IBN HALDUN UNIVERSITY
SCHOOL OF GRADUATE STUDIES
DEPARTMENT OF AIR TRANSPORT MANAGEMENT

MASTER THESIS

FACTORS CONTRIBUTING TO THE RISK OF AIRLINE PILOT AND CREW FATIGUE

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THESIS SUPERVISOR

PROF. ÜMİT HACIOĞLU

ISTANBUL, 2021

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by

ENGİN ÖZEL

A thesis submitted to the School of Graduate Studies in partial fulfillment of the requirements for the degree of Master of Science in Air Transport Management

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APPROVAL PAGE

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science in Air Transport Management.

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This is to confirm that this thesis complies with all the standards set by the School of Graduate Studies of Ibn Haldun University

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ACADEMIC HONESTY ATTESTATION

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

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ÖZ

HAVA TAŞIMACILIĞINDA PİLOT VE KABİN EKİBİ YORGUNLUĞUNA NEDEN OLAN RİSKLER VE FAKTÖRLER

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Uçuş ve yer ekiplerinin "yorgun" olduğu söylemi havacılığa aşina olmayan bazı kişiler tarafından hafife alınmaktadır. Her profesyonel grubun kendi stresi ve yorgunluğu vardır ve ciddiye alınmalıdır; ancak uçuş ekiplerinin stres ve yorgunluğuna verdiğimiz önem, uçak kazalarında ana aktör olabilmeleri için kritik noktalarda olmalarıdır. Yorgunluk kavramı genellikle kas ağrıları, güç kaybı ve yoğun fiziksel aktiviteden kaynaklanan düşük performans ile eşleştirilir. Bu durum "Yorulmak" ve "Tükenmek" sözcüklerine uymaktadır. Ancak "Yorgunluk" kavramı içerisinde yorgunluk ve tükenmişlikten daha önemli olan zihinsel ve psikolojik yorgunluk unsurları da bulunmaktadır. Bu unsurların açık ve örtük sonuçları; dikkatsizlik, unutkanlık, zamanlama ve karar verme hataları, tahammülsüzlük, sinirlilik, vb. olmaktadır. Bir pilotun veya uçuş görevlisinin vücudu yeterince dinlenmemiş, uyuyamamış ve beyninin tazelenememiş olması durumunda güvenli bir iş yapması beklenemez. Yorgunluk, sürekli faaliyetler, yetersiz dinlenme, uykusuzluk ve düzensiz çalışmanın sonucudur. Yorgunluğun bilinen sonuçları tepki süresinin yavaşlaması, ayrıntılara olan ilginin azalması, problem çözmede güçlük, kişisel enerji ve motivasyon eksikliği, iletişim sorunları ve görevini gerektirdiği şekilde yerine getirememedir.

Anahtar Kelimeler: Yorgunluk, Kronik Yorgunluk, Pilot, Kabin Ekibi, Ekip, Stres

ABSTRACT

FACTORS CONTRIBUTING TO THE RISK OF AIRLINE PILOT AND CABIN CREW FATIGUE

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The rhetoric that flight and ground crews are "tired" is taken lightly by some people unfamiliar with aviation. Every professional group has its own stress and fatigue and should be taken seriously; However, the importance we attach to the stress and fatigue of flight crews is that they are at critical points so that they can be the main actors in flight accidents. The concept of fatigue is often equated with muscle aches, loss of strength and decreased performance resulting from intense physical activity. This situation fits with the words "Tiredness" and "Exhaustion". However, within the concept of "Fatigue", there are also mental and psychological fatigue elements that are more important than fatigue and burnout. Their explicit and implicit consequences; carelessness, forgetfulness, timing and decision-making mistakes, intolerance, irritability, etc. A pilot or flight attendant cannot be expected to do a safe job if his/her body has not rested sufficiently, has not been able to get sleep and refresh his/her brain. Fatigue is the result of constant activities, insufficient rest, lack of sleep, and irregular work. The known consequences of fatigue are slowing down of reaction time, reduced attention and attention to details, difficulty in solving problems, lack of personal energy and motivation, communication problems, and inability to perform as required by the task.

Keywords: Fatigue, Chronic Fatigue, Pilot, Flight Attendant, Crew, Stress

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LIST OF SYMBOLS AND ABBREVIATIONS

ATC	Air Traffic Control
BAC	Blood Alcohol Concentration
FAA	Federal Aviation Administration
FRMS	Fatigue Risk Management System
FRT	Fatigue Risk Trajectory
HEA	Heightened Emotional Activity
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
MBI	Maslach Burnout Inventory
NANDA	North American Diagnosis Association
NASA	National Aero Space Agency
PVT	Psychomotor Vigilance Task load
Q	Question
REM	Rapid Eye Movement
WHO	World Health Organization

CHAPTER I

INTRODUCTION

When employees start to have negative and destructive thoughts about their job, the institution they work for, and their private lives, they should be able to comment that something is wrong with a skeptical attitude. In this case, before it is too late, he should be able to realize whether the source of this is individual or organizational and should determine the style of struggle accordingly. Persons who want to be a cockpit and cabin crew should set attainable and realistic targets by knowing the working conditions and hours, the wages, communication skills and abilities with people well. Otherwise, they may experience burnout to the extent that their sense of personal accomplishment decreases. Employees who are in face-to-face relationships with people in a busy working tempo are often exposed to emotional exhaustion, so it may be beneficial for them to get away from this environment physically for a while, in a way, to isolate themselves and rest. During the flight operation, many negativities that can trigger exhausting, wearing, stressful and burnout can be encountered, such as trying to cope with problematic passengers, ensuring the safety of passengers in an emergency, flying for long periods in various time zones or serving a wide variety of people with cultural differences. In order to minimize their impact, it is useful to have a perspective that will evaluate them positively as much as possible. There have been researchers investigating the relationship between job satisfaction and burnout. Both concepts stem from the emotional responses of employees(Bendak & Rashid, 2020). A service employee who has a feeling of burnout has a hard time communicating and dealing with passengers at work. This situation, which has a negative effect on efficiency and profitability, will be to the detriment of the company. In addition, the energy and performance of the employees are reduced. In companies that reduce the level of burnout by taking preventive measures, the job satisfaction of the employees will increase and positive results will be obtained. Long flights, jetlag caused by local time differences, and frequently changing flight schedules affect the cabin crew as well as the cockpit crew. Cabin crews, who have been separated from their families and friends for a long time and suffer from a lack of social life, face especially

physiological disorders and mental fatigue(Cabon et al., 2012). Over time, this situation can lead to family conflicts, family conflicts, tension and work stress, and tension and work stress can cause burnout syndrome in a short time. As a result of the burnout suffered by cabin crews, nervousness, unnecessary and violent discussions, depression and related health problems may occur in the workplace. Therefore, organizational success, which is vital for the business, is also seriously reduced(Boksem et al., 2006).

This research was carried out by adopting a "positivist" approach, with an "instant" method in terms of the time it covers and a "descriptive" method in terms of its purpose. The "survey" method was used to obtain the data. The target population of the research is the cockpit and cabin crews of the scheduled and non-scheduled airlines operating in the Turkish civil aviation sector. For the reasons stated under the scope and limitations of the research, the cockpit and cabin attendants of the airline companies that are not named as the research sample, but that perform scheduled and non-scheduled domestic and international passenger transportation flights. Although the number of cockpit and cabin attendants working in the companies is tens of thousands, 254 people answered the questionnaire. A total of 48 questions consisting of the Minnesota job satisfaction questionnaire, Maslach burnout questionnaire and demographic information questions were applied to the cockpit and cabin crews forming the sample.

CHAPTER II

LITERATURE REVIEW

Although the sustainability of the activities depends on the decisions taken by the top management of the company, the effective and efficient implementation of these decisions can only be possible with the well-motivated qualified employees who have adopted the company goals and have high organizational commitment and job satisfaction. As in all businesses, it is always expected that the employees are well-educated, professionally experienced, skilled, idealistic and dynamic people who care about the quality in their work, in the success of an airline business. The transportation service offered by airline transportation by combining speed and comfort has started to be more attractive to people whose expectations for life satisfaction and whose income level has increased compared to previous years. The law that introduced liberalization in the airline transportation sector in the United States in 1978 also affected Europe and Turkey, causing new airline companies to enter the sector, and the number of flight frequencies and networks to increase; therefore, it has created an intense competitive environment. In the meantime, technological innovations that make communication between people easier, faster and more comfortable have increased and continue to increase service quality expectations by increasing the interaction of passengers who prefer airline in their travels(Dawson et al., 2011).

The air transport sector, where there is fierce competition on both domestic and international lines, is a service-oriented sector by its very nature. The most important duty of airline companies should be the successful and healthy management of human resources, which is the most fundamental factor that can ensure the desired quality and sustainability of service delivery. During the flight operation, the cabin crew on board plays the most effective role on passengers in evaluating the service quality and therefore the company's success. Employees at the frontline do the delivery of the final service to the customer face to face. Unfortunately, these employees often encounter situations that are stressful and require special effort in the service sector. For example,

while dealing with customers who are constantly waiting to be served, they may encounter customers who verbally taunt them to an insulting degree, and yet are expected not to compromise on politeness. In addition, they must be able to communicate with customers and constantly smile while providing services. A profession that requires full control of their emotions and managing them well, cabin crewing is a profession that combines long flights that cause mental and physical fatigue and low duty initiative, and can easily lead to emotional exhaustion(Phillips et al., 2017). This emotional exhaustion situation may cause the personnel turnover rate to be very high due to the fact that this job is at irregular hours and its unique characteristics, although there are many applications to become a flight attendant. In Turkey, although it is not possible to reach clear and precise information due to the airline companies' refusal to provide information about their personnel, the results of the research conducted on personnel in other foreign airlines around the world support this. When flight attendants working in airline companies with scheduled and intense flight activity, they may stay away from regular social relations both in their workplace and in their private lives when they work in companies that operate non-scheduled (charter) flights. This situation can cause them to feel detached from life, and when combined with mental and physical fatigue, they become extremely sensitive and stressed.

It cannot be denied that flight safety, which is a must at every stage of air transportation activities, offers a sustainable competitive advantage. However, one of the elements that airline companies cannot give up in order to achieve this goal is the quality of service provided to passengers. For this reason, the mental, psychological and physical health of the personnel serving the passengers face to face is the most important factor that determines the quality of the service to be provided to the passengers. Cabin and cockpit crews make an effort to please passengers with different cultures, personalities, religions, languages and other demographic variables by providing them with good service every day. Apart from these duties, important responsibilities such as preparing, calming, directing, reminding the passengers of their movement, and applying safe evacuation procedures when necessary increase their workload. This extraordinary and self-sacrificing job can lead to physiological and psychological fatigue, mental wear, depression and, in more advanced stages, burnout in cabin crews over time. Cabin and cockpit crews are different from other service workers in terms

of the characteristics of the place they work and the work they do. Because in an area with limited mobility, they often have to deal with problematic passengers and at the same time feel the pressure of strict rules of flight safety. They undergo special training to establish healthy emotional interactions with the passengers they serve. In most country where educational opportunities are unfair and finding a job is getting more and more difficult, the difference in individual abilities restricts the job alternative and thus makes it difficult to transition to different professions, which can force those in this situation to remain as cabin and cockpit crew. This naturally increases social life, future expectations and career plan concerns, thus creating a relationship with burnout syndrome. Some flight attendants who are exposed to fatigue prefer to leave their jobs, but most of them continue to stay in this job due to the reasons mentioned above, however, they cannot show sufficient and quality service delivery performance. In recent years, with the increase in the number and frequency of flights, and the effect of long-term and night flights, the working conditions of cabin and cockpit crews have become more difficult. The high quality and quantity of requests and expectations of the company management from cabin crews negatively affect the perceived workload and stress level. This situation can lead to physical and emotional fatigue, which leads to emotional exhaustion, which is at the core of burnout. Therefore, the body's defense mechanism can push cabin and cockpit crews to insensitivity.

Cabin and cockpit crews may need longer than other employees to recover from the effects of time differences and fatigue caused by jet lag. As a result, this situation may cause the personnel qualified in the airline industry to experience burnout and leave their jobs. Studies indicate that job satisfaction plays a key role in increasing the performance of cabin crews and decreasing personnel turnover rates(Castro et al., 2015).

The decrease or exhaustion of the dignity, earnings, status and social support elements that are very important for the employees creates stress(Dorrian et al., 2012). Cabin crews, whose dedication and good service are expected, can easily lose the mentioned factors with their stressful workload and tend to quit the job due to emotional exhaustion and then job dissatisfaction(Efthymiou et al., 2021). Although the topic is crucial, the causes and consequences of job satisfaction in the airline industry have been little addressed. Emotional work in the service sector can be stressful and push

the person to burnout. Burnout affects the attitudes and behaviors of cabin crews and therefore their choice of the same airline again depending on the satisfaction of the passengers. (Plieger et al., 2015)showed that being aware of burnout can positively contribute to a person's health and well-being.

There have been researchers investigating the relationship between job satisfaction and burnout. Both concepts stem from the emotional responses of employees(The European Road Safety Observatory (ERSO), 2018). A service employee who has a feeling of burnout has a hard time communicating and dealing with passengers at work. This situation, which has a negative effect on efficiency and profitability, will be to the detriment of the company. In addition, the energy and performance of the employees are reduced. In companies that reduce the level of burnout by taking preventive measures, the job satisfaction of the employees will increase and positive results will be obtained(FAA, 2007). Long flights, jetlag caused by local time differences, and frequently changing flight schedules affect the cabin crew as well as the cockpit crew. Cabin crews, who have been separated from their families and friends for a long time and suffer from a lack of social life, face especially physiological disorders and mental fatigue. Over time, this situation can lead to family conflicts, family conflicts, tension and work stress, and tension and work stress can cause burnout syndrome in a short time. As a result of the burnout suffered by cabin crews, nervousness, unnecessary and violent discussions, depression and related health problems may occur in the workplace(Gawron, 2016). Therefore, organizational success, which is vital for the business, is also seriously reduced.

Unfortunately, there has been very limited number of studies on stress, burnout and fatigue syndrome in cabin crews, who have a high risk level due to their nature, operate on a 24-hour basis, require great responsibilities especially in emergencies and perform a stressful job in close contact with people.

As a result of the developments and needs in the 21st century, the necessity of continuing the transportation sector activities on a 24/7 basis has emerged worldwide. This necessity has affected the aviation industry as well as in other branches of the sector and fatigue has emerged as one of the most important factors. Fatigue has been recorded as an important factor in many cases in the civil aviation industry. The

literature review of cockpit and cabin crew fatigue factors includes information from experimental studies, scientific publications, articles, manuals and survey reports. Unfortunately, we should accept that flight crew fatigue literature has certain limits. Most experimental studies were not conducted with cockpit and cabin crew or conducted only with cockpit crew. Several studies have proved that fatigue can significantly impair people's ability to perform duties and tasks that requires manual dexterity, high concentration and complex thinking. Fatigue is not only an uncomfortable sensation to be suffered because fatigue reduces peoples' performance. Fatigue is a nonspecific symptom because it can be an indicator of many illnesses or diseases, medical conditions and physiological disorders. For example; sleep deprivation, autoimmune illnesses, anxiety and major depression(Greenberg, 2002). Also consuming excessive caffeine and alcohol, psychosocial stressors and frequent sleep disorder may cause fatigue. Health identified by the 'World Health Organization' (WHO) as; purely physical, mental and social well-being and the absence of illness or weakness. The factors that negatively affect the health of people are medical and disease states. Medical conditions and illness condition causes fatigue. The effects are don't only depend on for medical conditions or the nature of the disease, but on the type of work performed(Hartley, 1998). For example, a person with a problem of Anemia constantly complains of tiredness. This condition shows that Anemia disease increases the fatigue of people and decrease work performance of people. Some unnoticed psychological problems, chronic hormonal disorders such as fatigue syndrome, vitamin deficiencies, hypothyroidism, viral upper respiratory tract infections, anemias and some rheumatologic diseases can increase stress or cause work stress. The common cold flu, which is a small disease, delays the response time and effects your coordination. The common cold flu also effects people's performance efficiency.

Adverse working conditions while causing weaken the person's performance and periodic fatigue; bad health status of people causes long-term fatigue. Long-term fatigue of the person concerned with cognitive performance and health. Health has an impact on people's performance(Hartzler, 2014). Health problems cause performance decreases, motivation decreases and their concentration deterioration. Other factors that affect fatigue are the age of the person and the fit of his body. Changes depending on the age of the person; less sleep than need, high blood pressure, poor visual

perception, worsening of physical condition, medication increases in usage cause decrease in performance of people.

Fatigue is a common problem at all transportation sectors including aviation. It is a known fact that fatigue is the most important factor which causes accidents. For this reason, it's important to conduct researches on the causes and occurrence rates of fatigue. The reasons for the occurrence of plane crashes are based on many reasons, however it was determined that fatigue is one of the most important factors which causes plane crashes(FAA, 2010a). There is no accepted universal definition of fatigue. Fatigue; is a complex and subjective concept which is extreme energy loss as a result of physical exertion or lack of sleep. The definition of fatigue is defined in the Medical Dictionary in three different ways. First fatigue in definition; exhaustion after strenuous physical activity. In another definition, fatigue; it is a situation where the responsiveness of tissues ready to give is reduced. (Like a muscle contraction in response to a motor neuron). Another definition of fatigue; it is an emotional state, manifested by exposure to excessive and prolonged psychological pressure. Fatigue accepted as a nursing diagnosis by the North American Diagnosis Association (NANDA) in 1988. NANDA describes fatigue as; continuous fatigue that doesn't go away with rest, reduces physical and mental work capacity (Plieger et al., 2015).

According to the FAA, fatigue can be defined as a condition which is usually accompanied by tiredness and a feeling of weariness, characterized by lessened capacity for work and increased discomfort (FAA, 2007). According to the ICAO, fatigue impairs crew members' ability to maintain their ability to safe fly an aircraft or to perform safety-related duties (ICAO, 2016). Fatigue causes to a physiological condition due to biological sleep clock patterns or workload and causes a decrease in mental or physical performance ability.

Fatigue has been classified in various ways. But among them the most common classification is between acute and chronic fatigue. Although acute fatigue is seen as temporary fatigue, it occurs as a result of physical or mental exertion. Acute fatigue limit varies from person to person and when enough rest is achieved, fatigue disappears. Chronic fatigue is not about straining oneself. It is a type of fatigue that continuing for more than 6 months and usually accompanied by a chronic disease

(Englebienne & DeMeirleir, 2002). It is obvious that a variety of sources can develop fatigue. The main issue is the negative impact of fatigue on a person's task performing ability. Daily long mental concentration such as getting prepared for an exam or writing an important report can be as fatiguing as manual labor(Australian Civil Aviation Safety Authority, 2012). Studies about fatigue proved that fatigue may significantly impair a person's ability to perform tasks which require high concentration, complex thinking, and even manual dexterity. Fatigue may become in a short time after some significant heavy and long physical or mental activity. As an alternative, fatigue may happen after several days or weeks(IATA, 2014). The recent situation typically happens when someone does not get sufficient sleep over a prolonged period for reasons such as having a baby at home, frequent long travels, sleep disorders such as insomnia or sleep apnea, and shift work. Ongoing physical / mental effort with insufficient rest may often involve by personal demands or workload(Dai et al., 2020).

