T.C.

YEDİTEPE UNIVERSITY

INSTITUTE OF HEALTH SCIENCES

DEPARTMENT OF PHYSIOTHERAPY AND REHABILITATION

THE EFFECTS OF SENSORY-BASED ACTIVITIES AND MAT MODIFIED EXERCISES ON BALANCE, POSTURE, QUALITY OF LIFE, ANXIETY AND DEPRESSION LEVEL ON HEALTHY ADULT FEMALES DOING AMATEUR FOLK DANCE

MASTER THESIS

BURÇİN ÇOLAKOĞLU KILIÇ, PT.

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ADVISER

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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 07/02/2020 tarih ve 2020/02-22 sayılı kararı ile onaylanmıştır.

Prof. Dr. Bayram YILMAZ
Sağlık Bilimleri Enstitüsü Müdürü

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 acknowledgement has been made in the text.

BURÇİN ÇOLAKOĞLU KILIÇ

DEDICATION

I would like to dedicate my husband Baran Fırat KILIÇ and also I thank to my loving parents Belgin ÇOLAKOĞLU and Mustafa ÇOLAKOĞLU and my sister Aleyna Fatma ÇOLAKOĞLU for their support.

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LIST OF SYMBOLS / ABBREVIATIONS

AGP	Area Gap Percentage
AL	Anterolateral System
ANOVA	One Way Analysis of Variance
ANS	Autonomic Nervous System
APPI	Australian Physiotherapy and Pilates Institute
BAI	Beck Anxiety Inventory
BDI	Beck Depression Inventory
BMI	Body Mass Index
BOS	Base of Support
CI	Confidence Interval
CNS	Central Nervous System
COM	Center of Mass
DCML	Dorsal Column Medial Meniscal Pathway
DOC	Declaration of Helsinki
DSM	Diagnostic and Statistical Manual of Mental Disorder
ES	Effect Size
IPAQ	International Physical Activity Questionnaire
IPAQ-SF	International Physical Activity Questionnaire Short Form
LSD	Least Significant Difference
LSVT	Lateral Vestibulospinal Tract
MEC-AP	Medium Equilibrium Center Anterior Posterior
MEC-ML	Medium Equilibrium Center Medial Lateral
MET	Metabolic Equivalent
MS	Medium Speed
MVST	Medial Vestibulospinal Tract

NHP	Nottingham Health Profile
NYPRS	New York Posture Rating Scale
PL	Perimeter Length
PNS	Peripheral Nervous System
SD	Standard Deviation
SEC	Second
SLST	Single Leg Stance Test
SPSS	Statistical Package for Social Sciences
WHO	World Health Organization

ABSTRACT

Kılıç, Ç. B. (2020) The effects of sensory-based activities and mat modified pilates exercises on balance, posture, quality of life, anxiety and depression level in healthy adult females doing amateur folk dance. Yeditepe University, Institute of Health Sciences, Department of Physiotherapy and Rehabilitation, Master Thesis. Istanbul.

The aim of the study is to investigate the effectiveness of sensory-based activities and mat modified pilates exercises on balance, posture, quality of life, anxiety and depression. The study was conducted during June 2018- September 2018 in Care Oyun Akademisi and IKS Akademi. The study included 40 health adult female volunteer aged between 25-65 years which 30 of them was doing amateur folk dance and 10 of them continued their daily sedentary life. They are separated four groups (Group 1, Group 2, Group 3, and Group 4). Group 1(n=10) participated sensory-based activities, Group 2(n=10) done mat modified pilates exercises, Group 3(n=10, active control) continued amateur folk dance, Group 4(n=10, sedentary control) was sedentary group. Each groups performed activities/exercises during the 6 weeks, one session in a week, and they were evaluated before and after interventions. The static balance was evaluated Single Leg Stance Test (SLST), dynamic balance was evaluated by Prokin device, the posture was evaluated by New York Posture Rating Scale (NYPRS), The Notingham Health Profile (NHP) was used for evaluation of quality of life, Beck Anxiety Inventory (BAI) and Beck Depression Inventory (BDI) were used to evaluate the level of anxiety and depression. The main results of this study comparing the groups, while Group 1 and Group 2 were demonstrating improvement in dynamic balance parameters on bipedal position, Group 1 also showed greater improvement in dynamic balance parameters on right foot and left foot, and NYPRS. There were no statistically significant changes in level of quality of life, anxiety and depression. Conclusion, while the sensory based activities and mat modified pilates exercises are affective on dynamic balance on bipedal position, the sensory based activities are also affective on dynamic balance on right and left foot.

Key Words: Sensory, sensory integration, pilates, mat pilates, modified pilates, exercises, balance, posture, quality of life, anxiety, depression

ÖZET

Kılıç, Ç. B. (2020). Amatör halk oyunu oynayan sağlıklı yetişkin kadınlarda duyusal temelli aktivitelerin ve mat modifiye pilates egzersizlerinin denge, postür, yaşam kalitesi, anksiyete ve depresyon düzeyleri üzerine etkisi. Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü, Fizyoterapi ve Rehabilitasyon ABD., Yüksek Lisans Tezi. İstanbul

Duyusal temelli aktivitelerin ve mat modifiye pilates egzersizlerinin denge, postür, yaşam kalitesi, anksiyete ve depresyon üzerine etkisini araştırmak amacıyla planlanan bu çalışma, Haziran 2018 ve Eylül 2018 tarihleri arasında, Care Oyun Akademisi ve IKS Akademi 'de yapıldı. Çalışmaya 25-65 yaş aralığında; 30'u amatör halk oyunlarına devam eden ve 10'u sedanter yaşam sürdüren 40 katılımcı, gönüllü olarak katıldı. . Katılımcılar dört gruba ayrıldı; Grup 1(n=10) duyusal temelli aktivitelere katılan grup, Grup 2(n=10) ise mat modifiye pilates egzersizlerine katılan grup, Grup 3(n=10 aktif kontrol) amatör halk oyunlarına devam eden grup ve Grup 4(n=10 sedanter kontrol) ise günlük sedanter yaşamını devam ettiren grup. Egzersizler fizyoterapist eşliğinde 6 hafta süreyle, haftada 1 seans şeklinde yapıldı. Tüm gruplar çalışma başlangıcında ve 6. hafta sonunda değerlendirildi. Statik denge değerlendirmesinde Tek Bacak Üstünde Durma testi, dinamik denge değerlendirmesinde Prokin cihazı, postür değerlendirmesinde New York Postür Değerlendirme Skalası, yaşam kalitesinin değerlendirilmesinde Notingham Sağlık Profili ve anksiyete ve depresyon düzeylerinin değerlendirilmesinde ise Beck Anksiyete Envanteri ve Beck Depresyon Envanteri kullanıldı. Çalışma sonunda Grup 1 ve Grup 2 çift ayak üzerinde dinamik denge parametrelerinde iyileşme gösterirken, Grup 1 ayrıca sağ ve sol ayak üzerindeki dinamik denge parametrelerinde ve postürde anlamlı iyileşme gösterdi. Yaşam kalitesi, anksiyete ve depresyon düzeylerinde istatistiksel olarak anlamlı değişimler saptanmadı. Sonuç olarak; duyusal temelli aktiviteler ve mat modifiye pilates egzersizlerinin çift ayak dinamik dengeyi geliştirdiği; ayrıca duyusal temelli aktivitelerin sağ ve sol ayak üzerinde ki dinamik dengenin geliştirilmesinde de etkili olduğu görüldü.

Anahtar Kelimeler: Duyu, duyu bütünleme, pilates, mat pilates, modifiye pilates, egzersiz, denge, postür, yaşam kalitesi, anksiyete, depresyon

1. INTRODUCTION AND PURPOSE

Balance is defined as a complex motor controlling which is provided in upright, sitting, steady-state motion, or movement by maintaining the body's centre of mass (COM) over its base of support (BOS) (1, 2). It requires a combination of information from the visual, vestibular, somatosensory, and cognitive systems (2, 3). It is necessary to stay stable in every position and to perform daily living activities (3).

Balance can be measured in the body's static or dynamic position. Static balance control is evaluated in standing and sitting position and it gives information about the ability to maintain a stable position. On the other hand, dynamic balance gives information about the body's position changing during movement, unstable surfaces, or unexpected perturbations. To maintain body's COM over its BOS on unstable surfaces and during unexpected perturbations, some strategies are used: ankle, hip and stepping strategies (2).

Many factors can affect the balance control and contribute to a good balance (1). Posture, which is called as the position of body segments and joints in upright, sitting or recumbent, is one of these factors. Optimal body alignment provides good balance control (2). Ideal body alignment is defined as "a straight line that passes through the ear lobe, the bodies of the cervical vertebrae, the tip of the shoulder, midway through the thorax, through the bodies of the lumbar vertebrae, slightly posterior to the hip joint, slightly anterior to the axis of the knee joint, and just anterior to the lateral malleolus." (4).

To provide good balance and posture, visual, vestibular and proprioceptive inputs coming from the body and around must be processed and integrated by the central nervous system (2, 5). By the maturation of visual, vestibular and proprioceptive systems, a sensorial organization can be conducted and thus, balance and postural control can be provided (5). Also, strengthening of muscle is important to provide postural stability and balance control. Especially, core stability formed by core muscles strength is effective (6). The core was defined by Akuthota V. et al. (2008) as " Muscular box with the abdominals in the front, paraspinal muscles and gluteal muscles in the back, the diaphragm as the roof, and the pelvic floor and hip girdle musculature as the bottom" (7). The recent study found that by strengthening the core muscle, especially Transverse Abdominis, the core stability and balance can be provided (8).

Today, there are many modalities, approaches and exercises to enhance balance and postural stability. Sensory integration therapy or sensory-based activities and pilates exercises can be preferred to improve balance and postural control (8, 9). Kuo A. (2005) found that the sensory integration model can be effective on balance and reproducing the nature of postural motions (9). Also, Nallegowda M. et al. (2004) showed that impairment in visual, proprioceptive and vestibular sense resulted in deterioration of muscle strength, postural stability and balance (10). On the other hand, Granacher U et al. (2013) revealed that pilates exercise training can be used as an alternative program to traditional balance exercise for old adults and was effective in balance and postural control (11). Besides, in the research of Johnson E et al. (2007), it is found that pilates based exercise can improve balance in healthy adults (12).

Moreover, some studies about sensory-based activities and pilates exercises showed the effectiveness of sensory-based activities and pilates exercises on quality of life, anxiety, and depression level. The study including the subject with twenty-eight adults and found that sensory modulation was effective on quality of life, anxiety and depression (13). In a study made in 2013 by Mokhtari M et al., it was showed that pilates exercises can decrease depression levels in the elderly (14).

On the basis of current literature, we hypothesized that sensory-based activities applied in six weeks may be more effective on balance, posture, quality of life, anxiety and depression level with respect to mat modified pilates exercises on healthy women adults who are in amateur folk dance groups and continuing this activity.

