklıkla tansiyonunuz aniden düşer?	1	2	3	4
Merdiven çıkarken nefes darlığı çeker misiniz?	1	2	3	4
Ne sıklıkla yüksek tansiyonunuz olur?	1	2	3	4

Kalbinizin düzensiz attığını fark ettiğiniz oldu mu?	1	2	3	4
Ne sıklıkla göğsünüzde daralma hissedersiniz?	1	2	3	4
Ne sıklıkla küçük bulaşıcı hastalık geçirirsiniz? (grip, nezle vb.)	1	2	3	4
Omuz ve boyun ağrısı yaşarım	1	2	3	4
Sırt ve bel ağrısı yaşarım	1	2	3	4
El ve bilek ağrısı yaşarım	1	2	3	4
Bacak ve diz ağrısı yaşarım	1	2	3	4

Aşağıdaki sorular son birkaç hafta içinde genel olarak nasıl hissettiğinizle ilgilidir. Lütfen her soru için en uygun cevabı daire içine alınız. Uzak geçmişte olanlara değil, şimdiki ve son zamanlardaki şikayetlerinize odaklanınız.

Son zamanlarda:

ne yaptığıma konsantre olabildim.	Her zamankinden fazla	Her zamanki kadar	Her zamankinden az	Her zamankinden çok az
bir şeylerde yararlı bir rol oynadım.	Her zamankinden fazla	Her zamanki kadar	Her zamankinden az	Her zamankinden çok az
bir şeyler hakkında karar verme yeteneğine sahibim	Her zamankinden fazla	Her zamanki kadar	Her zamankinden az	Her zamankinden çok az
günlük aktivitelerimden keyif alırım	Her zamankinden fazla	Her zamanki kadar	Her zamankinden az	Her zamankinden çok az
problemlerimle yüzleşirim	Her zamankinden fazla	Her zamanki kadar	Her zamankinden az	Her zamankinden çok az
her şeyi düşündüğümde mutlu hissederim	Her zamankinden fazla	Her zamanki kadar	Her zamankinden az	Her zamankinden çok az
Endişe yüzünden uykum kaçtı..	Pek sayılmaz	Her zamanki kadar	Her zamankinden fazla	Her zamankinden çok daha fazla
Sürekli baskı altında hissediyorum.	Pek sayılmaz	Her zamanki kadar	Her zamankinden fazla	Her zamankinden çok daha fazla

Zorlukların üstesinden gelemediğimi hissediyorum.	Pek sayılmaz	Her zamanki kadar	Her zamankinden fazla	Her zamankinden çok daha fazla
Mutsuz ve depresif hissederim	Pek sayılmaz	Her zamanki kadar	Her zamankinden fazla	Her zamankinden çok daha fazla
Kendimi değersiz biri olarak hissederim	Pek sayılmaz	Her zamanki kadar	Her zamankinden fazla	Her zamankinden çok daha fazla

B. Survey of Shiftworkers (Original)

Age_____ Female / Male *(circle one)*

What kind of job do you do?_____

Are you: Married/Living with a partner _____

(tick one) Single _____

Separated/Divorced/Widowed _____

How many dependants live with you (e.g. children)? _____

How long have you worked altogether? _____

How long have you worked on your **present** shift system? _____ years
_____ months

How long **altogether** have you been working shifts? _____ years
_____ months

How many hours are you **contracted** to work for each week? _____ hours
_____ minutes

How many hours do you **actually** work each week? _____ hours
_____ minutes
(including overtime)

On average, how long does it take you to travel to and from work?

	TO WORK	**FROM WORK**
Morning Shift	_____ mins	_____ mins
Afternoon Shift	_____ mins	_____ mins
Night Shift	_____ mins	_____ mins

Please rate your workload on each shift that you work:

	Extremely Light	**Quite Light**	**Average**	**Quite Heavy**	**Extremely Heavy**
Morning or Day (12h) Shift	1	2	3	4	5
Afternoon Shift	1	2	3	4	5
Night Shift	1	2	3	4	5

	Entirely outside my control	**Somewhat outside my control**	**In between**	**Somewhat under my control**	**Entirely under my control**
The pacing of the job I do is:	1	2	3	4	5

	Definitely not		**Probably not**		**In between**		**Probably yes**		**Definitely yes**
Are you the sort of person who feels at their best early in the morning, and who tends to feel tired earlier than most people in the evening?	1	2	3	4	5	6	7	8	9
Are you the sort of person who finds it very easy to sleep at unusual times or in unusual places?	1	2	3	4	5	6	7	8	9

Your Shift System

For each of the shifts that **you normally work**, at what time do they start and finish? (Please use 24h time, e.g. 21:30 or clearly indicate "am" or "pm"). Please use the following symbols to describe the shifts that you work.