A distinction needs to be made between chronic fatigue and acute fatigue(Johnston et al., 2019). Acute fatigue is time-limited, usually with a good rest or adequate sleep fatigue is reduced. Chronic fatigue does not decrease with rest or sleep. Chronic fatigue is an unpleasant situation, the person can't get rid of feeling excessive tiredness and exhaustion for a long time. While acute fatigue takes on protective function, chronic fatigue creates a feeling of running away and inadequacy (Maslach et al., 2001). Chronic fatigue leaves profound negative effects on their abilities to perform the activities and roles of patients that add value and meaning to their lives. (Opal Arilla Mclnnis, 2011) studied with a hundred twenty-two subjects about the connection between chronic fatigue syndrome and fibromyalgia. Author found that; subjects living with chronic fatigue syndrome and fibromyalgia impact their well-being by high level of depression.

In our study, human error-based accidents are reported due to fatigue as an important factor in the occurrence of aircraft accidents in the aviation industry. Fatigue and the effects of fatigue are inevitable if preventive measures are not taken(Goode, 2003).

2.1. Theoretical Background

Burnout, known as one of the important phenomena of modern times, was first used in America in the 1970s to express the professional crisis experienced by people working in customer service. However, the British Writer Graham Greene published in 1961, "A Burn-Out Case", which tells about an architect who suffered a mental breakdown and was disappointed and escaped to the African forests, was also included in his novel, defined as "the exhaustion of idealism with great weariness and devotion to one's work". Burnout was previously expressed as a "social problem" by social critics before it was not an important study subject by researchers(Maslach et al., 1996). Burnout as an academic concept was first included in the article "Staff Burn-Out" written by the German psychologist Herbert J. Freudenberger in 1974. This article provides information on what burnout is, its physiological and behavioral symptoms, who are more susceptible, how to prevent burnout and how to deal with burnout, and how to help someone who is exposed to this condition. Freudenberger (1974) expressed the definition of burnout in its simplest form as “fatigue and failure as a result of exhaustion of energy, power or resources due to excessive demands” in the article in question, and stated that this situation varies from person to person and started to show itself especially about a year after starting work. Looking at the above definitions, Freudenberger describes burnout as a condition that can happen to every professional group; Maslach and Jackson described it as a disadvantage that can be encountered in jobs that require one-on-one communication with people. Studies on burnout are mostly focused on human services, health and education sector where the human factor is at the forefront. However, burnout is a negativity that can occur in all other sectors and professions. Hence, Maslach, Jackson, and Leiter rearranged the definition of burnout in 1996, focusing more on human-work relationships than on interpersonal relationships.

There are different definitions of burnout that vary according to the interests and perspectives of researchers in the academic field. Social psychologist Christina Maslach, one of the first names that come to mind about burnout, says that burnout is “physical exhaustion, prolonged fatigue, helplessness, hopelessness and a sense of uselessness seen in those who work in professions that require face-to-face interaction

with people and it is an emotional, mental and physical condition that includes negative attitudes towards other people(Maslach et al., 2001).

Pines (2003) defines burnout as the physical, emotional and spiritual exhaustion of people who start to work with great ambitions and cannot achieve the success they want.

The authors define burnout as "a state of physical, emotional, and mental exhaustion that occurs as a result of long-term situations that require emotional effort." Here, "physical exhaustion" means low energy, chronic fatigue and weakness; "Emotional exhaustion" means feelings of helplessness, despair, trapped; "Mental exhaustion" refers to the state of developing negative attitudes towards self, work and life itself.
As can be seen, many different definitions have been made to the concept of burnout in academic literature depending on different perspectives and approaches. Although this situation makes the subject multidimensional, there are some common points in most definitions. The most obvious issues that are commonly accepted; It is seen in idealistic professionals working in service businesses or in environments where emotional effects are experienced more. It is mentioned in many definitions that burnout is a process that expresses emotional, mental and physical fatigue and develops insidiously over time(Laub et al., 2020). Studies conducted on various occupational groups reveal that employees become insensitive to problems in the work environment, withdraw themselves and spend less and less time on their jobs. It has been observed that the employees' tendencies such as not coming to work, being late and getting reports, in addition to encountering health problems, have increased. The impact of all these problems on work quality and productivity is undeniable. Burnout emerges as a social problem that starts with the harm of the individual in the center, affects the social environment accordingly, causes financial damages such as productivity and quality for the organization and also in the social dimension(Englebienne & DeMeirleir, 2002).

In the first studies, interview and observation method was generally used, especially in the 1980s, survey studies measuring the level of burnout were started. In these years, more research has begun to be done thanks to the clearer understanding of the importance of the subject in the scientific world and the developed scales. During this

period, Maslach Burnout Inventory (MBI) was developed by Maslach and Jackson, which is still widely used today. This inventory contains items that are only defined for professional interactions with other people. Some later studies focused on burnout dimensions in a broader framework. For example, the feeling of exhaustion that emerges without pointing to other people as the source of one's exhaustion, cynicism, which indicates a generally distant or unrelated attitude towards work without relation to other people, and professional self-efficacy, which includes both social and other aspects of work success, are other factors that emerge in this context(Maslach et al., 1996).

The second trend in burnout studies is the research on the concept of work engagement, which indicates the opposite of burnout. In this framework, the sense of attachment, which consists of the sub-dimensions of being energetic, devotion and assimilation, shows a situation that shows positivity and satisfaction about work in an organizational context. In this context; The concept of job attachment is seen as a positive reflection of the concept of burnout(Englebienne & DeMeirleir, 2002).

The effects of organizational factors on burnout led to the creation of various research models. Thanks to these models, the factors that cause burnout are better understood; The effect of employee interaction with the work environment on burnout has been revealed more clearly.

There are many models that introduces burnout/fatigue in the literature. Meier, Perlman and Hartman, Cherniss and Maslach Burnout Models are the most discussed models.

2.1.1. Meier Model

Meier Model means that; the positive reinforcer expectations about the job are very low and the punishment expectations are very high. According to this model, personal competence to have low expectations of being able to control existing reinforcers, to do the necessary behaviors to control reinforcers and the pressure of punishment develops burnout syndrome(Le et al., 2018). The three dimensions of this model are:

i. Lack of controllable life expectancy

The employee faces hopelessness especially in situations where the employee avoid punishment. Personal behaviors and performances are no longer important because both punishment and reward will be recognized through external forces.

ii. High expectation or low reward of punishment

Related to the employees' past experiences about their job leads them to burnout because they have high expectation of punishment or low expectation of reward.

iii. Lack of sense of personal competence

The employee's lack of personal skills in exhibiting the behaviors which necessary for control causes burnout.

2.1.2. Pearlman and Hartman Model

Perlman and Hartman (1982) tried to create a concept of burnout based on a synthesis and content analysis of the definitions made in the process until they came to them. According to this, burnout is "a response to chronic emotional stress and consists of three components. Perlman and Hartman's (1982) model has a cognitive or perceptual focus that interprets personal variables and the individual's environment. According to this model, the three dimensions of burnout reflect the three basic symptom categories of stress. These are:

i. Physiological dimension (physical exhaustion) focusing on physical symptoms

This is a stage that shows which situation is causing stress. There are two major factors that cause stress; First, the skills and abilities of the individual, which may not be sufficient to meet perceived or real organizational demands. Second, an individual's job may not meet his own expectations, needs, and values. In short, the degree of stress determines the degree of incompatibility between the individual and the organizational variables.

ii. Emotional-cognitive dimension (emotional exhaustion) that focuses on attitudes and emotions (Perceived Stress Level)

Many situations that causes stress do not result in a person perceiving themselves under stress. The transition from the first to the second stage depends on the variables of the role and organization, the personalities of the individuals and their "backround" characteristics.

iii. The behavioral dimension that focuses on symptomatic behaviors (Response)

This stage includes 3 main response categories given in response to stress. Personal and organizational variables determine which of the physiological, cognitive and behavioral symptoms will appear. At this stage, burnout is caused by chronic emotional stress. As a result of burnout, job satisfaction or a change in work level may occur. A deterioration in psychological and physiological health may occur. The individual may quit work or be fired.

The model is quite extensive and includes almost all the variables considered in burnout studies(Naeeri et al., 2019). According to this model, the characteristics of the individual, work environment and social environment are very effective in coping with burnout. The model has four stages. There are four stages in the burnout model of Perlman and Hartman (1982): "the degree of stress caused by the situation, the perceived stress level, the response to stress and the result of the reaction to stress".

2.1.3. Cherniss Model

Cherniss described burnout as "the sickness of devotion". According to the Cherniss model, burnout is a process that spreads over time, begins as a response to the stresses experienced in the workplace and results in emotional dismissal. In Cherniss's (1989) research on the service sector; Inconsistencies in employees' roles in the workplace can lead to burnout. According to this model; Some characteristics of the work environment affect the factors that cause stress, leading to behavioral changes in employees. This model also revealed that role ambiguity and complexity affect burnout. According to Cherniss, burnout syndrome is caused by the inconsistency in the roles of employees in the service sector. The person who realizes that he / she is experiencing burnout first tries to eliminate the source of stress. If he fails to do this, he will resort to methods of coping with stress. If he is not successful in this step, he tries to cut his psychological connection with the job in order to relieve his emotional burden. The work environment both activates sources of stress and causes attitude changes. Individuals try to cope with the resulting stress sources in different ways.

2.1.4. Edelwich and Brodsky Model

People who start the business world with great enthusiasm and hope usually have certain ideals for the beginning of their working life and for their business careers. Employees who are enthusiastic, enthusiastic and dynamically recruited begin to lose their enthusiasm, enthusiasm, dynamism and efficiency over time when they cannot find the working environment and conditions they expect(Deveci & Demirel, 2018). Some of the reasons that push them to this negativity can be listed as workload, long working hours, low wages and staying far from their ideal goals. When he starts to think that he will not be able to reach his initial goals, his goals begin to change. These employees, whose point of view to their work and future are changing, enter into a process that leads to burnout and consists of certain stages. Edelwich and Brodsky (1980) argued that burnout passes through successive and determinable stages, and that it occurs at the end of a process, and they often explain these stages that come to mind when the "Development Process of Burnout" is called "idealistic enthusiasm, stagnation, frustration and apathy":

i. Idealistic Enthusiasm

This stage, which can also be called as enthusiasm, enthusiasm or enthusiasm and commitment to the profession, is generally seen in individuals who have just started working life; It is the stage where there is excess energy, high expectations and hopes, and a strong motivation to achieve the goals in the chosen profession.

ii. Stagnation

At this stage, the individual is no longer able to show the effort he has shown towards his job in the first stage, as a result of which his energy level decreases, his motivation decreases, he experiences disappointments about his job-related expectations and the result of this is getting colder from his job. At this stage, the individual's interest is much more than his ideals. He turned to non-work activities such as making money, living better, and making better use of his free time.

iii. Frustration

As time passes, the employee starts to think that he is being blocked in order to achieve his professional goals. Frustration; It takes place in two ways: preventing the employee by failing to meet the needs of the people he / she serves, and the employee sacrificing his / her own needs in order to satisfy the needs of the people he / she serves. As time

passes, the individual who thinks that his efforts to be successful are insufficient begins to question whether he can continue his profession at this stage.

iv. Apathy

They are typical symptoms of apathy, expressed as "a natural defense mechanism used against frustration" and reflected in every aspect of the relationship of the service provider with the people they serve. Emotional detachment occurs in the form of loss of beliefs, despair, coming to work late, shortening the meetings with the service providers, giving up everything, mechanization and preserving routines

2.1.5. Maslach Model

Although Maslach was not the first researcher to introduce burnout into the literature, she made great contributions to the subject and collected her research in a work published in 1982 called "Burnout: The Cost of Caring". At the same time, she developed the Maslach Burnout Inventory, which was also used as a data collection tool in this study, with Jackson in 1986. The Maslach burnout model is known as the "multidimensional burnout model" or "three-dimensional burnout model" in the literature. According to this model, burnout; It has been expressed as a syndrome in which individuals feel emotionally exhausted, insensitive to the people they encounter due to their jobs, and a decrease in their personal sense of accomplishment in professions where people work face to face. According to Maslach, burnout is a constant response to chronic emotional and interpersonal stressors related to the job and is defined in three dimensions as emotional exhaustion, depersonalization and low personal accomplishment(Maslach et al., 1996). These dimensions, in a sense, express the changes that take place in the life of the individual experiencing burnout. According to this; the individual experiences chronic fatigue; he is relieved of his job, withdrawn into his own shell, and increasingly feeling incapable of his job(Maslach et al., 2001).

i. Emotional Exhaustion

Considered as a process, emotional exhaustion can be considered as the first phase of burnout. At this stage, the individual faces emotional wear. Emotional exhaustion, which occurs due to the frustration and stress experienced by the individual who

interacts with the organization, gaining strong impressions that their expectations are not met, may deepen if no measures are taken. Emotional exhaustion is the first reaction to the stress of job demands and changes. This dimension of burnout is mostly seen in professionals who have intense and face-to-face relationships with people. In emotional exhaustion, the first dimension of burnout, people both experience emotional and physical fatigue. They feel like they are out of energy and cannot get out of this negative situation(Maslach et al., 1996). Emotional demands of other people who are served or have a mutual relationship with can create stress. When this situation is continuous, employees cannot find the energy to deal with other people and projects. Employees who experience burnout syndrome face the most emotional exhaustion among the three sub-dimensions of burnout. However, the fact that the emotional exhaustion dimension is a basic and necessary criterion for burnout does not mean that it will be sufficient alone in making the diagnosis of burnout. Focusing only on the individual burnout dimension of burnout means losing the holistic view of this syndrome.

ii. Depersonalization

The depersonalization component represents the interpersonal dimension of burnout. Desensitization refers to negative, rigid attitudes towards customers and unresponsiveness to work(Maslach et al., 2001). According to Maslach, the depersonalization dimension constitutes the most serious dimension of burnout. In the dimension of depersonalization, people try to keep other people away from themselves, display indifferent attitudes and even hostile behaviors as much as possible, tend to react negatively to events and people. Desensitization, defined as "displaying a harsh, cold, indifferent, and even un-humanly negative attitude towards those served" is a result of a significant decrease in idealism for work. In this dimension, negative changes are observed especially in the attitudes towards people served in the workplace(O'Hagan et al., 2018). A desensitized service employee begins to treat customers as an item or an insignificant entity, rather than as a human being. Employees in this situation have a distant and careless attitude towards the business they work with as well as to the customers. Other signs of depersonalization include using rude language without courtesy in their discourse, and approaching the people they serve in different non-standard ways(Boksem et al., 2006). In today's world where the importance of customer satisfaction is getting more and more looser

and the competition ground is getting looser, businesses operating in the service sector should adopt more understanding, constructive and motivating policies in their approach towards their employees. Because for an employee who becomes insensitive, business profit and customer satisfaction are the concepts that lose their importance. It should not be forgotten that an employee who starts to lose interest in his colleagues, business environment and environment will not only have a profit but also a loss.

iii. Reduced Personal Accomplishment

Personal success is defined as overcoming your problem successfully and finding yourself competent. Personal failure is perceiving oneself as inadequate and unsuccessful at work. As a result of negative thoughts about other people, the individual also develops negative thoughts about himself. Feelings of guilt, unloved and failure can reduce self-esteem and depress the person(Maslach, 2003). When a person feels inadequate, a great deficiency occurs. He thinks he can't handle anything. According to these people, everything they have accomplished is too pointless and too small. When they lose their self-confidence, other people also lose their trust in them. Later, the person starts to think that he / she is inadequate and unsuccessful in his job and that no one in the workplace likes him and does not respect his work. These thoughts seem so convincing and real to them that the person begins to lose self-esteem(Plieger et al., 2015). These negative thoughts experienced in the inner world of the person grow and become an even more corrosive and impossible psychological pressure to fight. All these things significantly reduce the capacity, desire to work, effort and creativity of people.

2.2. Conceptual Background of Fatigue

The concept of fatigue has been attracted the attention of various science from the times of World War I to the present day. First initial researches on fatigue were in the industrial field and the effects of fatigue on productivity are discussed. George Poore developed a framework for fatigue, separating between general/local and chronic/acute fatigue in 1881(Noy et al., 2011). Afterwards researches of fatigue investigated physiological and anatomical pathways. Various authors have been described fatigue as a moral and physical problem which results a breakdown of a mind and body causing to a complete exhaustion. Fatigue researches were especially

performed on war pilots during World War II. These studies are focused on determining pilot's fatigue. The research has continued for many years (Maslach et al., 2001).

American Neurologist Beard identified fatigue with the word of "neurasthenia" in the late 19th century. The word 'neurasthenia' is a disease refers to many physical and psychological complaints. This disease appears in the literature in various ways. While it is used chronic fatigue syndrome as neurasthenia in American medical literature it is used as Asthenia in Europe (Brezonakova, 2017). The words exhaustion and weakness are often used to mean fatigue. Cella and friends have identified fatigue as weakness, lack of energy and exhaustion (Torres-Harding & Jason, 2018). Fatigue is a reality of the life cycle in normal life or it is a reaction that occurs as a result of activities or effort. Exhaustion is extreme fatigue. Olson suggested as a meaning that "fatigue is an unadaptable response to exhaustion. Ream and Richardson defined exhaustion as a temporary decrease in strength and energy (Englebienne & DeMeirleir, 2002). However, it is thought to be fatigue is chronic and relentless. Weakness has been described as a neurological disorder which prevents individuals from performing their duties. People can do their activities on their own when they are tired, but they cannot do if they are weak (Maslach et al., 1996).

Fatigue is an experience of physical or mental weariness that results in reduced alertness. For most people, the major cause of fatigue is having insufficient rest and recovery from previous activities. In a simple term, fatigue mainly results from insufficient quantity or quality of sleep because both factors mean equal importance to recover from fatigue and to maintain normal alertness and performance(Nelson, 1997). An insufficient quantity or quality sleep series of nights causes a sleep debt which results as increased fatigue.

As can be seen from the analysis made, the word of exhaustion and weakness have different characteristics and should not be used as a substitute for fatigue. There are some differences and similar points between these two subject. There are several up-to-date studies listed below about fatigue.