Therefore, the aim of the present study is to compare the effects of sensory-based activities, and the mat modified pilates exercises on balance, posture, quality of life, anxiety and depression levels in healthy women adults who are in amateur folk dance groups and continuing this activity.

2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1. SENSORY SYSTEMS AND SENSORY INTEGRATION

The human nervous system consists of three systems which are the central nervous system (CNS), the peripheral nervous system (PNS), and the autonomic nervous system. There are many connections to transmit messages from the autonomic nervous system (ANS) and PNS into and out of the central system. The nervous systems consist of many neurons and receptors (15). Neurons are cells which provide to perceive senses, reveal motor and emotional responses and learning process. Neurons are functionally classified as motor neurons, sensorial neurons and inter-neurons. Receptors are specialized structures that perceive differences in or out of the body (16). Each sensory system has specific receptors that are sensitive to different forms of physical energy to form activation. The receptors can be primary sensory neurons or specialized cells according to the needs of the sensory system (15). The inputs coming from sensory organs or receptors located in the body internally or externally are transferred to the nervous system by afferent nerves or afferent fiber of cranial nerves. Then, these inputs are evaluated on the level of CNS or on segments medulla spinalis (16, 17). Impulses coming from CNS to muscles and glands are transmitted (16). The sensory integration theory also pays attention to these sensory systems and their integration process (15).

2.1.1. SENSORY SYSTEMS

All sensory systems require almost the same processes to create an action that can be listed like as; receiving a sensory stimulus, transduction and coding of the stimulus, adaptation of receptors, lateral inhibition, convergence and divergence, distribution of processing and control, and also serial and parallel processing. The human nervous system is important in these processes which are already talked about. CNS, PNS, and ANS are responsible for the taking and carrying of sensory stimulus and response (15).

Neurons, pathways, and glia consist of CNS. A cell body, axons, and dendrites make up the neuron. These structures form pathways of the CNS. The information is carried by fiber bundles and pathways from the body to CNS and also from CNS to the body (15, 16). On the other hand, glial cells structurally support the nervous system, separate groups of neurons from each other, remove waste after injuries, protect the electrochemical environment of neuron endings, nourish neurons (15). Glial cells do not

have stimulating specialties like neurons (16). CNS provides the organization of function hierarchically and heterarchical. Sensory input is processed hierarchically at each level of CNS, and also cognitive processing and intrinsic actvity contribute to the processing of information, thus sensory information attains all levels within the motor system (15).

PNS consists of peripheric nerves which are outgoing axons of CNS and ganglions which collect neurons out of CNS. Peripheric nerves are classified as efferent nerves and afferent nerves. Afferent nerves carry inputs from receptor organs to CNS while efferent nerves transmit motor response from CNS to effector organs (16). In this way, the PNS provides the connection between the outside world and peripheral structures and the brain and spinal cord (15).

Furthermore, ANS sustains the unconscious process in the body. It works with a reflex principle. The ANS innerves hearth, smooth muscles and glands. It consists of receptors responding to pressure, streches, changing in body chemistry and body temperature. The ANS creates two different responses in the same organ: sympathetic and parasympathetic (15, 17). The sympathetic system is activated in the stress conditions and gives fight or flight reactions. In contrast, the parasympathetic system has rested and diggest functions, and thus, it arranges the body responses (17).

These three important nervous systems are effective in the arrangement of sensory systems and integration. There are eight senses which are classified according to their receptors. Five of the senses, which are vision, hearing, taste, smell, and tactile, take information by exteroceptors. Two of the senses, which are proprioception and vestibular, take information by proprioceptors. One of the senses, which is visceral, is related to interceptors (18).

2.1.1.1. Vestibular System

The vestibular system gives information about gravity, head movement and balance. It is sensitive to movement or any changing of position, and also affect the brain. Its effect is seen early in fetal life so that the vestibular nuclei are observed in 9 weeks after conception, and functions by the 10^{th} or 11^{th} week. The development of the vestibular system is observed by the 5^{th} month in utero, and with the tactile and visceral systems, it gives almost all of the sensory input to the fetal brain. The vestibular system of the fetus is stimulated by the mothers' body movements (18).

Vestibular sensations are taken by the receptors of the system which are located in the inner ear. They are called the vestibular apparatus. The vestibular apparatus includes the semicircular canals and the otolith organs (the utricle and the saccule). The vestibular apparatus is located in the inner ear, so the receptors of the vestibular system are close to the receptors of the auditory system (15). The vestibular apparatus and cochlea and endolymph form the labyrinth (19).

The otolith organs are responsible for the static function, thus they provide to detect the position of head and body in space. On the other hand, the semicircular canals are responsible for dynamic functions, and so, they provideba response to head movement in space (15).

The otolith organs, utricle and saccule, are seen as a saclike organ. The receptor region of the otolith organs is called maculae, and maculae have hair cells. The macular hair cells have a jelly layer that has calcium carbonate crystals (15, 18, 19). The utricle and saccule give the response to head tilt in any direction and to linear movement. In the upright position, crystals are resting on top of hair cells, then when the head tilts or movement occur, these crystals change their place in the hair cells and the stimulus detection process starts. This movement creates an electrical energy which is converted chemical energy in the synapse between hair cells and vestibular ganglion projections (15, 19). Then, the nerve fibers of the vestibular nerve are activated, and this nerves carries inputs to the vestibular nuclei of the brain stem (18). By these processes, utricle and saccule notice of head movement or position. Besides, they have slowly adapting receptors and gives tonic input to CNS, thus they encourage the head position and movement and also provide the maintenance of upright posture and equilibrium (15).

Moreover, the semicircular canals are the other part of the vestibular apparatus. These canals are like tiny closed tubes. They are filled with a fluid. The semicircular canals are three pairs of canals and they lie up and down, left to right, front to back (19). To give the right information about in all three planes in space, they are placed at right angles. For this reason, the right position is 30˚ forward flexion of the head. The semicircular canals have enlarged ending receptors called the ampulla , and the ampulla has hair cell receptors. Like macula, these receptors are embedded in a gelatinlike substance called cupula. The cupula extends nearly to the ampula and its edges are attached to epithelium of canals which are filled with endolymph (15). When the head

moves rapidly in any direction, this endolymph goes back in one or more canals in the each ear. The pressure of this fluid stimulates the receptors located in the semicircular canals, the the impulses are created by the receptors. These impulses are transferred by vestibular nerve to the vestibular nuclei. Through this process, the sense of movement is conducted. The changes in the sensory input change according to the speed or direction of movement (18).

The combination of the information coming from the otolith organs and semicircular canals give information about where we are in relation to gravity, whether we are moving or stopped, and how fast we are going and also in what direction we are going (15, 18).

2.1.1.1.A. Vestibular Reflexes

There are two reflexes elicited from vestibular apparatus, which are vestibulo-ocular and vestibulo-spinal reflexes (also called postural reflexes) (19).

One of the tasks of the vestibular system is to control the eye movement. The controlling of this eye movement an be provided by using vestibulo-ocular pathway (20). There are many vestibulo-ocular reflexes mediated by reflex arcs. The role of these reflexes is to keep images stationarily on the retina when head rotates. When the head rotate in a way, th compensatory eye movements starts in the other way with same velocity of the head, and inthis way, the image is kept stationarily. When tha rotation is done very fastly, the stabilization of the image is being impossible, and in this time, the eyes start to move in same direction with the head movement (19). This rhythmic rapid and slow movement of the eyes is called as nystagmus (19, 20). In this situation, the nystagmus occurs by the stimulation of the semicircular ducts. This is also known as vestibular nystagmus or post-rotary nystagmus (15, 19). Sometimes, the other subject moves and the eyes follow this movement without head rotation. This process is provided by the optokinetic nystagmus (19).

The other reflex mechanism related to the vestibular system is postural reflexes. The CNS takes informations from the several parts of the body to control the posture and balance. The labyrinth is the one of them (19). The stimuli are carried by two tracts from the labyrinth: the lateral vestibulospinal tract (LVST) and the medial vestibulospinal tract (MVST). The LVST is originated from lateral vestibular nucleus and terminates on all levels of spinal cords, so it helps extansor muscle tone and extansor reflexes. On the other

hand, the MSVT is originated from medial vestibular nucleus and it terminates at cervical level of spinal cord. The tasks of this tract are to help coordination of head position in equilibratory responses and to control eye movements to maintain fixation.

2.1.1.2. Proprioceptive System

Proprioception can be defined as the position's sense of mechanoreceptive (21). It gives contribution to conscious muscle sense and posture (22). Proprioception includes two part of position sense: static and dynamic parts. Static part of proprioception gives information about one body part orientation to another, and dynamic sense provides a neuromuscular feedback about the rate and direction of movement. Therefore, proprioception is a complex process which contain stability and orientation during activities (21).

Proprioception gives sensory information about the stretching and contraction of muscles and compression of joint because of its receptors' locations (18). The proprioceptive feedback comes from muscle spindle, mechanoreceptors of the skin,joint receptors and tendon organs (15, 19). *Muscle spindles* are a small bundle of thin muscle fibers which contains sensory nerve endings. A muscle spindle lies throughly muscle and it is also connected to the tendons of muscle. For this reason, the muscles spindle is stretched when the muscle elongates, and thus, the depolarization of sensory nerve endings start. These signals from the muscle spindle are important for reflex control of movement and kinesthesia that is known as consicious perception of joint positions and movements (19). Therefore, it is critical to became the perception of body and limbs in space (15). *Tendon organs* are located between the muscles and the tendons, and measures the muscle contraction force. *Joint receptors* are found in the joint capsule and the ligaments around the joints, and it is thought that the joint receptors can give information about the movement ranges and steady position (19).

The sensory inputs come from the receptors, and proprioception is carried to the spinal cord, the brain stem and cerebellum, and some of it travels to the cerebral hemispheres. Besides, most of these inputs is processed in the parts of the brain which do not produce conscious awareness. Thus, when the movements which are conducted by attention are performed, the sense of the muscles and joints is noticed (18).

2.1.1.3. Tactile System

The largest sensory system of the body is the tactile system and it is very important for human to organize behavioral, physical and mental conditions (18). The receptors of the tactile system are large mechanoreceptors and take stimulations about the touch, pressure, vibration, texture, heat or cold, pain, and movement of the hairs in the skin (15, 23).

The tactile receptors located below the neck carry impulses to the spinal cord and then, impulses are transmitted to the brain stem , while the receptors located in the skin of the head tranfer the impulses directly to the brain stem by cranial nerves. Many impulses are not reached to the parts of cerebral cortex, and the awareness of sensation is not conducted. But, the impulses used at lower levels of the brain provide to move effectively, to regulate the arousal system, to organize emotions, and to help other systems to create meaning (18).

