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YEDİTEPE UNIVERSITY  
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**COMPARING THE IMPACTS OF VIDEO-BASED  
AND PHYSIOTHERAPIST-LED YOGA  
PRACTICES ON THE RESPIRATORY  
CAPACITIES AND SLEEP QUALITY OF  
SEDENTARY INDIVIDUALS**

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## ONAY

Bu tez Yeditepe Üniversitesi Lisansüstü Eğitim-Öğretim ve Sınav Yönetmeliğinin ilgili maddeleri uyarınca yukarıdaki jüri tarafından uygun görülmüş ve Enstitü Yönetim Kurulu'nun 29/07/2020 tarih ve 2020/07-05 sayılı kararı ile onaylanmıştır.

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## DECLARATION

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which has been accepted for the award of any other degree except where due acknowledgment has been made in the text.

04/07/2020



Nahide Koçer



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## TABLE OF CONTENTS

|                                                               |      |
|---------------------------------------------------------------|------|
| APPROVAL                                                      | ii   |
| DECLARATION                                                   | iii  |
| ACKNOWLEDGEMENTS                                              | iv   |
| TABLE of CONTENTS                                             | v    |
| LIST OF TABLES                                                | viii |
| LIST OF FIGURES                                               | ix   |
| LIST OF SYMBOLS AND ABBREVIATIONS                             | xii  |
| ABSTRACT                                                      | xiii |
| ÖZET                                                          | xiv  |
| 1. INTRODUCTION AND PURPOSE                                   | 1    |
| 2. LITERATURE REVIEW                                          | 3    |
| 2.1.Sedentary                                                 | 3    |
| 2.1.1. The definition and characteristics of sedentary        | 3    |
| 2.1.2. Sedentary lifestyle                                    | 4    |
| 2.1.3. The effects of a sedentary lifestyle on human organism | 4    |
| 2.2. Women and Exercise                                       | 5    |
| 2.3. Yoga                                                     | 6    |
| 2.3.1. The history of yoga                                    | 6    |
| 2.3.2 Components of yoga                                      | 8    |
| 2.3.3. Main schools of yoga                                   | 9    |
| 2.3.3.1. Traditional schools                                  | 9    |
| 2.3.3.2. New age yoga schools                                 | 11   |

|                                         |    |
|-----------------------------------------|----|
| 2.3.4. Yoga and health                  | 13 |
| 2.3.4.1. Effects of yoga on respiration | 14 |
| 2.3.4.2. Effects of yoga on sleep       | 16 |
| 2.3.5. Yoga cycle                       | 16 |
| 2.3.5.1. Pranayama (Breath)             | 16 |
| 2.3.5.2. Asanas (Movements)             | 17 |
| 2.3.5.3. Meditation                     | 27 |
| 2.4. Internet-Based Home Exercises      | 28 |
| 3. MATERIALS AND METHODS                | 29 |
| 3.1. Assessment                         | 29 |
| 3.1.1. Socio-demographic data           | 29 |
| 3.1.2. Respiratory function             | 29 |
| 3.1.3. Pain                             | 30 |
| 3.1.4. Quality of life                  | 30 |
| 3.1.5. Quality of sleep                 | 31 |
| 3.1.6. Functional strength              | 31 |
| 3.1.7. Balance                          | 31 |
| 3.1.8. Fatigue                          | 32 |
| 3.1.9. Posture                          | 32 |
| 3.1.10. Flexibility                     | 32 |
| 3.2. Treatment Program                  | 35 |
| 3.2.1. Yoga group                       | 37 |
| 3.2.2. Video-based yoga group           | 45 |
| 3.2.3. Exercise group                   | 45 |

|                                                                                                                                   |     |
|-----------------------------------------------------------------------------------------------------------------------------------|-----|
| 3.3. Statistical Analysis                                                                                                         | 52  |
| 4. RESULTS                                                                                                                        | 53  |
| 4.1. Descriptive Characteristics of Cases                                                                                         | 53  |
| 4.2. Evaluation of Health-Related Physical Fitness                                                                                | 54  |
| 4.3. Evaluation of Respiratory Functions and Pain                                                                                 | 57  |
| 4.4. Evaluation of Sleep Quality                                                                                                  | 59  |
| 4.5. Evaluation of Fatigue                                                                                                        | 61  |
| 4.6. Evaluation of Quality of Life                                                                                                | 62  |
| 4.7. Evaluation of Posture                                                                                                        | 63  |
| 4.8. The Relation Between Respondents' Respiratory Functions, Flexibility<br>Measurements, Sleep Quality, Posture and Chest Girth | 64  |
| 5. DISCUSSION AND CONCLUSION                                                                                                      | 66  |
| 6. REFERENCES                                                                                                                     | 73  |
| 7. APPENDICES                                                                                                                     | 91  |
| 7.1. WHOQOL-BREF                                                                                                                  | 91  |
| 7.2. Pain Quality Assessment Scale                                                                                                | 93  |
| 7.3. The Fatigue Severity Scale                                                                                                   | 95  |
| 7.4. Pittsburgh Sleep Quality Index                                                                                               | 96  |
| 7.5. New York Posture Rating Chart                                                                                                | 97  |
| 7.6. Participant Consent Form                                                                                                     | 99  |
| 7.7. Ethical Approval                                                                                                             | 100 |
| 7.8. Curriculum Vitae                                                                                                             | 101 |

## LIST OF TABLES

|                                                                                                                                                                             |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>Table 4.1.</b> Evaluation of in-group and intergroup differences of the anthropometric measurements of respondents.                                                      | 53 |
| <b>Table 4.2.</b> Comparison of in-group and intergroup differences between flexibility, strength and balance test results with respect to health-related physical fitness. | 55 |
| <b>Table 4.3.</b> Comparison of in-group and intergroup differences in respiratory functions and pain of respondents.                                                       | 58 |
| <b>Table 4.4.</b> In-group and intergroup comparisons of the sleep qualities of respondents.                                                                                | 59 |
| <b>Table 4.5.</b> In-group and intergroup comparison of respondents' states of fatigue.                                                                                     | 61 |
| <b>Table 4.6.</b> In-group and intergroup comparison of the qualities of life of respondents.                                                                               | 62 |
| <b>Table 4.7.</b> In-group and intergroup comparison of the postures of respondents.                                                                                        | 63 |
| <b>Table 4.8.</b> The relation between respondents' respiratory functions, flexibility measurements, sleep quality, posture and chest girth                                 | 65 |

## LIST OF FIGURES

|                                                               |    |
|---------------------------------------------------------------|----|
| <b>Figure 2.1.</b> Prasarita Padottonnasana                   | 18 |
| <b>Figure 2.2.</b> Vrksasana                                  | 19 |
| <b>Figure 2.3.</b> Virabhadrasana 2                           | 20 |
| <b>Figure 2.4.</b> Parsva Konasana                            | 21 |
| <b>Figure 2.5.</b> Utthita Trikonasana                        | 22 |
| <b>Figure 2.6.</b> Paschimottanasana                          | 24 |
| <b>Figure 2.7.</b> Janusirsasana                              | 25 |
| <b>Figure 2.8.</b> Setubandhasana                             | 26 |
| <b>Figure 2.9.</b> Savasana                                   | 27 |
| <b>Figure 3.1.</b> Spirometer                                 | 29 |
| <b>Figure 3.2.</b> Single Leg Stance Test                     | 31 |
| <b>Figure 3.3.</b> Figure Four Test                           | 33 |
| <b>Figure 3.4.</b> Biceps Brachii Muscle Evaluation           | 34 |
| <b>Figure 3.5.</b> Research Flow Chart                        | 36 |
| <b>Figure 3.6.</b> Ujjayi Pranayama and Kapalabhati Pranayama | 37 |
| <b>Figure 3.7.</b> Bhramari Pranayama                         | 37 |
| <b>Figure 3.8.</b> Surya Namaskar (Sun Salutation)            | 38 |
| <b>Figure 3.9.</b> Chandra Namaskar (Moon Salutation)         | 39 |
| <b>Figure 3.10.</b> Prasarita Padottonnasana                  | 40 |
| <b>Figure 3.11.</b> Vrksasana                                 | 40 |
| <b>Figure 3.12.</b> Virabhadrasana 2                          | 40 |

|                                                          |    |
|----------------------------------------------------------|----|
| <b>Figure 3.13.</b> Parsva Konasana                      | 41 |
| <b>Figure 3.14.</b> Utthita Trikonasana                  | 41 |
| <b>Figure 3.15.</b> Sukhasana                            | 42 |
| <b>Figure 3.16.</b> Meruxasana Serie                     | 42 |
| <b>Figure 3.17.</b> Paschimottanasana                    | 43 |
| <b>Figure 3.18.</b> Janusirsasana                        | 43 |
| <b>Figure 3.19.</b> Setubandhasana                       | 43 |
| <b>Figure 3.20.</b> Urdvajanasana – Padajanasana         | 44 |
| <b>Figure 3.21.</b> Padasuptasana                        | 44 |
| <b>Figure 3.22.</b> Savasana                             | 44 |
| <b>Figure 3.23.</b> Diaphragmatic Respiration            | 45 |
| <b>Figure 3.24.</b> Pursed-Lip Respiration               | 46 |
| <b>Figure 3.25.</b> Abdominal Crunch                     | 46 |
| <b>Figure 3.26.</b> Bicycle Crunch                       | 46 |
| <b>Figure 3.27.</b> Squat                                | 47 |
| <b>Figure 3.28.</b> Bridge                               | 47 |
| <b>Figure 3.29.</b> Straight Leg Raise                   | 47 |
| <b>Figure 3.30.</b> Leg Abduction / Adduction Side Lying | 48 |
| <b>Figure 3.31.</b> Half Push-Up                         | 48 |
| <b>Figure 3.32.</b> Mountain Climber                     | 48 |
| <b>Figure 3.33.</b> Half Plank                           | 48 |

|                                                                                                         |    |
|---------------------------------------------------------------------------------------------------------|----|
| <b>Figure 3.34.</b> Half Side Plank                                                                     | 49 |
| <b>Figure 3.35.</b> Thera Band Exercises: Exercise for Shoulder Flexors, Extensors,<br>Abductor Muscles | 49 |
| <b>Figure 3.36.</b> Cat-Camel Exercise                                                                  | 50 |
| <b>Figure 3.37.</b> External / Internal Rotation Stretching By Holding Hands On The<br>Back             | 50 |
| <b>Figure 3.38.</b> Stretching The Shoulder Junction By Holding The Arms Behind                         | 51 |
| <b>Figure 3.39.</b> Bear Walk                                                                           | 51 |
| <b>Figure 4.1.</b> Years Variable of the Respondents                                                    | 54 |

## LIST OF SYMBOLS AND ABBREVIATIONS

|        |                                                   |
|--------|---------------------------------------------------|
| FVC    | The Forced Vital Capacity                         |
| FEV 1  | Forced Expiratory Volume at the End of 1st Second |
| PEF    | Peak Expiratory Flow                              |
| VC     | Vital Capacity                                    |
| MVV    | Maximum Voluntary Ventilation                     |
| PEFR   | Peak Expiratory Flow Rate                         |
| WHO    | World Health Organization                         |
| USA    | The United States of America                      |
| BMI    | Body Mass Index                                   |
| ATS    | American Thoracic Society                         |
| ERS    | European Respiratory Society                      |
| PQAS   | Pain Quality Assessment Scale                     |
| WHOQOL | World Health Organization Quality of Life         |
| PSQI   | Pittsburgh Sleep Quality Index                    |
| 5XSST  | 5X Sit-to-Stand Test                              |
| FSS    | The Fatigue Severity Scale                        |
| ASIS   | Anterior Superior Iliac Supine                    |
| ROM    | Range of Motio                                    |

## ABSTRACT

**Koçer, N. (2020). Comparing the Impacts of Video-Based and Physiotherapist-Led Yoga Practices on the Respiratory Capacities and Sleep Quality of Sedentary Individuals. Yeditepe University, Graduate School of Health Sciences, Physiotherapy and Rehabilitation Program, Master's Thesis. Istanbul.**

Aiming to compare the impacts of video-based and physiotherapist-led yoga practices on the respiratory capacities and sleep quality, this research study hypothesizes that video-based yoga improves respiratory capacities and sleep quality. Sedentary women were randomly divided into three groups; video-based yoga (n=17), yoga (n=15) and exercise (n=16). The yoga group was assigned pranayama (respiration), asana (poses) and meditation and the exercise group, various exercises of respiration, strengthening, stabilization and flexibility with the supervision of a physiotherapist. Yoga exercises were also recorded in video and later used for the video-based yoga group. In the beginning and at the end of the study, which took a total of 6 weeks (2 days/week) and 12 sessions, respiration (spirometer, Cosmed, Pony Fx), sleep (Pittsburgh Sleep Quality Index), flexibility (goniometer, measuring tape), posture (New York Posture Rating Chart), pain (Pain Quality Assessment Scale), balance (Single Leg Stance Assessment), functional strength (5 squat test), fatigue (Fatigue Severity Scale) and quality of life (WHOQOL-BREF) were evaluated. The data was analyzed with SPSS 22.0. In-group evaluations revealed significant improvement in all data of the yoga group other than physical health, psychological health, social relations and environmental components of quality of life ( $p<0.05$ ) and a statistically significant improvement in all data other than sleep quality and quality of life of video-based yoga and exercise groups were found ( $p<0.05$ ). Intergroup comparisons revealed a significant improvement, favoring the video-based yoga groups with vital capacity values, regarding M. triceps brachii flexibility and respiration. As a result, significant improvement in sedentary women was detected in the vital capacities of video-based yoga group and in the sleep qualities and qualities of life of the yoga group. While improvements related to posture are observed in video-based yoga, yoga and exercise groups, the significant improvement in the shoulder and leg postures of those in the exercise group is noteworthy. Video-based yoga approach for sedentary women ( $30,44\pm9,61$  years) is an easily accessible, economical and efficient method.

**Keywords: sedentary, video, yoga, respiration, women**

## ÖZET

**Koçer, N. (2020). Video Temelli ve Fizyoterapist Eşliğinde Yapılan Yoga Pratiklerinin, Sedanter Kişilerin Solunum Kapasiteleri ve Uyku Kaliteleri Üzerine Etkilerinin Karşılaştırılması. Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü, Fizyoterapi ve Rehabilitasyon Programı, Master Tezi. İstanbul.**

Video temelli yapılan yoga ile fizyoterapist eşliğinde yapılan yoga ve egzersizin solunum ve uyku kalitesine etkisinin karşılaştırılması amacıyla yaptığımız çalışmanın hipotezi, video temelli yoganın solunum ve uyku kalitesini arttırdığı yönünde kurulmuştur. Sedanter kadınlar randomize olarak video temelli yoga (n=17), yoga (n=15) ve egzersiz (n=16) olarak üç gruba ayrıldı. Yoga grubuna pranayama (solunum), asana (hareket) ve meditasyon; egzersiz grubuna solunum, güçlendirme, stabilizasyon, esneklik egzersizleri fizyoterapist gözetiminde yaptırıldı. Yoga egzersizleri videoya çekilerek video temelli yoga grubu için kullanıldı. Toplam 6 hafta (2gün/hafta), 12 seans süren çalışmanın başında ve sonunda solunum (spirometre, Cosmed, Pony Fx), uyku (Pittsburgh Uyku Kalitesi İndeksi), esneklik (gonyometre, mezura), postür (New York Postür Değerleme Testi), ağrı (Ağrı Kalitesi Değerlendirme Ölçeği), denge (Tek Ayak Üstünde Durma Testi), fonksiyonel güç (5 defa otur kalk testi) ve yorgunluk (Yorgunluk Şiddet Ölçeği) durumları ile yaşam kaliteleri (WHOQOL-BREF) değerlendirildi. Elde edilen veriler, SPSS 22.0 kullanılarak analiz edildi. Grup içi değerlendirmede çalışma sonunda, yaşam kalitesinin fiziksel sağlık, psikolojik, sosyal ilişkiler, çevre komponentleri dışında yoga grubunun tüm verilerinde anlamlı bir gelişme olduğu ( $p<0.05$ ); video temelli yoga ve egzersiz grubunda uyku ve yaşam kalitesi dışında tüm verilerde istatistiksel olarak anlamlı bir gelişme bulunmuştur ( $p<0.05$ ). Gruplararası karşılaştırmalarda ise, M. triceps brachii esnekliği ve solunumları açısından vital kapasite değerlerinde video temelli yoga grubu lehine anlamlı düzeyde bir gelişme bulunmuştur. Sonuç olarak, sedanter kadınlardan yogayı video ile evde yapanların vital kapasitelerinde, yoga yapanların uyku ve yaşam kalitesinde anlamlı gelişme olduğu saptanmıştır. Video temelli yoga, yoga ve egzersiz yapanların postüründe gelişme gözlenirken, egzersiz yapanlarda omuz ve bacaklarının postüründeki anlamlı gelişme dikkat çekicidir. Sedanter kadınlarda (30,44±9,61 yaş), video temelli yoga yaklaşımı ulaşımı kolay, ekonomik ve etkili bir yöntemdir.

**Anahtar Kelimeler:** sedanter, video, yoga, solunum, kadın

## **1. INTRODUCTION AND PURPOSE**

Yoga is an alternative treatment approach for sustaining the individual's physical and mental well-being and relieving complaints of fatigue, pain, concentration impairment and loss of balance, consisting of relaxing, breathing techniques and proper posture and dynamic exercises (1).

Including short periods of meditation and relaxing techniques, which can be conducted lying down and with eyes closed (2, 3), yoga is comprised of three essential components; asana, pranayama and meditation. Asana yoga consists of approximately 84 different movements that are performed standing up, sitting down or lying down by bending forward, turning or in balance positions (4). Pranayama yoga, on the other hand, consists of inhalation (paraka), exhalation (recaka) and holding the breath (kumbhaka) and emphasizes respiration (5). Pranayama yoga requires voluntary control of respiratory muscles and includes controlling techniques for the respiratory rhythm. Thus, respiration improves by focusing on extending and contracting the respiratory muscles and carrying out breath holding procedures. This is because the voluntary movements of respiratory muscles in question stimulate the autonomous system and respiratory control center and play a key role in the regulation of respiration itself (6). Joshi et al. (7) report that a six-week special pranayama training paved the way for increase in respiratory parameters (FVC, FEV 1, MVV and PEFr) in healthy respondents and improved respiratory function for these persons. Sivakumar et al. (8), on the other hand, examined the acute effect of deep breaths (for 2-10 min.) and concluded that they found significant improvement in the respiratory function parameters of healthy respondents.

Increasing scientific studies have shown in the recent years that yoga practices produce potential benefits for healthy and clinical populations (9), improve sleep quality (10, 11) and relieve symptoms of insomnia (12, 13). In a study with 410 cancer patients, who suffer from moderate and severe sleep disorders, Mustian et al. (14) purported that an eight-session yoga program improved the results of slumber of respondents. Newton et al. (10) also showed that home-based practices, in addition to 12 weeks of yoga classes, decreased symptoms of insomnia for women with menopausal vasomotor symptoms. Moreover, Chen et al. (15) in their study, pointed out that yoga substantially increases sleep quality in older adults with sleep complaints (15).

Therefore, developing efficient interventions to encourage the adaptation and persistence of physical activities is a great need. Furthermore, said interventions must be spread throughout 75% of sedentary or insufficiently active population (16). To that end, interventions of physical activity and those that could benefit more from newer technologies such as the Internet must be highlighted, so that merely relying on vis-à-vis and other approaches is surpassed (17, 18).

From this point of view, the purpose of this study is to investigate the effect of yoga practices, which are conducted via video clips and in accompaniment of a physiotherapist, on respiratory capacities and sleep quality. The hypothesis of the study is that video-based yoga is just as much efficient as the yoga practices, conducted with a physiotherapist, and also improves respiration and quality of sleep.

## **2. LITERATURE REVIEW**

### **2.1. Sedentary**

#### **2.1.1. The definition and characteristics of sedentary**

The word sedentary, by definition, refers to lack of movement, stability, steadiness and being stationary. Living in a steady manner without movement, like a machine, is called a sedentary lifestyle. Said lifestyle causes a number of health issues that could have a negative influence of people's lives, while it also makes them lazy (19).

Along with the developing technology, the most striking problem humanity encounters is the decreasing need for moving; in other words, humanity is rapidly being dragged to a sedentary lifestyle. While the world was fulfilling 90% of its energy needs a century ago, this ratio has dropped to 1% nowadays. The decreasing need for movement at this rate brings along a series of health issues and metabolism disorders, which are potential problems today. Overall, it is well known that our society currently displays quite low ratios of having the habit of doing correct and regular exercise. Therefore, our priority is to exercise no matter what, at every opportunity and in every possible environment to move the body (19).

Examples of a sedentary lifestyle would be driving to places in close proximity, rather than walking, using escalators instead of stairs, doing our jobs on the computers and by the desks, because it is more practical, spending more time before the television and limiting all of the possible physical activities that one must conduct throughout the day (20).

Sedentary individuals are those, who do not carry out any other physical activities except for their daily work; as such, sedentary lifestyles negatively impact people's lives, increasing the importance of physical activity levels and exercise. Thus, persons with sedentary work lives must be encouraged to conduct physical activities on a regular basis in order to take their living standards to higher levels. World Health Organization (WHO) defines quality of life as "the manner of perceiving one's state within elements of value and culture, in which individuals live, by relating them to their targets, expectations, standards and interests". In other words, quality of life is described to be the individual's subjective perception of his or her own health in the sociocultural environment in which he or she lives (21). According to World Health Organization's report dated 2002, 1.9

million people around the world pass away due to sedentary lifestyles. Around the world, an estimated 10-16% of breast cancer, colon cancer and diabetic issues and 22% of cardiac disorders are caused by the sedentary lifestyle in question. There are 4 main areas, where people can physically move and be more active. They are as follows:

- Workplaces
- Transportation (walking, cycling, etc.)
- Daily house chores
- Leisure activities (sports and recreational activities)

### **2.1.2. Sedentary lifestyle**

A sedentary lifestyle is the type that is adopted by persons, who conduct no sports-related activities, except for their daily activities during the day (22).

### **2.1.3. The effects of a sedentary lifestyle on human organism**

A sedentary lifestyle could cause a disturbance in the lifestyle energy balance and even obesity. Obesity is distinguished by high rates of fat and excessive endomorphic ratios. Health issues that may be caused by a sedentary lifestyle can also increase the unwanted effects, which are often encountered during menopause. Especially when the body weight is rather higher than usual, many serious health issues can be observed, in addition to a drop in physical manpower. A sedentary life may lead to obesity, high cholesterol and increased hypertension. Long term lack of movement could have many impacts on the organism in middle and older ages such as high blood pressure, muscular weakness, postural problems, increased risk factors of diabetes and coronary artery disease, flexibility in thorax and absences in respiratory capacity, weakening of abdominal muscles, digestive and excretory difficulties, posture disorders, loss of function in motor features in muscles such as strength, flexibility and endurance, vulnerability to injuries, disorders and losses in bone mineral density, arthritic calcification and functional problems, increased blood sugar and blood lipid rate and other unwanted health issues (23).

## **2.2. Women and Exercise**

Exercise is the total of one or more planned physical activities, which are voluntarily conducted to improve physical performance, physical fitness and health status (24).

In other words, exercise can also be called the entirety of target-driven movements. It can also be defined as the movement and training to activate the body. Exercise includes all activities, conducted with or without instruments, such as gymnastics and sports, which are bodily activities to acquire skills, improve agility, strength, endurance and become vigorous, healthier, protect the body and ensure its development. Exercise is equivalent to the word 'training'. When one thinks about being healthy, one often thinks of not being sick. However, being healthy has many more meanings today. Being healthy refers to the physical, mental, social, intellectual and spiritual well-being. The way to achieve it goes through exercising. It is not likely to acquire that wholeness without exercising. The purpose of lifelong exercising is to prevent or slow down the organic, psychological and physical problems that are caused by a sedentary lifestyle and increase the physiological capacity, which is the basis of bodily health, and keep physical fitness and health at a balance for long years. It is possible to explain the reason underlying the increasing attention towards exercise in developed countries as the need for biological, psychological and social balance (25).

In parallel with the environmental and social changes in recent years, women are keener to sports as well. Sports activities, which were deemed to be for men only in the past, gradually increased and spread among women too (26).

The increase in the number of women, who actively conduct sports activities, increased the number of contests, organized for them simultaneously. Women are observed to assume positions in an active life since the beginning of 19th century. This develops in direct proportion today with the developmental and cultural levels of countries. Women are frequently seen to engage in sports activities, just like men. Until the age of 10 – 12, boys and girls display parallel growth and development. However, after the age of 12, women start releasing estrogen hormones and men start releasing testosterone more, which clearly shows the distinctions between the two sexes. Said distinction is even clearer in physical and physiological systems. They also prevent men

and women to compete in the same games. Men are more achieved in some sports branches, while women excel in others (27).

Women's participation in different sports branches brought along many unknown data about them too. In the past, negative arguments about women were posited. They were later refused by women's achievements in sports-related activities. In societies with different developmental levels, this unexpected achievement of theirs drove scientists to conduct research studies about this topic. Consequently, sports studies started to include more and more research studies about women and sports (28).

When the exercise program is conducted on a regular basis, the fat ratio in the body would be decreased and lean body mass would be increased through the regulation of body composition in women (29).

### **2.3. Yoga**

At its core, yoga is a philosophy of life that underlines the entire body of the individual, rather than merely the physical body and emphasizes the harmony between body and mind. In general, it is a life science, based on the combination of soul and body to comprise a flexible and healthy body. The Word yoga means combining and integrating. Yoga is a universal art, conducted to discover ourselves, attain inner peace and form an integrity. Those who practice this philosophy are called "yogi" (30, 31).

The philosophy of yoga has its foundations on the metaphysical beliefs of the Far East. The purpose of this philosophy is to ensure the person's enlightenment", after obtaining the balance of body and soul. Yoga also has benefits for the human body, in addition to the metaphysical concepts (31).

#### **2.3.1. The history of yoga**

The history of yoga dates back to ancient times and it is known to have emerged in India about 4 thousand years ago. Yoga techniques are kept like secrets, are not written or announced. Yoga masters have relayed these techniques as an oral tradition to only honest and sincere students, whom they trust, through instructors or gurus (guides) (32, 33). In order to comply with the changing and developing conditions of the world, yoga has also changed and developed constantly throughout thousands of years, progressing towards a model that would help the individual unlock full strength and then mental consciousness (34).

The first written records about yoga are seen in Rig Veda, a sacred collection of texts from between 1500 and 1200 B.C., accepted to be the foundation of Hindu culture and philosophy. The first full explanation of the principles and purposes of yoga, on the other hand, can be found in the Upanishads, collected in the 8th and 4th centuries B.C. Sacrifices and ceremonies for gods are replaced in the Upanishads with abstaining from mundane desires with Mighty Being Brahman/Mahatman, being moral, being one and whole through educating the mind (35).

Bhagavad Gita, on the other hand, is considered to be the main source of yoga; it represents a part of the Mahabharatta epic and seen sacred by Hindus. Bhagavad Gita is assumed to have been written between the 5th and 2nd centuries B.C. It is the first book that comes to mind after the Upanishads regarding Indian mysticism. The majority of Hindu priests in India have this book memorized. Accepted to be a spiritual masterpiece by the Hindus and those who are interested in Eastern philosophy, Bhagavad Gita means the Song of the God, the Mightiest. This book is believed to have been revealed or taught by Vaishnava God Vishnu's avatar Krishna to Arjuna. Bhagavad Gita is sometimes called "Gitopanishad" too, for it is a sacred text that is similar to Upanishad in quality. The book does not include mythological elements much; it has a mystical and philosophical structure and explains the philosophy of yoga clearly and concisely (35).