Table 2. 1. Several Up-To-Date Studies

Author	Subject	Contribution
Van Drongelen et al., 2017	Risk factors for fatigue among airline pilots	The aim of this study is to determine fatigue risk factors for pilots in aviation
Reis et al., 2016	Sleep complaints and fatigue of airline pilots	The aim of this study is to determine sleep complaints prevalence and evaluate the influence of sociodemographic parameters variables on sleep complaints and fatigue
Phillips et al., 2017	Fatigue in transport: a review of exposure, risks, checks and controls	The aim of this study is to review fatigue-related risk, exposure factors and control measures for transportation operators
Honn et al., 2016	Fatiguing effect of multiple take-offs and landings in regional airline operations	The aim of this study is to establish scientifically a connection between circadian rhyme and the number of flight sectors effect to fatigue
Australian Civil Aviation Safety Authority, 2012	Fatigue Management Strategies for Aviation Workers: A Training & Development Workbook	The aim of this study is to improve aviation safety through the management of Fatigue-related risks in aviation industry
Kandera et al., 2019	Consequences of flight crew fatigue on the safety of civil aviation	The aim of this study is to find an objective way to measure fatigue through sleep which is a component of fatigue
ICAO, 2016	Doc 9966. Manual for the Oversight of Fatigue Management Approaches	This manual is one in a suite of manuals which related to fatigue management.

Source: Fictitious data, for illustration purposes only

2.2.1. Fatigue Risk Management System (FRMS)

The theoretical foundation of this study is based on the Fatigue Risk Management System. The International Civil Aviation Organization (ICAO) published an amendment to Annex 6 Operation of Aircraft, Part 1, Section 4 Flight Operations and Appendix 8 FRMS requirements. A science-based approach to duty and flight time limits (FTL) has been introduced in this amendment. FRMS is a management system for airlines to use in particular operations to lessen the effects of fatigue(Cabon et al., 2012). FRMS is a kind of data-driven system that based on operational knowledge and scientific principles. Aviation companies can monitor and manage safety risks with

FRMS. It can help to determine the fatigue-related errors, potential risks associated with fatigue, chronic sources of fatigue(FAA, 2005). The FRMS is a recurring performance improvement process to maintain continuous and effective safety improvements by identifying fatigue factors and changing operational / physiological conditions across time. The aim of the FRMS is to monitor, manage and lessen the effects of fatigue to improve cockpit and cabin crew members' alertness and minimize performance errors. The FRMS should be designed to reach a truthful balance between productivity and safety.

If the company build it on valid scientific principles FRMS will be an effective fatigue mitigation strategy. When an FRMS guided by information which is provided by scientific studies of fatigue it combines continuous and systematic analysis, operational data collection and schedule assessment for reactive and proactive fatigue mitigations(ICAO, 2016). There are four useful tools for an FRMS to be more effective. These are application of fatigue lessen procedures, fatigue data, management and identification of fatigue elements and fatigue analysis methodology(Goode, 2003). Application of Fatigue lessen procedures is a part of collaborative management process which includes all employees. Fatigue data is difficult to detect because there is no obvious biomarker or plain test for fatigue. A secret volunteer reporting system and no punitive reporting system allows employees to report subjective fatigue(Roach et al., 2012). These subjective reports contain valuable data and this reporting system is necessary as part of overall safety system to encourage the reporting of fatigue-related events. Management and identification of fatigue elements are the factors that aviation companies must manage to minimize risk of fatigue such as crew duty periods, schedule changes and layover timings. Fatigue analysis methodology is to monitor, manage and lessen operational risk by using a science-based fatigue model(FAA, 2005).

FRMS is a living system which gives a visualization to the aviation companies about detecting, adapting and taking specific actions to fatigue impact on their operations. FRMS process is a very sensitive process and it must be handled and evaluated very carefully. FRMS process divided into four general repeating steps:

i. Measure and Assess Current Conditions

This is the first step for measuring and assessing the associated level of fatigue risk with current operations and schedules. It is critical for the development of a valid fatigue mitigation plan to collect information from crew reports about fatigue-related incidents and errors.

ii. Modeling and Analysis of Fatigue Risk

This is the second step to understand the root cause of fatigue. Scientific principles are aided by computer modeling to determine significant performance changes due to fatigue.

iii. Manage and Mitigate Fatigue Risk

It requires all the information, measuring and analyses from last two steps to develop solutions to the fatigue-causing factors.

iv. Assessment and Feedback

This step is necessary and important for continuous improvement(ICAO, 2016).

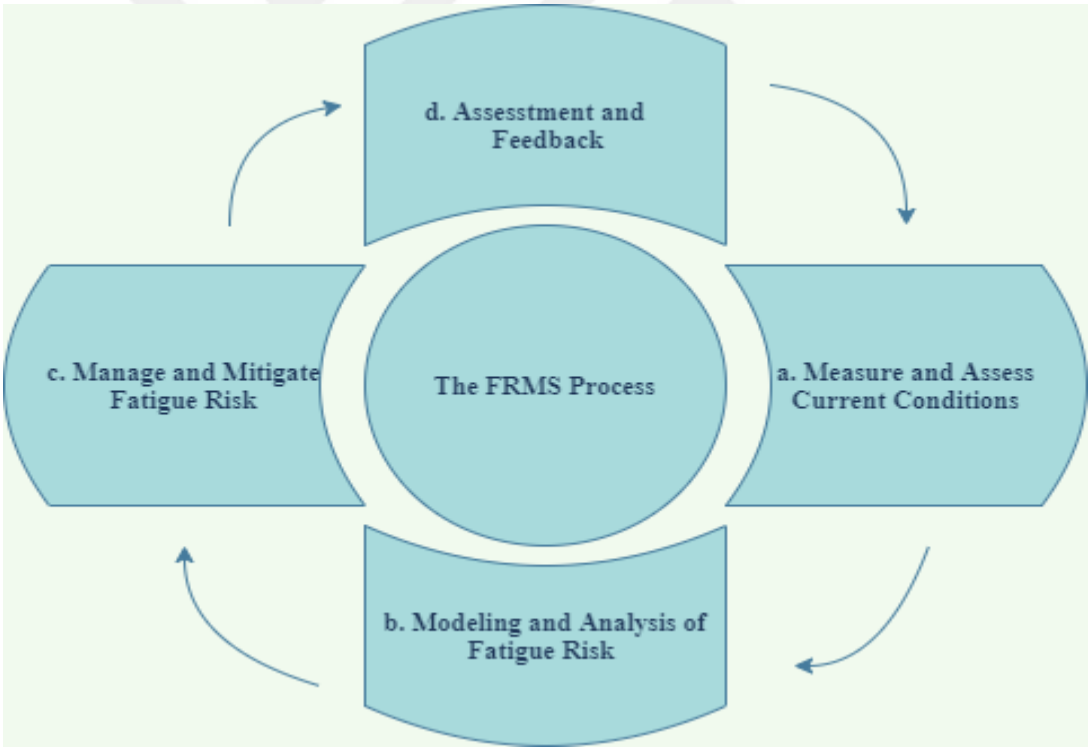

Figure 2. 1. Fatigue Risk Management System Flow Chart (FAA, 2005)

Source: FAA, 2005

2.2.2. Sleep Quality and Quantity as a Fatigue Factor

When trying to determine why fatigue has occurred, there is often a focus on the sleep quality and quantity because, sleep quality is very important to recover from fatigue and to maintain stable alertness and performance. Lack of sleep over a continuous series of nights causes a "sleep debt," and it results as increased fatigue which can sometimes be bad than a single night of lack of sleep. Shift works, especially night shifts, may limit the opportunity for sleep and recovery in each 24-hour period. Shift work usually reduces the amount of sleep which a person normally gets by between one and three hours per day. According to(Dawson & McCulloch, 2005), there are four identifiable segments which common to all fatigue-related incidents. These segments are related to appropriate utilization of a sleep period and the provision of an adequate opportunity to sleep. The level of mental fatigue is linked to the duration of sleep. Some theoretical models of circadian rhythms and sleep which aimed to predict to fatigue examined by (Dawson et al., 2011). They also determined how current fatigue models being applied by companies and regulators. They discussed about these models and made recommendations on the most applicable ways to use and improvement ways of these current fatigue models. According to(Drury et al., 2012), it is significant that cabin and cockpit crews with restricted sleep, they display emotional responses. They investigated whether sleep patterns influence the strength of Heightened Emotional Activity (HEA) as a response to threats and the relationship between restricted sleep and (HEA). The findings indicate that reduced sleep causing to increased occurrences of confusion and frustration in response to threats.

(Darwent et al., 2012) used software-based bio mathematical models of alertness which means to estimate fatigue-related risks in a work schedule. The purpose of the analyses is to evaluate the predictive validity of a sleep predictor model which is designed to predict sleep probability of the long-haul pilots. The model validated on 225 samples who collected sleep/wake and work/rest data during two weeks. Observed and predicted sleep periods robusted 85%. (Roach et al., 2012) examined the impact of layover length on the pilots' sleep. They determined the effects of layover length on the amount of sleep that pilots obtained during the trip and subjective fatigue levels and capacity to sustain attention. Results showed that pilots had higher fatigue level at the end of the flight, obtained more sleep during layover days than they obtained on

days off at home. (Ferguson et al., 2012) examined the independent contributions of sleep, sleep debt and circadian phase to fatigue ratings. They used a sophisticated laboratory protocol. In the study subjective fatigue ratings were recorded to determine the sleep dose and effects of circadian times. Pre-sleep fatigue related to only circadian time but post-sleep fatigue related to sleep dose and circadian time. Results showed that, with higher levels of sleep restriction post-sleep fatigue ratings are higher. (Matthews et al., 2012) determined the independent effects of time of day and prior wake on driving performance with sleep restrictions. They used circadian phase, prior wake and sleep debt as fatigue factors. Results showed that, circadian influence and its combined effects with other factors of fatigue have been detected. Also, prior wake influence achieved. Reduced sleep combined with these two factors and conditions identified as high fatigue risk. (Åkerstedt et al., 2014) studied about sleepiness levels on factory workers in a chemical factory who works at night shift. Sleepiness level was low during the day but it was rising in the evening on the first day. Next three days workers involved wakefulness after a 5 hours' sleep. It has been seen that there was no adjustment.

2.2.3. Mental Fatigue, Motivation and Performance

Demanding cognitive activity which is characterized by lack of energy and tiredness causes a psychobiological state described as mental fatigue(Lee & Kim, 2018). There is a significant relationship between fatigue and motivation. It can be measured as a reducing ability when performing mental tasks. Fatigue may be considered a deficiency of motivation or drive to perform. In recent years, researchers have compared the effects of alcohol and fatigue on performance. While most people understand that alcohol intoxication can be a significant risk on the roads, the effects of fatigue may not be as readily understood or acknowledged. Studies using particular performance tests have indicated that(Australian Civil Aviation Safety Authority, 2012):

i. The performance of a person who wakes at 7 a.m. and stays awake for 17 hours until midnight is, by that stage, likely to be as impaired by fatigue as someone with a blood-alcohol concentration (BAC) of 0.05% -- the legal driving limit in many countries

ii. A person who wakes at 7:30 a.m. and stays awake for 23 hours until 6:30 a.m. the following day will have a level of general performance impairment similar to someone with a BAC of 0.10% - which is twice the legal limit for fully licensed drivers

(Honn et al., 2016) studied with twenty-four airline pilots about early beginning and long duty times' effect on fatigue with multiple take-off and landings during two days. Study showed that work load which associated with multiple take-offs and landings increased fatigue over the duty day. Cockpit crew's performance indicated greater fatigue in the five duty day than in a single duty day on the PVT. (Brezonakova, 2017) examined European Aviation Safety Agencies' new Flight Time Limitations within the legal framework. Author found some threats caused by unmanageable and extensive job demands which increased pilot burnout. Frequently time zone changes, early beginning duty planning's and long duty hours leave the cockpit and cabin crew members fatigued without enough time to recover from fatigue. Aviation has a safety sensitive environment and fatigue with burnout symptoms will cause to lack of performance for critical tasks by longer reaction times.

According to (NASA, 2015) coordination is the most important factor for effective team performance and stress significantly reduces teammates' performance. They analyzed some accidents for errors and found 212 errors. Thirty of the errors involved insufficient and improper communication. Thirty-six errors involved to lack of management of competing task demands. Another thirty-six errors involved to inadvertent omission of required tasks and actions. After these analyses some critical points of skilled performance of pilots are vulnerable to disruption emergency and other serious situations. (Boksem et al., 2006) examined the effects of mental fatigue on behavior. Subjects performed a task during continuously two hours that required a high concentrated action monitoring. Subjects offered a cash reward if they can perform very well as a motivation. They stressed the instructions accuracy and speed. Subjects choose to focus on to improve their performance only on their speed or accuracy. For the concept of mental fatigue these results have important implications. When fatigued subjects motivated, subjects monitored their actions adequately by sacrificing their speed of response. These results showed that there is a significant motivational component involved in the process related to mental fatigue. On the other

hand, subjects couldn't improve their performance in both ways. This explains that fatigue is more than a reward/effort imbalance and need adaptive strategies at an acceptable level under adverse conditions to keep performance.

(Arsintescu et al., 2020) examined the relationship between cockpit crew workload, sleep duration, performance, subjective fatigue and flight duty time. The subjectives were ninety pilots and they wanted from pilots to complete a NASA Task Load Index, a Samn-Perelli fatigue scale and Psychomotor Vigilance Task on top-of-descent of each flight. At the end of the study, they found significant correlations between workload and other factors. When fatigue increased cockpit crews reported higher workload and objective performance was worst. (Flindall, 2015) researched to improve mental fatigue related errors without pharmacological use. Author explored cognitive cues which can be used to improve cognitive recall and medical documentation in the acute mental fatigue state with a medicine. The research has demonstrated that non-sleep deprived subjects have improved recall if cognitively fatigue. Author suggest that it is possible to improve fatigue related errors without pharmacological use.

2.2.4. Causes and Symptoms of Fatigue

Fatigue is complex and multi-factorial. We understand some things reasonably well such as sleep and circadian rhythm. But there are multiple factors such as; inadequate sleep, circadian rhythms, high workload, extended duty periods, psychosocial factors, environmental factors, and others(Tiesinga et al., 1996). There is also considerable individual variability. It's important to emphasize that there is no simple, universal solution to the problem.

Fatigue is a physiological condition that occurs when three main factors come together(Holmes et al., 2012). These are;

i. Environmental factors
ii. Personal factors
iii. Workload

Fatigue can have serious consequences in both business and daily life. Insomnia, sleep debt, chronic insomnia, and staying awake for a long time are the main causes of fatigue. Some factors that can cause insomnia(Greenberg, 2002);

i. Working or staying awake at hours that can disturb the circadian rhythm
ii. Time difference
iii. Factors that can affect sleep quality, such as caffeine and alcohol consumption and light
iv. Personal factors such as stress, irregular lifestyle

When people report fatigue, they are not fully aware of the effects of fatigue. The person experiencing fatigue may show symptoms such as forgetfulness, poor decision making, slow reaction time and apathy(Goode, 2003). Adequate quality sleep is required to combat this triple threat. Sleep is an antidote to fatigue and is essential for being fit. When people do not get enough sleep, fatigue affects people negatively. There are several factors that can cause fatigue, and primary factors are directly considered to be causes of fatigue(ICAO, 2016);

i. Sleep Time

On average, it refers to the time spent asleep in a night. Night sleep is more effective in relieving fatigue than daytime sleep

ii. Wakefulness time

Refers to the total time elapsed since waking up

iii. Circadian rhythm disruption

It refers to the cycle of sleep and wake in the biological clock pattern of our body. Generally, this rhythm is at its lowest hour intervals between 02: 00-05: 59 and 15: 00-17: 00. During these hours, the body tends to sleep due to its natural structure. In particular, staying awake between 02:00 and 05:59 in the adapted home base time frame counteracts the body's natural tendency to sleep and affects the circadian rhythm.

Secondary factors indirectly affect fatigue(FAA, 2005);

i. Sleeping disorders

It can reduce the sleep quality of the person by affecting the sleep cycle. People are often unaware that they have a sleep disorder, and this condition can be treated if diagnosed.

ii. Accommodation in different time zones

Traveling in different time zones can lead to fatigue. Because the incompatibility between the body's biological clock and environmental factors can affect the day / night sleep balance from time to time and making it difficult to sleep.

iii. Stress and illness

Chronic illnesses and stress can lead to sleep loss. Stress and anxiety can often prevent people from falling asleep even when they feel very exhausted. Doctor control is important for treatment.

iv. Flight Scheduling/ Rostering

The body's biological clock working differently from the normal sleep pattern often results in too little or poor-quality sleep. Like overwork, low workload also causes fatigue.

v. Lifestyle

Healthy eating, regular exercise and water consumption are important factors in combating fatigue.

For physiological reasons, people live actively throughout the day and have to sleep at certain times at night. Fatigue emerges as an important risk in the aviation industry due to physiological needs and the operation structure that continues 24/7. Being awake, especially during the time to sleep, causes unwanted cognitive effects and consequences by creating sleep debt. Errors and omissions, decreased situational awareness, inability to perform routine tasks or make mistakes, inattention and forgetfulness, difficulty in making decisions are common effects of fatigue on human performance(Tiesinga et al., 1996). Human biorhythm involves cyclical activities that occur in the body within 24 hours.

Hormones, blood circulation, digestive system and neurological systems increase or decrease their activities depending on certain time intervals of the day. This cycle is controlled by the central nervous system and creates the circadian rhythm, also called the biological clock. When the inconsistency in day and night time perception affects the circadian rhythm, for example during the sleep time in different time zones, the

brain tries to cognitively adapt itself to this situation and the body and central nervous system work hard to compensate for the difference between the biological clock. All of these will increase fatigue(Caldwell, 2005).

Another symptom is; people cannot continue to their routine works. People's routine work need extra energy to realize, physically making complaints, emotionally unstable and restless, having trouble concentrating or focusing on a topic, the loss of joy and the mood of indifferent to the environment, sexually strong reduction and increased susceptibility to accidents are also signs of fatigue(Göker, 2018). Also, people have difficulty remembering, difficulty concentrating, dizziness, nausea, unexplained weight loss can also be seen. Healthy, successful, intellectual and strong individuals can quickly get into a bed-bound and unable to work mood. Fatigue can be a symptom of many diseases, but more than 50% patients with fatigue complaints had no significant disease. This result has led to the recommendation of emotional and psychiatric etiologies for fatigue(National Road Transport Commission, 2001).

Catherbas (1992) compared patients who were and were not tired in his study and determined that tired patients have a higher diagnosis of depression and anxiety. It is comparable that phobia, panic disease, overstrain and timidity rates for both groups. Patients with fatigue complaints, although they have stated that they have more personal stress in the last 3 months were no significant differences in their stressful life stories. It has been seen that patients with and without fatigue symptoms; there is not much difference between their current illnesses and the severity of their past illnesses(Englebienne & DeMeirleir, 2002). Working constantly under heavy workload causes fatigue. Workload; the burden of a person working long hours or considered to performing tasks which is physically demanding, mentally stressful. Lack of rest periods during long working hours causes fatigue. Working time in the air, although working conditions are intense often around 12 hours a day, 7 days a week. It is not always possible to realize uninterrupted and long-term sleep period to relieve fatigue for supporting the performance of the flight crew.