Two subdivisions, which are dorsal column medial lemniscal pathway (DCML) and anterolateral system (AL) , are used to carry somatosensorial from the body to the CNS. These subdivision provide the ability to interpret the tactile world and to give response to touch. The DCML gives response to mechanical stimuli and transmits primarily tactile stimuli. It is associated with tactile discrimination or perception. Besides, because of its task about carrying propriceptive information, it transfers information about the position of the body and limbs in space. On the other hand, AL carries information aboout the pain, temprature, light touch and tickles. Also, there is one more pathway called trigeminothalamic pathway. It carries all somatosensorial informations from the face to CNS (15).

2.1.1.4. Visual System

The visual system is highly developed system in which the large parts of cerebral cortex process. Almost 40% of the total axons of the cranial nerves are the axons of the optic nerve (19). The receptors of the visual system are found in the retina located on the back wall of the eye. These receptors are photoreceptors and named as rods and cones. Rods are responsible for scotopic vision and sensitive to the light more than cones. On the other hand, cones are responsible for the photopic vision and conduct the color vision (23). Rods give slow response to the light while cones are rapid responding receptors (15). The retina is stimulated by the light and the sensory input are sent to the visual

processing centers in the brain stem. The processing of the impulses are done in these centers with the relation with other sensory information coming from other sensory systems. Thus, the awareness of the environment and the location of things are formed. The impulses are sent to the brain stem and cerebellum from the brain stem nuclei, and then, the information coming from the visual system and the information coming from the muscles of the eyes and neck are integrated. By this way, the following of the objects with eyes and head is conducted. Besides, several impulses are sent to other parts of the cerebral hemispheres and the discrimination of the details are occurred (18).

Three pathways are used in sending the stimuli to CNS. The first pathway called as the lateral geniculate pathway is responsible for processing and recognition of faces,shapes, and motion. The second pathway is the superior colliculus pathway and it responds to horizontal movement in visual field and plays role in the coordination of posture and eye movements. The third pathway is named as the accessory optic tract pathway and responsible for oculomotor adaptation (15).

2.1.1.5. Auditory System

A large number of different sounds can be discriminated by humans because of that human auditory system has many abilities to recognise the voice of the people, understand the speech, discriminate the kind of sounds like a music (23). These discriminations are recognized by the receptors located in the inner ear and the auditory system (15, 23). The activation of the auditory system is known as a complex process because of that the sound waves are collected by the external ear, transferred by the middle ear, and then, transduced into action potentials within the inner ear (15). But, as mentioned before, the receptors of the auditory system are located in the inner ear which is also called the cochlea, and these receptors are the hair cells which are component of the Corti (15, 19).

The auditory receptors are stimulated by the sound waves and these stimuli are sent to the brain stem auditory centers. Then, the auditory impulses are processed in the nuclei with comig impulses from other systems like the vestibular system and the muscles and skin. Like the visual inputs, the auditory inputs can travel to the other parts of the brain stem and the cerebellum for integration with other sensations and to create motor response. Then, this information goes to the cerebral hemispheres (18).

The auditory nerve has afferent and efferent components. The afferent components of the auditory nerve conduct the cochlear portion of the vestibulocochlear nerve while the efferent components come from the superior olivary complex and innervate the outer and inner hair cells. By this process, when the efferent components are active, the efferent fibers inhibit the transmission of the information th the CNS and thus, the discrimination of specific sounds in the presence of backgroundg noise. There are two pathways of the auditory systems: core pathway and belt pathway. The core pathway is responsible for the maintenance of the organization and transmission of the sound frequency. The task of the belt pathway is to transmit information relative to timing and intensity of the sound input and to arrange the bilateral interaction of sound (15).

2.1.1.6. Gustatory System

The chemical sense of taste is important for the people to determine the content of the food and to keep poisonous food away. This is provided by the chemoreceptors which are sensitive to the molecules even in the extremely low concentrations (19).

Taste receptors are located in the tongue and take information about the four tastes: sweet, sour,bitter and salty (18, 19, 23). The taste cell organelles called as taste buds respond by the chemoreceptors and the gustation is initiated. These taste buds are innervated by the facial, glossopharyngeal, and vagus nerve (20). The signals from the taste buds are transferred by these nerves to the solitary nucleus in the upper medulla. Then, the signals are distributed to the other nuclei of the brain stem which are important for food intake and digestion, and to higher levels. The orbitofrontal cortex integrates the olfactory and gustatory information and by this process, the appropriate behaviors are facilitated (19).

2.1.1.7. Olfactory System

The olfactory system is different from the other system because of that its sensorial inputs are directly transmitted to the limbic system without having to travel the typical brain stem (18, 19). Because of this speciality, it is possible that a smell activates the emotions and influences how much the people like or do not like , and creates memories and associations that affect the decisions (18). The sensory cells of olfaction are located in the sensory epithelium in the upper nasal cavity. Their sensitivity differs from one person to another (23). These sensory cells are the neurons going directly to the

olfactory bulb part of the CNS. The signals in the olfactory tract are not interrupted in the thalamus but goes directly to the primary olfactory cortex (19).

2.1.1.8. Visceral Sense

The internal organs and the major blood vessels have receptors. These receptors are stimulated by activity, blood flow and blood chemical. This stimulation is important to provide the brain stem to keep the body healthy. By the way, the visceral input help to arrange the blood pressure, digestion, breathing , and other functions of autonomic system. The autonomic system is also influenced by the other sensory systems, especially the tactile and vestibular system. Because of this reason, the digestion can be disturbed by the spinnig, or the breathing is interrupted by the painful conditions (18).

2.1.2. SENSORY INTEGRATION

Sensory integration is an unconscious process which contains the organization of the informations conducted by the senses giving information about the body's conditions and the environment around us. It provides us to focus on what the stimulus is important, and by this way, it allows us to create adaptive responses (identified as a purposeful and goal-directed responses to the sensorial experiences) to the different situations (18). Sensory integration is defined by Ayres in 1972 as "the neurological process that organizes sensation from one's own body and from the environment and makes it possible to use the body effectively within the environment" (24).

The sensory integration process begins in the fetal life. The movements of the mother also stimulate the baby in the womb (18). During the early years of childhood, stimulation of sensorial receptors and motor activity provide shaping the neurons and interconnections between neurons. This development creates the basis of the sensory and motor processess which continues the rest of the life (25). An amount of sensory integration must be occured and developed to produce many motor activities like crawling and standing n the first year of life. Until the age of 7, the brain act as a sensory processing machine. It takes sensory information from the body and gets meaning to them, thus provides more musculor or motor adaptive responses than mental. For this reason, the first 7 years are called sensorimotor develıoment years (18).

The sensory integration theory of Ayres is used to explain the behaviours of individuals, plan intervention, and predict the changes on the behaviour by this interventions. This theory has three components which are to describe the development

and typical sensory integrative functioning, to define the sensory integrative dysfunction, and to prepare intervention programs (15). The sensory integraiton theory is based on restoration of the effective neurological processing by using the enhancement of the vestibular, proprioceptive and tactile system. On this purpose, the "sensory diet" ,which provides sensorial stimulus by some activities like as jumping, rolling, swimming, brushing, joint compression, oral motor exercises, are commonly used (26).

Additionally, Ayres defined sensory integrative process by the four level. At the first level, the senses,which are vestibular, proprioceptive and tactile, are taken from the body to create many activities like eye movement, posture, balance, muscle tone, gravitational security, sucking, eating, mother-infant bond. At the second level, these senses are integrated into a body perception, coordination of t twp side of the body, motor planning, attention span, emotional stability. By the third level, using the auditory and visual sensations, the accurate visual perception, speech and language are developed. At the fourth level, all these parameters come together and conduct end products that are ability to concentrate, the ability to orginize, self-esteem, self-control, academic learning theory, specialization of each side of the body and the brain (18).

As a result, the Ayres' Sensory Integration Theory consists of three interrelated elements of practice: theory, evaluation method, and a specific approach to the intervention. This relationship was shown as a schematically (Figure 1):

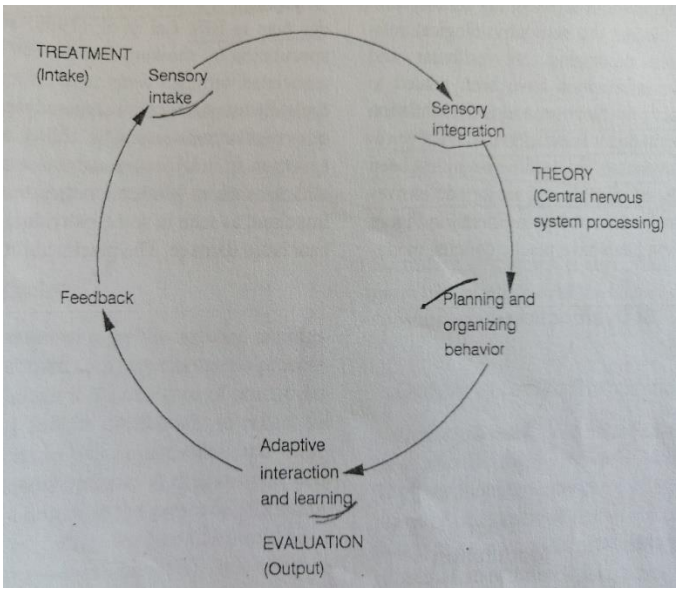

FIGURE 1: Sensory Integration Theory Schema

2.2. PILATES METHOD

Pilates method is generated by Joseph Pilates in the early 1900s (12, 27). He started to work with nonambulatory patients, and and saw the beneficial effects of his methods. Pilates' method provided encouragement of movement early in the rehabilitation process (27). In time, pilates exercises became a popular exercise modality. It contains strength and flexibility training and provides improvement of muscular control of the deeper abdominal muscles and also may be effective on postural stability (28).

The categorization of the Pilates method can be made into mat Pilates and apparatus Pilates (29). Mat Pilates is performed on the floor, while apparatus Pilates is performed on variety of machines like reformer and cadillac (12, 29). Pilates exercises can be consisted of a series of approximately 25-50 simple, repetitive, low- impact flexibility and muscular endurance exercises in the abdominals, lower back, hips, thighs, and buttocks (27). Also, Pilates method has six basic principles which are centering, concentration, control, precision, breathing, and flow (30).

2.2.1. Modified Pilates Method

The Modified Pilates method was prepared by physiotherapists of Australian Physiotherapy and Pilates Institute (APPI). The APPI has modified the original 34 Pilates matwork exercises to more functional ones for the sedentary people, adults or patients because the traditional Pilates was not enough in rehabilitation world and it does not give enough specificity in the exercises (31).

Modified Pilates consists of slow, controlled movements and focusing on posture and breathing. While traditional Pilates method consists of exercises which are related to strengthening and increasing whole-body flexibility, Modified Pilates do not give permission to intense contractions of abdominal muscles, breath-holding, or increasing pressure on the pelvic floor (32).