Yoga in Gita is depicted as a path towards salvation and it is considered by Hindus as a discipline, aimed at directing one's energy towards a certain goal (36).

The oldest remnants concerning yoga was found during the archeological excavations in Pakistan's East Balochistan region, between Indus and Sarasvati rivers. The excavations revealed almost 5 thousand years old tablets with depictions of people doing yoga. These tablets are claimed to belong to Neolithic settlements from 7,000 B.C., called Mehrgarh. Therefore, this philosophy regarding man's observation of the nature and being one with it is assumed to have developed around this time (37).

Following Queen Victoria's ascend to the throne in 1880 as the Empress of India, her interest towards India's spiritual heritage and culture caught the attention of the west. Especially as of 1600s, London East Indian Company and Dutch Indian Company, established in India, moved all information to the west, which became an attraction of interest. That is how yogic values found places for themselves in the west. This attention

reached its highest level with the speech Swami Vivekananda gave in 1893 at the Parliament of the World's Religions in Chicago.

Paramahansa Yogananda, author of the book "Autobiography of a Yogi", went to USA in 1920 and established Self-Realization Fellowship, while Krishnamacharya and students contributed to the journey of yoga around the world, introducing schools such as Ashtanga Yoha, Hatha Yoga and Power Yoga to the world. The 4 great students of Krishnamacharya are B.K.S. Iyengar, Indra Devi, Pattabhi Jois and Desikachar (38). Becoming more widespread and accepted with these developments, the yogic system supported the training of good Yoga instructors in the west and yoga knowledge to be relayed to wider groups through these instructors.

The yoga practices and mentality in our country, on the other hand, are seen to be perceived as a method of meditation, based on physical exercises, much like the case in the west, conducted only to relax and stay healthy. While this framing of yoga mentality in Turkey is criticized, books on yoga and yoga centers increase in numbers with each passing day. Yoga centers are being opened particularly in high income neighborhoods and yoga practices are often taught by yoga instructors at gyms in meditative ways (39).

### **2.3.2 Components of yoga**

Yoga is the method of becoming a happy and enlightened human being by ensuring that one recognizes his/her own self, keeps it in balance and integrates it with universal harmony. Yoga is not a religion. It is a philosophy that aims to help people reach success and enlightenment through physical, mental and spiritual disciplines. In fact, it is a path that requires long term training and is learned with the guidance of a yogi (31,40,41).

According to Patanjali, who lived in the 3rd century BC, yoga consists of 8 steps as follows (30, 31,40,42-44):

**Yama:** Consisting of ahimsa, satya, brahmakarya, aparigraha and Yamaha, this principle teaches the individual about external living practices and abiding by moral rules. Accordingly, violence, theft, greed and indulgence are forbidden.

**Niyama:** Niyama is a philosophy that consists of five stages; sauca, santosa, tapa, svadyaya and isvarapranidhanat, teaching self-discipline by aiming for purity, simplicity and hard work.

**Asana:** Asanas are the bodily exercises, completed at certain positions and stances.

**Pranayama:** Pranayama teaches breathing in and out with certain rhythms and methods that control respiration.

**Pratyahara:** Pratyahara ensures that one controls his/her perceptions and emotions.

**Dharana:** Dharana teaches how to concentrate on a particular idea and to focus on the object of meditation.

**Dhayana-Meditation:** Having full control over the mind and thoughts, meditation is one of the foundations of yoga. It is a principle that ensures becoming one with and being integrated to the universe. It is a state of consciousness, where thoughts that stem from senses are out of question; in other words, it is the mental state that occurs right after full concentration.

**Samadhi:** According to Samadhi, the subject and the object, as well as the observing and observed are one. It is the ultimate aim of meditation. As the body and the senses rest, the mind and the soul remain awake and one attains a supreme consciousness. Yoga is completed, once one attains Samadhi.

To clarify, these eight steps may be classified in 3 groups;

1. Way of living of yogis (yama and niyama)
2. External yogic practices (asana, pranayama, pratyahara)
3. Internal yogic practices (dharana, dhayana, samadhi)

### **2.3.3. Main schools of yoga**

#### **2.3.3.1. Traditional schools**

**Raja Yoga:** As the most metaphysical type of yoga, this type is often called ‘noble yoga’ too. It is a popular yoga philosophy, where posture and breathing exercises are integrated with meditation techniques and scientific research.

**Bhakti Yoga:** It is a yoga technique, practiced with the philosophy of “the power of love represents the source of energy”. Bhakti yoga philosophy is often adopted by persons, whose emotional characteristics are rather more dominant.

**Karma Yoga:** The “kri” root means “doing” in Sanskrit. All of how we behave, what we think and what we say; in other words, all actions that connect the individual to his/her cycle of life “samsara” are “karma”. Karma yoga is the way to free the individual from his/her karma links. What is aimed on this path is to save the individual from selfishness and purify the heart.

**Jnana Yoga:** It is the path to wisdom, which is the most challenging path of the philosophy of yoga. After passing through all paths and maturing, individuals on this particular path would need desire and a supreme mental power. It aims for the experience of unity doctrine.

**Hatha Yoga:** Consisting of a mixture of the words ha (sun) and tha (moon), this type of yoga aims for the balance of our living sources and thus, that between our bodies and minds. It includes physical movements, positions and breathing techniques that includes the preparation for supreme consciousness.

It is the most commonly practiced yoga technique, where thoughts are deepened and breathing exercises are used for purification, in addition to combinations of physical exercises. Hatha yoga exercises are often used for the treatment of many diseases, for they relax the muscles in the body and involve specialized movements with isometric contractions.

It comprises of three main sections at its core; pranayama (breathing techniques), asana (posture techniques) and savasana (relaxation). All muscle groups work with hatha yoga technique and an increase in flexibility, muscular strength and balance is hence achieved (30).

**Kundalini Yoga:** It includes active meditation that focuses on one force in the body, bodily movements and quick breathing exercises.

**Ananda Yoga:** It involves practices that aim to activate high energy centers of the body.

**Sahaja Yoga:** It is a method that aims to awaken the primordial forces of the body through posture and breathing exercises (40-42, 45).

### 2.3.3.2. New age yoga schools

Yoga is a whole. Regardless of the tradition or approach that shapes the content, its ultimate purpose is the well-being of the individual's mind, body and soul. All techniques, used for this creation, date back to the eight stage classical yoga method of Patanjali. It is observed that propensities towards individual development and health improvement required various structures with different names in order for schools to be interpreted by their own approaches and for practitioners to interpret their practical styles, in addition to differentiation advantages.

**Iyengar Yoga** focuses on correct posture and attention on the position's fine details. It was developed by B.K.S. Iyengar. This method follows a relatively slower advancement line due to longer practices of positions and their frequent repetitions. It is recommended in this practice to the newcomers to work on standing positions that ensure the solid foundation for yoga and place the right position from feet to top.

After excelling yoga positions in the Iyengar School, the practitioner switches to breathing exercises. On the other hand, Iyengar yoga places importance on complementary materials such as the utilization of belts, blankets, mats and chairs, for they support balance of the body and the improvement of the position. It also aims to minimize the risk of injury and maximize the highest level of improvement for the body (46).

**Ashtanga Yoga** follows series of consecutive, dynamic, rapid and challenging positions, linked with ujjayi breath, which is also known as the victorious breath or ocean breath, and vinyasa positions. This yoga technique is systematized by K. Pattabhi Jois. It generates strength and flexibility, improves endurance, warms up the body and purifies the body from toxins as the flowing method it is (46, 47). It is also different from the eight-stage yoga of Patanjali, which is known with the same name.

**Sivananda Yoga** is based on the teaching of Swami Sivananda; focusing mainly on yoga positions, breathing techniques, relaxing, nourishing, positive thinking and meditating.

**Power Yoga** is comprised of a series of energetic and flowing movements that take Ashtanga yoga school at their bases; however, it does not have clearly defined series. It is very close to sports with its improving qualities in terms of flexibility and strength.

This type is utilized in many wellness clubs or gyms, when individuals are moving from aerobics to yoga. Among the renowned names in this school are Beryl Bender Birch, Bryan Kest, Baron Baptiste and Sherri Baptiste Freeman (47).

**Bikram Yoga** is a challenging, dynamic and intense type of yoga, developed by Bikram Choudhury. The exercises consist of a series of movements, including twenty-six yoga positions, which are specifically designed to strengthen the productive functioning of all kinds of bodily systems. The series of movement in question is exercised with ujjayi breaths. The yoga studio, where this type of yoga is practiced, is warmed up to 37-38C degrees to promote perspiration and to accelerate the elimination of toxins from the body. It mainly aims to purify the body on a higher level, speed up the detoxing of the body and achieve higher levels of flexibility. The first part of the series consists of standing positions. Bending backward, bending forward and side flexion movements are carried out with kapalabhati breath, which is also known as the fire breath. Each yoga position is usually practiced twice, while the positions are also held for a while. Those without any prior health issues, chronic illnesses or with minimum disorders can safely practice this type of yoga.

**Anusara Yoga** is based on Hatha yoga and biomechanical principles. In addition to grounding physical energy and focusing on internal and external harmony, this type of yoga keeps the heart open and allows one's access to kindness with a touch of grace in each position. Yoga positions follow each other in a flowing manner in this type. Founded by John Friend, this system posits that it is differentiated from other Hatha yoga types with its three main elements, granting spiritual content to Hatha Yoga.

The three elements in question are as follows (46, 47);

- **Attitude:** The individual opens himself/herself to the creator and to blessing through his/her nature and in accordance with it.
- **Harmony:** During each movement, the individual is aware of each and every different part of his/her body.
- **Action:** The focus during yoga positions is the heart and there is a balance between muscular strength and the enhancement and increase of internal freedom.

**Vini Yoga** is developed by T.K.V. Desikachar and has softer movements and therapeutic functions. This style represents the method that each and every individual can

utilize as they grow and change throughout life, in order to develop a holistic technique. It comprises of rearranged and flowing yoga positions to fulfill special needs of the individual, such as being filled with feelings of strength and health, in addition to speeding up the process of well-being, improving flexibility and having sturdy joints. The yoga philosophy is intertwined with physical exercise and this method is often taught via private classes (48).

Viniyoga technique requires the absolute coordination of movement and breath. Moreover, the ratio of inhaling and exhaling is timed according to the durations of inhaled and exhaled breaths and the changing of classical positions, contrary to Iyengar yoga (46).

**Kripalu Yoga** is developed by Amrit Desai and includes three stages (46, 47);

- Exercising internally and willingly by consciously focusing on the posture and the breath,
- Strengthening the will and the sense of submission by holding the positions without any distortions, therefore perceiving the internal world, consisting of feelings and thoughts, in further depth,
- Immersing oneself in meditation within the movement and holding the position of the body during meditation and believing that one is sufficiently wise to remove all unnecessary obstacles and strains, submitting oneself completely to the whole.

#### **2.3.4. Yoga and health**

In addition to breathing correctly and eliminating harmful substances from the body via respiration techniques and yoga position, massaging the abdominal area with diaphragm movements during inspiration and expiration of the lungs through respiration also contributes to the well-being of the body by improving blood flow to the digestive system, liver, kidneys and other organs. There are different types of practice such as respiration via controlled changes of nostrils (anuloma viloma), diaphragmatic respiration (Kapalabathi), abdominal respiration and pulmonary respiration. In order to apply the breathing techniques in question and to acquire efficiency, practices shall be completed regularly, in open air and standing up or by leaning on a surface (42,49,50).

Asana postures, which are hatha yoga stances, grammatically refer to a comfortable, joyful stance. Hatha yoga asanas are positions that utilize coordinated body postures and respiratory techniques with certain concentrations to impact physical

composure and spiritual existence. Each asana, according to its own group, balances and flexes the physical composure, stretches the muscles and increases their extensibilities. Stretching the body with yoga postures is not a direct weight loss method, but it still helps with the overall fitness of the body. Asanas are exercises that can easily be practiced for the bodily health, providing various benefits and without forcing the body too much. They also bring along resistance, healthy joints and keep away diseases (30,31,40-42).

In a sense, yogic asanas are isometric exercises that improve the uniformity, flexibility and endurance of antagonist muscles. In many studies, it has been pointed out that asanas develop static motor performance and decrease states of excessive fatigue by increasing extensibility and endurance (30).

Studies regarding the efficiency of yoga on rheumatic disorders are conducted, such as lower back pain, carpal tunnel syndrome, hand osteoarthritis and rheumatoid arthritis, reporting positive outcomes. Additionally, yoga regulates overall energy and improves quality of life, which render it a practice with positive impact on the general state of being (30,31,51,52).

#### **2.3.4.1. Effects of yoga on respiration**

According to the philosophy of yoga, breathing is not merely an exchange of oxygen and carbondioxyde; the fundamental knowledge of yoga posits that breathing allows one to crack the door to a holistic transformation, enhances one's bodily awareness and establishes a bridge between the spiritual mind and body. Breathing exercises, conducted in light of the knowledge of yoga are thought to play key roles in noticing the deeper meaning of life, regulation breathing patterns physiologically and organizing the autonomous system, which controls the respiratory system, by changing neurotransmitters (31).

Cells in the human body need constant oxygen to continue their vital functions. One hundred trillion air molecules are inhaled with each breath and 21 trillion out of them are oxygen molecules. When one is not breathing correctly, the oxygen level in the blood declines, which gives way to tissue hypoxia. In this case, chemoreceptors relay the necessary information to the brain, which are needed for breathing regulation. Controlled breathing exercises increase the tolerability of low oxygen levels by decreasing chemoreceptor sensitivity towards hypoxia or hypercapnia. Oxygen is also stated to be one of the most important reasons of aging. As oxygen is burnt with nutrients during

metabolic processes and reduced to water, oxygen derivatives such as superoxide and hydroxyl radical, which are dangerous “free radicals” are released. Free radicals may also come from outside the body and not only from the inside. Radiation, air pollution, cigarettes, medicine and so on may be sources of free radicals. Occurring as a result of the increase of reactive oxygen types and the insufficiency of antioxidants that balance the increase in question, “oxidative stress” can also be relieved by yogic breathing exercises (Pranayama), for they ensure low oxidative stress levels (53).

The impacts of pranayama and asana exercises on the respiratory system are listed below:

- Bronchi, smooth muscle tone/tonus, Respiratory control relieves the tension in the muscles surrounding the lung and the connective tissue that comprises the lung; decreases smooth muscle tonus and respiratory way’s resistance via activating the parasympathetic system and facilitates respiration per se.
- Breathing deeply and slowly with full awareness ensures a respiration, similar to fundamental breathing training.
- Dependent on the tension through yoga, pulmonary compliance improves and total lung capacity is enhanced. This way, prostaglandin and/or surface active substances are released to the alveolar clearance, which increases lung compliance and decreases smooth muscular tonus and the resistance of the airway.
- The primary muscle of respiration, the diaphragm is massaged via contractions as the asanas are conducted; thus, a normal respiratory pattern is developed.
- . It bring along a micromassaging effect to the abdomen and thoracic organs.
- Yoga exercises contribute to the individual’s development of a calmer and deeper respiration pattern, helping to control the breathing itself.
- Yoga affects the endocrine system and inhibits cortisol release, which has a secondary and facilitating impact on the individual’s respiration task.
- Sinus hygiene is provided and the strong and regular breathing through the nose cleanses the nasal particles and secretion (54-57).

#### **2.3.4.2. Effects of yoga on sleep**

While sleep is an irreversible state of consciousness, it is not only a state of immobility that prepares the ground for the resting of the body, but an active rejuvenation period that prepares the body for the next day and for movement (58). It is one of the fundamental and indispensable activities that has an impact on the quality of life and health of individuals – a significant concept with physiological, psychological and social dimensions (59). Sleep is an important parameter among basic factors that supports physical development and academic achievement. Sleep deprivation is also observed to increase daytime somnolence and distracted behavior. Sleep deprivation also affects behavioral problems of children (60). Yoga increases relaxing and brings a balanced mental state. Studies that investigate its effects on improvement of sleep and enhancement of sleep quality show that practicing yoga regularly significantly decreases the amount of time it takes to fall asleep, increases total sleeping time and has positive effects of waking up tired (61).

#### **2.3.5. Yoga cycle**

##### **2.3.5.1. Pranayama (Breath)**

##### **Ujjayi pranayama (Powerful breath)**

Ujjayi is sometimes called “ocean breath” too, due to the noise the air makes as it passes through the windpipe. In order to practice Ujjayi breathing technique, inhale and exhale with the same rhythm and the same intensity, while shrinking the epiglottis in the back of your throat. Ujjayi strengthens internal organs, increases the internal temperature of the body, improves mental concentration abilities and brings along serenity (62, 63).

##### **Kapalabhati pranayama (Shining skull)**

Kapalabhati applies a rhythmical pressure on the abdominal muscles. Start by relaxing your abdominal muscles and fill your diaphragm with air; then, exhale suddenly and quickly and push that air from your abdomen. You will then start breathing automatically. This makes one cycle. Start by two sets of ten cycles and gradually increase this number from twenty cycles to four sets. Kapalabhati strengthens the diaphragm, boosts energy and purifies the body by regulating the respiratory system (62,63).

### **Bhramari pranayama (Bee breath)**

Sit up straight on the floor. Bring your hands to your face and keep your elbows in line with your shoulders. Close your ear with your thumb. Then close your eyelids with your index and middle fingers and gently push. Use your fourth finger to slowly apply pressure on the sides of your nostrils. Meanwhile, keep your little finger on your lip. Inhale and exhale as you normally do. Start and take a deep breath (like ujjayi). As you exhale, make a buzzing sound (like a bee). Keep your lips closed. This noise should persist for as long you exhale. Repeat 5-10 minutes. Never hold your breath (63).

### **2.3.5.2. Asanas (Movements)**

#### **Namaskar (Salutation)**

Namaskar is a special type of vinyasa in the form of a synchronized mudra or a series of asana. Designed to awaken and transform, it is a form of movement alchemy.

Classic flows such as Surya (sun) and Chandra (moon) corresponds with the phases of the sun and the moon. While namaskar is not widely known outside of yoga yet, it has various forms of “salutation” in classic Indian dances and martial arts such as kalaripayattu (64).

#### **Surya namaskar (Sun salutation)**

Surya namaskar, which is also called “sun salutation”, is an ancient yoga practice. It consists of 14 consecutive poses that establish a balance between flexion and extension that are conducted via synchronized respiration (65).

Surya namaskar series are listed as follows; pose 1 - namaskar tadasana, Pose 2- urdhva hastasana, Pose 3- namaskar tadasana, Pose 4- namaskar utkatasana, Pose 5- sukha malasana, Pose 6- urdhva malasana, Pose 7- sukha adho svanasana, Pose 8- satangasana, Pose 9- purva hastasana, Pose 10- satangasana, Pose 11- sukha adho svanasana, Pose 12- urdhva malasana, Pose 13- hasta malasana, Pose 14- utkatasana.

#### **Chandra namaskar (Moon salutation)**

Chandra namaskar consists of movements corresponding to the phases of the moon or tithis. The origins of these movements regarding the moon are not as well documented as the sun salutation. Still, they have the nature of moon with slow and inward swaying movements. Chandra namaskar flow is suggested to be conducted by

looking at the Moon or visualizing the nature of the moon with each breath. This initiates a perceivable and healing hormonal stimulation by connecting the senses with the mind (64).

Chandra namaskar series are as follows; pose 1- hastabalasana, pose 2- mukabalasana, pose 3- satangasana, pose 4- purva hastasana, pose 5- satangasana, pose 6- sukha pada svanasana, pose 7- urdhva malasana, pose 8- hasta malasana, pose 9- utkatasana, pose 10- namaskar tadasana, pose 11- parsva tadasana, pose 12- namaskar utkatasana, pose 13- sukha malasana pose 14- urdhva malasana, pose 15- adho dandasana, pose 16- satangasana, pose 17- sukha adho svanasana, pose 18- satangasana.

### **Prasarita padottonnasana (Wide legged forward bend)**



**Figure 2.1. Prasarita Padottonnasana (66)**

Stand up on your feet. Take a wide step about a meter to the side. Your feet should be parallel to each other. Keep your spine straight, straighten up and tighten your upper leg muscles. Breathe out and bend forward from the hips by keeping your back straight. As you lower your body, push your chest bone forward and look straight ahead. Touch the floor with your fingertips, while keeping your elbows straight. As you exhale again, put your hands between your feet, on the floor and bring your body fully to the floor as

well. Lift your sitting bones upwards and stretch your spine by pulling down your head. If you can, bend your elbows and put your forehead to the ground. Remain at this position for 30-60 seconds. In order to finish the pose, straighten your elbows and lift your body up by keeping your back straight (62).

### **Vrksasana (Tree pose)**



**Figure 2.2. Vrksasana (66)**

Stand up on your feet. Shift your weight gently onto your left foot and try to keep your foot firmly and fully on the ground. Bend your right knee, reach down with your right hand and grasp your right ankle. Lift your right foot up and place the sole of your foot to the inner part of your left thigh. As you push your right heel to the inside of your left groin, your toes should be facing the floor. At this position, the middle axis of your pelvis must be right on top of your left foot. Put your hands on the upper edges of your pelvis. Your pelvis should be in a natural position with the upper edges parallel to the floor. Extend your sacrum downwards. While you try to apply resistance with your left hand on the outside, firmly press the sole of your left foot to your inner right thigh. Press the palms of your hands together and fix your gaze to a point on the floor that is 1-1.5 meters away. Remain at this position for 30 seconds to 1 minute. Exhale and put your right foot down. Repeat the move with your other side (62).

## Virabhadrasana 2 (Warrior pose 2)

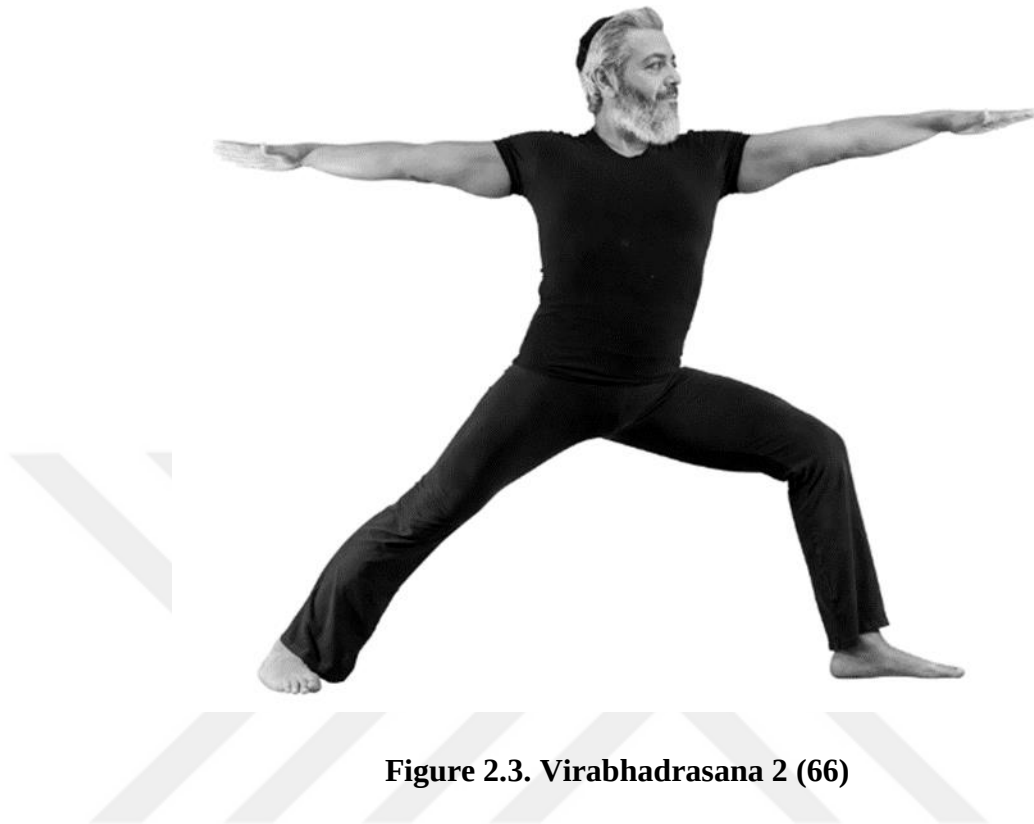


**Figure 2.3. Virabhadrasana 2 (66)**

Stand up straight on your feet. Exhale and take a wide step to the side with your feet apart 1-1.2 meters. Lift your arms up, parallel to the floor and keep them in alignment with your shoulders on two sides. Your palms should be facing the floor. Turn your left foot gently inside and to the right and your right foot 90 degrees outside and to the right. Align your right heel with your left. Squeeze the muscles of your upper leg and turn your right upper leg outwards, aligning the middle part of your right kneecap with the middle part of your right ankle. Exhale and bend your right knee to switch your lower leg to a vertical position. Squeeze the muscles on your left leg, firmly push the ground with the outer part of your left foot, stabilize your right knee and bring your right upper leg to a parallel position with the floor. Keep both sides of your body at the same length and your shoulders in alignment with your pelvic bone. Turn your head right and fix your gaze on a point over your fingers. Remain at this position for 30-60 seconds. Inhale and bring your feet together to be parallel with one another. Change your feet and repeat the move with the other side (62).

### **Parsva konasana (Extended sides angle pose)**



**Figure 2.4. Parsva Konasana (66)**

It is also called Utthita Parsvakonasana. Assume Warrior 2 Position with your right knee bent, left leg straight, arms on the sides and parallel to the floor. Push your left shoulder down. Your right knee should be bent and aligned with your right ankle, while your lower leg is vertical to the floor. Turn the inside of your knee towards the outer edge of your foot. Bring your right upper leg to parallel position to the floor. Stabilize your shoulder blades by pressing them to your back frame. Extend your left arm straight towards the ceiling and turn your left palm to face your head. Inhale and as your palm faces the floor, extend your left arm towards the back of your left ear to extend and fully stretch the left side of your body, from your left heel to left hand's fingertips. Make sure that you are not bending your elbow. Turn your head to fix your gaze on your left arm. As you did with the left side of your body, lower your right shoulder and reach out with your right side by keeping your shoulder away from your knee. Make sure you are pushing the floor with your left heel. Exhale and tilt the right side of your body on your right upper leg. Press the fingertips of your right hand or your palm right next to your

right foot, on the floor. As you push your sacrum towards your pubic bone and your hips forward, push your right knee backwards towards your arm on the inside. Remain at this position for 30-60 seconds. Inhale and start rising. Firmly step on the floor with both of your heels and reach towards the ceiling with your left arm to facilitate the movement you are performing upwards. Change legs and repeat the move to the other side (62).

### **Utthita trikonasana (Extended triangle pose)**



**Figure 2.5. Utthita Trikonasana (66)**

Stand up straight on your feet. Exhale and put one foot away from another with a distance of about 1 meter or more. Lift your arms up parallel to the floor and bend down by extending them to the sides. Keep your shoulder blades wide and open and your palms facing down. Turn your left foot 45-60 degrees to the right and inwards and your right foot 90 degrees to the right and outwards. Align your heels with each other. Squeeze the muscles of your upper front leg and turn your upper leg outwards to align your right knee cap's middle part with that of your right ankle. Exhale and turn your body to the right, so that the two front edges of your pelvic bone is parallel to the front edge of the mat. Firmly push your left heel to the ground, as you turn the left side of your hip to the right. Inhale. Exhale, turn your body a little bit more to the right and bend over your leg on the front. Touch the floor with your left hand and place it on the floor or on any part of your right foot. Gently release your left hip downwards. Turn your head to fix your gaze on the

thumb of your hand on top. Open your arms to both sides to widen the distance between your shoulder blades. Shift the majority of your weight to the heel on the back and to your hand in the front. Remain at this position for 30-60 seconds. Exhale, straighten your lower back and bring your whole body to a straight, vertical position by inhaling. Repeat the move with your other leg, this time turning left, for the same duration (62).