D = Day Shift

M = Morning or Early Shift

A = Afternoon, Late, Evening or Swing Shift

N = Night Shift

R = Rest Day

O = Other - Please specify

(Use different symbols for each if more than one)

Shift **e.g. Night**	**Symbol** **e.g. "N"**	**Start Time** **e.g. 23:00**	**End Time** **e.g. 07:00**

Now use the symbols to show a complete cycle of your shift system including rest days. Please do not use more weeks than necessary to show how your system "repeats itself".

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Week 1							
Week 2							
Week 3							
Week 4							
Week 5							
Week 6							
Week 7							
Week 8							
Week 9							
Week 10							
Week 11							
Week 12							

	Definitely not	Probably not	In between	Probably yes	Definitely yes
Do you feel that overall the advantages of your shift system outweigh the disadvantages?	1	2	3	4	5

At what time do you normally fall asleep and wake up at the following points within your shift system? Please ignore options that do not occur on your shift system and use 24h time (e.g. 22:30) or clearly indicate "am" or "pm".

Your Shift System

For each of the shifts that **you normally work**, at what time do they start and finish? (Please use 24h time, e.g. 21:30 or clearly indicate “am” or “pm”). Please use the following symbols to describe the shifts that you work.

D = Day Shift
M = Morning or Early Shift
A = Afternoon, Late, Evening or Swing Shift
N = Night Shift
R = Rest Day
O = Other - Please specify
(Use different symbols for each if more than one)

Shift e.g. Night	Symbol e.g. “N”	Start Time e.g. 23:00	End Time e.g. 07:00

Now use the symbols to show a complete cycle of your shift system including rest days. Please do not use more weeks than necessary to show how your system “repeats itself”.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Week 1							
Week 2							
Week 3							
Week 4							
Week 5							
Week 6							
Week 7							
Week 8							
Week 9							
Week 10							
Week 11							
Week 12							

	Definitely not	**Probably not**	**In between**	**Probably yes**	**Definitely yes**
Do you feel that overall the advantages of your shift system outweigh the disadvantages?	1	2	3	4	5

	FALL ASLEEP	**WAKE UP**
Between two successive **morning** or **day** (12h) shifts	_____	_____
Between two successive **afternoon** shifts	_____	_____
Before your first **night** shift	_____	_____
Between two successive **night** shifts	_____	_____
After your last **night** shift	_____	_____
Between two successive **days off**	_____	_____
Between an **afternoon** and a **morning** shift (quick return)	_____	_____

How many hours sleep do you feel you usually need per day, irrespective of which shift you are on?

_____ hours _____ minute

How do you feel about the amount of sleep you normally get? *(Circle one number for each)*

		Nowhere near enough	**Could do with a lot more**	**Could do with a bit more**	**Get the right amount**	**Get plenty**
(a)	Between successive morning shifts	1	2	3	4	5
(b)	Between successive afternoon shifts	1	2	3	4	5
(c)	Between successive night shifts	1	2	3	4	5
(d)	Between successive days off	1	2	3	4	5
(e)	Between an afternoon and a morning shift	1	2	3	4	5

How well do you normally sleep? *(Circle one number for each)*

		Extremely badly	**Quite badly**	**Moderately well**	**Quite well**	**Extremely well**
(a)	Between successive morning shifts	1	2	3	4	5
(b)	Between successive afternoon shifts	1	2	3	4	5
(c)	Between successive night shifts	1	2	3	4	5
(d)	Between successive days off	1	2	3	4	5
(e)	Between an afternoon and a morning shift	1	2	3	4	5