2.3. BALANCE

Balance means the protection of the body's position in equilibrium (33). When the body's center of mass (COM) is maintained in the limits of the base of support (BOS) within any position, the balance is provided (33, 34). The COM is defined as "A point that corresponds to the center of the total body mass and th point where the body is in perfect equilibrium". The BOS is defined as " The perimeter of the contact area between the body and its support surface" (33).

The measurement of the balance is conducted in static BOS or during movement of the BOS from one to another (34). The static balance control means to maintain the stable antigravity position in any steady position such as standing or sitting (33). Standing balance is important to perform daily activities such as reading, taking shower (35). On the other hand, dynamic balance control provide the stabilization of the body when the support surface is moving such as sit to stand transfers, walking or in a moving platforms. Besides, there is postural reactions is connected by balance changes. This provides the sudden balance reactions to unexpected external perturbations (33).

Horak and Nasher described three primary movement strategies to recover balance in any sudden perturbations of the surface. These are ankle, hip and stepping strategies. During the small perturbations, the ankle strategy provide balance control by restoring the COM to a stable position with movements at ankle (33, 36). The gastrocnemius, hamstrings and paraspinal muscles are important in the loss of balance in forward direction, and the anterior tibialis, quadriceps and abdominals are important in the balance loss backwardly (33). In the hip strategy, person uses rapid hip flexion or extansion to move COM within the BOS during the rapid or large external perturbations. The abdominalis and the quadriceps are used in forwarding sway, while the paraspinalis and the hamstring are used in backward sway (33, 37). Third primary strategy is stepping strategy. During the large forces, the COM displays beyond the limint of stability, and a step is used to regain balance control by enlarging the BOS. Moreover, according to researches, it can be mentioned three more strategies which are weight-shift strategy, suspension strategy and combined strategy. The weight-shift strategy is used during the shifting body weight laterally by controlling mediolateral perturbations.In this strategy, hip abductors and adductors and foot invertor and evertor muscles are important. In the suspension strategy, during the balance tasks, person flexes knees, then the ankles and hips are also flexed. Finally, the combined strategy is also used to provide balance control according to tasks, for example, standing on a bus (33).

Balance can be affected by many physiological changes in the body. Aging, reduction of the muscle strength, changes in the joint range of motions, deteoriation in the proprioception and reaction time, or changes in the sensory systems affect the balance control (34, 38). To enhance balance ability requires sensory integration and postural response practice. Therefore, the activities or exercises which contains sensorial inputs

and muscle strengthening provides improvement of balance control and regaining of the impaired balance (33, 38).

2.3.1. Balance and Sensory- Based Activities

Balance ability is a complicated process. Integration of sensory information is important to adjust balance ability (38). Any deficits in somatosensory, visual, or vestibular system impair balance and mobility. When there is a damage in higher level central nervous system about the sensorial organization, it can result in the deteriotation of balance reactions and strategies, thus the balance control is affected (33).

To provide and maintain the erect position, visual , articular and muscular, and vestibular informations are integrated by CNS. In this position, by reflexive muscular reactions and well-coordinated voluntary movements, the balance is provided (38). These three systems which are visual, vestibular , and somatosensory work in a coordination. When the visual and somatosensory systems take information from the environment, the vestibular system gives information about the internal reference by the movement of the head. Without other systems, one sense does not determine the position of the body, so it does not provide balance control (5, 39). Wilczyński an et al. (2017) researched the effects of sensory integration technique on static and dynamic balance control. They used sensory-based activities once a week in six month, and the found that sensory integration is effective on the balance of children after prenatal exposure to alcohol (40). Also, the study of Fil (2013) about the effect of sensory integration therapy on patient with Parkinson's Disease showed that this therapy method is effective on balance measures and postural stability of patients with Parkinson's Disease (41).

2.3.2. Balance and Modified Pilates Exercises

To enhance the balance ability, trunk stabilization is helpful. By the increasing the muscular strength and activity of trunk muscles and especially increasing the core muscle activity, trunk stabilization can be supported (38, 39). The deeper muscles of the core are important in the stabilization of spine as superficial muscles. Between the deeper muscles, the most important muscle for lumbar stabilization is M.Transverse Abdominis (8). By the strengthening the Transverse Abdominis, the lumbar stabilization is provided (42) and thus balance can be improved by lumbar stabilization (43). The thickness of Transverse Abdominis was observed after Pilates exercises in many studies (8). Also, it was found that Pilates exercises is effective method to increase core stabilization and thereby

increase balance ability (7). Moreover, the effectiveness of Pilates exercises on the balance in healthy adults and elderly people was found in the researches (6).

2.4. POSTURE

Posture is defined as a "position or attitude of the body, the relative arrangement of body parts for a specific activity, or a characteristic manner of bearing one's body." It is determined according to alignment of joints and body segments and balance between muscle affecting the joints (33). Ideal posture was defined by Kapandji as " body's being in balance with minimal stress and loading ". Spinal movement segment composes of two adjacent vertebra, intervertebral disks, ligaments and facet jonts. The load is shared by anterior and posterior structures. These columns provide support. Anterior column is resposible for static role while posterior column is responsible for dynamic role (44).

To create ideal posture, in the vertical view, the ear lobe, the cervical vertebrae bodies, the tip of the shoulder, midway of tge thorax, lumbar vertebral bodies must be in a straight line and this line must pass posteriorly to the hip joint, anteriorly to the knee joint, and anteriorly to the lateral malleolus (4). On the other hand, in the back view, the reference line must pass through the midline of the body. Therefore, the midline must be between hells, lower extremities, pelvis, spine, and skull. According to these lines, the body must be symmetrical in the back view and in equilibrium inside view (39).

Postural changes affect the personal life. These postural changes are formed by different factors (44). Factors affecting the posture can be stated as physiological impairments (range of motion, muscle length, joint integrity, muscle performance, motor control, balance and coordination, pain), anatomic impairments, anthropometric characteristics, psychologic impairments, developmental factors, environmental influences, and disease or pathology (39).

Postural management starts with the patient examination. This examination includes the assesment of impairments on body, movements and tasks affacted by postural changes. After examination, the problem and its reasons are listed. Then, the intervention plan is determined according to problem and its mechanisms. For the management of impaired posture, exercise programs according to complications, manual therapy, or external supports can be planned (45). According to researches, sensory-based activities as a exercises program and Pilates exercises are effective on management of posture (9, 29).

2.4.1. Posture and Sensory-Based Activities

A person takes sensorial inputs from pre-natal life until end of the life. These sensorial inputs are taken and integrated to create body awareness and body's actions. Some sensorial input gives us information about space, timing, and depth, and others may provide information about our body (40). These three sensorial inputs which are somatosensorial, vestibular and visiual are responsible for posture and postural control. The proprioceptive system gives information about position of muscles and joints, vestibular system gives reflexive responses for postural control, and visual system is responsible for motion detection and processing and also gaze fixation (9, 15, 22).

Higher-level integrative mechanisms are responsible for the coordination of vestvular, visual and proprioceptive information and manage postural disturbances. For this reason, these are important on posture. In the researches, it was shown that decreasing of taking sensorial input by the aging influence the posture,postural control and balance (46). Also, according to many studies, proprioception and maintaining proprioceptive integration was found effective on posture and by the way, pan-free daily activities (22, 47). Moreover, it was found that by proprioceptive exercises which contain activities composed of proprioceptive sensorial input, the perception of joint and muscle position and motion is generated and thus, healthy posture and balance are gained (48). As proprioceptive inputs, vestibular inputs are important in ideal posture because by the vestibular inputs taken by turning or motion of head in prone and supine position, the reflexes which contain vestibulo-ocular and vestibulo-spinal using the lateral and medial vestibular tract create postural reactions and thus, affect the posture. In these periods, visual system help the other systems (15).

2.4.2. Posture and Modified Pilates Exercises

Many stabilization exercises which contain proprioceptive informaition strength abdominal and pelvis muscle, and thus improve posture because of that strength training increase spinal stabilization (29, 43). Weakness on trunk flexion and extension muscle affect the stability (3). Effective training that integrates trunk muscles especially Tranverse Abdominis muscle increases the stability (8). Pilates exercises are one of these exercises (7, 29). Pilates exercises combine strength and flexibility training with benefits of increased muscular control of the deeper abdominal muscles and promote postural stability (28, 38). Also, according to other many studies, regular pilates exercises are

found effective on body and self-awareness, stability, relaxation, posture and coordination (49). Besides, not only pilates exercises with equipment but also mat pilates exercises was found effective core strength, postural stability and posture (50).

2.5. QUALITY OF LIFE

Quality of life is defined by the World Health Organization (WHO) as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. " (51). It is also known as a concept which contains physical, cognitive, social and emotional parts (52). Therefore, it is related to many parameters which are level of independence, social relations, psychological factors, and person's environment. And it actually could not be measured by tests because it is unique to person and can change by the time which is called response shift (51).

Changes in sub-parameters affect the quality of life. It can be because of biological, physiological or environment. The important thing in this process is to determine the changing factors and their treatment. Two methods of providing improvement in quality of life are sensory-based activities (53) and modified pilates method (54).

2.5.1. Quality of Life and Sensory-Based Activities

The impaired sensory system can affect the quality of life. These changes can be because of not taking sensorial input and its limited integration, and/or impairment in systems like vision or hearing loss (55, 56). All these conditions also may negatively affect the sensory modulation and create change in the quality of life. Sensory modulation disorder is described as the reactions of a person to environment by under or over responses. It is a sensory integration problem and it is divided into subdivisions. One of the subdivisions is the sensory defensiveness. It can be impactive on behaviour, emotions, mental health, and functional abilities (57).

According to recent researches, the effectiveness of the sensory-based activities on quality of life was found. Gonzalez and Kirkevold searched the effectiveness of sensory garden for people with dementia and found that to take sensory inputs is affective on well-being (58). Besides, in a study conducted on elderly people aged 70-75s, it was showed that if people participate in the activities containing sensory input, they are more happy, social and have a better quality of life (53).

2.5.2. Quality of Life and Modified Pilates Exercises

Physical activity is important for self-care behavior which contributes to more healthy aging, quality of life, and physical fitness. Interventions contain the control of body on the body movement like Pilates aim to improve quality of life, motor skills, and cognitive functions (59). Aerobic, flexibility, balance exercises and resistance training are affective on overall fitness (60). The Pilates exercises can combine all these parameters (59). Especially, the effectiveness of Modified Pilates exercises was found (61).

Many studies (about the effect of Pilates exercises) conducted on different populations and different types of diseases (e.g. low back pain, type 2 diabetes, postmenouposal osteoporosis, juvenil idiopatic arthritis) supported that quality of life can be developed and improved by Pilates exercises (61-64).