### **Sukhasana (Meditation pose)**

Sit down on the floor and extend your legs forward. Bend your knees and cross your legs, bringing your left foot under your right knee and your right foot under your left knee with a gap between your groins. Do not keep your knees up, let them fall down and keep them relaxed. Push your sitting bones down to the floor and sit up straight, keeping your spine straight as well. Open your chest and keep your shoulders relaxed, not squeezed. Place your hands on your knees with your palms facing the ceiling. Form the letter “O” by touching your index finger with your thumb. Inhale and exhale slowly and regularly. You can also practice this position by putting the other leg to the front (62).

### **Meruxasana Series**

Sit down with one leg straight and the other bent. One arm should be down with your fingertips on the floor and the other should wrap the bent leg. Then, turn your spine to the right from your navel and as you do so, your arm will naturally turn to your back; at this point, lower your hand to the floor. Fix your gaze to the knee on the front. Hold the inside of your heel and lift your foot upwards. Bring your lower leg parallel to the floor. Straighten your knee as much as you can, open your leg to the side and hold it from the outside. Turn your body to the side of your leg. As your body turns towards the middle, hold your foot with both hands and in a cross manner and bring your leg close to your spine. As you bend your leg and bring your foot to the ground, wrap your leg with the arm on the opposite side. Turn your body a little bit to the back from the side of your bent knee and reach up with the arm of the side of the leg. Place your hand on the ground by bringing down the arm on the turning side. Support the stretching of your spine with your hand on the ground. Part of this series can be performed, instead of a whole, if one wishes to do so.

### **Paschimottanasana (Seated forward bend)**



**Figure 2.6. Paschimottanasana (66)**

Sit down with your feet in front of you. In order to keep your sitting bones away from your heels as much as possible, open your sitting bones by gently sliding back and forth. Bend your feet and squeeze the muscles of your upper leg to push the back part of your legs. Inhale and reach up with your arms straight, stretching your spine. Exhale and bend from your hips, stretching your chest bone forward. Keep your head forward and bring down your abdominal muscles to your upper legs. Hold your heels or your ankles. Extend your spine each time you inhale. Stretch more deeply each time you exhale. If possible, bend your elbows to stretch your body forward, gently and without forcing too much, and put your forehead on your lower leg. Remain at this position for 1-3 minutes (62).

### **Janusirsasana (Head-to-knee forward bend)**



**Figure 2.7. Janusirsasana (66)**

Sit down by placing your feet on the front. Bend your right knee, tuck your heel towards to your groin and place the heel of your foot to your left inner thigh. Lower your left knee to the ground. At this point, your right leg shall be on the floor, vertical to your left lower leg. Open your sitting bones completely and sit down fully on the floor. Inhale and sit up straight, stretching your spine. As you exhale, turn your body gently to your left. Thus, your body and your left leg will be aligned. Bend your foot so that your toes face the ceiling and squeeze the muscles of your left upper thigh to push the back side of the leg to the floor. When you exhale again, lower your body onto your left leg and stretch your chest bone forward. Hold the inner part of your left foot with your left hand. Use your right hand to direct your body to the right. Extend your right arm towards your right foot. You can grasp your foot with both hands or place your hands on two sides of your foot with elbows bent. If you can, place your forehead on your right lower leg. Stretch your spine a little bit more forward every time you inhale and stretch more intensively every time you exhale. Remain at this position for 1-3 minutes. Extend your right knee, bend your left knee and repeat the move (62).

### **Setubandhasana (Bridge pose)**



**Figure 2.8. Setubandhasana (66)**

Lie down on your back. Bend your knees and lift your heels, bringing them closer to your hips. Keep your hands flat and place them on the floor on both sides. Exhale and push the ground with your feet to lift your hip from the ground. Keep your feet and your upper legs parallel to each other, extend your fingertips forward and simultaneously stretch your arms and push the ground with them. Extend the back of your neck and distance it from your shoulders. Lift your hip up to elevate your body from the floor. Remain at this position for 30-60 seconds. Exhale as you release your spine to the ground, as if you are lowering each vertebra one by one. Repeat the move (62).

### **Urdvajanasana – Padajanasana (Tucking the knees to the chest)**

It is also called Apanasana. Lie down on your back. Exhale and tuck your knees to your chest. Wrap your arms around your knees and put both hands on the elbows on opposite sides. Extend the back of your neck as if you want to diverge from your shoulders. Straighten your back and shoulders each time you exhale by tucking your

knees a little bit more to your chest. Remain at this position for 30 seconds to 1 minute (62).

### **Padasuptasana**

It is the name for the first part of Halasana (Plow pose). Lie down on your back with your knees bent. Your arms should be on your sides with your hands on the floor, straight. Squeeze your abdominal muscles and lift your knees up from the ground. Keep your legs straight and vertical to your spine (62).

### **2.3.5.3. Meditation**

#### **Savasana (Dead pose)**



**Figure 2.9. Savasana (66)**

Relax your legs and let them open freely to the sides. Your feet should face each other with a close angle similarly. Open your arms from the body and relax them to both sides. Also relax your shoulders and let them down with your palms facing the ceiling and your arms outwards. Extend your neck to the back, as if you are trying to diverge it from your shoulders and gently rest it on the floor. Close your eyes. Breathe regularly and comfortably. Focus on the relaxed extremities and on your breath. Starting with your toes, relax your body from your head to each and every part and let your body on the floor, completely relaxed. Relax your facial muscles and try to clear your mind. Remain at this

position for 5 – 10 minutes. Slowly tuck your knees towards your abdomen and roll towards one side. Finally, finish the move by turning your head to the same side (62).

## **2.4. Internet-Based Home Exercises**

The utilization of a low-cost communication technology such as the internet from amongst all technology-based methods for exercise and rehabilitation purposes is quite new (67, 68). Internet-based technologies encourage physical activities and exercise, offer the potential to reach a large number of people with relatively low cost, 24-hour easy access and the possibility for the clinician to communicate with the patient on a more frequent basis (69). Consequently, “American Heart Association Presidential Advisory” called for well-designed research studies to test the feasibility and efficiency of internet-based rehabilitation practices (70). Different methods and protocols are used in internet-based exercise programs for different disorders (69, 71-77). Lear et al. (68) used telemonitoring system to monitor the cardiac rehabilitation services they offer to patients via the internet. The group to receive the online training for this study, where patients were provided with the monitoring system to screen blood pressure and heart rate, remained limited with 8 patients. Schaarupa et al., on the other hand, developed a system called “Online Diabetes Exercise System”. The system utilized eye-tracking, a technique that is often used in marketing and cognitive psychology, and patients were shown 25-minute exercise sessions without any practice. The eye movements of the patients were tracked with a camera. This system was solely designed to detect the interest levels of patients towards exercise and improve their cognitive motivations. Supported by “European Union 7th Framework Programme”, this project does not include the results with clinical data (77).

Other studies with exercise trainings, offered on the internet, track patient compliance with the treatment with tracking applications within the software of the web site, reporting systems, phone calls or e-mails (67, 76, 78, 79). The common ground of internet-based exercise programs is their applicability and reliability as a method, in comparison with the clinical exercise sessions of these services (67, 68, 71-76).

### 3. MATERIALS AND METHODS

#### 3.1. Assessment

##### 3.1.1. Socio-demographic data

The demographic data of the individuals (name, last name, sex, age, dominant hand, educational background, smoking status and number of cigarettes per day), body weight (in kilograms) and height (in meters) are recorded. For the calculation of body mass index (BMI), the formula that divides body weight with the square of height is used and the result is registered in  $\text{kg/m}^2$ . Additionally,  $\text{BMI} < 18,5 \text{ kg/m}^2$  is classified as cachexia,  $\text{BMI} = 18,5\text{-}24,9 \text{ kg/m}^2$  as normal,  $\text{BMI} = 25,0\text{-}29,9 \text{ kg/m}^2$  as overweight and  $\text{BMI} \geq 30,0 \text{ kg/m}^2$  as obese.

##### 3.1.2. Respiratory function



**Figure 3.1. Spirometer**

Respiratory functions are assessed with a portable spirometer (Cosmed, Pony Fx, Rome, Italy) and according to the criteria of American Thoracic Society (ATS) and European Respiratory Society (ERS) (80). During the test; the air volume that is released with forced, quick and deep expiration after maximal inspiration (FVC), the air volume

that is released in the first second during forced expiration (FEV1), the ratio of forced expiratory volume to the forced vital capacity in the first second (FEV1/FVC), peak expiratory flow during forced expiration (PEF) and vital capacity (VC) are evaluated (81). The evaluation is carried out, while the individuals are sitting up straight with their shoulders relaxed. The test was repeated at least three times and the best performing ones among the tests, which have less than 5% difference are used for the statistical analysis. Parameters of the test are recorded as the percentage of the expected reference values of the person (82). Test parameters are over 80% in healthy individuals (83, 84).

### **3.1.3. Pain**

Participants in the study provided answers to twenty PQAS descriptors (Appendix). For PQAS, an introduction is presented to explain that each individual responds to pain differently and unpleasantness in terms of pain must be differentiated from its intensity. Afterwards, descriptors ask participants to rate 20 pain (quality and spatial) descriptor domains on a scale of 1 to 10, where 0 refers to lack of pain and 10 refers to most pain sensation imaginable. Accordingly, a temporal item to evaluate temporal pain pattern is also involved, despite the fact that it is excluded from this particular study (85).

### **3.1.4. Quality of life**

The WHOQOL-BREF test is used to assess quality of life within the scope of the study. A scale of quality of life that is related to health, this method of evaluation is developed by World Health Organization and its validity and reliability studies are conducted by Eser et al. (86). The scale has two versions – a long form (WHOQOL-100) and a short form (WHOQOL-27). The scale consists of 26 questions and is used to measure physical, mental, social and environmental well-being. When the Turkish version is used (for the 27<sup>th</sup> question is a national one), the Environment area score is named environment-TR. To that end, the Environment-TR area score is used instead of the environment score. The scale can be applied to adults, who are not elders yet (87). Since each area refers to the quality of life in their own respective fields independently, the area scores are calculated between 1 and 100. As the scores increase, the quality of life increases as well (86-88).

### **3.1.5. Quality of sleep**

Utilized in the study, PSQI is a scale that was developed by Buysse et al. (89) and measures quality of sleep. The relevant validity and reliability study has been conducted by Ağargün et al. (90). The Cronbach alpha value of the scale was found to be 0.79 (Cronbach alpha=0.79). PSQI is a self-reporting scale that is comprised of 19 items. Each element of the scale is evaluated on a score of 0 to 3 equally. Questions are assigned a score between 0 and 3 and higher scores reflect bad sleep quality. The scale involves 5 questions that assess quality of sleep, delayed sleep, sleep disorders, usage of sleeping pills and loss of functionality during the day and 7 additional subscales. The total PSQI score of 0-21 is acquired after the addition of the subscales. High values indicate that the sleep quality is bad and the level of sleep disturbance is high. A total score above 5 indicates that the quality of sleep is poor clinically.

### **3.1.6. Functional strength**

Within the scope of this study, 5X Sit-to-Stand test (5XSST) is used to evaluate the functional strength. This test assesses the functional strength of the lower extremity, transitional movements, balance and risk. The measurement is carried out with a chronometer (91).

### **3.1.7. Balance**

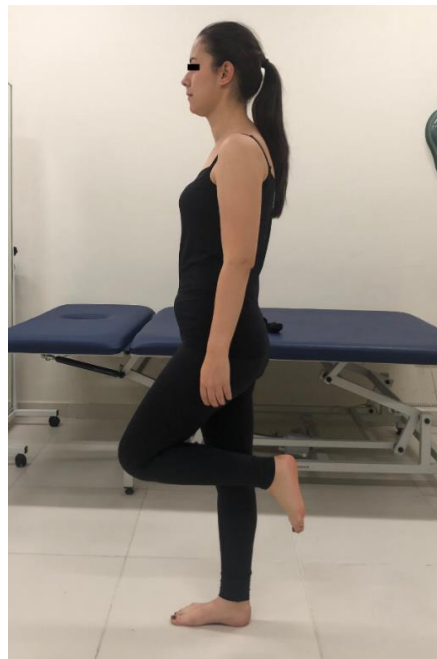


**Figure 3.2. Single Leg Stance Test**

Single Leg Stance Test is used to evaluate balance in the study. The single leg stance test is used to measure balance and static standing capability. At this point, the individual is asked to lift one foot up, while standing. The time is stopped, once the foot touches the floor (92).

### **3.1.8. Fatigue**

The Fatigue Severity Scale (FSS) is used to measure fatigue, within the scope of the study. It evaluates the effects of fatigue on everyday life. Each item of the scale is comprised of 7 scorings with 9 items in total. The arithmetic average of the total score is taken. Cases with a score of 4 and above are considered in the fatigue group (93).

### **3.1.9. Posture**

New York Posture Analysis Test is used to evaluate posture in the study. This system scores posture changes that may occur in 13 different parts of the body. Accordingly, if the individual's posture is decent, a score of five (5) is assigned; if there is moderate distortion in the posture, a score of three (3) and if there is severe distortion in the posture, a score of one (1) is assigned. At the end of the test, the total score can be maximum 65 and minimum 13. The standard evaluation criteria, developed for this test, is stated to be "very good", if the total score  $\geq 45$ ; "good", if it is 40-44; "moderate", if it is 30-39; "weak", if it is 20-29 and "bad", if it is  $\leq 19$  (94-96).

### **3.1.10. Flexibility**

Functional reach test, figure four test and goniometer measurement of latissimus dorsi, pectoralis major, biceps and triceps muscles are used to assess flexibility within the scope of the study.

For the Functional Reach test, the person is asked to stand sideways next to a wall and wait without touching his/her arm to the wall with the fist closed and the shoulder is at an elbow extension and 90 degrees flexion. The evaluator marks the level of 3<sup>rd</sup> metacarp head alignment to the ruler on the wall. The person is then asked to "reach as far as s/he can without taking a step". The 3<sup>rd</sup> metacarp head alignment is once again marked. The scores are determined by measuring the difference between the starting and ending positions. Three trials are conducted and the average of the final two trials are taken (97).



**Figure 3.3. Figure Four Test**

The Figure Four Test is used to measure hip flexibility. The person is at a supine position, the knee to be tested is bent and the feet are lifted upwards. The person is asked to move his/her hips by using gluteal muscles. Throughout the test, the person is asked to keep the knee and the medial (inner) part of the ankle in contact with the surface. The distance between anterior superior iliac supine (ASIS) and test surface is measured with a measuring tape. Any sensation of pain or discomfort must be noted immediately. A distance that is more than 3 centimeters refers to the anterior capsule tension for the hip joint (98). Extremely high ASIS can be determined with an external hip rotation, extension or a decline in both. This may be a result of the tension in tensor fasciae latae or rectus femoris, iliopsoas or capsular limitation.

For the evaluation of latissimus dorsi muscle, the person lays down on his/her back with arms on the sides and the elbows extended. Attention must be paid to ensure that the lumbar vertebrae leans on the supporting surface. Standing on one side of the person, his/her shoulder is stretched throughout the possible ROM and as close to the head as possible. Once again, attention must be paid to ensure that the lumbar vertebrae is in flat alignment with the support surface. The goniometer is then placed on the glenohumeral joint. The fixed arm of the goniometer is placed horizontally through the midaxillary line, while its moving arm is aligned from the lateral epicondyle through the humerus. The degree of flexion for the shoulder is scored from the horizontal point. If a tape is used, the distance between the cubital cavity and lateral epicondyle is used for scoring (99).

For the evaluation of pectoralis major muscle, the person lies down on his/her back with hands behind the head. Attention must be paid to make sure that the cervical vertebrae is not at an overflexion or extension. The person's cervical vertebrae must be at a neutral position and hands must remain behind his/her head. The person is then asked to relax the shoulders and converge his/her elbows towards the surface. Attention must be paid to ensure that the lumbar vertebrae is straight. The distance between the olecranon of the humerus and the surface is measured with a tape (99).



**Figure 3.4. Biceps Brachii Muscle Evaluation**

For the biceps brachii evaluation, the person lies down with an arm on the edge of the surface, his/her elbow in extension and the forearm on pronation. As the elbow is at a full extension, the person's shoulder is brought to the current ROM. The level of shoulder extension is measured with the goniometer, placed on the lateral epicondyle on the movement axis. The middle or vertical line of the thorax is the marking point for the fixed arm of the goniometer and the lateral middle line of the humerus is the marking point for the moving arm (99, 100).

For triceps brachii evaluation, the person is asked to assume a position with shoulders at full flexion, elbows in extension and forearm in supination. The shoulder is in full flexion and the humerus preserves its neutral position, while the person's elbow is stretched throughout his/her range of motion (ROM). In order to measure elbow flexion with the goniometer, the axis is placed on the lateral epicondyl, the fixed arm is placed on the midline and the portable arm is placed towards the radial styloid protrusion (99, 100).

### **3.2. Treatment Program**

The study is conducted at Kadıköy Municipality Rasimpaşa Volunteer Training and Consultation Center. The study was unanimously accepted by Yeditepe University's Ethical Committee for Clinical Research meeting no. 1700 on the date of 10/07/2019 and the approval of the Ethical Committee was thus received.

A total of 90 cases between the ages of 18 and 60 participated in our study. Detailed information about the methods of the study was explained to each case and their written consent was received. A wait list for the participants, who state their wishes of participating in the study, according to the prepared inclusion and exclusion criteria, was formed. They were later randomized into groups.

#### **Inclusion Criteria**

- Having no history of a systemic disease, such as musculo-skeletal problems, neurological issues, cardiac diseases, lung diseases and diabetes and no history of surgery due to a musculo-skeletal system issue.
- Not having participated in a regular exercise program in the last 6 months and not having a history of active sports engagement before.
- Being in the age range of 18-60

A total of 90 cases were included within the study with 30 cases in the Yoga Group (YG), 30 cases in the Video-Based Yoga Group (VBYG) and 30 cases in the Exercise Group (EG). However, 42 cases were excluded from the study due to various reasons. 15

cases formed the YG, 17 cases formed the VBYG and 16 cases formed the EG with 48 female participants in total.

Cases were assessed by the same physiotherapist before and after the study. The procedure took 6 weeks in total with 2 days a week for 1 hour. All three study groups were also given an additional period of one week for the cases, who missed exercise sessions due to various reasons. Cases, who missed more than three sessions were excluded from the study.

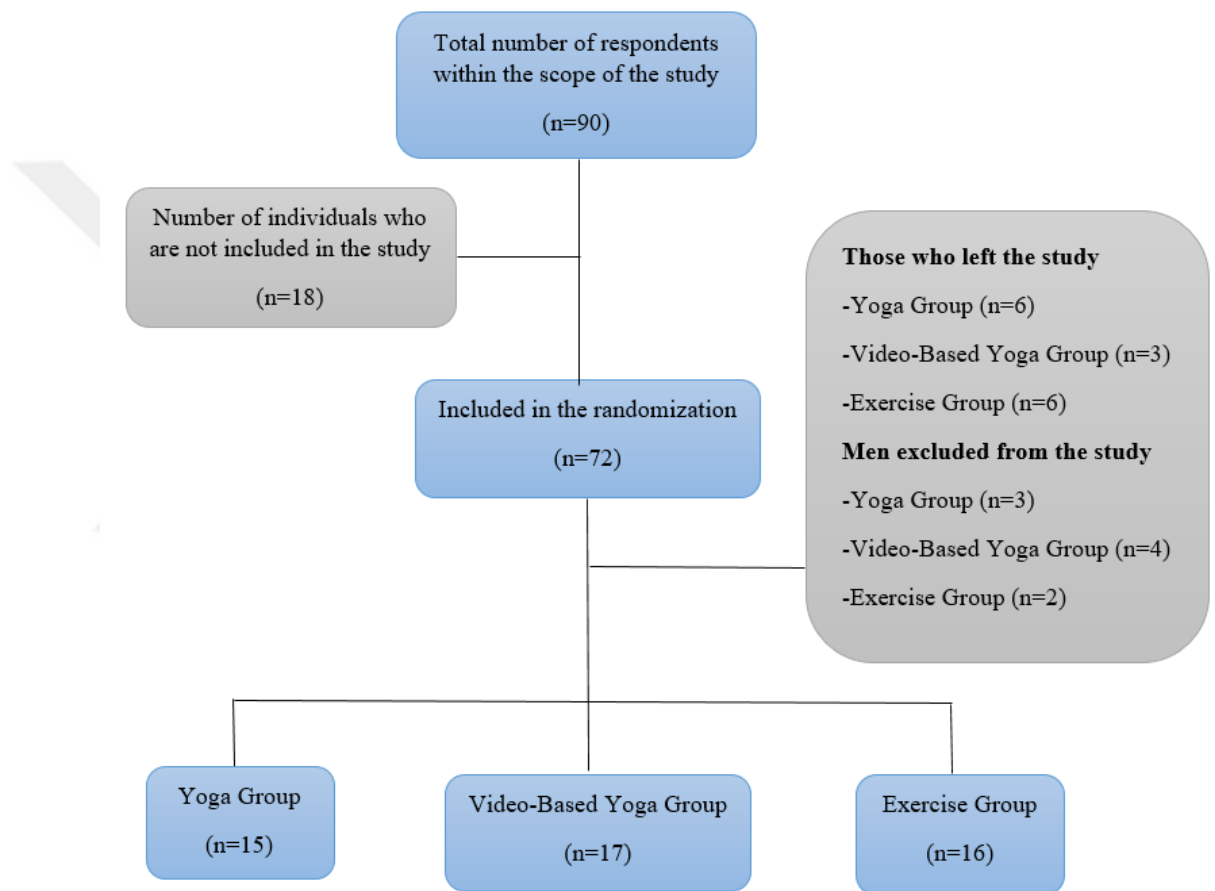


**Figure 3.5. Research Flow Chart**

### **3.2.1. Yoga group**

The Yoga program was carried out by a physiotherapist, who received a Yoga Specialist Training, in 1-hour sessions, comprising of 10 persons in each group. The session consisted of 10 minutes of pranayama, 40 minutes of asana and 10 minutes of savasana. The program was divided into two; the first three weeks included moon salutation and the other three weeks included sun salutation practices. Asanas were practiced respectively from easier to more difficult.

#### **Pranayama (Breath)**



**Figure 3.6. Ujjayi Pranayama and Kapalabhati Pranayama**



**Figure 3.7. Bhramari Pranayama**

## Asanas (Movements)

## Namaskar (Salutation)

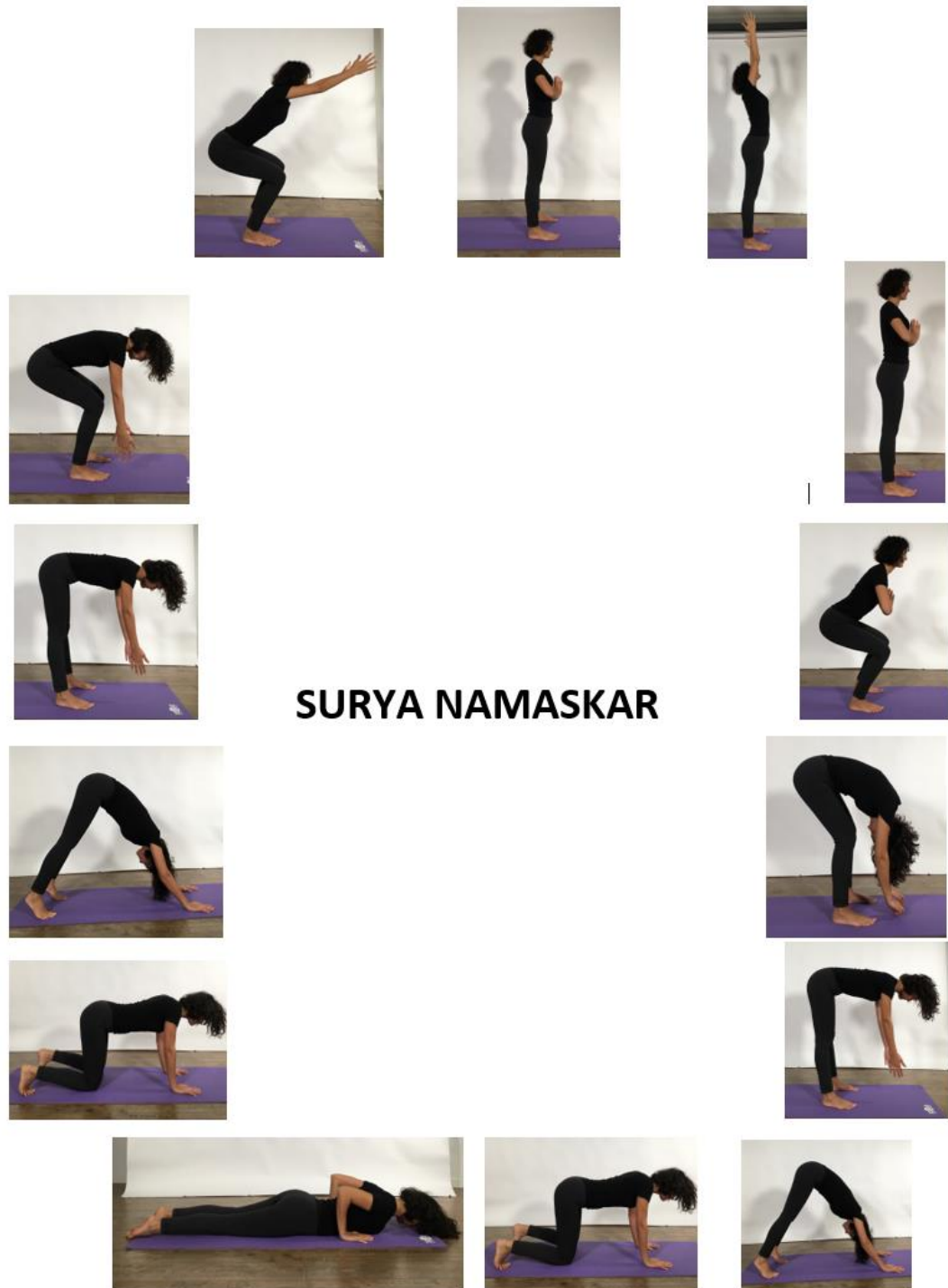


Figure 3.8. Surya Namaskar (Sun Salutation)

