NEAR EAST UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
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MASTER'S PROGRAMME

MASTER'S THESIS

TURKISH VALIDITY AND RELIABILITY STUDY OF MULTIDIMENSIONAL FATIGUE INVENTORY

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Prepared by

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Examining Committee in Charge

Assoc. Prof. Dr. Ebru ÇAKICI	Near East University Department of Psychology
Assoc. Prof. Dr. Zihniye Okray	European University Of Lefke Department of Psychology (Supervisor)
Assist. Prof. Dr. Deniz Ergün	Near East University Department of Psychology

Approval of the Graduate School of Social Sciences

Assoc. Prof. Dr. Mustafa SAĞSAN

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I Fatma Bubble Kurtgan, hereby declare that this dissertation entitled "Turkish Validity and Reliability Study of Multidimensional Fatigue Inventory" has been prepared myself under the guidance and supervison of "Assoc. Prof. Dr. Zehra Oluay" in partial fulfilment of The Near East University, Graduate School of Social Sciences regulations and does not to the best of my knowledge breach any Law of Copyrights and has been tested for plagarism and a copy of the result can be found in the Thesis.

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ABSTRACT

TURKİSH VALIDITY AND RELIABILITY STUDY OF MULTIDIMENSIONAL FATIGUE INVENTORY

Fadime BUDAK KURTGÜN

Master Thesis, Department Of Psychology
Supervısors: Assoc. Prof. Zihniye OKRAY
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The purpose of the study is to investigate the effect of sociodemographic characteristics on the fatigue level of healthy university students and to qualify Turkish validity and reliability of the Multidimensional Fatigue Inventory (MFI) developed to assess fatigue by Ema Smets.

Multidimensional Fatigue Inventory was translated into Turkish by a medical doctor and a psychologist who know Turkish and English very well. Afterwards, the translated version was evaluated by another expert to make the final decision on the Turkish version of the inventory.

The study was conducted in May-September 2016 with the participation of healthy university students who were educated at Near East University. The number of participants was 403 distributed as %43,9 female, and %56,1 male.

In order to determine the Turkish validity of MFI, the Fatigue Severity Scale (FSS) was used. The study of reliability was carried out by a method known as the MFI parallel form reliability.

Analysis of the internal consistency of the MFI were found to have a Cronbach alpha coefficient α=0,860 over the total score of the respondents' responses to the MFI questionnaire. The alfa coefficients for the sub-dimensions of the MFI scale were found as the following: 0.60 for general fatigue, 0.63 for physical fatigue, 0.60 for reduced activity, 0.51 for reduced motivation, and 0.646 for mental fatigue.

It was seen that the MFI scale was highly reliable. Principal component factor analysis was applied to the survey results in order to determine the construct validity of the MFI questionnaire. In the principal component factor analysis, Kaiser-Meyer-Olkin (KMO) value was first evaluated, and found to be 0.885 in the study.

The results of the factor analysis show that the MFI used in the study has been structred with the four factors that is different from its original. The number of processing factors was conducted again with five factors as it is in the original.

According to the gender the study participants have, the faculties they are studying at, the number of course hours they are attending in a week, the place where they are living, whether they have health insurance, whether they do sport activities, whether they consume caffeinate beverages, whether they use alcohol, it was found that there are statistically significant differences in the MFI scores of the participants.

This study concluded that MFI is a valid and reliable scale. The results of the correlation analysis demonstrated a positive and linear relationship between scales.

Keywords: Multidimensional Fatigue Inventory, Validity, Reliability, Sociodemographic factors.

ÖZ

MULTİDİMENSİONAL FATİGUE INVENTORY (ÇOK BOYUTLU YORGUNLUK ENVANTERİ) TÜRKÇE GEÇERLİLİK VE GÜVENİLİRLİK

Fadime BUDAK KURTGÜN

Yüksek Lisans, Psikoloji Anabilim Dalı
Danışman: Doç. Dr. Psk. Zihniye OKRAY
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Bu çalışmanın amacı, yorgunlugu degerlendirmek için Ema SMETS tarafından geliştirilen Multidimensional Fatigue Inventory (Çok Boyutlu Yorgunluk Ölçeği) nin Türkçe geçerlilik ve güvenilirliğini belirlenmesi, sağlıklı üniversite öğrencilerinin, sosyodemografik özelliklerinin yorgunluk düzeyleri üzerine etkisinin araştırılmasıdır.

ÇBYÖ, Türkçe'yi ve İngilizce'yi iyi derecede bilen biri Tıp hekimi, diğeri psikolog olan iki kişi tarafından Türkçe'ye çevrildi. Daha sonra başka bir uzman tarafından çeviriler değerlendirilip ölçeğin son haline karar verildi.

Çalışma Mayıs – Eylül 2016 tarihleri arasında Yakın Doğu Üniversitesi'nde eğitim gören, sağlıklı 403 üniversite öğrencisi (%43,9'u kadın, %56,1erkek) üzerinde yapıldı. Türkçe ÇBYÖ geçerliliğini belirlemek amacıyla Yorgunluk Etki Ölçeği (YEÖ) kullanıldı. ÇBYÖ 'paralel form güvenilirliği' olarak bilinen bir yöntemle güvenilirlik çalışması yapıldı.

ÇBYÖ nin iç tutarlığına ilişkin analizler katılımcıların verdiği cevapların toplam skoru üzerinden cronbach alfa katsayısı α=0,860 bulundu. Ölçeğin alt boyutlarının α katsayısı ise; genel yorgunluğun değerlendirmesi için 0,60, fiziksel yorgunluk için 0,63, azalmış aktivite için 0,60, azalmış motivasyon için 0,51 ve mental yorgunluk için 0,646'dır.

MFI ölçeği yüksek derecede güvenilir olduğu görülmüştür. MFI anketinin yapı

geçerliliğini belirlemek amacıyla uygulanan anket sonuçlarına temel bileşenler faktör analizi uygulandı. Temel bileşenlerin faktör analizinde ilk olarak Kaiser-Meyer-Olkin (KMO) değerine bakıldı. Çalışmada KMO değeri 0,885 olarak bulundu.

Yapılan analizde anketin orijinalinden farklı olarak 4 faktörlü yapıya sahip olduğu görüldü. İşlem faktör sayısı orijinalindeki gibi 5 faktörle tekrar yapıldı.

Cinsiyete göre, Okudukları fakülteye göre, Öğrencilerin haftada kaç saat ders aldıkları, Sağlık güvencesi olup olamaması, Kaldığı yere, Spor aktivitelerinin olup olmadığına göre kafeinli içecek içme durumuna göre, alkol kullanmalarına göre, bakıldığında MFI de anlamlı farklılıklar olduğu görüldü

Koralasyon analiz sonucunda ölçekler arasında pozitif ve doğrusal bir ilişki olduğu görülmüştür. Çalışmamızda ÇBYÖ' nin geçerli ve güvenilir bir ölçek olduğu belirlendi.

Anahtar Kelimeler: MFI, Geçerlilik, Güvenilirlik, sosyodemoğrafik faktörler

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ABBREVIATIONS

ÇBYÖ :Çok boyutlu yorgunluk ölçeği

YEÖ :Yorgunluk etki ölçeği

MFI :Multidimentional fatigue inventory

FSS :Fatigue severity scale

CFS :Choronic fatigue sendrome

NANDA :North American Nursing Diagnosis

ICD :World health organization international classification

CDC :Centers for Disease Control and Prevention

1. SUMMARRY OF LITERATURE FATIGUE

1.1. Definition of Fatigue

Fatigue is a universal phenomenon that is experienced healthy and ill persons. Although variations of definition there is a consensus that fatigue is subjective, multidimensional and multifactorial phenomenon. Fatigue is defined as unpleasant physical perception and with the common strategies for storing energy it is an exhaustion not eased. Its duration and density vary and it is stated that fatigue can ease the daily activities in different levels (Amaducci et.al., 2010).

There is no commonly accepted definition of the fatigue. Fatigue is a special symptom affecting quality of life, damaging functionality, causing not using the capacity (Bal, 2011). Individuals defines fatigue as decrease in energy, exhaustion, feeling of burnout, deterioration in motivation and concentration, sleeplessness, depression, blurred vision and boredom (Karakoç, 2008; Ghaderi and Shamsi 2014; paintful-bladder).

Fatigue and feeling fatigue differ from each other. Feeling fatigue is a temporary situation. Mostly fatigue is originated from life style of individual. Working, malnutrition, sleeplessness, decreases in daily activities, increase in work load density and responsibilities in social life can affect the fatigue. This situation can be got over by resting for some days or some weeks. But fatigue is a decrease in energy deterioration of physical and mental functionality of individual. Fatigue can last long time (Karakoç, 2008).

In Turkish, fatigue is decrease in mental and body activities due to working or another reason (Sozluklamine.com). “Fatigue” is called as fatigue in English. It is derived from France word “fatigue”. Fatigue is a decrease in energy, weariness and exhaustion because of physical activities. According to Collins English Dictionary it is decease in physical force and mental inadequacy depending on the energy consumption. Fatigue draws attention of some theoretician in different disciplines and subject of discussion. It has so many definitions in different disciplines.

Individual differences, having long time and being subjective result to continuation of definition confusion of fatigue (Karakoç, 2008).

In 1988 nurses theoretician of the North American Nursing Diagnosis Association (NANDA) has accepted fatigue as diagnosis of nursing. NANDA defines fatigue as feeling of exhaustion which is lasting long, decreasing physical and mental performance. Hard working conditions, performance above their capacities, working hours lasting long are called fatigue in nursing definition (Güven,2010; Bayram, 2010; Amaducci et.al., 2010).

Different expert areas make different definitions of fatigue. Pathologists define it symptom of neuromuscular, metabolic diseases. Psychologists define it perceptual disorder, concentration difficulty and mental inadequacy. Physiologists define it as decreasing physical activities (Eğlence, 2011). At the end of the studies on rheumatoid arthritis patients, Tack defines fatigue as subjective symptom with the feeling of burnout syndrome. At the end of the studies on multiple sclerosis patients Hubsky and Sears (1992) find similar results with Tack. On the other hand, Appels and Mulder (1988) define fatigue as not doing anything requiring physical force due to decreasing of energy and a burnout syndrome accompanying these symptoms. These definitions include definition of Piper (1986). Piper defines fatigue as complicated structure seen physiologic and psychologic symptoms together (Eğlence, 2011). According to Carpentio(1992) fatigue is defined as serious symptom do not recovering with resting, feeling of burnout syndrome, continues feeling of fatigue, serious decline of physical and mental activities(Cameron et.al., 2006). Gordon defines fatigue likewise Carpentio. Because of being subjective complaint man researches have made different definitions of fatigue. But there are some properties of fatigue that all of them make a consensus. Some of them are as follows;

-differing from depending on the experiences and perception of the patients

-not knowing the exact cause

-even though not depending on the chronic disease, made of all laboratory and radiologic surveys, not having a physical and mental disease it can be seen on the healthy individuals.

-feeling of inadequacy in terms of physical, emotional, social, cognitive

-seen on most of the society and not knowing the duration

-diagnosis and recovering of fatigue is difficult and so it causes that person experiences difficulties in his life (Karakoç, 2008; Ghaderi and Shamsi, 2014).

On the other hand, some researchers emphasize that fatigue differs from individual differences and defined with different words. Some of them are as follows; decrease in performance with the infirmity, anhedonia of working, decrease in performance with weakness, more need of energy routine works indeed, increasing of fatigue after exercise, increasingly continuing of distress with feeling of exhaustion (Loblay, 2002).

Furthermore in some studies Cella and his friends define fatigue as not only physical but also mental deficiency in capacity, energy and weakness (Cella et al, 2005; Lasseter 2009). Tiesinga, Dassen, Halfens and Van Den Heuvel say that increasing volume of fatigue causes to weariness and exhaustion from fatigue. Fatigue is a normal reaction of body as a result of daily activities. If impact and severity of the fatigue is much more than usual this situation is called as exhaustion. These researchers have stated that properties of fatigue should be inclusive, constant and periodic. Ream and Richardson define weariness as short term decrease in force and ability of working (Lasseter, 2009). But fatigue is thought as chronic and painful period individuals. On the other hand, weakness is defined as brain and neural system defect which is an obstruct for discharging responsibility of individuals. In fatigue individuals do some determinant activities willingly whereas in weakness they do not (Ream and Richardson, 1996). Weariness, exhaustion and fatigue have different meanings. Because of not having same meanings, it is stated that these terms cannot be used instead of fatigue (Ulukavak, 2004).

1.2. History of Fatigue

Although fatigue is evaluated as single handed disease it is expressed in different terms in history. Because of being specific, accompanying different disease, showing

individual differences and being subjective it is difficult to make definition of fatigue. First doctor in history that accepts fatigue as disease is Hippocrates. He observes the symptom of fatigue depending on the destruction of jenital region of grooms (Candansayar and Sayın, 2007, Asdemir and others, 2006). In 1750, Manningham hypothermia defines fatigue that envelopes all body with fatigue and pain symptoms (Sayın, 2012). In 1764 de Bouchut evaluated fatigue as neuropathy (Candansayar and Sayın, 2007). From the 18th century to present fatigue attracts some of the disciplines. In19th century defined fatigue as neurasthenia and it is used as chronic fatigue syndrome at USA (Sayın, 2012). On the other hand Cullen says that destruction of strength of nervous system or weakness cause to some diseases and fatigue rises to the surface as a symptom. Silas Weir Mitchell is the first person using "asthenia" for people feeling war stress in American War. Neurologist Victor and Ropper is the first person that using psychomotor asthenia. Mac Cobe states that depression and mental asthenia are different. There are so many terms resulting for complaints of asthenias and not used present but resemble each other; neurocirculatory asthenia, DaCosta syndrome, heart of soldier, subacute asthenia, cardiac norozsubacute, functional cardiac vascular disease, chronic asthenia, myalgic encephalomyelitis. These so many terms causes to contradiction in terms (Candansayar ve Sayın, 2007). In First World War first research was done in the industry area and impact of fatigue to performance was examined. Similar research was done 2nd War pilots and check lists for fatigues was prepared. Later on this list has been used by nurse researchers. Myalijk encephalomyelit known also as Royal Free disease thought as post viral fatigue syndrome. In 1955 at London, with the myalgic and fatigue motor and sensory epidemic was observed at the common most of clinics of Royal Free Hospital. It was thought as infection affecting to brain and muscles at first. When comes to the middle of 1980's it was published that there is a strong resemblance between Epstein Bar virus and chronic fatigue (Gölcür, 2014). Taking have a look at present, according to some researcher asthenia is a different physical disease like chronic fatigue syndrome. There are also some ones that advocate fatigue is a psychologic disorder. Asthenia is called neurasthenia or chronic asthenia. On the other hand some people stated that fatigue is observed with the physical, psychiatric disease or irregular and intensive life style. They also stated that underlying cause is psychologic. Asthenie is tackled as a clue forming with physical, emotional, behavioral and cognitive components. Asthenie may be not only a disease

but also a symptom depending on the life style and causing perception disorder. Neurasthenia is a disease whose primary complaint is ”fatigue” accompanying with physical and psychologic complaints. Because of having complex structure, although in World Health Organization International Classification (ICD-10) it is ranked as at the neurasthenia, it does not have a classification in American Classification System. In American Medical Literature chronic fatigue syndrome is accepted as similar to neurasthenia. There are some ones who have opinion that neurasthenia has similar symptoms with chronic asthenia (Eğlence, 2011). According to Frenches as fatigue syndrome, chronic asthenia and myalgic encephalomyelit can be interchangeable in Britain Medical.