2.6. ANXIETY AND DEPRESSION

Freud stated that "anxiety is unpleasant affective state or condition which cis covered by the word nervousness". It has many manifestations. These are disturbed respiration, heart palpitation, sweating, vertigo, tremor and other behavioral and physiological manifestations. By some qualities known as phenomenological and physiological, the anxiety is different from feeling of fear. The feeling of apprehensive expectation or horror (65). On the other hand, to the identification of the depression, it requires time-consuming interviews (66).

To achieve the anxiety and depression, there are many approaches. The exercise methods are important in this process. The activities which include sensory inputs and the pilates exercises are two of these affective approaches (49, 57).

2.6.1. Anxiety, Depression and Sensory-Based Activities

Sensory Integration Theory of Ayres recommended that sensory processing is a important part of person’s neurophysiological foundation, affecting the occupational adaptation and functional performance. If there is changes on this process, it can lead to anxiety and depression (67).

For this reason, by using sensory based activity program, the level of anxiety and depression level can be decreased. It is searched in many researches. For example, the study of Engel- Yeger and Dunn stated that the occupational therapy interventions is

effective on axiety and depression level of healthy people aged 18-50s (68). Also, Kinnealey et al. found that the interventions which conclude the sensorial inputs are affective on daily activities and anxiety and depression level (69).

2.6.2. Anxiety, Depression and Modified Pilates Exercises

The goal of Pilates training is affected by the improvement of general body flexibility and health. This modern Pilates approach can be idetified as body-mind conditioning. In the study which twenty-five female patient aged 33-63s with fibromyalgia, a 12-week pilates training method is affective on reducing of the level of anxiety and depression (70). Moreover, according to a meta-analysis prepared by Fleming and Herring, although there was small size groups, the effectiveness of pilates exercises on mental health outcomes was found highly (71).

3. MATERIALS AND METHODS

3.1. SUBJECTS

This study is a randomized and controlled trial. It was conducted in Care Oyun Akademisi and IKS Akademi during June 2018 – September 2018. Forty healthy women adults who met inclusion criteria were included in the study. They were randomly divided to four groups which are Sensory Based Activity Group (Group 1), Mat Modified Pilates Group (Group 2), Active Control Group (Group 3), and Sedentary Control Group (Group 4). Randomization was conducted by registration number. "Statistical Package for Social Sciences" (SPSS) Version 21.0 (SPSS inc., Chicago, IL, ABD) program was used for data analysis. The study was conducted with 37 participants.

The study protocol was approved by the Yeditepe University Ethical Committee at the date of 17.05.2018 and issue number was 847 (Appendix 1). Participants involved in the study on a voluntary basis. All patients were informed of Declaration of Helsinki (DOH) and Informed consent was obtained from all individual participants included in the study

The aim and plan was explained and informed written consent was obtained from each patient (Appendix 2).

3.1.1. Inclusion Criteria

- Women adults aged between 25-65 years,
- To continue the national folk dance in IKS Akademi
- Not to have any health problem which restricts activities/exercises
- To have minimum 600 MET-min/week activity level according to International Physical Activity Questionnaire (IPAQ) – Short Form for active groups

3.1.2. Study process

Fifty-two women, who were willing to be volunteers, had resource to participate in the study. Thirty-seven of them were appropriate for the study according to inclusion criteria. But, seven of participants did not want to go on the study because of their special reasons. Before activity and exercise program, thirty participants were separated to groups randomly by turns according to their registration order. In the fourth and fifth week, two participants from Group 2 and one participant from Group 4 left the study. On

the other hand, ten of participants, excluded because of not meeting inclusion criteria, were added to Sedentary Group because their physically activity level was low (IPAQ-SF ≤ 600 MET-min/week) and they did not participate in national folk dance. Thus, the study was completed by thirty-seven participants (Figure 2).

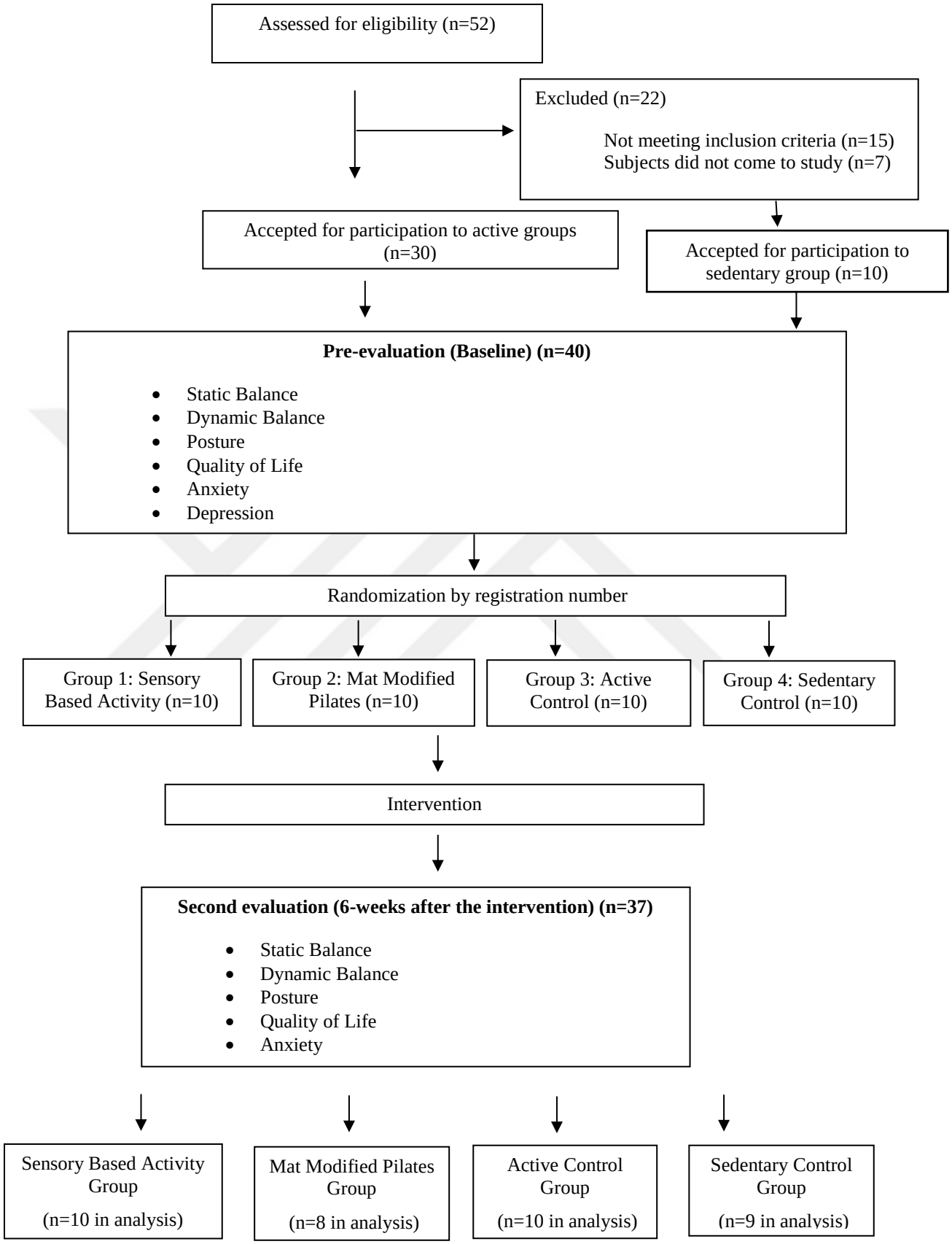

FIGURE 2: Flowchart of the study.

3.1.3. Study Protocol

All participants were evaluated before and after activity and exercise programs. While participants of three groups which are Group 1, Group 2, and Group 3 were going on national folk dance for 6-weeks, Sedentary group continued their daily living life activities. After evaluations, in addition to national folk dance, Group 1 performed Sensory Based Activity Program and Group 2 performed Mat Modified Pilates Exercises under the supervision of researcher physiotherapist. Activities and exercises were done six weeks, one day in every week and one hour every session.

Sensory Based Activity Program consisted of activities which contain proprioceptive, vestibular, visual, tactile and auditory inputs (Figure 2) (Appendix 3). On the other hand, Mat Modified Pilates Exercises Program contained pilates exercises which are done on prone-lying, supine- lying, side-lying, kneeling, standing on boot feet, standing on one foot, and standing on different materials (Figure 3) (Appendix 4).

FIGURE 3: A sample room with equipments to provide a place for sensory-based activities.

FIGURE 4: Samples of Mat Modified Pilates exercises *

(* Mat Modified Pilates Course Booklet)

3.2. EVALUATION

Volunteers answered IPAQ – Short Form to assess their physical activity level, before the separation to groups. Participants' sociodemographic characteristics, static and dynamic balance, posture, quality of life, level of anxiety and level of depression were evaluated. Volunteers' evaluation was continued for two weeks after they were divided to groups.

3.2.1. International Physical Activity Questionnaire – Short Form (IPAQ-SF)

Volunteers were evaluated by IPAQ- Short Form to assess physical activity levels to be seperated into groups. The International Physical Activity Questionnaire (IPAQ) is a standardized tool to survey physical activity (72). IPAQ was developed in 1998 to observe the physical activity status of population on global standards (73). A reliability and validity study in 2000 conducting in 14 centers and 12 countries showed that IPAQ can be used as a physical activity questionnaire to evaluate the physical activity status of young and middle-aged adults (15-69 years) (74, 75). Turkish version of IPAQ also was found reliable and valid for adults (72, 76).

The International Physical Activity Questionnaire (IPAQ) consist of two versions which are short and long form. There are 9 items in short form and 31 items in long form (74, 75). The short form (IPAQ-SF) contains information about walking time, vigorous intensity and moderate intensity activity time and time of sedentary activity (2, 73). The long form (IPAQ-LF) gives information about the physical activity which are related wıth job, transportation, housework and caring family, recreation, sport and leisure time, time spent sitting (74).

The IPAQ-SF gives duration and frequency scores on walking, moderate-intensity and vigorous-intensity activity (Apppendix 5). Total score of the IPAQ-SF calculated by summation of scores of these three activity level (75). Scores of walking, modarate-intensity and vigorous- intensity activities can be calculated by formulations which are:

1) Vigorous MET-minutes/week = 8.0 × moderate intensity activity minutes × moderate intensity activity days

2) Moderate MET-minutes/week = 4.0 × moderate intensity activity minutes × moderate intensity activity days

3) Walking MET-minutes/week = 3.3 × walking minutes × walking days

Total physical activity MET-minutes/week = sum of Walking + Moderate + Vigorous MET minutes/week score (75, 77).

The physical activity score can be categorized as (74, 75);

1) Category 1- Low: This is the lowest level of physical activity. Those individuals who not meet criteria for Categories 2 or 3 are considered to have a ‘low’ physical activity level.