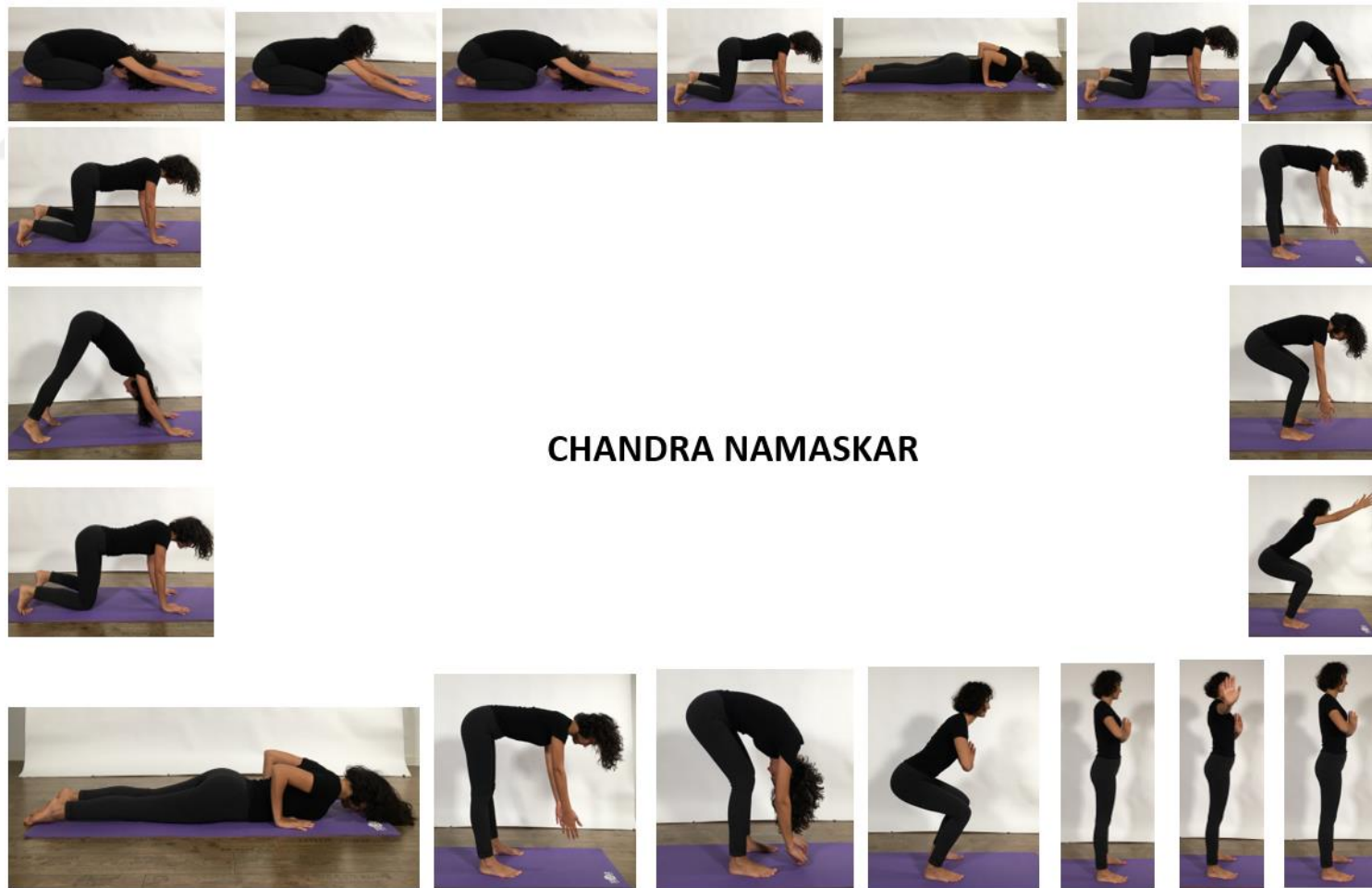


Figure 3.9. Chandra Namaskar (Moon Salutation)



**Figure 3.10. Prasarita Padotttonnasana**



**Figure 3.11. Vrksasana**



**Figure 3.12. Virabhadrasana 2**



**Figure 3.13. Parsva Konasana**



**Figure 3.14. Utthita Trikonasana**



**Figure 3.15. Sukhasana**

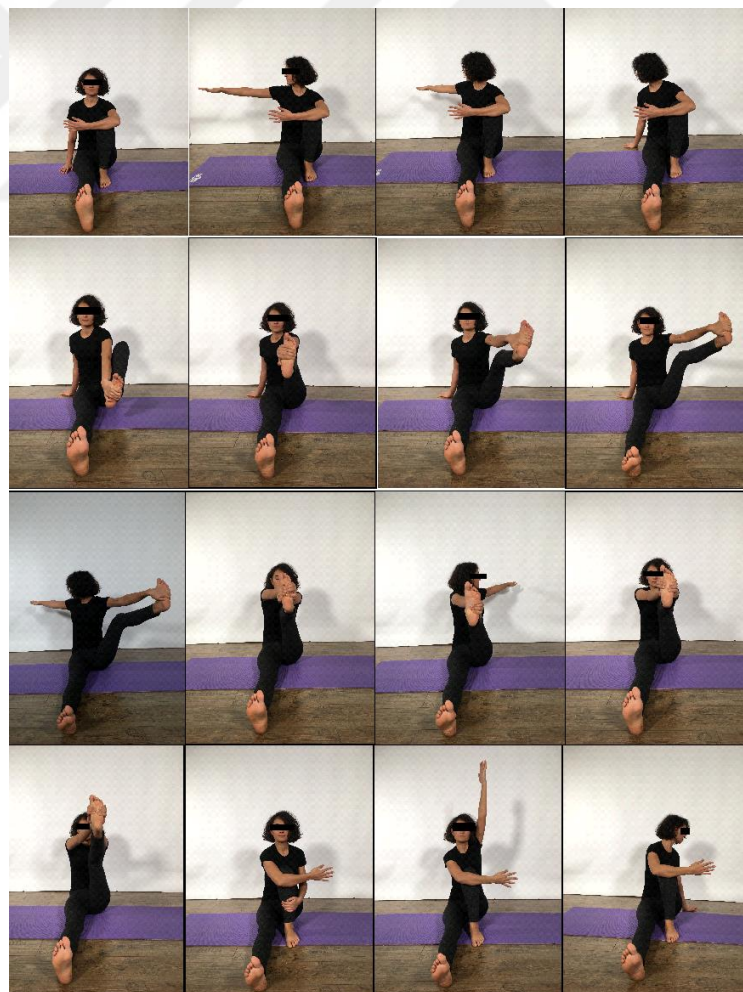


**Figure 3.16. Meruxasana Serie**



**Figure 3.17. Paschimottasana**

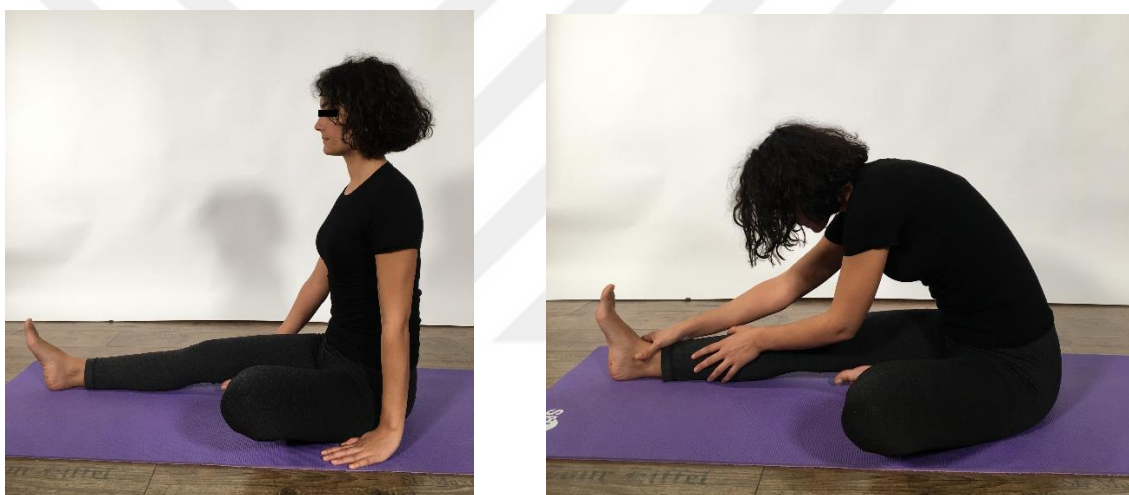


**Figure 3.18. Janusirsasana**



**Figure 3.19. Setubandhasana**



**Figure 3.20. Urdvajanasana – Padajanasana**



**Figure 3.21. Padasuptasana**



**Figure 3.22. Savasana**

### **3.2.2. Video-based yoga group**

Within the scope of the yoga program, the same yoga program was recorded in video, uploaded to YouTube and sent to respondents via e-mail. Respondents were called twice a week and their attendance to exercise was recorded in a six week chart.

### **3.2.3. Exercise group**

The exercise program is applied with groups of maximum 10 persons, including respiration, strengthening, stabilization and flexibility exercises, each consisting of 15 repetitions and 3 sets for 1 hour with an accompanying physiotherapist. Respondents were explained about the easier and more challenging versions of all of the exercises in the exercise program and were asked to practice the ones that are suitable for them.



**Figure 3.23. Diaphragmatic Respiration**



**Figure 3.24. Pursed-Lip Respiration**



**Figure 3.25. Abdominal Crunch**



**Figure 3.26. Bicycle Crunch**



**Figure 3.27. Squat**



**Figure 3.28. Bridge**



**Figure 3.29. Straight Leg Raise**



**Figure 3.30. Leg Abduction / Adduction Side Lying**



**Figure 3.31. Half Push-Up**



**Figure 3.32. Mountain Climber**



**Figure 3.33. Half Plank**



**Figure 3.34. Half Side Plank**

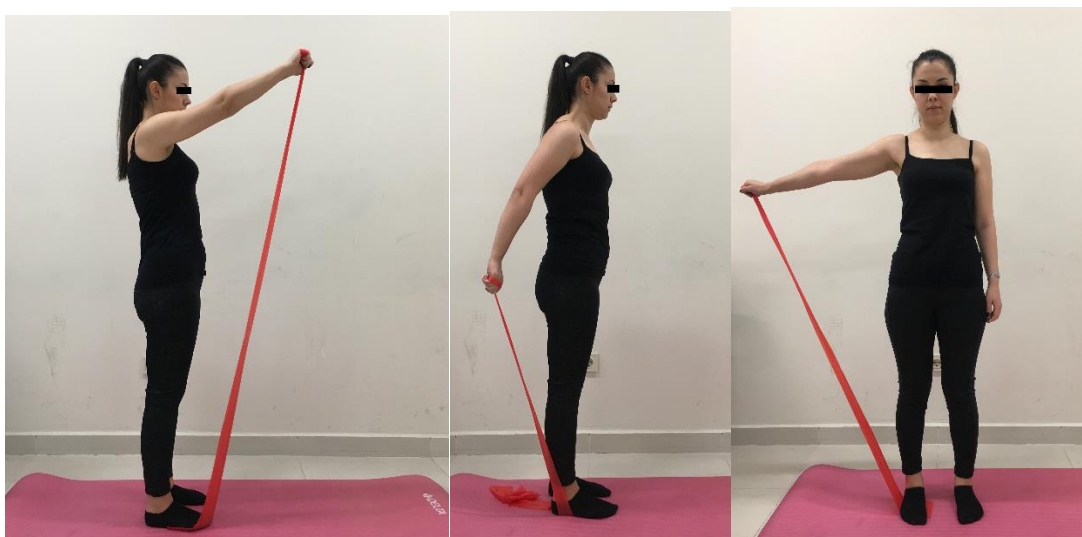


**Figure 3.35. Thera Band Exercises: Exercise for Shoulder Flexors, Extensors, Abductor Muscles**



**Figure 3.36. Cat-Camel Exercise**



**Figure 3.37. External / Internal Rotation Stretching by Holding Hands on the Back**



**Figure 3.38. Stretching the Shoulder Junction by Holding the Arms Behind**



**Figure 3.39. Bear Walk**

### **3.3. Statistical Analysis**

Collected to compare the impact of yoga practices, which were conducted with the accompaniment of videos and physiotherapists, on the respiratory capacity and sleep quality of sedentary persons, data was analyzed in three groups. All data was also analyzed with the statistical software, SPSS 22.0. With the help of descriptive statistics for observation, the data set was scrutinized at length. Little observation in the groups and the manner of distribution regarding variables limited the use of parametric methods and the data of the research study was thus analyzed with non-parametric methods. The pretest and posttest score comparisons within the groups were analyzed with Wilcoxon T-test statistics and the pretest and posttest score differences between groups were compared with Median test statistics. Sperman correlation test, which is a non-parametric test, is used to examine the relation between assessments according to the groups in the study.

## 4. RESULTS

### 4.1. Descriptive Characteristics of Cases

According to the acquired results, no differences with respect to height, weight, BMI, ABSI and smoking habits among the three groups at the beginning of the study were found ( $p>0,05$ ) (Table 4.1.). However, the age average is higher in the exercise group ( $p<0,05$ ) (Figure 4.1.).

**Table 4.1. Evaluation of in-group and intergroup differences of the anthropometric measurements of respondents.**

| Variables                | Study Groups                |                                  |                             | Comparison of the Three Groups |
|--------------------------|-----------------------------|----------------------------------|-----------------------------|--------------------------------|
|                          | Yoga Group<br>(n=15)        | Video-based Yoga Group<br>(n=17) | Exercise Group<br>(n=16)    |                                |
|                          | $\bar{X}\pm SD$             | $\bar{X}\pm SD$                  | $\bar{X}\pm SD$             | Median Test Statistic          |
|                          | Median                      | Median                           | Median                      | $p^b$                          |
| Age (years)              | 28.40 $\pm$ 9.58<br>25.00   | 25.88 $\pm$ 7.08<br>22.00        | 37.06 $\pm$ 12.19<br>32.00  | 7.726<br>0.021* <sup>c</sup>   |
| Height (cm)              | 166.87 $\pm$ 5.36<br>168.00 | 165.53 $\pm$ 5.71<br>165.00      | 167.00 $\pm$ 7.51<br>165.50 | 0.909<br>0.635                 |
| Weight (kg)              | 59.80 $\pm$ 6.96<br>60.00   | 60.71 $\pm$ 9.33<br>61.00        | 68.38 $\pm$ 13.40<br>65.50  | 3.379<br>0.185                 |
| BMI (kg/m <sup>2</sup> ) | 21.54 $\pm$ 2.98<br>21.30   | 22.10 $\pm$ 2.87<br>22.10        | 24.60 $\pm$ 5.10<br>23.77   | 2.725<br>0.256                 |
| ABSI                     | 33.78 $\pm$ 1.90<br>34.23   | 34.33 $\pm$ 1.87<br>34.09        | 35.16 $\pm$ 2.71<br>36.04   | 0.846<br>0.655                 |
| Number of cigarettes     | 6.53 $\pm$ 7.18<br>5.00     | 5.06 $\pm$ 7.08<br>1.00          | 5.81 $\pm$ 7.78<br>0.00     | 0.909<br>0.635                 |

$\bar{X}\pm SD$ : Average  $\pm$  Standard Deviation, cm: Centimeters, kg: Kilograms, kg/m<sup>2</sup>: kilogram/meter square, BMI: Body Mass Index, ABSI: A Body Shape Index, \* $p<0,05$ ; <sup>b</sup> Median Test Statistic; <sup>c</sup> Higher in the exercise group

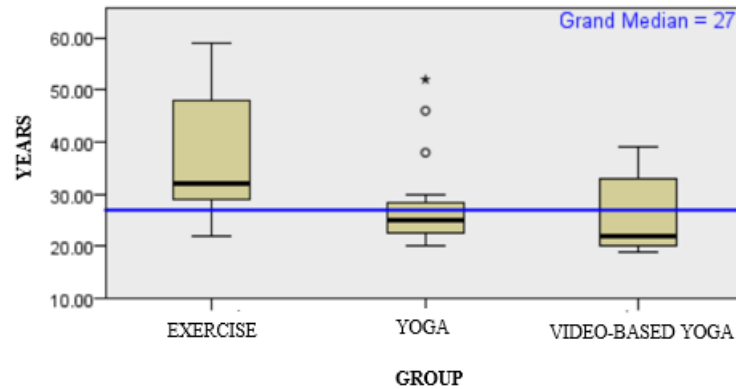


**Figure 4.1. Years Variable of the Respondents**

#### **4.2. Evaluation of Health-Related Physical Fitness**

With respect to the in-group evaluation of health-related physical fitness, all data regarding flexibility, strength and balance in the yoga and exercise groups and all data except for the right and left M. Latissimus dorsi flexibility in the video-based yoga group showed statistically significant improvements at the end of the 6-week study ( $p < 0,05$ ) (Table 4.2.).

The intergroup difference, on the other hand, revealed that the flexibility of right and left M. Triceps brachii of individuals in the video-based yoga group, before and after the study, increased ( $p < 0,05$ ). Since the difference in the flexibility values of the right M. Latissimus dorsi is –median “0”, no comparison was made. However, left M. Latissimus dorsi flexibility was increased after the study ( $p = 0.000 < 0.05$ ). Still, the group, for which this difference is significant, could not have been observed. Other data of the groups concerning flexibility and the differences between the results of strength and balance tests did not show any significance ( $p > 0,05$ ) (Table 4.2.).

**Table 4.2. Comparison of in-group and intergroup differences between flexibility, strength and balance test results with respect to health-related physical fitness**

|                          | Variables                      | Yoga Group (n=15) |                  |                | Video-based Yoga Group (n=17) |                  |                | Exercise Group (n=16) |                  |                | Comparison of the Three Groups |
|--------------------------|--------------------------------|-------------------|------------------|----------------|-------------------------------|------------------|----------------|-----------------------|------------------|----------------|--------------------------------|
|                          |                                | Before            | After            | z              | Before                        | After            | z              | Before                | After            | z              | Median Test Statistic          |
|                          |                                | $\bar{X} \pm SD$  | $\bar{X} \pm SD$ |                | $\bar{X} \pm SD$              | $\bar{X} \pm SD$ |                | $\bar{X} \pm SD$      | $\bar{X} \pm SD$ |                |                                |
|                          |                                | Median            | Median           | p <sup>a</sup> | Median                        | Median           | p <sup>a</sup> | Median                | Median           | p <sup>a</sup> |                                |
| Flexibility Measurements | Functional Reach Distance (cm) | 34.93±4.20        | 39.00±3.70       | 2.625          | 34.88±6.12                    | 40.35±5.67       | -3.633         | 32.63±6.09            | 38.69±5.02       | -3.471         | 2.872                          |
|                          |                                | 35.00             | 40.00            | 0.009*         | 35.00                         | 40.00            | 0.000*         | 32.50                 | 38.50            | 0.001*         | 0.238                          |
|                          | Figure Four Test Right (cm)    | 11.06±3.01        | 8.20±2.43        | -3.316         | 10.23±2.56                    | 8.35±2.32        | -3.089         | 12.31±4.38            | 9.62±4.70        | -3.314         | 1.662                          |
|                          |                                | 12.00             | 7.00             | 0.001*         | 9.00                          | 9.00             | 0.002*         | 13.50                 | 10.50            | 0.001*         | 0.436                          |
|                          | Figure Four Test Left (cm)     | 10.53±2.56        | 8.33±2.38        | -3.198         | 9.76±2.49                     | 8.05±1.92        | -2.952         | 13.56±5.23            | 10.00±4.53       | -3.420         | 3.792                          |
|                          |                                | 11.00             | 8.00             | 0.001*         | 10.00                         | 8.00             | 0.003*         | 14.50                 | 10.50            | 0.001*         | 0.150                          |
|                          | M. Latissimus Dorsi Right (°)  | 154.33±5.94       | 161.00±2.80      | -2.751         | 156.17±5.16                   | 157.05±5.88      | -1.342         | 152.27±5.47           | 158.43±3.97      | -3.176         | Cannot be calculated           |
|                          |                                | 155.00            | 160.00           | 0.006*         | 155.00                        | 155.00           | 0.180          | 150.00                | 160.00           | 0.001*         | Cannot be calculated           |
|                          | M. Latissimus Dorsi Left (°)   | 152.66±7.53       | 161.00±2.80      | -2.869         | 156.17±5.16                   | 157.05±5.88      | -1.342         | 152.18±5.76           | 158.43±3.97      | -3.176         | 15.608                         |
|                          |                                | 150.00            | 160.00           | 0.004*         | 155.00                        | 155.00           | 0.180          | 150.00                | 160.00           | 0.001*         | 0.000*                         |
|                          | M. Pectoralis Major Right (cm) | 4.93±0.78         | 4.33±0.82        | -2.754         | 4.62±0.78                     | 3.97±0.54        | -2.992         | 5.69±1.14             | 4.53±1.18        | -3.573         | 2.257                          |
|                          |                                | 5.00              | 4.00             | 0.006*         | 5.00                          | 4.00             | 0.003*         | 5.00                  | 4.50             | 0.000*         | 0.324                          |
|                          | M. Pectoralis Major Left (cm)  | 5.13±0.61         | 4.33±0.82        | -3.022         | 4.62±0.78                     | 3.97±0.54        | -2.992         | 5.69±1.14             | 4.53±1.18        | -3.573         | 1.214                          |
|                          |                                | 5.00              | 4.00             | 0.003*         | 5.00                          | 4.00             | 0.003*         | 5.00                  | 4.50             | 0.000*         | 0.545                          |

$\bar{X} \pm SD$ : Average  $\pm$  Standard Deviation, \*p<0,05, <sup>a</sup> Wilcoxon T-Test Statistic, <sup>b</sup> Median Test Statistic, <sup>c</sup> Higher in the video-based yoga group

**Table 4.2. Comparison of in-group and intergroup differences between flexibility, strength and balance test results with respect to health-related physical fitness**

|                          | Variables                              | Yoga Group (n=15)          |                           |                | Video-based Yoga Group (n=17) |                           |                | Exercise Group (n=16)      |                           |                | Comparison of Three Groups |
|--------------------------|----------------------------------------|----------------------------|---------------------------|----------------|-------------------------------|---------------------------|----------------|----------------------------|---------------------------|----------------|----------------------------|
|                          |                                        | Before<br>$\bar{X} \pm SD$ | After<br>$\bar{X} \pm SD$ | z              | Before<br>$\bar{X} \pm SD$    | After<br>$\bar{X} \pm SD$ | z              | Before<br>$\bar{X} \pm SD$ | After<br>$\bar{X} \pm SD$ | z              | Median Test Statistic      |
|                          |                                        | Median                     | Median                    | p <sup>a</sup> | Median                        | Median                    | p <sup>a</sup> | Median                     | Median                    | p <sup>a</sup> | p <sup>b</sup>             |
| Flexibility Measurements | M. Biceps Brachii Right (°)            | 70.33±11.87                | 77.66±9.04                | -2.375         | 72.94±7.92                    | 79.12±6.18                | -2.687         | 68.44±12.74                | 77.50±7.30                | -2.790         | 2.872                      |
|                          |                                        | 70.00                      | 80.00                     | 0.018*         | 70.00                         | 80.00                     | 0.007*         | 72.50                      | 77.50                     | 0.005*         | 0.238                      |
|                          | M. Biceps Brachii Left (°)             | 70.00±11.80                | 77.67±9.04                | -2.536         | 72.94±7.92                    | 79.12±6.18                | -2.687         | 69.37±12.63                | 78.44±7.00                | -3.027         | 2.135                      |
|                          |                                        | 70.00                      | 80.00                     | 0.011*         | 70.00                         | 80.00                     | 0.007*         | 75.00                      | 80.00                     | 0.002*         | 0.344                      |
|                          | M. Triceps Brachii Right (°)           | 136.67±5.56                | 145.33±4.42               | 3.220          | 145.88±3.18                   | 147.06±3.09               | 2.000          | 134.69±9.21                | 146.56±4.37               | 3.431          | 22.217                     |
|                          |                                        | 140.00                     | 145.00                    | 0.001*         | 145.00                        | 145.00                    | 0.046*         | 137.50                     | 150.00                    | 0.001*         | 0.000* <sup>c</sup>        |
|                          | M. Triceps Brachii Left (°)            | 137.00±5.28                | 145.00±4.23               | 3.235          | 145.88±3.18                   | 147.06±3.09               | 2.000          | 134.38±9.11                | 146.56±3.97               | 3.442          | 22.217                     |
|                          |                                        | 140.00                     | 145.00                    | 0.001*         | 145.00                        | 145.00                    | 0.046*         | 135.00                     | 147.50                    | 0.001*         | 0.000* <sup>c</sup>        |
| Strength                 | 5 Squat Test (seconds)                 | 8.27±1.67                  | 5.330±0.98                | -3.429         | 6.47±1.33                     | 4.59±0.71                 | -3.332         | 8.19±1.60                  | 5.50±0.97                 | -3.426         | 3.030                      |
|                          |                                        | 8.00                       | 5.00                      | 0.001*         | 6.00                          | 4.00                      | 0.001*         | 8.50                       | 5.00                      | 0.001*         | 0.220                      |
| Balance                  | Single Leg Stance Assessment (seconds) | 248.27±235.86              | 407.530±383.26            | -3.068         | 201.47±138.74                 | 337.82±208.96             | -2.947         | 119.56±81.47               | 212.19±160.06             | -3.181         | 3.379                      |
|                          |                                        | 125.00                     | 275.00                    | 0.002*         | 187.00                        | 302.00                    | 0.003*         | 95.00                      | 186.00                    | 0.001*         | 0.185                      |

$\bar{X} \pm SS$ : Average  $\pm$  Standard Deviation, \*p<0,05, <sup>a</sup> Wilcoxon T-Test Statistic, <sup>b</sup> Median Test Statistic, <sup>c</sup> Higher in the video-based yoga group

### **4.3. Evaluation of Respiratory Functions and Pain**

According to the respiratory function test, PEF value of the yoga group; FVC, FEV1, PEF and VC values of the video-based yoga group and FVC, FEV1 and PEF values of the exercise group revealed statistical significance at the end of the 6-week study ( $p<0,05$ ) (Table 4.3).

Comparison of the intergroup differences showed that VC values were higher in video-based yoga group ( $p<0,05$ ). Other results of the respiratory function test did not yield any differences among groups ( $p>0,05$ ) (Table 4.3).

As a result of the pain quality assessment scale, a statistically significant decline was observed in all groups at the end of the 6-week study ( $p<0.05$ ); however, no differences among groups were found ( $p=0.939>0.05$ ) (Table 4.3).

**Table 4.3. Comparison of in-group and intergroup differences in respiratory functions and pain of respondents.**

|                       | Variables    | Yoga Group (n=15)      |                        |                  | Video-based Yoga Group (n=17) |                       |                  | Exercise Group (n=16) |                       |                  | Comparison of the Three Groups |
|-----------------------|--------------|------------------------|------------------------|------------------|-------------------------------|-----------------------|------------------|-----------------------|-----------------------|------------------|--------------------------------|
|                       |              | Before                 | After                  | z                | Before                        | After                 | z                | Before                | After                 | z                | Median Test Statistic          |
|                       |              | $\bar{X} \pm SD$       | $\bar{X} \pm SD$       |                  | $\bar{X} \pm SD$              | $\bar{X} \pm SD$      |                  | $\bar{X} \pm SD$      | $\bar{X} \pm SD$      |                  |                                |
|                       |              | Median                 | Median                 | p <sup>a</sup>   | Median                        | Median                | p <sup>a</sup>   | Median                | Median                | p <sup>a</sup>   | p <sup>b</sup>                 |
| Respiratory Functions | FVC (%)      | 78.60±14.48<br>76.00   | 81.07±13.25<br>79.00   | -1.592<br>0.111  | 71.12±14.44<br>77.00          | 81.18±8.76<br>80.00   | -3.349<br>0.001* | 71.69±14.79<br>71.00  | 80.75±12.40<br>79.50  | -2.292<br>0.022* | 2.234<br>0.327                 |
|                       | FEV1 (%)     | 84.20±19.96<br>84.00   | 84.87±18.46<br>88.00   | -0.566<br>0.572  | 75.41±15.21<br>81.00          | 86.06±9.30<br>86.00   | -3.078<br>0.002* | 78.69±18.74<br>79.00  | 91.56±14.45<br>91.00  | -2.897<br>0.004* | 1.809<br>0.405                 |
|                       | FEV1/FVC (%) | 107.60±18.51<br>113.00 | 106.67±17.76<br>113.00 | -0.947<br>0.344  | 103.71±25.23<br>110.00        | 109.82±7.25<br>110.00 | -0.597<br>0.550  | 112.69±9.45<br>113.50 | 115.19±5.04<br>115.50 | -1.649<br>0.099  | 3.710<br>0.156                 |
|                       | PEF (%)      | 54.20±20.54<br>52.00   | 67.20±24.79<br>66.00   | -2.302<br>0.021* | 60.41±18.74<br>67.00          | 79.12±23.15<br>83.00  | -3.243<br>0.001* | 59.56±21.73<br>55.00  | 81.94±23.82<br>80.50  | -3.414<br>0.001* | 2.446<br>0.294                 |
|                       | VC (%)       | 74.93±14.66<br>79.00   | 73.07±11.71<br>76.00   | -0.535<br>0.593  | 64.47±16.58<br>65.00          | 83.47±14.96<br>86.00  | -3.623<br>0.000* | 76.81±11.59<br>77.00  | 80.00±12.14<br>79.50  | -0.957<br>0.339  | 16.341<br>0.000* <sup>c</sup>  |
|                       |              |                        |                        |                  |                               |                       |                  |                       |                       |                  |                                |
| Pain                  | PQAS         | 52.53±32.50<br>37.00   | 35.20±20.28<br>28.00   | -2.945<br>0.003* | 36.94±12.87<br>40.00          | 22.76±7.93<br>19.00   | -3.015<br>0.003* | 59.25±36.66<br>48.50  | 39.38±23.12<br>29.50  | -2.794<br>0.005* | 0.125<br>0.939                 |

$\bar{X} \pm SD$ : Average  $\pm$  Standard Deviation, FEV1: Forced Vital Capacity during the first second, FVC: Forced Vital Capacity, FEV1/FVC: Tiffeneau-Pinelli Index, PEF: Peak Expiratory Flow, VC: Vital Capacity, PQAS: Pain Quality Assessment Scale, \*p<0,05, <sup>a</sup> Wilcoxon T-Test Statistic, <sup>b</sup> Median Test Statistic, <sup>c</sup> Higher in video-based yoga group , Normality range of respiratory functions: 120%>normal $\geq$ 80%

#### 4.4. Evaluation of Sleep Quality

At the end of the 6-week study, only the yoga group showed a statistically significant decline according to Pittsburgh Sleep Quality Index and the median value was found to be 5 ( $p=0.038<0.05$ ); however, no differences among the groups were found ( $p>0.05$ ) (Table 4.4).