1.3. Symptoms of Fatigue

Fatigue is not only common in chronic patients but also in healthy people. Most important symptoms of fatigue taken detailed anamnesis from people come to the hospital with fatigue complaint are as follows; not doing daily activities by passing time, not concentrating to something, disordering functionality, having difficulties in social activities, increasing of physical complaints, changing of nutrition habits, decrease in weight, continues changing of emotional situation, unrest, bother, depressive mood, losing of cheer, not enjoying life, incuriousness to environment, sexual anorexia, weakness, sleeping disorder, disorder of mental ability, having a quick temper, having behaviours causing accidents forgetfulness. Fatigue is a subjective disorder and prompts to people to feeling of exhaustion (Karakoç, 2008; Amaducci, 2010; Aykar, Kangas et.all, 2008, Kuruoğlu and Albayrak).

Fatigue can emerge depending on the activities or independent of the activities. Because of this reason it should be researched whether is pathologic or not. Not having a disease known or unknown by individual that chronic or acute, physical or psychological and normal results of all laboratory and radiological investigation make it easy to diagnose fatigue. For example, in some diseases fatigue is a result of first symptom. Patients experiencing myocardial infarction fatigue is a first sign before infarction period. Most of the cancer patients fatigue is determined as among

the most important factors that is destructive, annoying, preventing someone for carrying out personal needs and causing workforce losses (Karakoç, 2008; Kangas et.al., 2008; Lin, J.M.S. et.al., 2009). Or fatigue may be side effect of a drug. Sometimes despite of one or two week usage sedative-hypnotic drugs, antidepressants, neuromuscular blockers, morphine derivatives, antihypertensives, antihistaminics and drugs including so many antibiotics are commonly connected with fatigue. If there is no diagnosed disease, fatigue should be evaluated as acute or chronic and its treatment should be organized (Malik et al., 2008)

1.4. Chronic Fatigue Syndrome (CFS)

Chronic fatigue syndrome, besides to more fatigue is a complex health problem that it is not recovered by resting, not let to individual to do daily activities, may be lasting from some months to years, not being an exact reason, emerging suddenly, occurring continuously with definite period. Its severity and impact change according to patients. It can be observed each age, sex and it leads to trouble to people (Baltaretsou and Reveals, 2013)

This syndrome may bring some symptoms like as; throat ache, of sensitiveness of lymphatic, muscle and joint pain, sleep disorder, concentration disorder, psychiatric disorder, memory weakness, and chronic contagious ones. It cannot be explained with any physical and psychologic disorder, it lasts at least 6 months. With this disorder there is decline in daily activities and it ruins individual, social, occupational and mental functions. Chronic Fatigue Syndrome (CFS) is observed very frequently in society (Asdemir et.al., 2006; Kılıçarslan, 2007; Özerol, 1994; Twisk, 2015). It is observed more frequently in 40 and above age and women more than men. In a research done, its rate of incidence in adults is between 0,02 % and 2,8 %. But common belief is that this rate is more than mentioned ones (Duman, 2014). Social researches show that CFS complaints are commonly observed in developed countries. According to American Health and Nutrition Research Chronic prevalence is 14,3 % for men whereas 20,4 % for women. Although fatigue problems

do not need medical intervention, ın America each year more than two million people visit to policlinic of internal diseases (Lewis and Wessely, 1992)

According to Buchwald CFS is a chronic disease that has so many symptoms and results, showing more than one symptoms for diagnosed patients, accompanying with physical disease (İstek, 2008). In USA CDC (Centers for Disease Control and Prevention) disease was called as CFS and to provide definite standards for this patient groups specific diagnosis criterias were brought up (Kahve, 2008). CFS concept was firstly used with this specific diagnosis criteria. Afterwards England, Australia and North America made their own CFS definitions. Because of emerging different definitions of it mentioned diagnosis criteria were established by CDC. These criteria are currently used nowadays. CFS are also known as İmmune Disfunction Syndrome (KYIDS) or Myalgic Encephalome or Fibromyalgia Syndrome. All of the alternative definitions are used to understand CFS in detail and gather information about it rather than proving CDC (Savaş, 2014; Lewis and Wessely, 1992).

CFS patients state that before starting of disease their energy level declines and activities are restricted. Period of disease changes depending on the patient and disease can last for years. Vagueness of the reason of the CFS still continues. Not having a defined treatment causes a problem for patients. Having a determined symptom for acute and chronic disease makes difficult to make diagnose. To make diagnose other diseases should be excluded. Especially depression and chronic fatigue can be confused (Asdemir, 2006). Depression diagnosed people have some symptoms like as; depressive mood, not enjoying of life, desperation, guilt feelings, eating disorder, uneasiness, impairment of concentration and care, feeling small, slowness of movements ,decline in self-respect and suicide ideation (Tezcan, 2000). Although it is possible to experience depression and fatigue simultaneously, in order to manage the cure of fatigue doctors should differentiate depression from fatigue. Fatigued patients state that they do not do specific activities because of insufficient energy or weakness. Whereas depression and boring are associated with a definition of general disease that cause to not able to do anything (Malik, 2008).

Diagnose Criteria for CFS (1994 CDC)

Minor criteria

Unexplained and severe fatigue last more than 6 months

1-mild temperature

2-throat ache

3-painful and sensitive arm pit lymph nodes

4-muscle fatigue that has no cause

5-muscle pains

6-incipient head ache or different type of headache

7-fatigue that does not pass with resting in 24 hours

8-joint swelling and wandering pain without sensitiveness

9-neurophysiologic symptoms

10-sleeping problems

Major Criteria

Fatigue that lasts at least 6 months and cause impairment or decline of activity of individual

1-explicit impairment in concentration or memory

2-throat ache

3-muscle pain or hardening

4-joint pain

5-recently started head ache

6-poor quality sleeping

7-long lasting fatigue after exercise

In order to make diagnosis at least 4 minor criteria should be in addition to major ciriteria. However there are patients that do not meet these criteria. These patients are diagnosed as idiopathic chronic fatigue. Idiopathic chronic fatigue (causes not

known) lasts at least 6 months and does not meet fatigue severity and number of criteria exactly (Asdemir, 2006; Kılıçarslan, 2007; Bayram 2010.)

1.5. Epidemiology

It is predicted that prevalence of fatigue is more than thougt. Because of not having clear symptoms, not having a consensus about diagnose, not making clear measurements, changing of symptoms and course of disease depending on each patient, it is difficult to determine how many patients are (Chang, 2010). Most of the diagnoses are sporadic and there is no finding that CFS is a contagious disease.

Another difficulty for diagnosing CFS is that there are other diseases sharing similar symptoms with it. Fibromyalgia, temporomandibula, joint disorder, irregular intestine syndrome, interstitial cystitis, migraine, disorder of thyroid, Raynoud phenomenon and depression (Schembri, 2014).

It is thought that CFS is a heterogeneous disease that does not have one cause. It is thought that CFS triggers infection, toxins, physical and psychologic rooted diseases. For defining etiology of CFS at least 6 months duration is required. Most of the studies it is hard to determine causative factor (Nisenbaum et.al., 2003).

CFS can be observed in people from every sex, race and income level. It is found that it is observed more frequently in white women and outcome studying people. It is reported that CFS is less more observed in 12-18 teenager than adults (Barker, 2012). No CFS reported below 12 ages. It is found that individuals who have family member with CFC has more risk. It is observed that child with CFS has probability of having CFS family member with 50 %.

Exact prevalence and incidence of CFS is not known. According to research done in USA it is predicted that population of CFS is 0,44 % or % 1 in society. It is observed more frequently in women than men (Ranjith, 2005). Without any race or ethnic origin discrimination complaint about this disease is made. Mostly observed in between ages of 30 and 50 (Chang et.al., 2010)

It was observed that prevalence gap is too wide. According to a study done in USA it is predicted that probability of occurrence in healthy societies is between 14 % and 20 %. For patients applying to primary care health service it is reported that it is between 10 % and 20 %. Wide cohort prospective clinical trial study done in England shows that correlation between factors affecting life and causuing CFS. Taking have a look at the results patients states they had active life before the CFS. Frequency for development of CFS is tenfold for people who work with continuous physical activity between ages 31-43 (Boshuizen et.al., 2004).

For chronic patients effect of fatigue depends on psychology, social conditions and course of disease. CFS is observed with so many diseases like as heart diseases, immune system diseases, HIV, chronic renal impairment, cancer and so on. According to a study it is found that CFS prevalence is 1 % for rheumatoid patient at West and threefold for woman. Especially for these patients CFS is increased by way of depression and rheumatoid arthritis ache. Frequently observed effects of CFS for lung cancer and COPD disease are as follows; decrease in Daily activities, mental disorder, not carrying on social life and decrease in life quality. According to studies 92,5 % of renal impairment patients, 30%- 55% of MI experienced patients, 92% of congestive heart failure patients have faced with mild or severe fatigue, mental, physical and emotional impairments. Another study done in Taiwan University it is found that there is a big rate of CFS for master degree students. Risk factors for young adults are not only existing chronic disease and sleeplessness but also lack of physical activities (Chen et.al., 2007). An epidemiologic study done in Norway 11,4 % worth of note fatigue is observed. This rate is high and it makes us think that it prevents to people for doing Daily activities.

According to another research 83,5 % of nursing students have complaints about fatigue and 20 % of them effect of fatigue are more than effect of daily activities (Amaducci et.al., 2010). Research done in İran, medical students are more prone to CFS because of heavy lesson weight, requirement of attending clinic area and other reasons.

This situation has some physical and psychological impacts on medical student community who is very important for increasing public's health in future (Ghaderi and Shamsi, 2014). Common symptoms among students are fatigue and unrest sleep.

On the other hand, research done in Turkey it is found that symptoms are commonly observed in women students. According to answers given in questionnaire it is observed that students correspond to CFS by 2 %, idiopathic chronic fatigue by 7 % and continuous fatigue criteria by 25 % (Aslan and others, 2014).

Most of research done for fatigue claim that diseases thought correlated with fatigue and other factors are independent. But situation may not be like this. Long term studies done after temporary fatigue it is found that premorbid symptoms are correlated with severe fatigue risk. These results guide before psychiatric diseases or advices for people prompted to fatigue symptoms. Some variables like recovering methods, beliefs about disease and following treatments affect the risk of chronic fatigue (Lewis and Wessely, 1992).

1.6. Aetiopathogenesis

CFS's pathogenesis is not known better than its etiology. Causes of disease are not found exactly (Özerol, 1994; Bateman and others, 2012). There are not any laboratory diagnostic tests for fatigue syndrome. Up to now there is not any abnormal diagnosed test results characterized with CFS (Bateman and others, 2012). Many theories have been asserted for factors affecting CFS (Özerol, 1994). Acute viral infections and psychiatric diseases are among the first theories (Bateman and others, 2012). Subsequent theories are thought as differences in brain structure and function, neuroendocrine dysfunction, sleep disorders, immune system, decreases in muscle forces and environmental factors (Candansayar and Sayın, 2000). Another opinion asserted that biomedical anomaly, oxidative stress, genetic susceptibility, transmission via pathogenic or nonpathogenic virus, immune dysfunction, hypothalamic hypophysis adrenal anomaly, psychologic factors, psychosocial factors (Bateman and others, 2012; Twisk, 2005). Up to now it is not proved that CFS is correlated with causes and effects of viral diseases. Similarly it is also not proven that there is no relationship between bacterial diseases. But it is estimated that inflammatory situation (may not be infective or post infective) occurring with CFS is a result of common bond pain, myalgia, symptoms like flu and painful

lymphadenopathy (Bateman 2012). Table 1 shows a possible CFS model as mulysystemic disease. Although results obtained by different researches are contradictory recent period studies done in order to evaluate difficulties developed by physical or cognitive activities are more consistent. More importantly these incentive studies will reveal basic symptom of fatigue after exercise. Future studies done for defining importance of effort on various diseases may clarify the multidimensional disease.

1.7. Immune System Anomalies

For CFS patient immune system anomalies are prone to increase, decrease or may be related with severe symptoms. But determined immune system anomalies are not continuous or special to a disease.

Table 1: Multisystem Disorder

Factors creating tendency

↓

Triggers

- ✓ Acute or chronic infections
- ✓ Environmental toxins
- ✓ Major physical/ emotional trauma

↓

Immune Reply

(Brain, spinal cord, neural system, hormones)

↓

- ✓ Muscle Symptoms: Pathologic fatigue, fatigue after exercise, muscle and joint pains, flu symptoms

- ✓ Central nervous system symptoms: Fatigue/weariness after exercise, memory and concentration difficulties, head ache, sleep disorder, depression/ anxiety
- ✓ Neuroendocrine symptoms: Hot cold intolerance, remarkable weight gain/loss, decrease in stress tolerance
- ✓ Immune Symptoms: Throat ache, pain nodes, new sensitiveness to drugs, foods, chemicals.
- ✓ Autonomous Symptoms: Orthostatic intolerance, vertigo, heart-throb, irritable bowel syndrome, urinary system disorders.

Immune system findings observed in CFS patients

- •Changing to Th2 which is a dominant immune reply due to domination of humoral on cell-mediated immunity
- •Immune activation because of increasing of number of activated T lymphocyte containing high cycling sitotoxin and sitotoxin cells.
- •Weak cellular function due to low natural cytocide
- •2-5 A synthetase antiviral defence disorder due to increasing of low molecular weight.
- •Occasional result of low level antinuclear antibody, low level rheumatoid factor, thyroid antibody, lyme disease antibody

Symptoms like fatigue and flue may associate with increase of level of various cytokine. Disorder of Rnase L road supports the hypothesis that viral infection has a role of pathogenesis of diseases (Twisk, 2005; Fletcher et.al., 2008; Koneru and Klimas, 2007).

1.8. Neuroendocrine Disorder

Studies done with CFS patients one or more than one neuroendocrine disorders below were found

- ✓ Mild adrenal insufficiency and decreased daily cortisol variation
- ✓ Decrease in HPA'a axis function which may affect adrenal, gonad and thyroid function
- ✓ Depression in DHEA reply to ACTH injection in spite of normal basal level.

- ✓ Low IGF1(somatomedin) level and excessive growth hormone reply to pyridostigmine
- ✓ Increase in prolactine reply to buspiron.
- ✓ Disorder of plasma metabolism proved by low subgrade level arginine vasopressin
- ✓ In comparison with control groups relatively low level of aldosterone of patients
- ✓ Increase in neuropeptide level (releasing in brain and sympathetic nervous system after stress) is probably related with failure of HPA's axis.

  Neuropeptide Y levels in plasma are associated with serious/severe symptoms

  (Bartgis, 2012; Mccleary and Vernon, 2010; Demitrack, 1997; Wyller, 2007).

1.9. Brain Anomalies

Static and dynamic neuroimaging, EFG studies, examination of cerebrospinal fluid reveal structural, functional, metabolic and behavioral linked with brain anomalies. These anomalies are not intrinsic to diseases or continuous. But they can give clues for pathophysiology of the diseases. These findings contain listed below:

- ✓ Extensive decrease in grey matter and high signal intensity dotted areas(white points)
- ✓ Cerebral perfusion and decrease in glucose metabolism
- ✓ In comparison with the control groups more area of brain's working for processing of new information
- ✓ In comparison with the control groups slowing of reply of cerebral activity to accelerator and visual refreshing activities
- ✓ Increase in ventricular lactic acid
- ✓ Decrease in slow sleep wave, long duration sleep delay
- ✓ Existence of special protein in cerebrospinal fluid (Sayın, 2012; Twisk, 2015; Devanur and Kerr, 2006).

