MENTAL HEALTH OF TURKISH CIVIL ENGINEERS IN THE CONSTRUCTION INDUSTRY

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

BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
CIVIL ENGINEERING

JUNE 2022

Approval of the thesis:

MENTAL HEALTH OF TURKISH CIVIL ENGINEERS IN THE CONSTRUCTION INDUSTRY

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ABSTRACT

MENTAL HEALTH OF TURKISH CIVIL ENGINEERS IN THE CONSTRUCTION INDUSTRY

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June 2022, 109 pages

The construction industry is notoriously dangerous regarding employees' physical safety. Countermeasures have been developed in the past to prevent hazards. Although the construction industry is showing progress in workplace safety, an essential part of the health problem is often neglected; mental health. Few studies have been made in the past regarding the mental health of the workers. These studies are mostly done in developed countries. Turkey, as a developing country, is the subject location of this thesis. A questionnaire is developed to evaluate the mental health of Turkish civil engineers. A mental health assessment tool from the literature has been selected, Depression Anxiety Stress Scale (DASS). The questionnaire consists of four main parts; the participant profile, sources of work stress, coping strategies, and the Turkish version of the DASS. The questionnaire was distributed to large Turkish construction firms via email, and 182 responses were received. The average DASS scores for depression, anxiety, and stress are computed at 13.99, 9.91, and 16.66, respectively. The top three answers to work stress questions are work overload, poor occupational climate, and long working hours. To cope with the stress, participants mostly employ mental disengagement, seeking social support from family and friends, and alcohol and drug disengagement. In conclusion, this study aims to be a starting point for mental health research in the Turkish construction industry.

Keywords: Mental Health, Depression, Anxiety, Turkish Civil Engineers, Work Stress

ÖZ

İNŞAAT SEKTÖRÜNDEKİ TÜRK İNŞAAT MÜHENDİSLERİNİN ZİHİN SAĞLIĞI

Üstün, Dündar Can
Yüksek Lisans, İnşaat Mühendisliği
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Haziran 2022, 109 sayfa

İnşaat sektörü, çalışanların fiziksel sağlığı açısından tehlikeli bir noktadadır. Bu duruma karşı önlemler geliştirilmiştir. İnşaat sektörü iş güvenliğinde ilerleme gösterse de, işçi sağlık sorunun önemli bir parçası genellikle ihmal edilmektedir; zihin sağlığı. Geçmişte çalışanların zihin sağlığı hakkında cok az çalışma yapılmıştır. Bu çalışmalar genellikle gelişmiş ülkelerde yürütülmüştür. Gelişmekte olan bir ülke olan Türkiye bu tezin çalışma alanını oluşturmaktadır. Türk inşaat mühendislerinin zihin sağlığını değendirmek için bir anket geliştirilmiştir. Literatürden bir zihin sağlığı değerlendirme aygıtı seçilmiştir, Depresyon Anksiyete Stres Skalası (DASS). Anket dört ana bölümden oluşmaktadır; katılımcı profili, iş stresi kaynakları, stresle başa çıkma stratejileri ve DASS'ın Türkçe versiyonu. Anket, büyük Türk inşaat firmalarına e-posta yoluyla dağıtıldı ve 182 yanıt toplandı. Depresyon, anksiyete ve stres için ortalama DASS puanları sırasıyla 13.99, 9.91 ve 16.66 olarak hesaplanmıştır. İş stresi sorusuna verilen ilk üç yanıt, aşırı iş yükü, kötü mesleki iklim ve uzun çalışma saatleri olmuştur. Katılımcılar, stresle başa çıkmak için çoğunlukla zihinsel geri çekilme, aile ve arkadaşlarından sosyal destek arama ve alkol ve bağımlılık maddeleri kullanma yöntemlerini kullandıklarını belirtmişlerdir.

Sonuç olarak, bu çalışma Türk inşaat sektöründe zihin sağlığı araştırmaları için başlangıç noktası olmayı amaçlamaktadır.

Anahtar Kelimeler: Zihin Sağlığı, Depresyon, Anksiyete, Türk İnşaat Mühendisleri, İş Stresi

Dedicated to my beloved family

ACKNOWLEDGMENTS

I would like to express my deepest gratitude to my supervisor Assoc. Prof. Dr. Onur Behzat Tokdemir for every step. Without him, I could not finish this thesis. His assistance helped me get through a lot of problems. He is the best supervisor I could ever ask for.

I would like to thank committee members one by one.

I would like to give my special thanks to every participant for my questionnaire. Their five minutes created this thesis.

I want to thank my family for everything. My family always believed in and supported me unconditionally. I hope this thesis will make them proud.

One big thank you is to my fiancee and future wife, Gözde Eylem Üzümcü. Her presence was enough to find my calmness. She was the biggest emotional supporter during my thesis work. I also want to thank METU for bringing us together.

I want to thank my colleagues at Destek Engineering Ankara Team.

Finally, I want to thank my friend Alişan Kalender. He was my work buddy during thesis work. He made those thesis working hours sufferable.

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CHAPTER 1

INTRODUCTION

The construction industry is well-known for its hazardous nature. The physical health of the workers has become important in more recent years. Research has been done on how to make the industry safer for everyone. While these researches are essential for the future of the construction industry, one aspect of health is often neglected; mental health. Up to 30% world population has some sort of mental problem every year (Chisholm et al. 2007).

World Health Organization (WHO), an agency of the United Nations (U.N.) for international health issues, defined mental health as "a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community." (WHO 2018). Looking from WHO's perspective, good or poor (ill) mental health separation can be made. A person who has good mental health can contribute to their community efficiently, which is a must for every community to stay together. The absence of good mental health can be called ill mental health, which is a growing problem for nations. Ill mental health will not only affect the individual as a person; its impact will hit the nation of the individual as a whole. No industry can work properly without healthy employees, and mental health is a part of this equation.

The construction industry has a unique position among other sectors. First, its workforce can be considered one of the largest sources of employment for a country (Langdon and Sawang 2018). Second, the nature of the construction industry can be demanding. Overtime, impractical and tight deadlines, and high job demand are just a couple of well-known examples among construction employees (Beswick et al. 2007). Third, occupational injuries are common on construction sites. Poor mental health and injuries on job sites have a direct correlation, studies show (Park et al. 2001). Although this study is done among farmers, the same logic can be applied to the construction industry.

There are some common physiological disorders in the construction industry that deteriorates the workers' mental health. Depression, anxiety, and obsessive-compulsive disorders (OCD) can be given as examples. Additional information about disorders will be provided in Chapter 2, Literature Review. These disorders associated with the employees' mental health will result in absenteeism, presenteeism, drug and alcohol abuse, etc. Absenteeism is absence from work because of various reasons, primarily personal reasons, which are not beneficial to the company or the society (Cucchiella et al. 2014). Unlike absenteeism, presenteeism is when the employee is at work physically but not mentally (Lack 2011). Drug and alcohol abuse have self-explanatory names and will have a devastating effect on the company.

At this point, employee definition inside the construction industry should be established. Blue-collar and white-collar workers are the most common types of employees in the construction sector. Blue-collar workers deal with more physical activities; on the contrary, white-collar workers will have more desk jobs, operating without any significant physical activity. Based on this, blue-collar workers are more susceptible to physical injuries. On the other hand, problems of the white-collar workers can be related to the mental health of the person. This thesis will focus on white-collar workers, especially engineers.

Although the research on mental health in the construction industry can be considered insufficient, some studies have been made in the past. The main problem for these researches is the focus group. Most of these researches are in developed countries, showing that more studies should be carried out in lower-income countries (Chan et al. 2020). This thesis aims to fill out this gap in the literature. Turkey is an economically developing country (United Nations 2021). Working conditions will differ from developed countries, where the workers have improved conditions in higher-income countries. Turkey will be an example for developing countries.

The structure of this thesis is as follows.

Chapter 2: After the introduction, Chapter 2 will act as a literature review section. In this chapter, previous studies will be analyzed. First, mental health stressors will be defined in a detailed manner. Second, possible risk factors causing these health stressors will be investigated. At this point, some validated mental health assessment scales will be given. Finally, a summary will be provided to explain these processes.

Chapter 3: In this chapter, the methodology of this thesis will be presented. A questionnaire is developed to assess the mental health of Turkish civil engineers.

Chapter 4: Questionnaire results will be given in this chapter. Comparisons with the other studies can be observed in this chapter. Finally, differences based on the participant profile can be seen.

Chapter 5: In this chapter, the results will be discussed in detail.

Chapter 6: In this part, a quick summary of the thesis will be given. Limitations of the thesis and possible future studies will be discussed.

CHAPTER 2

LITERATURE REVIEW

As mentioned beforehand, some research has been done in the past regarding mental health inside the construction industry. In this chapter, previous studies will be explained in a detailed manner. Their findings will be the base of this thesis. Although studies can be considered not too many, there are some studies that are very useful to this thesis.

In this literature review, first, the causes which affect the mental health of the workers will be investigated. These causes will result in psychological injuries. In this second part, some common disorders caused by construction industry conditions will be named. The third part will focus on the impacts of these disorders. These disorders affect the employee in a negative way. This individual's performance and behavior will have a detrimental impact on the company. To fight against these negative consequences, everyone is using a particular coping mechanism, which is largely affected by the individual's character and the environment in which they are living. The fourth part will explain coping mechanisms. Some tools have been developed to measure workers' mental well-being. These measurement tools are widely used in the literature as surveys to collect data from people inside the construction industry. These tools will be given in the fifth part of this literature review. In literature, papers are prepared with these tools. Some papers focus on different aspects of mental health, and some papers are different in their focus group choices. The final part will show these papers and summarize them.

2.1 Causes of Mental Illness for the Construction Industry

The nature of the construction industry can be disruptive to the workers. Several factors are the causes of the mental deterioration among employees. Chan et al. (2020) reviewed previous studies to collect these causes; they called these causes risk factors. In total, they found 32 risk factors. Table 1 shows these risk factors. Some factors have a higher impact than others.

Table 1. Risk Factors from the Literature (Chan et al. 2020)

Physical illness
Nature of work/mental demand
Hours worked per day (Excess of 60 h per week)
Low income/financial insecurity
Work overload/quantity of work
Increased work speed/pressure
Little opportunity/ability to participate in decision making
Little social support from colleagues/immediate supervisors
Little relationship with colleagues/coworkers
Occupational injury/hazards
Poor working conditions
Inability to further learning
Job insecurity (fear and uncertainty about the work)
Posttraumatic Stress
Fatigue and need for recovery
Criticism
Lack of feedback mechanism in place
Low socioeconomic status
Overpromotion concerns
Poor occupational climate (i.e., task autonomy, responsibility, authority)
Fear of failure
Interpersonal conflict
Substance abuse
Alcohol consumption
Musculoskeletal pain and injuries
Poor physical working condition
Marital status
Gender discrimination

Table 1. Risk factors from the literature (Chan et al. 2020) (continued)

Lack of respect from subordinates
Workplace harassment/bullying
Work–home conflict/life imbalance (lack of time for family and other leisure due to work)
Age discrimination

2.1.1 Hours Worked Per Day (Excess of 60 h per Week)

Chan et al. (2020) show that excessive work hours are the most mentioned risk factor in related papers. The construction industry is notorious for unpredictable and long work hours. Figure 1 compares working hours between construction workers and all other nonfarm industry workers from 1985 to 2015 (CPWR 2016). The nonfarm industry is defined as all industries except farmworkers, non-profit organizations, and some parts of government workers (Chen 2022).

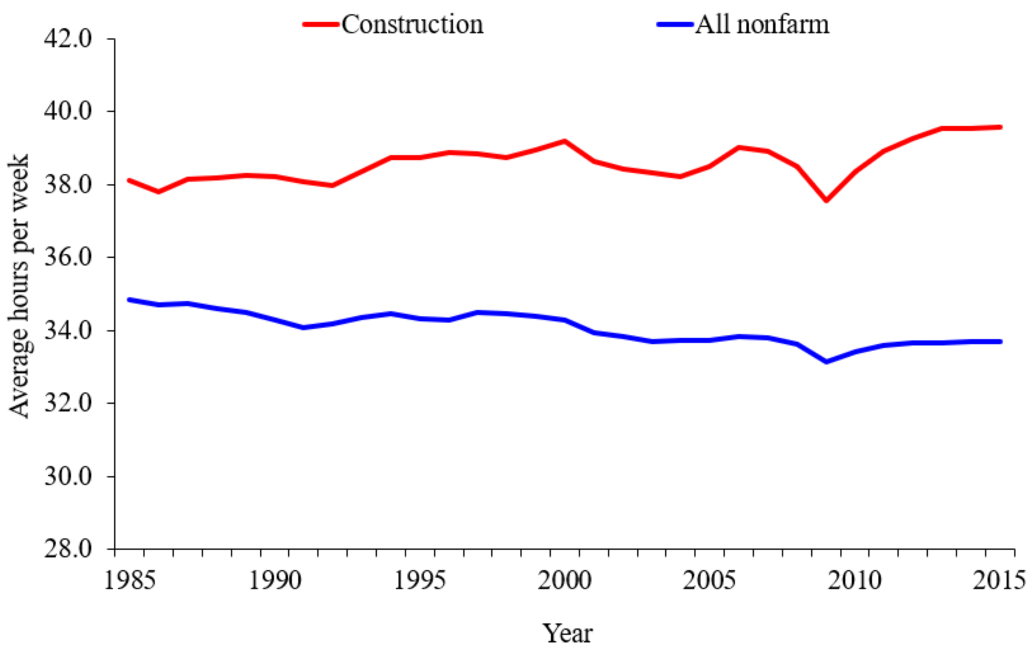


Figure 1. Average Hours Worked per Week, Construction Versus all Nonfarm Industries, 1985-2015 (CPWR 2016)

As you can see from figure 1, the construction industry has long working hours. This situation affects both white and blue-collar workers. Forty hours per week is the norm across the United States, excluding overtime payment (Wage and Hour Division of the U.S. Department of Labor 2008). If the average is close to 40 hours, a considerable amount of employees work longer than the norm. For contractors and foremen, working more than 60 hours can be considered normal, which will result in a stressful work environment (Love et al. 2010). Also, it is important to remember that the United States is a developed country. Regulations and worker rights are well established. Worker conditions from developing or under-developed countries are much worse; this will result in harsher numbers for working hours. When a person cannot spare time for their family and social activities outside of work, their mental well-being will take a hit.

2.1.2 Work Overload

When it comes to the amount of labor that is expected of its employees, the construction business is one of the most demanding. This issue is also correlated with working hours. Most of the time, unmanageable work expectancy from workers will result in long working hours and overtime. Construction works are unique among other jobs. Timetables and project due dates are very dense since most of the work can be categorized as projects. The important point of the construction projects is that all have a definitive start and end dates. In order to satisfy client expediencies, companies often put some pressure on their employees. Work distribution could be challenging for some construction jobs since project dates can be overlapped with each other.

Another reason for work overload is the lack of skilled workers. This is common in the construction industry. Welders can be given as examples for blue color workers. Finding an adequate welder could be tough for some jobs. Working in difficult environments, negative perceptions about the job, and repetitive work often prevents people from following a carrier in welding (Reed 2021). When a company finds a skilled worker, usually they tend to assign excessive work to these people. This unhealthy amount of work will negatively affect the workers.