**Table 4.4. In-group and intergroup comparisons of the sleep qualities of respondents.**

|                                | Variables                | Yoga Group (n=15) |                   |                 | Video-based Yoga Group (n=17) |                   |                 | Exercise Group (n=16) |                   |                 | Comparison of the Three Groups |
|--------------------------------|--------------------------|-------------------|-------------------|-----------------|-------------------------------|-------------------|-----------------|-----------------------|-------------------|-----------------|--------------------------------|
|                                |                          | Before            | After             |                 | Before                        | After             |                 | Before                | After             |                 | Median Test Statistic          |
|                                |                          | $\bar{X}\pm SD$   | $\bar{X}\pm SD$   | z               | $\bar{X}\pm SD$               | $\bar{X}\pm SD$   | z               | $\bar{X}\pm SD$       | $\bar{X}\pm SD$   | z               |                                |
|                                |                          | Median            | Median            | p <sup>a</sup>  | Median                        | Median            | p <sup>a</sup>  | Median                | Median            | p <sup>a</sup>  | p <sup>b</sup>                 |
| Pittsburgh Sleep Quality Index | Subjective sleep quality | 1.53±0.64<br>1.00 | 1.13±0.74<br>1.00 | -1.540<br>0.124 | 1.29±0.85<br>1.00             | 1.18±0.53<br>1.00 | -0.707<br>0.480 | 1.63±0.72<br>1.50     | 1.31±0.60<br>1.00 | -1.667<br>0.096 | 1.166<br>0.558                 |
|                                | Sleep latency            | 1.73±1.16<br>2.00 | 1.33±0.98<br>2.00 | -1.897<br>0.058 | 1.41±0.80<br>1.00             | 1.00±0.71<br>1.00 | -1.588<br>0.112 | 1.50±0.89<br>1.50     | 1.31±0.95<br>1.50 | -0.905<br>0.366 | 0.860<br>0.651                 |
|                                | Sleep duration           | 0.33±0.62<br>0.00 | 0.47±0.64<br>0.00 | 0.816<br>0.414  | 0.82±1.02<br>0.00             | 1.00±0.87<br>1.00 | 0.722<br>0.470  | 0.94±0.77<br>1.00     | 1.06±0.93<br>1.00 | 0.816<br>0.414  | 0.203<br>0.904                 |
|                                | Habitual sleep activity  | 0.33±0.62<br>0.00 | 0.20±0.41<br>0.00 | -1.414<br>0.157 | 0.12±0.33<br>0.00             | 0.12±0.49<br>0.00 | 0.000<br>1.000  | 0.44±0.89<br>0.00     | 0.25±0.45<br>0.00 | -0.966<br>0.334 | 0.350<br>0.839                 |
|                                |                          |                   |                   |                 |                               |                   |                 |                       |                   |                 |                                |
|                                |                          |                   |                   |                 |                               |                   |                 |                       |                   |                 |                                |

$\bar{X}\pm SD$ : Average  $\pm$  Standard Deviation, PSQI: Pittsburgh Sleep Quality Index, \* $p<0,05$ , <sup>a</sup> Wilcoxon T-Test Statistic, <sup>b</sup> Median Test Statistic

Total range of PSQI scores: 5≤ poor sleep quality; ≤5 good sleep quality

**Table 4.4. In-group and intergroup comparison of the sleep qualities of respondents.**

|                                | Variables             | Yoga Group (n=15) |                   |                  | Video-based Yoga Group (n=17) |                   |                 | Exercise Group (n=16) |                   |                 | Comparison of the Three Groups |
|--------------------------------|-----------------------|-------------------|-------------------|------------------|-------------------------------|-------------------|-----------------|-----------------------|-------------------|-----------------|--------------------------------|
|                                |                       | Before            | After             |                  | Before                        | After             |                 | Before                | After             |                 |                                |
|                                |                       | $\bar{X} \pm SD$  | $\bar{X} \pm SD$  | z                | $\bar{X} \pm SD$              | $\bar{X} \pm SD$  | z               | $\bar{X} \pm SD$      | $\bar{X} \pm SD$  | z               | Median Test Statistic          |
|                                |                       | Median            | Median            | p <sup>a</sup>   | Median                        | Median            | p <sup>a</sup>  | Median                | Median            | p <sup>a</sup>  | p <sup>b</sup>                 |
| Pittsburgh Sleep Quality Index | Sleep disturbance     | 1.73±0.59<br>2.00 | 1.40±0.51<br>1.00 | -1.890<br>0.059  | 1.47±0.72<br>1.00             | 1.47±0.51<br>1.00 | 0.000<br>1.000  | 1.56±0.51<br>2.00     | 1.63±0.62<br>2.00 | 0.447<br>0.655  | 1.041<br>0.594                 |
|                                | Use of sleeping pills | 0.20±0.56<br>0.00 | 0.07±0.26<br>0.00 | -0.816<br>0.414  | 0.12±0.49<br>0.00             | 0.18±0.73<br>0.00 | 1.000<br>0.317  | 0.00±0.00<br>0.00     | 0.19±0.54<br>0.00 | 1.342<br>0.180  | 4.591<br>0.101                 |
|                                | Daytime Dysfunction   | 1.40±0.91<br>1.00 | 1.00±1.00<br>1.00 | -1.730<br>0.084  | 1.00±0.87<br>1.00             | 0.94±0.90<br>1.00 | -0.302<br>0.763 | 1.06±0.57<br>1.00     | 1.00±0.89<br>1.00 | -0.378<br>0.705 | 0.441<br>0.802                 |
|                                | PSQU Total            | 7.27±3.22<br>7.00 | 5.60±2.13<br>5.00 | -2.072<br>0.038* | 6.24±3.65<br>6.00             | 5.88±2.98<br>6.00 | -1.305<br>0.192 | 7.13±2.71<br>6.00     | 6.75±3.45<br>6.50 | -0.850<br>0.395 | 1.991<br>0.370                 |

$\bar{X} \pm SD$ : Average  $\pm$  Standard Deviation, PSQI: Pittsburgh Sleep Quality Index, \*p<0,05, <sup>a</sup> Wilcoxon T-Test Statistic, <sup>b</sup> Median Test Statistic

Total range of PSQI scores: 5≤ poor sleep quality; ≤5 good sleep quality

#### 4.5. Evaluation of Fatigue

As a result of the fatigue severity scale, all groups revealed statistically significant declines at the end of the 6-week study ( $p < 0.05$ ). When the differences among groups are compared, no intergroup differences with respect to the fatigue severity scale were observed ( $p = 0.060 > 0.05$ ) (Table 4.5.).

**Table 4.5. In-group and intergroup comparison of respondents' states of fatigue.**

| Variables              | Yoga Group (n=15) |                  |                | Video-based Yoga Group (n=17) |                  |                | Exercise Group (n=16) |                  |                | Comparison of the Three Groups |
|------------------------|-------------------|------------------|----------------|-------------------------------|------------------|----------------|-----------------------|------------------|----------------|--------------------------------|
|                        | Before            | After            |                | Before                        | After            |                | Before                | After            |                |                                |
|                        | $\bar{X} \pm SD$  | $\bar{X} \pm SD$ | z              | $\bar{X} \pm SD$              | $\bar{X} \pm SD$ | z              | $\bar{X} \pm SD$      | $\bar{X} \pm SD$ | z              | Median Test Statistic          |
|                        | Median            | Median           | p <sup>a</sup> | Median                        | Median           | p <sup>a</sup> | Median                | Median           | p <sup>a</sup> | p <sup>b</sup>                 |
| Fatigue Severity Scale | 3.78±1.40         | 2.37±1.29        | -3.181         | 4.54±1.34                     | 3.64±1.69        | -2.892         | 4.13±1.59             | 3.27±1.42        | -2.875         | 5.622                          |
|                        | 3.55              | 2.77             | 0.001*         | 5.00                          | 3.66             | 0.004*         | 4.50                  | 3.00             | 0.004*         | 0.060                          |

$\bar{X} \pm SD$ : Average  $\pm$  Standard Deviation, n: number, \* $p < 0.05$ , <sup>a</sup> Wilcoxon T-Test Statistic, <sup>b</sup> Median Test Statistic

Fatigue severity scale score range: 4 > no fatigue; chronic fatigue syndrome  $\geq 4$

#### 4.6. Evaluation of Quality of Life

As a result of the quality of life scale, only the yoga group revealed a statistically significant increase in overall health at the end of the 6-week study ( $p=0.016<0.05$ ). When the differences among groups were compared, it was observed that the results of the quality of life scale show none ( $p>0.05$ ) (Table 4.6.).

**Table 4.6. In-group and intergroup comparison of the qualities of life of respondents.**

|                                        | Variables            | Yoga Group (n=15)                   |                                    |                 | Video-based Yoga Group (n=17)       |                                    |                 | Exercise Group (n=16)               |                                    |                 | Comparison of the Three Groups        |
|----------------------------------------|----------------------|-------------------------------------|------------------------------------|-----------------|-------------------------------------|------------------------------------|-----------------|-------------------------------------|------------------------------------|-----------------|---------------------------------------|
|                                        |                      | Before<br>$\bar{X}\pm SD$<br>Median | After<br>$\bar{X}\pm SD$<br>Median | z<br><br>$p^a$  | Before<br>$\bar{X}\pm SD$<br>Median | After<br>$\bar{X}\pm SD$<br>Median | z<br><br>$p^a$  | Before<br>$\bar{X}\pm SD$<br>Median | After<br>$\bar{X}\pm SD$<br>Median | z<br><br>$p^a$  | Median Test<br>Statistic<br><br>$p^b$ |
|                                        |                      |                                     |                                    |                 |                                     |                                    |                 |                                     |                                    |                 |                                       |
| Quality of Life<br>WHOQOL<br>-<br>BREF | Overall health       | 54.17 $\pm$ 17.47<br>50.00          | 64.17 $\pm$ 12.38<br>62.50         | 2.401<br>0.016* | 61.03 $\pm$ 18.16<br>62.50          | 68.38 $\pm$ 13.34<br>75.00         | 1.742<br>0.082  | 60.16 $\pm$ 13.09<br>62.50          | 62.50 $\pm$ 13.69<br>62.50         | 1.000<br>0.317  | 2.968<br>0.227                        |
|                                        | Physical health      | 71.43 $\pm$ 11.77<br>71.43          | 75.48 $\pm$ 10.96<br>78.57         | 1.691<br>0.091  | 72.48 $\pm$ 15.86<br>75.00          | 76.26 $\pm$ 10.78<br>78.57         | 0.691<br>0.490  | 70.87 $\pm$ 14.40<br>73.21          | 74.78 $\pm$ 12.61<br>75.00         | 0.823<br>0.410  | 2.537<br>0.281                        |
|                                        | Psychological        | 63.89 $\pm$ 7.16<br>62.50           | 67.78 $\pm$ 7.46<br>66.67          | 1.615<br>0.106  | 64.22 $\pm$ 12.85<br>66.67          | 67.65 $\pm$ 12.11<br>66.67         | 0.984<br>0.325  | 64.32 $\pm$ 17.48<br>64.58          | 67.19 $\pm$ 16.59<br>68.75         | 0.315<br>0.753  | 1.596<br>0.450                        |
|                                        | Social relationships | 66.11 $\pm$ 11.56<br>66.67          | 67.22 $\pm$ 10.19<br>66.67         | 0.513<br>0.608  | 75.00 $\pm$ 15.59<br>75.00          | 69.12 $\pm$ 19.04<br>75.00         | -1.561<br>0.118 | 60.42 $\pm$ 20.53<br>58.33          | 62.50 $\pm$ 19.25<br>66.67         | 0.678<br>0.498  | 2.241<br>0.326                        |
|                                        | Environment          | 62.71 $\pm$ 11.48<br>59.38          | 65.83 $\pm$ 13.90<br>65.63         | 1.065<br>0.287  | 64.71 $\pm$ 14.94<br>62.50          | 68.56 $\pm$ 11.77<br>65.63         | 1.194<br>0.232  | 65.63 $\pm$ 13.36<br>65.63          | 65.43 $\pm$ 11.49<br>62.50         | -0.571<br>0.568 | 1.596<br>0.450                        |

$\bar{X}\pm SD$ : Average  $\pm$  Standard Deviation, \* $p<0,05$ , <sup>a</sup> Wilcoxon T-Test Statistic, <sup>b</sup> Median Test Statistic, WHOQOL-BREF score range: 0-100

#### 4.7. Evaluation of Posture

According to the results of the New York Posture Rating Test, statistically significant increases were observed in the body and New York total values in the yoga group; head, body and New York total values of the video-based yoga group and all values of the exercise group at the end of the 6-week study ( $p < 0,05$ ). When the differences among groups were compared, it was observed that New York Posture Rating Test results revealed no differences among groups ( $p > 0.05$ ) (Table 4.7.).

**Table 4.7. In-group and intergroup comparison of the postures of respondents.**

|                              | Variables      | Yoga Group (n=15)         |                           |                 | Video-based Yoga Group (n=17) |                           |                 | Exercise Group (n=16)     |                           |                 | Comparison of the Three Groups |
|------------------------------|----------------|---------------------------|---------------------------|-----------------|-------------------------------|---------------------------|-----------------|---------------------------|---------------------------|-----------------|--------------------------------|
|                              |                | Before                    | After                     |                 | Before                        | After                     |                 | Before                    | After                     |                 | Median Test Statistic          |
|                              |                | $\bar{X} \pm SD$          | $\bar{X} \pm SD$          | z               | $\bar{X} \pm SD$              | $\bar{X} \pm SD$          | z               | $\bar{X} \pm SD$          | $\bar{X} \pm SD$          | z               | $p^b$                          |
|                              |                | Median                    | Median                    | $p^a$           | Median                        | Median                    | $p^a$           | Median                    | Median                    | $p^a$           |                                |
| New York Posture Rating Test | Head           | 7.47 $\pm$ 1.41<br>8.00   | 8.27 $\pm$ 1.03<br>8.00   | 1.897<br>0.058  | 8.00 $\pm$ 0.71<br>8.00       | 8.59 $\pm$ 0.94<br>8.00   | 2.236<br>0.025* | 7.38 $\pm$ 0.96<br>8.00   | 8.25 $\pm$ 0.68<br>8.00   | 2.646<br>0.008* | 2.247<br>0.325                 |
|                              | Body           | 21.47 $\pm$ 3.82<br>20.00 | 28.47 $\pm$ 3.74<br>27.00 | 3.306<br>0.001* | 22.47 $\pm$ 3.84<br>22.00     | 30.29 $\pm$ 2.64<br>31.00 | 3.650<br>0.000* | 22.88 $\pm$ 3.86<br>22.00 | 29.75 $\pm$ 4.73<br>31.00 | 3.473<br>0.001* | 0.781<br>0.677                 |
|                              | Shoulder       | 7.47 $\pm$ 1.41<br>8.00   | 7.73 $\pm$ 1.49<br>8.00   | 0.707<br>0.480  | 7.18 $\pm$ 1.02<br>8.00       | 8.00 $\pm$ 1.41<br>8.00   | 1.615<br>0.106  | 6.88 $\pm$ 1.63<br>7.00   | 8.00 $\pm$ 1.46<br>8.00   | 2.496<br>0.013* | 2.003<br>0.367                 |
|                              | Legs           | 13.80 $\pm$ 1.27<br>13.00 | 14.47 $\pm$ 0.92<br>15.00 | 1.890<br>0.059  | 14.18 $\pm$ 1.59<br>15.00     | 14.76 $\pm$ 0.97<br>15.00 | 1.414<br>0.157  | 13.63 $\pm$ 1.20<br>13.00 | 14.50 $\pm$ 0.89<br>15.00 | 2.333<br>0.020* | 0.951<br>0.621                 |
|                              | New York Total | 50.20 $\pm$ 5.23<br>49.00 | 54.73 $\pm$ 4.06<br>53.00 | 2.332<br>0.020* | 51.82 $\pm$ 4.36<br>51.00     | 58.06 $\pm$ 2.93<br>59.00 | 3.456<br>0.001* | 50.75 $\pm$ 4.67<br>51.00 | 56.75 $\pm$ 6.11<br>58.00 | 3.387<br>0.001* | 0.042<br>0.979                 |

$\bar{X} \pm SD$ : Average  $\pm$  Standard Deviation, \* $p < 0,05$ , <sup>a</sup> Wilcoxon T-Test Statistic, <sup>b</sup> Median Test Statistic,

New York Posture Rating Chart score range: 65 $\geq$ very good  $\geq$ 45; 44 $\geq$ good $\geq$ 40; 39 $\geq$ medium $\geq$ 30; 29 $\geq$ poor $\geq$ 20; 19 $\geq$ bad $\geq$ 13

#### **4.8. The Relation Between Respondents' Respiratory Functions, Flexibility Measurements, Sleep Quality, Posture and Chest Girth**

A negatively significant relation between the total PSQI score ( $5 \leq$ ) of respondents in the yoga group, which expresses poor sleep quality, chest girth, FVC and PEF values was observed ( $p < 0,05$ ). Also, a positively significant relation was observed between the total score acquired as per the results of New York posture test and VC ( $p < 0,05$ ).

In the video-based yoga group, only a negative relation between chest girth, from amongst anthropometric assessments, and total PSQI score, was detected ( $p < 0,05$ ).

A negatively significant relation between a high total PSQI score, which signifies poor sleep quality ( $5 \leq$ ), functional reach distance and FVC value within respiratory function tests in the respondents from the exercise group ( $p < 0,05$ ,  $p < 0,001$ ). Moreover, a significant relation was observed between latissimus dorsi flexibility in flexibility measures and PEF value from amongst respiratory function tests ( $p < 0,05$ ,  $p < 0,001$ ) (Table 4.8.).

**Table 4.8. The relation between respondents' respiratory functions, flexibility measurements, sleep quality, posture and chest girth**

|                                                   |       |     | Yoga Group                  |                       |         |        | Video-based Yoga Group      | Exercise Group                 |                       |         |
|---------------------------------------------------|-------|-----|-----------------------------|-----------------------|---------|--------|-----------------------------|--------------------------------|-----------------------|---------|
| Assessments                                       |       |     | Anthropometric Measurements | Respiratory Functions |         |        | Anthropometric Measurements | Flexibility Measurements       | Respiratory Functions |         |
|                                                   |       |     | Chest Girth (cm)            | FVC (%)               | PEF (%) | VC (%) | Chest Girth (cm)            | Functional Reach Distance (cm) | FVC (%)               | PEF (%) |
| Pittsburgh Sleep Quality Index (PSQI) Total Score | rho   |     | -0.558*                     | -0.539*               | -0.628* | -      | -0.535*                     | -0.744**                       | -0.567*               |         |
|                                                   | p     |     | 0.031                       | 0.038                 | 0.012   | -      | 0.027                       | 0.001                          | 0.022                 |         |
| New York Posture Rating Test Total Score          | rho   |     | -                           | -                     | -       | 0.523* | -                           | -                              | -                     |         |
|                                                   | p     |     |                             |                       |         | 0.045  |                             |                                |                       |         |
| M. Latissimus Dorsi Flexibility (°)               | Right | rho | -                           | -                     | -       | -      | -                           | -                              | -                     | 0.621*  |
|                                                   |       | p   |                             |                       |         |        |                             |                                |                       | 0.010   |
|                                                   | Left  | rho | -                           | -                     | -       | -      | -                           | -                              | -                     | 0.689** |
|                                                   |       | p   |                             |                       |         |        |                             |                                |                       | 0.003   |

FVC: Forced vital capacity, PEF: Peak expiratory flow, VC: Vital capacity, \* Spearman Correlation, \*  $p < 0.05$ ; \*\*  $p < 0.001$  Normality range of respiratory functions: 120% > normal  $\geq 80\%$ , Total PSQI score range: 5  $\leq$  poor sleep quality;  $\leq 5$  good sleep quality, New York Posture rating total test score range: 65  $\geq$  very good  $\geq 45$ ; 44  $\geq$  good  $\geq 40$ ; 39  $\geq$  medium  $\geq 30$ ; 29  $\geq$  weak  $\geq 20$ ; 19  $\geq$  bad  $\geq 13$

## 5. DISCUSSION AND CONCLUSION

Interventions that are effective in improving the physical activity levels of the general population are needed to relieve chronic illness loads and untimely death due to an inactive lifestyle (1-3).

The increasing numbers of means of Internet access and Internet users (101) paved the way for physical activity programs to spread via the Internet use and reach wider masses. Therefore, Internet-based physical activity approaches ensure reaching more people with lower costs, compared to the conventional, face-to-face practices (102). Moreover, participants can interact and reach myriad information with the use of Internet, including the time they wish to be informed (103). Prior studies regarding the efficiency of Internet-based physical activity interventions have proven that Internet can actually be a hopeful new method in providing physical activity interventions (18, 102-105).

Yang and James (106) studied the effects of yoga programs on the physical activity levels of overweight sedentary adults with a six month pilot study and found that the DVD group showed a higher level of physical activity than the face to face group. It was also reported that a larger sample size and comparative studies between different groups are needed to better assess the effects of the program on the level of physical activity in such a population. Gothe et al. (107), on the other hand, investigated whether or not a DVD exercise program improves the physical activity levels of elderly individuals and concluded that the DVD exercise program with Flexitoba exercises increased physical activity levels in elderly individuals.

This study compares the impact of video-based yoga, which is still a new method in the field of physiotherapy and rehabilitation, and physiotherapist-led yoga and exercise practices on the respiratory capacity and sleep quality of sedentary individuals.

According to the results of the respiratory function, all three groups improved their respiration. There was a significant difference among groups in VC only, which favors the video-based yoga group.

In another study, it was reported that following a yoga program, which largely included pranayama, FEV<sub>1</sub>, FVC and PEF values increased, but no statistically significant changes in the FEV<sub>1</sub>/FVC ratio was observed and a yoga program was hence recommended to improve pulmonary functions (108).

Liu et al. (109) reported that only FEV1 values increased statistically, after the yoga practice of the group in the study they conducted with patients, who suffer from COPD. Cramer et al. (110), on the other hand, conducted a meta-analysis, where they investigated the impact of yoga practices on pulmonary functions in patients, who suffer from asthma and reported an increase in FEV1, FVC, FEV1/FVC and PEF values, concluding that it can be a useful and supplementary method alongside respiratory exercises for patients, who suffer from asthma. Chanavirut et al. (111), conducted a study in young and healthy individuals to investigate the impact of yoga exercises on chest wall width and lung volume and concluded that they improved respiratory capacity by increasing said width and forced expiratory volume. Yadav and Das (112), on the other hand, studied the impacts of yoga practices on respiratory functions in young women. At the end of week 12, they found a significant improvement in FVC, FEV1 And DEFV values. In healthy, sedentary men, increases in FEV1 and VC values as per the test results on respiratory function, following yoga exercise training, were reported (113). In middle aged, healthy men, who were assigned yoga exercise trainings, including pranayama exercises, improvements in pulmonary functions and substantially higher increase in FEV1, FVC, FEV1/FVC, PEF, VC and IC values, compared to aerobic exercise were noted (114). Similar outcomes after a yoga training for elderly and healthy volunteers were also recorded (115).

From this perspective, our study shows parallelism with the literature. During the time of pandemic that embraced our country and the whole world, we believe that video-based yoga programs that can be done at home would have positive influences on the respiratory functions of individuals.

According to the results of our study concerning sleep quality, the yoga group revealed a significant increase. However, there is no significant difference among groups. A negatively significant relation was observed between PSQI score and chest girth in both the yoga group and the video-based yoga group. In other words, as the chest expansion improved in those who practice yoga, whether it is face to face or via video, their sleep quality improved as well. The results of the study, conducted by Yurtkuran et al., (116) on hemodialysis patients, also support the results acquired in this study. A total of 25% improvement in sleep disorders was also reported for the 12-week yoga-based exercise program. It was reported that yoga helps with better sleep quality and relaxation (117). According to a review article, when one practices yoga for a minimum of 6 months, one

becomes less depressed and relieves sleep problems thanks to yoga. In chronic insomnia, sleep quality also improved in pregnant women, elderly and cases of pain (118).

In the exercise group, the sleep quality was observed to be linked with functional reach distance and forced vital capacity from amongst respiratory function tests. While the treatment efficiency of physiotherapy programs often found a place for themselves in the literature (119-124), the existing studies often focus on comparing yoga with various treatment programs rather than a specific exercise program or with long follow-up periods such as once or twice a week. Moreover, other studies, where intensive yoga programs of 7-8 hours in short term are compared, can be encountered (117, 125-128).

The flexibility of individuals improved in all three groups in our study. However, only the measurement of M. triceps brachii flexibility revealed a significant difference between the groups. The difference favors the video-based yoga group. Respondents in the exercise group, on the other hand, revealed a significant relation between latissimus dorsi flexibility in flexibility measurements and PEF value in respiratory function tests.

According to the results of this study on sleep quality, a significant improvement was found only in the yoga group. However, no significant differences among groups were observed.

Loss of flexibility causes postural tension and muscle fatigue, in which case the load on the joints become heavier. Consequently, incorrect vertebrae sequences and degenerative changes may occur. Studies that include exercises state that exercise improves flexibility and movements become more fluent (124, 129-132). In a study that compares various exercises, body flexibility is assessed and it was reported that motor control exercises, compared to classic exercises, are more effective on flexibility (124). Studies on yoga, on the other hand, show that both flexibility and normal joint mobility increase (2, 118, 127).

Williams et al. (133), researched the therapeutic effects of Iyengar yoga in patients with chronic lower back pain and concluded that by improving the flexibility of gluteus medius and iliocostalis muscles, the range of joint motion of hip flexion is also improved. Grabara and Szopa (134) also concluded as per their study that Hatha yoga practices improve spine flexibility in all three planes in women over the age of 50.