Excessive working hours and fatigue cause the following adverse situations:

i. Increase in accident and death rates
ii. Increase in tobacco, alcohol and drug addiction

iii. Poor quality and interrupted sleep
iv. Frequency of cardiovascular, respiratory and digestive disorders
v. Increased risk of infection
vi. Loss of appetite

Sleep is an active process and when people sleep, their state of consciousness is actually changing. Not all sleep is the same quality and it doesn't provide the same healing benefit. Effective sleep must have four features to meet the needs of the human body(Holmes et al., 2012). These features are duration, continuity, time of day and the quality of sleep. Although everyone's sleep needs are different, the recommended sleeping time is about 7-8 hours of sleep per day. The people need enough sleep to feel refreshed. Vigilance and performance are directly related to sleep(Castro et al., 2015). Excessive insomnia for several days in a row adversely affects people's condition. Only sleep maintains and renews people's performance levels. Nights with overlapping short sleep periods negatively affect the depth of sleep. This situation reduces people's energy levels as they start their day and strengthens the effects of fatigue accumulated throughout(Australian Civil Aviation Safety Authority, 2012). Even a one-day insomnia situation causes a decrease in cases of occurrence. In such a situation, the probability of an accident occurring is very high. People who work from the night hours until the early hours of the morning feel the same effects. Regarding symptoms of fatigue factors specific to flight crew in aviation industry have been recognized for a long time(Gregory et al., 2010). At the same time, it has been noticed that such symptoms may be an important factor hindering the performance and reliability of the person. Specific symptoms or disorders arises as a result in individuals.

2.2.5. Sleep State

Sleep is an active process and when people sleep, their state of consciousness is actually changing. Not all sleep is the same quality and it doesn't provide the same healing benefit. Effective sleep must have four features to meet the needs of the human body. These features are duration, continuity, time of day and the quality of sleep(Ferguson et al., 2012). Although everyone's sleep needs are different, the recommended sleeping time is about 7-8 hours of sleep per day. The people need

enough sleep to feel refreshed. Vigilance and performance are directly related to sleep(Van den Berg et al., 2020). Excessive insomnia for several days in a row adversely affects people's condition. Only sleep maintains and renews people's performance levels(Greenberg, 2002).

Nights with overlapping short sleep periods negatively affect the depth of sleep. This situation reduces people's energy levels as they start their day and strengthens the effects of fatigue accumulated throughout(Coombes et al., 2020). Even a one-day insomnia situation causes a decrease in cases of occurrence. In such a situation, the probability of an accident occurring is very high. People who work from the night hours until the early hours of the morning feel the same effects(Pellegrino & Marqueze, 2019). The person must have at least 8 hours of sleep. Sleep must be uninterrupted. When people are sleeping, different levels of sleep fluctuations are experienced. These levels are known as sleep stages, and this stage offers different functions for the person's body. Sleep structure is called a cyclic model of light sleep, deep sleep and REM (Rapid Eye Movement) sleep. The cycle normally takes place within 90 minutes and there are 4 to 5 cycles in the period of 8 hours of sleep. Each cycle has a distinct role about refreshing. Sleep must be uninterrupted during 3 to 5 cycles while doing its refreshing task(Eurocontrol, 2018). When people's sleep is interrupted due to external factors, this situation tends to keep sleep quality in mild sleep stages. So, it becomes difficult to pass form of deep sleep and the third, fourth and the fifth phase.

People need deep sleep. A comfortable sleep environment is required for people to reach deep sleep levels. Many factors cause sleep interruptions on the plane. Some of these factors are under our control and some are not. Factors beyond our control are(Van den Berg et al., 2020);

i. Environmental factors (severe aircraft movement, weather conditions, intense vibration, sound, bad condition of the crew rest)
ii. Food and consumed chemicals (not fresh food, alcohol, caffeine and taking medication)
iii. Psychological factors (stress, anxiety and longing for family, hierarchical problems, task responsibilities)
iv. Sleep disorders, Sleep apnea

Every person has a biological clock, and this biological clock regulates the body's circadian rhythm. We need to understand circadian rhythm functions. Various physical processes occur such as sleep/wake, body temperature, hormone level in the time period of 24 hours in our body in the cycle of the circadian rhythm. Our biological watch regulates our circadian rhythm. The biological clock perfectly synchronizes the state of wakefulness and sleep at night(Atkinson et al., 2014). Biological clock makes the person sleepy or awake whether the person works on a regular schedule or not. Under normal conditions, the sleep-wake cycle follows a 24- hour rhythm. However, this cycle is not the same for everyone. As a result of the researches, the majority of human-induced accidents at night occurs between 01:00 and 03:00. However occurrence of accidents between 13:00 and 15:00 hours ranks second(Castro et al., 2015).

Many flight crew's working hours are contrary to their biological clock. Irregular work schedules disturb the synchronization of the circadian rhythm as a result of the changing working hours cycle and time zone change(FAA, 2010b). In addition, the person's biological clock is adjusted in one or two hours every day. Sometimes, depending on the new work schedule, the adjustment may take days. As a result, the biological clock keeps the people awake when they want to sleep or it takes them sleep when they want to wake up(Roach et al., 2012). Circadian rhythm synchronizes perfectly to staying awake during daylight hours and sleeping during night hours. The biggest problem of the shift work program that; the shifts are not adapting to the working rhythm of the body(Dawson & McCulloch, 2005). When Person's circadian rhythm adjusts itself between one to two hours a day, it cannot adapt eight or twelve hours change immediately which required by many schedules on board. It takes a few days to adapt to a new schedule and synchronize with the world around us(Abeer A. Al Saedi, Eman A. Al Shafei & Shah, 2019). Flight crews who have to sleep during the day, they sleep shorter and are more likely to experience frequent awakenings. The 3rd and 4th phases of sleep, which are the refreshing feature of sleep, are experienced for a shorter period of time during daytime sleep. Therefore, because of the short stages of 3rd and 4th phases of sleep, it causes people to feel tired after a sleep for 6-8 hours. When people sleep for 6 to 8 hours, they think they will get up rested and revitalized(Castro et al., 2015).

If the way of working in shifts is not in order and the person cannot adjust himself to continue on the same program for a long time, as a result people cannot synchronize their bodies to the way they work. A person flying at night for 8 hours can't adjust his body's biological clock because when he is not working on off days, his body goes back to his daily schedule(IATA, 2014). The body adjusts the program change, but it takes time. The time required to achieve is approximately a few days. But when there is a slip or a sudden change in the program, problems can arise.

2.3. Fatigue in Transportation Industry

The importance and need of transportation industry are getting growing every single day in the whole world. This will continue to rise the number of vehicles, drivers and off course hazards. Transportation companies competing about cost efficiencies and expanding their networks globally. This fast-growing industry also competing with time. This competitive condition directs companies to some compulsory targets to achieve success. Because of these conditions' transportation workers in operational side, especially drivers and couriers are facing to work during long duty times.

Fatigue is affecting the behavioral and cognitive safety performance of transportation industry operators and linked to safety outcomes(Noy et al., 2011). There are also implications between long-term health disorders and shift work(Bandeira et al., 2018). Fatigue is still a hazard for transportation industry. Staffing cuts, delivery pressures, increasing workload and increasing competition are some of them to recognized(Phillips et al., 2017). Transportation industry fatigue has been managed by rules which describes the upper limits for the spent time on work or operation. According to (Civil Aviation Safety Authority (CASA) Australia, 2014) these rules are failing to detect important causes of transportation industry's fatigue.

(Dawson & McCulloch, 2005) studied to describe how transportation industry companies would manage and mitigate fatigue risks as a chain of events. They called this chain of risk subjects as the fatigue-risk trajectory (FRT). This chain of risk error trajectories and events always preceded by an event classification which leads to the accident.

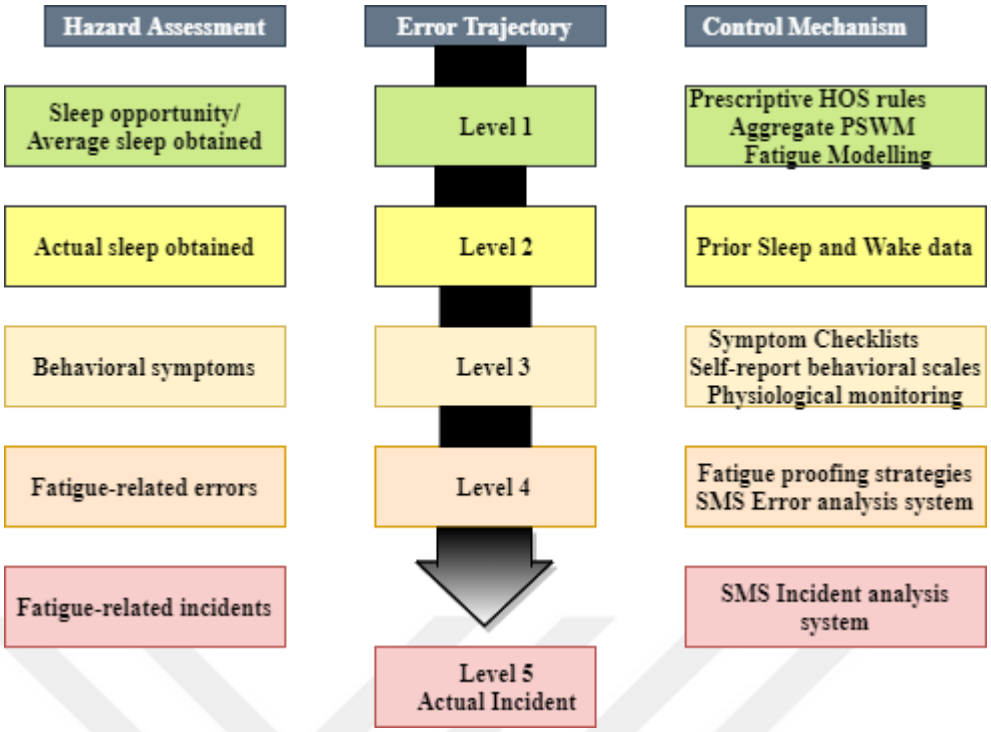

Figure 2. 2. Fatigue Risk Trajectory (Dawson & McCulloch, 2005)

Source: Dawson & McCulloch, 2005

2.3.1. Fatigue in Aviation Industry

Fatigue is a problem for transportation industry as well as aviation industry which goes on 24/7 operation conditions. However, the aviation industry has unique aspects that distinguish it from other transportation sectors. Aviation industry workers' alertness, performance and well-being are influenced by the presence of circadian rhythm. Economic factors in the aviation industry decreases the tendency to struggle with the fatigue of flight crews. Below there are the factors that trigger fatigue. These factors are:

i. To reduce the number of people working on the plane for economic gain increases the workload of the flight crew and causes fatigue
ii. Since the institutions do not realize the importance of fatigue sufficiently, they do not take the issue of fatigue very seriously
iii. Safety rules and laws currently in force is not enough to protect against fatigue
iv. Work and recreation programs are not effective enough, and this increases fatigue

v. Loneliness felt due to the working environment while working on the plane and the feeling of isolation triggers the increase in fatigue

Regarding symptoms of fatigue factors specific to flight crew in aviation industry have been recognized for a long time(Ono et al., 1991). At the same time, it has been noticed that such symptoms may be an important factor hindering the performance and reliability of the person. Specific symptoms or disorders arises as a result in individuals. Fatigue has effects on the human body, mind and emotions. Prominent symptoms of fatigue in the aviation industry are;

i. Forgetfulness
ii. Poor decision-making
iii. Slowed reaction time
iv. Sleepiness
v. Poor communication
vi. İmpaired mood
vii. Micro-sleep
viii. Apathy and lethargy

2.3.2. Fatigue in Cockpit and Cabin Crew

It must be accepted that flight crews have been sentenced to work in a closed environment. Firstly, working conditions varies from flight to flight with unpredictable environmental factors (changing weather conditions, etc.), working hours and duration of layover stays which is away from home. Secondly, there is no clear distinction between the working area and the recreational area while working in aircraft environment. Thirdly, today's crews are from a wide variety of countries and origins and they come together to live together over a long period of time(Patterson et al., 2019). When it compared to standard industries, operational aspects related to aviation is more complicated such as; aircraft types, model and length of the voyage plan, time to return to the airport and turn over duration at the airport. All these aspects are the unique potential constitute combination of reasons of fatigue.

Cockpit and cabin crews begin to their duties two hours before the scheduled flight’s take-off time. When we add the travelling distance from home to airport and the way

to reach to airport, by public transportation or by own car it makes minimum three hours from home to flight's take-off time(Yildiz et al., 2017). Cockpit and crew members are responsible from serious and high concentration required responsibilities from beginning to the end of the flight duty. As we summarize these responsibilities;

i. Pre-flight Responsibilities:

Checking destination airport performance and country regulations, printing and checking flight plan and weather report, checking revisional documentations, attending to pre-flight briefing, checking aircraft maintenance log, checking on-board emergency and operational equipment, checking flight and entertainment systems, performing a security search checklist in the whole cabin, checking notification to captain documents, checking dangerous goods items and creating an intervention plan to any abnormal condition caused by these items, refueling the aircraft, making take-off briefing, profiling passengers, observing the boarding to make sure passenger seating plan is valid according to company and country regulations especially exit seat procedures and luggage stowage procedures, arming doors and checking door status.

ii. During Flight Responsibilities:

Preparing cabin and passengers for take-off and landing, making necessary announcements on time, observing cabin, aircraft and passenger conditions, preparing catering service, observing any abnormal situation sign, applying medical procedures if needed, applying emergency procedures if needed, applying fire procedures if needed, applying decompression procedures if needed, getting ready cabin and passengers for emergency landing or ditching if needed, keeping communication with ATC, observing aircraft technical conditions, observing weather conditions, observing flight plan en-route changes, following and repeating desired checklists during whole flight, making landing briefing and determining turn around and hold point decisions.

iii. Post-Flight Responsibilities:

Disarming doors, de-boarding passengers, checking whole cabin and aircraft, filling the flight documentations, filling flight reports.

As we mentioned above cockpit and cabin crews are responsible from a number of physically demanding tasks. Many cabin crew spending most of the flight on their feet and also emotionally challenging by requirements to perform multiple tasks in a short time. On the other hand, cockpit crew spending most of the time to observe flight indicators and a lot of radio conversations with ATC to fly safe in their seats. These responsibilities require high concentration. Crew members always need to be alerted,

proactive and must response quickly to any situation. The biggest challenges for crew are to maintain safety and to respond to an unexpected emergency situation. At this point the crew's skill, ability and trainings becoming more important because in an abnormal situation which a crew would expect the other stressors' effects such as fatigue and circadian dysfunction to have the biggest impact.

2.4. Cockpit and Cabin Crew Fatigue

There is a significant relationship between cockpit/cabin crew member's fatigue and flight safety. A fatigued crew member cannot have enough awakeners and alertness when a safety issue occurs. The effects of fatigue are evidenced by the numerous studies and fatigue-related mishaps. These studies showed that most cockpit crews suffer a deterio-ration in cognitive performance with increased stress during a flight(Patterson et al., 2019).

2.4.1. Fatigue and Stress Relationship

Stress has become a part of every stage of daily life and has become an indispensable element. With each passing day, a period of rapid change is experienced and innovations are rapidly entering the lives of people. It is noteworthy that the majority of the studies in this area have been carried out in the last 30-40 years(Pourabdian et al., 2020). Among the reasons for this; Factors such as rapid change in all aspects, the transition from the industrial era to the information age, the change in competition and production conditions, the emergence of differences in human needs, metropolization and the need for qualified human resources can be shown. It is also not expected that the intensity of work in this area will decrease. In particular, it is expected that companies that want to increase their workforce efficiency sufficiently in business life will actively continue their stress research. Stress affects people at many stages of life. This effect often shows itself negatively and it is stated that it reduces the productivity of human resources and the quality of production and service in the organization. Threatening the organism and thus disrupting its balance causes an alarm response aimed at preserving vitality(Kelly, 2017). In order to restore the deteriorated balance, it is necessary to adapt to the new situation. For this reason, the stress response is also known as the "General Symptom of Adaptation".

The General Adaptation Symptom developed by Selye on stress describes the body's reaction process when faced with stress. The first stage, the Alarm Reaction (A) stage, is the process in which the body encounters stress and gives the first reaction. In this process, the resistance of the body that experiences a shock in the first place decreases, and the organism tries to struggle or avoid to cope with this situation. If an adaptation can be achieved in response to the stress encountered in the second stage, the Resistance Period (B), the resistance of the body rises and rises above normal. If this stage is successfully overcome, the body returns to normal. In the third and last stage, the Exhaustion Period (C), the resistance of the body decreases significantly since the effect of the stressful event is very serious and long-lasting(Sallinen et al., 2017). At this stage, the symptoms of the Alarm Reaction stage are seen, the balance is disrupted and the harmony energy is exhausted. During this period, signs of burnout begin and may leave deep scars in the organism.

The concepts of stress and fatigue, which are often confused with each other in the literature, do not express the same thing. Stress can have both positive and negative effects, but it is not possible to say the same for fatigue. When the stress is continuous, anxiety / anxiety, depression increase and fatigue occurs(Price et al., 1992).

2.4.2. Fatigue and Job Satisfaction Relationship

The concept of job satisfaction means that a person feels competent in his / her job, produces creatively, thinks that he / she receives material and spiritual reward for what he / she produces, and that he / she is happy in his / her job. When job satisfaction is examined conceptually, the concepts of motivation, personality traits, interests, attitudes, values, needs, and subordinate relations come before us. When we look at the results of job dissatisfaction, it is seen that besides the decrease in work efficiency, the psychological and physical health of the person is negatively affected(The European Road Safety Observatory (ERSO), 2018). Therefore, it is understood that job satisfaction affects the person and the life he / she lives in addition to his / her job. When occupational fatigue is examined, it seems conceptually different from job satisfaction, but when its causes and effects are examined, it is seen that they are similar to each other. Occupational fatigue causes are personal characteristics, stress, needs, conflict, psychological harassment (mobbing), excessive workload, subordinate

relations. Although the results are similar to job dissatisfaction, it can be thought that it has more negative results than job satisfaction. The consequences of fatigue may be alienation, burnout and stress symptoms, negative affect, and occupational suicide. While it is thought that job dissatisfaction is at a more normal level and can be reduced more easily with measures and regulations, occupational fatigue can be seen as an occupational depression and it may be thought that it is more difficult to alleviate the feelings of occupational fatigue(van Drongelen et al., 2017). Studies have found supportive findings that there is a significant and inverse relationship between fatigue and job satisfaction. Based on these results, the higher the job satisfaction of individuals, the less likely they are to experience fatigue.