How rested do you normally feel after sleep? *(Circle one number for each)*

		Definitely not rested	**Not very rested**	**Moderately rested**	**Quite rested**	**Extremely rested**
(a)	Between successive morning shifts	1	2	3	4	5
(b)	Between successive afternoon shifts	1	2	3	4	5
(c)	Between successive night shifts	1	2	3	4	5
(d)	Between successive days off	1	2	3	4	5
(e)	Between an afternoon and a morning shift	1	2	3	4	5

Do you ever wake up earlier than you intended? *(Circle one number for each)*

		Almost never	**Rarely**	**Sometimes**	**Frequently**	**Almost always**
(a)	Between successive morning shifts	1	2	3	4	5
(b)	Between successive afternoon shifts	1	2	3	4	5
(c)	Between successive night shifts	1	2	3	4	5
(d)	Between successive days off	1	2	3	4	5
(e)	Between an afternoon and a morning shift	1	2	3	4	5

Do you have difficulty in falling asleep? *(Circle one number for each)*

		Almost never	**Rarely**	**Sometimes**	**Frequently**	**Almost always**
(a)	Between successive morning shifts	1	2	3	4	5
(b)	Between successive afternoon shifts	1	2	3	4	5
(c)	Between successive night shifts	1	2	3	4	5
(d)	Between successive days off	1	2	3	4	5
(e)	Between an afternoon and a morning shift	1	2	3	4	5

The following items relate to how tired or energetic **you generally feel**, irrespective of whether you have had enough sleep or have been working very hard. Some people appear to "suffer" from permanent tiredness, even on rest days and holidays, while others seem to have limitless energy. Please indicate the degree to which the following statements apply to your own normal feelings. *(Circle one number for each)*

	Not at all		**Some-what**		**Very much so**
I generally feel I have plenty of energy	1	2	3	4	5
I feel tired most of the time	1	2	3	4	5
I usually feel lively	1	2	3	4	5

Please **rate how alert or sleepy you normally feel** at 2-hourly intervals before, during and after an average Morning (or Day), Afternoon or Night shift by circling the appropriate numbers. **Please only make ratings for those times when you are normally awake**

MORNING or DAY SHIFT

	Very alert		**Alert**		**Neither alert nor sleepy**		**Sleepy (but not fighting sleep)**		**Very sleepy (fighting sleep)**
04:00	1	2	3	4	5	6	7	8	9
06:00	1	2	3	4	5	6	7	8	9
08:00	1	2	3	4	5	6	7	8	9
10:00	1	2	3	4	5	6	7	8	9
12:00	1	2	3	4	5	6	7	8	9
14:00	1	2	3	4	5	6	7	8	9
16:00	1	2	3	4	5	6	7	8	9
18:00	1	2	3	4	5	6	7	8	9
20:00	1	2	3	4	5	6	7	8	9
22:00	1	2	3	4	5	6	7	8	9
24:00	1	2	3	4	5	6	7	8	9

02:00	1	2	3	4	5	6	7	8	9

AFTERNOON SHIFT

	Very alert		**Alert**		**Neither alert nor sleepy**		**Sleepy (but not fighting sleep)**		**Very sleepy (fighting sleep)**
06:00	1	2	3	4	5	6	7	8	9
08:00	1	2	3	4	5	6	7	8	9
10:00	1	2	3	4	5	6	7	8	9
12:00	1	2	3	4	5	6	7	8	9
14:00	1	2	3	4	5	6	7	8	9
16:00	1	2	3	4	5	6	7	8	9
18:00	1	2	3	4	5	6	7	8	9
20:00	1	2	3	4	5	6	7	8	9
22:00	1	2	3	4	5	6	7	8	9
24:00	1	2	3	4	5	6	7	8	9
02:00	1	2	3	4	5	6	7	8	9
04:00	1	2	3	4	5	6	7	8	9

NIGHT SHIFT

	Very alert		Alert		Neither alert nor sleepy		Sleepy (but not fighting sleep)		Very sleepy (fighting sleep)
12:00	1	2	3	4	5	6	7	8	9
1400	1	2	3	4	5	6	7	8	9
16:00	1	2	3	4	5	6	7	8	9
18:00	1	2	3	4	5	6	7	8	9
20:00	1	2	3	4	5	6	7	8	9
22:00	1	2	3	4	5	6	7	8	9
24:00	1	2	3	4	5	6	7	8	9
02:00	1	2	3	4	5	6	7	8	9
04:00	1	2	3	4	5	6	7	8	9
06:00	1	2	3	4	5	6	7	8	9
08:00	1	2	3	4	5	6	7	8	9
10:00	1	2	3	4	5	6	7	8	9
12:00	1	2	3	4	5	6	7	8	9

Please try to decide which response option represents your usual way of acting or feeling.