This study found that there are efficient methods in flexibility and normal joint range of motion in all study groups. Similar studies in the literature focus on a single exercise group or similar exercise groups (2, 119, 125, 128). In this study, on the other hand, three different exercise groups were compared. The inclusion of parameters such as stretching, strengthening, posture and fitness of the body into regular exercise programs are deemed to be effective factors in improving flexibility and normal joint range of motion.

A significant amelioration in posture was found in our study in all three groups, according to posture results, and no significant difference among the groups was observed. There was a positively significant relation between the total New York posture test scores and vital capacity in respondents in the yoga group. Postural control is positively affected by regularly repeated exercises and posture trainings (135-137). Similarly, Gauchard et al., (136) concluded in their study, where they examined physical activity habits and their effects of posture in elderly sedentary women, physical activities are specifically helpful in improving postural control and stabilization.

Savic et al. (138), also found that Hatha yoga seriously improves posture in children, while it improves quality of life, stooping range and distance in 3 minute all-out running test.

Grabara (139), on the other hand, studied the impact of Hatha yoga practices on anterior posterior spinal curvatures and observed declines in thoracic kyphosis angle measurements, thoracic curvature and lumbar lordosis angle. In cases of excessive anterior posterior curvature of the spine, yoga practices appear to improve overall body posture as well.

Kim et al. (140), investigated the relation between forward head posture and respiratory functions, as well as between respiratory accessory muscles and muscle activities. Accordingly, a positive and significant relation was found between craniovertebral angle and VC, FVC, FEV1, PEF and maximal voluntary ventilation. They also found a negative significant relation between the craniovertebral angle and sternocleidomastoid activity ratio. Finally, there was a significant and negative relation between cranial rotational angle and VC and FVC; and a positive and significant relation between cranial rotational angle, sternocleidomastoid and upper trapezius activity ratios.

In this study, it was found that exercise, in comparison with the yoga programs, is more effective on the shoulders and legs. We are of the opinion that the underlying reason of the aforementioned phenomenon is the decreased period of movement in yoga and video-based yoga programs, for they included a 10-minute deep relaxation meditation portion. In addition, we have encountered no articles in the literature that focused on the effects of yoga on posture.

According to the in-group results concerning pain, all programs revealed a statistically significant decrease in pain, whereas no statistically significant difference was observed in intergroup evaluations.

The existing studies report that exercise intensive treatments are important in pain management. Especially, specific exercises are observed to be more successful in managing pain. One of these specific exercises is yoga (127, 129-132, 141, 142). Thanks to the altering of one's focus with the meditation and breathing exercises of yoga programs, pain relief is reported (118). According to Evans et al. (143), physiotherapy and yoga programs substantially diminish the pain in lower back pain cases. Studies that were conducted with only yoga, on the other hand, were reported to relieve lower back pain as well (117, 125).

This study thus supports the literature.

According to the balance-related results of the study, all programs improved balance of the respondents, while no significant difference was observed among the groups.

In a study that compares to different physiotherapy methods, it was observed that decreasing pain was accompanied by improved balance (129). In another study, women with musculoskeletal problems were assigned yoga programs and positive improvements in balance were reported as a result (144). Field (118) argued that a 6-week Hatha yoga program increases physical conditioning, single leg stance performance and flexibility values. It was also stated that in healthy individuals, yoga can have positive impacts on balance and flexibility and can be performed in a preventative way (145, 146). According to the research article, penned by Sorosky et al. (2), Galantino et al. assigned a 6-week yoga program, which helped with depression and improved flexibility and balance.

Our study revealed parallel results with those in the literature.

According to the functional strength results of our study, all programs revealed significant increase, while the intergroup evaluations did not show any significant differences.

Conducted by Kabul et al. (147), the study on the effect of short term dynamic stabilization training on functional levels in healthy young individuals, sit-ups, squat and Y balance test results were found to be statistically significant after the 3-week exercise training. The short term dynamic stabilization training generated positive effects in healthy young individuals on muscular endurance of the body and lower extremities and dynamic balance.

According to the results on the quality of life, only the yoga group revealed a significant improvement in the overall health. For the other sub-parameters, the in-group and intergroup evaluations did not yield any significant differences.

In a study that investigates the effects of an 8-week yoga program on quality of life and anxiety, it was observed that patients' scores of quality of life increased after the yoga exercise programs (148). In another study, which was conducted with 107 individuals with an age average of 34, a yoga exercise program was assigned. Respondents were later evaluated with SF-36 and all scores revealed positive outcomes in quality of life (149). Finally, in another study that went on between 2012 and 2015 with 279 obese individuals, the effect of short term yoga exercise training on quality of life was scrutinized and an increase in the total score of quality of life was reported (150). Our study displays parallelism with the literature, in this sense.

According to the results of our study, all programs revealed a significant decrease in fatigue and no significant differences were found in the intergroup evaluations.

In a study that was conducted for 6 weeks with patients, who suffer from fibromyalgia, they were assigned yoga programs, which resulted in decreased levels of pain and fatigue and improved sleep quality (151). Patients, who suffer from chronic fatigue syndrome, performed a single session of isometric yoga and it was concluded that fatigue was relieved, vagal nerve functions increased and anti-stress and anti-inflammatory impacts were achieved (152).

Our study shows parallelism with the existing literature.

More than half of the respondents were observed to participate in exercise programs regularly. While exercise habits did not reveal a significant difference between respondents, such exercising habits may disrupt the study and weaken the interpretability of the results.

Following the study, significant improvements in respiratory functions in all groups were observed. When the groups were compared, vital capacity was found to be more significant for the individuals in the video-based yoga programs, which were practiced at home. Internet-based exercise approaches comprise a method that allows individuals to exercise at the comfort of their homes and feel safe as they do so (153). From this perspective, we are of the opinion in this study that video-based yoga exercises that were performed at home are more efficient in improving vital capacities. Before the study, individuals had poor sleep quality, according to the results of the sleep quality evaluations. After the study, those in the yoga group reported improvement in sleep quality. According to the results of the flexibility evaluations, we observed improved levels of flexibility in all groups of the study. We are of the opinion that M. triceps brachii muscle is used more by those in the video-based yoga group due to the moon salutation and sun salutation yoga flows that incorporate the use of handstands. Future studies shall include, in addition to young adult practitioners of video-based yoga programs, older adults and clinical populations and relevant effects on physical fitness. According to the results on posture evaluations, individuals in the study were observed to have slightly hunched shoulders, different shoulder levels, rounded upper backs, increased lordosis and mildly outward facing feet. According to the test results, only the exercise group improved shoulder and leg stances. We are of the opinion that this occurred, due to the adoption of an exercise program that included eccentric-concentric contractions for antigravity muscles.

## 6. REFERENCES

- 1) Özdemir AT, Ertekin Ö, Multipl skleroz'da yoga. TFD Nörolojik Fizyoterapi Grubu Bülteni, 2016; Cilt:2 Sayı:8. Erişim tarihi (11.11.2017), [www.norofzt.org](http://www.norofzt.org)
- 2) Sorosky S, Stilp S, Akuthota V. Yoga and pilates in the management of low back pain. Curr Rev Musculoskelet Med. 2008;1(1):39-47. doi:10.1007/s12178-007-9004-1
- 3) Sarang PS, Telles S. Oxygen consumption and respiration during and after two yoga relaxation techniques. Appl Psychophysiol Biofeedback. 2006;31(2):143-153. doi:10.1007/s10484-006-9012-8
- 4) Bowman AJ, Clayton RH, Murray A, Reed JW, Subhan MM, Ford GA. Effects of aerobic exercise training and yoga on the baroreflex in healthy elderly persons. Eur J Clin Invest. 1997;27(5):443-449. doi:10.1046/j.1365-2362.1997.1340681.x
- 5) Villien F, Yu M, Barthélémy P, Jammes Y. Training to yoga respiration selectively increases respiratory sensation in healthy man. Respir Physiol Neurobiol. 2005;146(1):85-96. doi:10.1016/j.resp.2004.11.010
- 6) Verges S, Boutellier U, Spengler CM. Effect of respiratory muscle endurance training on respiratory sensations, respiratory control and exercise performance: a 15-year experience. Respir Physiol Neurobiol. 2008;161(1):16-22. doi:10.1016/j.resp.2007.11.004
- 7) Joshi LN, Joshi VD, Gokhale LV. Effect of short term 'Pranayam' practice on breathing rate and ventilatory functions of lung. Indian J Physiol Pharmacol. 1992;36(2):105-108.

- 8) Sivakumar G, Prabhu K, Baliga R, Pai MK, Manjunatha S. Acute effects of deep breathing for a short duration (2-10 minutes) on pulmonary functions in healthy young volunteers. *Indian J Physiol Pharmacol*. 2011;55(2):154-159.
- 9) Telles S, Naveen KV. Yoga for rehabilitation: an overview. *Indian J Med Sci*. 1997;51(4):123-127.
- 10) Newton KM, Reed SD, Guthrie KA, et al. Efficacy of yoga for vasomotor symptoms: a randomized controlled trial. *Menopause*. 2014;21(4):339-346. doi:10.1097/GME.0b013e31829e4baa
- 11) Dhruva A, Miaskowski C, Abrams D, et al. Yoga breathing for cancer chemotherapy-associated symptoms and quality of life: results of a pilot randomized controlled trial. *J Altern Complement Med*. 2012;18(5):473-479. doi:10.1089/acm.2011.0555
- 12) Afonso RF, Hachul H, Kozasa EH, et al. Yoga decreases insomnia in postmenopausal women: a randomized clinical trial. *Menopause*. 2012;19(2):186-193. doi:10.1097/gme.0b013e318228225f
- 13) Jindani F, Turner N, Khalsa SB. A Yoga Intervention for Posttraumatic Stress: A Preliminary Randomized Control Trial. *Evid Based Complement Alternat Med*. 2015;2015:351746. doi:10.1155/2015/351746
- 14) Mustian KM, Sprod LK, Janelson M, et al. Multicenter, randomized controlled trial of yoga for sleep quality among cancer survivors. *J Clin Oncol*. 2013;31(26):3233-3241. doi:10.1200/JCO.2012.43.7707

- 15) Chen KM, Chen MH, Chao HC, Hung HM, Lin HS, Li CH. Sleep quality, depression state, and health status of older adults after silver yoga exercises: cluster randomized trial. *Int J Nurs Stud*. 2009;46(2):154-163.  
doi:10.1016/j.ijnurstu.2008.09.005
- 16) U.S. Department of Health and Human Services Physical activity and health: a report of the Surgeon General, U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Atlanta, GA ;1996.
- 17) McKinlay, J. B.. The new public health approach to improving physical activity and autonomy in older populations. Boston: Springer. 1995. p. 87-103
- 18) Marcus BH, Owen N, Forsyth LH, Cavill NA, Fridinger F. Physical activity interventions using mass media, print media, and information technology. *Am J Prev Med*. 1998;15(4):362-378. doi:10.1016/s0749-3797(98)00079-8
- 19) Dıraçoğlu, D., Denge ve koordinasyon ölçümleri. 2. Romatoloji Ve Tibbi Rehabilitasyon Günleri, “Ölçme Ve Değerlendirme” Sempozyumu Özet Kitabı.2008. s. 40-9. Ankara, Türkiye.
- 20) Gallagher D, Song MY. Evaluation of body composition: practical guidelines. *Prim Care*. 2003;30(2):249-265. doi:10.1016/s0095-4543(03)00030-7
- 21) Arslan, C., Ceviz, D. Ev Hanımı ve Çalışan Kadınların Obezite Prevalansı ve Sağlıklı Yaşam Biçimi Davranışlarının Değerlendirilmesi. Fırat Üniversitesi Beden Eğitimi ve Spor Yüksek Okulu. 2007. 21 (5) :211-220
- 22) Arıkan, B., Hazar S., Arıkan E., Bel Ağrısı Çeken Sedanter Bayanlarda Bel Egzersizlerinin Ağrı Durumlarına Etkisi. *Uluslararası İnsan Bilimleri Dergisi*. 2010. Cilt;7., Sayı :2

- 23) Karacan, S., Günay M. Aerobik Antrenman Programının Menopoz Dönemindeki Kadınların Kardiyovasküler Risk Faktörlerine Etkisi. GÜ . B.E.S.Y.O ,Beden Eğitimi ve Spor Öğretmenliği Bölümü, GÜ, Gazi Eğitim Fakültesi Dergisi. 2003. cilt:23 sayı :3.
- 24) Yağcı N, Gürsoy S, Cavlak U, Er S ve ark. Huzurevinde yaşayan yaşlılarda 6 haftalık yürüme programının fiziksel performansa etkileri. Fizyoterapi Rehabilitasyon 2003; 14: 121-125.
- 25) Zorba, E., Ziyagil, M.A., Vücut kompozisyonu ve ölçüm metotları, Ankara: Gen Matbaacılık. 1995 s.219-220
- 26) Kalyon, T.A., Spor Hekimliği Spor Sağlığı ve Spor Sakatlığı, Ankara: Gata bası evi. 1990; 4: 123– 130
- 27) Erkan, N., Yaşam Boyu Spor. Ankara: Bağırhan Yayınevi; 1998.
- 28) Cihan H. Kadın Ve Spor. 2007. [www.hamitcihan.com/dizin.asp?id=129&t=1](http://www.hamitcihan.com/dizin.asp?id=129&t=1).
- 29) Restrepo Calle MT, Monroy de Peña A, Giraldo JP, Velásquez Echeverri MC. Efecto de la actividad física controlada sobre la composición corporal de mujeres sedentarias posmenopáusicas [The effect of controlled physical activity on the body composition of postmenopausal sedentary women]. Rev Panam Salud Publica. 2003;14(4):229-234. doi:10.1590/s1020-49892003000900003
- 30) Yuan, C. S., Bieber, E. J. ed. Textbook of Complementary and Alternative Medicine. London: Informa Healthcare; 2006.
- 31) Borman, P., Yorgancıoğlu Z.R., ed. Fiziksel Tıp Ve Rehabilitasyonda Yeni Ufuklar: Alternatif Tıp. Ankara: Güneş Tıp Kitapevleri; 2010.
- 32) Manaf, A., Yoga nedir? Ne değildir?, İstanbul: Gala Film Sanat Ürünleri San. Tic. Ltd. Şti. 2013. p. 32-204.

- 33) Satyananda, S.S., Asana Pranayama Mudra Bandha, New Delhi, Thomson Press Limited. 2002: 2-403.
- 34) Atılğan E. Kronik Bel Ağrılı Olgularda Yoganın ve Fizyoterapi Programının Yaşam Kalitesi, Denge, Ağrı Düzeyi ve Uyku Kalitesi Üzerine Etkilerinin Karşılaştırılması. Ankara: Hacettepe Üniversitesi Sağlık Bilimleri Enstitüsü; 2013.
- 35) Günay, N. Yoganın Mahiyeti ve Çeşitleri. Süleyman Demirel Üniversitesi İlahiyat Fakültesi Dergisi. 2007. 2(19), 51-79, s. 54.
- 36) Beden, M., Dünya Dinlerinden Hinduizm. İstanbul: Festival Yayıncılık; 2016.
- 37) Öner, Ç. Yoga'nın Tarihsel Boyutu.2014, Erişim tarihi (20.02.2020).  
<https://www.cigdemoner.com.tr/yoganin-tarihsel-boyutu/>.
- 38) Worby, C., Her Yönüyle Yoga, Ankara: Arkadaş Yayınevi. 2007. s: 2, 22, 24-46.
- 39) Derin S. Shaja Yoga: İçeriği, Amacı, Türkiye'deki Faaliyetleri. İzmir: Dokuz Eylül Üniversitesi Sosyal Bilimler Enstitüsü; 2011.
- 40) Müheyya, I., Çağdaş Yoga, Yoga Nedir?. İstanbul: Dharma yayınları; 2003.
- 41) Peter, K., Tibetin Gençlik Pınarı. İstanbul: Dharma yayınları; 1999.
- 42) Barnes PM, Powell-Griner E, McFann K, Nahin RL. Complementary and alternative medicine use among adults: United States, 2002. Adv Data. 2004;(343):1-19.
- 43) De Michelis, E.. Modern yoga: History and forms. In Yoga in the Modern World. Routledge, 2008. 29-47.
- 44) Shearer, A.. The Yoga Sutras of Patanjali. New York: Harmony; 2010.

- 45) Oken BS, Zajdel D, Kishiyama S, et al. Randomized, controlled, six-month trial of yoga in healthy seniors: effects on cognition and quality of life. *Altern Ther Health Med*. 2006;12(1):40-47.
- 46) Worby C. *Her Yönüyle Yoga*. Ankara: Arkadaş Yayınevi; 2007. s: 2, 22, 24-46.
- 47) Feuerstein G, Payne L. *Yoga for Dummies*. 2nd ed. Indianapolis USA: Wiley Publishing Inc.; 2010, p: 17-18.
- 48) Weintraub, A., *Yoga for Depression A Compassionate Guide to Relieve Suffering Through Yoga*. 1st ed. USA: Amy Broadway Books: 2004. p. 107-108.
- 49) Manocha R, Marks GB, Kenchington P, Peters D, Salome CM. Sahaja yoga in the management of moderate to severe asthma: a randomised controlled trial. *Thorax*. 2002;57(2):110-115. doi:10.1136/thorax.57.2.110
- 50) Khanam AA, Sachdeva U, Guleria R, Deepak KK. Study of pulmonary and autonomic functions of asthma patients after yoga training. *Indian J Physiol Pharmacol*. 1996;40(4):318-324.
- 51) Cooper S, Osborne J, Newton S, et al. Effect of two breathing exercises (Buteyko and pranayama) in asthma: a randomised controlled trial. *Thorax*. 2003;58(8):674-679. doi:10.1136/thorax.58.8.674
- 52) Saper RB, Eisenberg DM, Davis RB, Culpepper L, Phillips RS. Prevalence and patterns of adult yoga use in the United States: results of a national survey. *Altern Ther Health Med*. 2004;10(2):44-49.
- 53) Önder, Ö. *Nefesten Solunuma*. İstanbul: Kuraldışı Yayıncılık Eğitim Danışmanlık Ltd Şti; 2019.

- 54) Jiwtode MT, Rathod VR. Effect of integrated yoga module on respiratory pressures and pulmonary functions in children. *Int J Res Med Sci.* 2015;3:3548–52.
- 55) Birkel DA, Edgren L. Hatha yoga: improved vital capacity of college students. *Altern Ther Health Med.* 2000;6(6):55-63.
- 56) Ray US, Sinha B, Tomer OS, Pathak A, Dasgupta T, Selvamurthy W. Aerobic capacity & perceived exertion after practice of Hatha yogic exercises. *Indian J Med Res.* 2001;114:215-221.
- 57) Arambula P, Peper E, Kawakami M, Gibney KH. The physiological correlates of Kundalini Yoga meditation: a study of a yoga master. *Appl Psychophysiol Biofeedback.* 2001;26(2):147-153. doi:10.1023/a:1011343307783
- 58) Karadağ, M.. Uyku bozuklukları sınıflaması (ICSD-2). *Türkiye Klinikleri Archives of Lung*, 2007. 8(3), 88-91.
- 59) Bingöl N. Hemşirelerin Uyku Kalitesi, İş Doyumu Düzeyleri Arasındaki İlişkinin İncelenmesi. Sivas: Cumhuriyet Üniversitesi; 2006.
- 60) Koulouglioti C, Cole R, Kitzman H. Inadequate sleep and unintentional injuries in young children. *Public Health Nurs.* 2008;25(2):106-114. doi:10.1111/j.1525-1446.2008.00687.x
- 61) Michalsen A, Grossman P, Acil A, et al. Rapid stress reduction and anxiolysis among distressed women as a consequence of a three-month intensive yoga program. *Med Sci Monit.* 2005;11(12):CR555-CR561.
- 62) Ellsworth A. Yoga anatomisi. Ankara: Akılçelen Kitaplar; 2017.
- 63) Suryana, S. Yaşam Boyu Pranayama. İstanbul: ALFA Basım Yayım Dağıtım Ltd. Şti.; 2006.

- 64) Rea, S.. *Tending the Heart Fire: Living in Flow with the Pulse of Life*. Sounds True: 2014.
- 65) Jakhotia KA, Shimpi AP, Rairikar SA, et al. Suryanamaskar: An equivalent approach towards management of physical fitness in obese females. *Int J Yoga*. 2015;8(1):27-36. doi:10.4103/0973-6131.146053
- 66) Gozlan A, Rea S. *Kabalah Yoga : Embodying the Hidden Power of the Sacred Hebrew Letters*. Oakland: Reveal Press; 2017.
- 67) Lorig KR, Ritter PL, Laurent DD, Plant K. Internet-based chronic disease self-management: a randomized trial [published correction appears in *Med Care*. 2007 Mar;45(3):276]. *Med Care*. 2006;44(11):964-971.
- 68) Lear SA, Singer J, Banner-Lukaris D, et al. Randomized trial of a virtual cardiac rehabilitation program delivered at a distance via the Internet. *Circ Cardiovasc Qual Outcomes*. 2014;7(6):952-959.
- 69) Joseph RP, Durant NH, Benitez TJ, Pekmezi DW. Internet-Based Physical Activity Interventions. *Am J Lifestyle Med*. 2014;8(1):42-68.
- 70) Balady GJ, Ades PA, Bittner VA, et al. Referral, enrollment, and delivery of cardiac rehabilitation/secondary prevention programs at clinical centers and beyond: a presidential advisory from the American Heart Association. *Circulation*. 2011;124(25):2951-2960. doi:10.1161/CIR.0b013e31823b21e2
- 71) Piepoli MF, Corrà U, Benzer W, et al. Secondary prevention through cardiac rehabilitation: from knowledge to implementation. A position paper from the Cardiac Rehabilitation Section of the European Association of Cardiovascular Prevention and Rehabilitation. *Eur J Cardiovasc Prev Rehabil*. 2010;17(1):1-17. doi:10.1097/HJR.0b013e3283313592

- 72) Southard BH, Southard DR, Nuckolls J. Clinical trial of an Internet-based case management system for secondary prevention of heart disease. *J Cardiopulm Rehabil.* 2003;23(5):341-348. doi:10.1097/00008483-200309000-00003
- 73) Munro J, Angus N, Leslie SJ. Patient focused Internet-based approaches to cardiovascular rehabilitation--a systematic review. *J Telemed Telecare.* 2013;19(6):347-353. doi:10.1177/1357633X13501763
- 74) Clark RA, Conway A, Poulsen V, Keech W, Tirimacco R, Tideman P. Alternative models of cardiac rehabilitation: a systematic review. *Eur J Prev Cardiol.* 2015;22(1):35-74. doi:10.1177/2047487313501093
- 75) Pfaeffli L, Maddison R, Whittaker R, et al. A mHealth cardiac rehabilitation exercise intervention: findings from content development studies. *BMC Cardiovasc Disord.* 2012;12:36. Published 2012 May 30. doi:10.1186/1471-2261-12-36
- 76) Brooks MA, Beaulieu JE, Severson HH, et al. Web-based therapeutic exercise resource center as a treatment for knee osteoarthritis: a prospective cohort pilot study. *BMC Musculoskelet Disord.* 2014;15:158. Published 2014 May 17. doi:10.1186/1471-2474-15-158
- 77) Schaarup C, Hartvigsen G, Larsen LB, Tan ZH, Årsand E, Hejlesen OK. Assessing the Potential Use of Eye-Tracking Triangulation for Evaluating the Usability of an Online Diabetes Exercise System. *Stud Health Technol Inform.* 2015;216:84-88.
- 78) Jennings CA, Vandelanotte C, Caperchione CM, Mummery WK. Effectiveness of a web-based physical activity intervention for adults with Type 2 diabetes-a randomised controlled trial. *Prev Med.* 2014;60:33-40.

- 79) Maddison R, Whittaker R, Stewart R, et al. HEART: heart exercise and remote technologies: a randomized controlled trial study protocol. *BMC Cardiovasc Disord.* 2011;11:26. Published 2011 May 31. doi:10.1186/1471-2261-11-26
- 80) Quanjer PH, Tammeling GJ, Cotes JE, Pedersen OF, Peslin R, Yernault JC. Lung volumes and forced ventilatory flows. Report Working Party Standardization of Lung Function Tests, European Community for Steel and Coal. Official Statement of the European Respiratory Society. *Eur Respir J Suppl.* 1993;16:5-40.
- 81) Miller, A., Becklake, M. R., Crapo, R. O., Buist, A. S., Burrows, B., Clausen, J. L., Lebowitz, M. D.. Lung function testing: Selection of reference values and interpretative strategies. *American Review of Respiratory Disease*, 1992. 146(5), 1368-1369.
- 82) Pellegrino R, Viegi G, Brusasco V, et al. Interpretative strategies for lung function tests. *Eur Respir J.* 2005;26(5):948-968. doi:10.1183/09031936.05.00035205
- 83) Barreiro TJ, Perillo I. An approach to interpreting spirometry. *Am Fam Physician.* 2004;69(5):1107-1114.
- 84) Miller MR, Hankinson J, Brusasco V, et al. Standardisation of spirometry. *Eur Respir J.* 2005;26(2):319-338. doi:10.1183/09031936.05.00034805
- 85) Jensen MP, Gammaitoni AR, Olaleye DO, Oleka N, Nalamachu SR, Galer BS. The pain quality assessment scale: assessment of pain quality in carpal tunnel syndrome. *J Pain.* 2006;7(11):823-832. doi:10.1016/j.jpain.2006.04.003
- 86) Eser SY, Fidaner H, Fidaner C, Elbi H. Measure of quality of life WHOQOL-100 and WHOQOL-Bref. *J Psychiatr Psychol Psychopharmacol.* 1999;7:5-13.
- 87) Aydemir Ö, Köroğlu E. Psikiyatride kullanılan klinik ölçekler. Ankara: Hekimler Yayın Birliği; 2007.

- 88) Eser E, Fidaner H, Fidaner C, Eser SY. Psychometric properties of WHOQOL-100 and WHOQOL-BREF. *J Psychiatr Psychol Psychopharmacol.* 1999;7:23-40.
- 89) Buysse DJ, Reynolds CF 3rd, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry Res.* 1989;28(2):193-213. doi:10.1016/0165-1781(89)90047-4
- 90) Ağargün MY, Kara H, Anlar Ö. Pittsburgh uyku kalitesi indeksinin geçerliği ve güvenilirliği. *Türk Psikiyatri Dergisi*, 1996; 7, 107-115.
- 91) Mong Y, Teo TW, Ng SS. 5-repetition sit-to-stand test in subjects with chronic stroke: reliability and validity. *Arch Phys Med Rehabil.* 2010;91(3):407-413. doi:10.1016/j.apmr.2009.10.030
- 92) Vellas BJ, Wayne SJ, Romero L, Baumgartner RN, Rubenstein LZ, Garry PJ. One-leg balance is an important predictor of injurious falls in older persons. *J Am Geriatr Soc.* 1997;45(6):735-738. doi:10.1111/j.1532-5415.1997.tb01479.x
- 93) Gencay-Can A, Can SS. Validation of the Turkish version of the fatigue severity scale in patients with fibromyalgia. *Rheumatol Int.* 2012;32(1):27-31. doi:10.1007/s00296-010-1558-3
- 94) Magee, DJ. Orthopedic Physical Assessment. Gait Assessment. Toronto: W.B.Saunders Company; 2014.
- 95) Sherrill, C. Posture, appearance, and muscle imbalance. In: Adapted physical activity, recreation, and sport. Crossdisciplinary and lifespan ( 6th Ed). Boston: Mc-Graw- Hill. 2004. Pp.390-412
- 96) İnal, H. S. Spor ve Egzersizde Vücut Biyomekaniği. İstanbul: Hipokrat Yayınevi; 2017.