1.10. Mental Disorder

Mental anomalies are primary preventive property of CFS frequently. These types of anomalies may constrain ability of engaging activity, planning and completing activities in real life conditions. Documented anomalies contain some problems like as short duration memory disorder, slowdown in speed of processing, weakness in learning new information, slowdown in duration of concentration and giving attention, difficulties in remembering words and increase in distractibility (Mccleary and Vernon, 2010; Brown et.al., 2013).

Mental processing may degenerate because of light, voice, multiple stimuluses and/or activity done rapidly and even high sensitiveness to social routine interaction. Standard neurocognitive test series may not find mental disorder experienced by patients in real life. Individuals can array their personal resource in partially ideal evaluation environment and short evaluation period. But patients may not make an effort requiring continuous performance (school, work, etc.) and long periods. Dense mental activity cause decrease in cognitive function and at the same time symptoms after exercise originate from physical activities (Griffith and Zarrouf, 2008 ; Demitrack, 1997; Wyller, 2007).

1.11. Autonomy/ Cardiovascular Disorders

Autonomy dysfunction may originate from upright posture disability or standing faint or feeling weak (orthostatic intolerance). Such conditions it may show results like tilt table testing hypotension (NMH), postural orthostatic tachycardia syndrome (Mccleary and Vernon, 2010; Lucin and Pagani, 1999; Dehghan et.al., 2015).

Some CFS patients may complain about heart throb and continuing tachycardia during resting. Audit with holter device may disclose benign cardiac rhythm disorder and repetitive oscillatory T wave changes and/or flatten T waves which are not specific. By using EKG doubtful diastolic dysfunction were certified for some CFS patients. This doubtful diastolic dysfunction may originate from lack of energy in

cellular level. Low blood volume was found in some CFS patients (Maes and Twisk, 2009; Bested and Marshall, 2015).

1.12. Mitochondrial/ Energy Production Anomalies

Studies done last period claim that mitochondrial dysfunction is an essential cause underlying energy deficit of CFS patients. A range of proofs show disorder of aerobic energy production. As a result of this disorder effort of patient may exceed aerobic capacity or activate anaerobic metabolic roads (whose effect is very low in energy production). This process is ended up with production of lactic acid or disorder of metabolic processing of ATP/ADP. But the role of disorder of metabolic processing cannot be explained for production of pathologic fatigue production, fatigue after exercise and longtime recovery period (Booth and Marshall, 2009).

Proof of mitochondrial anomalies contain followings; mitochondrial myopathy, disorder in oxygen consumption during exercise, activation of anaerobic exercise at early phase of exercise, increase in level of brain ventricular lactate acid. Cardiopulmonary exercise test study (depending on the exercise) programmed for successive two days shows that abnormal recovery result referring metabolic dysfunction. In contrast to, healthy control groups increased their exercise performance a little or reproduced their performance at the end of two days. And this shows that recovery occurs after first exercise (Twisk, 2015; Biiling Ross et.al., 2016; Booth and Marshall, 2009).

1.13. Gene Studies

Gene studies done for CFS asserts that expression of specific genes can be changed. These contain expression change in immune modulation (arrangement), oxidative stress and apoptosis. Some different genomic sub groups are reported.

Being of some of these sub groups are associated with severe symptoms (Asthon et.al., 2012).

One of the control studies done recently two sub groups of CFS patients are defined with change of gene explanation after exercise. MRNA also shows an increase for bigger sub group sensory and adrenergic receptors and cytokine. Most of the patients with smaller sub groups orthostatic intolerance and expression of adrenergic alpha 2A receptor decreases after exercise (Bested et.al., 2003).

A study done in Australia on twins for determining CFS pathogenesis it is thought that it may be with gene. Most of the researchers think that its etiology is very sophisticated and it depends on many variables (Asdemir and others, 2003).

Fatigue is commonly observed physical symptom for patients having chronic diseases like arthritis and cancer. Complaints of patients are associated with psychiatric diseases like depression and anxiety or biologic factors. Fatigue can be explained with care and cure related factors for patients having physical disease like cancer or chronic disease and depression (Ceyhan, 2012). But at primary care service, there are many reasons that biologic factors cannot explain for patients whose major component is fatigue (Lewis and Wessely, 1992).

Pathogenesis of fatigue disease are classified in four primary areas; physical diseases, demographic factors, life style factors and social factors. Life style and social factors play very important role for young adult. Insufficient physical activity can be associated with fatigue. Risk factors for fatigue prevalence among working and young adult population are so insufficient (Chen.et.al., 2007).

2. MATERIAL AND METHOD

2.1. Purpose

Translation of Multidimensional Fatigue Inventory, used for evaluating fatigue, to Turkish, determination of its validity and reliability, researching of healthy university students' sociodemographic properties on fatigue level.

2.2. Location of Study

After taking ethics committee approval our study was performed on Near East University's students continuing their education based on voluntariness.

2.3. Duration of Study

Our study is planned to carry out between May-September 2016.

2.4. Sample

Research was carried out on students of Near East University aged between 18-25 ages. The purposive sampling method was used. Sample of research is approximately 403 people. At the end of the commitment of individuals who do not experience any mental and/or physical disorder in past or recently, not use drag, not having an operation recently, are not pregnant, it was aimed to reach data by talking face to face, having informed consent form signed.

2.5. Evaluation

In addition to Multidimensional Fatigue Inventory (MFI) and Fatigue Severty Scale (FSS) an evaluation form was created for recording demographic and other data of individuals. This form contains some data such as sex, age, height, weight, smoking, marital status, education level, occupation, job status. All of the statistical analyses are carried out by SPPS 20 packaged software.

2.6. Method

MFI was translated to Turkish from English by two person (doctor and psychologist) who know English and Turkish well. After translations were evaluated by another expert and final state of scale was performed.

It is aimed to perform study on 403 students taking education at Near East University between May-September 2016. For determining Turkish Multidimensional Fatigue Inventory (MFI) Fatigue severty Scale (FSS) is used. Reliability work is done by a method known MFI parallel form reliability.

2.7. Multidimensional Fatigue Inventory (MFI)

MFI is core notification scale. Current version contains 20 questions including different dimensions of fatigue. These 20 questions is formed 5 different sub scale. Each sub scale contains 4 questions/sentences. Each scale is balanced in order to decrease question's tendency impact as much as possible. Each sentences in subgrade scales are arranged to measure fatigue (2 sentences) and opposite to fatigue (2 sentences). For example "I'm tired" or "I feel fit". Experimental subject/patient should evaluate each situation/sentence by taking into consideration how he feels in recent times. Within this scope scale is designed to detect chronic fatigue not to detect acute fatigue or fatigue originating from an effort or medical treatment. Scale should be sensitive to variations such as derived from treatment. Because of this reason time frame cannot be very long. It is consisted of 5 point likert scale question; "yes true" and "no false". Experimental subject choose the best option explaining his situation. Original studies done there are sub scales determined; General Fatigue, Physical Fatigue, Reduced Activity, Reduced Motivation and Mental Fatigue.

High points refer high fatigue. 2, 5, 9, 10, 13, 14, 16, 17, 18, 19 bullets are coded reversely. Total point changes between minimum 4 maximum 20. Total point is calculated by summing of all bullets. Finally when common belief/predict about the level of fatigue appears, questions also appear about whether sub level of scales affect the general evaluation and to what extent. If no matter how individual is interested in only one indicator of fatigue, we advise him to use general fatigue part of the scale. Points for each sub scale are obtained summing of each bullet one by one. (Smets et.al., 1995)

2.8. Fatigue Severity Scale

Scale consists of 40 questions. First 10 bullets evaluate the cognitive situation; second 10 bullets evaluate the physical situation and third 20 bullets evaluate psychologic situation. Each question is pointed between 0(no problem) and 4(maximum problem). Maximum score is 160. At 2007 it was carried out in Turkish by Armutlu and his friends.(Armutlu and others)

2.9. Procedure

After taking ethics committee approval it is aimed to reach students taking education at Near East University. It is planned that duration of tests carried on lasts approximately 40 minutes.

It is targeted to reach 500 students in two weeks. Purpose of the study is explained to the participants by researcher. After approval is taken from participants by informed consent. Procedure of research is determined in order to determine the validity and reliability of MFI in Turkish, to measure the effect of sociodemographic factors of healthy university students on fatigue level. After completing questions participants will be thanked and Informative Form will be given. Gathered data will be entered to SPSS 20.00 and statistical analyses will be done.

3. THE RESULTS OF THE STUDY

3.1. Analysis Methods:

After data collection was completed, the gathered data was entered into the SPSS 20.0 statistical analysis program to perform statistical analysis on computer. The reliability of MFI questionnaire was calculated using the Cronbach alpha coefficient. Factor analysis was used to examine the factor structure of the MFI questionnaire. It was investigated the frequency, percentage, and arithmetic mean of dependent and independent variables. In order to determine the relationship between dependent and independent variables, t-Test and ANOVA tests were used. For the purpose of the examination the relationship between the MFI scale and its sub-dimensions, Pearson correlation analysis was employed.

3.2. Reliability Of Multidimensional Fatigue Inventory (MFI) And Fatigue Severity Scale (FSS):

Based on the internal consistency analysis of FSS, Cronbach alpha coefficient value was found to be α=0.947 over the total score of the participants' responses to the questionnaire. It was revealed that fatigue severity scale is highly reliable.

The reliability of the scale was investigated in terms of internal consistency, item correlation. The MFI scale was subjected to the reliability analysis so that the expressions (items) having low reliability could be identified before the factor analysis was performed.

The analysis regarding the internal consistency of the scale showed the value of Cronbach alpha coefficient as α=0.860 over the total score of the participants' responses to the questionnaire. The MFI scale was seen to be highly reliable. The Cronbach's Alpha table is presented below (Table 1).

Table 1. MFI Scale Cronbach's Alpha

MFI total scale		
Cronbach's Alpha value	**0,860 (0,80-1,00: highly reliable)**	
Scale item	**Corrected item - total correlation**	**Delete Cronbach's Alpha**
item_1	0,434	0,854
item_1	0,353	0,857
item_1	0,617	0,847
item_1	0,539	0,850
item_1	0,405	0,855
item_1	0,366	0,857
item_1	0,538	0,850
item_1	0,557	0,850
item_1	0,382	0,856
item_1	0,387	0,856
item_1	0,567	0,849
item_1	0,398	0,856
item_1	0,296	0,859
item_1	0,497	0,852
item_1	0,381	0,856
item_1	0,477	0,852
item_1	0,468	0,853

item_1	0,422	0,855
item_1	0,468	0,853
item_1	0,462	0,853

Regarding the internal consistency of the scale's sub-dimension ''general fatigue'', the Cronbach alpha coefficient value was found to be α=0.593. It was indicated that general fatigue sub-dimension scale of the MFI had a low degree of reliability. The Cronbach's Alpha table is provided below (Table 2).

Table 2. MFI scale "General Fatigue" sub-dimension cronbach's alpha

	MFI General fatigue scale	
Cronbach's Alpha Value	**0,593 (0,40-0,59: less reliable)**	
Scale item	**Corrected item-total correlation**	**Delete Cronbach's Alpha**
item_1	0,429	0,481
item_5	0,364	0,530
item_12	0,443	0,466
item_16	0,268	0,600

The internal consistency of the sub-dimension scale ''physical fatigue'' of the MFI was found to be α=0.634. The reliability of the Physical Fatigue sub-dimension of the MFI scale was revealed as quite reliable. The Cronbach's Alpha table is presented below (Table 3).

Table 3. MFI scale "Physical Fatigue" sub-dimension cronbach's alpha

	MFI Physical Fatigue scale		
Cronbach's Alpha Value	**0,634 (0,60-0,79: quite reliable)**		
Scale item	Corrected item-total correlation	Delete Alpha	Cronbach's
item_2	0,355	0,608	
item_8	0,445	0,546	
item_14	0,435	0,550	
item_20	0,426	0,556	

The Cronbach Alpha coefficient value for the internal consistency of the sub-dimension scale ''reduced activity'' of the MFI was found to be α=0.603. The reduced activity sub-scale of the MFI was demonstrated as quite reliable. The Cronbach's Alpha table is presented below (Table 4).

Table 4. MFI scale "Reduced Activity" sub-dimension cronbach's alpha

	MFI Reduced Activity scale		
Cronbach's Alpha Value	**0,603 (0,60-0,79: quite reliable)**		
Scale item	Corrected item-total correlation	Delete Alpha	Cronbach's
item_3	0,362	0,548	
item_6	0,406	0,516	

item_10	0,421	0,503
item_17	0,347	0,560

Concerning the internal consistency of the MFI scale's sub-dimension ''reduced motivation'', the Cronbach alpha coefficient value was found to be α=0.507. It was seen that Reduced Motivation sub-scale of the MFI was pretty much reliable. The Cronbach's Alpha table is provided below (Table 5).

Table 5. MFI scale "Reduced Motivation" sub-dimension cronbach's alpha

	MFI Reduced Motivation Scale	
Cronbach's Alpha Value	**0,507 (0,40-0,59: less reliable)**	
Scale item	Corrected item-total correlation	Delete Cronbach's Alpha
item _4	0,313	0,425
item _9	0,257	0,477
item _15	0,305	0,431
item _18	0,327	0,410

For the internal consistency of ''mental fatigue'' sub-dimension scale of the MFI, the Cronbach alpha coefficient value was found as α=0.646. It was indicated that the reliability of the Mental Fatigue sub-scale of the MFI was quite high. The Cronbach's Alpha table is presented below (Table 6).

Table 6. MFI scale "Mental Fatigue" sub-dimension cronbach's alpha

	MFI Mental Fatigue Scale	
Cronbach's Alpha Value	**0,646 (0,60-0,79: quite reliable)**	
Scale item	Corrected item-total correlation	Delete Cronbach's Alpha
item_7	0,498	0,527
İtem_11	0,516	0,517
item _13	0,292	0,669
item _19	0,415	0,586

Factor Analysis of MFI:

In an attempt to determine the construct validity of the MFI questionnaire, principal component factor analysis was applied to the survey results. In the factor analysis of principal components, Kaiser-Meyer-Olkin (KMO) value was first evaluated. The KMO value was found to be 0.885 in the study. It was seen that the found value for KMO was above the acceptable limit of 0.70.

In order to check out if the data came from a multivariate normal distribution, the results of the Bartlett's Test of Sphericity test were assessed. The statistical significance of the chi-square test ($X2=2857,122$; $p<0,01$) obtained from the test results shows that the data came from a multivariate normal distribution.

The Kaiser criterion was preferred for the principal component factor analysis. The criteria taken as a basis include that the factor load was at least 0.35 and the variance rate was 0.40 and above. In the analysis carried out, it was seen that the questionnaire had four factorial structure different from its original version. The

number of process factors re-performed with five factors as in the original (see Table 7).

Although the factor coefficient is quite high, the reason underlying that the model does not fit its original may result from the different socio-economic and socio-cultural structures.