2.4.3. Fatigue and Organizational Success Relationship

Fatigue Syndrome is a condition that individuals and organizations should take seriously due to its negative consequences affecting physical and mental health, social relations and business life. While fatigue affects customers who are exposed to low quality service and inhumane attitudes; It also affects organizations whose employees have to deal with problems such as low performance and high turnover rate. The negative consequences of fatigue on the individual can lead to undesirable conflicts and relationships in family life. The fact that fatigue affects not only the individual himself, but also the people around him and the organization he works for, and therefore the economy, social and cultural life of the country, is the most basic feature that needs to be taken seriously. The individual symptoms of burnout also appear as the consequences of fatigue on the individual(Zaslona et al., 2018). Therefore, the organizational consequences of fatigue are emphasized in this section. As mentioned before, the concept of fatigue is perceived as an individual problem by institutions and workplaces. However, a depleted employee can have a negative effect on the work at the workplace, on the workflow or on other employees. In fact, many of those who suffer from fatigue are really good and careful workers. Considering that every person has a backup, and a reserve that can be run even cheaper, causes really talented people to waste. Among the consequences of fatigue affecting the organization(Dorrian et al., 2012),

i. Neglecting or slowing things down,
ii. Increasing reports and permissions,

iii. Carelessness towards customers or people receiving services,
iv. Increasing customer dissatisfaction,
v. Increasing tension in relationships at work,
vi. Increase in error rates,
vii. Losing good employees,
viii. Decrease in work efficiency,
ix. Loss of qualified workforce,
x. Systemic problems due to the deterioration of work disciplines in institutions,
xi. The consequences of disruptions at work can be counted.

An organization with fatigued employees cannot easily make changes in its structure and processes in order to adapt to changes in the environment. Fatigue prevents creativity and decreases the capacity of the individual to work efficiently with customers and colleagues (Maslach, Leiter, 1997). Employees who experience fatigue gradually decrease their job satisfaction and their commitment to the organization. The retirement of people caught with fatigue syndrome, despite being able to work productively for many years, is a significant loss for the organization.

2.4.4. Cockpit and Cabin Crew's Personal Characteristic

As a human-being crew member's age, experience and life styles are naturally personal characteristics which is a fatigue factor. Individual characteristics are also effective to sensitivity to fatigue and relief from fatigue. People's knowledge, education and experience affect the performance of people. In addition, people's health conditions, age, athletic and fit body, drinking, characteristics of bad habits such as consumption alcohol creates individual characteristics. To raise awareness by various organizations, numerous researches, created guidelines and rules created for both crew and the aviation industry. The information in these documents is not for information only, also it is used to train flight crews and airline enterprises to reduce the effects of fatigue.

Lack of knowledge in the flight crew occurs low self-confidence, head confusion and improper actions. Knowledge of the aircraft's equipment, systems, procedures and the environment are important. Education is about improving people's knowledge, skills and attitudes. Insufficient, irrelevant and practicable education effects people's

performance negatively. There is an inverse relationship between education and fatigue, fatigue increases while training decreases(Englebienne & DeMeirleir, 2002). Experience includes the personal experience, knowledge and education of the people related to the subject. Experienced flight crew's confidence will increase and it will cause less work stress. Based on the fatigue-increasing effect of work stress, the fatigue level of the experienced flight crew is known to be less than the fatigue level of the inexperienced flight crew.

Consumption of alcohol, caffeine and some narcotic drugs can negatively affect sleep. This situation causes fatigue. Alcohol causes poor perception of visual and auditory stimuli. Also, alcohol has effects in memory, decision-making, judgment, and coordination providing. While alcohol slows people's reaction times, it increases the wiliness of risk. Fatigue and alcohol go hand in hand in many ways. According to the estimates made by insurance company experts, 50% of the 'fatigue accidents' are caused by alcohol consumption(Flindall, 2015). Consumption of drugs with narcotic effects can cause drowsiness and dizziness. While consumption of such drugs may affect the mood and coordination of individuals, it also causes decrease in mental functions and sensory perceptions. Caffeine consumption can also cause side effects such as high blood pressure, headache, mood swings, and anxiety.

2.4.5. Operational Conditions

To avoid fatigue may be impossible for cockpit and cabin crew members due to early morning duty beginnings, frequent changes in daily duty schedule, extended duty periods and average workload. Both cockpit and cabin crew members must be fully high concentrated and must be alerted for any abnormal and emergency condition during every take-off and landing. According to (FAA, 2009b) most aircraft accidents happened between within three minutes after take-off and within eight minutes before landing. Because of this reason take-off and landing period and count in a duty period influences cockpit and cabin crew fatigue. Also, airport performance is another fatigue factor for cockpit crews. Runway length, number of runways, runway floor performance, airport taxi way scheme, notams, airport performance category (CAT I, CAT II, CAT III), airport’s geographical location, weather and wind conditions and airport’s aircraft congestion on the taxi-ways and parking gates. Cockpit crew must

examine these airport performance criteria due to the weather conditions and need to create a safety and emergency alternative plan against to any unpredicted abnormal and emergency situation before landing via performing a landing briefing in cockpit. Air Traffic Control (ATC) communication is another operational fatigue factor for cockpit crews. ATC and cockpit crew begin to communicate from push-back to parking. Also, there are a lot of documents and reports to fill and sign as a paper work during a flight duty that some of them have no option to forget. Aviation's international language is English but especially spoken English and pronunciation differences in different countries are enforcing cockpit crew to multiple read-backs, multiple corrections and communication failures which causes mental fatigue. As we discussed above; one by one all four reason like a piece of chain and challenging factors for cockpit crew to deal for flight safety in a duty period.

2.4.6. Technical/Maintenance Conditions

Technical and maintenance conditions of an aircraft is another factor which causes fatigue. As the aircraft gets bigger; its control, observation of its system monitors and performance efficiency requires more effort. Aircraft configuration is getting more importance on flights which is longer more than 5 hours. Because resting availability is the key point to fight against fatigue during long flights. Repeating technical failures and emergency landings due to technical and maintenance failures are some factors that causing fatigue on both cockpit and crew members.

2.4.7. Managerial Conditions

Busy paperwork requirement, flight duty schedule and overtime cause very significant fatigue in flight crew and It increases the mistakes made by the flight crew. Undoubtedly; management style of aviation companies on airplanes has great importance in terms of its effect about fatigue on flight crew. Company management policy sometimes does not give the necessary attention to needs and flight crews. This causes conflicts between staff and increased stress in people. (Bandeira et al., 2018) studied on a model of aircraft accident analysis according to the principal factors as well as organizational, human and environmental factors. The results showed that

pilot's performance is being influenced by these factors and indicates how may impact on success or failure of tasks of flight procedures.

Cockpit and crew members must be always up-to-date about company procedures and regulations, country civil aviation procedures and regulations and world-wide civil aviation procedures and regulations. Cockpit and crew members are responsible to apply all regulations and procedures 100% effectively and true during their duty for flight safety. Cockpit and crew members refresh their certificates every year via recurrent trainings and simulator trainings. Cabin and cockpit crew members are mobile personnel and management needs to be sure to reach every cockpit and crew member about new announcements, regulation changes, duty changes and sensitive implements about operation via e-mail or mobile applications. This causes to an information and notification bombardment on personnel's mailboxes and mobile applications which will be very hard to follow, compare and understand the new revisions. Also, there are a lot of documents and reports to fill and sign as a paper work during a flight duty that some of them have no option to forget. Management's FRMS policy is another factor. It must be easily accessible from all platforms and must give to personnel a clear expression way without a punishment to express themselves and also effective immediate action must be taken due to fatigue reports. Layover accommodation conditions also another factor for cockpit and crew member's fatigue. There is a significant connection between sleep and fatigue(ICAO, 2016). It is very important to get pre-flight sleep enough and quality for flight safety. Most of the airline companies mark this subject with bold and underlined letters and put it to their operation's manual procedures that cockpit and cabin crew members must get a minimum eight hours of sleep-in horizontal conditions. Instead of commercial concern and cost control worries, accommodation must be chosen according to the best rest and sleep condition availability. Due to the reasons which explained above, managerial issues are another factor of fatigue.

2.4.8. Rostering Efficiency

Some changes between new ORO.FTL and old regulation are shown below

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Table 2. 2. Differences Between FTL And ORO.FTL

Regulation	Subpart Q	ORO.FTL	Revision Reason
Max. Flight Duty Period (Daily)	Day: 05:00 – 21:59 = 13 hours. Night: 22:00 – 04:59 = 11:45 hours.	The night time period changed to 17:00 – 04:59 and maximum Flight Duty Period limited to 11h. Day period remained 13h but it will be maximum four sectors in case of consecutive night flights. More than 10h night duties must be applied with FRMS.	According to scientific researches on chronic sleep loss and circadian rhythm and Window of Circadian Low (WOCL) period limits have been set.
Extending Flight Duty Times with in-flight rest	There is not a universal limit. National aviation authorities deciding to the procedures.	Class1, Class 2 and Class 3 rest and duty time limitation types created. Class1: Must be apart from passenger cabin. There must be a bunk or a seat with an 80 degree recline. Class 2: Must be apart from passenger seats with a curtain. It must have 45 degrees recline ability. Class 3: Must be apart from passenger seats with a curtain and it must have 40 degrees recline ability.	It is an important factor for cabin and cockpit crews to rest in-flight especially on over-seas duties which is more than 10 hours. Creating effective crew rest types will fight against on-flight fatigue.
Duty and Flight Time Upper Limits	Consecutive 7 days:60 hours. Consecutive 28 days: 190 hours. Consecutive 12 months: 900 hours.	Consecutive 14 days: 110 hours. Consecutive 12 months 1000 hours.	This regulation limits the maximum duty periods in a short period of time.
Day-off rest periods	Minimum 12 hours at home base or 10 hours at layover destinations or length of proceeding duty.	Local time rest and Local time WOCL definitions added to rules. Day-off and duty beginning time limitations will be calculated on local time zone.	Most of the airlines are used to be schedule and plan crew duties and day-off times according to GMT. For example, Istanbul is GMT+3. Before new FTL, day-off beginning time was GMT 23:59 which means Local 02:59 in Istanbul.
Fatigue Risk Management	No subject	A Fatigue Risk Management must be maintained by aviation operators as a part of Safety Management System.	Due to scientific researches about sleep loss, performance and fatigue effects FRM will assist FTL in a positive way to reduce fatigue and accident risks.

Source: Fictitious data, for illustration purposes only

Cockpit and cabin crew members are frequently facing with long duty times, early beginning duties and nonstandard duty times which includes heavy night duties. Long-haul cockpit and cabin crew members frequently fly over-seas and deal with time differences which cause to circadian disruptions and sleep disorders. (Honn et al., 2016) studied with twenty-four airline pilots about early beginning and long duty times' effect on fatigue with multiple take-off and landings during two days.

CHAPTER III

RESEARCH AND METHODOLOGY

Could providing quality and friendly service to airline passengers consume energy of cabin crews and cause insensitive and rude attitudes because of fatigue? Airline operating activities, which gradually increase in the intense competitive environment, require long working hours, thus increasing work-related fatigue and stress levels on employees. This situation can lead to emotional exhaustion, depersonalization and feeling of personal failure, in short, fatigue syndrome, especially in employees who have to establish “face-to-face” relationships with people for a long time. "Job satisfaction", which makes it easier for these employees to catch fatigue syndrome and has a meaningful and inverse relationship with burnout, is a very important concept that should be emphasized and should not be ignored in fatigue studies. It is seen that fatigue syndrome studies, which are also expressed as the feeling of burnout, are mostly concentrated in the education and health sector in public institutions and private enterprises in our country. It is seen that the number of academic studies on job satisfaction and fatigue in the aviation sector both in our country and abroad is very limited. Cockpit and cabin crews perform an emotionally intense profession that has to act in line with company service policies and often have to provide quality service without revealing their negative feelings in their inner world. This situation can easily expose them to fatigue syndrome. Unlike other occupational groups, cockpit and cabin crews have to serve in the same environment with the same people, without a break, on long-term flights that can take up to fifteen hours.

It is seen that the source of stress is more diverse compared to other sectors. Responsibility for the fulfillment of flight safety procedures, including the possibility of fights and attacks in the aircraft, infectious diseases caused by breathing the same air as many people living in different geographical regions, the company's programs to fulfill the maximum legal mandate with the intention of minimizing costs, disrupting the biorhythm balance of day and night shifts(FAA, 2009a). Factors such as the conditions that are not ideal for working can be listed as sources of stress specific to

this profession. All these factors create physical, emotional, mental and work-oriented stress in cabin crews. The constant state of this stress, combined with other negative factors, causes the road to fatigue. It is a great responsibility for cabin crews to serve passengers at high altitudes, trying to meet their needs and desires, and also to deal with troubled passengers. From time to time, many events from smoke alarm to fights can be experienced in the aircraft. Determining the job satisfaction and burnout levels of cabin crews who are faced with such problems is of vital importance in terms of the competitiveness and sustainability of companies in the air transportation sector built on "safety, trust and quality"(ICAO, 2016).

Especially in terms of managerial approach and communication skills, it is an inevitable necessity to determine the factors that cause job satisfaction and fatigue in cockpit and cabin crews. The decrease in the effectiveness of the management, the failure to set the standards of behavior in the events faced by cockpit and cabin crews and the lack of management support can cause discomfort and more psychological pressure among cockpit and cabin crews. In particular, trying to please the passengers who are angry with the delays, being subjected to anti-social behavior and verbal attacks by the passengers cause excessive stress and tension in cockpit and cabin crews (Choy, 2002). The success of an airline depends on its ability to attract new customers and retain existing customers. For this reason, companies renew their aircraft and
They try to achieve this by improving their convenience, reducing their costs and increasing their service quality. Service quality directly affects customer satisfaction in airline companies that provide transportation services. The quality of the service provided by cabin crews stands out as the most important factor determining job performance, passenger satisfaction and loyalty. If the service quality on the flight determines the efficiency of the cabin crew, it is important to investigate the factors that affect their job satisfaction.

The intense competitive conditions of airline companies operating in the air transport sector require high performance and efficiency in all activities that support flight and flight. These activities, which require intense work pace and sensitivity, can increase work stress and cause some negative emotions and behavioral changes in employees(Maslach et al., 2001). Extremely sensitive and strict rules brought about by the high risks inherent in the airline industry are intended to prevent unsafe and poor

quality practices, most of which are caused by human factors. Psychological factors (workload, irregular and insufficient rest, stress, personality structures, management pressures, responsibility level, etc.) that affect cockpit and cabin crew members in terms of their job characteristics will easily force them to make mistakes and improve their communication and job performance.

To determine the levels of job satisfaction and factors of fatigue in cockpit and cabin crews working in airline companies in Turkey, which carries passengers on domestic and international lines, and the relationship between these phenomena, and to evaluate the results according to demographic factors. In addition, to be a reference source for researches for other business or institution employees in the aviation sector in the future; Providing benefits for academics, employees and businesses, and offering suggestions to airline company managers and cabin crews are the targeted sub-goals.

3.1. Population and Sample of the Research

The target population of the research is the cockpit and cabin crews of the scheduled and non-scheduled airlines operating in the Turkish civil aviation sector. For the reasons stated under the scope and limitations of the research, the cockpit and cabin attendants of the airline companies that are not named as the research sample, but that perform scheduled and non-scheduled domestic and international passenger transportation flights. Although the number of cockpit and cabin attendants working in the companies is tens of thousands, 254 people answered the questionnaire.

3.2. Scope and Limitations of the Research

The issues that the researcher cannot control during the research process are as follows:

i. Commercial concerns brought about by intense competition between businesses in the airline industry
ii. The opinion of the management that the image of the company will be negatively affected due to the research on the employees
iii. The company's name is not included in the research text due to company privacy policies

iv. Differences in the perceptions of cabin crews who have a different understanding of culture

The findings obtained as a result of the research are limited to the cockpit and cabin attendants who applied the burnout and job satisfaction questionnaires. It is assumed that the cockpit and cabin attendants participating in the research are at the level of education to comprehend the importance of the subject, and therefore give realistic and accurate information about fatigue, burnout and job satisfaction. The number of studies conducted to determine the fatigue factors of airline cockpit and flight attendants is very limited. The research application covers a period of approximately two months.

3.3. Research Methodology

This research was carried out by adopting a "positivist" approach, with an "instant" method in terms of the time it covers and a "descriptive" method in terms of its purpose. The "survey" method was used to obtain the data.

3.3.1. Data Collection Tools

A total of 48 questions consisting of the Minnesota job satisfaction questionnaire, Maslach burnout questionnaire and demographic information questions, detailed below, were applied to the cockpit and cabin crews forming the sample.

3.3.1.1. Minnesota Job Satisfaction Survey

It was developed by Dawis, Weis, England, and Lofquist in 1967 to determine the level of job satisfaction, and it was adapted into Turkish by Baycan (1985) and a validity-reliability study was performed (Cronbach Alpha= 0.77).

The scale used in the Minnesota job satisfaction questionnaire is a five-point Likert-type job satisfaction scale scored between 1 and 5. In the scoring, I am not happy at all 1 point, not satisfied 2 points, undecided 3 points, satisfied 4 points, very satisfied 5 points. The questionnaire consists of individual (internal) and organizational

(external) job satisfaction sub-dimensions and 20 questions that determine the general job satisfaction level of employees.

In the individual (internal) dimension, satisfaction consisted of questions 1, 2, 3, 4, 7, 8, 9, 10, 11, 15, 16 and 20. It consists of elements related to satisfaction related to the intrinsic nature of the job, such as success, recognition or recognition, the job itself, the responsibility of the job, promotion and reassignment due to promotion. Individual job satisfaction score is obtained by dividing the scores obtained from the questions of this dimension by 12.

Satisfaction in the organizational (external) dimension consisted of questions 5, 6, 12, 13, 14, 17, 18 and 19. It consists of elements of the business environment such as business policy and management, mode of supervision, relations with managers and subordinates, working conditions, wages. The organizational job satisfaction score is found by dividing the sum of the scores obtained from the questions of this dimension by 8. The score ranges that determine the level of job satisfaction are shown in Table 3.1.

Table 3. 1 The Score Ranges That Determine The Level Of Job Satisfation (Baycan, 1985)

High	Medium	Low
3,35 and up	1,68 – 3,34	0 – 1,67

3.3.1.2. Maslach Burnout Survey

In Turkey, the Maslach Burnout Questionnaire was preferred in most of the studies on the measurement of employee burnout. In this study, consisting of 22 questions was adapted to Turkish and used. This questionnaire was pre-tested with a group of 235 people (doctors, nurses, teachers, lawyers, police, etc.), and some changes were made as a result of the analysis of the data obtained from this group(Ergin, 1992). Its original form consists of 7-digit answer options. In this study, the scale consisting of 5-digit answer options such as "never, very rare, sometimes, most of the time, always" was used in the Turkish version.

In the factor analysis applied for the construct validity of the MBI, first, 5 natural factors emerged and it was seen that they were collected in three sub-dimensions. The result was re-evaluated by performing varimax rotation. Thus, it was concluded that the burnout syndrome consists of three sub-dimensions: emotional exhaustion, depersonalization, and personal achivement. High scores on the mentioned scale indicate a high level of burnout. The 1st, 2nd, 3rd, 6th, 8th, 13th, 14th, 16th and 20th questions in the questionnaire indicate the level of emotional exhaustion; Questions 5, 10, 11, 15 and 22 measure the level of depersonalization, while questions 4, 7, 9, 12, 17, 18, 19 and 21 measure the level of personal achievement. The answers corresponding to the questions were scored between 0 and 4 points. The highest and lowest scores of the total burnout questionnaire and its sub-dimensions are shown in Table 3.2.