2.1.3 Low Income / Financial Insecurity

Without financial security, it is hard to expect a person to have a mentally healthy life. The construction industry is notoriously known for its inadequate salaries among its workers. Table 2 compares median annual engineer salaries across different fields in the United States (U.S. Bureau of Labor Statistics 2020).

Table 2. Median Annual Salaries in U.S. (U.S. Bureau of Labor Statistics 2020)

Aerospace Engineer	$118,610
Biomedical Engineer	$92,620
Chemical Engineer	$108,540
Civil Engineer	$88,570
Environmental Engineer	$92,120
Computer Hardware Engineer	$119,560
Electrical/Electronic Engineer	$103,390
Industrial Engineer	$88,950
Mechanical Engineer	$90,160
Nuclear Engineer	$116,140
Petroleum Engineer	$137,330

As can be seen from Table 2, civil engineer salaries are one of the lowest ones among other engineering disciplines. This situation worsens for developing or under-developed countries where the civil engineers are under-valued by their companies. Income is directly correlated with depression scale and suicidal thoughts (Al-Maskari et al. 2011). If a person does not have financial security, they cannot have a healthy life in terms of physically and mentally.

As mentioned early, financial problems are expected to be worse for other countries, such as Turkey, where the economic conditions are worse. These countries will also lose their high-skilled blue and white-collar workers to developed countries.

2.1.4 Job Insecurity

Job insecurity is common among workers inside the construction business since most of the work is project-based. When a company finishes a project, some employees can be no longer needed. In addition, financial problems inside the company can lead to downsizing, which will eventually result in job termination of employment.

Employees who are married tend to have a higher rate of job insecurity (Lim et al. 2017). This is an understandable situation since married people have a family to take care of other than themselves.

Technological advancements have an impact on older workers, primarily white-collar workers. Young people can adapt to new technologies more quickly. This will make older employees uncomfortable with their job status.

2.1.5 Gender Discrimination

The construction industry is known for its lack of gender diversity. Australian female construction workforce is only 11% of the total workforce (Turnbull 2016). The construction industry is missing out on a considerable labor potential by not including the women workforce.

There are several reasons why women are staying away from the construction industry, as listed below (Fielden et al. 2000):

- Macho Culture
- Conflict-Laden Work Environments
- Sexism

If a woman decides to enter the construction industry despite these factors, she needs to work harder to overcome these issues, unlike her male counterparts. Male-driven industry produces an uneasy work environment for women workers. Male workers are often having a hard time taking orders from female superiors (Chan et al. 2020).

These kinds of situations will drive the women workforce out of the construction industry. The women that decide to stay in the industry have to face psychological challenges.

2.2 Common Psychological Disorders for the Construction Industry

As mentioned earlier, harmful conditions for the employees of the construction industry will result in psychological disorders. A psychological disorder can be defined as a collection of clinically significant behavioral or psychological symptoms in a person linked to present distress or disability or with a significantly increased risk of suffering, death, pain, disability, or a severe loss of independence (American Psychiatric Association 2000). Approximately 25% of the working population is afflicted by mental symptoms that are uncomfortable to the individual but not severe enough to be classified as an actual disease (Sørensen and Munk-Joergensen 2011). These mental disorders affect all industries, and the construction industry is no exception.

In order to determine the common psychological disorders and measure their impact on the people linked with construction management, Wang et al. (2017) prepared a questionnaire survey. Table 3 shows the participant demographic.

Table 3. Demographic Profile of Survey (Wang et al. 2017)

Items	Demographic characteristic	Frequency	Percent
Gender	Male	111	55.2
	Female	90	44.8
Age	18 to 23	20	10
	24 to 30	68	33.8
	31 to 40	67	33.3
	41 to 50	21	10.5
	51 and above	25	12.4
Designation	Project manager	15	7.5
	Architect	32	15.9
	M&E engineer	28	13.9
	Quantity surveyor	33	16.4
	Contractor	24	11.9
	Civil engineer	51	25.4
	Construction management admin	20	10
Working experience	Less than 3	8	4
	3 to 6	14	7
	7 to 10	37	18.4
	11 to 14	14	7
	15 to 18	49	24.4
	18 to 21	58	28.9
	More than 21	21	10.4

Through this questionnaire survey, Wang et al. (2017) found the six common psychological disorders. These disorders can be named as follows:

- Depression
- Generalized Anxiety Disorders (GAD)
- Obsessive-Compulsive Disorders (OCD)
- Substance Use Disorders (SUD)
- Acrophobia
- Claustrophobia

The occurrence of these disorders can be seen in figure 2.

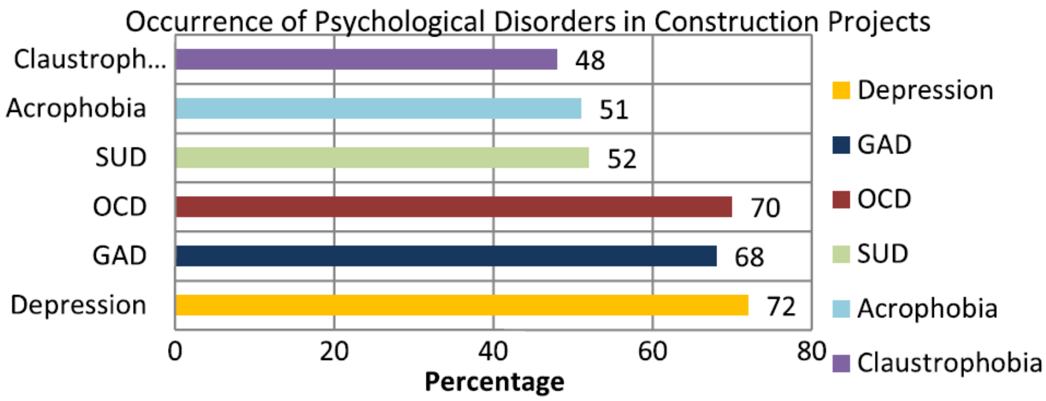


Figure 2. Occurrence of Psychological Disorders Among Construction Project Management Personnel (Wang et al. 2017)

In construction management, these disorders lead to the following results (Wang et al. 2017):

Table 4. Results of Disorders in the Construction Management (Wang et al. 2017)

Disorder	Result in the Construction Management
Depression	Dwindled work motivation
GAD	improper behavior, r workplace interpersonal issues
	Reduced productivity
	Workplace interpersonal issues
OCD	Poor time management skills
	Multitasking issues
	Concentration problems
SUD	Low productivity
	Work motivation issues,
	Diminished ability to concentrate
Acrophobia & Claustrophobia	Distress
	Anxiety
	Panic
	Interfering with one’s ability to operate and one’s ability to think

In the following subchapters, these disorders will be discussed in detail.

2.2.1 Depression

Based on the survey (Wang et al. 2017), 72% of the participants showed symptoms of depression, which makes depression the most common psychological disorder for the construction management personnel.

Depression lasts at least two weeks and is characterized by a gloomy mood or a loss of interest or pleasure in almost all activities (American Psychiatric Association 2000). Depression affects a person in such a way that that individual will lose their psychical and mental drive (Watts 1966). In terms of impact, depression is one of the most common triggers of suicide (Hawton et al. 2013). Suicide is a critical issue for modern societies. Suicide is the tenth cause of death in the United States (Kochanek et al. 2016). In 2014, approximately 43.000 people ended their lives via suicide in the United States (Kochanek et al. 2016). This alone shows the impact of the depression on society.

There are several symptoms of depression. International Statistical Classification of Diseases and Related Health Problems listed the following symptoms (WHO 2016):

- Depressed mood
- For at least two weeks, a loss of interest in activities
- Significant functional impairment
- Insomnia
- A sense of insignificance
- Loss of energy
- Difficulty in thinking or concentrating
- Tiredness
- Loss of self-confidence
- Agitation
- Loss of appetite
- Weight loss
- Loss of libido

Workers affected by these symptoms in the workplace cannot perform efficient performance for their company. In addition, psychological disorders are correlated with each other. That means depressed people have a higher probability of having other psychological disorders, such as anxiety, substance abuse, and various medical problems (Kendler et al. 1995). Other results of the depression inside the workplace, like absenteeism and presenteeism, will be explained in the following subchapters.

2.2.2 Generalized Anxiety Disorders (GAD)

According to American Psychiatric Association (2000), anxiety can be defined as a state of mind marked by tense sensations, concerned thoughts, and physical changes such as elevated blood pressure. Based on this definition, generalized anxiety disorder (GAD) can be specified as long-term, which means the state will last at least six months, excessive anxiety and worry over a variety of life events, including job and family commitments, income, health, and little everyday tasks (American Psychiatric Association 2000).

There are a number of symptoms that can be associated with generalized anxiety disorders. Wang et al. (2017) listed these symptoms as follows:

- The nervousness that doesn’t seem to go away
- Trembling
- Muscular tensions
- Sweating
- Lightheadedness
- Palpitations
- Dizziness
- Epigastric discomfort

Like depression, anxiety has a direct and harmful effect on the employees inside the workplace. These effects are valid for every worker, regardless of their position in the company. There are some workplace conditions that might trigger anxiety. For example, high expectations from the subordinate might push the employee into a negative state of mind. This state of mind might result in anxiety. In the construction industry, tight deadlines and unrealistic work expectations from the workers can be given as examples of the causes of anxiety.

2.2.3 Obsessive-Compulsive Disorders (OCD)

Obsessive-Compulsive Disorder (OCD) is a curable psychiatric illness characterized by a person's brain becoming fixed on a single idea, which subsequently leads to serious worry, doubt, or superstition (Woliver 2008). OCD is primarily defined by two phenomena (American Psychiatric Association 2000):

- Obsessions
- Compulsions

Obsession is a state of mind in which the person suffers unwanted and repetitive thoughts, urges, or images; on the other hand, compulsion is defined as the response to minimalize the negative effects caused by obsessions (Frost and Steketee 2001). Performing ritualistic thoughts or actions can be given as examples of compulsive responses (Frost and Steketee 2001).

OCD is common across the general public. In the United States, It is estimated that 1% of adults have OCD, which might be an underestimation because of the incorrect diagnosis or keeping a secret by the patient (Woliver 2008).

There are several common OCD symptoms that the patient shows in daily life, which can be listed as follows (Pulse TMS 2022):

- Uneasiness about germs or some sort of contamination
- Ideas about sex, religion, or harm that are banned or taboo
- Aggressive thoughts about others or about oneself
- Obsessions with objects being symmetrical or in perfect order

Left unchecked, OCD will impact a person's daily life and workplace performance in a negative way. Like depression and anxiety, OCD has a tendency to trigger other mental disorders. The individual might isolate themselves, turn to drugs or alcohol to cope with the problems, and spend an unhealthy amount of time satisfying their compulsive needs, which will reduce their working or social hours (Pulse TMS 2022).

2.2.4 Substance Use Disorders (SUD)

Substance Use Disorders (SUD) is a mental disease in which people have strong desires to use drugs, alcohol, or other psychoactive substances (Maser et al. 2002). Patients who have SUD persist in obsessive activity despite negative repercussions such as destroying their health, income, personal relationships, and careers (American Psychiatric Association 2000). These types of substances will temporarily give pleasure to the user; however, this pleasure is often followed by depression and guilt (Maser et al. 2002).

There are several substances that are abused by the patient, which can be found in the following list (Wang et al. 2017):

- Alcohol
- Marijuana
- Opiates (Heroin and Morphine)
- Hallucinogens (For example, cocaine)
- Amphetamines (For example, ecstasy)
- Inhalants (For example, glue and gum sniffing)

SUD is growing increasingly. Grant et al. (2004) performed a survey in the United States to determine substance use. Table 4 shows the twelve-month prevalence of substance use disorders.

Table 5. Twelve-Month Prevalence of Substance Use Disorder (Grant et al. 2004)

Disorder	Respondents, %
Any substance use disorder	9.35
Any alcohol use disorder	8.46
Any drug use disorder	2.00
Sedative use disorder	0.16
Tranquilizer use disorder	0.13
Opioid use disorder	0.35
Amphetamine use disorder	0.16
Hallucinogen use disorder	0.14
Cannabis use disorder	1.45
Cocaine use disorder	0.27

SUD will not only damage the mental health of the individual, but it will also damage the physical health as well. SUD has a huge effect on the work performance of the workers. Sometimes using these substances to cope with the problems that originated inside the workplace will damage the employee's overall performance in a negative way.

2.2.5 Acrophobia

Acrophobia is a fear of heights that is frequently connected with avoiding height-related situations such as stairways, high-rise buildings, bridges, elevators, and airplane flights (Coelho et al. 2009). As can be seen from the definition, this phobia is directly related to the construction industry. Construction projects often consist of the type of structures that have some sort of height issue. For example, the construction of high-rise buildings requires the employees to work in elevated positions, which might be discomforting to some people. Bridges are also well known for their heights from the ground. Companies need to keep an eye on this situation to protect their workers.

2.2.6 Claustrophobia

The definition of claustrophobia is fairly simple; fear of enclosed environments (American Psychiatric Association 2000). Examples of enclosed spaces can be listed as follows:

- Tanks
- Cargo Holds
- Tunnels
- Cellars
- Vaults
- Manholes
- Elevators

As can be seen from examples, most enclosed spaces are common for construction projects. For underground projects, construction workers generally spend their time in tunnels, which can trigger claustrophobia. Elevators are another example of this, which is related to both acrophobia and claustrophobia.

2.3 Impact of the Psychological Disorders on the Construction Industry

Effects of the beforementioned psychological disorders are interrelated, meaning that depression will impact substance use, for example. Wang et al.'s (2017) study already showed the results for the construction management. This subchapter will focus on already defined workplace concepts such as absenteeism, presenteeism, and burnout.

2.3.1 Absenteeism

There is no clear definition and limit for absenteeism. It can be generalized as an absence from the workplace. This generalization does not explain the absence reasons since absence from work can occur for various reasons. Figure 3 shows the tabulated view of reasons for absence from work (Australasian Faculty of Occupational Medicine 1999).

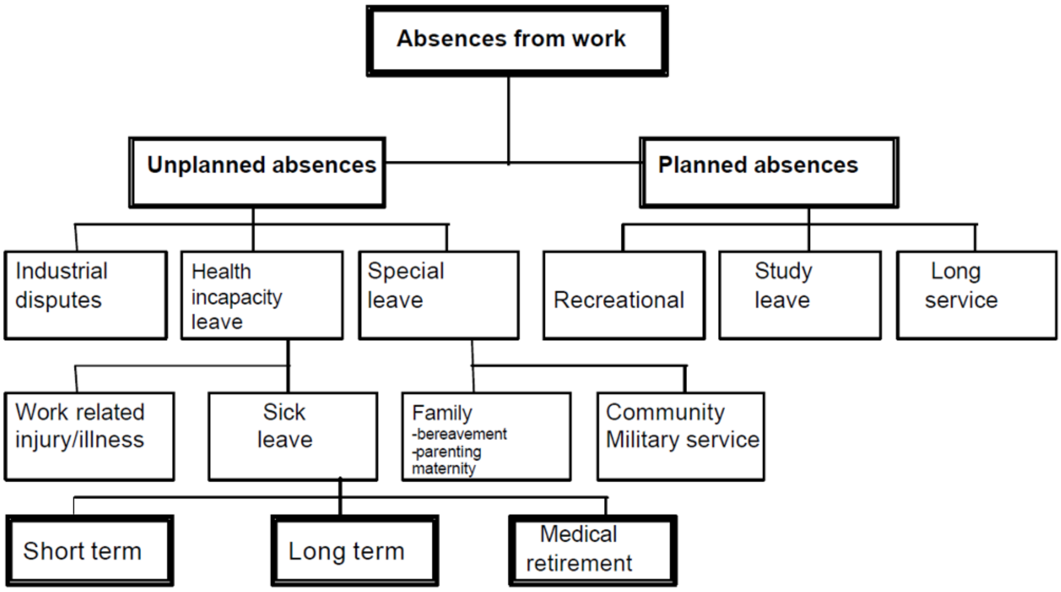


Figure 3. Leave Category Hierarchy (Australasian Faculty of Occupational Medicine 1999)

As can be seen from Figure 3, there are various reasons why a person can be absent from work. Since mental health problems are not direct as physical sickness, it is difficult to pinpoint whether a person is absent from work because of the mental issues. However, mental issues impact work absence directly. When an employee cannot cope with the problem inside the workplace, absenteeism can occur.