2) Category 2- Moderate: The pattern of activity to be classified as ‘moderate’ is either of the following criteria: a) 3 or more days of vigorous-intensity activity of at least 20 minutes per day b) 5 or more days of moderate-intensity activity and/or walking of at least 30minutes per day c) 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum Total physical activity of at least 600 MET-minutes/week.

3) Category 3- High: A separate category labeled ‘high’ can be computed to describe higher levels of participation. The two criteria for classification as ‘high’ are: a) vigorous-intensity activity on at least 3 days achieving a minimum Total physical activity of at least 1500 MET-minutes/week b) 7 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum Total physical activity of at least 3000 MET-minutes/week.

There is also one score about sitting question. This gives information about time spent in sedentary activity. It is not included summation of other scores (74).

3.2.2. Structured Questionnaire

The structured questionnaire prepared by researchers applied face to face interviews. The first part of questionnaire consisted of questions about age, gender, education level, occupation, marital status to understand socio-demographic carachterictics of participants while the second part was consisting of questions about dominancy, alcohol and smoking habits, diseases, and physical activity and exercise level to evaluate health status (Appendix 6).

3.2.3. Balance Evaluation

3.2.3.1. Static Balance Evaluation

Single Leg Stance Test (SLST) was applied to evaluate static balance. Postural steadiness in a static position is quantitatively assessed by this test (78). Its test-retest reliability has been accepted according to studies (79). The test prosedure was not standardized. Maximum time, leg selection, opening/closing eye, number of repetitions can change from one study to other (78). In this study, these procedures were used:

- Participants are evaluated with eyes-open and closed.
- Participant stands on one foot and other foot raised up without touching other leg. Then, feet were changed (80).
- Participants stand on one foot during 60s (78).
- When participant changed position and direction, opened eyes, or foot contacted thr floor or other foot, the test was terminated, and time recorded (81-83).

3.2.3.2. Dynamic Balance Evaluation

Dynamic Balace was evaluated by using Techno Body Prokin PK200 device (Figure 4). Prokin is a computerized advanced technology which contains classic tilting platform, connected to a monitor, and speaker which gives a visual and audio feedback when there is a movement changing of platform in any planes (84). Data conducting from platform transmitted to the computer by the wireless transmitter , and by this way, each angular movement are detected with chip in the platform. Platform is seen like a circle on the monitor, and volunteer tries to keep indicator on mid or inside of circle. Also, there are aplicators which are easy, medium and hard (Figure 5) (75).

For evaluation, the applicator is chosen and then, feet are nakedly placed to each side of the midlines for bipedal position, or one foot is nakedly placed to the midline. When the participant loses his/her balance or places foot to the floor, or there is a falling risk, the test is terminated (80).

FIGURE 5: Techno Body Prokin PK200 device

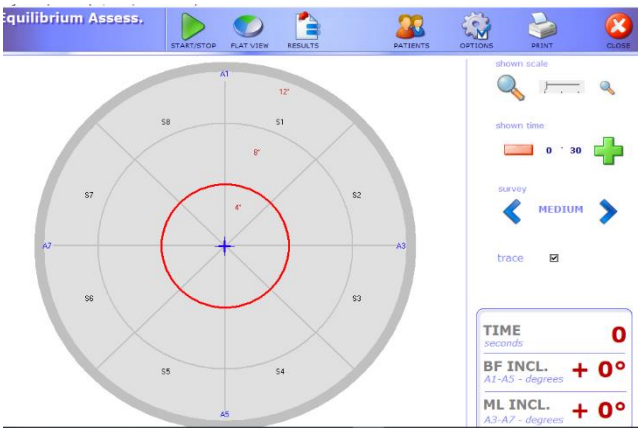

FIGURE 6: Prokin PK 200 Pc Screening Platform for Equilibrium Assessment

In this study, evaluations were conducted on the bipedal, right foot, and left foot, and an easy mode applicator was chosen. Participants were asked to keep indicators as possible as mid of the circle during 30s.

There are five parameters to evaluate resultswhich are (85) (Figure 6):

1. Perimeter length=The number of total degrees done during the exercise.

2. Area gap percentage=The percentage of the area included in the drawn on flat view trace in respect to the reference circle.

3. Medium speed=The average number of covered degrees for second.

4. Medium equilibrium center-AP=The average among the values reached on the backward-forward axis.

5. Medium equilibrium center-ML=The average among the values reached on the medium-lateral axis.

FIGURE 7: Equilibrium test results

Moreover, the score "0" in area gap percentage means that there is no significant change in the degree of movement, positive results of AP means that platform inclines on the anterior way, and positive results of ML shows that platform deviates on right footway (85).

3.2.4. Posture Evaluation

New York Posture Rating Scale (NYPR) was used to evaluate participants' postures. In 1958, NYPR was published as "The New York Physical Fitness Test", then, in 1992, it was modified by Howley and Franks (86). It is an easy, acceptable and cost-effective test (87). In 1958 version, this test gives information about posture from the posterior and lateral view. There are 13 parameters which identify postural changes in positions of the head, shoulder, spine, cervical, thoracic and lumbar region, hip, and feet

(86, 88). In this test, participant must be taken off clothes or wear light clothes (89). They are assessed in anatomical posture (86). Each body part is scored 5 (correct posture), 3 (slight deviation), or 1 (pronounced deviation). The total score can be maximum of 65, minimum 13 (86, 88) (Appendix 7). According to these scores, a standardized evaluation score chart was developed (88) (Table 1).

TABLE 1: Posture Evaluation Score Table (86, 88)

Total Score	**Classification**
≥45	Very good
40-44	Good
30-39	Moderate
20-29	Nearly Poor
≤19	Poor

3.2.5. Evaluation of Quality of Life

Nottingham Health Profile(NHP) was used to evaluate participants' quality of life. NHP measures health status by recording troubles of participants about physical, emotional and social fields. Its reliability and validity were developed in UK and used in different health problem and general population studies (90, 91). Then, it was adapted to Turkish because of its simple instructions, easy application, and valuable measure to identify muscoloskeletal impairments and chronic disabilities (91). NHP consists of 38 items divided into subsections as physical mobility, pain, sleep, emotional reactions, social isolation, and energy level. Also, there is a part which contains seven question about problems because of health problem. There are "yes" or "no" questions and these are scored different quantities. The sum of these scores gives information us about health profile (91, 92). Scores range from 0(named as normal health) to 100 (named as very poor health) (92) (Appendix 8).

3.2.6. Evaluation of Anxiety Level

Beck Anxiety Inventory (BAI) was used to assess anxiety level. BAI was developed to measure anxiety for psychiatric patient. It is also simple and brief. The clinical researches conducted on anxious and depressed patients in mental health care showed that BAI can significantly discriminate anxiety from depression (93, 94). Validation of this scale conducted on psychiatric patients diagnosed with Structured Clinical Inverview for DSM-III,and test-re-test reliability was found high (93, 95). It was into translated to Turkish by psychologists and back-translation was done by different instructors from Bilkent University. Then, Turkish version of BAI was accepted (94) (Appendix 9).

The BAI has 21 items describing anxiety symptoms and measuring anxiety level (93, 94). Four of these items define anxious mood; three of items evaluate specific fears; other items examine the symptoms about hyperactivity and motor tension because of anxiety disorder and panic (94). Participants are asked to answer about symptoms seen in the past week. Each item has 4 pointing scale which ranges from 0 (not at all) to 3 (severely, I could barely stand it). The total score changes from minimum of 0 to maximum of 63 (93, 94, 96). According to guidelines (Table 2), scores are defined as (96);

TABLE 2: Beck Anxiety Inventory Score Table (96)

Total Score	**Classification**
0-9	Normal or no anxiety
10-18	Mild to moderate anxiety
19-29	Moderate to severe anxiety
30-63	Severe anxiety

3.2.7. Evaluation of Depression Level

Beck Depression Inventory (BDI) was used to assess depression level of participants. BDI was firstly introduced in 1961. Then its revision was developed by Beck et al. in 1971. It was used to evaluate the psychiatric population in these years (97). Then, BDI ,which its psychometric properties have been reviewed by Beck,Steer , and Garbin,

is commonly used to measure the severity of depression of the normal population (97, 98). BDI was found reliable to use in non-psychiatric population. The content and convert validity were found high (99). Also, Turkish version of BDI for university student conducted by Hisli was found valid and reliable (100) (Appendix 10).

BDI consists of 21 items determined according to clinical observation of symptoms. Each item is rated from 0 to 3 in terms of intensity. Total score is calculated by summation of these item scores (97). The total score changes from minimum of 0 to maximum of 63. If participant's score is higher than 19, participant must be evaluated by other psychological tests (100) (Table 3) ;

TABLE 3: Beck Depression Inventory Score Table (100)

Total Score	**Classification**
0-9	Normal or no depression
10-18	Mild depression
19-29	Moderate depression
30-63	Severe depression

3.3. STATISTICAL ANALYSIS

"Statistical Package for Social Sciences"(SPSS) Version 21.0 (SPSS inc., Chicago, IL, ABD) program was used for data analysis. Randomization was conducted by registration number. Before the statistical analysis, a "**Kolmogorov–Smirnov test"** was used to assess the distribution of data. A parametric test was used for normally distributed data (dynamic balance, posture, anxiety and depression) and a non-parametric test was used for data that was not normally distributed (static balance and quality of life).

Demographic and clinical baseline variables were compared between groups using a **"One-way analysis of variance (one-way ANOVA)"** for continuous variables and a **"Chi-square test"** for categorical data. The variables were defined as mean, standard deviation (SD), confidence interval (95% CI) and percentage values. A "**Paired Sample t-test"** and **"Wilcoxon Signed Rank test"** were used to carry out the changes within group.

A "**Kruskal-wallis H-test"** was conducted for comparing the effect of interventions on static balance and quality of life between groups. A **"2x4 mixed model repeated measure analysis of variance (Ranova)"** was conducted with time (baseline and after 6-weeks intervention) as within-subject variable and group (Group 1, Group 2, Group 3, and Group 4) as between-subjects variable to assess the effect of interventions on dynamic balance, posture, anxiety and depression. In the case of significant differences, the post-hoc "Least Significant Difference" (LSD) test was used to interpret the differences between the groups. By applying Bonferroni correction to decrease the level of error, level of significance was considered as $p < 0.025$. Effect size was calculated by using the equation as following (101):

"Effect Size (ES) = The difference between measurements (after 6-week intervention-baseline)/ Standard deviation of baseline value"

ES was elucidated as small 0.20–0.50; moderate 0.51–0.80 and large >0.81 (101). Significance level was set as $p<0.05$.