Table 3. 2 Scoring Range Of The Burnout Questionnaire

	Min. Point	**Max. Point**	**Question Count**
Total Burnout	0	88	22
Emotional	0	36	9
Personal Achivement	0	20	5
Depersonalization	0	32	8

In this study, in order to compare the subscales with each other, the arithmetic averages of the subscale and total burnout scores were calculated and the analyzes were made according to the arithmetic averages. First of all, each individual received from the subscale.The score is divided by the number of items in the subscale. Then, these averages obtained for each individual were summed and divided by the number of individuals, and these obtained values were interpreted by considering the intervals in Table 3.3. The dimensions of emotional exhaustion and depersonalization consist of negative expressions, and the dimension of personal achievement consists of positive expressions. For this reason, the score of each sub-dimension was evaluated separately. While the increase in emotional exhaustion and depersonalization scores indicate that burnout is high, the decrease in the personal achievement score explains the burnout.

In Table 3.3, the weight scores of the answers to the questions in the burnout questionnaire and the burnout levels corresponding to the arithmetic averages of the total scores are indicated.

Table 3. 3 Burnout Level Score Ranges According To Arithmetic Averages (Ergin, 1992)

Point	Choice	Point	Burnout Level
0	Never	0 – 0.79	Very Low
1	Very Rarely	0.80 – 1.59	Low
2	Sometimes	1.60 – 2.39	Medium
3	Often	2.40 – 3.19	High
4	Always	3.20 – 4.00	Very High

Source: Ergin, 1992

The reliability of the scale was examined by Ergin (1992) with two methods. The first is the calculation of the internal consistency of the scale. The internal consistency (Cronbach's Alpha) coefficients of the data obtained from the group consisting of a total of 552 doctors and nurses are as follows: Emotional exhaustion 0.83, Depersonalization 0.65, personal success 0.72.

Reliability was also examined with a test-retest method. For this, 99 subjects were reached 2-4 weeks after the first application. Test-retest reliability coefficients for the sub-dimensions of the scale are: Emotional exhaustion 0.83, Depersonalization 0.72, and personal success 0.67.

3.3.1.3. Data Collection Process

In order to answer the questionnaires, firstly, a web link address was created from the internet. Considering that there may be those who do not want to fill out the questionnaire on the web or cannot use the internet for various reasons, questionnaires containing the same questions were also printed.

CHAPTER IV

FINDINGS

4.1. Findings on the Distribution of Survey Responses

In order to talk about the normal distribution, the significance value of the statistics testing the normal distribution should be greater than 0.05. It is seen in Table 4.1 that the significance values (sig.) of the Kolmogorov-Smirrov and Shapiro-Wilk tests used to test the normal distribution are less than 0.05.

Table 4. 1 Data Distribution Analysis Of Surveys

	Kolmogorov - Smirnov			**Shapiro - Wilk**		
	Statistic	df	Sig.	Statistic	df	Sig.
Job Satisfaction	,101	237	,000	,973	237	,000
Burnout	,081	237	,001	,979	237	,002

In this case, "non-parametric" analysis techniques were applied as the variables were not suitable for normal distribution.

4.1.1. Findings on the Reliability of the Questionnaires

Burnout questionnaire Cronbach Alpha values are given in Table 4.2. It is seen that the reliability is high with the sub-dimensions.

Table 4. 2 Burnout Questionnaire Reliability Analysis Values

	Cronbach Alpha	**Question Quantity**
Total Burnout	.872	22
Emotional Burnout	.723	9
Personal Achievement	.731	5
Depersonalization	.618	8

As a result of the reliability analysis for the job satisfaction questionnaire applied to cabin crews in this study, Cronbach Alpha values are shown in Table 4.3. According to the values found, it is seen that the reliability of the job satisfaction questionnaire is high, together with its sub-dimensions.

Table 4. 3 Job Satisfaction Survey Reliability Analysis Values

	Cronbach Alpha	Question Quantity
Total Job Satisfaction	.878	20
Individual Job Satisfaction	.638	12
Organizational Job Satisfaction	.489	8

4.2. Findings on Job Satisfaction

4.2.1. Findings of Job Satisfaction at the Individual Level

These are the findings regarding the questions 1, 2, 3, 4, 7, 8, 9, 10, 11, 15, 16 and 20 in the questionnaire.

Table 4. 4 Minnesota Q1 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	7	2,8	2,8
Not Satisfied	43	16,9	19,7
Undecided	79	31,1	50,8
Satisfied	104	40,9	91,7
Very Satisfied	21	8,3	100,0
Total	254	100,0	

The question 1 is "I am…..in terms of keeping me busy." When Table 4.9 is examined, it is seen that more than half of the cockpit and cabin crews answered as either satisfied or very satisfied. The number and rate of those who are satisfied is 40.9% with 104

people; those who are very satisfied are 8.3% with 21 people. Those who were undecided were 31.1% with 79; dissatisfied is 19.7% with 50 people.

Table 4. 5 Minnesota Q2 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	3	1,2	1,2
Not Satisfied	43	16,9	18,1
Undecided	128	50,4	68,5
Satisfied	74	29,1	97,6
Very Satisfied	6	2,4	100,0
Total	254	100,0	

The question 2 is "I am…in Terms of the Suitability of the Working Environment." When Table 4.10, which shows the proportions of the answers related to the suitability of the working environment, is examined, it is seen that the answers given by the cockpit and cabin crew are very close to the number and ratio of the answers given to the previous question, which is too busy. The rate of those who are not satisfied at all is 18.1% with 46 people; undecided with 128 people 50.4%; those who are satisfied are 31.5% with 80 people.

Table 4. 6 Minnesota Q3 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	10	3,9	3,9
Not Satisfied	83	32,7	36,6
Undecided	72	28,3	65,0
Satisfied	59	23,2	88,2
Very Satisfied	30	11,8	100,0
Total	254	100,0	

The question 3 is "I am…in Terms of Having the Chance to do Different Things from Time to Time." The answers given to having the chance to do different things from

time to time are given in Table 4.11. When the table is examined, it is seen that 35% were able to catch this opportunity and were satisfied. Those who were not satisfied at all were 36.6% with 93 people; undecided with 72 people 28.3%.

Table 4. 7 Minnesota Q4 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	2	0,8	0,8
Not Satisfied	18	7,1	7,9
Undecided	72	28,3	36,2
Satisfied	114	44,9	81,1
Very Satisfied	48	18,9	100,0
Total	254	100,0	

The question 4 is “I am… in Terms of Giving Me the Chance to be a "Respected Person" in Society.” The proportions of the answers given by the cockpit and cabin crew who evaluated their profession in terms of being a respected person in the society are given in Table 4.12. Accordingly, it is seen that mostly positive answers are given. Unsatisfied with 20 people, 7.9%. To this question, where the rate of undecided people is also high (28.3%), the majority of 162 people and 43.8% answered positive.

Table 4. 8 Minnesota Q7 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	4	1,6	1,6
Not Satisfied	35	13,8	15,4
Undecided	65	25,6	40,9
Satisfied	95	37,4	78,3
Very Satisfied	55	21,7	100,0
Total	254	100,0	

The question 7 is “I am… in Terms of the Fact that My Work does not Force Me to Act Contrary to My Conscience.” Table 4.8 shows the answers given to the work done

to force them to act against conscience. Those who were not satisfied at all were 15.4% with 39 people; undecided people make up 25.6% with 65 people. The rate of the dissatisfied and undecided corresponds to a minority rate of 40.9% in total. According to the answer given by the majority, there is no situation in the cockpit and cabin crew that leads the person to act against conscience. Because those who are satisfied are 59.1% with 150 people.

Table 4. 9 Minnesota Q8 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	2	0,8	0,8
Not Satisfied	56	22,0	22,8
Undecided	73	28,7	51,6
Satisfied	97	38,2	89,8
Very Satisfied	26	10,2	100,0
Total	254	100,0	

The question 8 is “I am… in Terms of Providing Me with a Stable Job.” Table 4.9 shows the answers given to the cabin crew providing a fixed job opportunity to the employees. Those who are not at all satisfied with this situation are 22.8% with 58 people; undecided people are at the rate of 28.7% with 73 people. The rate of those who think that they have a stable job opportunity in this profession is in the majority. Satisfied with 123 people 48.4%.

Table 4. 10 Minnesota Q9 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	6	2,4	2,4
Not Satisfied	56	22,0	24,4
Undecided	81	31,9	56,3
Satisfied	77	30,3	86,6
Very Satisfied	34	13,4	100,0
Total	254	100,0	

The question 9 is “I am… in Terms of being able to do Something for Other People.” The answers given to the possibility of doing something for other people, which can also be expressed as being able to serve others, are shown in Table 4.10. Naturally, 111 people and 43.7% were given a very high level of satisfaction in terms of professional requirements.

Table 4. 11 Minnesota Q10 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	4	1,6	1,6
Not Satisfied	45	17,7	19,3
Undecided	85	33,5	52,8
Satisfied	81	31,9	84,6
Very Satisfied	39	15,4	100,0
Total	254	100,0	

The question 10 is “I am… in Terms of Having the Chance to Tell People What To Do.” When Table 4.11 is examined, it is seen that the answers given to the situation of having the chance to tell people what to do are similar to the answers given to the previous question. Those who answered this question with satisfaction are as high as 47.3%, with a total of 120 people. The rate of undecided is 33.5% with 85 people; The rate of dissatisfied people is 19.3% with 49 people in total.

Table 4. 12 Minnesota Q11 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	8	3,1	3,1
Not Satisfied	48	18,9	22,0
Undecided	66	26,0	48,0
Satisfied	89	35,0	83,1
Very Satisfied	43	16,9	100,0
Total	254	100,0	

The question 11 is “I am… in Terms of Having a Chance to do Something with My Own Abilities.” The answers given by the cockpit and cabin crew to the chance to do something with their own skills are given in Table 4.12. According to these answers, those who were not satisfied at all were 22.0% with 56 people; those who are undecided are at the rate of 26.0% with 66 people; those who are satisfied are 51.9% with 132 people.

Table 4. 13 Minnesota Q15 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	12	4,7	4,7
Not Satisfied	61	24,0	28,7
Undecided	73	28,7	57,5
Satisfied	71	28,0	85,4
Very Satisfied	37	14,6	100,0
Total	254	100,0	

The question 15 is “I am… in Terms of Giving Me the Freedom to Apply My Own Decisions.” The answers given by the cabin crew to the freedom of implementation of their own decisions are shown in Table 4.13. Despite the issues mentioned in the previous paragraph, nearly half of the respondents answered the question as satisfied. 42.6% of 108 people are satisfied. Undecided with 73 people 28.7%; dissatisfied is 28.7% with 73 people.

Table 4. 14 Minnesota Q16 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	9	3,5	3,5
Not Satisfied	45	17,7	21,3
Undecided	73	28,7	50,0
Satisfied	89	35,0	85,0
Very Satisfied	38	15,0	100,0
Total	254	100,0	

The question 16 is “I am… in Terms of Giving Me the Chance to Use My Own Talents.” Table 4.14 shows the answers given to the chance to use one's own abilities.

According to this, those who are not satisfied at all are 21.2% with 54 people; undecided with 73 people at the rate of 28.7%; those who are satisfied are 35.0% with 89 people, and those who are very satisfied are 15.0% with 38 people.

Table 4. 15 Minnesota Q20 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	13	5,1	5,1
Not Satisfied	55	21,7	26,8
Undecided	68	26,8	53,5
Satisfied	83	32,7	86,2
Very Satisfied	35	13,8	100,0
Total	254	100,0	

The question 20 is "I am… in Terms of the Feeling of Success that I Feel for the Work I do." The answers given to the sense of achievement in return for the work done are given in Table 4.15. As can be seen, the vast majority of cabin and cockpit crews are satisfied with the sense of accomplishment they feel in return for the service they provide. Those who are very satisfied are 46.5% with 118 people; undecided 26.8% with 68 people; Those who are not satisfied are 26.8% with 68 people.

4.2.2. Findings of Job Satisfaction in Organizational Dimension

These are the findings regarding the 5th, 6th, 12th, 13th, 14th, 17th, 18th and 19th questions in the job satisfaction survey. Job satisfaction is a very important factor about personal motivation and personal happiness in people's work life. The answers given by the cockpit and cabin crew about the way their managers manage themselves are shown in Table 4.16.

Table 4. 16 Minnesota Q5 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	13	5,1	5,1
Not Satisfied	60	23,6	28,7
Undecided	96	37,8	66,5
Satisfied	69	27,2	93,7
Very Satisfied	16	6,3	100,0
Total	254	100,0	

The question 5 is "I am… in Terms of Management Style of My Managers and Supervisors." According to this, those who were not satisfied at all were 28.7% with 73 people; those who were undecided were 37.8% with 96 people; those who are satisfied have a rate of 33.5% with 85 people.

Table 4. 17 Minnesota Q6 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	8	3,1	3,1
Not Satisfied	75	29,5	32,7
Undecided	81	31,9	64,6
Satisfied	64	25,2	89,8
Very Satisfied	26	10,2	100,0
Total	254	100,0	

The question 6 is "I am… in Terms of My Superior's Ability to Make Decisions." Evaluating the decision-making abilities of their supervisors in Table 4.22, the flight crew were not satisfied at all with 83 people which means 32.6%; undecided at the rate of 31.9% with 81 people; They stated that they were satisfied with a rate of 35.4% with 90 people.

Table 4. 18 Minnesota Q12 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	6	2,4	2,4
Not Satisfied	53	20,9	23,2
Undecided	73	28,7	52,0
Satisfied	89	35,0	87,0
Very Satisfied	33	13,0	100,0
Total	254	100,0	

The question 12 is "I am… in Terms of Putting Business-Related Decisions into Practice." According to the answers given to the implementation of work-related decisions in Table 4.18, those who were not satisfied at all were 23.3% with 59 people; those who are undecided are 28.7% with 73; those who are satisfied represent 48.0% with 122 people.

Table 4. 19 Minnesota Q13 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	8	3,1	3,1
Not Satisfied	43	16,9	20,1
Undecided	75	29,5	49,6
Satisfied	81	31,9	81,5
Very Satisfied	47	18,5	100,0
Total	254	100,0	

The question 13 is "I am… in Terms of the Wages I Receive for My Work." As can be seen in Table 4.19, where the wages received are evaluated, those who were not satisfied at all were 20.1% with 51; undecided with 75 people 29.5%; those who are satisfied represent 50.4% with 128 people.

Table 4. 20 Minnesota Q14 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	14	5,5	5,5
Not Satisfied	50	19,7	25,2
Undecided	70	27,6	52,8
Satisfied	73	28,7	81,5
Very Satisfied	47	18,5	100,0
Total	254	100,0	

The question 14 is "I am… in Terms of Having the Opportunity to be Promoted in the Job." The answers given to the question about providing promotion opportunities in the job are given in Table 4.25. Those who are not at all satisfied with the possibility of promotion are 64 people, 25.2%; those who are undecided are 27.6% with 70 people; those who are satisfied have a rate of 47.2% with 120 people.

Table 4. 21 Minnesota Q17 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	11	4,3	4,3
Not Satisfied	42	16,5	20,9
Undecided	71	28,0	48,8
Satisfied	89	35,0	83,9
Very Satisfied	41	16,1	100,0
Total	254	100,0	

The question 17 is "I am… in Terms of Working Conditions." The answers given by the cockpit and cabin crew by evaluating the working conditions are given in Table 4.26. According to these answers, it is seen that those who are satisfied constitute the majority. Among them, those who were not satisfied at all were 20.8% with 53 people; undecided are the ones who answered this question with the highest rate and they make up 28% with 71 people.

Table 4. 22 Minnesota Q18 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	9	3,5	3,5
Not Satisfied	60	23,6	27,2
Undecided	73	28,7	55,9
Satisfied	76	29,9	85,8
Very Satisfied	36	14,2	100,0
Total	254	100,0	

The question 18 is "I am… in Terms of My Colleagues Agreeing with Each Other." In Table 4.22, there are answers of the cabin crew who filled out the questionnaire evaluating the agreement of their colleagues with each other. When the table is examined, we can say that the cockpit and cabin attendants are mostly in good relations and compatible with each other. The rate of those who are not satisfied is 27.2% with 69 people. Those who are satisfied are 44.1% with 112 people. The rate of undecided people is 28.7% with 73 people.

Table 4. 23 Minnesota Q19 Analyze

I am…	Frequency	Percentage	Cumulative Percentage
Not Happy at All	6	2,4	2,4
Not Satisfied	41	16,1	18,5
Undecided	63	24,8	43,3
Satisfied	95	37,4	80,7
Very Satisfied	49	19,3	100,0
Total	254	100,0	

The question 19 is "I am… in Terms of Being Appreciated for a Good Job that I Do." The ratio of the answers given by the cockpit and cabin crew to this question, in which the managers' appreciation of the good work done is evaluated, is shown in Table 4.28. Accordingly, it is seen that half of the respondents are satisfied. The rate of those who

are not satisfied at all is 18.5% with 47 people. The rate of undecided people is 24.8% with 63 people. Among the answers given to this question, the highest rate was those who said that they were satisfied with 144 people with a rate of 56.7%.

4.3. Findings of Fatigue / Burnout Syndrome

These are the findings regarding the emotional burnout, signs of desensitization and signs of personal feelings of failure.

4.3.1. Emotional Fatigue / Burnout Findings

These are the findings regarding the 1st, 2nd, 3rd, 6th, 8th, 13th, 14th, 16th and 20th questions in the burnout questionnaire. Emotional fatigue and it's level is very important for a flight crew because it may cause to emotional and psychological depression, anxiety or other problems.

Table 4. 24 MBI Q1 Analyze

	Frequency	**Percentage**	**Cumulative Percentage**
Never	12	4,7	4,7
Very Rare	51	20,1	24,8
Sometimes	56	22,0	46,9
Most of the Time	112	44,1	90,9
Always	23	9,1	100,0
Total	254	100,0	

The question 19 is "I Feel Cold from My Job." Table 4.24 shows the answers given by the cockpit and cabin crew about how often they feel cold about their work. 4.7% of 12 people who never felt cold; 51 people who rarely feel cold; 20.1%; sometimes 22 percent with 56 people; It is 44.1% with 112 people who feel most of the time and 9.1% with 23 people who always feel.

Table 4. 25 MBI Q2 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	7	2,8	2,8
Very Rare	41	16,1	18,9
Sometimes	110	43,3	62,2
Most of the Time	75	29,5	91,7
Always	21	8,3	100,0
Total	254	100,0	

The question 2 is "I Feel Mentally Tired After Work." The number and rate of those who feel mentally tired after returning from work are shown in Table 4.25. According to this, those who never felt tired were 2.8% with 7; those who rarely felt tired were 41 with 16.1%; those who sometimes felt tired were 43.3% with 110 people; Those who feel tired most of the time are 29.5% with 75 people and 8.3% with 21 people who always feel tired.