2.3.2 Presenteeism

Presenteeism is more complicated and difficult to notice than absenteeism. Presenteeism occurs when a person is physically present at the workplace but not mentally present (Lack 2011). Absenteeism can be noticed easier than presenteeism. An employee can show up to work; however, their mental status can prevent them from doing the actual work. Presenteeism can also occur because of various reasons.

Physical illness can also affect the employee in a way that they cannot put their standard performance. The beforementioned mental disorders also have a negative effect on the employee. For example, a mentally unhealthy person can ignore the problem to cope; however, this coping mechanism might create presenteeism at work.

2.3.3 Burnout

Individuals can obtain prosperity and spiritual fulfillment by doing the job that they enjoy. Employees may, however, become dissatisfied with their occupations as a result of their superiors, company processes, or other factors and continue to work just because they have to, which is referred to as burnout (İnandi and Büyüközkan 2021). As can be seen from this definition, the risk factors mentioned beforehand play a huge part in burnout.

2.4 Coping

People who work in the construction business are often subjected to high levels of work-related stress. To overcome and adapt, everyone develops some sort of mechanism. These mechanisms can generally be called coping mechanisms.

Coping is a term that describes a person’s continual attempts in thought and behavior to handle certain demands that are deemed to be burdensome on their psychological well-being (Sunindijo and Kamardeen 2017). According to Sunindijo and Kamardeen (2017), coping processes can be grouped into two main processes as follows:

- Problem-focused coping
- Emotion-focused coping

Based on this grouping and other research related to coping, 14 coping mechanism is proposed (Carver et al. 1989). These 14 coping mechanisms can be listed as follows:

1. Active coping: The person tries to take action to neutralize or reduce the problem.
2. Planning: In this coping mechanism, the person thinks and finds strategies to overcome the problem.
3. Suppression of competing activities: The person puts everything else aside and focuses on the specific problem.
4. Restraint coping: The person waits for the right time to take action.
5. Seeking social support for instrumental reasons: The person asks for advice from another person who had a similar issue in the past.
6. Seeking social support for emotional reasons: The person seeks emotional support from friends or family.
7. Positive reinterpretation & growth: In this coping strategy, the person looks at other positive things in their life.
8. Acceptance: The person tries to live with the problem.
9. Turning to religion: The person tries to find a solution from their religious activities.
10. Focus on & venting of emotions: In this coping mechanism, the person lets their feelings out.
11. Denial: As the name indicates, the person refuses to believe the problem exists.
12. Behavioral disengagement: The person reduces their attempts to deal with the problem or quits entirely.
13. Mental disengagement: The person tries to distract themselves via alternative activities.
14. Alcohol and drug disengagement: This is also a straightforward coping mechanism; the person takes drugs or alcohol to think less about the problem.

2.5 Mental Health Assessment Tools

In literature, some studies have been made to assess the mental health of the people in the construction industry. These tools assist the studies in extracting data from the participants. Chan et al. (2020) found eleven validated health assessment scales in the studies:

- Depression Anxiety Stress Scale (DASS)
- General Health Questionnaire (GHQ)
- Hopkins Symptom Checklist (HSCL)
- Crown-Crisp Experimental Index (CCEI)
- Center for Epidemiologic Studies Depression Scale (CES-D)
- Whooley Depression Screen
- Hamilton Depression Rating Scale (HAM-D)
- State-Trait Anxiety Inventory (STAI)
- International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10)
- Impact of Event Scale (IES)
- Mini International Neuropsychiatric Interview (MINI)

2.5.1 Depression Anxiety Stress Scale (DASS)

The DASS is a collection of three self-report measures that are used to assess depression, anxiety, and Stress (Lovibond and Lovibond 1995). There are two versions of the tool:

- DASS 42
- DASS 21

DASS 42 has 42 questions in total, each set of 14 questions for depression, anxiety, and stress. DASS 21 is the simplified version of the DASS 42. DASS 21 has 21 questions in total, each set of 7 questions for depression, anxiety, and stress. DASS is free to the public, meaning that it can be used without any payment or permission.

DASS has several translated versions on its website. For example, there are two different translated Turkish versions of the DASS, which can be quite useful to this thesis. Additional information for this assessment tool will be given in Chapter 3, Methodology.

2.5.2 General Health Questionnaire (GHQ)

GHQ, created by D.Goldberg, is a widely used psychological health screening instrument (Montazeri et al. 2003). GHQ is copyrighted (Chan et al. 2020). This tool has different versions based on how many questions the questionnaire has (Chan et al. 2020):

- GHQ-60
- GHQ-30
- GHQ-28
- GHQ-12

2.5.3 Hopkins Symptom Checklist (HSCL)

The main goal of the HSCL is to detect anxiety and depression (Chan et al. 2020). It has 25 questions; thus, the name becomes HSCL-25. These 25 questions are divided into 15 depression-related and 10 anxiety-related questions.

2.5.4 Crown-Crisp Experimental Index (CCEI)

CCEI is a self-rating mental health screening tool for anxiety, depression, and hysteria (Joukamaa 2009). For measuring free-floating anxiety, phobic anxiety, obsessionality, somatic anxiety, depression, and hysteria, the CCEI comprises six subscales, each with eight items (Chan et al. 2020).

2.5.5 Center for Epidemiologic Studies Depression Scale (CES-D)

The National Institute of Mental Health created the CES-D, which is suitable for measuring depression symptoms in the general population (Radloff 1977). CES-D consists of 20 questions with scores ranging from 0 to 3, with a higher score indicating greater depression severity (Chan et al. 2020). CES-D can be used in 10 or 20-question format, and it is not copyrighted (Chan et al. 2020).

2.5.6 Whooley Depression Screen

The Whooley Depression Screen is a two-item questionnaire that is used to determine whether or not someone is depressed (Chan et al. 2020). The questions are in “yes” or “no” format. The Whooley questions are helpful in recognizing mental health issues, although they don’t always imply depression (Howard et al. 2018).

2.5.7 Hamilton Depression Rating Scale (HAM-D)

HAM-D is a 17-item questionnaire that assesses the frequency and severity of depression (Akdemir et al. 2001). Some questions have been raised in the past regarding the validity of the test, Akdemir et al. (2001) concluded that HAM-D can be used to detect depression.

2.5.8 State-Trait Anxiety Inventory (STAI)

The purpose of the STAI is to assess the existence and intensity of present anxiety symptoms, as well as a generic anxiety tendency (Julian 2011). STAI has 40 questions and can be divided into two equal subscales; the State Anxiety Scale (S-

Anxiety) and the Trait Anxiety Scale (T-Anxiety) (Julian 2011). S-Anxiety assesses how anxious a person is at the moment; on the other hand, T-Anxiety measures more stable aspects of "anxiety proneness" (Julian 2011).

2.5.9 International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10)

ICD-10 established reliable standards for undertaking mental research and classification (Chan et al. 2020). It aids in the identification of people who have the same symptoms based on clearly defined parameters (Chan et al. 2020). According to Chen et al. (2020), a specialized person should conduct the ICD-10, so this tool might not be proper for this thesis.

2.5.10 Impact of Event Scale

IES is a useful tool for measuring posttraumatic stress disorders and identifying who needs medical help (Sundin and Horowitz 2002).

2.5.11 Mini International Neuropsychiatric Interview (MINI)

MINI is a multivariant assessment instrument that can be used to detect depression, anxiety, and suicidality (Li et al. 2017). According to Li et al. (2017), MINI is frequently used as a second-stage or additional diagnostic technique to investigate problems reported during a previous evaluation.

2.6 Previous Studies on Mental Health in the Construction Industry

After explaining the risk factors, disorders, impact of the disorders, coping mechanisms, and the tools that are used to detect the disorders, in this subchapter, previous studies on mental health in the construction industry will be shown.

Chen et al. (2020) prepared a systematic review on the subject that shows the studies in a collective manner. Chen et al. (2020) found a total of 16 studies that are related to the mental health of the people in the construction industry. Table 6 shows these previous studies. The first three columns are taken from Chen et al. (2020). For this thesis, the last three columns are added. These columns indicate the location of the study, the number of participants in the study, and the participant job definition. In this table, PTSD means posttraumatic stress disorder.

Table 6. Modified Previous Mental Health Studies in the Construction Industry (Chan et al. 2020)

Authors	Diagnosis	Mental Health Assessment Tool	Location	Number of Participants	Participant Job Definition
Al-Maskari et al. (2011)	Depression	DASS 42	United Arab Emirates	239	Male Migrant Workers
Boschman et al. (2013)	Depression PTSD	Whooley Depression Screen Impact of Event Scale	Netherlands	563	Bricklayers and Construction Supervisors
Bowen et al. (2018)	Psychological Distress	Questions extracted from previous studies	South Africa	630	Construction Professionals
Dong et al. (2015)	Depression	Center for Epidemiological Studies - Depression (CES-D)	United States	1435	Blue-Collar Construction Workers
Haynes and Love (2004)	Depression Anxiety	DASS 21	Australia	100	Male Construction Professional Managers
Hu et al. (2013)	PTSD Depression	HAM-D ICD-10 Classification Mental and Behavioral Disorders	China	41	Male Construction Workers
Jacobsen et al. (2013)	Depression Anxiety Suicide	HSCL-25 MINI	United States	172	Construction Workers
Kamardeen and Sunindijo (2017)	Anxiety Depression	DASS 21	Australia	283	Construction Professionals

Table 6. Modified Previous Mental Health Studies in the Construction Industry (Chan et al. 2020) (continued)

Authors	Diagnosis	Mental Health Assessment Tool	Location	Number of Participants	Participant Job Definition
Langdon and Sawang (2018)	Depression Anxiety	DASS 21	Australia	91	Construction Workers
Lim et al. (2018)	Depression Anxiety	CES-D STAI-T	South Korea	396	Construction Workers
Love et al. (2010)	Depression Anxiety	GHQ-12	Australia	449	Construction Professionals
Sutherland and Davidson (1993)	Anxiety Depression	CCEI	United Kingdom	561	Construction Site Managers
Sunindijo and Kamardeen (2017)	Depression Anxiety	DASS 21	Australia	277	Construction Professionals
Tsutsumi et al. (2001)	Depression	CES-D	Japan	190	Workers in Different Industries
Bowen et al. (2014)	Psychological Strain	Questions extracted from previous studies	South Africa	676	Construction Professionals
Lingard et al. (2007)	Mental Distress	Questions extracted from GHQ-12	Australia	42	Blue and White-Collar Workers

As can be seen from Table 6, DASS is the most used mental health assessment tool in previous studies. DASS 21 or DASS 42 have been used five times in the past. The reason is that DASS is easy to use, and it is not copyrighted. In addition, the beforementioned developed country argument can be seen in Table 6. Nearly all of the studies have been implemented in developed countries, which creates a gap in the literature for developing and under-developed countries. Also, a clear distinction between white-collar and blue-collar workers can be seen in Table 6. Most of the studies focused the construction workers or construction professionals. Construction professionals' examples are engineers, managers, architects, etc. Construction workers indicate the blue-collar employees, mostly doing the physical work.

CHAPTER 3

METHODOLOGY

In this chapter, the methodology for this thesis will be explained in detail. As explained in Chapter 2, there is a gap in the literature on the mental health of construction employees in developing countries. Turkey is a developing country. In this thesis, the mental health of Turkish civil engineers in the construction industry will be investigated.

As mentioned in Chapter 2, there are several tools to evaluate mental health. In order to investigate this problem, a questionnaire is developed. This questionnaire can be divided into four parts:

1. Demographic and Professional Background of the Participants
2. Stressors at Work
3. Coping Strategies
4. Selected Mental Health Assessment Tool (Turkish DASS 21)

Since this questionnaire is for Turkish civil engineers, the language of the questionnaire is Turkish. The beforementioned four parts will be explained in detail. After presenting the questionnaire, the distribution and sampling strategy of the questionnaire will be described. In the end, the ethics of this questionnaire will be discussed briefly.

3.1 Demographic and Professional Background of the Participants

The first part of the questionnaire focuses on the participant’s background. In this part, there are eight questions to compare the differences between the participants. These questions can be named as follows:

1. Gender of the Participants

2. Level of Education of the Participants
3. Marital Status of the Participants
4. Work Environment of the Participants
5. Which Country is the Participant Currently Working?
6. Years of Experience of the Participants
7. Weekly Working Hours of the Participants
8. Monthly Income of the Participants

3.1.1 Gender of the Participants

As mentioned in Chapter 2, the construction industry is well-known for its macho culture, where women encounter more obstacles than their men counterparts. In order to see the difference between men and women, a multiple-choice question is given in the questionnaire. A third option is also provided as “other”.

3.1.2 Level of Education of the Participants

In order to become a civil engineer, a person has to have an undergraduate degree. For Turkish civil engineers, a four-year university degree is a must. A multiple-choice question is provided in the questionnaire to see the education levels of civil engineers. There are three options:

- Undergraduate Level
- Graduate Level
- Doctorate Level

3.1.3 Marital Status of the Participants

Social support coming from outside of the construction business is essential for the employees. In order to investigate this, marital status is asked of the participants. There are two options for this question; married or single.

3.1.4 Work Environment of the Participants

The work environment of the civil engineers can be divided into two main parts; office and field. There are some employees who are working both of those simultaneously as well. The risk factors explained in Chapter 2 are different for field or office civil engineers to some degree. For example, poor working conditions are more critical for field engineers since construction sites are well known for their hazardous nature. Office politics is another source of work stressors, which may differ in field and office.

3.1.5 Which Country is the Participant Currently Working?

The journey of the expansion of the Turkish construction sector started at the beginning of the 1970s when the Turkish contractors took the Tripoli port contract in Libya (Daily Sabah 2020). Fifty years later, the total value of the projects undertaken by the Turkish contractors outside of Turkey is approximately $451.5 billion, and these projects are located in 131 different countries with 11093 contractors (Daily Sabah 2022). There are 40 Turkish companies in the top 250 worldwide contractors (Hurriyet Daily News 2021). This giant industry creates expatriate workers, often shortened to expats. The general definition of the term “expat’’ is the person living outside of their native country permanently or for a period of time. Typical usage of the word “expat” often refers to educated professionals. Expats are white-collar workers in the construction industry, and civil engineers are inside of this definition. As mentioned earlier, there are several projects outside of Turkey that belong to Turkish contractors, and Turkish civil engineers works on these projects; on field and sites.