Table 7. Factor Analysis Of MFI Scale

	General fatigue	**Physical fatigue**	**Reduced activity**	**Reduced motivation**	**Mental Fatigue**
Scale item	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
Item_1	0,793				
Item_5	0,538				
Item _12	0,693				
item_20	0,589				
Item_3	0,666				
item_4	0,582				
item_16		0,481			
Item_17		0,468			
Item_9		0,386			
Item_18		0,655			
Item_13		0,772			
Item_19		0,635			
Item_8			0,553		

Item _15	0,665		
Item _7	0,654		
Item_11	0,655		
Item_14		0,648	
Item_2		0,771	
Item_6			0,694
Item_10			0,742
KMO	0,885		
Barlett's Test	2857,122		
p	0,000		
Total explained variance	%56		

Results: Findings From The Sociodemographic Factors

Frequency and percentage distributions of the sociodemographic features of the survey participants are presented in Table 8.

Table 8. Distribution of participants according to sociodemographic characteristics

Variable	**Group**	**n**	**%**
Gender	Male	226	56,1
	Female	177	43,9
Faculty		72	17,9

	Faculty of Education		
	Faculty of Arts and Sciences	58	14,4
	Faculty of Administrative Sciences	79	19,6
	Physical Education Sports High School	40	9,9
	Faculty of Law	32	7,9
	Faculty of Engineering	62	15,4
	Faculty of Architecture	28	6,9
	Others	32	7,9
Grade	1. grade	58	14,4
	2. grade	87	21,6
	3. grade	123	30,5
	4. grade	119	29,5
	Master Degree	16	4,0
Course load per week	15 hour	130	32,3
	16-20 hour	209	51,9
	20 hour	64	15,9
Work status	Yes	81	20,0
	No	322	80,0
Working style	Shift Work	7	8,5
	Part Time	62	75,6
	Full Time	13	15,9
Health	No	125	31,0

Insurance	Yes	278	69,0
Family type	Nuclear Family	290	72,0
	Extended Family	106	26,3
	Broken Family	7	1,7
Place to live	Home , with friends	141	35,0
	Home , with family	171	42,4
	Dormitory	91	22,6
Relationship with family	Below 3	70	17,4
	Between 4 -6	105	26,0
	Above 7	228	56,6
Social activity	Yes	206	51,0
	No	197	49,0
Sport activity	Yes	213	53,0
	No	190	47,0
Dietary Habits	Carbonhydrate and oil-weighted foods	167	33,4
	Protein weighted foods	88	17,6
	Foods rich in sugar	40	8,0
	Fruit and vegetable weighted foods	34	6,8
	Balanced diet	171	34,2
The same sleeping time	Yes	64	16,0
	No	206	51,0
	Change every day	133	33,0

Smoking	Yes	169	41,9
	No	224	55,6
	Some Times	10	2,5
Consumption of Caffeinated beverages	Yes	220	54,6
	No	94	23,3
	Some times	89	22,1
Alcohol use	Yes	79	19,6
	No	268	66,5
	Some times	56	13,9
Body mass index	<18,5 Weight loss	44	10,9
	18,5-24,9 Normal	297	73,7
	25-30 Overweight	57	14,1
	30> Obesity	5	1,3

According to the table, the distribution of participants by gender can be seen as 43,9 % female, and 56,1% male.

The distributions of the participants according to the faculties they are studying at are as in the following: 17,9% of the Faculty of Education, 14,4% of the Faculty of Science and Literature, 19,6% of the Faculty of Economics and Administrative Sciences, 9,9% of Physical Education Sports High School, 7,9% of the Faculty of Law, 15,4% of the Faculty of Engineering, 6,9% of the Faculty of Architecture, 7,9% of the other faculties (see Table 7).

When the distributions of the participants by grade they are going into is examined, it can be seen that 14,4% were grade 1, 21,6% were grade 2, 30,5 were grade 3, 29,5% were grade 4, and 4,0% were master's degree (Table 7).

The distribution of the participants according to the weekly hours of lesson is as in the following; 32,3% had 15 course hours, 51,9% had 16-20 hours, and 15,9% had 20 hours and over (Table 7).

According to whether the study participants worked in a job or not, the table shows their distributions as in the following; 80% of them are not working, 20% are working (Table 7).

When the distribution of the employees according to the ways of working is examined, it can be seen that 8,5% are in shift, 75,6% are part-time, and 15,9% are in full-time work (Table 7).

The distribution of the study participants according to whether they have health insurance or not indicates that 31,0% of them do not have health insurance, and 69,0% of them have health insurance (Table 7).

The family types of the study participants are distributed as in the following; 72,0% are in the nuclear family, 26,3 % are in the extended family, and 1,7% are in the broken family (Table 7).

When the distribution of the participants according to the places where they live is examined through , it is seen that 35,0 % are at home with their friends, 42,4 % are at home with their family, 22,6 % are staying at dormitory (Table 7).

When examined the family relationships of the participants, they are distributed as 17,4 % is less than 3 times, 26,0 % is 4-6 times, 56,6% is more than seven times (Table 7).

When the distribution of the study participants according to their social activities is examined; 51,0% of them stated that they had social activity, but 49,0 % had no social activity (Table 7).

According to whether they do sport activities or not, their distribution on the table shows that 53,0 % of them do, but 47,0 % do not (Table 7).

When the distribution of the participants according to their food habits is examined, it can be seen that 33,4 % feed on carbohydrates and high-fat foods, 17,6

% on protein weighted foods 8,0 % on sugar-rich foods, 6,8 % vegetable-fruit weighted foods, and 34,2 % eat healthily (Table 7).

When the study participants are analyzed according to whether they sleep at the same time, their responses to the survey vary as in the following; 16% is yes, 51 % is no, 33 % is changing every day (Table 7).

The distributions of the participants according to if they smoke are as in the following; 55,6 % of more than half are not smoker, 41,9% smoke, and 2,5 % occasionally smoke (Table 7).

When the study participants are examined in terms of whether they consume caffeinated drinks, their responses are distributed as in the following; 54,6 % for yes, 23,3 % for no, 22,1% for sometimes drinking caffeinated beverages (Table 7).

The participants in the study are distributed according to their alcohol use as in the following; 19,6% of them use alcohol, 66,5% do not, 13,9% sometimes drink alcohol.

When the distribution of the study participants is examined according to their body-mass index (BMI), it can be stated that 10,9 % of them have lower weight than 18,5, 73,7% of them have normal weight between 18,5-24,9, 14,1 % have overweight between 25-30, 1,3 % have overweight more than 30 known as obesity.

Arithmetic Analysis Of Mfi Scale And Independent Variables

The values for the minimum, maximum, and arithmetic means of the independent variables used in the study including age, height, weight, BMI as well as of the FSS and MFI scales and their sub-dimension scales are presented in Table 9 as below.

Table 9. Arithmetic Mean Distribution Of MFI Scale And İndependent Variables

Variables	n	Min	Max	Mean	Sd
Age	403	18	25	21,79	2,04
How many hours do sports	403	0	6	0,8	1,09
Height	403	154	195	173,23	8,48
Weight	403	40	105	66,66	12,25
BMI	403	10	32,40	22,07	3,01
MFI	403	24,00	87,00	56,97	8,65
General fatigue	403	5,00	20,00	11,61	2,68
Physical fatigue	403	5,00	20,00	11,49	2,51
Reduced activity	403	5,00	20,00	11,79	2,50
Reduced motivation	403	5,00	20,00	11,10	2,60
Mental fatigue	403	5,00	20,00	11,00	2,44
FSS	403	40,00	168,00	76,75	26,44

According to the Table 9, it can be seen that the average age of participants is 21,79 ranging from 18 as minimum to 25 as maximum age. It is also observed that the study participants are doing spots on average 0,8 hours ranging from 0 as minimum hour to 6 as maximum hours in doing sport.

The participants' height and weight averages with their lower and upper limits are demonstrated through the table 8 as in the following respectively; height average: 173,23cm, 154cm, 195cm; weight average: 66,66kg, 40kg, 105kg.

The BMI average of the study participants is found to be 22,07 with the minimum of 10 and the maximum of 32,40.

The arithmetic mean of the scores on the MFI scale is seen as 56,97 with minimum 24 and maximum 87 points. The arithmetic means of the sub-dimensions scale of the MFI are assessed as in the following: for the general fatigue 11,61, for the physical fatigue 11,49, for the reduced activity 11,79, for the reduced motivation 11,10, for the mental fatigue 11,00. The arithmetic average of the fatigue impact scale (FSS) appears to be 79,75

MFI and FSS t-Test Based On The Gender

The t-test was used to determine whether there is a statistical difference between the MFI scale and its sub-dimension scales scores of the study participants by gender, and the results are presented in Table 10 as the following.

Table 10. MFI and FSS-Test Results According to Gender

	Age	**n**	**Mean**	**St.S.**	**t**	**p**
MFI	Male	226	55,64	9,03	-3,532	**0,000***
	Female	177	58,67	7,84		
General fatigue	Male	226	11,34	2,60	-2,271	**0,024****
	Female	177	11,95	2,76		
Physical fatigue	Male	226	11,12	2,51	-3,331	**0,001***
	Female	177	11,96	2,45		
Reduced activity	Male	226	11,49	2,60	-2,815	**0,005***
	Female	177	12,19	2,31		

Reduced motivation	Male	226	10,98	2,58	-1,067	0,287
	Female	177	11,26	2,62		
Mental fatigue	Male	226	10,73	2,44	-2,433	**0,015****
	Female	177	11,33	2,41		
FSS	Male	226	73,00	25,73	-3,246	**0,001***
	Female	177	81,52	26,64		

*p<0,01; **p<0,05

When it is examined, Table 10 indicates that there is a significant difference between the MFI scales scores according to gender (t=-3,532; p<0,01). The difference in the MFI scores of the female students seems to be higher than males'. There is a significant difference according to the general fatigue sub-dimension by gender (t=-2,271; p>0,5). Additionally, there is a statistically significant difference for the physical fatigue sub-dimension according to gender (t=-3,331; p<0,01).

This difference shows that female students are physically more tired than male students. Furthermore, because it can be seen a statistically significant difference between the reduced activity sub-dimension scores of the participants by gender (t=-2,815; p<0,01), the female students seem to have more reduced activity than the male students have.

According to the Table 10, it does not seem to be a statistically significant difference between the reduced motivation sub-dimension scores of the participants by gender (t=-1,067; p>0,01). On the other hand, the table indicates a statistically significant difference between the mental fatigue sub-dimension scores of the participants by gender (t=-2,433; p<0,01). This difference confirms that the female students are more mentally tired than the male students. Finally, another statistically significant difference can be identified between the FSS (fatigue Severty scale) scores of the study participants by gender (t=-3,246; p<0,01). This difference says that the female students are more physically tired than the male students.

MFI and FSS Anova Test Based on The Faculties

In order to determine whether there is a statistical difference between MFI scale and its sub-dimension scales scores of the participants according to the faculties they are studying, ANOVA test was performed and its results are presented in Table 11.

Table 11. MFI and FSS ANOVA test results according to the faculty

	Faculty	**n**	**Mean**	**Sd**	**F**	**p**	**Tukey HSD**
MFI	Faculty of Education	72	57,43	8,51	3,095	**0,003***	7<1,3,6
	Faculty of Arts and Sciences	58	57,36	10,87			
	Faculty of Administrative Sciences	79	58,70	6,55			
	Physical Education Sports High School	40	53,95	7,20			
	Faculty of Law	32	56,93	8,72			
	Faculty of Engineering	62	58,24	8,59			
	Faculty Of Architecture	28	51,50	9,64			
	Others	32	57,12	7,90			
General Fatigue	Faculty of Education	72	11,69	2,38	1,184	0,311	
	Faculty of Arts and	58	11,84	3,31			

	Sciences					
	Faculty of Administrative Sciences	79	12,01	2,40		
	Physical Education Sports High School	40	10,75	2,12		
	Faculty of Law	32	11,40	3,37		
	Faculty of Engineering	62	11,77	2,65		
	Faculty of Architecture	28	11,00	2,94		
	Others	32	11,53	2,32		
Physical Fatigue	Faculty of Education	72	11,86	2,51	1,510	0,162
	Faculty of Arts and Sciences	58	11,32	2,46		
	Faculty of Administrative Sciences	79	11,96	2,19		
	Physical Education Sports High School	40	11,27	2,37		
	Faculty of Law	32	11,37	2,44		
	Faculty of Engineering	62	11,53	2,69		
	Faculty Of Architecture	28	10,50	3,34		
	Others	32	11,00	2,28		

	Faculty Of Education	72	11,90	2,32			1>4,7
	Faculty Of Arts And Sciences	58	12,12	2,93			3>4,7
	Faculty Of Administrative Sciences	79	12,46	2,06			6>7
Reduced Activity	Physical Education Sports High School	40	10,55	2,17	4,245	**0,000***	
	Faculty Of Law	32	11,43	2,58			
	Faculty of Engineering	62	12,22	2,50			
	Faculty Of Architecture	28	10,39	2,57			
	Others	32	11,65	2,41			
	Faculty Of Education	72	10,79	2,59			7<5,6
	Faculty Of Arts And Sciences	58	11,34	2,61			
Reduced Motivation	Faculty Of Administrative Sciences	79	10,97	2,27	3,169	**0,003***	
	Physical Education Sports High School	40	11,20	2,38			
	Faculty Of Law	32	12,03	2,93			
	Faculty of	62	11,59	2,62			

	Engineering						
	Faculty Of Architecture	28	9,32	2,61			
	Others	32	11,31	2,64			
Mental Fatigue	Faculty Of Education	72	11,19	2,48	1,575	0,141	
	Faculty Of Arts And Sciences	58	10,91	3,10			
	Faculty of Administrative Sciences	79	11,29	2,42			
	Physical Education Sports High School	40	10,20	2,26			
	Faculty of Law	32	10,71	2,05			
	Faculty of Engineering	62	11,11	2,16			
	Faculty of Architecture	28	10,32	2,09			
	Others	32	11,65	2,29			
FSS	Faculty of Education	72	81,25	25,22	2,161	**0,037****	4<1,2,7
	Faculty of Arts and Sciences	58	80,67	30,89			
	Faculty of Administrative Sciences	79	75,26	23,65			
	Physical Education	40	64,27	25,82			

Sports High School				
Faculty of Law	32	78,18	23,21	
Faculty of Engineering	62	78,29	28,68	
Faculty of Architecture	28	80,46	28,14	
Others	32	71,09	20,71	

*p<,01; **p<,05

When it is analyzed, the Table 11 reports a statistically significant difference between the fatigue levels of MFI scale according to the faculties the study participants are studying (F=3,095; p<0,01). In an attempt to identify that this difference comes in view between which faculties, Tukey HSD test was administrated. The findings of the test analysis reveal that the fatigue level of the students studying at Faculty of Architecture (med=51,50) is quite low when compared to the ones studying at Faculty of Education (med=57,43), at Faculty of Economics and Administrative Sciences (med=58,70), and at Faculty of Engineering (med=58,24).

Another statistically significant difference is detected between the reduced activity fatigue levels by faculties being studied (F=4,245; p<0,01). According to the results of Tukey HSD test, it is seen that the reduced activity fatigue levels of the students who are studying at Faculty of Education (med=11,90) and Faculty of Economics and Administrative Sciences (med=12,46) are much higher than the ones' who are studying at Faculty of Physical Education Sports High School (med=10,55) and Faculty of Architecture (med=10,39). Additionally, the reduced activity fatigue levels of the students studying at Faculty of Engineering (med=12,22) is determined to be higher than the students at Faculty of Architecture (med=10,39) have.