Table 4. 26 MBI Q3 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	11	4,3	4,3
Very Rare	75	29,5	33,9
Sometimes	73	28,7	62,6
Most of the Time	60	23,6	86,2
Always	35	13,8	100,0
Total	254	100,0	

The question 3 is "I Feel Tired When I Get Up in The Morning and Have to Face a New Work Day." In Table 4.26, the answers given to the feeling of tiredness caused by encountering the situation of going to work again when getting up in the morning are seen. It is striking that the rate of mental work fatigue felt when getting up in the morning is less than feeling mentally tired after the end of work. 4.3% of 11 people who never felt tired; those who feel very rare with 75 people 29.5%; those who

sometimes feel 28.7% with 73 people; those who feel most of the time are 23.6% with 60 people and those who always feel are 13.8% with 35 people.

Table 4. 27 MBI Q6 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	9	3,5	3,5
Very Rare	56	22,0	25,6
Sometimes	71	28,0	53,5
Most of the Time	84	33,1	86,6
Always	34	13,4	100,0
Total	254	100,0	

The question 6 is “It is Really Weary for Me to Deal with Problem People All Day.” Table 4.27 shows the ratio of cockpit and cabin attendants who think that dealing with problematic people on flights is exhausting. Those who say it is never abrasive are 3.5% with 9 people; those who think that it is abrasive very rare is 22.0% with 56 people; those who say it is sometimes abrasive are 28.0% with 71 people; Those who say it is often abrasive is 33.1% with 84 people, and those who say it is always abrasive are 13.4% with 34 people.

Table 4. 28 MBI Q8 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	7	2,8	2,8
Very Rare	53	20,9	23,6
Sometimes	69	27,2	50,8
Most of the Time	82	32,3	83,1
Always	43	16,9	100,0
Total	254	100,0	

The question 8 is “I Feel so Tired of My Work.” In Table 4.28, the answers given to feeling tired of the work done are given. According to this, those who never give up

were 2,8% with 7; those who rarely feel intimidated by 53 with 20.9%; those who think they sometimes get discouraged are 27.2% with 69 people; those who think that they are often intimidated are 32.3% with 82 people, and those who always feel intimidated are 16.9% with only 43 people.

Table 4. 29 MBI Q13 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	7	2,8	2,8
Very Rare	47	18,5	21,3
Sometimes	67	26,4	47,6
Most of the Time	88	34,6	82,3
Always	45	17,7	100,0
Total	254	100,0	

The question 13 is "I Feel that My Job Constrains Me." Table 4.29 shows the answers given by the cockpit and cabin crew to feeling that the job restricts them. Those who say that they never restrict are 2.8% with 7 people; 18.5% with 47 people who say that they restrict it very rarely; those who say that they sometimes restrict it with 67 people, 26.4%; Those who think that they restrict most of the time are 34.6% with 88 people and 17.7% with 45 people who say that they always restrict. According to these results, the rate of those who state that they do not have much problems with restriction (21.3%) is quite low compared to the rate of those who say that they generally restrict it (52.3%).

Table 4. 30 MBI Q14 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	12	4,7	4,7
Very Rare	48	18,9	23,6
Sometimes	62	24,4	48,0
Most of the Time	76	29,9	78,0
Always	56	22,0	100,0
Total	254	100,0	

The question 14 is “I Feel Like I'm Working Above My Strength in My Job.” The proportions of those who think that they are working beyond their power are as in Table 4.30. Those who think that they are not working above their strength constitute a small group of 4.7% with only 12 people. Those who think that they work beyond their power, although very rarely, have a rate of 18.9% with 48 people. 62 people marked sometimes that they work in a job that is beyond their power, and this number is 24.4%. Those who think that they work beyond their power most of the time are as high as 29.9% with 76 people. Those who claim that they always work above their power have a rate of 22.0% with 56 people.

Table 4. 31 MBI Q16 Analyze

	Frequency	**Percentage**	**Cumulative Percentage**
Never	9	3,5	3,5
Very Rare	42	16,5	20,1
Sometimes	70	27,6	47,6
Most of the Time	87	34,3	81,9
Always	46	18,1	100,0
Total	254	100,0	

The question 16 is “Working Directly with People is Causing Me a Lot of Stress.” The answers given to the fact that working directly with people causes too much stress are shown in Table 4.31. According to this, those who have never experienced stress are 3,5% with 9 people; those who rarely experienced stress was 16.5% with 42 people; those who sometimes experience stress is 27.6% with 70 people; Those who think that they are stressed most of the time are 34.3% with 87 people, and those who think that they are always stressed are 18.1% with only 46 people.

Table 4. 32 MBI Q20 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	20	7,9	7,9
Very Rare	53	20,9	28,7
Sometimes	71	28,0	56,7
Most of the Time	69	27,2	83,9
Always	41	16,1	100,0
Total	254	100,0	

The question 20 is "I Feel so Helpless." The answers given to the question of feeling very helpless are shown in Table 4.32. The answers to this question are mostly negative. Those who have never felt helpless have a very low rate of 7.9% with 20 people. Those who rarely felt helpless were 53 people with a rate of 20.9%; those who sometimes feel are 28.0% with 71 people; Those who often feel it is 27.2% with 69 people, and those who think they are always helpless are 16.1% with only 41 people.

4.3.2. Depersonalization Findings

These are the findings related to the 5th, 10th, 11th, 15th and 22th questions in the burnout questionnaire.

Table 4. 33 MBI Q5 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	6	2,4	2,4
Very Rare	41	16,1	18,5
Sometimes	108	42,5	61,0
Most of the Time	85	33,5	94,5
Always	14	5,5	100,0
Total	254	100,0	

The question 5 is “I'm Treating the People as a Different Entity Whom I Come Across as Part of My Job.” Table 4.33 shows the answers given to the question of perceiving people in the workplace as a different entity and acting accordingly. Those who never behaved in this way were 2.4% with 6; those who act very rarely 16.1% with 41 people; those who act sometimes, with 108 people, 42.5%; those who act most of the time are 33.5% with 85 people, and those who always see people differently and act accordingly are 5.5% with 14 people.

Table 4. 34 MBI Q10 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	12	4,7	4,7
Very Rare	38	15,0	19,7
Sometimes	73	28,7	48,4
Most of the Time	88	34,6	83,1
Always	43	16,9	100,0
Total	254	100,0	

The question 10 is “Ever Since I Started Working in this Business I Feel Like I'm Getting Hard on People.” Those who think they have never hardened are 4.7% with 12; 15.0% with 38 people who think that they rarely get hard; 28.7% of 73 people said that they sometimes get hard; those who feel hardened most of the time are 34.6% with 88 people and 16.9% with 43 people who feel hardened all the time.

Table 4. 35 MBI Q11 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	10	3,9	3,9
Very Rare	42	16,5	20,5
Sometimes	73	28,7	49,2
Most of the Time	82	32,3	81,5
Always	47	18,5	100,0
Total	254	100,0	

The question 11 is “I'm Afraid This Job will Harden Me.” According to the table, those who indicated that they never solidified were 3.9% with 10; those who felt stiffened very rarely were 16.5% with 42 people; sometimes solidified 28.7% with 73 people; those who feel solidified most of the time are 32.3% with 82 people and 18.5% with 47 people who are always solid now.

Table 4. 36 MBI Q15 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	12	4,7	4,7
Very Rare	50	19,7	24,4
Sometimes	67	26,4	50,8
Most of the Time	85	33,5	84,3
Always	40	15,7	100,0
Total	254	100,0	

The question 15 is “I Feel Like I don't Care about the People Whom I Meet for My Job.” It is seen in Table 4.36 that the answers given to the question of not caring about people are almost the same as the answers given to the last few questions. Those who do not care about people are 4.7% with 12; those who rarely don't care 19.7% with 50 people; sometimes they don't care 26.4% with 67 people; those who don't care most of the time are 33.5% with 85 people and 15.7% with 40 people who don't care anymore.

Table 4. 37 MBI Q22 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	10	3,9	3,9
Very Rare	52	20,5	24,4
Sometimes	71	28,0	52,4
Most of the Time	92	36,2	88,6
Always	29	11,4	100,0
Total	254	100,0	

The question 22 is “I Feel that the People I Meet as Part of My Job Acting as I Created Some of Their Problems.” The cockpit and cabin crews answered the question that the people they met at work felt that they acted as if they had created their own problems, and they mostly replied that they had such a feeling. According to the values given in Table 4.37, 10 people who never felt such a feeling were 3.9%; those who feel very rarely are 20.5% with 52 people. Those who felt sometimes were 28.0% with 71; those who often feel it is 36.2% with 92 people and 11.4% with 29 people who always feel this way. When we look at the ratios, it is seen that approximately 50% of the population is in distress about this issue.

4.3.3. Findings of Personal Achievement

These are the findings regarding the 4th, 7th, 9th, 12th, 17th, 18th, 19th and 21st questions in the burnout questionnaire.

Table 4. 38 MBI Q4 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	8	3,1	3,1
Very Rare	26	10,2	13,4
Sometimes	64	25,2	38,6
Most of the Time	101	39,8	78,3
Always	55	21,7	100,0
Total	254	100,0	

The question 4 is “As a Matter of My Job I Immediately Understand What the People Feel Whom I Met While Working.” Table 4.38 shows the answers given to the question about understanding how people feel. When the table is examined, it is understood that the majority gave a positive answer. Those who always understand are 21.7% with 55 people; those who understand most of the time make up the majority with 101 people at the rate of 39.8%. Sometimes those who can understand are 25.2% with 64 people; those who understand very rarely are 10.2% with 26 people, and those who do not understand at all are 3.1% with only 8 people.

Table 4. 39 MBI Q7 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	8	3,1	3,1
Very Rare	42	16,5	19,7
Sometimes	71	28,0	47,6
Most of the Time	96	37,8	85,4
Always	37	14,6	100,0
Total	254	100,0	

The question 7 is “As a Result of My Job I Find the most Appropriate Solutions to the Problems of the People I Encounter.” What is expected from cabin crew is to provide the most appropriate service to solve the wishes, needs and problems of the passengers who prefer them. Table 4.39 contains the answers given to the question about finding the most appropriate solutions to the problems. According to this, those who always find it are 14.6% with 37 people; most of the time, 37.8% with 96 people; sometimes 28.0% with 71 people; Those who find it very rarely are 16.5% with 42 people and 3.1% with only 8 people who can't find it at all. It is understood from this table that cabin crew mostly think that they are successful in what they do.

Table 4. 40 MBI Q9 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	12	4,7	4,7
Very Rare	52	20,5	25,2
Sometimes	57	22,4	47,6
Most of the Time	91	35,8	83,5
Always	42	16,5	100,0
Total	254	100,0	

The question 9 is “I Believe that I Contribute to People's Lives by the Work I Do.” Air transport provides fast transportation, which is one of the most important needs of people due to its feature. Thus, it is a business sector that contributes to people's lives.

Since this job is a team job and one of the most important contributions is made by the cabin crew by serving the passengers, it is expected that the answers given to this question will be mostly positive. Looking at Table 4.40, it is seen that the answers given to this question are as expected. Those who think they always contribute are 16.5% with 42 people; mostly contributors 35.8% with 91 people; those who think they sometimes contribute are 22.4% with 57 people. 52 people who think they contribute very rarely have 20.5%, and only 12 people who think they don't contribute at all have a rate of 4.7%.

Table 4. 41 MBI Q12 Analyze

	Frequency	**Percentage**	**Cumulative Percentage**
Never	12	4,7	4,7
Very Rare	55	21,7	26,4
Sometimes	60	23,6	50,0
Most of the Time	65	25,6	75,6
Always	62	24,4	100,0
Total	254	100,0	

The question 12 is “I am Strong Enough to do so many Things.” The answers given to feeling the power to do many things are given in Table 4.41. According to this, those who always feel strong are 24.4% with 62 people; those who feel strong most of the time are 65 with 25.6%; those who sometimes feel are at the rate of 23.6% with 60 people. Those who rarely feel this power are 21.7% with 55 people and 4.7% with 12 people who do not feel it at all. The reason why they feel capable of doing a lot can be thought of as the fact that most of the cockpit and flight attendants who answered the questionnaire are young and energetic, as well as the hope of a long future that awaits them.

Table 4. 42 MBI Q17 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	10	3,9	3,9
Very Rare	52	20,5	24,4
Sometimes	72	28,3	52,8
Most of the Time	71	28,0	80,7
Always	49	19,3	100,0
Total	254	100,0	

The question 17 is "I Create a Comfortable Atmosphere with the People I Meet as a Part of My Job." Table 4.42 shows the answers given to the question asked about the characteristics of creating a comfortable atmosphere with people. Those who always create a comfortable atmosphere are 19.3% with 49 people; most of the time the creators are 28.0% with 71 people; sometimes the creators are 28.0% with 72 people. Those who answered very rarely were 20.5% with 52 people, and 3.9% with 10 people said that they could not create a comfortable atmosphere at all.

Table 4. 43 MBI Q18 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	9	3,5	3,5
Very Rare	49	19,3	22,8
Sometimes	80	31,5	54,3
Most of the Time	79	31,1	85,4
Always	37	14,6	100,0
Total	254	100,0	

The question 18 is "I Feel Revitalized After Working Closely with People." Table 4.43 shows the answers given by the cabin attendants who participated in the survey to make them feel alive when they have a dialogue with people. According to this, those who always feel revitalized are 14.6% with 37 people; those who felt refreshed most of the time were 31.1% with 79; those who feel sometimes are 31.5% with 80

people. Those who rarely felt revitalized were 19.3% with 49 people, and 3.5% with 9 people who never felt this way.

Table 4. 44 MBI Q19 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	11	4,3	4,3
Very Rare	42	16,5	20,9
Sometimes	63	24,8	45,7
Most of the Time	83	32,7	78,3
Always	55	21,7	100,0
Total	254	100,0	

The question 19 is “I had a lot of Remarkable Success in this Business.” The answers given by the cockpit and cabin attendants who evaluated the achievements of many remarkable achievements are given in Table 4.44. According to this, those who think that they have always achieved significant success are 21.7% with 55 people; those who think this way most of the time, 32.7% with 83; those who say sometimes is 24.8% with 63 people. Those who think that they rarely achieve significant success are 16.5% with 42 people and 4.3% with 11 people who think that they have no significant success. Nearly a quarter of them have negative thoughts in terms of sense of achievement.

Table 4. 45 MBI Q21 Analyze

	Frequency	Percentage	Cumulative Percentage
Never	13	5,1	5,1
Very Rare	38	15,0	20,1
Sometimes	71	28,0	48,0
Most of the Time	74	29,1	77,2
Always	58	22,8	100,0
Total	254	100,0	

The question 21 is “I Approach to Emotional Problems in my Job with Calmness.” The answers given to approaching emotional problems calmly are shown in Table 4.45. Those who can always approach calmly are 22.8% with 58 people; 29.1% of 74 people are cool-headed most of the time; sometimes it is 28.0% with 71 people who can achieve this. Those who rarely manage to be cool are 15.0% with 38 people, and 5.1% with 13 people who can't approach at all.

4.4. Findings on the Relationship between Job Satisfaction and Burnout

Table 4. 46 The Relationship Between Job Satisfaction And Burnout

		Job Satisfaction	**Burnout**
Job Satisfaction	Spearman Correlation	1	.348*
	Sig. (2-tailed)	.	.000
	N	254	254
Burnout	Spearman Correlation	.348*	1
	Sig. (2-tailed)	.000	.
	N	254	254

* Correlation is significant at the 0.01 level (2-tailed)

When the findings in Table 4.46 are examined, it is seen that there is a negative relationship between total job satisfaction and total burnout. The relationship between the sub-dimensions of burnout and job satisfaction is shown in Table 4.47. According to this table, it is seen that all of the sub-dimensions are in a significant relationship with each other at the 0.01 level.

According to the findings in Table 4.47, "personal job satisfaction" and "organizational job satisfaction" sub-dimensions are positively related to each other and to the "personal feeling of failure" sub-dimension of burnout; There is a negative relationship with the sub-dimensions of "emotional burnout" and "depersonalization". There is a positive relationship between the "emotional burnout" and " depersonalization " sub-dimensions of the burnout questionnaire and a negative relationship with the sub-dimensions of job satisfaction. It is seen that there is a negative relationship between the "personal achievement" sub-dimension and the sub-dimensions of "emotional burnout" and " depersonalization ", which are among the sub-dimensions of burnout,

and a positive relationship with the sub-dimensions of job satisfaction. No significant relationship was found between demographic factors and job satisfaction and burnout.

Table 4. 47 Relationship Between Burnout And Job Satisfaction Sub-Dimensions

		Organizational Job Satisfaction	Personal Job Satisfaction	Emotional Burnout	Personal Achievement	Depersonalization
Organizational Job Satisfaction	Spearman Correlation	1.000	.438*	.202*	.236*	.101
	Sig. (2-tailed)		.000	.001	.000	.109
	N	254	254	254	254	254
Personal Job Satisfaction	Spearman Correlation	.438*	1.000	.314*	.324*	.211*
	Sig. (2-tailed)	.000		.000	.000	.001
	N	254	254	254	254	254
Emotional Burnout	Spearman Correlation	.202*	.314*	1.000	.483*	.538*
	Sig. (2-tailed)	.001	.000		.000	.000
	N	254	254	254	254	254
Personal Achievement	Spearman Correlation	.236*	.324*	.483*	1.000	.507*
	Sig. (2-tailed)	.000	.000	.000		.000
	N	254	254	254	254	254
Depersonalization	Spearman Correlation	.101	.211*	.538*	.507*	1.000
	Sig. (2-tailed)	.109	.001	.000	.000	
	N	254	254	254	254	254

* Correlation is significant at the 0.01 level (2-tailed)

CHAPTER V

DISCUSSIONS

The importance of human resources, especially in the air transportation sector, where the quality expectations of the customers are increasing and making a positive difference in the service offered in order to maintain the competitive power, is increasing day by day. The fact that the leading customer representatives of airline companies, in other words, cockpit and cabin crews, who are the face of the company in the field, have not been sufficiently studied in business science, leaves the steps to solve the problems they experience in the background. However, cockpit and cabin crew, where human relations are extremely important in the quality of service delivery, is a profession that brings efficient and profitable results to the company only if high job satisfaction and sufficient motivation are provided to its employees. However, at the beginning of the steps to be taken in order to solve the problems that cockpit and cabin crews working in the aviation sector are facing today, these problems should be scientifically revealed and discussed. The results obtained by evaluating the job satisfaction and burnout questionnaires applied to cockpit and cabin crews in this study are explained below with their sub-dimensions.