- 97) Duncan PW, Weiner DK, Chandler J, Studenski S. Functional reach: a new clinical measure of balance. *J Gerontol.* 1990;45(6):M192-M197.
- 98) Harvey D, Mansfield C. Measuring flexibility for performance and injury prevention. In: *Physiological Tests for Elite Athletes*. Gore C.J., ed. Champaign, IL: Human Kinetics, 2000, pp. 98–113.
- 99) Reese NB, Bandy WD. Joint range of motion and muscle length testing. Philadelphia: WB Saunders; 2002.
- 100) Greenman PE. *Principles of Manual Medicine*. 2d ed. Baltimore: Williams & Wilkins; 1996.
- 101) World Internet Users and Population Statistics 2020. Internet World Stats. URL: <http://www.internetworldstats.com/stats.htm>
- 102) Marcus BH, Nigg CR, Riebe D, Forsyth LH. *Interactive communication strategies: implications for population-based physical-activity promotion*. *Am J Prev Med* 2000; 19(2):121-126.
- 103) Napolitano MA, Marcus BH. Targeting and tailoring physical activity information using print and information technologies. *Exerc Sport Sci Rev.* 2002;30(3):122-128. doi:10.1097/00003677-200207000-00006
- 104) Marshall AL, Owen N, Bauman AE. Mediated approaches for influencing physical activity: update of the evidence on mass media, print, telephone and website delivery of interventions. *J Sci Med Sport.* 2004;7(1 Suppl):74-80.
- 105) Winett RA, Tate DF, Anderson ES, Wojcik JR, Winett SG. Long-term weight gain prevention: a theoretically based Internet approach. *Prev Med.* 2005;41(2):629-641. doi:10.1016/j.ypmed.2004.12.005

- 106) Yang K, James KA. Yoga, as a transitional platform to more active lifestyle: a 6-month pilot study in the USA. *Health Promot Int.* 2016;31(2):423-429.
- 107) Gothe NP, Wójcicki TR, Olson EA, et al. Physical activity levels and patterns in older adults: the influence of a DVD-based exercise program. *J Behav Med.* 2015;38(1):91-97. doi:10.1007/s10865-014-9581-6
- 108) Divya TS, Vijayalakshmi MT, Mini K, Asish K, Pushpalatha M, Suresh V. Cardiopulmonary and Metabolic Effects of Yoga in Healthy Volunteers. *Int J Yoga.* 2017;10(3):115-120. doi:10.4103/0973-6131.186162
- 109) Liu XC, Pan L, Hu Q, Dong WP, Yan JH, Dong L. Effects of yoga training in patients with chronic obstructive pulmonary disease: a systematic review and meta-analysis. *J Thorac Dis.* 2014;6(6):795-802. doi:10.3978/j.issn.2072-1439.2014.06.05
- 110) Cramer H, Posadzki P, Dobos G, Langhorst J. Yoga for asthma: a systematic review and meta-analysis. *Ann Allergy Asthma Immunol.* 2014;112(6):503-510.e5. doi:10.1016/j.anai.2014.03.014
- 111) Chanavirut R, Khaidjapho K, Jaree P, et al. *Yoga exercise increases chest wall expansion and lung volumes in young healthy thais.* *Thai J Physiol Sci* 2006;19:1-7
- 112) Yadav RK, Das S. Effect of yogic practice on pulmonary functions in young females. *Indian J Physiol Pharmacol.* 2001;45(4):493-496.
- 113) Makwana K, Khirwadkar N, Gupta HC. Effect of short term yoga practice on ventilatory function tests. *Indian J Physiol Pharmacol.* 1988;32(3):202-208.

- 114) Harinath K, Malhotra AS, Pal K, et al. Effects of Hatha yoga and Omkar meditation on cardiorespiratory performance, psychologic profile, and melatonin secretion. *J Altern Complement Med*. 2004;10(2):261-268.
- 115) Santaella DF, Devesa CR, Rojo MR, et al. Yoga respiratory training improves respiratory function and cardiac sympathovagal balance in elderly subjects: a randomised controlled trial. *BMJ Open*. 2011;1(1):e000085. Published 2011 May 24. doi:10.1136/bmjopen-2011-000085
- 116) Yurtkuran M, Alp A, Yurtkuran M, Dilek K. A modified yoga-based exercise program in hemodialysis patients: a randomized controlled study. *Complement Ther Med*. 2007;15(3):164-171. doi:10.1016/j.ctim.2006.06.008
- 117) Schultz LH, Uytterhoeven S, Khalsa SBS. Evaluation of yoga program for back pain. *Journal of Yoga and Physical Therapy*. 2011;1:103.
- 118) Field T. Yoga clinical research review. *Complement Ther Clin Pract*. 2011;17(1):1-8. doi:10.1016/j.ctcp.2010.09.007
- 119) Norastek, A.A. Low Back Pain. Croatia, Janeza Trdine. 2012.
- 120) Seco J, Kovacs FM, Urrutia G. The efficacy, safety, effectiveness, and cost-effectiveness of ultrasound and shock wave therapies for low back pain: a systematic review. *Spine J*. 2011;11(10):966-977.
- 121) Lewis SE, Holmes PS, Woby SR, Hindle J, Fowler NE. Short-term effect of superficial heat treatment on paraspinal muscle activity, stature recovery, and psychological factors in patients with chronic low back pain. *Arch Phys Med Rehabil*. 2012;93(2):367-372. doi:10.1016/j.apmr.2011.08.043

- 122) Poitras S, Brosseau L. Evidence-informed management of chronic low back pain with transcutaneous electrical nerve stimulation, interferential current, electrical muscle stimulation, ultrasound, and thermotherapy. *Spine J.* 2008;8(1):226-233.
- 123) Costa LO, Maher CG, Latimer J, et al. Motor control exercise for chronic low back pain: a randomized placebo-controlled trial. *Phys Ther.* 2009;89(12):1275-1286. doi:10.2522/ptj.20090218
- 124) Unsgaard-Tøndel M, Fladmark AM, Salvesen Ø, Vasseljen O. Motor control exercises, sling exercises, and general exercises for patients with chronic low back pain: a randomized controlled trial with 1-year follow-up. *Phys Ther.* 2010;90(10):1426-1440. doi:10.2522/ptj.20090421
- 125) Salmon P, Lush E, Jablonski M, Sephton SE. Yoga and Mindfulness: Clinical Aspects of an Ancient Mind/Body Practice. *Cognitive and Behavioral Practice.* 16(1):59-72. doi:10.1016/j.cbpra.2008.07.002.
- 126) Tilbrook HE, Cox H, Hewitt CE, et al. Yoga for chronic low back pain: a randomized trial. *Ann Intern Med.* 2011;155(9):569-578.
- 127) Tekur P, Nagarathna R, Chametcha S, Hankey A, Nagendra HR. A comprehensive yoga programs improves pain, anxiety and depression in chronic low back pain patients more than exercise: an RCT. *Complement Ther Med.* 2012;20(3):107-118. doi:10.1016/j.ctim.2011.12.009
- 128) Sherman KJ, Cherkin DC, Erro J, Miglioretti DL, Deyo RA. Comparing yoga, exercise, and a self-care book for chronic low back pain: a randomized, controlled trial. *Ann Intern Med.* 2005;143(12):849-856.
- 129) Aydoğan S. *Bel Ağrında Farklı Fizyoterapi Programlarının Etkinliğinin Karşılaştırılması.* Ankara: Hacettepe Üniversitesi; 2009.

- 130) Suyatmaz Ö. *Kronik Mekanik Bel Ağrılı Hastalarda Bel Okulunun Etkinliğinin Araştırılması*. İstanbul: İstanbul Eğitim ve Araştırma Hastanesi; 2008
- 131) Coşkun G. *Kronik Bel Ağrısının Rehabilitasyonunda Propriyoseptif Egzersizlerin Kas kuvveti ve Fonksiyonel Düzey Üzerine Olan Etkisi*. Ankara: Hacettepe Üniversitesi; 2008.
- 132) Çakmak M.E. *Mikrodiskektomi Sonrası Erken Dönem Egzersiz Tedavisinin Etkinliği*. Ankara: Başkent Üniversitesi; 2007.
- 133) Williams K, Steinberg L, Petronis J. Therapeutic Application of Iyengar Yoga for Healing Chronic Low Back Pain. *International journal of yoga therapy*. 2003.
- 134) Grabara M, Szopa J. Effects of hatha yoga exercises on spine flexibility in women over 50 years old. *J Phys Ther Sci*. 2015;27(2):361-365.
- 135) Paillard T, Montoya R, Dupui P. Postural adaptations specific to preferred throwing techniques practiced by competition-level judoists. *J Electromyogr Kinesiol*. 2007;17(2):241-244. doi:10.1016/j.jelekin.2006.01.006
- 136) Gauchard GC, Gangloff P, Jeandel C, Perrin PP. Physical activity improves gaze and posture control in the elderly. *Neurosci Res*. 2003;45(4):409-417.
- 137) Paillard T, Pau M, Noé F, González LM. Rehabilitation and Improvement of the Postural Function. *Biomed Res Int*. 2015;2015:703679.
- 138) Savić K, Pfau D, Skorić S, Pfau J, Spasojević N. [The effect of Hatha yoga on poor posture in children and the psychophysiologic condition in adults] *Medicinski Pregled*. 1990;43(5-6):268-272.
- 139) Grabara M. Effects of 8-months yoga training on shaping the spine in people over 55, *Biomedical Human Kinetics*, 2013; 5(1), 59-64.

- 140) Williams K, Steinberg L, Petronis, J. Therapeutic Application of Iyengar Yoga for Healing Chronic Low Back Pain. *International journal of yoga therapy*. 2003.
- 141) Henchoz Y, Kai-Lik So A. Exercise and nonspecific low back pain: a literature review. *Joint Bone Spine*. 2008;75(5):533-539.
- 142) Gökçül B. *Bankacılık Sektöründe Yoga Programı Uygulanarak Stres Kontrolünün Sağlanması Üzerine Bir Araştırma*. İstanbul: İstanbul Üniversitesi; 1998.
- 143) Evans DD, Carter M, Panico R, Kimble L, Morlock JT, Spears MJ. Characteristics and predictors of short-term outcomes in individuals self-selecting yoga or physical therapy for treatment of chronic low back pain. *PMR*. 2010;2(11):1006-1015. doi:10.1016/j.pmrj.2010.07.006
- 144) Ülger O, Yağlı NV. Effects of yoga on balance and gait properties in women with musculoskeletal problems: a pilot study. *Complement Ther Clin Pract*. 2011;17(1):13-15. doi:10.1016/j.ctcp.2010.06.006
- 145) Ülger Ö.G., Altay S., Arslan E., Başoğlu B., Vardar N.Y., Aslan Ü.B. Sağlıklı kadınlarda Hatha yoganın esneklik ve denge üzerine etkileri. *Fizyoterapi Rehabilitasyon*. 2007;18(2):72-78.
- 146) Baş Ü. *Hatha yoga ve klasik egzersiz yaklaşımının sağlıklı gençlerde postür ve fiziksel uygunluk üzerine etkileri*. Ankara: Hacettepe Üniversitesi; 1998.
- 147) Kabul EG, Çalık BB, Aslan UB, Ünver F. Sağlıklı gençlerde kısa dönem dinamik stabilizasyon eğitiminin esneklik, kassal endurans ve dinamik denge üzerine etkileri: rastgele kontrollü çalışma. *Journal of Exercise Therapy and Rehabilitation*. 2018; 5(1), 1-8.

- 148) Ulger O, Yağlı NV. Effects of yoga on the quality of life in cancer patients. *Complement Ther Clin Pract*. 2010;16(2):60-63.
- 149) Hadi N. Effects of hatha yoga on well-being in healthy adults in Shiraz, Islamic Republic of Iran. *East Mediterr Health J*. 2007;13(4):829-837.
- 150) Yadav R, Yadav RK, Pandey RM, Kochar KP. Effect of a Short-Term Yoga-Based Lifestyle Intervention on Health-Related Quality of Life in Overweight and Obese Subjects. *J Altern Complement Med*. 2016;22(6):443-449.
- 151) Lazaridou A, Koulouris A, Devine JK, et al. Impact of daily yoga-based exercise on pain, catastrophizing, and sleep amongst individuals with fibromyalgia. *J Pain Res*. 2019;12:2915-2923. Published 2019 Oct 17.
- 152) Oka T, Tanahashi T, Sudo N, Lkhagvasuren B, Yamada Y. Changes in fatigue, autonomic functions, and blood biomarkers due to sitting isometric yoga in patients with chronic fatigue syndrome. *Biopsychosoc Med*. 2018;12:3.
- 153) McAuley E, Wójcicki TR, Gothe NP, et al. Effects of a DVD-delivered exercise intervention on physical function in older adults. *J Gerontol A Biol Sci Med Sci*. 2013;68(9):1076-1082. doi:10.1093/gerona/glt014

## 7. APPENDICES

### 7.1. WHOQOL-BREF

# WHOQOL-BREF

## (Dünya Sağlık Örgütü Yaşam Kalite Ölçeği-Kısa Formu)

Hastanın Adı Soyadı: \_\_\_\_\_ Tarih: \_\_\_\_/\_\_\_\_/\_\_\_\_

Başlamadan önce kendinizle ilgili genel bir kaç soruyu cevaplamanızı istiyoruz. Lütfen doğru yanıtlara işaret koyun ya da verilen boş yerleri doldurunuz.

|                                             |                                           |                                         |                                                                   |                                        |
|---------------------------------------------|-------------------------------------------|-----------------------------------------|-------------------------------------------------------------------|----------------------------------------|
| Cinsiyetiniz nedir?                         | <input type="checkbox"/> Erkek            | <input type="checkbox"/> Kadın          | Doğum tarihiniz nedir?                                            |                                        |
| Gördüğünüz en yüksek eğitim derecesi nedir? | Medeni durumunuz nedir?                   |                                         |                                                                   |                                        |
| <input type="checkbox"/> Hiç Eğitim Almadım | <input type="checkbox"/> İlkokul-Ortaokul | <input type="checkbox"/> Hiç Evlenmemiş | <input type="checkbox"/> Evli Gibi Yaşıyor                        | <input type="checkbox"/> Evli          |
| <input type="checkbox"/> Lise Veya Eşdeğeri | <input type="checkbox"/> Üniversite       | <input type="checkbox"/> Boşanmış       | <input type="checkbox"/> Ayrılmış                                 | <input type="checkbox"/> Eşi Yaşamıyor |
| Şu anda bir hastalığınız var mı?            | <input type="checkbox"/> Evet             | <input type="checkbox"/> Hayır          | Eğer şu anda sağlığınıza ilgili yolunda gitmeyen bir durum varsa; |                                        |
| Sizce bu nedir? _____ (hastalık/sorun)      |                                           |                                         |                                                                   |                                        |

Bu anket sizin yaşamınızın kalitesi, sağlığınıza ve yaşamınızın öteki yönleri hakkında neler düşündüğünüzü sorgulamaktadır. Lütfen bütün soruları son 2 haftayı göz önünde bulundurarak ve size en uygun olanı seçerek cevaplayınız.

|             |                                                                                               |                                                |                                             |                                                      |                                             |                                              |
|-------------|-----------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------|------------------------------------------------------|---------------------------------------------|----------------------------------------------|
| 1<br>G1     | Yaşam kalitenizi nasıl buluyorsunuz?                                                          | Çok kötü<br><input type="checkbox"/> 1         | Biraz kötü<br><input type="checkbox"/> 2    | Ne iyi, ne kötü<br><input type="checkbox"/> 3        | Oldukça iyi<br><input type="checkbox"/> 4   | Çok iyi<br><input type="checkbox"/> 5        |
| 2<br>G4     | Sağlığınıza ne kadar hoşnutsunuz?                                                             | Hiç hoşnut değil<br><input type="checkbox"/> 1 | Çok az hoşnut<br><input type="checkbox"/> 2 | Ne hoşnut, ne de değil<br><input type="checkbox"/> 3 | Epeyce hoşnut<br><input type="checkbox"/> 4 | Çok hoşnut<br><input type="checkbox"/> 5     |
| 3<br>F1.4   | Ağrılarınızın yapmanız gerekenleri ne kadar engellediğini düşünüyorsunuz?                     | Hiç<br><input type="checkbox"/> 5              | Çok az<br><input type="checkbox"/> 4        | Orta derecede<br><input type="checkbox"/> 3          | Çokça<br><input type="checkbox"/> 2         | Aşırı derecede<br><input type="checkbox"/> 1 |
| 4<br>F11.3  | Günlük uğraşlarınızı yürütmek için herhangi bir tıbbi tedaviye ne kadar ihtiyaç duyuyorsunuz? | <input type="checkbox"/> 5                     | <input type="checkbox"/> 4                  | <input type="checkbox"/> 3                           | <input type="checkbox"/> 2                  | <input type="checkbox"/> 1                   |
| 5<br>F4.1   | Yaşamaktan ne kadar keyif alırsınız?                                                          | <input type="checkbox"/> 1                     | <input type="checkbox"/> 2                  | <input type="checkbox"/> 3                           | <input type="checkbox"/> 4                  | <input type="checkbox"/> 5                   |
| 6<br>F24.2  | Yaşamınızı ne ölçüde anlamlı buluyorsunuz?                                                    | <input type="checkbox"/> 1                     | <input type="checkbox"/> 2                  | <input type="checkbox"/> 3                           | <input type="checkbox"/> 4                  | <input type="checkbox"/> 5                   |
| 7<br>F5.3   | Dikkatinizi toplamada ne kadar başarılısınız?                                                 | Hiç<br><input type="checkbox"/> 1              | Çok az<br><input type="checkbox"/> 2        | Orta derecede<br><input type="checkbox"/> 3          | Çokça<br><input type="checkbox"/> 4         | Son derecede<br><input type="checkbox"/> 5   |
| 8<br>F16.1  | Günlük yaşamınızda kendinizi ne kadar güvende hissediyorsunuz?                                | <input type="checkbox"/> 1                     | <input type="checkbox"/> 2                  | <input type="checkbox"/> 3                           | <input type="checkbox"/> 4                  | <input type="checkbox"/> 5                   |
| 9<br>F22.1  | Fiziksel çevreniz ne ölçüde sağlıklıdır?                                                      | <input type="checkbox"/> 1                     | <input type="checkbox"/> 2                  | <input type="checkbox"/> 3                           | <input type="checkbox"/> 4                  | <input type="checkbox"/> 5                   |
| 10<br>F2.1  | Günlük yaşamı sürdürmek için yeterli gücünüz kuvvetiniz var mı?                               | Hiç<br><input type="checkbox"/> 1              | Çok az<br><input type="checkbox"/> 2        | Orta derecede<br><input type="checkbox"/> 3          | Çokça<br><input type="checkbox"/> 4         | Tamamen<br><input type="checkbox"/> 5        |
| 11<br>F7.1  | Bedensel görünüşünüzü kabullenir misiniz?                                                     | <input type="checkbox"/> 1                     | <input type="checkbox"/> 2                  | <input type="checkbox"/> 3                           | <input type="checkbox"/> 4                  | <input type="checkbox"/> 5                   |
| 12<br>F18.1 | İhtiyaçlarınızı karşılamaya yeterli paranız var mı?                                           | <input type="checkbox"/> 1                     | <input type="checkbox"/> 2                  | <input type="checkbox"/> 3                           | <input type="checkbox"/> 4                  | <input type="checkbox"/> 5                   |
| 13<br>F20.1 | Günlük yaşamınızda size gerekli bilgi ve haberlere ne ölçüde ulaşabiliyorsunuz?               | <input type="checkbox"/> 1                     | <input type="checkbox"/> 2                  | <input type="checkbox"/> 3                           | <input type="checkbox"/> 4                  | <input type="checkbox"/> 5                   |
| 14<br>F21.1 | Boş zamanları değerlendirme uğraşları için ne ölçüde fırsatınız olur?                         | <input type="checkbox"/> 1                     | <input type="checkbox"/> 2                  | <input type="checkbox"/> 3                           | <input type="checkbox"/> 4                  | <input type="checkbox"/> 5                   |

## WHOQOL-BREF Sayfa-2

|           |                                                                                                                                  |                                            |                                          |                                               |                                           |                                              |
|-----------|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|------------------------------------------|-----------------------------------------------|-------------------------------------------|----------------------------------------------|
| <b>15</b> | Bedensel hareketlilik (etrafta dolaşabilme, bir yere gidebilme) beceriniz nasıldır?                                              | Çok kötü<br><input type="checkbox"/> 1     | Biraz kötü<br><input type="checkbox"/> 2 | Ne iyi, ne kötü<br><input type="checkbox"/> 3 | Oldukça iyi<br><input type="checkbox"/> 4 | Çok iyi<br><input type="checkbox"/> 5        |
| F9.1      |                                                                                                                                  |                                            |                                          |                                               |                                           |                                              |
|           |                                                                                                                                  | Hiç hoşnut değil                           | Çok az hoşnut                            | Ne hoşnut, ne de değil                        | Epeyce hoşnut                             | Çok hoşnut                                   |
| <b>16</b> | Uykunuzdan ne kadar hoşnutsunuz?                                                                                                 | <input type="checkbox"/> 1                 | <input type="checkbox"/> 2               | <input type="checkbox"/> 3                    | <input type="checkbox"/> 4                | <input type="checkbox"/> 5                   |
| F13.3     |                                                                                                                                  |                                            |                                          |                                               |                                           |                                              |
| <b>17</b> | Günlük uğraşlarınızı yürütebilme becerinizden ne kadar hoşnutsunuz?                                                              | <input type="checkbox"/> 1                 | <input type="checkbox"/> 2               | <input type="checkbox"/> 3                    | <input type="checkbox"/> 4                | <input type="checkbox"/> 5                   |
| F10.3     |                                                                                                                                  |                                            |                                          |                                               |                                           |                                              |
| <b>18</b> | İş görme kapasitenizden ne kadar hoşnutsunuz?                                                                                    | <input type="checkbox"/> 1                 | <input type="checkbox"/> 2               | <input type="checkbox"/> 3                    | <input type="checkbox"/> 4                | <input type="checkbox"/> 5                   |
| F12.4     |                                                                                                                                  |                                            |                                          |                                               |                                           |                                              |
| <b>19</b> | Kendinizden ne kadar hoşnutsunuz?                                                                                                | <input type="checkbox"/> 1                 | <input type="checkbox"/> 2               | <input type="checkbox"/> 3                    | <input type="checkbox"/> 4                | <input type="checkbox"/> 5                   |
| F6.3      |                                                                                                                                  |                                            |                                          |                                               |                                           |                                              |
| <b>20</b> | Aile dışı kişilerle ilişkilerinizden ne kadar hoşnutsunuz?                                                                       | <input type="checkbox"/> 1                 | <input type="checkbox"/> 2               | <input type="checkbox"/> 3                    | <input type="checkbox"/> 4                | <input type="checkbox"/> 5                   |
| F13.3     |                                                                                                                                  |                                            |                                          |                                               |                                           |                                              |
| <b>21</b> | Cinsel yaşamınızdan ne kadar hoşnutsunuz?                                                                                        | <input type="checkbox"/> 1                 | <input type="checkbox"/> 2               | <input type="checkbox"/> 3                    | <input type="checkbox"/> 4                | <input type="checkbox"/> 5                   |
| F15.3     |                                                                                                                                  |                                            |                                          |                                               |                                           |                                              |
| <b>22</b> | Arkadaşlarınızın desteğinden ne kadar hoşnutsunuz?                                                                               | <input type="checkbox"/> 1                 | <input type="checkbox"/> 2               | <input type="checkbox"/> 3                    | <input type="checkbox"/> 4                | <input type="checkbox"/> 5                   |
| F14.4     |                                                                                                                                  |                                            |                                          |                                               |                                           |                                              |
| <b>23</b> | Yaşadığınız evin koşullarından ne kadar hoşnutsunuz?                                                                             | <input type="checkbox"/> 1                 | <input type="checkbox"/> 2               | <input type="checkbox"/> 3                    | <input type="checkbox"/> 4                | <input type="checkbox"/> 5                   |
| F17.3     |                                                                                                                                  |                                            |                                          |                                               |                                           |                                              |
| <b>24</b> | Sağlık hizmetlerine ulaşma koşullarınızdan ne kadar hoşnutsunuz?                                                                 | <input type="checkbox"/> 1                 | <input type="checkbox"/> 2               | <input type="checkbox"/> 3                    | <input type="checkbox"/> 4                | <input type="checkbox"/> 5                   |
| F19.3     |                                                                                                                                  |                                            |                                          |                                               |                                           |                                              |
| <b>25</b> | Ulaşım olanaklarınızdan ne kadar hoşnutsunuz?                                                                                    | <input type="checkbox"/> 1                 | <input type="checkbox"/> 2               | <input type="checkbox"/> 3                    | <input type="checkbox"/> 4                | <input type="checkbox"/> 5                   |
| F23.3     |                                                                                                                                  |                                            |                                          |                                               |                                           |                                              |
| <b>26</b> | Ne sıklıkta hüznü, umutsuzluk, bunalım, çökkünlük gibi duygulara kapılırsınız?                                                   | Hiçbir zaman<br><input type="checkbox"/> 5 | Nadiren<br><input type="checkbox"/> 4    | Ara sıra<br><input type="checkbox"/> 3        | Çoğunlukla<br><input type="checkbox"/> 2  | Her zaman<br><input type="checkbox"/> 1      |
| F8.1      |                                                                                                                                  |                                            |                                          |                                               |                                           |                                              |
| <b>27</b> | Yaşamınızda size yakın kişilerle (eş, iş arkadaşı, akraba) ilişkilerinizde baskı ve kontrolle ilgili zorluklarınız ne ölçüdedir? | Hiç<br><input type="checkbox"/> 1          | Çok az<br><input type="checkbox"/> 2     | Orta derecede<br><input type="checkbox"/> 3   | Çokça<br><input type="checkbox"/> 4       | Aşırı derecede<br><input type="checkbox"/> 5 |
| U         |                                                                                                                                  |                                            |                                          |                                               |                                           |                                              |

Bu formun doldurulmasında size yardım eden oldu mu? ☐ Evet ☐ Hayır Bu formun doldurulması ne kadar sürdü? .....

THE WHOQOL Group Development of the World Health Organization WHOQOL-BREF Quality of Life Assessment (1998) Psychological Medicine, 1998, 28, 551-558

| Skorlama Yönergesi  |                                                 |
|---------------------|-------------------------------------------------|
| Alt Parametre       | Oluşturan sorular                               |
| Genel sağlık durumu | 1 ve 2. Soruların toplamı                       |
| Fiziksel sağlık     | 3, 4, 10, 15, 16, 17, 18. Soruların toplamı     |
| Psikolojik          | 5, 6, 7, 11, 19, 26. Soruların toplamı          |
| Sosyal ilişkiler    | 20, 21, 22. Soruların toplamı                   |
| Çevre               | 8, 9, 12, 13, 14, 23, 24, 25. Soruların toplamı |

Bu şekilde elde edilen skorlar "ham" skordur. Yüzdelik sisteme değiştirmek için gerekli olan formül;

$$\frac{(\text{Hastanın ham skoru}) - (\text{o alt parametreye ait olabilecek en düşük skor})}{\text{o alt parametrenin skor aralığı}} \times 100$$

Örnek: Fiziksel sağlık alt parametresini ele alalım; toplam 7 madde var. Hastanın skor toplamı 30 olsun  

$$[(30-7) / (35-7)] \times 100 = (23/28) \times 100 = \%82,14$$

## 7.2. Pain Quality Assessment Scale

### Ağrı Kalitesi Değerlendirme Ölçeği Pain Quality Assessment Scale

Hastanın Adı Soyadı: \_\_\_\_\_

Tarih: \_\_\_\_/\_\_\_\_/\_\_\_\_

Aşağıdaki 19 soruyu geçtiğimiz son bir haftayı göz önünde bulundurarak cevaplayınız.