In order to determine whether the participant are currently working in Turkey or not, a question is inserted into the questionnaire. The question has two options, Turkey or another country. Another country option can be written by the participant.

3.1.6 Years of Experience of the Participants

Work stressors and coping strategies may change based on the experience of the participant inside the construction sector. New and old generations may have different concerns with work and life. A year of experience question is given inside the questionnaire.

3.1.7 Weekly Working Hours of the Participants

As mentioned in Chapter 2, the construction industry is known for its unpredictability and long work hours. In the literature, long working hours are one of the main risk factors for mental health in the construction industry. In order to investigate the effects of these working hours, a question is asked inside the questionnaire.

3.1.8 Monthly Income of the Participants

Some risk factors in the construction industry defined in Chapter 2 are related to the income of the workers. In order to observe the effect of financial status on mental health, a question is inserted into the questionnaire. This is a tricky question since some participants may not want to share their financial status via a questionnaire. Because of this, participants can skip this question so people will not avoid the questionnaire entirely. The currency of the question is the Turkish Lira in order to make the comparison viable. If a participant earns their income in Euro, U.S. Dollar, etc., it is asked to convert that income to Turkish Lira.

3.2 Stressors at Work

The second part of the questionnaire is about the causes of mental illness. The purpose of this question is to collect the opinion of the participants about the causes of the stressors in the workplace. This is an open-ended question. Participants can answer this question in their own words. More than one stressor can be inserted here.

In Chapter 2, 32 risk factors for mental illness in the construction industry are presented (Chan et al. 2020*)*. Table 1 shows these risk factors. The responses are categorized based on Table 1.

3.3 Coping Strategies

The third part of the questionnaire is about dealing with the stress mentioned in the second part of the questionnaire; stressors at work. This is a similar question to the stressors at work question, where the participants can use their words to describe their strategies to cope with the problems inside the workplace.

In Chapter 2, coping mechanisms are explained in detail. Carver et al. (1989) proposed 14 coping mechanisms. For this question, the responses are also categorized just like the second part of the questionnaire. This time the beforementioned 14 coping mechanisms are used.

3.4 Selected Mental Health Assessment Tool (Turkish DASS 21)

In the literature, previous articles used a mental assessment tool in their study. Table 6 shows these studies. As can be seen in Table 6, DASS is the most used mental assessment tool in the literature. There are some reasons why the DASS is the most used mental assessment tool in the literature. First, DASS is free to use, meaning that no permission is needed to administrate it. Second, everyone can administrate the tool; no specialized qualification is required. For this thesis, there is also an additional perk of the DASS, translations. There are two Turkish versions of the DASS, which are accessible via the DASS website.

As mentioned briefly in Chapter 2, DASS is a set of questions that measures depression, anxiety, and stress (Lovibond and Lovibond 1995). There are long and short versions of the DASS. For this thesis, the short version is selected. The reason for this is to collect more results from the participants. People tend to avoid long voluntary questionnaires. With DASS 21, people can keep their attention on the questionnaire.

DASS 21 consists of three categories, seven questions for each state. These questions measure the participant’s mental status over the past week. There are four numerical answers to each question:

0 = This statement did not apply to me at all.

1 = This statement applied to me to some degree.

2 = This statement applied to me to a considerable degree.

3 = This statement applied to me very much.

The final score is the sum of each numerical point. DASS 21 scores should be multiplied by two to get comparable results with the DASS 42.

Lovibond and Lovibond (1995) describe the characteristics of high scorers on each DASS scale:

Depression Scale:

- Self-disparaging
- Dispirited, dismal, and blue
- Convinced that life is meaningless
- Cynical about the future
- Unable to experience pleasure or fulfillment
- Unable to get involved or interested
- Sluggish and lacks initiative

Anxiety Scale:

- Fearful and panicky
- Jittery and shaky

- Dry mouth, breathing difficulty, pounding of the heart, sweaty palms
- Concerned about performance and the possibility of losing control

Stress Scale:

- Tight, over-aroused
- Unable to unwind
- Sensitive and quickly agitated
- Irritable
- Easily startled
- Nervous, jumpy, fidgety
- Lack of tolerance towards delays and interruptions

As mentioned earlier, DASS has another advantage; it has been translated into other languages. These translations can be found on the DASS website. The focus group of this thesis is Turkish civil engineers. It is logical to use a translated version of the DASS. There are two different Turkish versions of the DASS:

- Akin and Cetin (2016)
- Bilgel and Bayram (2010)

Akin and Cetin (2016) focused on the reliability and validity of the Turkish version of the DASS. Participants were university students from Sakarya University. They concluded that Turkish DASS is a reliable instrument for assessing mental health (Akin and Cetin 2016).

Bilgel and Bayram (2010) conducted a study among university students to evaluate their translated version of the DASS. They also concluded that this translated version of the DASS is an efficient tool for the intended use (Bilgel and Bayram 2010). In this paper, the mean and standard deviation scores of the results can be seen. This creates an opportunity to compare the results of this thesis with Bilgel and Bayram's (2010) study. Thus, Bilgel and Bayram's (2010) translated version of the DASS is selected.

3.5 Sampling and Questionnaire Administration

As mentioned earlier, the focus group of this questionnaire is Turkish civil engineers. A random sampling technique is utilized to achieve the required sample size. The questionnaire is written in Turkish, and Google Forms is used to create the questionnaire online. Google Forms is a survey administration program that is a product of Google. It is free to use and easy to administrate.

In order to reach Turkish civil engineers, e-mail requests are sent to large Turkish construction firms. The questionnaire can be filled out for a period of 1 month, from January to February 2022.

Determination of adequate participant volume is essential to get meaningful results. In order to find such a size, several formulations can be used. For this thesis, the formula prepared by Cochran (1977) will be used. Cochran's (1977) formula can be seen below.

$$n = \frac{t^2 \text{ x } s^2}{d^2} \qquad \text{(Equation 1)}$$

Where;

n = sample size

t = value for selected confidence level (z-score)

s = estimate of variance deviation for the scale used for data collection

d = number of points multiplied by an acceptable margin of error

If a confidence level is set to 95%, that means the margin of error is 5%, or 0.05. This confidence level is considered acceptable; many similar studies used a 95% confidence level. Z-score of 95% confidence level is 1.96. DASS has four different answer possibilities. The mean score of the DASS is 1.5, putting two scores on each side (0 and 1 are on one side; 2 and 3 are on another side). That means the range of the DASS is four. This value should be divided by answer possibilities. Thus, Equation 1 becomes;

$$n = \frac{(1.96)^2 \text{ x } (4/4)}{(4 \text{ x } 0.05)^2} = 96$$

Based on this result, participant quantity should exceed 96 to produce meaningful results.

3.6 Ethics of the Questionnaire

Before distributing the questionnaire, necessary documents and one copy of the questionnaire were sent to METU Human Subjects Ethics Committee. The committee approved the questionnaire. Additionally, it is critical to keep participants anonymous. No personal information is collected from the participants to expose their identity.

CHAPTER 4

RESULTS

4.1 General Findings

4.1.1 Participant Profile

After one month, results are collected online; in the end, 182 responses are collected. As calculated with Equation 1 in Chapter 3, a minimum of 96 participant numbers is exceeded. The majority of the respondents are males; 151 male civil engineers participated in this study. This is an expected result since the construction industry is known for its macho culture. Nearly an even distribution exists for marital status. Single participants generated 96 responses. For a level of education, most participants only finished an undergraduate program; 133 people. There is also an even distribution of the work environment. As expected, Turkey comes as a number one working location, with 114 engineers working inside the country. Expats are working in different countries, such as Serbia, Russia, Qatar, Kazakhstan, etc. Working hours are found to be high as expected, with a mean value of 55.56 hours. Nearly 42% of the participants did not want to share their income. Since a significant amount of participants are from different countries, the income average can be considered as high, 24900 Turkish Liras. This is a misleading result since most expats earn with foreign currencies. Expat income average is close to 57500 Turkish lira, which is close to $4000 at the beginning of 2022. Civil engineers who work in Turkey earn 11000 Turkish Liras on average. The working experience average is calculated as 9.64 years. These results will be presented in detail in the following subchapters.

4.1.2 DASS Results

As mentioned in Chapter 3, DASS 21 results are straightforward, the sum of respective parts. Depression, anxiety, and stress results are separated, and sum scores are collected. In order to convert the results to DASS 42, each sum is multiplied by 2. Mean values and standard deviations (SD) are calculated for each scale. An additional calculation is made to test the reliability of the results. This calculation will show the internal consistency of the scales. In order to achieve this, Cronbach's Alpha (α) is calculated. Cronbach's alpha formula is as follows:

$$\alpha = \frac{K}{K-1}\left(1-\frac{\sum_{i=1}^{K}\sigma_{Y_i}^2}{\sigma_X^2}\right) \qquad \text{(Equation 2)}$$

Where;

α = Cronbach's alpha

K = number of questions for each scale (7 for Depression, Anxiety, and Stress)

$\sigma_{Y_i}^2$ = variance for each individual question

σ_X^2 = variance of total scores

Based on Equation 2, each α value for each scale is calculated. Table 7 shows the values. DASS Scale indicates the total internal consistency.

Table 7. Cronbach's Alpha (α) Values

Scale	α
Depression Scale	0.91
Anxiety Scale	0.72
Stress Scale	0.84
DASS Scale	0.92

In order to understand these values, cutoff values should be investigated. Table 8 shows the degree of reliability where α values indicate an explanation.

Table 8. Cronbach's Alpha (α) Cutoff Values (Yockey 2016)

α	Reliability
α ≥ 0.9	Excellent
0.9 > α ≥ 0.8	Good
0.8 > α ≥ 0.7	Acceptable
0.7 > α ≥ 0.6	Questionable
0.6 > α ≥ 0.5	Poor
0.5 > α	Unacceptable

Based on Table 8, Depression Scale and DASS Scale have excellent reliability. The Stress Scale has good reliability; on the other hand, the Anxiety Scale has only acceptable reliability. This is a shortcoming of DASS 21, where questions are limited to 7 for each scale. Nevertheless, all scales have acceptable reliability at a minimum.

After showing the consistency of the results, scores for Depression, Anxiety, and Stress are presented in Figure 4. Mean and Standard Deviation (SD) values are given at the bottom of the chart.

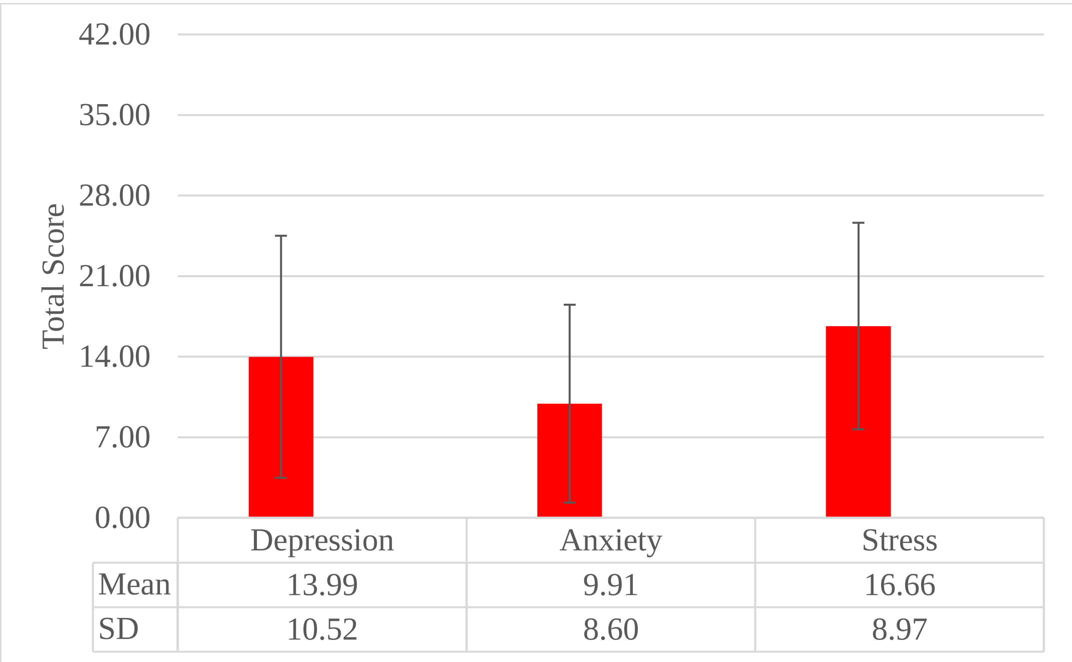


Figure 4. DASS 21 Results

In order to interpret the results, cutoff values should be investigated. Table 9 shows these cutoff values, which this study will group the responses to the questionnaire accordingly (Lovibond and Lovibond 1995).

Table 9. Cutoff Scores for Each Scale of DASS 42 (Lovibond and Lovibond 1995)

Ranking	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

The values shown in Table 9 are for DASS 42 results. The results of this thesis are adjusted for DASS 42 to compare the results in a correct way. The participant results and their respective cutoff groups are shown in Table 10.

Table 10. Cutoff Score Distribution for Each Scale of DASS

Scale	Cutoff Score	Number of Participants	%
Depression	Normal	69	37.9%
	Mild	26	14.3%
	Moderate	43	23.6%
	Severe	20	11.0%
	Extremely Severe	24	13.2%
Anxiety	Normal	81	44.5%
	Mild	14	7.7%
	Moderate	40	22.0%
	Severe	19	10.4%
	Extremely Severe	28	15.4%
Stress	Normal	88	48.4%
	Mild	34	18.7%
	Moderate	30	16.5%
	Severe	20	11.0%
	Extremely Severe	10	5.5%

4.1.3 Stressors at Work Responses

As mentioned in Chapter 3, Table 1 will be the guide for this part. Each participant's responses are categorized based on Table 1. As a reminder, one participant can answer multiple answers here. Results are sorted from highest to lowest.

Table 11. Stressors at Work Responses

Risk Factor	Number of Participants	%
Work overload/quantity of work	81	44.5%
Poor occupational climate (i.e., task autonomy, responsibility, authority)	71	39.0%
Hours worked per day (Excess of 60 h per week)	43	23.6%
Low income/financial insecurity	38	20.9%
Increased work speed/pressure	31	17.0%
Little social support from colleagues/immediate supervisors	30	16.5%
Interpersonal conflict	14	7.7%
Poor working conditions	12	6.6%
Work─home conflict/life imbalance (lack of time for family and other leisure due to work)	11	6.0%
Job insecurity (fear and uncertainty about the work)	8	4.4%
Workplace harassment/bullying	5	2.7%
Inability to further learning	2	1.1%
Overpromotion concerns	2	1.1%
Substance abuse	2	1.1%
Gender discrimination	2	1.1%
Nature of work/mental demand	1	0.5%

As shown in Table 11, work overload is the number one response among participants, which is explained in Chapter 2. Poor occupational climate responses can be listed as follows:

- Lack of communication inside the company
- Lack of job definition

- Lack of planning
- Lack of qualified workers

In this questionnaire, the average work hours are 55.56 hours, so it is expected from participants to give working hours as a work stressor. Next, low income is another stressor for participants. In the next chapter, these stressors will be explained in detail.

4.1.4 Coping Strategies Responses

For coping strategies, the same logic is applied, just like stressors at work question. Responses are categorized based on the beforementioned 14 coping mechanisms. Results can be seen below from most frequent response to least frequent response.