5.1. Discussion on Job Satisfaction at the Individual and Organizational Level

It has been observed that the answers given by the cockpit and cabin crew to the questions about the degree of occupation of the job, the suitability of the working environment and the ability to do different jobs from time to time regarding individual job satisfaction are very close to each other. People in an intense working environment where the same tasks are repeated may experience both physical and mental fatigue with boredom after a certain period of time. This can lead to job dissatisfaction and burnout in the future. Despite the fact that the same things are always repeated in the cabin crew job, meeting different passengers from different cultures, flying to different destinations, different cabin crew members in most missions, and most importantly, the satisfaction and pride of achieving a job are the factors that reduce the effect of

uniformity in the job. These factors are considered to be the most important reason why the majority of cabin crews gave positive answers to the above-mentioned individual job satisfaction questions. Therefore, the perceived individual job satisfaction level is positively supported.

In parallel with the rapid acceleration in the aviation industry in recent years, increasing the need for cockpit and cabin crew of companies, it has also increased the interest of people who are looking for a profession in this profession. In addition to its prestige in the society, the attractiveness of flights to many touristic centers makes this profession especially popular among young people. The fact that the cockpit and cabin crew, who evaluate their profession in terms of being a respected person in the society, mostly gave positive answers, shows that they have adopted the job they do and understand its importance. The continuous growth and continued growth of the national civil aviation sector for the last 19 years, especially with the effect of liberalization in domestic routes in 2002, brought along the need for qualified personnel. The risk of being unemployed has also decreased at a time when companies are almost competing with each other in order to avoid shortages not only in the cockpit crew but also in the cabin crew. It is highly likely that a flight attendant who continues to do his/her job well will continue to stay within the company. Therefore, it can be evaluated that the cabin attendants who answered the questionnaire were not very worried about this issue.

Cockpit and cabin crews try to help passengers by providing services and trying to meet their needs. Due to this feature, it can be thought that those who gave a negative or undecided answer to the question among the people who were asked to evaluate their jobs in terms of "providing the opportunity to help others" in the job satisfaction survey experienced job dissatisfaction in their profession. It is considered that the main reason for this negative thought is that they are exposed to mental fatigue due to tiring and stressful service delivery. Because the main element of the profession is to serve others, namely passengers, and the fact that the question asked is clear, understandable and clear strengthens this possibility. It tries to help passengers by providing service and trying to meet their needs. Due to this feature, it can be thought that those who gave a negative or undecided answer to the question among the people who were asked to evaluate their jobs in terms of "providing the opportunity to help others" in the job

satisfaction survey experienced job dissatisfaction in their profession. It is considered that the main reason for this negative thought is that they are exposed to mental fatigue due to tiring and stressful service delivery. Because both the fact that the main element of the profession is to serve others, namely passengers, and the question asked is clear, understandable and clear, strengthens this possibility. It tries to help passengers by providing services and trying to meet their needs. Due to this feature, it can be thought that those who gave a negative or undecided answer to the question among the cabin attendants who were asked to evaluate their jobs in terms of "providing the opportunity to help others" in the job satisfaction survey experienced job dissatisfaction in their profession. It is considered that the main reason for this negative thought is that they are exposed to mental fatigue due to tiring and stressful service delivery. Because both the fact that the main element of the profession is to serve others, namely passengers, and the question asked is clear, understandable and clear, strengthens this possibility.

It is seen that the answers given to the situation of having the chance to tell people what to do are similar to the answers given to the previous question. Because cabin crews that perform the service have to tell the passengers about their course of action and what to do in which situation due to the characteristics of the working environment. In answering this question with dissatisfaction or indecision, the cabin attendants' thinking about the problematic and belligerent passengers they encountered during the service delivery may have been effective. The most frustrating and tiring factors for the aviation profession are the aggressive behaviors and impossible and irrational demands of the problematic, incompatible and belligerent passengers. When such passengers are told about their behavior during travel, negative reactions can be received as stated above. These negative situations are the situations that cabin crew come across very often and they have to make great efforts to overcome. In the face of these well-known situations, flight attendants' feeling helpless and lonely leads to professional attrition.

The autonomy of the cockpit and cabin crew is very limited. Because there are standards and policies determined by the airline company regarding service delivery. It is often not possible to go beyond these standards. They do not have a chance to take the initiative in the face of sudden situations. In addition to the obligation to comply with company standards and policies, they must obtain the approval of the captain in

charge of the aircraft. Because the responsibility of maintaining the flight operation safely and smoothly belongs to the captain. Therefore, the fact that cabin crews cannot find the freedom to easily implement their own decisions and use their special talents as they wish in their job are the issues that affect individual job satisfaction relatively negatively. It was seen in the survey that the answers given to the questions related to these were similar and almost half of the cabin crew were either dissatisfied or undecided on this issue.

When the answers given to the questionnaire are evaluated, it is concluded that the main factors that positively affect the individual level of job satisfaction of cockpit and cabin crew are as follows:

i. Less affected by work uniformity
ii. Being aware of the prestige and value of their profession in society
iii. With the rapid and continuous development of the civil air transport sector, the decrease in the concern of being unemployed due to the increase in the need for personnel
iv. Emotional pleasure due to the ability of the work to help others

In addition to the high level of job satisfaction in general, the limited autonomy and the inability of approximately one-third of the cabin crew to express their satisfaction with their personal sense of accomplishment are considered as a situation that should be considered institutionally.

From the beginning of their business life, employees feel the need to make a career plan in order to guarantee and shape their future, as well as meeting their immediate basic vital needs. They want to know what they may encounter over time within this career plan and what they need to do to reach their goals. Having a promotion system that will enable them to become better socially and economically on the way to their goals is a factor that positively supports organizational commitment as well as increasing the motivation and productivity of employees. It is an important human resources management policy that should be implemented in the business world, regardless of the sector, through fair and encouraging promotion practices. Working conditions are one of the most important factors affecting the choice of employees to

change jobs. After the salary, one of the most questioned situations when choosing a job is working conditions. In addition to the negative answers given to the question about working conditions in the survey, there are also those who are satisfied with the working conditions and even very satisfied. This situation leads to the conclusion that there is a need for the management to examine the working conditions together with the cabin crew and to implement the possible improvements. Employees should be interviewed and remedial steps should be taken in order to turn the ideas of the undecided into a positive direction, since the issue that will most affect the people who have just started the cockpit and cabin crew job will be the working conditions. The harmony of colleagues with each other and the quality of communication are undoubtedly a factor that affects the peace at work, work performance and satisfaction with the work done. The flight crew is not just the pilots who are in the cockpit and manage the aircraft. Very important duties such as the safety, control and supervision of the passenger cabin, which is behind the cockpit section and which constitutes a very large part of the aircraft, meeting the needs of hundreds of passengers, directing the passengers in emergency situations and evacuating them, if necessary, are among the responsibilities of the cabin crew. The smooth and safe execution of all these activities depends on the agreement of the cabin crew working as a team and their ability to communicate effectively. Like all employees, flight attendants want their managers to appreciate them in return for their superior performance, quality and friendly service and efforts. Spiritual satisfaction is as important as material satisfaction in the work done. People who are financially satisfied in many business areas, but who do not feel emotionally attached to their job or the company they work for, and therefore cannot experience moral satisfaction, can easily quit their job. For this reason, it is extremely important that the reward-punishment mechanism is applied fairly in airline companies as in other businesses.

According to the result obtained by calculating the averages of the scores of the answers given when the values in the job satisfaction level scoring table are taken as a criterion, it is seen that the flight attendants have a "moderate" organizational job satisfaction with an average of 3.04 points. It is evaluated that the factors affecting the lower level of organizational job satisfaction compared to individual job satisfaction are as follows:

i. Although cabin crew are generally satisfied with their supervisor's management style and decision-making abilities, they are not as satisfied with the implementation of the decisions made
ii. Discomfort caused by remuneration policy and low wages, which is one of the most important motivational tools
iii. Approximately half of the cockpit and cabin crews evaluate promotion opportunities as insufficient
iv. Discomfort at not being appreciated enough for good job performance

In the light of all the above-mentioned data, it is seen that the job satisfaction level of cockpit and cabin attendants is at a “moderate” level with a score of 2.88.

5.2. Discussion on Fatigue Factors in the Effect of Job Satisfaction and Burnout

While about half of the cockpit and cabin attendants do not experience much difficulty in cooling off from work, the fact that the ratio of those who live most of the time and always corresponds to a total rate of 53.2% should be considered as a problem that should be questioned. In addition, the 22% group, who marked that they were undecided, may easily start to feel cold very often due to some negative factors such as the management's approach, frequency of flights, being away from the family, and low wages may go towards mental and physical fatigue. Those who are exposed to mental fatigue most of the time and all the time after returning from work constitute a remarkable 37.8% in total. It is considered with a high probability that those who feel tired sometimes start to feel fatigued more often due to the fact that the work conditions do not change or get more intense. Being physically and mentally rested, energetic and dynamic is a necessity, especially for those who do high-paced and stressful jobs. On the contrary, employees who feel tired by starting work "in the morning before they even start" will not be able to show their determination and will to deal with stressful and difficult situations during the working hours, and will get even more tired. If this is repeated continuously and frequently, after a while, the employees will show signs of mental fatigue. Approximately 37.4% of cockpit and cabin attendants responding to the survey experience this feeling frequently. The fact that cockpit and cabin crews experience such a feeling of fatigue, even if they are a minority, requires that the issue

be examined institutionally and that the problem should be revealed and resolved. More than half of the cockpit and cabin crew (51.9%) think that they are overworked. If we add the undecided to this rate, there is a very high rate (76.3%) of cockpit and cabin crew who think that they are working beyond their power. Factors that may cause them to think in this way can be listed as irregular working hours, comparison of the wages according to the work they work, excessive time spent away from home, and very busy flights. If this is repeated continuously and frequently, after a while, the employees will show signs of excessive physical and mental fatigue. The issues that negatively affect the mental fatigue level of cockpit and cabin crews can be summarized as follows:

i. Being away from home for a long time due to frequent and long flights, physical and mental fatigue after returning from work, low wages and coldness from work as a result of poor management styles
ii. Thinking that you are being overworked
iii. Mental fatigue felt when starting work

It is seen that the behavior of the majority of crew members towards people does not change depending on the time they spend in the profession. However, it is understood that a portion of 39% tend to approach passengers as if they are a different entity apart from the natural behavior they should have. About 51.5% of them state that they feel tougher towards the passengers, and 50.8% of them clearly feel that they are getting tougher. In addition, it can be concluded that 47.6% of the crew, who do not care about the passengers and feel as if they have created some of their problems, experience burnout at the level of insensitivity. Considering the fact that this situation can create a crisis that may result against the company at any time, it is considered to be a result that should be carefully considered as a fatigue factor.

In general, although they do not cool off from their work, they feel mentally fatigued after returning from work; The fact that they feel they are working on their strength due to the intense flight tempo and the variability of the working hours drags the cockpit and cabin crews to emotional fatigue. The low rate of cabin crew, whose attitudes and thoughts towards passengers are becoming increasingly rigid and who see them as a different object rather than as customers to whom quality service will be

provided, keeps the level of fatigue in the dimension of depersonalization at low levels. Although many of the cockpit and cabin crews, as the most visible and prominent employees of the aviation industry, which is the favorite of the transportation world, understand the importance and value of the work they do, the negative thoughts of some of them negatively affect the feeling of personal failure. Accordingly, if the issues that disturb the cockpit and cabin crew, who have a moderate level of emotional fatigue and a sense of personal failure, the level of fatigue will likely increase. Accordingly, it is considered that the company may be adversely affected by the increase in customer dissatisfaction and personnel turnover rate. However, it should not be forgotten that the emotional fatigue and burnout of cockpit and cabin crews does not mean that they will definitely quit their job. Because there are many factors that force them to do this job. For example, factors such as being above the minimum wage, the popularity of the profession and its value in the eyes of the public may outweigh the salaries, even if they are well below expectations. Regardless of the occupational group, the most important and effective method to be followed in the fight against fatigue is the ways of coping with stress, which are largely similar to burnout. For this reason, it would be appropriate to apply scientific methods on the subject. These can be summarized as follows:

i. First of all, there should be a serious desire to cope with stress and make some positive changes in life
ii. “Recent Life Events List”, which determines how often negative events are experienced and the degree of their impact on life; “Stress Source Scale”, which determines the source of stress; It is necessary to determine which methods are appropriate in the fight against stress by applying the "Stress and Anxiety Scale" applications that reveal the bodily response during stress
iii. The correct breathing technique should be learned because of its relaxing, oxygenating and relaxing properties
iv. Among bodily relaxation techniques, biofeedback (biological feedback), autogenic (self) relaxation, progressive relaxation and physical exercise practices should be learned and applied

Airline company managers need to meet with the employees at regular intervals, know their thoughts and needs, in order to learn the elements that help increase the level of

organizational commitment, motivation and job satisfaction in cockpit and cabin crews. Using verbally motivating statements, rewarding those with high job performance, and flexible flight schedules are important for the perception of company support. When evaluated from this point of view, the communicative identities of the managers come to the fore so that the employees do not experience burnout. The level of fatigue is determined not only by the relations with the customers, but also by the social relations and communication style among the employees within the company or between the employees and the management. Although it is impossible to completely eliminate fatigue in today's intense competitive environment, practices that will increase the job satisfaction of flight attendants and reduce their fatigue should be tried to be included. For this purpose, airline company managers should communicate with expert academicians and support studies to determine methods that will have a positive impact on flight attendants. The fact that the job performance and service quality of cabin attendants is a very important factor contributing to the commercial success of the national air transport sector as well as the company they work for should be well known by the national civil aviation authority. In this context, the aviation authority should take radical decisions and include the job satisfaction and fatigue levels of sector employees as flight safety multipliers among the company evaluation criteria.

CHAPTER VI

CONCLUSIONS

Small mistakes caused by fatigue accumulates and become more difficult in the future that causes serious errors and resultant accidents or massacres. A difficulty encountered in studies of measuring fatigue is that the perception of fatigue is mostly subjective and relative. Although exact findings are not obtained as much as a blood test, it is necessary to try to make an objective measurement as much as possible. Fatigue is not a disease, but because it is as problematic as the disease, the word "cure" is used to cure it. Methods used in the treatment of fatigue; to reduce physical strain and stress, to create opportunities for mental and physical rest, and to take measures to increase the motivation of employees. In this study, it is aimed to be a guide to the managers who have to take the necessary precautions by mapping the fatigue-oriented problems.

Unfortunately, we should accept that flight crew fatigue literature has certain limits. Most experimental studies were not conducted with cockpit and cabin crew or conducted only with cockpit crew. Several studies have proved that fatigue can significantly impair people's ability to perform duties and tasks that requires manual dexterity, high concentration and complex thinking. Fatigue is not only an uncomfortable sensation to be suffered because fatigue reduces peoples' performance. Fatigue is an experience of physical or mental weariness that results in reduced alertness(Boksem et al., 2005). For most people, the major cause of fatigue is having insufficient rest and recovery from previous activities. In a simple term, fatigue mainly results from insufficient quantity or quality of sleep because both factors mean equal importance to recover from fatigue and to maintain normal alertness and performance. An insufficient quantity or quality sleep series of nights causes a sleep debt which results as increased fatigue.

This research was carried out by adopting a "positivist" approach, with an "instant" method in terms of the time it covers and a "descriptive" method in terms of its

purpose. The "survey" method was used to obtain the data. The target population of the research is the cockpit and cabin crews of the scheduled and non-scheduled airlines operating in the Turkish civil aviation sector. For the reasons stated under the scope and limitations of the research, the cockpit and cabin attendants of the airline companies that are not named as the research sample, but that perform scheduled and non-scheduled domestic and international passenger transportation flights. Although the number of cockpit and cabin attendants working in the companies is tens of thousands, 254 people answered the questionnaire. A total of 48 questions consisting of the Minnesota job satisfaction questionnaire and Maslach burnout questionnaire applied to the cockpit and cabin crews forming the sample.

People in an intense working environment where the same tasks are repeated may experience both physical and mental fatigue with boredom after a certain period of time. This can lead to job dissatisfaction and burnout in the future. Despite the fact that the same things are always repeated in the cockpit and cabin crew job, meeting different passengers from different cultures every day, flying to different destinations, different cockpit and cabin crew members in most missions, and most importantly, the satisfaction and pride of accomplishing a job are the factors that reduce the effect of uniformity in the job.

Although it is impossible to completely eliminate burnout in today's intense competitive environment, regulations should be tried to be included that will increase the job satisfaction of cockpit and cabin crews and reduce their burnout. For this purpose, airline company managers should communicate with expert academicians and support studies to determine methods that will have a positive impact on cockpit and cabin crews.

Further researches can be done about COVID-19 pandemic’s effects on cockpit and cabin crew fatigue and burnout factors.

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APPENDIXES

APPENDIX A

Minnesota Job Satisfaction Survey

	Not Happy at All	Not Satisfied	Undecided	Satisfied	Very Satisfied
1.From my job, in terms of keeping me busy					
2.In terms of the suitability of the working environment.					
3. In terms of having the chance to do different things from time to time					
4. In terms of giving me the chance to be a "respected person" in society					
5. In terms of management style of my managers and supervisors					
6. In terms of my superior's ability to make decisions					
7. In terms of the fact that my work does not force me to act contrary to my conscience					
8. In terms of providing me with a stable job					
9. In terms of being able to do something for other people					
10. In terms of having the chance to tell people what to do					
11. In terms of having a chance to do something with my own abilities					
12. In terms of putting business-related decisions into practice					
13. In terms of the wages I receive for my work					
14. In terms of having the opportunity to be promoted in the job					
15. In terms of giving me the freedom to apply my own decisions					
16. In terms of giving me the chance to use my own talents					
17. In terms of working conditions					
18. In terms of my colleagues agreeing with each other					
19. In terms of being appreciated for a good job that I do					
20. In terms of the feeling of success that I feel for the work I do					

APPENDIX B

Maslach Burnout Inventory

	Never	Very Rare	Sometimes	Most of the Time	Always
1. I feel cold from my job					
2. I feel mentally tired after work					
3. I feel tired when I get up in the morning and have to face a new work day					
4. As a matter of my job I immediately understand what the people feel whom I met while working					
5. I feel like I'm treating the people as a different entity whom I come across as part of my job					
6. It is really weary for me to deal with problem people all day					
7. As a result of my job I find the most appropriate solutions to the problems of the people I encounter					
8. I feel so tired of my work					
9. I believe that I contribute to people's lives by the work I do					
10. Ever since I started working in this business I feel like I'm getting hard on people					
11. I'm afraid this job will harden me					
12. I am strong enough to do so many things					
13. I feel that my job constrains me					
14. I feel like I'm working above my strength in my job					
15. I feel like I don't care about the people whom I meet for my job					
16. Working directly with people is causing me a lot of stress					
17. I create a comfortable atmosphere with the people I meet as a part of my job					
18. I feel revitalized after working closely with people					
19. I had a lot of remarkable success in this business					
20. I feel so helpless					
21. I approach to emotional problems in my job with calmness					
22. I feel that the people I meet as part of my job acting as I created some of their problems					

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