	Almost never	**Quite seldom**	**Quite often**	**Almost always**
Does your mood go up and down?	1	2	3	4
Do you feel 'just miserable' for no good reason?	1	2	3	4
When you get annoyed do you need some-one friendly to talk to?	1	2	3	4
Are you troubled about feelings of guilt?	1	2	3	4
Would you call yourself tense or 'highly strung'?	1	2	3	4
Do you suffer from sleeplessness?	1	2	3	4

	Almost never	Quite seldom	Sometimes	Quite often	Almost always
How much does your shift system interfere with your leisure time?	1	2	3	4	5
How much does your shift system interfere with your domestic life?	1	2	3	4	5
How much does your shift system interfere with your non-domestic life(e.g. going to doctor, library, bank, hairdresser, etc.)?	1	2	3	4	5

	Not at all		Some-what		Very much so
I generally feel I have plenty of energy	1	2	3	4	5
I feel tired most of the time	1	2	3	4	5
I usually feel lively	1	2	3	4	5

Please indicate how frequently you experience the following, by circling the appropriate number:

	Almost never	**Quite seldom**	**Quite often**	**Almost always**
How often is your appetite disturbed?	1	2	3	4
How often do you have to watch what you eat to avoid stomach upsets?	1	2	3	4
How often do you feel nauseous?	1	2	3	4
How often do you suffer from heartburn or stomach-ache?	1	2	3	4
How often do you complain of digestion difficulties?	1	2	3	4
How often do you suffer from bloated stomach or flatulence?	1	2	3	4
How often do you suffer from pain in your abdomen?	1	2	3	4
How often do you suffer from constipation or diarrhoea?	1	2	3	4
How often do you suffer from heart palpitations?	1	2	3	4

How often do you suffer from aches and pains in your chest?	1	2	3	4
How often do you suffer from dizziness?	1	2	3	4
How often do you suffer from sudden rushes of blood to your head?	1	2	3	4
Do you suffer from shortness of breath when climbing the stairs normally?	1	2	3	4
How often have you been told that you have high blood pressure?	1	2	3	4
Have you ever been aware of your heart beating irregularly?	1	2	3	4
How often do you feel "tight" in your chest?	1	2	3	4
How often do you suffer from minor infectious diseases, e.g. colds, flu, etc.?	1	2	3	4
How often do you suffer from pain in your shoulder and/or neck?	1	2	3	4

How often do you suffer from pain in your back and/or lower back?	1	2	3	4
How often do you suffer from pain in your arm and/or wrist?	1	2	3	4
How often do you suffer from pain in your leg and/or knee?	1	2	3	4

The following questions deal with **how you have felt in general over the past few weeks.** Please circle the most appropriate answer for each question. Remember to concentrate on present and recent complaints, not those that you have had in the distant past.

been able to concentrate on what you are doing?	Better than usual	Same as usual	Less than usual	Much less than usual
lost much sleep over worry?	Better than usual	Same as usual	Less than usual	Much less than usual
felt that you are playing a useful part in things?	Better than usual	Same as usual	Less than usual	Much less than usual
felt capable of making decisions about things?	Better than usual	Same as usual	Less than usual	Much less than usual
felt constantly under strain?	Better than usual	Same as usual	Less than usual	Much less than usual
felt you could not overcome your difficulties?	Better than usual	Same as usual	Less than usual	Much less than usual

been able to enjoy your normal day to day activities?	Better than usual	Same as usual	Less than usual	Much less than usual
been able to face up to your problems?	Better than usual	Same as usual	Less than usual	Much less than usual
been feeling unhappy and depressed	Better than usual	Same as usual	Less than usual	Much less than usual
been losing confidence in yourself?	Better than usual	Same as usual	Less than usual	Much less than usual
been thinking of yourself as a worthless person?	Better than usual	Same as usual	Less than usual	Much less than usual
been feeling reasonably happy all things considered?	Better than usual	Same as usual	Less than usual	Much less than usual