Table 12. Coping Strategies Responses

Coping Strategy	Number of Participants	%
Mental disengagement	55	30.2%
Seeking social support for emotional reasons	53	29.1%
Alcohol and drug disengagement	35	19.2%
Seeking social support for instrumental reasons	11	6.0%
Denial	11	6.0%
Positive reinterpretation & growth	10	5.5%
Active coping	8	4.4%
Acceptance	8	4.4%
Behavioral disengagement	7	3.8%
Planning	4	2.2%
Restraint coping	4	2.2%
Turning to religion	4	2.2%
Suppression of competing activities	3	1.6%
Focus on & venting of emotions	1	0.5%

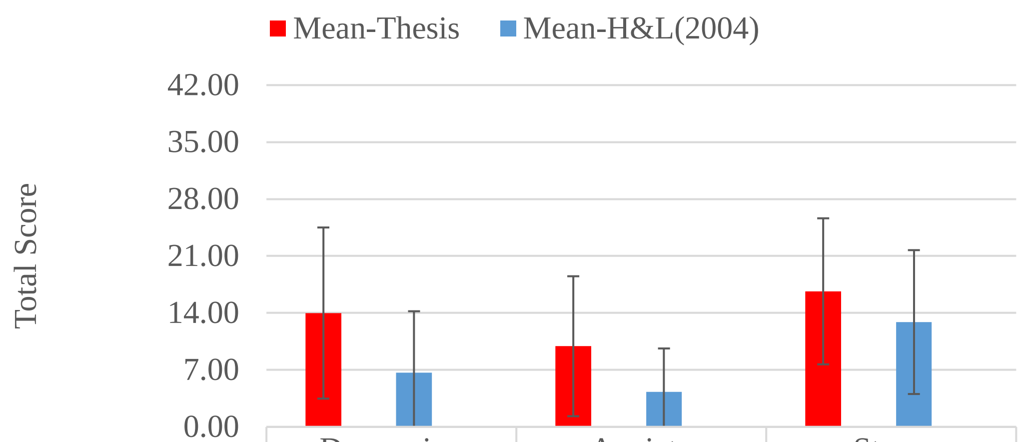
For coping strategies, there are three common responses, which can be seen in Table 12. The first one is mental disengagement. As mentioned in Chapter 2, in this coping strategy, the person tries to distract themselves with other activities. Try to engage in some social activities, sports, and watching films can be given as examples. The second response is mostly related to family and close friends. In this strategy, participants mostly seek support from their families. For the third strategy, alcohol and drug disengagement, the person uses these substances to avoid thinking about their problems. The cigarette is the most used substance for this strategy; 24 respondents stated that they smoke to cope with their problems.

4.2 Comparison with the Other Studies

In this subchapter, DASS 21 results will be compared with other studies. One study is selected from the construction industry, Haynes and Love (2004). Another study is selected from Turkey, Bilgel and Bayram (2010).

4.2.1 Comparison with Haynes and Love (2004)

Haynes and Love (2004) conducted their study in Australia, specifically the State of Victoria. Their participant group consists of project managers only. In addition, all participants are male. In total, 100 responses are collected. DASS 21 is used to evaluate the results, which makes the comparison easy. A comparison of the DASS results can be seen in Figure 5. This study also conducted a survey for sources of stress. In this part, the top three answers are workload, long working hours, and insufficient family time.

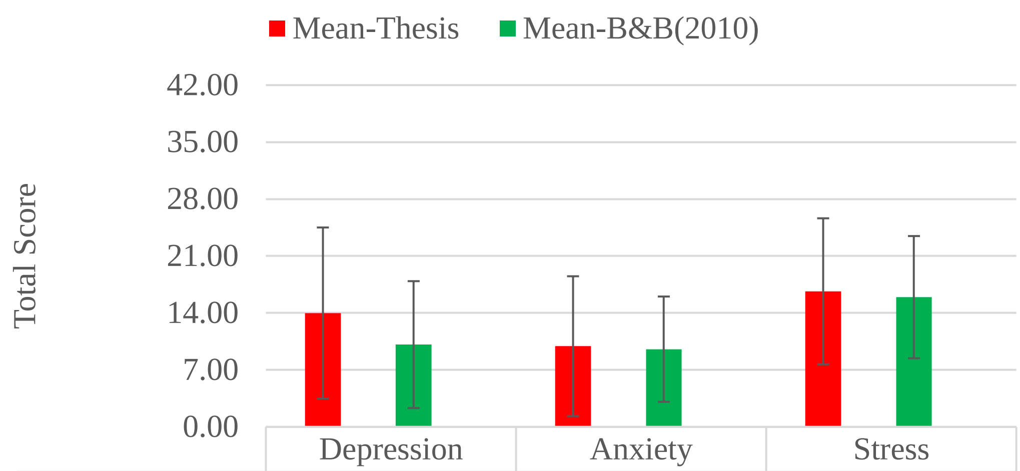


	Depression	Anxiety	Stress
Mean-Thesis	13.99	9.91	16.66
SD-Thesis	10.52	8.60	8.97
Mean-H&L(2004)	6.66	4.30	12.88
SD-H&L(2004)	7.55	5.34	8.84

Figure 5. Comparison of the DASS Results with Haynes and Love (2004)

4.2.2 Comparison with Bilgel and Bayram (2010)

This study is also the source of the Turkish DASS. Turkish university students filled out the DASS form. In total, 1102 responses are collected. Specifically, DASS 42 is used. The results of this thesis can be compared with DASS 42, as mentioned before. Figure 6 shows the comparison of the results between this thesis and Bilgel and Bayram (2010).



	Depression	Anxiety	Stress
Mean-Thesis	13.99	9.91	16.66
SD-Thesis	10.52	8.60	8.97
Mean-B&B(2010)	10.11	9.55	15.94
SD-B&B(2010)	7.80	6.47	7.51

Figure 6. Comparison of the DASS Results with Bilgel and Bayram (2010)

4.3 Participant Profile Results

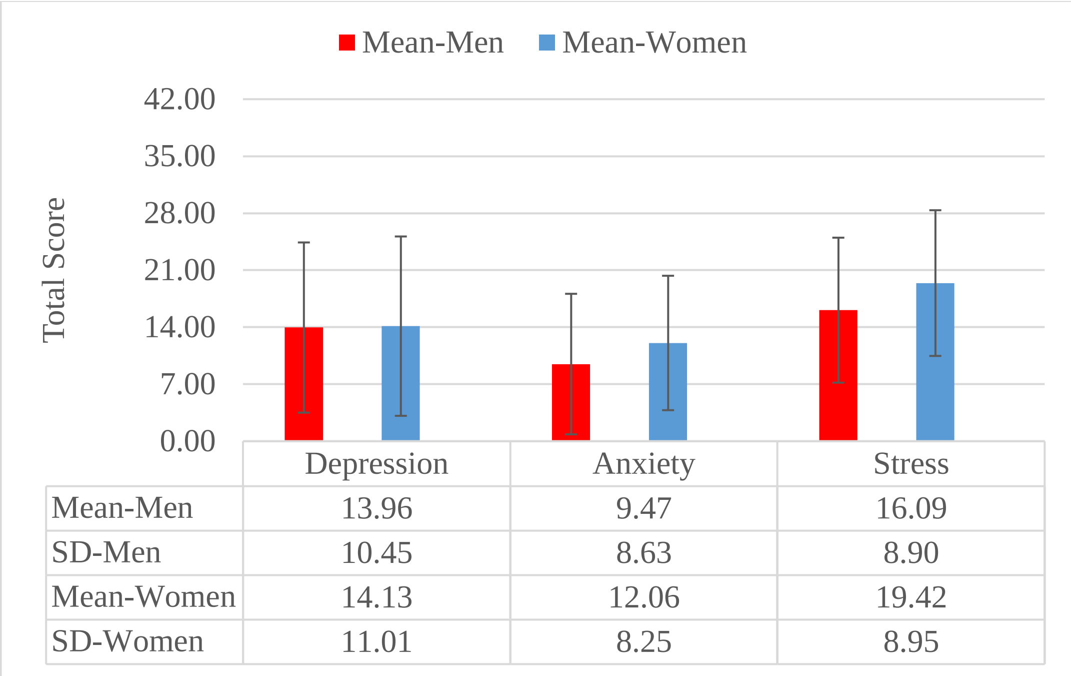
Results are categorized based on the participant profile. In this part, compared results will be presented. DASS 21 results will be compared. As mentioned earlier, the income question is skipped by a significant amount of respondents. Thus, the comparison is also not included here.

4.3.1 Results Based on the Gender of the Participants

A total of 182 people participated in this survey. The participants can be divided based on the gender as follows:

- Men = 151 participants (83.0%)
- Women = 31 participants (17.0%)

Figure 7 shows DASS 21 results for women and men separately.



	Depression	Anxiety	Stress
Mean-Men	13.96	9.47	16.09
SD-Men	10.45	8.63	8.90
Mean-Women	14.13	12.06	19.42
SD-Women	11.01	8.25	8.95

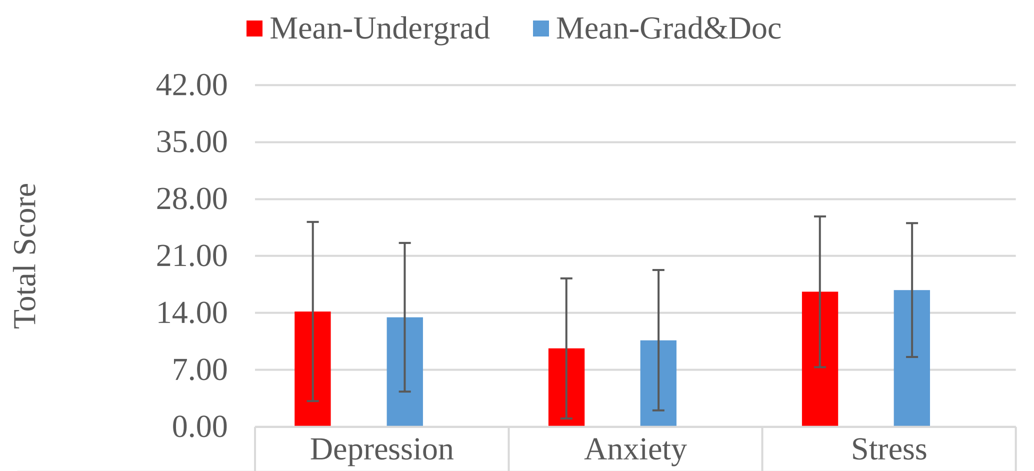
Figure 7. DASS 21 Results Based on Gender

4.3.2 Results Based on the Level of Education of the Participants

As mentioned in previous chapters, there are three options for this question. The distribution can be seen as follows:

- Undergraduate Level = 133 participants (73.1%)
- Graduate Level = 45 participants (24.7%)
- Doctorate Level = 4 participants (2.2%)

Since the participant quantity for doctorate-level education is too low, they are considered together with graduate levels. Comparison results can be seen in Figure 8.



	Depression	Anxiety	Stress
Mean-Undergrad	14.18	9.64	16.60
SD-Undergrad	11.01	8.61	9.26
Mean-Grad&Doc	13.47	10.65	16.82
SD-Grad&Doc	9.14	8.63	8.23

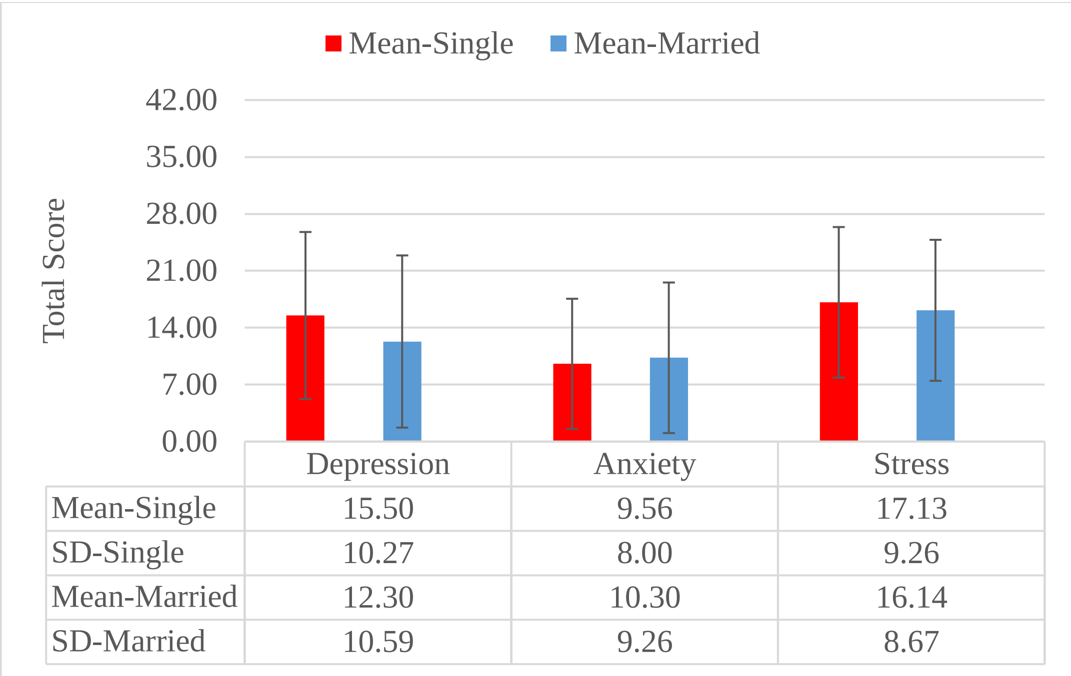
Figure 8. DASS 21 Results Based on Education

4.3.3 Results Based on the Marital Status of the Participants

Marital status is asked of the participants. Only married or single options are considered. Numbers can be seen below:

- Single = 96 participants (52.7%)
- Married = 86 participants (47.3%)

Almost equally distributed groups are formed. Figure 9 reveals the comparison between these two groups.