In terms of the reduced motivation fatigue levels by the faculties, a statistically significant difference (F=3,169; p<0,05) is identified. As a result of the Tukey HSD

test, this difference becomes visible between the students studying at Faculty of Architecture whose reduced motivation fatigue level (med=9,79 is lower than those who are studying at Faculty of Law (med=12,03) and Faculty of Engineering (med=11,59).

Regarding the FSS scale scores of the participants by the faculties they are studying at, it can be seen a statistically significant difference (F=2,161; p<0,05) determined by the Tukey HSD test. The test analysis shows that the students studying at Physical Education Sports High School have lower fatigue levels (med=64,27) than the ones at Faculty of Education (Ort=81,25), Faculty of Science and Literature (med=80,67)), and Faculty of Architecture (med=80,46)

As regard to the sub-dimensions of the MFI scale including general fatigue, physical fatigue, and mental fatigue, there is no a statistically significant difference between these sub-scales scores of the participants according to the faculties they are studying at.

MFI and FSS Anova Test Based on The Grades

The ANOVA test was performed to explore whether there is a statistical difference between the MFI scale and its sub-scales according to the grades of the students participated in the study. The results of the test are presented in Table 12.

Table 12. MFI and FSS ANOVA Test Results According to the grade

	Grade	**n**	**Mean**	**Sd**	**F**	**p**
	1. grade	58	58,27	8,57		
MFI	2. grade	87	56,67	8,96	0,608	0,657
	3. grade	123	56,36	9,04		

	4. grade	119	57,00	8,37		
	Master Degree	16	58,37	6,21		
General fatigue	1. grade	58	12,00	2,99		
	2. grade	87	11,54	3,00		
	3. grade	123	11,21	2,55	1,346	0,252
	4. grade	119	11,79	2,48		
	Master Degree	16	12,25	1,84		
Physical Fatigue	1. grade	58	11,68	2,56		
	2. grade	87	11,58	2,62		
	3. grade	123	11,57	2,50	0,412	0,800
	4. grade	119	11,26	2,51		
	Master Degree	16	11,37	2,06		
Reduced Activity	1. grade	58	11,75	2,78		
	2. grade	87	11,85	2,34		
	3. grade	123	11,59	2,75	1,459	0,214
	4. grade	119	11,80	2,27		
	Master Degree	16	13,18	1,42		
Reduced Motivation	1. grade	58	11,60	2,79		
	2. grade	87	11,00	2,72		
	3. grade	123	11,01	2,51	0,675	0,610
	4. grade	119	11,09	2,50		
	Master Degree	16	10,75	2,74		

Mental Fatigue	1. grade	58	11,29	2,74	0,470	0,758
	2. grade	87	10,75	2,50		
	3. grade	123	10,98	2,51		
	4. grade	119	11,07	2,16		
	Master Degree	16	10,81	2,61		
FSS	1. grade	58	76,82	23,90	1,739	0,141
	2. grade	87	80,75	25,72		
	3. grade	123	78,82	27,27		
	4. grade	119	71,84	25,95		
	Master Degree	16	75,25	33,26		

In the examination of the Table 12, it can be inspected that there is no a statistically significant difference between the sub-scales of the MFI including general fatigue (F=1,346; p>0,05), physical fatigue (F=0,412; p>0,05), reduced activity (F=1,459; p>0,05), reduced motivation (F=0,675; p>0,05), mental fatigue (F=0,470; p>0,05) and FSS (F=1,739; p>0,05) in terms of the fatigue levels.

MFI and FSS Anova Test Based on The Course Load

According to how many hours per week the students participated in the study attend their courses, the statistical differences between MFI scale and its sub-dimension scales were determined with the help of ANOVA test. The findings of the test are provided in Table 13 as can be seen below.

Table 13. MFI and FSS ANOVA Test Results According to Course Load

		n	Mean	Sd	F	p
MFI	15 hours	130	56,46	8,50	0,569	0,567
	16-20 hours	209	57,01	8,96		
	Over 20	64	57,87	7,96		
General fatigue	15 hours	130	11,45	2,77	1,287	0,277
	16-20 hours	209	11,56	2,56		
	Over 20	64	12,09	2,88		
Physical Fatigue	15 hours	130	11,26	2,58	0,830	0,277
	16-20 hours	209	11,56	2,56		
	Over 20	64	11,70	2,21		
Reduced Activity	15 hours	130	11,96	2,56	0,524	0,593
	16-20 hours	209	11,68	2,56		
	Over 20	64	11,82	2,16		
Reduced Motivation	15 hours	130	10,84	2,69	1,416	0,244
	16-20 hours	209	11,31	2,63		
	Over 20	64	10,96	2,25		
Mental Fatigue	15 hours	130	10,94	2,40	0,501	0,606
	16-20 hours	209	10,94	2,55		
	Over 20	64	11,28	2,44		
FSS	15 hours	130	77,23	27,00	3,816	**0,023***
	16-20 hours	209	74,10	25,07		

	Over 20	64	84,42	28,47

*P<0,01

When it is examined, the Table 13 presents no statically significant difference between the MFI scale (F=0,569;p>0,05), and its sub-scales including general fatigue (F=1,287;p>0,05), physical fatigue (F=0,830;p>0,05), reduced activity (F=0,524;p>0,05), reduced motivation (F=1,416;p>0,05), and mental fatigue (F=0,501;p>0,05) in terms of the course load, that is, the number of course hours the students have to attend per week.

On the other hand, there is a statically significant difference in terms of the FSS (F=3,816; p<0,05). based on the course load. In order to find out that this difference existed at which faculties, the Tukey HSD test was administered. According to the test results, it was determined that the students studying at the faculties that have 20 hours or above course load (med=84,42) have higher levels of FSS than the ones who are studying at the faculties having the course load varying between 15 hours (med=77,23) and 16-20 hours (med=74,10).

MFI and FSS Dimensions t-Test Based on The Work Status

The t-Test was conducted to identify whether there is a statistical difference between the MFI scale and its sub-dimension scales according to the working status of the study participants, and the results are presented in Table 14 below.

Table 14. MFI and FSS t-Test results according to work status

	Work	n	Mean	Sd	t	p
MFI	Yes	81	56,88	8,71	-0,100	0,920
	No	322	56,99	8,65		
General fatigue	Yes	81	11,44	2,74	-0,630	0,529
	No	322	11,65	2,67		
Physical Fatigue	Yes	81	11,33	2,48	-0,641	0,522
	No	322	11,53	2,52		
Reduced Activity	Yes	81	11,97	2,43	-0,709	0,479
	No	322	11,75	2,52		
ReducedMotivation	Yes	81	11,32	2,52	0,818	0,414
	No	322	11,05	2,62		
Mental Fatigue	Yes	81	10,85	2,44	-0,609	0,543
	No	322	11,03	2,45		
FSS	Yes	81	74,08	25,62	-1,014	0,311
	No	322	77,41	26,64		

Based on the analysis of the Table 14, it was not identified any statistically significant difference in terms of the fatigue levels between the MFI scale (t=-0,100; p>0,05) and its sub-dimension scales including general fatigue (t=-0,630; p>0,05), physical fatigue (t=-0,641; p>0,05), reduced activity (t=-0,709; p>0,05), reduced motivation (t=0,818; p>0,05), mental fatigue (t=-0,609; p>0,05) and the FSS scale (t=-1,014; p>0,05)

MFI and FSS Anova Test Based on The Way of Work

ANOVA test was applied to determine the statistical difference between the MFI and its sub-dimension scales according to the way of working of the study participants, and the results of the test are presented in Table 15 below.

Table 15. MFI and FSS ANOVA Test Results According to Working Style

		n	**Mean**	**Sd**	**F**	**p**
MFI	Shift Work	7	57,28	10,20	1,177	0,318
	Part Time	62	55,98	8,60		
	Full Time	13	60,92	7,45		
General fatigue	Shift Work	7	11,57	3,04	1,047	0,372
	Part Time	62	11,19	2,61		
	Full Time	13	12,53	3,01		
General fatigue	Shift Work	7	12,14	1,57	0,368	0,776
	Part Time	62	11,30	2,46		
	Full Time	13	11,15	3,02		
Reduced Activity	Shift Work	7	11,57	3,59	1,648	0,178
	Part Time	62	11,74	2,37		
	Full Time	13	13,30	1,43		
Reduced Motivation	Shift Work	7	11,71	3,09	2,456	0,063
	Part Time	62	10,87	2,57		
	Full Time	13	12,92	1,25		

	Shift Work	7	10,57	3,59		
Mental Fatigue	Part Time	62	10,87	2,29	0,150	0,930
	Full Time	13	11,07	2,64		
	Shift Work	7	68,28	11,92		
FSS	Part Time	62	76,58	28,92	0,511	0,675
	Full Time	13	70,53	19,25		

When the results on the Table 15 is examined, it can be observed that there is no statistically significant difference between the MFI scale (F=1,177;p>0,05) and its sub-dimension scales including general fatigue (F=1,047;p>0,05), physical fatigue (F=0,368;p>0,05), reduced activity (F=1,648;p>0,05), reduced motivation (F=2,456;p>0,05), mental fatigue (F=0,150;p>0,05) and the FSS scale (F=0,511;p>0,05) with regard to the fatigue levels of the study participants resulting from their work status.

MFI and FSS t-Test Based on The Health Insurance

The t-Test was conducted to determine whether there was statistical significant difference between the MFI scale and its sub-dimensions scale according to the health insurance of the study participants, and the results are presented in Table 16.

Table 16. MFI and FSS t-test results according to health insurance

	Assurance	**n**	**Mean**	**Sd**	**t**	**p**
	No	125	55,52	9,42		
MFI					-2,274	**0,023***
	Yes	278	57,62	8,22		

General fatigue	No	125	11,45	2,74	-0,785	0,433
	Yes	278	11,68	2,66		
Physical Fatigue	No	125	11,31	2,50	-0,971	0,332
	Yes	278	11,57	2,52		
Reduced Activity	No	125	11,35	2,62	-2,419	**0,016***
	Yes	278	12,00	2,42		
Reduced Motivation	No	125	10,90	2,53	-1,061	0,290
	Yes	278	11,20	2,63		
Mental Fatigue	No	125	10,58	2,45	-2,299	**0,022***
	Yes	278	11,18	2,42		
FSS	No	125	76,83	28,21	0,042	0,967
	Yes	278	76,71	25,66		

*P<0,05

Table 16 indicates that there is a statistically significant difference between the scores of the MFI scale (t=-2,274; p<0,05) and its sub-scale, reduced activity reduced activity (t=-2,419; p>0,05). This difference shows that the reduced activity of those with health insurance is higher than those without health insurance (t=-2,419;p<0,05). On the other hand, there is no significant difference between the subdimension scales including general fatigue (t=-0,785; p>0,05), physical fatigue (t=-0,971; p>0,05), reduced motivation (t=-1,061;p>0,05) and the FSS scale (t=0,111; p>0,05) in terms of their fatigue levels.

According to the mental fatigue sub-dimension scale; however, a statistical significant diference was identified in respect of whether the study particpants have

health insurance or not. This difference shows that the mental fatigue of those with health insurance is higher than those without health insurance (t=-2,299;p<0,05).

MFI and FSS Anova Test Based on The Family Type

In order to determine whether there is statistically significant difference between the MFI scale and its sub-dimensions scales according to the family types of the study participants, ANOVA test was used, and its results are presented in Table 17 below.

Table 17. MFI and FSS ANOVA Test Results by Family Type

		n	Mean	Sd	F	p	Tukey HSD
MFI	Nuclear Family	290	57,42	7,99	1,568	0,210	290
	Extended Family	106	55,96	9,97			106
	Broken Family	7	53,85	12,64			7
General fatigue	Nuclear Family	290	11,71	2,63	1,045	0,353	290
	Extended Family	106	11,40	2,83			106
	Broken Family	7	10,57	2,50			7
Physical Fatigue	Nuclear Family	290	11,49	2,48	0,233	0,793	290
	Extended Family	106	11,52	2,62			106
	Broken Family	7	10,85	2,54			7
Reduced Activity	Nuclear Family	290	11,95	2,42	2,244	0,107	290
	Extended Family	106	11,35	2,65			106

	Broken Family	7	12,00	2,94			7
Reduced Motivation	Nuclear Family	290	11,13	2,59	0,500	0,607	290
	Extended Family	106	11,09	2,50			106
	Broken Family	7	10,14	4,29			7
Mental Fatigue	Nuclear Family	290	11,14	2,42	1,975	0,140	290
	Extended Family	106	10,64	2,45			106
	Broken Family	7	10,28	3,14			7
FSS	Nuclear Family	290	76,86	26,11	2,376	0,094	290
	Extended Family	106	75,05	26,55			106
	Broken Family	7	97,42	33,61			7

*p<0,05

Based on the analysis of the Table 17, it was not found to be statistically significant difference between the MFI scale and its sub-dimensions scales according to the family types of the students participated in the study.

MFI and FSS Anova Test Based On The Place To Live

Whether there is a statistical difference between the MFI scale and its sub-dimensions scales in terms of the place where the study participants are living was determined by means of ANOVA test. The findings from the test are presented in Table 18.

Table 18. MFI and FSS ANOVA Test Results According to the place to live

		n	Mean	Sd	F	p	Tukey HSD
MFI	Home , with friends	141	55,63	8,69	6,960	**0,001***	3>1,2
	Home , with family	171	56,56	8,38			
	Dormitory	91	59,81	8,55			
General fatigue	Home , with friends	141	11,51	2,69	3,919	**0,021****	3>2
	Home , with family	171	11,33	2,60			
	Dormitory	91	12,28	2,74			
Physical Fatigue	Home , with friends	141	10,97	2,47	5,849	**0,003***	1<2,3
	Home , with family	171	11,59	2,50			
	Dormitory	91	12,09	2,48			
Reduced Activity	Home , with friends	141	11,62	2,49	2,898	0,056	
	Home , with family	171	11,64	2,57			
	Dormitory	91	12,35	2,32			
Reduced Motivation	Home , with friends	141	10,90	2,61	1,713	0,182	

	Home , with family	171	11,05	2,54			
	Dormitory	91	11,53	2,68			
Mental Fatigue	Home , with friends	141	10,66	2,40			1<3
	Home , with family	171	10,98	2,37	3,650	**0,027****	
	Dormitory	91	11,54	2,57			
FSS	Home , with friends	141	74,97	26,92	0,824	0,439	
	Home , with family	171	76,73	27,42			
	Dormitory	91	79,53	25,77			

*p<0,01;**p<0,05

According to the findings in the Table 18, it can be seen that there is statistically significant difference between the MFI scale and its sub-dimensions scales (F=6,960; p<0,01) in relation to the places to live. The analysis of Turkey HSD applied to determine which groups this difference occurs shows that the students who stayed in the dormitory have lower fatigue level when compared to the ones staying in the home either with friends or family. The statistically significant difference was found between the physical fatigue according to the place where the students stayed (F=3,919;p<0,01). According to the Turkey HSD analysis, this difference explains that the physical fatigue level of the students staying at home with their friends is lower compared to those staying at home with their family and at dormitory.

Another statistical significance difference is detected between the mental fatigue sub-scale scores of the participants in terms of the place they are living

(F=3,650;p<0,05). This difference says that the students who stay at home with their friends are less mentally tired compared to those staying at dormitory.