4. RESULTS

Fifty-two healthy women adults characterized by a mean (SD) age of 40.81 (9.75) years were screened for possible inclusion in the study. Of these patients, 15 did not satisfy the inclusion criteria, and 7 declined to participate. Over 40 adults, 10 healthy women adults were randomized to the Sensory Based Activity Group (Group 1), ten of these participants were randomized to Mat Modified Pilates Group (Group 2), ten of them were randomized to Active Control Group (Group 3), and ten of participants, excluded because of not meeting inclusion criteria, were added to Sedentary Control Group (Group 4). Moreover, 3 of the participants, which two of them was from Group 2 and one of them was from Group 4, stopped participation while interventions were continuing. The analysis presented here accordingly focuses on 37 healthy women adults. These patients were analyzed after the 6-week interventions (Chart 1).

4.1. Sociodemographic Characteristics

The age, height, weight, body mass index, dominant hand, dominant foot, marital status, working status, duration of participating in the national folk dance and level of physical activity in the study groups were given in Table 4.1.1. There were no statistically significant differences in terms of age, height, weight, body mass index, dominant hand, dominant foot between groups ($p>0,05$) (Table 4.1.1).

When comparing of the participants for sociodemographic characteristics in four groups, there were statistically significant differences between groups in terms of marital status and working status ($p=0.001$ and $p=0.002$, respectively). In addition, duration of the participating in the national folk dance and level of physical activity in the Group 1, Group 2, and Group 3 significantly differed from Group 4 ($p<0.05$) (Table 4.1.1).

Table 4.1.1 Baseline characteristics of participants

	Groups					
	Group 1 (n=10)	**Group 2 (n=8)**	**Group 3 (n=10)**	**Group 4 (n=9)**	**F(x^2)**	**P***
Age (years)	45.00±8.96	35.25±8.87	41.90±7.06	39.88±12.55	1.63	0.20
Height (cm)	165±0.04	162±0.07	162±0.05	161±0.07	0.49	0.68
Weight (kg)	65.95±14.68	60.62±12.39	64.40±7.86	65.00±7.76	0.37	0.77
BMI (kg\m^2)	24.23±5.65	22.89±3.94	24.26±2.04	24.85±2.97	0.37	0.77
Dominant Hand						
Right	9(90%)	7(87.5%)	9(90%)	9(100%)	1.09	0.77**
Left	1(10%)	1(12.5)	1(10%)	0 (0%)		
Dominant Foot						
Right	8(80%)	8(100%)	9(90%)	9(100%)	3.40	0.32**
Left	2(20%)	0 (0%)	1(10%)	0 (0%)		
Marital Status						
Married	8(80%)	8(100%)	10(100%)	5(55.6%)	20.75	***0.001*****
Single	2(20%)	0 (0%)	0 (0%)	4(44.4)		
Working Status						
Yes	1(10%)	7(87.5%)	2(20%)	6(66.7%)	15.10	***0.002*****
No	9(90%)	1(12.5)	8(80%)	3(33.3%)		
National folk dance (months)	26.40±13.32	33.00±21.98	13.30±8.30	0.00±0.00	11.07	***0.001***
National folk dance (day/wk)	1.70±0.48	1.00±0.00	1.60±0.69	0.00±0.00	28.88	***0.001***
IPAQ-short form (MET.min/wk)	3230.95±2860.22	1161.56±388.69	1959.90±1290.05	364.77±206.79	5.18	***0.005***

Group 1: Sensory Based Activity; Group 2: Mat Modified Pilates; Group 3: Active Control; Group 4: Sedentary Control.

Abbreviations: BMI, body mass index; IPAQ-short form, International Physical Activity Questionnaire Short Form; MET, The Metabolic Equivalent of Task; Min, Minute; Wk, Week.

*One-way analysis of variance, the level of significance set at $p<0.05$.

**Chi Square test, the level of significance set at $p<0.05$.

4.2. Comparison of the balance and posture between groups before intervention

Static and dynamic balance and posture between groups before intervention were compared by using One-way analysis of variance (ANOVA). There was no significantly difference between groups on bipedal position and right foot ($p>0.05$). However, some values of dynamic balance on the left foot were significantly different between Group 1 and other groups ($p<0.05$). The results of PL, AGP and MS on left foot were high in Group 1 (Table 4.2.1).

Table 4.2.1 Comparison of the balance and posture between groups before intervention

	Groups				One way ANOVA			
	Group 1 (n=10)	Group 2 (n=8)	Group 3 (n=10)	Group 4 (n=9)	F	p*	LSD Grup	LSD P*
Static Balance								
Eyes Opened								
Right	41.20±24.64	60.00±0.00	53.20±15.09	42.88±24.41	1.87	0.15	-	-
Left	51.10±15.82	60.00±0.00	49.00±22.42	45.55±19.48	1.07	0.37	-	-
Eyes Closed								
Right	11.60±9.90	10.62±9.42	13.00±18.46	5.66±3.16	0.67	0.57	-	-
Left	16.20±19.67	19.75±18.85	9.70±17.77	10.66±16.80	0.59	0.62	-	-

Dynamic Balance								
Bipedal Position								
PL (°)	422.30±67.01	351.19±71.76	356.02±73.94	382.34±78.04	1.91	0.14	-	-
AGP (%)	42.82±11.53	31.86±13.24	34.63±13.27	35.22±14.81	1.18	0.33	-	-
MS (°/sec)	14.08±2.23	11.28±2.36	12.19±2.28	12.74±2.60	2.22	0.10	-	-
MEC-AP (°)	-0.62±2.64	-0.59±2.39	-0.20±2.20	-0.01±2.72	0.13	0.94	-	-
MEC-ML (°)	0.36±1.78	1.43±1.79	0.52±0.98	0.22±3.24	0.56	0.64	-	-
Right Foot								
PL (°)	413.55±110.52	282.16±77.13	297.00±92.92	372.73±180.15	2.44	0.08	-	-
AGP (%)	14.37±6.93	6.56±6.86	13.50±13.29	11.43±17.63	0.71	0.54	-	-
MS (°/sec)	13.78±3.68	9.53±2.69	9.91±3.08	12.42±6.00	2.33	0.09	-	-
MEC-AP (°)	0.52±1.61	0.38±1.59	0.55±2.42	-0.96±2.32	1.16	0.33	-	-
MEC-ML (°)	0.79±1.14	1.52±2.05	0.74±1.32	1.84±4.11	0.46	0.70	-	-

Left Foot								
PL (°)	408.87±88.03	310.37±78.31	303.22±74.22	362.33±130.55	7.22	***0.001***	1-2	***0.001***
							1-3	***0.001***
							1-4	***0.01***
							2-3	0.87
							2-4	0.26
							3-4	0.18
AGP (%)	20.22±6.72	9.01±11.37	8.52±9.10	12.81±9.66	3.32	***0.03***	1-2	***0.01***
							1-3	***0.008***
							1-4	0.08
							2-3	0.91
							2-4	0.40
							3-4	0.31
MS (°/sec)	15.96±3.01	10.34±2.61	10.13±2.52	12.07±4.35	6.87	***0.001***	1-2	***0.001***
							1-3	***0.001***
							1-4	***0.01***
							2-3	0.88
							2-4	0.27
							3-4	0.19
MEC-AP (°)	0.74±2.19	0.70±2.11	1.00±2.34	2.25±3.57	1.81	0.16	-	-
MEC-ML (°)	-1.83±1.22	-0.84±1.84	-1.23±1.88	-0.70±2.24	0.73	0.54	-	-
New York Posture	51.00±5.81	54.00±4.00	52.80±5.02	52.55±4.66	0.55	0.64	-	-

Group 1: Sensory Based Activity; Group 2: Mat Modified Pilates; Group 3: Active Control; Group 4: Sedentary Control.

Abbreviations: PL, Perimeter Lenght; AGP, Area Gap Percentage; MS, Medium Speed; MEC-AP, Medium Equilibrium Center-Anterior Posterior; MEC-ML, Medium Equilibrium Center-Medial Lateral, Sec, Second; LSD, Least Significant Difference.

*One-way analysis of variance, the level of significance set at $p<0.05$.

4.3. Comparison of the quality of life, anxiety and depression between groups before intervention

When comparing the groups for quality of life, anxiety and depression before the intervention, there were no statistically significant differences between groups ($p>0.05$) (Table 4.3.1).

Table 0.1 Comparison of the quality of life, anxiety and depression between groups before intervention

	Groups					
	Group 1 (n=10)	**Group 2 (n=8)**	**Group 3 (n=10)**	**Group 4 (n=9)**	**F**	**p***
Nottingham Health Profile						
Energy	28.72±32.78	22.30±25.19	15.04±26.46	27.55±34.76	0.41	0.74
Pain	21.67±27.56	9.33±9.77	8.33±17.00	19.16±18.02	1.12	0.34
Emotional Reactions	10.74±10.71	6.62±5.66	5.24±7.42	16.85±13.14	2.61	0.06
Sleep	26.71±29.75	3.59±6.72	7.76±20.51	29.91±25.22	3.03	0.05
Social Isolation	4.45±14.08	1.99±5.64	1.59±5.05	6.07±12.70	0.38	0.76
Physical Mobility	11.00±11.41	9.63±9.31	15.76±11.20	6.07±12.70	1.27	0.29
Beck Anxiety Inventory	15.30±10.79	12.50±8.76	7.90±7.46	11.22±5.09	1.34	0.24
Beck Depression Inventory	9.10±5.21	6.00±3.92	7.30±6.11	10.33±4.76	1.21	0.32

Group 1: Sensory Based Activity; Group 2: Mat Modified Pilates; Group 3: Active Control; Group 4: Sedentary Control.

*One-way analysis of variance, the level of significance set at $p<0.05$.

4.4. Comparison of the static balance within group and between groups after intervention

A Wilcoxon Signed-Rank test was used to compare the results of the single leg stance test on both feet with eyes-closed or eyes-open values within group after 6-week intervention. When static balance assessment results were examined, there was no statistically significant difference after 6-week intervention in all groups ($p>0.05$) (Table 4.4.1).

A Kruskal Wallis test was used to analysis the results of the single leg stance test on both feet with eyes-closed or eyes-open values between groups after 6-week intervention. The findings demonstrated no statistically significant difference in terms of static balance after 6-week intervention between groups ($p>0.05$) (Table 4.4.1).