	Depression	Anxiety	Stress
Mean-Single	15.50	9.56	17.13
SD-Single	10.27	8.00	9.26
Mean-Married	12.30	10.30	16.14
SD-Married	10.59	9.26	8.67

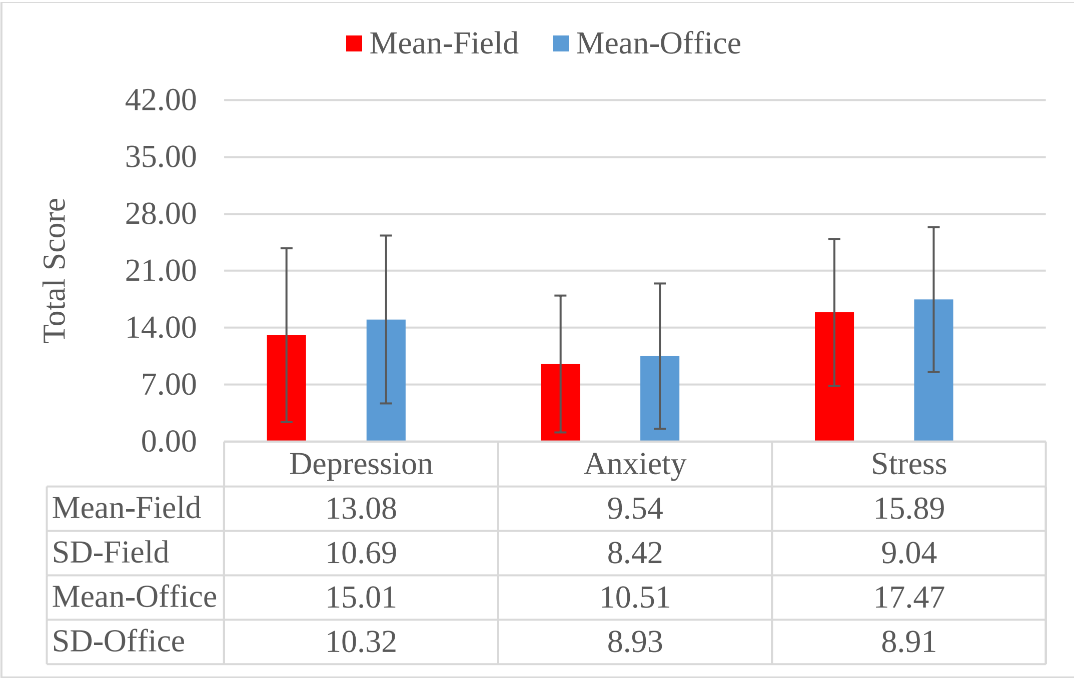
Figure 9. DASS 21 Results Based on Marital Status

4.3.4 Results Based on the Work Environment of the Participants

For this question, three answers are collected. The distribution based on the answer can be observed below:

- Field = 91 participants (50.0%)
- Office = 83 participants (45.6%)
- Field & Office = 8 participants (4.4%)

As mentioned before, there are some people who are working in the field and office simultaneously. The number of these participants is too low. Therefore, the results of these participants are omitted from this comparison. Figure 10 manifests the results for field and office civil engineers.



	Depression	Anxiety	Stress
Mean-Field	13.08	9.54	15.89
SD-Field	10.69	8.42	9.04
Mean-Office	15.01	10.51	17.47
SD-Office	10.32	8.93	8.91

Figure 10. DASS 21 Results Based on Work Environment

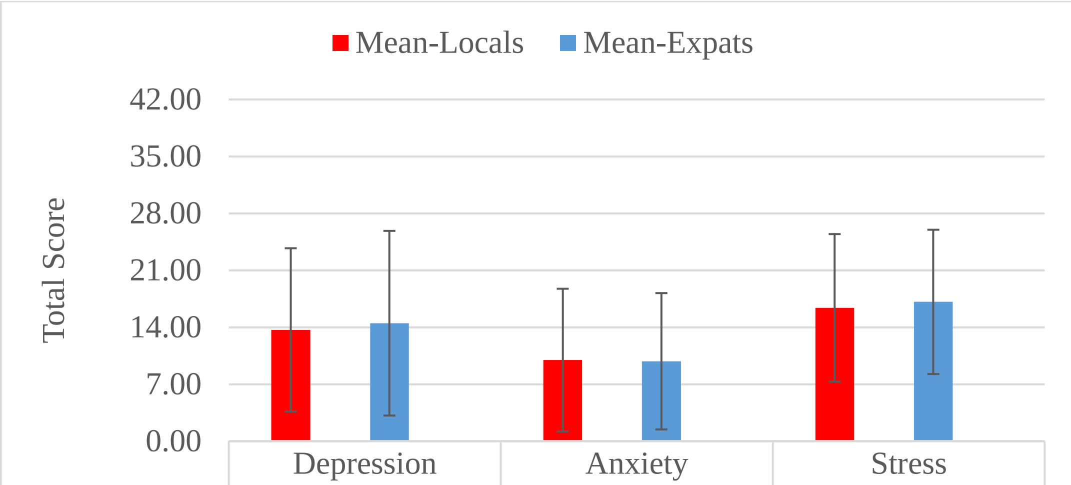
4.3.5 Results Based on the Country of the Participants

For this question, different country responses are collected. As expected, Turkey is the number one response. All countries are listed below:

- Turkey = 114 participants (62.6%)
- Serbia = 21 participants (11.5%)
- Russia = 20 participants (11.0%)
- Uzbekistan = 6 participants (3.3%)
- Kazakhstan = 5 participants (2.7%)
- Saudi Arabia = 3 participants (1.6%)
- Bahamas = 3 participants (1.6%)
- Egypt = 1 participant (0.5%)
- Georgia = 1 participant (0.5%)
- Germany = 1 participant (0.5%)
- Iraq = 1 participant (0.5%)

- Kenya = 1 participant (0.5%)
- Mexico = 1 participant (0.5%)
- Paraguay = 1 participant (0.5%)
- Oman = 1 participant (0.5%)
- Qatar = 1 participant (0.5%)
- Ukraine = 1 participant (0.5%)

In order to compare the results, participants are divided into two groups; expats and locals. In Figure 11, the results for these groups can be observed.



	Depression	Anxiety	Stress
Mean-Locals	13.68	9.96	16.39
SD-Locals	10.03	8.77	9.07
Mean-Expats	14.50	9.82	17.12
SD-Expats	11.34	8.38	8.87

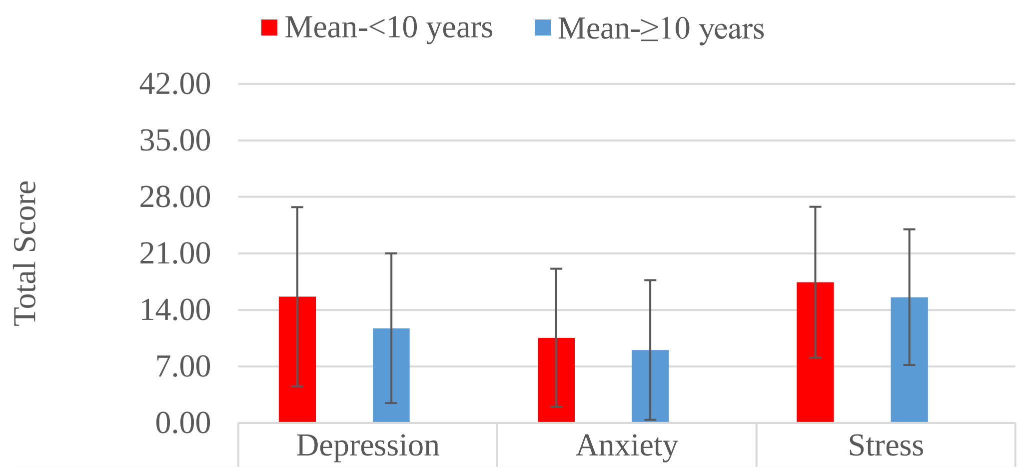
Figure 11. DASS 21 Results Based on Country

4.3.6 Results Based on the Years of Experience of the Participants

The average experience of the participants inside the sector is calculated as 9.64 years. Thus, ten years of experience is a good cutoff value for comparison. One group consists of participants who have less than ten years of experience. Others have ten years or more than ten years of experience. Distribution can be seen below:

- Less than 10 years = 105 participants (57.7%)
- 10 years and more than 10 years = 77 participants (42.3%)

Figure 12 shows the results for these two groups.



	Depression	Anxiety	Stress
Mean-<10 years	15.64	10.55	17.45
SD-<10 years	11.10	8.55	9.33
Mean-≥10 years	11.74	9.04	15.58
SD-≥10 years	9.28	8.65	8.41

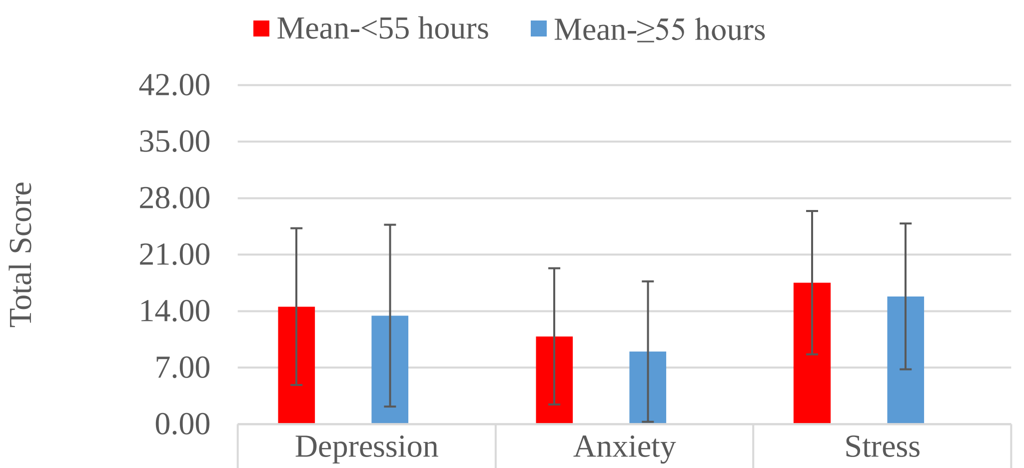
Figure 12. DASS 21 Results Based on Experience

4.3.7 Results Based on the Weekly Working Hours of the Participants

The average weekly working hours are calculated as 55.56 hours. The cutoff value is considered 55 hours. Two groups are formed:

- Less than 55 hours = 89 participants (48.9%)
- 55 hours and more than 55 hours = 93 participants (51.1%)

The results between these two groups can be observed in Figure 13.



	Depression	Anxiety	Stress
Mean-<55 hours	14.56	10.88	17.53
SD-<55 hours	9.71	8.44	8.88
Mean-≥55 hours	13.44	8.99	15.83
SD-≥55 hours	11.26	8.70	9.03

Figure 13. DASS 21 Results Based on Weekly Hours

CHAPTER 5

DISCUSSION OF RESULTS

In Chapter 4, the results are presented. In this chapter, discussions will be made to explain the findings in detail.

The first point should be made about the participant's gender profile. As expected, men outnumber women. When Sunindijo and Kamardeen (2017) conducted their study about gender diversity in the construction industry, they tried to even the numbers purposefully. In this study, women generate 17% of the total responses. This shows the construction industry is still a male-driven industry. Undergraduates also produced most of the respondents, also expected. People do not want to share their incomes, thus resulting in an unhealthy income average.

DASS results are the core of this study. This study used DASS 21 to shorten the time required to fill the form. There are three scales, with seven questions for each scale. In reliability analysis, the Anxiety Scale produced only acceptable reliability. This shortcoming could be prevented with DASS 42. Other scales do not show any problem in terms of reliability. In terms of results, more than 50% of respondents show at least mild symptoms for each scale. Results that can be considered normal with cutoff scores are less than 50% total results for each scale.

In Chapter 4, the results are compared with other studies to understand the final numbers. The first comparison is with Haynes and Love (2004). As can be seen in Figure 5, Turkish civil engineer DASS scores are nearly double the Australian counterparts for depression and anxiety. For stress, Turkish civil engineers still have high scores. In terms of sources of stress, responses are very similar to each other. Workload and long working hours seem to be sources of stress for both studies. Another study is from Turkey (Bilgel and Bayram 2010). This study is not for civil engineers or anyone from the construction industry. The reasoning for this comparison is to see the effect based on country. As mentioned in previous chapters, nearly all studies on mental health in the construction industry were conducted in developed countries. The lack of studies in developing or under-developed countries is the starting point of this thesis. Turkish university students are the participants in Bilgel and Bayram's (2010) study. Anxiety and stress results are very close to each other. The difference can be seen in depression results. Turkish civil engineers have more depression symptoms than university students.

Another important question inside the questionnaire is about stressors at work. As can be seen in Table 11, nearly half of the respondents complained about work overload. This response is similar to Haynes and Love's (2004) study, which shows work overload as the main source of stress. The second answer is about poor occupational climate. This answer is a combination of many answers, such as lack of planning and lack of communication. Organizational problems inside the construction company are another primary source of stress for employees. Stress caused by long working hours is another answer to this question. It is an expected answer since the average hourly working hours are too high. It is surprising to see low-income answer in fourth place. For example, Turkish civil engineers earn much less than their American counterparts. Table 2 shows the average American civil engineer income by year. In Chapter 4, the average income of the Turkish civil engineers from the questionnaire can be observed.

The last part of the questionnaire is about coping strategies. Table 12 shows all the responses to this question. The number one coping strategy is mental disengagement. Mental disengagement is a coping strategy that the person tries to take their mind off using various activities. Going to catch a movie or sleeping more than usual can be considered examples of mental disengagement, as explained in Chapter 4. The second strategy is all about family and friend support. Expats might have some issues finding family and friend support since they are working outside the country. Alcohol and drug disengagement is worrisome for the industry, which is the third coping strategy. This strategy will also deteriorate the physical health of the respondents with time, which shows the direct correlation between physical and mental health.

This thesis also compared the participants based on their profiles. The first comparison is about gender. Women and men have similar results in depression; however, women's anxiety and stress scores are higher than men's. This is a big problem for the construction industry. The construction industry should try to include the women workforce. An interesting observation can be made about the coping strategy based on gender. Nearly half of the women respondents seek social support from their families and friends. This rate is way less for men, nearly a quarter of respondents only. This shows the difference in how to deal with stress between men and women.

A comparison of the level of education results can be seen in Figure 8. DASS 21 results between undergraduates and others are close to each other, and no significant differences are observed.

The effect of marital status on mental health is illustrated in Figure 9. Depression scores are the main difference in this comparison. Single participants show more signs of depression. The working hours of both groups are similar. The difference is in years of experience. Married participants average approximately 14 years of experience. On the other hand, single participants average approximately 6 years of experience. For causes of work stress, married people point out increased work speed more than their single counterparts. For coping strategies, single people tend to use alcohol and drug disengagement more; 24 single participants answer in total.

The difference between field and office work environments can be observed in Figure 10. All scores are slightly high for the participants who work in the office. Hourly working hour differences for these groups affect the work stress. Mean working hours for field civil engineers and office civil engineers are 60 and 50 hours, respectively. The first two main work stress sources are the same for both groups. The third work stress source is low income for office civil engineers. On the other hand, field civil engineers suffer from long working hours, as expected.

The expat situation is investigated in Figure 13. There are slight differences between scores gathered from locals and expats, but none of these differences can be considered significant. There is a slight increase in depression and stress for expats. Similar to office-field comparison, weekly working hours are very different for these groups. Mean working hours for expats and locals are 65 and 50 hours, respectively. The work stress source is also similar to the office-field comparison. Expats suffer from long working hours; on the flip side, locals have to deal with low income.

Years of experience comparison is pretty similar to marital status comparison. As illustrated in Figure 12, young civil engineers are more depressed, stressed, and have more anxiety issues. In addition, young civil engineers tend to use alcohol and drugs more than experienced civil engineers to cope with the stress.

The last comparison is about weekly working hours. The results are similar to the office-field comparison for DASS 21. Low income-long working hours order difference for work stress can also be observed here. Engineers who work more than 55 hours per week complain about long working hours. The other group states that low income is a problem.

CHAPTER 6

CONCLUSION

Mental health is an integral part of a person's well-being. It is as important as the physical health of an individual. The construction industry has a reputation for its dangerous work environment where workers encounter accidents. Many types of research and precautions have been enabled in the past to correct this bad reputation. On the other hand, conditions can still be improved the mental health of the employees. Studies have been done in the past on mental health in the construction industry; however, these studies are implemented in developed countries. Developing countries should be investigated. The aim of this thesis is to be an addition to mental health research in developing or underdeveloped countries' construction sectors.