Finally, according to the results in the Table 18, there is a statistically significant difference between the general fatigue (F=3,919; p<0,05) scores of the participants. In order to determine in which groups this difference occurs, the Tukey HSD test was used. Test analysis showed that the students who stay at dormitory are more tired compared to those staying at home with their families..

The sub-scales of MFI that produce no statistical significant difference in the fatigue levels of the students according to the place they stay include as in the following; reduced activity (F=2,898;p>0,05), reduced motivation (F=1,713;p>0,05) and the FSS scale (F=0,824; p>0,05)

MFI and FSS Anova Test Based on The Family Relationship

Whether there is a statistical difference between the MFI scale and its sub-dimensions scales in terms of how often the study participants have a relationship with their families was determined by means of ANOVA test. The findings from the test are presented in Table 19.

Table 19. MFI and FSS ANOVA Test Results According to Relationship with Family

		n	**Mean**	**Sd**	**F**	**p**
MFI	Less than 3	70	57,20	10,47	0,264	0,768
	4-6	105	56,44	8,28		
	More than 7	228	57,14	8,23		
General fatigue	Less than 3	70	11,80	2,97	0,619	0,539

	4-6	105	11,77	2,76		
	More than 7	228	11,48	2,56		
	Less than 3	70	11,30	2,48		
Physical Fatigue	4-6	105	11,58	2,54	0,276	0,759
	More than 7	228	11,51	2,52		
	Less than 3	70	11,71	2,63		
Reduced Activity	4-6	105	11,50	2,35	1,243	0,290
	More than 7	228	11,96	2,52		
	Less than 3	70	11,21	2,98		
Reduced Motivation	4-6	105	10,83	2,38	0,769	0,464
	More than 7	228	11,20	2,57		
	Less than 3	70	11,21	2,98		
Mental Fatigue	4-6	105	10,78	2,40	0,711	0,492
	More than 7	228	11,03	2,28		
	Less than 3	70	81,45	26,84	1,639	0,196
FSS	4-6	105	77,39	27,66		
	More than 7	228	76,74	25,66		

According to the results of Table 19, there is no statistically significant difference considering the fatigue levels of the MFI scale (F=0,264;p>0,05), and its sub-scales including general fatigue (F=0,619;p>0,05), physical fatigue (F=0,276;p>0,05), reduced activity (F=1,243;p>0,05reduced motivation (F=0,769;p>0,05), mental fatigue (F=0,711;p>0,05) and the FSS scale (F=1,639;p>0,05)

MFI and FSS t- Test Based on The Social Activity

The t-Test was conducted to determine whether there is statistical difference between the MFI scale and its sub-dimensions scales according to the social activities of the study participants. The results of the test are presented in Table 20 below.

Table 20. MFI and FSS t-Test Results According To Social Activity

		n	Mean	Sd	T	p
MFI	Yes	206	56,50	8,13	-1,127	0,260
	No	197	57,47	9,16		
General fatigue	Yes	206	11,56	2,53	-0,343	0,732
	No	197	11,65	2,84		
Physical Fatigue	Yes	206	11,30	2,52	-1,534	0,126
	No	197	11,69	2,50		
Reduced Activity	Yes	206	11,74	2,40	-0,422	0,674
	No	197	11,85	2,60		
Reduced Motivation	Yes	206	10,90	2,49	-1,629	0,104
	No	197	11,32	2,70		
Mental Fatigue	Yes	206	11,00	2,38	0,041	0,968
	No	197	10,99	2,51		
FSS	Yes	206	72,58	24,20	-3,273	**0,001***
	No	197	81,10	28,01		

*p<0,01

When it is examined, Table 20 shows that according to whether the study participants have social activities or not, there is no statistically significant difference in terms of the fatigue levels of MFI scale (t=-1,127;p>0,05), and its sub-scales including general fatigue (t=-0,343;p>0,05), physical fatigue (t=-1,534;p>0,05),), reduced activity (t=-0,422;p>0,05), reduced motivation (t=-1,629;p>0,05) mental fatigue t=0,041;p>0,05). But, it was found that there is a statistical difference between the levels of FSS scale (t=-3,273;p<0,05) according to the social activities the study participants have.

MFI and FSS t- Test Based on The Spor Activity

The t-Test was conducted to determine whether there is statistical difference between the MFI scale and its sub-scales according to the sport activities the study participants are doing. The results of the test are presented in Table 20 below

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Table 21. MFI and FSSt-Test Results According to Sports Activity

		n	**Mean**	**Sd**	**T**	**p**
MFI	Yes	213	55,79	8,31	-2,928	**0,004***
	No	190	58,30	8,85		
General fatigue	Yes	213	11,50	2,52	-0,874	0,383
	No	190	11,73	2,86		
Physical Fatigue	Yes	213	10,98	2,40	-4,380	**0,000***
	No	190	12,06	2,53		
Reduced Activity	Yes	213	11,56	2,54	-1,969	**0,049****
	No	190	12,06	2,43		

Reduced Motivation	Yes	213	10,98	2,57	-1,044	0,297
	No	190	11,25	2,63		
Mental Fatigue	Yes	213	10,79	2,43	-1,757	0,080
	No	190	11,22	2,45		
FSS	Yes	213	69,46	23,28	-6,109	**0,000***
	No	190	84,91	27,44		

*p<0,01;**p<0,05

When the results in the Table 21 are examined, it can be seen that there is statistically significant difference between the fatigue levels of the MFI (t=-2,928;p<0,01) and its sub-scales including physical fatigue (t=-4,380;p<0,01)., reduced activity (t=-1,969;p<0,05) as well as the fatigue levels of the FSS scale (t=-6,109;p<0,01).in terms of whether the students participating in the study do sport activities. On the other hand, the Table 20 shows the sub-scales of the MFI that do not reveal any statistical difference in their fatigue levels in terms of the sport activities the study participants do. These sub-scales include general fatigue (t=-0,874;p>0,05), reduced motivation (t=-1,044;p>0,05), mental fatigue (t=-1,757;p<0,05).

MFI and FSS Anova Test Based on The Dietary Habits

The ANOVA test was used to identify whether there is statistically significant difference in the MFI scale and its sub-scales according to the dietary habits of the students participating in the study. The test results are provided in Table 22 below.

Table 22. MFI and FSS ANOVA Test Results According to Dietary Habits

		n	Mean	Sd	F	P	Tukey HSD
MFI	Carbonhydrate and oil-weighted foods	137	56,95	9,08	0,732	0,571	
	Protein weighted foods	76	55,73	8,13			
	Foods rich in sugar	28	56,21	7,34			
	Fruit and vegetable weighted foods	23	57,91	8,22			
	Balanced diet	139	57,66	8,83			
General fatigue	Carbonhydrate and oil-weighted foods	137	11,37	2,74	0,557	0,694	
	Protein weighted foods	76	11,59	2,36			
	Foods rich in sugar	28	11,50	2,31			
	Fruit and vegetable weighted foods	23	11,82	2,72			
	Balanced diet	139	11,84	2,86			
Physical Fatigue	Carbonhydrate and oil-weighted foods	137	11,82	2,57	1,676	0,155	
	Protein weighted foods	76	11,25	2,40			
	Foods rich in sugar	28	10,64	2,14			
	Fruit and vegetable	23	11,17	2,10			

	weighted foods					
	Balanced diet	139	11,52	2,62		
Reduced Activity	Carbonhydrate and oil-weighted foods	137	11,86	2,48	0,414	0,798
	Protein weighted foods	76	11,47	2,56		
	Foods rich in sugar	28	11,89	2,68		
	Fruit and vegetable weighted foods	23	11,73	2,73		
	Balanced diet	139	11,89	2,43		
Reduced Motivation	Carbonhydrate and oil-weighted foods	137	11,00	2,72	0,774	0,542
	Protein weighted foods	76	10,78	2,47		
	Foods rich in sugar	28	11,03	3,04		
	Fruit and vegetable weighted foods	23	11,60	2,96		
	Balanced diet	139	11,31	2,39		
Mental Fatigue	Carbonhydrate and oil-weighted foods	137	10,94	2,44	0,809	0,520
	Protein weighted foods	76	10,65	2,37		
	Foods rich in sugar	28	11,17	2,43		
	Fruit and vegetable weighted foods	23	11,56	2,27		

	Balanced diet	139	11,11	2,63			
FSS	Carbonhydrate and oil-weighted foods	137	81,59	26,04	4,255	**0,002***	**2<1,3**
	Protein weighted foods	76	72,32	26,50			**3>4,5**
	Foods rich in sugar	28	88,67	28,44			
	Fruit and vegetable weighted foods	23	70,30	25,08			
	Balanced diet	139	73,05	25,39			

*p<0,01

When the results in the Table 22 are analyzed, it can be seen that there is no statistical difference between the MFI scale (F=0,732;p>0,05) and its sub-scales including general fatigue (F=0,557;p>0,05), physical fatigue (F=1,676;p>0,05), reduced activity (F=0,414;p>0,05), reduced motivation (F=0,774;p>0,05), mental fatigue (F=0,809;p>0,05) in terms of the fatigue levels of the students based on their dietary habits.

The statistically significant difference in terms of the study participants' dietary habits; however, is detected in their fatigue levels on the FSS scale (F=4,255;p<0,01). In order to identify in which groups this difference is designated, the Turkey HSD analysis was carried out. According to the findings of this analysis, it was seen that there are differences in the fatigue levels of the groups of the students between those who are fed with protein weighted foods and those with foods containing high carbohydrate and sugar. Protein weighted diets were found to have lower levels of the FSS. In addition to this, there is also difference between the students feeding with foods rich in sugar and those with vegetable-fruit weighted foods and keeping balanced diet. The levels of the FSS were found to be higher in the students who are fed with food containing high sugar.

MFI and FSS Anova Test Based on The Same Sleeping Hour

The ANOVA test was performed to determine whether there is statistical difference between the MFI and its sub-scales in terms of whether the study participants sleep at the same time each day, and the results are presented in Table 23 below.

Table 23. MFI and FSS ANOVA Test Results According to the same sleeping time

		n	Mean	Sd	F	p
MFI	Yes	64	55,43	7,71	1,285	0,278
	No	206	57,11	9,18		
	Changes every day	133	57,50	8,20		
General fatigue	Yes	64	11,26	2,21	0,685	0,505
	No	206	11,64	2,82		
	Changes every day	133	11,73	2,67		
Physical Fatigue	Yes	64	11,45	2,33	0,020	0,980
	No	206	11,48	2,59		
	Changes every day	133	11,52	2,49		
Reduced Activity	Yes	64	11,45	2,68	1,253	0,287
	No	206	11,75	2,57		

	Changes every day	133	12,03	2,28		
Reduced Motivation	Yes	64	10,78	2,54	0,602	0,548
	No	206	11,17	2,75		
	Changes every day	133	11,16	2,39		
Mental Fatigue	Yes	64	10,50	2,30	1,604	0,202
	No	206	11,11	2,46		
	Changes every day	133	11,06	2,47		
FSS	Yes	64	74,62	25,39	0,914	0,402
	No	206	75,81	26,62		
	Changes every day	133	79,21	26,68		

According to the Table 23, there is no statistically significant difference between the fatigue levels of the students on the MFI ($F=1,285$; $p>0,05$), and its sub-scales including general fatigue ($F=0,685$;$p>0,05$), physical fatigue ($F=0,020$;$p>0,05$) reduced activity ($F=1,253$;$p>0,05$), reduced motivation ($F=0,602$;$p>0,05$), mental fatigue ($F=1,604$;$p>0,05$) and the FSS scale ($F=0,914$;$p>0,05$) in terms of their sleeping hours.

MFI and FSS Anova Test Based on Smoking

Whether there is any statistical difference between the fatigue levels of the study participants on the MFI and its sub-scales from the point of their smoking status was determined by means of ANOVA test, and the results are presented in Table 24.

Table 24. MFI and FSS ANOVA Test Results According to Smoking

		n	Mean	Sd	F	p
MFI	Yes	169	56,98	8,89	0,015	0,985
	No	224	56,99	8,52		
	Sometimes	10	56,50	8,40		
General fatigue	Yes	169	11,69	2,86	0,932	0,395
	No	224	11,60	2,53		
	Sometimes	10	10,50	3,06		
Physical Fatigue	Yes	169	11,28	2,39	1,292	0,276
	No	224	11,66	2,58		
	Sometimes	10	11,00	3,09		
Reduced Activity	Yes	169	11,89	2,57	0,258	0,772
	No	224	11,71	2,46		
	Sometimes	10	11,90	2,13		
Reduced Motivation	Yes	169	11,10	2,71	0,064	0,938
	No	224	11,09	2,52		
	Sometimes	10	11,40	2,67		
Mental Fatigue	Yes	169	11,02	2,53	0,460	0,631
	No	224	10,95	2,38		
	Sometimes	10	11,70	2,49		
FSS	Yes	169	78,45	28,33	0,619	0,539
	No	224	75,45	25,34		

	Sometimes	10	76,90	15,62			

Based on the test results, it was found to be no statistical difference in the fatigue levels of the students on the MFI scale (F=0,015;p>0,05), and its sub-scales including general fatigue (F=0,932;p>0,05),, physical fatigue (F=1,292;p>0,05), reduced activity (F=0,258;p>0,05), reduced motivation (F=0,064;p>0,05) mental fatigue (F=0,460;p>0,05) as well as on the FSS scale (F=0,619;p>0,05) according to whether the students participating in the study are smoking.

MFI and FSS Anova Test Based on The Consumption of Caffeinated Drinks

The ANOVA test was used to determine whether there is statistical difference between the fatigue levels of the students on the MFI scale and its sub-scales with regard to that they consume caffeinated beverages. The results of the test are presented in Table 25 below.

Table 25. MFI and FSS ANOVA Test Results according to the consumption of caffeinate drinks

		n	**Mean**	**Sd**	**F**	**p**	**Tukey HSD**
MFI	Yes	220	56,08	8,54	3,324	**0,037****	Evet<Bazen
	No	94	57,30	9,69			
	Sometimes	89	58,83	7,45			
General	Yes	220	11,48	2,66	1,265	0,283	
	No	94	11,53	2,88			

fatigue	Sometimes	89	12,01	2,53			
Physical Fatigue	Yes	220	11,10	2,57	6,539	**0,002***	Evet<Hayır
	No	94	11,76	2,59			
	Sometimes	89	12,16	2,11			
Reduced Activity	Yes	220	11,79	2,50	1,477	0,229	
	No	94	11,50	2,71			
	Sometimes	89	12,13	2,24			
Reduced Motivation	Yes	220	11,00	2,54	0,759	0,469	
	No	94	11,39	2,56			
	Sometimes	89	11,10	2,79			
Mental Fatigue	Yes	220	10,73	2,41	3,140	0,054	
	No	94	11,18	2,65			
	Sometimes	89	11,46	2,44			
FSS	Yes	220	79,18	28,14	2,187	0,114	
	No	94	72,87	24,28			
	Sometimes	89	74,83	23,78			

*p<0,01;**p<0,05

In view of the results in the Table 25, it was found to be a statistically significant difference in the fatigue levels of the students on the MFI scale (F=3,324; p<0,05). depending on their consumption of caffeinated drinks. The Tukey HSD analysis was carried out in order to find out that this difference occurs in which groups. According to the findings of the Turkey HSD analysis, the fatigue levels of the students consuming caffeinated drinks was found to be lower than those who used sometimes. Regarding the physical fatigue sub-scale of the MFI, there is statistical difference determined between the fatigue levels of the study participants. The Turkey HSD

analysis shows that the study participants consuming caffeinated beverages have lower physical fatigue (F=6,539; p<0,01) compared to those who do not consume. In terms of the levels of the MFI sub-scales including general fatigue (F=1,265; p>0,05), reduced activity (F=1,477; p>0,05), reduced motivation (F=0,759; p>0,05), mental fatigue (F=3,140; p>0,05), and the levels of the FSS (F=2,187;p>0,05) it was not detected a statistically significant difference in the fatigue levels of the study participants according to their consumption of the caffeinated drinks.