Son hafta süresince, ortalama olarak ağrınızın ne kadar yoğun olduğunu belirtiniz.

|   |          |   |   |   |   |   |   |   |   |                |
|---|----------|---|---|---|---|---|---|---|---|----------------|
| 1 | 1        | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10             |
|   | Ağrı yok |   |   |   |   |   |   |   |   | Çok yoğun ağrı |

Son bir hafta içinde hissettiğiniz ağrı ne kadar batıcıydı? (Bıçak saplanır, neşterle kesilmiş, delmişler gibi)

|   |           |   |   |   |   |   |   |   |   |                    |
|---|-----------|---|---|---|---|---|---|---|---|--------------------|
| 2 | 1         | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10                 |
|   | Batma yok |   |   |   |   |   |   |   |   | Çok şiddetli batma |

Son bir hafta içinde hissettiğiniz ağrı ne kadar yakıcıydı? (Ateş gibi, cayıır cayıır yanma hissi)

|   |           |   |   |   |   |   |   |   |   |                    |
|---|-----------|---|---|---|---|---|---|---|---|--------------------|
| 3 | 1         | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10                 |
|   | Yanma yok |   |   |   |   |   |   |   |   | Çok şiddetli yanma |

Son bir hafta içinde hissettiğiniz ağrı ne kadar sıkıntı vericiydi?

|   |             |   |   |   |   |   |   |   |   |                                 |
|---|-------------|---|---|---|---|---|---|---|---|---------------------------------|
| 4 | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10                              |
|   | Sıkıntı yok |   |   |   |   |   |   |   |   | Çok şiddetli sıkıntı veren ağrı |

Son bir hafta içinde hissettiğiniz ağrınızın ne kadarı soğukluk hissiydi? (Buz gibi, dondurucu)

|   |              |   |   |   |   |   |   |   |   |                             |
|---|--------------|---|---|---|---|---|---|---|---|-----------------------------|
| 5 | 1            | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10                          |
|   | Soğukluk yok |   |   |   |   |   |   |   |   | Çok şiddetli soğukluk hissi |

Son bir hafta içinde cildinizin dokunmaya veya giysilere ne kadar hassas olduğunu belirleyiniz. (Güneşte yanmış gibi)

|   |              |   |   |   |   |   |   |   |   |                                |
|---|--------------|---|---|---|---|---|---|---|---|--------------------------------|
| 6 | 1            | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10                             |
|   | Hassas değil |   |   |   |   |   |   |   |   | Çok aşırı hassas (ağrılı deri) |

Son bir hafta içinde herhangi bir uzvunuz basınca maruz kaldığında ne kadar ezilme hissi oluştuğunu belirleyiniz.

|   |                  |   |   |   |   |   |   |   |   |                                  |
|---|------------------|---|---|---|---|---|---|---|---|----------------------------------|
| 7 | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10                               |
|   | Ezilme hissi yok |   |   |   |   |   |   |   |   | Çok aşırı hassas (ezmişler gibi) |

Son bir hafta içinde hissettiğiniz ağrının ne kadarı kaşıntı vericiydi? (İsırğan dalaaması, sivrisinek ısırması gibi)

|   |                      |   |   |   |   |   |   |   |   |                     |
|---|----------------------|---|---|---|---|---|---|---|---|---------------------|
| 8 | 1                    | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10                  |
|   | Kaşıntı verici değil |   |   |   |   |   |   |   |   | Çok aşırı kaşıntılı |

Son bir hafta içinde hissettiğiniz ağrının ne kadarı vurucuuydu? (Vurup geçen şiddetli ağrı)

|   |              |   |   |   |   |   |   |   |   |                  |
|---|--------------|---|---|---|---|---|---|---|---|------------------|
| 9 | 1            | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10               |
|   | Vurucu değil |   |   |   |   |   |   |   |   | Çok aşırı vurucu |

Son bir hafta içinde hissettiğiniz ağrının ne kadarı uyuşma hissindeydi? (Uyuşuk, uyuşmuş, his yokmuş gibi)

|    |            |   |   |   |   |   |   |   |   |                  |
|----|------------|---|---|---|---|---|---|---|---|------------------|
| 10 | 1          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10               |
|    | Uyuşma yok |   |   |   |   |   |   |   |   | Çok aşırı uyuşma |

Son bir hafta içinde hissettiğiniz ağrının ne kadarı elektriklenme hissindeydi? (Şok, elektrik çarpması, kıvılcım gibi)

|    |                   |   |   |   |   |   |   |   |   |                                      |
|----|-------------------|---|---|---|---|---|---|---|---|--------------------------------------|
| 11 | 1                 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10                                   |
|    | Elektriklenme yok |   |   |   |   |   |   |   |   | Çok aşırı, elektrikle çarpılmış gibi |

## Ağrı Kalitesi Değerlendirme Skalası Sayfa-2

- 12 Son bir hafta içinde hissettiğiniz ağrının ne kadar karıncalanma hissindeydi? (İğnelenme gibi)
- 1 2 3 4 5 6 7 8 9 10
- Karıncalanma yok Çok aşırı karıncalanma hissi
- 13 Son bir hafta içinde hissettiğiniz ağrının ne kadar kramp tarzındaydı? (Sıkma, burma hissi gibi, sıkı)
- 1 2 3 4 5 6 7 8 9 10
- Kramp yok Çok aşırı kramp hissi
- 14 Son bir hafta içinde hissettiğiniz ağrının ne kadar yayıldığını belirleyiniz. (Başka bölgelere dağılma gibi)
- 1 2 3 4 5 6 7 8 9 10
- Yayılma yok Çok geniş bir yayılma hissi
- 15 Son bir hafta içinde hissettiğiniz ağrının ne kadar zonklayıcıydı? (Yumruk yemiş gibi, darbe gibi)
- 1 2 3 4 5 6 7 8 9 10
- Zonklama yok Çok aşırı zonklayıcı
- 16 Son bir hafta içinde hissettiğiniz ağrının ne kadar diş ağrısı gibi acı vericiydi?
- 1 2 3 4 5 6 7 8 9 10
- Acı yok Çok aşırı acı verici
- 17 Son bir hafta içinde hissettiğiniz ağrının ne kadar basınç ya da ağırlık varmış hissi oluştuyordu?
- 1 2 3 4 5 6 7 8 9 10
- Hiç ağırlık hissi yok Çok aşırı ağırlık hissi
- 18 Son bir hafta içinde hissettiğiniz tüm bu ağrılar sizde ne kadar hoşnutsuzluk oluşturdu? (Sinir bozucu, perişan eden, can sıkıcı, dayanılmaz) (Ağrı düşük yoğunluklu da olsa aşırı hoşnutsuzluk oluşturabilir, şiddetli fakat dayanılabilir olabilir)
- 1 2 3 4 5 6 7 8 9 10
- Hoşnutsuzluk yok Çok aşırı hoşnutsuzluk hissi
- 19 Son bir hafta içinde hissettiğiniz derin ağrının şiddetini belirleyiniz
- 1 2 3 4 5 6 7 8 9 10
- Derin ağrı yok Çok yoğun derin ağrı
- Son bir hafta içinde hissettiğiniz yüzeysel ağrının şiddetini belirleyiniz
- 1 2 3 4 5 6 7 8 9 10
- Yüzeysel ağrı yok Çok yoğun yüzeysel ağrı
- 20 Aşağıdakilerden hangisi ağrınızı daha iyi tanımlar? (Sadece birini işaretleyin)
- ☐ Gelip geçici ağrı tipine sahibim. Bazen ağrı hissediyorum ama diğer zamanlar ağrısızım
- ☐ Değişken ağrı tipine sahibim. Sürekli ağrı hissediyorum ama daha ağırlı olduğum, şiddetli ağrı dönemlerim oluyor. Ağrım aniden ortaya çıkabiliyor ya da ağrının tipi değişebiliyor.
- ☐ Değişmeyen ağrı tipine sahibim. Dönemden döneme fazla değişmeyen, sabit ağrı. Ağrısız dönem olmaması

### 7.3. The Fatigue Severity Scale

## Yorgunluk Şiddet Ölçeği The Fatigue Severity Scale (FSS)

Hastanın Adı Soyadı: \_\_\_\_\_

Tarih: \_\_\_\_/\_\_\_\_/\_\_\_\_

Bugün de dahil olmak üzere son bir hafta içinde ne derecede yorgun olduğunuzu öğrenmek istiyoruz. Lütfen tüm ifadeleri dikkatlice okuyunuz. Size en uygun rakamın olduğu bölgeyi işaretleyiniz

| Puanlamaya Ait İfadeler    |                            |                           |
|----------------------------|----------------------------|---------------------------|
| 1. Kesinlikle katılmıyorum | 3. Katılmama eğilimindeyim | 5. Katılma eğilimindeyim  |
| 2. Katılmıyorum            | 4. Kararsızım              | 6. Katılıyorum            |
|                            |                            | 7. Kesinlikle katılıyorum |

|   |                                                                       |                                                         |                      |
|---|-----------------------------------------------------------------------|---------------------------------------------------------|----------------------|
| 1 | Yorgun olduğum zaman motivasyonum azalır.                             | <div>Hiç Katılmıyorum 0 1 2 3 4 5 6 7 Katılıyorum</div> | <input type="text"/> |
| 2 | Egzersiz yapmak beni yoruyor.                                         | <div>Hiç Katılmıyorum 0 1 2 3 4 5 6 7 Katılıyorum</div> | <input type="text"/> |
| 3 | Kolay yorulurum.                                                      | <div>Hiç Katılmıyorum 0 1 2 3 4 5 6 7 Katılıyorum</div> | <input type="text"/> |
| 4 | Yorgunluk fiziksel fonksiyonumu etkiler.                              | <div>Hiç Katılmıyorum 0 1 2 3 4 5 6 7 Katılıyorum</div> | <input type="text"/> |
| 5 | Yorgunluk benim için sıklıkla problemlere neden olur.                 | <div>Hiç Katılmıyorum 0 1 2 3 4 5 6 7 Katılıyorum</div> | <input type="text"/> |
| 6 | Yorgunluğum fiziksel fonksiyonumu sürdürmeme engel olur.              | <div>Hiç Katılmıyorum 0 1 2 3 4 5 6 7 Katılıyorum</div> | <input type="text"/> |
| 7 | Yorgunluk belirli görev ve sorumluluklarımı yerine getirmemi etkiler. | <div>Hiç Katılmıyorum 0 1 2 3 4 5 6 7 Katılıyorum</div> | <input type="text"/> |
| 8 | Yorgunluk beni yetersiz bırakan en önemli 3(üç) şikâyetten biridir.   | <div>Hiç Katılmıyorum 0 1 2 3 4 5 6 7 Katılıyorum</div> | <input type="text"/> |
| 9 | Yorgunluk işimi, aile veya sosyal yaşantımı etkiler.                  | <div>Hiç Katılmıyorum 0 1 2 3 4 5 6 7 Katılıyorum</div> | <input type="text"/> |

Krupp LBI, LaRocca NG, Muir-Nash J, Steinberg AD (1989) Arch Neurol. 1989 Oct;46(10):1121-3

## 7.4. Pittsburgh Sleep Quality Index

# Pittsburgh Uyku Kalite İndeksi (PUKi)

## Pittsburgh Sleep Quality Index (PSQI)

Hastanın Adı Soyadı: \_\_\_\_\_

Tarih: \_\_\_\_/\_\_\_\_/\_\_\_\_

Aşağıdaki sorulara vereceğiniz cevaplar için son bir ayı göz önünde bulundurun.  
Lütfen tüm soruları cevaplandırın.

- 1 Geçen ay geceleri genellikle ne zaman yattınız? \_\_\_\_\_
- 2 Geçen ay geceleri uykuya dalmanız genellikle ne kadar zaman (dakika) aldı? \_\_\_\_\_ dakika
- 3 Geçen ay sabahları genellikle ne zaman kalktınız? \_\_\_\_\_
- 4 Geçen ay geceleri kaç saat uyudunuz (bu süre yatakta geçirdiğiniz süreden farklı olabilir) \_\_\_\_\_ saat
- 5 Geçen ay aşağıdaki durumlarda belirtilen uyku problemlerini ne sıklıkla yaşadınız?

|   | Haftada                                          | Hiç                      | 1'den az                 | 1 - 2 kez                | 3'ten Çok                |
|---|--------------------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a | 30 dakika içinde uykuya dalamadınız              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b | Gece yarısı veya sabah erkenden uyandınız        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c | Tuvalete gittiniz                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d | Rahat bir şekilde nefes alı veremediniz          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e | Aşırı derecede iştüünüz                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f | Aşırı derecede sıcaklık hissettiniz              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g | Kötü rüyalar gördünüz                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| h | Ağrı duydunuz                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| i | Diğer nedenler                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| j | Öksürdünüz veya gürültülü bir şekilde horladınız | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
- 6 Geçen ay uyku kalitenizi bütünü ile nasıl değerlendirirsiniz.

|                          |         |                          |             |                          |              |                          |          |
|--------------------------|---------|--------------------------|-------------|--------------------------|--------------|--------------------------|----------|
| <input type="checkbox"/> | Çok iyi | <input type="checkbox"/> | Oldukça iyi | <input type="checkbox"/> | Oldukça kötü | <input type="checkbox"/> | Çok kötü |
|--------------------------|---------|--------------------------|-------------|--------------------------|--------------|--------------------------|----------|
- 7 Geçen ay uyumanıza yardımcı olması için ne sıklıkta (reçeteli veya reçetesiz) uyku ilacı aldınız?

|                          |     |                          |                  |                          |                   |                          |                   |
|--------------------------|-----|--------------------------|------------------|--------------------------|-------------------|--------------------------|-------------------|
| <input type="checkbox"/> | Hiç | <input type="checkbox"/> | Haftada 1'den az | <input type="checkbox"/> | Haftada 1 - 2 kez | <input type="checkbox"/> | Haftada 3'ten çok |
|--------------------------|-----|--------------------------|------------------|--------------------------|-------------------|--------------------------|-------------------|
- 8 Geçen ay araba sürerken, yemek yerken veya sosyal bir aktivite esnasında ne kadar sıklıkla uyanık kalmak için zorlandınız?

|                          |     |                          |                  |                          |                   |                          |                   |
|--------------------------|-----|--------------------------|------------------|--------------------------|-------------------|--------------------------|-------------------|
| <input type="checkbox"/> | Hiç | <input type="checkbox"/> | Haftada 1'den az | <input type="checkbox"/> | Haftada 1 - 2 kez | <input type="checkbox"/> | Haftada 3'ten çok |
|--------------------------|-----|--------------------------|------------------|--------------------------|-------------------|--------------------------|-------------------|
- 9 Geçen ay bu durum işlerinizi yeteri kadar istekle yapmanızda ne derecede problem oluşturdu?

|                          |                                       |                          |                                      |
|--------------------------|---------------------------------------|--------------------------|--------------------------------------|
| <input type="checkbox"/> | Hiç problem oluşturmadı               | <input type="checkbox"/> | Bir dereceye kadar problem oluşturdu |
| <input type="checkbox"/> | Yalnızca çok az bir problem oluşturdu | <input type="checkbox"/> | Çok büyük bir problem oluşturdu      |
- 10 Bir yatak partneriniz veya oda arkadaşınız var mı?

|                          |                                                |                          |                                              |
|--------------------------|------------------------------------------------|--------------------------|----------------------------------------------|
| <input type="checkbox"/> | Bir yatak partneri veya oda arkadaşı yok       | <input type="checkbox"/> | Partneri aynı odada fakat aynı yatakta değil |
| <input type="checkbox"/> | Diğer odada bir partneri veya oda arkadaşı var | <input type="checkbox"/> | Partner aynı yatakta                         |
- 11 Eğer bir oda arkadaşı veya yatak partneriniz varsa son bir ayda ona aşağıdaki durumları ne sıklıkta yaşadığınızı sorun.

|   | Haftada                                         | Hiç                      | 1'den az                 | 1 - 2 kez                | 3'ten çok                |
|---|-------------------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a | Gürültülü horlama                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b | Uykuda nefes alıp verme arasında uzun aralıklar | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c | Uyurken bacaklarda seğirme veya sıçrama         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d | Uyku esnasında uyumsuzluk veya şaşkınlık        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e | Diğer huzursuzluklarınız:                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

## 7.5. New York Posture Rating Chart

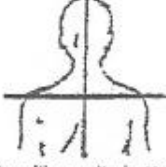
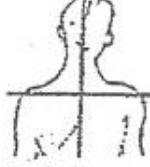
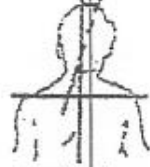
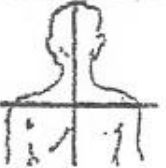
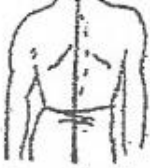
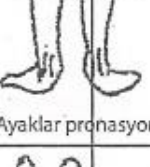
### NEW YORK POSTÜR DEĞERLEME TESTİ

Adı:

Soyadı:

Yaş:

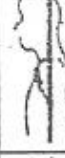
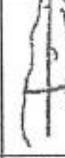
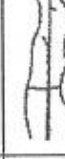
Cinsiyet:

|   | 5                                                                                                                                              | 3                                                                                                                                    | 1                                                                                                                                             | 1. | 2. | 3. |
|---|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|
| A |  <p>Baş dik gravite hattı<br/>direk merkezden<br/>geçiyor</p> |  <p>Baş hafifçe yana<br/>eğilmiş veya dönmüş</p>    |  <p>Baş ileri derecede<br/>yana eğilmiş veya<br/>dönmüş</p> |    |    |    |
| B |  <p>Omuzlar yere paralel</p>                                  |  <p>Bir omuz diğerinden<br/>hafifçe yukarıda</p>    |  <p>Bir omuz diğerinden ileri<br/>derecede yukarıda</p>     |    |    |    |
| C |  <p>Omurga düz</p>                                           |  <p>Omurga hafif yana<br/>eğilmiş</p>              |  <p>Omurga ileri derecede<br/>eğilmiş</p>                  |    |    |    |
| D |  <p>Kalçalar yere paralel</p>                               |  <p>Bir kalça diğerinden<br/>hafifçe yukarıda</p> |  <p>Bir kalça diğerinden<br/>derecede yukarıda</p>        |    |    |    |
| E |  <p>Ayaklar düz</p>                                         |  <p>Ayaklar dışa dönük</p>                        |  <p>Ayaklar pronasyonda</p>                               |    |    |    |
| F |  <p>Arkalar yüksek</p>                                      |  <p>Arkalar hafif düşük</p>                       |  <p>Arkalar düşük, tüz<br/>taban</p>                      |    |    |    |
|   | 5 normal                                                                                                                                       | 3 orta seviyede                                                                                                                      | 1 ileri seviyede<br>Birinci Sayfa Toplamı                                                                                                     |    |    |    |

Birinci Sayfa Toplamı

|  |  |  |
|--|--|--|
|  |  |  |
|--|--|--|

1. 2. 3.

|   |                                                                                                                                                |                                                                                                                                 |                                                                                                                                                      |  |  |  |
|---|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| G |  Boyun dik<br>çene içeride,<br>baş omuz<br>üstünde<br>dengede |  Boyun<br>hafif önde<br>çene hafif<br>dışarıda |  Boyun ileri<br>derecede<br>önde çene<br>ileri derecede<br>dışarıda |  |  |  |
| H |  Göğüs<br>yukarıda<br>sternum<br>vücut önünde<br>ileride      |  Göğüs<br>hafif<br>derecede<br>çökmüş          |  Göğüs ileri<br>derecede<br>çökmüş<br>(düz)                         |  |  |  |
| I |  Omuzlar<br>merkezde                                          |  Omuzlar<br>hafif ileride                      |  Omuzlar<br>protrakte                                               |  |  |  |
| J |  Üst sırt<br>normal                                          |  Üst sırt<br>hafif yuvarlak                   |  Üst sırt<br>ileri derecede<br>yuvarlak                            |  |  |  |
| K |  Gövde dik                                                  |  Gövde hafif<br>geriye<br>açılı              |  Gövde<br>geriye ileri<br>derecede<br>açılanmış                   |  |  |  |
| L |  Karın düz                                                  |  Karın<br>protrake                           |  Karın<br>protrake<br>ve sarkmış                                  |  |  |  |
| M |  Altı sırt<br>normal                                        |  Altı sırt<br>hafif çukur                    |  Altı sırt ileri<br>derecede<br>çukur                             |  |  |  |
|   | 5 normal                                                                                                                                       | 3 orta seviyede                                                                                                                 | 1 ileri seviyede<br>TOPLAM SKOR                                                                                                                      |  |  |  |

1. Eğer sol kolondaki açıklamaya uygun ise 5 puan
2. Eğer orta kolondaki açıklamaya uygun ise 3 puan
3. Eğer sağ kolondaki açıklamaya uygun ise 1 puan

## 7.6. Participant Consent Form

Tarih:

Sevgili .....,

‘Video Temelli ve Fizyoterapist Eşliğinde Yapılan Yoga Pratiklerinin, Sedanter Kişilerin Solunum Kapasiteleri ve Uyku Kaliteleri Üzerine Etkilerinin Karşılaştırılması’ başlıklı bu araştırma, Nahide Koçer isimli kişi tarafından yapılmaktadır. Bu çalışmada sedanter bireylerde video temelli yoga ve fizyoterapist eşliğinde yapılan yoga pratiklerinin, solunum kapasitesi ve uyku kalitesi üzerine etkilerinin araştırmak amaçlanmıştır. egzersiz, kişinin fiziksel ve ruhsal iyilik halinin devam ettirilmesi, yorgunluk, ağrı, konsantrasyon güçlüğü ve denge kaybı gibi şikayetlerin giderilmesine yönelik gevşeme, nefes alıp verme teknikleri, düzgün duruş ve dinamik egzersizleri içeren alternatif bir tedavi yaklaşımıdır. Bu müdahalelerin hareketsiz ya da yetersiz aktif nüfusun %75'ine yayılması büyük öneme sahiptir. Bu amaca ulaşmak için, fiziksel aktivite müdahaleleri, İnternet gibi daha yeni teknolojilerden daha fazla faydalanabilecek yöndeki yaklaşımlara doğru yönelmeli, yüz yüze ve diğer yaklaşımlara güvenmenin ötesine geçmelidir.

Eğer katılmaya gönüllü olursanız şu adımları izleyeceğiz:

- Uyku, yorgunluk, ağrı, yaşam kalitesi ile ilgili anket sorularını okuyacak ve size uygun olanları işaretleyecek, açık uçlu soruları kendinize göre yanıtlayacaksınız.
- Solunumunuzu, postürünüzü, dengenizi ve kas uzunluğunuzu değerlendirmek için ölçümler yapacağım.
- Egzersiz grupları, 6 hafta, haftada 2 gün 1'er saatten oluşacaktır.

Sizin yanıtlarınızdan ve yapılan testlerden elde edilecek sonuçlarla araştırmanın bir sonraki aşaması yani verilerin analizi yapılabilecek ve sonuca ulaşılacaktır. Bu nedenle soruların tümüne ve içtenlikle cevap vermeniz ve testleri isteyerek gerçekleştirmeniz büyük önem taşımaktadır. Bu eğitimler size dururken, hareket ederken ve yürürken dengenizi korumayı öğretecek, kas esnekliği arttıracak, varsa ağrınızı azaltacak, solunumunuzu düzenleyecek ve uyku kalitenizi arttırmaya yardımcı olacaktır.

Araştırmaya katılmanız gönüllülük esasına dayalıdır. Bu form aracılığı ile elde edilecek bilgiler gizli kalacaktır ve sadece araştırma amacıyla (veya “bilimsel amaçlar için”) kullanılacaktır. Çalışmaya katılmamayı tercih edebilirsiniz veya anketi doldururken istemezseniz son verebilirsiniz.

Anket ve testler toplamda 90 dakikanızı, eğitimlerin ise bir seansı altmış dakikanızı alacaktır.

Çalışma ile ilgili herhangi bir sorunuz olduğunda aşağıdaki kişi(ler) ile iletişim kurabilirsiniz.

Sorumlu Öğretmen Prof. Serap İnal

Araştırma Ekibi Fzt. Nahide Koçer

**ARAŞTIRMAYA KATILMAYI KABUL EDİYORSANIZ AŞAĞIDAKİ KUTUCUĞA ÇARPI KOYUNUZ**

Katılımcı no:

## 7.7. Ethical Approval



Sayı : 37068608-6100-15- 1725  
Konu: Klinik Araştırmalar  
Etik kurul Başvurusu hk.

11/07/2019

İlgili Makama (Nahide Koçer)

Bahçeşehir Üniversitesi Fizyoterapi ve Rehabilitasyon Bölümü Prof. Dr. H. Serap İnal'ın sorumlu araştırmacı olduğu **“Video Temelli Ve Fizyoterapist Eşliğinde Yapılan Yoga Pratiklerinin, Sedanter Kişilerin Solunum Kapasiteleri Ve Uyku Kaliteleri Üzerine Etkilerinin Karşılaştırılması”** isimli araştırma projesine ait Klinik Araştırmalar Etik Kurulu (KAEK) Başvuru Dosyası **(1700)** kayıt Numaralı KAEK Başvuru Dosyası), Yeditepe Üniversitesi Klinik Araştırmalar Etik Kurulu tarafından **10.07.2019** tarihli toplantıda incelenmiştir.

Kurul tarafından yapılan inceleme sonucu, yukarıdaki isimi belirtilen çalışmanın yapılmasının etik ve bilimsel açıdan uygun olduğuna karar verilmiştir ( **KAEK Karar No: 1073**).

Prof. Dr. Turgay ÇELİK  
Yeditepe Üniversitesi  
Klinik Araştırmalar Etik Kurulu Başkanı

## 7.8. Curriculum Vitae

### Kişisel Bilgiler

|            |                       |              |            |
|------------|-----------------------|--------------|------------|
| Adı        | Nahide                | Soyadı       | Koçer      |
| Doğum Yeri | KADİRLİ               | Doğum Tarihi | 20.01.1991 |
| Uyruğu     | T.C                   | TC Kimlik No |            |
| E-mail     | nahidekocer@gmail.com | Tel          |            |

### Öğrenim Durumu

| Derece        | Alan                          | Mezun Olduğu Kurumun Adı | Mezuniyet Yılı |
|---------------|-------------------------------|--------------------------|----------------|
| Doktora       |                               |                          |                |
| Yüksek Lisans |                               |                          |                |
| Lisans        | Fizyoterapi ve Rehabilitasyon | Trakya Üniversitesi      | 2014           |
| Lise          | -                             |                          |                |

| Bildiği Yabancı Dilleri | Yabancı Dil Sınav Notu (#) |
|-------------------------|----------------------------|
| İngilizce               |                            |

### İş Deneyimi (Sondan geçmişe doğru sıralayın)

| Görevi            | Kurum                               | Süre (Yıl - Yıl) |
|-------------------|-------------------------------------|------------------|
| Öğretim Görevlisi | Doğuş Üniversitesi                  | 2017-2020        |
| Fizyoterapist     | Onur Rehabilitasyon Merkezi         | 2015-2017        |
| Fizyoterapist     | Beyaz Düşler Rehabilitasyon Merkezi | 2014-2015        |

### Bilgisayar Bilgisi

| Program | Kullanma becerisi |
|---------|-------------------|
| Office  | İyi               |

\*Çok iyi, iyi, orta, zayıf olarak değerlendirin