This thesis started with checking the previous research in the literature. There are some risk factors in the constructions that affect the individual's well-being. These factors were presented in the literature review. After that, some common disorders which are common inside the sector were given. These disorders can be named depression, generalized anxiety disorders (GAD), obsessive-compulsive disorders (OCD), substance use disorders (SUD), acrophobia, and claustrophobia. The impact of these disorders was investigated. Next, coping strategies to deal with work stress were investigated. At last, there are some used mental health assessment tools in the literature, and these were shared.

This study focused on civil engineers only; other employees inside the sector were omitted. In order to assess their mental health, a questionnaire was developed. The first part of the questionnaire was about the participant's profile. After that, questions regarding causes of work stress and coping strategies were inserted. In the last part of the questionnaire, a mental health assessment tool was used, Depression Anxiety Stress Scale (DASS).

The questionnaire was distributed via e-mail among large Turkish construction firms. In the end, 182 responses were collected. The DASS scores for depression, anxiety, and stress were calculated at 13.99, 9.91, and 16.66, respectively. Cutoff values showed that more than half participants showed mild symptoms at a minimum for each scale.

Participants' answers pointed out that the top three work stressors were work overload, poor occupational climate, and long working hours. To deal with these stressors, participants utilized mental disengagement, seeking social support from friends and families, and alcohol and drug disengagement. Tobacco usage is worrying, and this shows a direct correlation between mental health and physical health.

Two comparisons were presented in Chapter 4 to show how these results compared with the other studies. It is concluded that Turkish civil engineers show more symptoms of each scale compared to their Australian counterparts. Other than these comparisons, participants were divided into groups based on their profiles. The finding can be seen in Chapter 5.

These results indicate that the mental health of Turkish civil engineers is at risk. Proper countermeasures should be developed to prevent further deterioration of mental health. There are some straightforward recommendations such as limiting working hours, proper payment, and improving the work environment. Another recommendation is to employ psychologists inside the construction firms. Psychologists can help employees to overcome their problems in a proper way.

6.1 Limitations

There were some limitations to this study. The first limitation is participant quantity. The number of results could be improved in the following studies. As mentioned in Chapter 4, anxiety reliability for the DASS is at an acceptable level. This could have been improved using the long version of the DASS. DASS 42 has 14 questions for each scale. Improved reliability results will help to eliminate false responses. Increasing the participant quantity is the best way to achieve that.

Another limitation is the mental health assessment tool, DASS. An additional mental health assessment could have been used simultaneously to get a better understanding.

Measurements of depression, anxiety, and stress are done with the help of DASS. The limitation here is the source of stress. Stress can be generated from work or social life. This separation is not an easy task. Studies should be made to separate them.

Working hours are asked in the questionnaire. However, defining working hours for the expats can be challenging. Most of the time, expats are not allowed to to take a break during weekends. Instead, paid time offs are given together. For example, every six months, they will have two weeks of paid time off. This could be the reason why expats working hours are found high in the questionnaire.

6.2 Recommendations for Future Research

As mentioned earlier, studies are very limited on this topic, especially in developing or underdeveloped countries. For future research, other members of the construction industry should be included. Blue-collar workers' mental status should be investigated. In addition, civil engineers are not the only white-collar workers in the industry. Architects, electrical engineers, mechanical engineers, etc., should be a part of the following studies.

The questionnaire is applied online. Face-to-face interviews might help for a better understanding of the worker's mental health. This can be done in a scientific way, probably with the psychology department.

Comparisons are made with other studies. The date of the studies can be improved in the future. More recent studies should be included for comparison. Another point here is the ongoing pandemic that started in 2020. The effects of the pandemic on mental health are yet to be explored.

With the help of the DASS, this thesis investigated the depression, anxiety, and stress levels of the participants. However, these are not the only disorders that can be observed in the construction industry. Post-traumatic stress disorder (PTSD), Attention-Deficit Hyperactivity Disorder (ADHD), bipolar and related disorders, and schizophrenia can be given as examples that are not mentioned in Chapter 2 in a detailed manner. These disorders can be tricky to figure out, so a detailed study will be needed. Selecting a construction firm and conducting interviews inside the firm might result in detailed results. Again, this study will need help from psychology.

This thesis did not include some topics related to mental health, such as suicide. Since the topic is sensitive, a joint study with psychologists can be prepared. With the help of the psychology department, detailed investigations can be made.

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APPENDICES

A. The Questionnaire

Yüksek Lisans Tez Anketi

Bu anket formu Yüksek Lisans Tez Çalışmam ile ilgilidir. Anketin tamamlanması yaklaşık 5 dakika sürmektedir. Anket sadece çalışan mezun İnşaat Mühendisleri içindir. Tez çalışmamın nihai amacı, İnşaat Mühendisi meslektaşlarımın zihin sağlıkları hakkında fikir sahibi olmaktır. Anketten edilecek veriler sadece bilimsel amaçla kullanılacaktır. Anket anonim olarak doldurulacaktır, herhangi bir kimlik bilgisi paylaşmanıza gerek yoktur. Zamanınızı anketime ayırdığımız için şimdiden çok teşekkür ederim. Herhangi bir sorunuz ya da geri bildiriminiz varsa aşağıdaki mail adreslerinden bana ulaşabilirsiniz.

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* Gerekli

1. Cinsiyetiniz *

Yalnızca bir şıkkı işaretleyin.

- Erkek
- Kadın
- Diğer

2. Eğitim Durumunuz *

Yalnızca bir şıkkı işaretleyin.

- Lisans Mezunu
- Yüksek Lisans Mezunu
- Doktora Mezunu

3. Medeni Durumunuz *

Yalnızca bir şıkkı işaretleyin.

- Evli
- Bekar

4. Çalışma alanınız *

Yalnızca bir şıkkı işaretleyin.

- Ofis
- Şantiye
- Diğer: ____________________

5. Nerede çalışıyorsunuz? (Yurtdışı ise diğer kısmına açıklama olarak ülkeyi girebilirsiniz) *

Yalnızca bir şıkkı işaretleyin.

- Türkiye
- Diğer: ____________________

6. Kaç yıldır sektörde çalışıyorsunuz? (Sadece sayı olarak giriniz) *

____

7. Haftada yaklaşık kaç saat çalışıyorsunuz (Haftalık toplam saat, örnek: 45)? (Sadece sayı olarak giriniz) *

____

8. Aylık net geliriniz ne kadar? (Türk Lirası cinsinden sayı olarak giriniz, Örnek: 5000). Açıklamak istemiyorsanız bu soruyu geçebilirsiniz.

9. İş yerinizde sizi strese sokan nedenler sizce nelerdir? İstediğiniz kadar neden yazmakta serbestsiniz. Örnek Cevaplar: Yoğun iş yükü, iş yetiştirme baskısı, uzun iş saatleri, iş tanımının yetersizliği, üstlerle ya da çalışanlarla iletişim eksikliği, yetersiz maaş, takdir görmeme, ayrımcılık, iş güvensizliği, kötü çalışma koşulları vb.). Başka sebepler de yazabilirsiniz. *

10. İş yerinizde sizi yaşadığınız stresli durumlarla nasıl başa çıkmaya çalışıyorsunuz? Birden fazla cevap yazabilirsiniz. Örnek Cevaplar: arkadaşlarımdan/ailemden destek almaya çalışıyorum, durum yaşanmamış gibi yapıyorum, sigara/alkol vb. tüketiyorum, dikkatimi başka şeylerle dağıtmaya çalışıyorum, kendimi dine/ ruhani aktivitivelere adıyorum). Başka sebepler de yazabilirsiniz. *

DEPRESYON-ANKSİYETE-STRES SKALASI
Lütfen her bir ifadeyi bugün dâhil son bir haftayı dikkate alarak size ne kadar uygun olduğuna göre işaretleyiniz.
Her sorunun karşısında bulunan;

0 bana hiç uygun değil,
1 bana biraz uygun,
2 bana genellikle uygun,
3 bana tamamen uygun anlamına gelmektedir.

Doğru ya da yanlış cevap yoktur. Sorularda çok fazla vakit harcamayın.

11. 1 - Gevşeyip rahatlamakta zorluk çektim *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
◯	◯	◯	◯

12. 2 - Ağzımda kuruluk olduğunu farkettim *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
◯	◯	◯	◯

13. 3 - Hiç olumlu duygu yaşayamadığımı farkettim *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
◯	◯	◯	◯

14. 4 - Soluk almada zorluk çektim (örneğin fizik egzersiz yapmadığım halde aşırı hızlı nefes alma, nefessiz kalma gibi) *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
◯	◯	◯	◯

15. 5 - Bir iş yapmak için gerekli olan ilk adımı atmada zorlandım *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
◯	◯	◯	◯

16. 6 - Olaylara aşırı tepki vermeye meyilliyim *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
◯	◯	◯	◯

17. 7 - Vücudumda (örneğin ellerimde) titremeler oldu *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
◯	◯	◯	◯

18. **8 - Sinirsel enerjimi çok fazla kullandığımı hissettim** *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
⬭	⬭	⬭	⬭

19. **9 - Panikleyip kendimi aptal durumuna düşüreceğim durumlar nedeniyle endişelendim** *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
⬭	⬭	⬭	⬭

20. **10 - Hiçbir beklentimin olmadığı hissine kapıldım** *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
⬭	⬭	⬭	⬭

21. **11 - Kışkırtılmakta olduğumu hissettim** *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
⬭	⬭	⬭	⬭

22. **12 - Kendimi gevşetip salıvermek zor geldi** *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
⬭	⬭	⬭	⬭

23. **13 - Kendimi perişan ve hüzünlü hissettim** *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
⬭	⬭	⬭	⬭

24. **14 - Beni yaptığım işten alıkoyan şeylere dayanamıyordum** *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
⬭	⬭	⬭	⬭

25. **15 - Panik haline yakın olduğumu hissettim** *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
⬭	⬭	⬭	⬭

26. **16 - Hiçbir şey bende heyecan uyandırmıyordu** *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
◯	◯	◯	◯

27. **17 - Birey olarak değersiz olduğumu hissettim** *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
◯	◯	◯	◯

28. **18 - Alıngan olduğumu hissettim** *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
◯	◯	◯	◯

29. **19 - Fizik egzersiz söz konusu olmadığı halde kalbimin hareketlerini hissettim (kalp atışlarımın hızlandığını veya düzensizleştiğini hissettim)** *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
◯	◯	◯	◯

30. **20 - Geçerli bir neden olmadığı halde korktuğumu hissettim** *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
⬭	⬭	⬭	⬭

31. **21 - Hayatın değersiz olduğunu hissettim** *

Yalnızca bir şıkkı işaretleyin.

0	1	2	3
⬭	⬭	⬭	⬭

B. Stressors at Work Responses Based on Participant Profile

Men = 151 participants

Risk Factor	Number of Participants	%
Work overload/quantity of work	66	43.7%
Poor occupational climate (i.e., task autonomy, responsibility, authority)	58	38.4%
Hours worked per day (Excess of 60 h per week)	33	21.9%
Low income/financial insecurity	29	19.2%
Increased work speed/pressure	26	17.2%
Little social support from colleagues/immediate supervisors	26	17.2%
Poor working conditions	11	7.3%
Interpersonal conflict	10	6.6%
Work─home conflict/life imbalance (lack of time for family and other leisure due to work)	9	6.0%
Job insecurity (fear and uncertainty about the work)	6	4.0%
Workplace harassment/bullying	4	2.6%
Inability to further learning	2	1.3%
Overpromotion concerns	2	1.3%
Substance abuse	1	0.7%
Nature of work/mental demand	1	0.7%

Women = 31 participants

Risk Factor	Number of Participants	%
Work overload/quantity of work	15	45.5%
Poor occupational climate (i.e., task autonomy, responsibility, authority)	13	39.4%
Hours worked per day (Excess of 60 h per week)	10	30.3%
Low income/financial insecurity	9	27.3%
Increased work speed/pressure	5	15.2%
Little social support from colleagues/immediate supervisors	4	12.1%
Interpersonal conflict	4	12.1%
Work─home conflict/life imbalance (lack of time for family and other leisure due to work)	2	6.1%
Job insecurity (fear and uncertainty about the work)	2	6.1%
Poor working conditions	1	3.0%
Workplace harassment/bullying	1	3.0%
Substance abuse	1	3.0%

Undergraduate Level = 133 participants

Risk Factor	Number of Participants	%
Work overload/quantity of work	63	47.4%
Poor occupational climate (i.e., task autonomy, responsibility, authority)	51	38.3%
Hours worked per day (Excess of 60 h per week)	33	24.8%
Low income/financial insecurity	28	21.1%
Increased work speed/pressure	25	18.8%
Little social support from colleagues/immediate supervisors	22	16.5%
Interpersonal conflict	11	8.3%
Work─home conflict/life imbalance (lack of time for family and other leisure due to work)	10	7.5%
Poor working conditions	9	6.8%
Job insecurity (fear and uncertainty about the work)	5	3.8%
Workplace harassment/bullying	4	3.0%
Inability to further learning	2	1.5%
Substance abuse	2	1.5%
Overpromotion concerns	1	0.8%
Gender discrimination	1	0.8%
Nature of work/mental demand	1	0.8%

Graduate & Doctorate Level = 49 participants

Risk Factor	Number of Participants	%
Poor occupational climate (i.e., task autonomy, responsibility, authority)	20	15.0%
Work overload/quantity of work	18	13.5%
Hours worked per day (Excess of 60 h per week)	10	7.5%
Low income/financial insecurity	10	7.5%
Little social support from colleagues/immediate supervisors	8	6.0%
Increased work speed/pressure	6	4.5%
Interpersonal conflict	3	2.3%
Poor working conditions	3	2.3%
Job insecurity (fear and uncertainty about the work)	3	2.3%
Work–home conflict/life imbalance (lack of time for family and other leisure due to work)	1	0.8%
Workplace harassment/bullying	1	0.8%
Overpromotion concerns	1	0.8%
Gender discrimination	1	0.8%

Single = 96 participants

Risk Factor	Number of Participants	%
Work overload/quantity of work	47	49.0%
Poor occupational climate (i.e., task autonomy, responsibility, authority)	39	40.6%
Hours worked per day (Excess of 60 h per week)	27	28.1%
Low income/financial insecurity	22	22.9%
Little social support from colleagues/immediate supervisors	17	17.7%
Increased work speed/pressure	12	12.5%
Work–home conflict/life imbalance (lack of time for family and other leisure due to work)	10	10.4%
Poor working conditions	9	9.4%
Interpersonal conflict	7	7.3%
Job insecurity (fear and uncertainty about the work)	4	4.2%
Workplace harassment/bullying	3	3.1%
Inability to further learning	2	2.1%
Substance abuse	2	2.1%
Overpromotion concerns	1	1.0%
Gender discrimination	1	1.0%
Nature of work/mental demand	1	1.0%

Married = 86 participants

Risk Factor	Number of Participants	%
Work overload/quantity of work	34	39.5%
Poor occupational climate (i.e., task autonomy, responsibility, authority)	32	37.2%
Increased work speed/pressure	19	22.1%
Hours worked per day (Excess of 60 h per week)	16	18.6%
Low income/financial insecurity	16	18.6%
Little social support from colleagues/immediate supervisors	13	15.1%
Interpersonal conflict	7	8.1%
Job insecurity (fear and uncertainty about the work)	4	4.7%
Poor working conditions	3	3.5%
Workplace harassment/bullying	2	2.3%
Work─home conflict/life imbalance (lack of time for family and other leisure due to work)	1	1.2%
Overpromotion concerns	1	1.2%
Gender discrimination	1	1.2%