MFI and FSS Anova Test Based on The Alcohol Use Status

The ANOVA test was used to determine whether there is statistical difference between the fatigue levels of the students on the MFI scale and its sub-scales according to the alcohol use status of the students participating in the study, and the results of the test are presented in Table 26 below.

Table 26. MFI and FSS ANOVA Test Results According to Alcohol Use

		n	**Mean**	**Sd**	**F**	**p**	**Tukey HSD**
MFI	Yes	79	54,54	8,87	3,945	**0,020****	Evet<Hayır
	No	268	57,52	8,53			
	Sometimes	56	57,75	8,46			
General fatigue	Yes	79	11,02	2,66	3,533	**0,030****	Evet<Bazen
	No	268	11,65	2,67			
	Sometimes	56	12,25	2,67			
Physical Fatigue	Yes	79	10,51	2,54	7,593	**0,001***	Yes<No
	No	268	11,73	2,48			Yes<Sometimes

	Sometimes	56	11,73	2,33		
Reduced Activity	Yes	79	11,74	2,79	0,147	0,864
	No	268	11,77	2,48		
	Sometimes	56	11,96	2,17		
Reduced Motivation	Yes	79	10,58	2,57	2,228	0,109
	No	268	11,27	2,62		
	Sometimes	56	11,03	2,50		
Mental Fatigue	Yes	79	10,67	2,59	1,217	0,297
	No	268	11,13	2,34		
	Sometimes	56	10,83	2,68		
FSS	Yes	79	79,73	28,67	0,958	0,385
	No	268	75,47	26,01		
	Sometimes	56	78,64	25,21		

*p<0,01

When analyzed the results in the Table 26, there is a statistically difference between the scores of the participants in the MFI scale (F=3,945; p<0,05) and its general fatigue (F=3,533; p<0,05) and physical fatigue (F=7,593; p<0,01) subscales according to whether they use alcohol or not. In order to identify the groups in which this difference comes in view, the Turkey HSD test was conducted. The results of the test indicate that the MFI scale scores of those who use alcohol were lower than those who do not or sometimes use alcohol. This difference was found to be the same in terms of the general fatigue subscale. According to the physical fatigue subscale, the fatigue levels of the students using alcohol are lower than those who do not use any alcohol and those who sometimes use alcohol.

On the other hand, it was not determined any statistical difference between the fatigue levels of the study participants on the subdimensions of the MFI scale including reduced activity (F=0,147; p>0,05), reduced motivation (F=2,228; p>0,05), mental fatigue (F=1,217; p>0,05) as well as the levels of FSS (F=0,958; p>0,05) in terms of their alcohol use status.

Corelation Analysis

In an attempt to determine if the MFI scale have a relationship with the general fatigue, physical fatigue, reduced activity, reduced motivation, and mental fatigue, and if it has, to identify the grade and direction of this relationship, correlation analysis was carried out. The results of the analysis are presented in Table 27 below.

Table 27. Correlation Analysis

		MFI	General fatigue	Physical Fatigue	Reduced Activity	Reduced Motivation	Mental Fatigue	FSS
MFI	r	1						
	p							
	N	403						
General fatigue	r	,665**	1					
	p	,000						
	N	403	403					
Physical Fatigue	r	,640**	,308**	1				
	p	,000	,000					
	N	403	403	403				

	r	,691**	,301**	,290**	1		
Reduced Activity	p	,000	,000	,000			
	N	403	403	403	403		
	r	,679**	,290**	,282**	,355**	1	
Reduced Motivation	p	,000	,000	,000	,000		
	N	403	403	403	403	403	
	r	,682**	,309**	,276**	,384**	,348**	1
Mental Fatigue	p	,000	,000	,000	,000	,000	
	N	403	403	403	403	403	403
	r	,025	-,017	,124*	-,009	-,018	,007
FSS	p	,613	,727	,013	,852	,723	,888
	N	403	403	403	403	403	403

**. P<0,01

The results in the Table 27 demonstrate that there is a positive and linear relationship between the MFI scale and its sub-dimensions. However, there is no statistical relationship of the MFI scale and its sub-dimensions including general fatigue, reduced activity, reduced motivation, mental fatigue with the FSS. There is positive and direct relationship only between the FSS and the physical fatigue sub-dimension of the MFI.

4. DISCUSSION

Many studies on fatigue have shown that intense work pressure, stress and adverse factors in emotional experiences increase the fatigue level (Hatcher et.al 2003, Blomkvist et.al, 1999). For this reason, the frequency of having CFS has increased, which results in decreasing the quality of people's life and leading to inadequacy (Acar and et.al., 2003). E. Smets performed the MFI scale on a homogenous group. He measured fatigue on the sample group consisting of Dutch (94) and Scottish (109) cancer patients who received radiotherapy (Smets et.al., 1995). In the MFI scale validity and reliability study conducted in Iran measured the fatigue on the students (300) studying at the university (Hafazi et.al., 2010). The study of Hafazi et al. (2010) is such as to support the current research study. They put a greater emphasis on that fatigue directly affects daily activities, education, and quality of life, and addressed to the inadequacy of the studies in this research area.

Fatigue was also measured in the MFI validity and reliability studies conducted on the Parkinson's patients (153) in Netherlands and cancer patients (225) in France (Elbert et.al., 2012, Favreet et.al., 2003). In MFI validity and reliability study carried out in Sweden, the participants (554) were divided into four groups consisting of palliative cancer patients, cancer patients receiving radiotherapy, non-cancerous out patients, and a group of hospital staff, and fatigue was observed in each group (Fürst, 2007). In the study conducted in Denmark with the participants (1608) between the range of 20-77 ages in equal gender distribution, the relationship of the fatigue with the variables including physical and mental diseases, the fatigue level, and sociodemographic factors was investigated through the MFI scale, and fatigue was found to be high in the study. The fatigue levels of the hospital staff and the fatigue levels in the sociodemographic factors found in this study also support the results of the present research study.

In an attempt to demonstrate the appropriateness for the use of MFI scale in determining the fatigue levels in different groups, a validity and reliability study on healthy university students has been found acceptable. For this reason, the validity

and reliability study of the MFI scale was conducted on the 500 healthy university students with the administration of Turkish MFI and FSS scales.

Many scales have been developed to evaluate fatigue. However, the number of scales in Turkish validity and reliability studies has been insufficient. Or, in the validity and reliability studies conducted in the interest area of the present research, chronic diseases have been taken as sample group. In the present research study, the validity and reliability of the MFI scale that was translated into Turkish by using the ‘’Back Translation Method’’ approved by Ema Smets, who developed the scale, was administrated to measure fatigue on healthy university students

4.1. Discusion On the Findings Related to The Reliabilty Of MFI Scale

The Cronbach alpha reliability coefficient was calculated as a measure of the internal consistency and the homogeneity of the MFI questionnaire. Alpha method is a weighted standard deviation averaging the values between 0 and 1 found by proportioning sum of the items’ variance in the scale to the general variance (Akgül, 2003). In the present study, the Cronbach alpha coefficient of the Turkish MFI questionnaire was calculated as α=0.86. The Cronbach alpha coefficient of the MFI developed by Ema Smets was found to be α=0,79 for Dutch patients and α=0,93 for Scottish patients (Smets et.al., 1995). The internal consistency coefficient of the MFI scale found in the present study is above the limit of 0.70 indicating that it is highly reliable scale. The Cronbach alpha coefficient was found to be α=0,85 in the study conducted in Iran with the participation of 300 students (Hafazi et.al., 2010).

Substance analysis is the relation between the value of the substances to be measured and the value of the sum of the substances measured. If the items in the scale are equal weight and independent, the relation between the value of the items and the total value must be high. When the values of coefficients are low, then it is decided on the scale not to be reliable. There are different opinions only about the reliability coefficient of the scale. It is stated that it is needed to fall below 0.25 to be considered insufficient (Akgül, 2003).

The total item correlation scores in the present study range from 0,296 to 0,617. Cronbach α measuring the general fatigue sub-scale was found to be low as α=0,593. When the substance was taken out and looked at Cronbach value, it was considered that the increase in the Cronbach alpha reliability coefficient is due to the evaluation of fatigue in health individuals.

The Cronbach alpha reliability coefficient for the internal consistency of reduced motivation, which is the sub-dimension of the MFI scale, was found to be α=0,507. The Cronbach alpha value is still low when the substance is removed. It is thought that the reason of being low in both cases is either because the socio-economic situation is low, or stemming from the cultural structure. For the other sub-dimensions, the results are quite reliable which are the same when the substances are removed.

Another analysis carried out to evaluate the reliability of the MFI scale is the application of the parallel structure form. In the parallel forms method, the same behavior desired to be measured is applied in the same group, at the same time or in the shortest time (Ercan and Kan, 2004). Through the analysis for the internal consistency of FSS scale in between the two measurements, the Cronbach alpha coefficient was found to be α=0,947 over the total scores of the participants' responses to the questionnaire. The Cronbach alpha coefficient was found to be α=0,860 over the total score of the answers given to the MFI survey. Based on these results, it is considered that the MFI and FSS scales are highly reliable. The high value of the correlation coefficient between the two measurements is an indication of the invariance of the measurement. In the study conducted on MS patients, the reliability coefficient value for the FSS scale was found to be α=0.94 (Kadriye et.al., 2007).

4.2. Discussion on The Findings Related to The Validity of MFI Scale

Since fatigue is a subjective value, there has not been found a standard measurement instrument up until now. For this reason, the fatigue scales measured fatigue indirectly are preferred to be able to measure the validity of the scales

(Beurskens et.al., 2000). Ema Smets used the Rotterdam Symptom Checklist scale in their study on the patients receiving radiotherapy (Smets et.al., 1995).

In the present research study on the university students who continue their education, FSS scale was preferred to measure the validity. It was investigated in the other studies conducted in this area that the FSS scale measures the fatigue directly that results in decreasing the quality of life (Kadriye et.al., 2007).

Principal component factor analysis was applied to the survey results to assess the construct validity of the MFI scale. Sample size is an important consideration when factor analysis is applied. Kaiser-Meyer-Olkin (KMO) is an index comparing the magnitude of the observed correlation coefficients and the magnitude of the partial correlation coefficients. The KMO criterion is excellent when 0.90-1.00, very good when between 0.80-0.89, good when between 0.70-0.79, average when between 0.60-0.69, weak when between 0.50-0.59, inacceptable when below 0.50 (Akgül, 2003).

In the factor analysis of the principal components, KMO value was first evaluated found to be 0.885 in the present study. This value was appeared to be above the acceptable limit of 0.70. The Bartlett's Test of Sphericity test results were examined in order to check out if the data came from a highly variable normal distribution. Having a statistically significant the chi-square ($X2=2857,122$; $p<0,01$) value obtained from the result of the Bartlett's Test of Sphericity indicates that the data come from a multivariate normal distribution.

For the procedure of principal components factor analysis, the Kaiser criterion was selected. The Kaiser criteria were taken as a basis including factor load at least 0.35 and variance ratio 0.40 and above. The results of the factor analysis show that the MFI questionnaire had four factorial structure different from its original. The number of factors proceeding was repeated with five factors as in the original. Although the factor coefficient is rather high, the reason of the model's failure to comply with the original is resulting from that phenomena taken into the study may be originated from different socio-economic or socio-cultural structures.

4.3. Corelation Between the Sociodemografic Factors and Fatigue Levels

There are statistical significant differences in the fatigue levels of the healthy individuals found as a result of making comparisons between the sociodemographic factors and the fatigue levels of the university students in the course of the present study. There are scarcely any research studies about fatigue on healthy individuals in the reviewed literature. However, when it is looked at the available studies conducted to compare patients to the healthy individuals, it can be seen that the fatigue levels of the patients are statistically much higher than healthy individuals' fatigue levels (Beurskens et. Al, 2000; Ergin, 2009).

According to the statistical difference based on the gender, it was found that the MFI scores of female students are higher than male students. Moreover, female students were also found to be more physically and mentally tired than male students. Regarding the subscale scores of reduced activity and reduced motivation, female students seem to have more reduced activity than male students. In terms of the FSS scores, it is seen that the physical fatigue levels of female students are higher than male students have.

Considering the faculties, the fatigue levels of the students studying at Faculty of Architecture were found to be lower than those who are studying at Faculty of Education, Faculty of Economics and Administrative Sciences, and Faculty of Engineering. When analyzed the sub-dimension of reduced activity scores on the MFI scale, the students who attended Faculty of Education and Faculty of Economics and Administrative Sciences were found to have higher levels than those attending Faculty of Physical Education Sports High School and Faculty of Architecture. When compared the reduced activity levels of the students studying at Faculty of Engineering and Faculty of Architecture, it was found that prospective engineers have more reduced activity fatigue levels than prospective architects.

Based on the scores of the reduced motivation subscale, it can be viewed that engineering faculty students are in the forefront in point of the reduced motivation fatigue levels, which was found to be higher than the students studying at Faculty of Architecture. The students who attended Faculty of Law were also found to have as

much high the reduced motivation fatigue level as the engineering faculty students have.

As regard to the FSS levels of the students in recognition of their faculties, the students studying at Faculty of Physical Education Sports High School were found to have lower fatigue levels than the students who are studying at Faculty of Education, Faculty of Arts and Sciences, and Faculty of Architecture.

In terms of having health insurance, reduced activity levels of the students with health insurance were found to be higher than those without health insurance. It was also found that the mental fatigue levels of the students having health insurance are higher than those not having health insurance.

The MFI scale scores based on the place where the study participants live shows that the students stay in the dormitory have lower MFI scores than those staying at home with either their friends or their family. The general fatigue levels of the students living in the dormitory were found to be higher than those the students who live at home with their families. Regarding the physical fatigue levels of the students, it is seen that those staying at home with their friends are physically less tired comparing to those staying at home with their families and in the dormitory. In terms of the mental fatigue levels, the students staying at home with their friends seem to have lower fatigue levels than those staying in the dormitory.

According to whether the study participants do sport activities, it is found to be a statistically significant difference in their fatigue levels for the sub-scales of the MFI including physical fatigue, reduced activity, reduced motivation and mental fatigue. In addition to this, the FSS scores of the study participants shows statistical difference in their fatigue levels.

The study analysis based on the consumption of caffeinate drinks indicates that there is a statistically significant difference in the levels of the MFI scale and its subscales of general and physical fatigue. According to the results of the analysis, those who drink caffeinate beverages have lower physical fatigue levels than who do not consume caffeinated drinks.

Based on the alcohol use, the study analysis reveals that the MFI scale and its general and physicial fatigue scales scores of the study participants who use alcohol are lower than those who do not use any alcohol or do sometimes.

According to how many hours per week the study participants have course, the FSS levels of the students reveal statistical difference between the students who have 20 and over course hours in a week and the ones whose course hours are ranging from 15 to 16-20. With regard to this difference, it was found that the more course hours the students have, the higher FSS levels they have.

There is a statistically significant difference between the FSS levels of the study participants according to whether they have social activities or not.

In terms of the dietary habits of the study participants, the statistical difference in their fatigue levels in the FSS scale are found to be between the students feeding with protein-weighted foods and those with the foods containing high carbohydrate and sugar. The fatigue levels of the students having protein-weighted diets are found to be lower than the others. Another difference is found between those feeding foods with high sugar and those having vegetable-fruit weighted and balanced diets. This difference shows that the fatigue levels of the students having sugar-weighted diets are higher than the others.

5. CONCLUSION AND RESULT

In the present research study, the validity and reliability of the MFI's Turkish version has been examined, and it has drawn the following conclusions.

5.1. Conclusions on the Reliability of the MFI Scale:

The Cronbach alpha coefficient which indicates the internal consistency of the scale was found to be α=0.86. The item-test correlation coefficients, which determine the reliability of the scale items, were found to be between r=0.35 and r=0.62. The FSS value demonstrating the reliability of the parallel structure of the scale was found to be α=0,947.

5.2. Conclusions on the Validity of the MFI Scale:

The results of the principal components factor analysis which determines the construct validity of the MFI scale show that factor components of the MFI scale are not compatible with the original scale. As a result of the factor analysis, it was found that there are four sub-dimensions of the MFI scale.

The results of the criterion-related validity and construct validity of the MFI scale that has been adapted to the Turkish version indicates that the MFI questionnaire is sufficient to be used as a valid measurement tool.

It has been observed that there are statistically significant differences in the fatigue levels of the study participants according to their gender, the faculties they are studying at, the number of course hours per week they have to attend, their family types, the place they are staying, as well as whether they have health insurance, consume caffeinate drinks, do sport activities, use alcohol, and have a psychiatric disease.

It has been seen that fatigue is moderate in the arithmetic mean of the MFI scale (mean:57.26) and the arithmetic means of its sub-scales as in the following: general fatigue (mean:11.64), physical fatigue (mean:11.53), reduced activity (mean:11.79),

reduced motivation (mean:11.17), and mental fatigue (mean:11.13). According to the FSS scale (mean:79.17), the fatigue levels of the study participants are found to be higher.

The correlation coefficient between the MFI total score indicating the criterion-related validity of the MFI scale and the sub-scales scores was found to be statistically significant in the positive ($p<0,01$). It is determined to be a positive and direct relationship between the only physical fatigue sub-scale and the FSS scale.

Alongside of breaking new ground in terms of the variety of sample and the number of descriptive criteria, the present research study has the characteristic of being the first in measuring fatigue on healthy individuals. Although there are a number of assessment and evaluation tests in the English used to measure fatigue, there is insufficient number of scales that is adapted to the Turkish.

Because of this fact stated above, the translation of the MFI scale in the Turkish in the way of measuring its validity and reliability makes it possible to use in the field. At the end of the study, it has been seen that the translation of the MFI scale is clear enough so that the study participants could have no difficulty in understanding the items and cultural adaptation of the scale items was able to be proceeded sufficiently.

As a result, the MFI used in the present research study shows consistency in general with its original version even though there are some differences between them. The internal consistency of the scale appears to be above average. The validity of the scale is also satisfactory. In addition to these, findings on the reliability and validity support that the MFI questionnaire can be applied to healthy people.

When the study results related to the validity and reliability of the MFI scale are evaluated, it can be seen that the scale would be used as a means of fatigue measurement in the communities where the Turkish language is spoken.

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Yorgun sözlük anlamı nedir? http://www.sozlukanlamine.com/yorgun-12537 (E.T. 05.04.2016)

APPENDIX A

SOCIODEMOGRAPHIC	INFORMATION FORM
What is your age?	
What is your sex?	a. Man b.Woman
What is your marital status?	a. Married b. Widow c.Single d. Divorced
Which faculty do you have education?	
What is your class?	a.1 b.2 c.3 d.4 e.Master Degree f.Doctorate
What is your lecture load for one week?	a.15 hours b.16-20 hours c.Above 30 hours
Do you have any work?	a.Yes b.No
If you work, what is your working principle?	a. Shift Work b. Part Time c. Full Time
If you work, what is your working principle?	
Do you have health insurance?	
What is your family type?	a. Nuclear Family b. Extended Family c. Broken Family
Where do you live?	a. Home , with friends b. Home , with family c. Dormitory
How often do you have a talk with your family for one week?	a. Below 3 b.Between 4 -6 c. Above 7
Do you have any social activities (folk dances, non-governmental organization, theater, etc)?	a.Yes b.No
Do you have any sport activity?	a.Yes b.No
How many hours sport do you have for one day?	
Height : Weight: BMI:	
What is your type of nutrition?	a. Carbonhydrate and oil-weighted foods b. Protein weighted foods c. Foods rich in sugar d. Fruit and vegetable weighted foods e. Balanced diet
How many hours do you sleep per day?	
Do you go to bed at same hour every day?	a.Yes b. No c. Changes
Do you smoke?	a. Yes b. No c.SomeTimes

How many months/years do you smoke?			
How many cigarette smoke per day?			
Do you drink caffeinated beverage every day?	a.Yes	b.No	c.Some Times
Do you drink alcoholic beverage?	a.Yes	b.No	c.Some Times
Do you have chronic disease?	a.Yes	b.No	
Do you use any drug continuously?	a.Yes	b.No	
Do you have any psychiatric disease?	a.Yes	b.No	

APPENDIX B

ÇOK BOYUTLU YORGUNLUK ÖLÇEĞİ

Açıklamalar:
Aşağıdaki durumlar ile ilgili olarak **son zamanlarda** kendinizi nasıl hissettiğiniz ile ilişkili bir fikir sahibi olmak istiyoruz
Örneğin verilen durum;

"RAHATLAMIŞ HİSSEDİYORUM"

Son zamanlarda rahatlamış hissetiğiniz ile ilgili durum sizin için tamamen doğruysa en soldaki kutucuğa gösterildiği gibi X işaretleyin

EVET BU DOĞRU ☒1 ❑2 ❑3 ❑4 ❑5 HAYIR BU DOĞRU DEĞİL

Eğer duruma **katılmıyorsanız** '' hayır bu doğru değil'' yönündeki kutucuklara X işareti koyabilirsiniz. Lütfen herhangi bir durumu atlamayın ve her bir durum için sadece bir kutucuğa X işareti koyun

1	Kendimi zinde hissediyorum.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
2	Fiziksel olarak, çok az yapabileceğimi hissediyorum.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
3	Kendimi çok aktif hissediyorum.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
4	Bütün güzel şeyleri yapabileceğimi hissediyorum.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
5	Yorgun hissediyorum.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
6	Gün içinde çok şey yaptıgımı hissediyorum.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
7	Birşey yapıyorken, düşüncelerimi onun üzerinde tutabiliyorum.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
8	Fiziksel olarak bir çok şeyin üstesinden gelebilirim.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
9	Bir şeyleri yapmak zorunda olmaktan korkuyorum.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
10	Gün içinde çok az şey yaptığımı düşünüyorum.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
11	İyi konsantre olabiliyorum.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
12	Dinlendim.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
13	Bir şeye odaklanmak çok fazla çaba gerektiriyor.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
14	Fiziksel açıdan kötü durumda olduğumu hissediyorum.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
15	Birçok planım var.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
16	Kolayca yorulurum.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
17	Çok az şey başardım.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
18	Birşey yapıyormuşum gibi hissetmiyorum.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**

19	Düşüncelerim kolayca dağılır.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**
20	Fiziksel olarak çok iyi durumda oldugumu hissediyorum.	**Evet, bu doğru**	❑1	❑2	❑3	❑4	❑5	**Hayır, bu doğru değil**

İşbirliğiniz için çok teşekkür ederiz.

APPENDIX C

Yorgunluk Etki Ölçeği

Bugün de dahil olmak üzere geçen ay içerisinde ne kadar yorgunluk problemi yaşadığınızı öğrenmek istiyoruz. Lütfen tüm ifadeleri dikkatlice okuyunuz. Yorgunluğunuz nedeniyle aşağıdaki durumlarda ne derecede problem yaşadığınızı seçeneğin solundaki parantezin içine çarpı (X) işareti koyunuz.

1. Kendimi daha az uyanık hissediyorum.

   ( ) Böyle bir problemim yok

   ( ) Biraz problem yaratıyor

   ( ) Orta derecede problem yaratıyor

   ( ) Önemli problem yaratıyor

   ( ) Çok önemli problem yaratıyor

2. Dikkatimi uzun süre toplamakta zorluk çekiyorum.

   ( ) Böyle bir problemim yok

   ( ) Biraz problem yaratıyor

   ( ) Orta derecede problem yaratıyor

   ( ) Önemli problem yaratıyor

   ( ) Çok önemli problem yaratıyor

3. Net bir şekilde düşünemediğimi hissediyorum.

   ( ) Böyle bir problemim yok

   ( ) Biraz problem yaratıyor

   ( ) Orta derecede problem yaratıyor

   ( ) Önemli problem yaratıyor

   ( ) Çok önemli problem yaratıyor

4. Daha fazla unutkan olduğumu hissediyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

5. Karar vermekte güçlük çekiyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

6. Düşünmeyi gerektiren herhangi bir şey yapmak için daha az istekliyim.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

7. Düşünmeyi gerektiren görevleri eskisine göre daha zor tamamlayabiliyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

8. Evde veya işte iş yaparken düşüncelerimi toplamak zor geliyor.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

9. Düşünce hızımın yavaşladığını hissediyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

10. Konsantre olmakta güçlük çekiyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

11. Daha sakar ve dağınığım.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

12. Fiziksel aktivitelerimde daha dikkatli olmalıyım.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

13. Fiziksel güç gerektiren herhangi bir işi yapmaya daha az istekliyim.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

14. Fiziksel gücümü uzun süre korumakta zorluk çekiyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

15. Kaslarım olması gerekenden çok daha zayıf.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

16. Fiziksel rahatsızlığım arttı.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

17. Fiziksel güç gerektiren görevleri tamamlamayı daha az becerebiliyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

18. Diğer insanlara nasıl göründüğüm konusunda endişeliyim.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

19. Fiziksel aktivitelerimi kısıtlamak zorundayım.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

20. Daha sık aralıklarla veya daha uzun süreyle dinlenmek istiyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

21. Kendimi sosyal ilişkilerden daha fazla soyutlanmış hissediyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

22. İş yükümü veya sorumluluklarımı azaltmak zorundayım.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

23. Daha huysuzum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

24. Ev içerisinde veya dışarıda çalışma etkinliğim azaldı.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

25. Benim için iş yapmaları veya bana yardım etmeleri için başkalarına daha fazla bel bağlamak zorunda kalıyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

26. Daha sinirliyim ve daha kolay öfkeleniyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

27. Sosyal aktivitelere katılmak için daha az istek duyuyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

28. Kendi evimin dışında çok az sosyal ilişkim var.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

29. Normal günlük olaylar bana stres veriyor.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

30. Bana stres verecek durumlardan kaçınıyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

31. Yeni birşeylerle ilgilenmek zor geliyor.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

32. İnsanların benden istediklerini karşılayamadığımı düşünüyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

33. Kendim ve ailem için maddi destek sağlamakta zorlanıyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

34. Cinsel aktivitelerle daha az ilgilenemiyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

35. Duygusal konularla daha az ilgilenebiliyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

36. Aile aktivitelerine tam olarak katılmakta güçlük çekiyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

37. Aileme olması gerektiği kadar duygusal destek veremiyorum.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

38. Küçük zorluklar gözümde büyüyor.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

39. Aktiviteleri ileriye yönelik planlamakta zorluk çekiyorum, çünkü yorgunluğum aktiviteleri etkileyebilir.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

40. Yorgunluk evimin dışına yolculuk yapmamı kısıtlıyor.

( ) Böyle bir problemim yok

( ) Biraz problem yaratıyor

( ) Orta derecede problem yaratıyor

( ) Önemli problem yaratıyor

( ) Çok önemli problem yaratıyor

Not: puanlama min: 0 max:160

(0) Böyle bir problemim yok

(1) Biraz problem yaratıyor

(2) Orta derecede problem yaratıyor

(3) Önemli problem yaratıyor

(4) Çok önemli problem yaratıyor

APPENDIX D

ETHICS COMMITTEE APPROVAL

YAKIN DOĞU ÜNİVERSİTESİ FEN VE SOSYAL BİLİMLER BİLİMSEL ARAŞTIRMALAR DEĞERLENDİRME ETİK KURULU (YDÜFSBBADEK)

ARAŞTIRMA PROJESİ DEĞERLENDİRME RAPORU

Toplantı Tarihi : 30.05.2016

Toplantı No : 2016-20

Proje No : 20

Yakın Doğu Üniversitesi Sosyal Bilimler Fakültesi Psikoloji Bölümü öğretim üyelerinden Yrd. Doç. Dr. Zihniye Okray'ın sorumlu araştırmacısı olduğu, YDU/ 2016-20 proje numaralı ve **"Multidimensional Fatique Inventory (Çok Boyutlu Yorgunluk Envanteri) Türkçe Geçerlilik Güvenirlik Çalışması"** başlıklı proje önerisi kurulumuzca değerlendirilmiş olup, etik olarak uygun bulunmuştur.

1- Prof. Dr. Mehmet Çakıcı (BAŞKAN)

2- Prof. Dr. Mahmut Savaş (ÜYE)

3- Doç. Dr. Nesil F. Baytın (ÜYE)

4- Doç. Dr. Direnç Kanol (ÜYE)

5- Yrd. Doç. Özgür Özerdem (ÜYE) KATILMADI

APPENDIX E

PERMISSION PAPER

----- Forwarded Message -----
From: "E.M.A. Smets" <e.m.smets@amc.uva.nl>
To: "ZIHNIYE OKRAY" <zokray@eul.edu.tr>
Sent: Thursday, December 10, 2015 10:25:12 AM
Subject: RE: MFI

Dear dr. Zihniye Okray,

Thank you very much for getting in touch with me. You herewith have my permission to translate and research the MFI. All translations have been derived from the English version which you will find attached. For your information I also attached a paper about the translation procedure followed for other MFI-language versions and a bibliography. The latter needs to be updated, but may nevertheless be of use.

Kind regards,
Ellen Smets

-----Oorspronkelijk bericht-----
Van: ZIHNIYE OKRAY [mailto:zokray@eul.edu.tr]
Verzonden: woensdag 9 december 2015 10:55
Aan: E.M.A. Smets
Onderwerp: Re: MFI

Dera Madam,

Fadime B. Kurtgün is my student in Near East University Clinical Psychology Masters Degree Program. In her thesis she is going to translate MFI-20 into Turkish and do the reliability and validity study of it with university student's sample if you give the permission of the study to use the scale.

APPENDIX F

TURNITIN

FILE	TEZ-ING.DOC (928K)		
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SUBMISSION ID	823284335	CHARACTER COUNT	105651

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ORIGINALITY REPORT

%9	%5	%7	%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

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RESUME

I was born in Darende in 1st of July of 1976. I finished primary, elementary and high school in Malatya. I was graduated from Gülhane Military Medical Faculty in 1987 as a nurse. I was graduated from Near East University Psychology Faculty in 2012. In January 2015 I started Clinic Master's Degree Programmes in Social Science Enstitue.