Field = 91 participants

Risk Factor	Number of Participants	%
Work overload/quantity of work	41	45.1%
Poor occupational climate (i.e., task autonomy, responsibility, authority)	35	38.5%
Hours worked per day (Excess of 60 h per week)	27	29.7%
Increased work speed/pressure	23	25.3%
Low income/financial insecurity	16	17.6%
Little social support from colleagues/immediate supervisors	14	15.4%
Interpersonal conflict	8	8.8%
Poor working conditions	7	7.7%
Work─home conflict/life imbalance (lack of time for family and other leisure due to work)	7	7.7%
Job insecurity (fear and uncertainty about the work)	4	4.4%
Workplace harassment/bullying	1	1.1%
Overpromotion concerns	1	1.1%
Substance abuse	1	1.1%
Nature of work/mental demand	1	1.1%

Office = 83 participants

Risk Factor	Number of Participants	%
Work overload/quantity of work	39	47.0%
Poor occupational climate (i.e., task autonomy, responsibility, authority)	32	38.6%
Low income/financial insecurity	21	25.3%
Little social support from colleagues/immediate supervisors	16	19.3%
Hours worked per day (Excess of 60 h per week)	14	16.9%
Increased work speed/pressure	7	8.4%
Interpersonal conflict	6	7.2%
Poor working conditions	4	4.8%
Work─home conflict/life imbalance (lack of time for family and other leisure due to work)	4	4.8%
Job insecurity (fear and uncertainty about the work)	4	4.8%
Workplace harassment/bullying	4	4.8%
Inability to further learning	2	2.4%
Gender discrimination	2	2.4%
Overpromotion concerns	1	1.2%
Substance abuse	1	1.2%

Locals = 114 participants

Risk Factor	Number of Participants	%
Work overload/quantity of work	46	40.4%
Poor occupational climate (i.e., task autonomy, responsibility, authority)	42	36.8%
Low income/financial insecurity	30	26.3%
Hours worked per day (Excess of 60 h per week)	21	18.4%
Little social support from colleagues/immediate supervisors	20	17.5%
Increased work speed/pressure	14	12.3%
Interpersonal conflict	9	7.9%
Poor working conditions	5	4.4%
Job insecurity (fear and uncertainty about the work)	5	4.4%
Workplace harassment/bullying	4	3.5%
Substance abuse	2	1.8%
Work–home conflict/life imbalance (lack of time for family and other leisure due to work)	1	0.9%
Inability to further learning	1	0.9%
Overpromotion concerns	1	0.9%
Gender discrimination	1	0.9%
Nature of work/mental demand	1	0.9%

Expats = 68 participants

Risk Factor	Number of Participants	%
Work overload/quantity of work	35	51.5%
Poor occupational climate (i.e., task autonomy, responsibility, authority)	29	42.6%
Hours worked per day (Excess of 60 h per week)	22	32.4%
Increased work speed/pressure	17	25.0%
Little social support from colleagues/immediate supervisors	10	14.7%
Work–home conflict/life imbalance (lack of time for family and other leisure due to work)	10	14.7%
Low income/financial insecurity	8	11.8%
Poor working conditions	7	10.3%
Interpersonal conflict	5	7.4%
Job insecurity (fear and uncertainty about the work)	3	4.4%
Workplace harassment/bullying	1	1.5%
Inability to further learning	1	1.5%
Overpromotion concerns	1	1.5%
Gender discrimination	1	1.5%

Years of experience less than 10 years = 105 participants

Risk Factor	Number of Participants	%
Work overload/quantity of work	55	52.4%
Poor occupational climate (i.e., task autonomy, responsibility, authority)	41	39.0%
Hours worked per day (Excess of 60 h per week)	35	33.3%
Low income/financial insecurity	28	26.7%
Little social support from colleagues/immediate supervisors	20	19.0%
Increased work speed/pressure	14	13.3%
Work—home conflict/life imbalance (lack of time for family and other leisure due to work)	10	9.5%
Interpersonal conflict	9	8.6%
Poor working conditions	8	7.6%
Job insecurity (fear and uncertainty about the work)	6	5.7%
Workplace harassment/bullying	2	1.9%
Inability to further learning	2	1.9%
Substance abuse	2	1.9%
Gender discrimination	1	1.0%
Nature of work/mental demand	1	1.0%

Years of experience 10 years and more = 77 participants

Risk Factor	Number of Participants	%
Poor occupational climate (i.e., task autonomy, responsibility, authority)	30	39.0%
Work overload/quantity of work	26	33.8%
Increased work speed/pressure	17	22.1%
Low income/financial insecurity	10	13.0%
Little social support from colleagues/immediate supervisors	10	13.0%
Hours worked per day (Excess of 60 h per week)	8	10.4%
Interpersonal conflict	5	6.5%
Poor working conditions	4	5.2%
Workplace harassment/bullying	3	3.9%
Job insecurity (fear and uncertainty about the work)	2	2.6%
Overpromotion concerns	2	2.6%
Work─home conflict/life imbalance (lack of time for family and other leisure due to work)	1	1.3%
Gender discrimination	1	1.3%

Weekly working hours less than 55 hours = 89 participants

Risk Factor	Number of Participants	%
Work overload/quantity of work	37	41.6%
Poor occupational climate (i.e., task autonomy, responsibility, authority)	35	39.3%
Low income/financial insecurity	22	24.7%
Little social support from colleagues/immediate supervisors	17	19.1%
Hours worked per day (Excess of 60 h per week)	12	13.5%
Interpersonal conflict	6	6.7%
Increased work speed/pressure	5	5.6%
Workplace harassment/bullying	5	5.6%
Poor working conditions	4	4.5%
Job insecurity (fear and uncertainty about the work)	4	4.5%
Substance abuse	2	2.2%
Work–home conflict/life imbalance (lack of time for family and other leisure due to work)	1	1.1%
Inability to further learning	1	1.1%
Overpromotion concerns	1	1.1%
Gender discrimination	1	1.1%

Weekly working hours 55 hours and more than 55 hours = 93 participants

Risk Factor	Number of Participants	%
Work overload/quantity of work	42	45.2%
Poor occupational climate (i.e., task autonomy, responsibility, authority)	32	34.4%
Hours worked per day (Excess of 60 h per week)	29	31.2%
Increased work speed/pressure	24	25.8%
Low income/financial insecurity	15	16.1%
Little social support from colleagues/immediate supervisors	11	11.8%
Work─home conflict/life imbalance (lack of time for family and other leisure due to work)	10	10.8%
Interpersonal conflict	8	8.6%
Poor working conditions	7	7.5%
Job insecurity (fear and uncertainty about the work)	3	3.2%
Inability to further learning	1	1.1%
Overpromotion concerns	1	1.1%
Gender discrimination	1	1.1%
Nature of work/mental demand	1	1.1%

C. Coping Strategies Responses Based on Participant Profile

Men = 151 participants

Coping Strategy	Number of Participants	%
Mental disengagement	45	29.8%
Seeking social support for emotional reasons	38	25.2%
Alcohol and drug disengagement	31	20.5%
Denial	10	6.6%
Seeking social support for instrumental reasons	8	5.3%
Positive reinterpretation & growth	8	5.3%
Active coping	7	4.6%
Acceptance	7	4.6%
Behavioral disengagement	7	4.6%
Planning	3	2.0%
Restraint coping	3	2.0%
Turning to religion	3	2.0%
Suppression of competing activities	3	2.0%

Women = 31 participants

Coping Strategy	Number of Participants	%
Seeking social support for emotional reasons	15	48.4%
Mental disengagement	10	32.3%
Behavioral disengagement	7	22.6%
Alcohol and drug disengagement	4	12.9%
Seeking social support for instrumental reasons	3	9.7%
Positive reinterpretation & growth	2	6.5%
Denial	1	3.2%
Active coping	1	3.2%
Acceptance	1	3.2%
Planning	1	3.2%
Restraint coping	1	3.2%
Turning to religion	1	3.2%
Focus on & venting of emotions	1	3.2%

Undergraduate Level = 133 participants

Coping Strategy	Number of Participants	%
Seeking social support for emotional reasons	41	30.8%
Mental disengagement	39	29.3%
Alcohol and drug disengagement	26	19.5%
Seeking social support for instrumental reasons	8	6.0%
Denial	8	6.0%
Positive reinterpretation & growth	8	6.0%
Active coping	6	4.5%
Acceptance	5	3.8%
Behavioral disengagement	5	3.8%
Restraint coping	3	2.3%
Turning to religion	3	2.3%
Suppression of competing activities	3	2.3%
Planning	2	1.5%
Focus on & venting of emotions	1	0.8%

Graduate & Doctorate Level = 49 participants

Coping Strategy	Number of Participants	%
Mental disengagement	16	32.7%
Seeking social support for emotional reasons	12	24.5%
Alcohol and drug disengagement	9	18.4%
Seeking social support for instrumental reasons	3	6.1%
Denial	3	6.1%
Acceptance	3	6.1%
Positive reinterpretation & growth	2	4.1%
Active coping	2	4.1%
Behavioral disengagement	2	4.1%
Planning	2	4.1%
Restraint coping	1	2.0%
Turning to religion	1	2.0%

Single = 96 participants

Coping Strategy	Number of Participants	%
Mental disengagement	28	29.2%
Seeking social support for emotional reasons	27	28.1%
Alcohol and drug disengagement	24	25.0%
Seeking social support for instrumental reasons	7	7.3%
Positive reinterpretation & growth	6	6.3%
Active coping	6	6.3%
Behavioral disengagement	5	5.2%
Denial	3	3.1%
Acceptance	2	2.1%
Restraint coping	2	2.1%
Suppression of competing activities	2	2.1%
Planning	1	1.0%
Turning to religion	1	1.0%
Focus on & venting of emotions	1	1.0%

Married = 86 participants

Coping Strategy	Number of Participants	%
Mental disengagement	27	31.4%
Seeking social support for emotional reasons	26	30.2%
Alcohol and drug disengagement	11	12.8%
Denial	8	9.3%
Acceptance	6	7.0%
Seeking social support for instrumental reasons	4	4.7%
Positive reinterpretation & growth	4	4.7%
Planning	3	3.5%
Turning to religion	3	3.5%
Active coping	2	2.3%
Behavioral disengagement	2	2.3%
Restraint coping	2	2.3%
Suppression of competing activities	1	1.2%

Field = 91 participants

Coping Strategy	Number of Participants	%
Seeking social support for emotional reasons	29	31.9%
Mental disengagement	24	26.4%
Alcohol and drug disengagement	14	15.4%
Positive reinterpretation & growth	7	7.7%
Seeking social support for instrumental reasons	6	6.6%
Denial	6	6.6%
Acceptance	6	6.6%
Active coping	5	5.5%
Behavioral disengagement	4	4.4%
Restraint coping	2	2.2%
Turning to religion	2	2.2%
Planning	1	1.1%

Office = 83 participants

Coping Strategy	Number of Participants	%
Mental disengagement	28	33.7%
Seeking social support for emotional reasons	22	26.5%
Alcohol and drug disengagement	20	24.1%
Seeking social support for instrumental reasons	5	6.0%
Denial	4	4.8%
Active coping	3	3.6%
Behavioral disengagement	3	3.6%
Planning	3	3.6%
Suppression of competing activities	3	3.6%
Positive reinterpretation & growth	2	2.4%
Acceptance	2	2.4%
Restraint coping	2	2.4%
Turning to religion	1	1.2%
Focus on & venting of emotions	1	1.2%

Locals = 114 participants

Coping Strategy	Number of Participants	%
Mental disengagement	32	28.1%
Seeking social support for emotional reasons	32	28.1%
Alcohol and drug disengagement	23	20.2%
Seeking social support for instrumental reasons	7	6.1%
Denial	7	6.1%
Acceptance	7	6.1%
Active coping	6	5.3%
Positive reinterpretation & growth	4	3.5%
Behavioral disengagement	3	2.6%
Planning	3	2.6%
Restraint coping	3	2.6%
Turning to religion	2	1.8%
Suppression of competing activities	2	1.8%
Focus on & venting of emotions	1	0.9%

Expats = 68 participants

Coping Strategy	Number of Participants	%
Mental disengagement	23	20.2%
Seeking social support for emotional reasons	21	18.4%
Alcohol and drug disengagement	12	10.5%
Positive reinterpretation & growth	6	5.3%
Seeking social support for instrumental reasons	4	3.5%
Denial	4	3.5%
Behavioral disengagement	4	3.5%
Active coping	2	1.8%
Turning to religion	2	1.8%
Acceptance	1	0.9%
Planning	1	0.9%
Restraint coping	1	0.9%
Suppression of competing activities	1	0.9%

Years of experience less than 10 years = 105 participants

Coping Strategy	Number of Participants	%
Seeking social support for emotional reasons	36	34.3%
Mental disengagement	29	27.6%
Alcohol and drug disengagement	24	22.9%
Seeking social support for instrumental reasons	7	6.7%
Positive reinterpretation & growth	6	5.7%
Active coping	5	4.8%
Behavioral disengagement	5	4.8%
Denial	4	3.8%
Acceptance	4	3.8%
Planning	3	2.9%
Turning to religion	3	2.9%
Restraint coping	2	1.9%
Suppression of competing activities	2	1.9%
Focus on & venting of emotions	1	1.0%

Years of experience 10 years and more = 77 participants

Coping Strategy	Number of Participants	%
Mental disengagement	26	33.8%
Seeking social support for emotional reasons	17	22.1%
Alcohol and drug disengagement	11	14.3%
Denial	7	9.1%
Seeking social support for instrumental reasons	4	5.2%
Positive reinterpretation & growth	4	5.2%
Acceptance	4	5.2%
Active coping	3	3.9%
Behavioral disengagement	2	2.6%
Restraint coping	2	2.6%
Planning	1	1.3%
Turning to religion	1	1.3%
Suppression of competing activities	1	1.3%

Weekly working hours less than 55 hours = 89 participants

Coping Strategy	Number of Participants	%
Seeking social support for emotional reasons	24	27.0%
Mental disengagement	23	25.8%
Alcohol and drug disengagement	20	22.5%
Seeking social support for instrumental reasons	8	9.0%
Denial	6	6.7%
Active coping	6	6.7%
Acceptance	5	5.6%
Positive reinterpretation & growth	4	4.5%
Behavioral disengagement	3	3.4%
Planning	2	2.2%
Restraint coping	2	2.2%
Suppression of competing activities	2	2.2%
Turning to religion	1	1.1%
Focus on & venting of emotions	1	1.1%

Weekly working hours 55 hours and more than 55 hours = 93 participants

Coping Strategy	Number of Participants	%
Mental disengagement	31	33.3%
Seeking social support for emotional reasons	26	28.0%
Alcohol and drug disengagement	13	14.0%
Positive reinterpretation & growth	6	6.5%
Denial	5	5.4%
Behavioral disengagement	4	4.3%
Seeking social support for instrumental reasons	3	3.2%
Acceptance	3	3.2%
Turning to religion	3	3.2%
Active coping	2	2.2%
Planning	2	2.2%
Restraint coping	2	2.2%
Suppression of competing activities	1	1.1%