Table 4.4.1 Comparison of the static balance within group and between groups after intervention

	Baseline Mean±SD	After Intervention Mean±SD	Wilcoxon Signed-Rank test	Within-group changes [95% CI]	Effect Size	Kruskal Wallis test			
			p*			H	p	Mann Whitney U test	
								Group	p*
Eyes Opened (Sec)									
Right									
Group 1	41.20±24.64	43.60±22.75	0.91	2.40[-56.00-54.00]	0.09	3.09	0.37	-	-
Group 2	60.00±0.00	59.62±1.06	0.31	-0.37[-3.00-0.00]	-				
Group 3	53.20±15.09	58.30±4.71	0.28	5.10[-2.00-44.00]	0.33				
Group 4	42.88±24.41	53.00±14.38	0.06	10.11[0.00-53.00]	0.41				
Left									
Group 1	51.10±15.82	52.40±17.79	0.89	1.30[-55.00-46.00]	0.08	0.64	0.88	-	-
Group 2	60.00±0.00	54.62±12.61	0.18	-5.37[-36.00-0.00]	-				
Group 3	49.00±22.42	49.80±14.64	0.89	0.80[-37.00-53.00]	0.03				
Group 4	45.55±19.48	46.11±21.77	0.71	0.55[-14.00-24.00]	0.02				

Eyes Closed (Sec)									
Right									
Group 1	11.60±9.90	15.50±11.15	0.19	3.90[-21.00-20.00]	0.39	3.65	0.30	-	-
Group 2	10.62±9.42	21.00±21.19	0.06	10.37[3.00-32.00]	1.10				
Group 3	13.00±18.46	20.90±23.58	0.61	7.90[-34.00-57.00]	0.42				
Group 4	5.66±3.16	8.11±7.92	0.48	2.44[-7.00-17.00]	0.77				
Left									
Group 1	16.20±19.67	18.20±15.95	0.68	2.00[-44.00-46.00]	0.10	4.41	0.22	-	-
Group 2	19.75±18.85	24.12±23.88	0.61	4.37[-28.00-37.00]	0.23				
Group 3	9.70±17.77	17.70±22.04	0.37	8.00[-5.00-43.00]	0.45				
Group 4	10.66±16.80	6.77±6.32	0.86	-3.88[-50.00-19.00]	0.23				

Group 1: Sensory Based Activity; Group 2: Mat Modified Pilates; Group 3: Active Control; Group 4: Sedentary Control.

Abbreviations: SD, Standard Deviation; CI, Confidence Interval; Sec, Second.

* Kruskal-Wallis H test, the level of significance set at $p<0.05$.

4.5. Comparison of the dynamic balance within group and between groups after intervention

The comparisons of mean values of the dynamic balance within and between groups after intervention were shown in Table 4.5.1, Table 4.5.2 and Table 4.5.3.

Paired Sample t- test was used to analize the results of dynamic balance within groups while 2x4 mixed Modal ANOVA was using to evaluate the results of dynamic balance between groups.

The findings revealed that there were no differences between PL, MS and AP on bipedal position after 6-week intervention , but AGP was significantly different in Group 1 and Group 2 ($p=0.04$), and ML value was different in Group 1 ($p=0.04$). The values of AGP decreased in these two groups while ML equilibrium was changing to negative way (Table 4.5.1).

Also, the changing among MS values on bipedal position was different between Group 1 and Group 2 after intervention ($p<0.05$). The effect size was higher in group 1 than the other groups, and the effect size was found modarate level which is 0.57. The significantly difference among PL, AGP, AP and ML values was not seen between groups ($p>0.05$) (Table 4.5.1).

The dynamic balance valuations on the right foot were statisticaly changed only in PL and MS within Group 3 ($p=0.01$). These values increased after six weeks (Table 4.5.2).

The improvement in PL, AGP, and MS values on left foot after 6- weeks interventions only was observed within Group 1 ($p=0.01$). Besides, variations of PL and MS values on left foot was significantly different between Group 1 and other groups ($p<0.05$). The effect size was higher in group 1 than the other groups. The effect size for PL value was found very low which is 0.20 ,but the effect size for MS value was large level which is 0.97. On the other hand, ML equilibrium was changed in a negative way within Group 4 ($p=0.03$) (Table 4.5.3).

Table 4.5.1 Comparison of dynamic balance on bipedal position within group and between groups after intervention

	Baseline Mean±SD	After Intervention Mean±SD	Paired Sample t-test	*Within-group changes [95% CI]*	Effect Size	ANOVA			
			p*			F	p	LSD Group	LSD p**
Dynamic Balance									
Perimeter Lenght (°)									
Group 1	422.30±67.01	383.97±98.68	0.16	-38.32[-151.47-	0.57	2.45	0.08	-	-
Group 2	351.19±71.76	306.51±59.57	0.15	-44.68[-175.67-	0.62				
Group 3	356.02±73.94	382.77±78.53	0.44	26.74[96.68-192.81]	0.36				
Group 4	382.34±78.04	396.68±50.55	0.55	14.34[-84.46-167.18]	0.18				
Area Gap Percentage (%)									
Group 1	42.82±11.53	30.21±11.93	***0.04***	-12.61[-43.38-6.52]	1.09	1.69	0.18	-	-
Group 2	31.86±13.24	20.06±13.47	***0.04***	-11.79[-27.23-14.08]	0.89				
Group 3	34.63±13.27	31.78±13.45	0.53	-2.85[-19.72-25.71]	0.21				
Group 4	35.22±14.81	31.09±11.95	0.52	-4.12[-31.35-17.14]	0.27				
Medium Speed (°/sec)									
Group 1	14.08±2.23	12.79±3.28	0.16	-1.28[-5.05-2.15]	0.57	***2.80***	***0.04***	1-2	***0.009***
Group 2	11.28±2.36	10.21±1.98	0.17	-1.07[-3.33-2.37]	0.45			1-3	0.30
Group 3	12.19±2.28	12.75±2.61	0.60	0.56[-3.22-6.42]	0.24			1-4	0.62
Group 4	12.74±2.60	13.19±1.67	0.57	0.45[-2.89-5.57]	0.17			2-3	0.08
								2-4	0.03
								3-4	0.60

Medium Equilibrium Center-Anterior Posterior (°)									
Group 1	-0.62±2.64	-0.06±2.29	0.50	0.56[-3.49-4.21]	0.21	0.08	0.97	-	-
Group 2	-0.59±2.39	-0.84±2.14	0.80	-0.24[-5.25-3.23]	0.10				
Group 3	-0.20±2.20	-0.71±1.85	0.47	-0.51[-2.54-2.70]	0.23				
Group 4	-0.01±2.72	-0.51±3.00	0.63	-0.49[-4.27-4.57]	0.18				
Medium Equilibrium Center-Medial Lateral (°)									
Group 1	0.36±1.78	-0.22±1.57	***0.04***	-0.59[-2.27-0.87]	0.32	0.49	0.68	-	-
Group 2	1.43±1.79	0.36±1.99	0.28	-1.07[-4.94-2.97]	0.59				
Group 3	0.52±0.98	0.06±1.17	0.40	-0.46[-3.38-2.06]	0.46				
Group 4	0.22±3.24	0.24±1.39	0.98	0.02[-4.92-3.59]	0.006				

Group 1: Sensory Based Activity; Group 2: Mat Modified Pilates; Group 3: Active Control; Group 4: Sedentary Control.

Abbreviations: SD, Standart Deviation; CI, Confidence Interval; Sec, Second; LSD, Least Significant Difference.

*Repeated measure analysis of variance, the level of significance set at $p<0.05$.

**The level of significance was accepted as $p^{**}= 0.05/2=0.025$ after the Bonferroni correction.

Table 4.5.2 Comparison of the dynamic balance on right foot within group and between groups after intervention

	Baseline Mean±SD	After Intervention Mean±SD	Paired Sample t-test		Effect Size	ANOVA			
			p*	*Within-group changes [95% CI]*		F	p	LSD Group	LSD p**
Perimeter Lenght (°)									
Group 1	413.55±110.52	358.54±111.51	0.17	-55.00[-207.38-	0.49	1.85	0.15	-	-
Group 2	282.16±77.13	292.22±72.31	0.75	10.05[-85.83-155.25]	0.13				
Group 3	297.00±92.92	337.96±84.37	***0.01***	40.95 8-12.30-107.97]	0.44				
Group 4	372.73±180.15	364.91±130.54	0.86	-7.82[-217.11-191.79]	0.04				
Area Gap Percentage (%)									
Group 1	14.37±6.93	12.66±13.08	0.65	-1.70[-19.05-20.58]	0.24	0.60	0.61	-	-
Group 2	6.56±6.86	7.63±10.44	0.77	1.07[-11.74-12.94]	0.15				
Group 3	13.50±13.29	13.43±13.21	0.98	-0.06[-14.59-27.01]	0.005				
Group 4	11.43±17.63	13.42±16.04	0.64	1.98[-17.20-20.33]	0.11				

Medium Speed (°/sec)									
Group 1	13.78±3.68	11.95±3.71	0.17	-1.82[-6.91-5.18]	0.49	1.78	0.16	-	-
Group 2	9.53±2.69	9.74±2.40	0.84	0.22[-3.74-5.18]	0.07				
Group 3	9.91±3.08	11.27±2.79	***0.01***	1.36[-0.41-3.60]	0.44				
Group 4	12.42±6.00	12.05±4.24	0.81	-0.37[7.24-6.39]	0.06				
Medium Equilibrium Center-Anterior Posterior (°)									
Group 1	0.52±1.61	-0.34±1.59	0.24	-0.86[-3.73-2.48]	0.33	0.18	0.90	-	-
Group 2	0.38±1.59	-0.92±1.23	0.11	-1.31[-5.30-1.55]	0.81				
Group 3	0.55±2.42	0.18±3.06	0.43	-0.37[-2.50-1.18]	0.15				
Group 4	-0.96±2.32	1.25±3.74	0.21	2.22[-1.97-14.43]	0.95				
Medium Equilibrium Center-Medial Lateral (°)									
Group 1	0.79±1.14	1.38±1.71	0.42	0.58[-1.45-6.22]	0.51	0.32	0.80	-	-
Group 2	1.52±2.05	0.61±2.45	0.08	-0.91[-2.88-0.78]	0.44				
Group 3	0.74±1.32	0.09±1.63	0.22	-0.64[-3.86-1.34]	0.49				
Group 4	1.84±4.11	0.79±2.81	0.24	-1.04[-6.16-2.03]	0.25				

Group 1: Sensory Based Activity; Group 2: Mat Modified Pilates; Group 3: Active Control; Group 4: Sedentary Control.
Abbreviations: SD, Standart Deviation; CI, Confidence Interval; Sec, Second; LSD, Least Significant Difference.
*Repeated measure analysis of variance, the level of significance set at $p<0.05$.
**The level of significance was accepted as $p^{**}= 0.05/2=0.025$ after the Bonferroni correction

Table 4.5.3 Comparison of the dynamic balance on left foot within group and between groups after intervention

	Baseline Mean±SD	After Intervention Mean±SD	Paired Sample t-test		Effect Size	ANOVA			
								LSD	
			p*	*Within-group changes [95% CI]*		F	p	Group	p**
Perimeter Lenght (°)									
Group 1	408.87±88.03	391.12±125.19	***0.01***	-89.74[-217.83-97.76]	0.20	***4.19***	***0.01***	1-2	***0.005***
Group 2	310.37±78.31	307.62±136.54	0.96	-2.75[-147.53-341.56]	0.03			1-3	***0.005***
Group 3	303.22±74.22	325.57±64.31	0.26	22.34[-67.84-98.20]	0.29			1-4	0.12
Group 4	362.33±130.55	381.81±112.30	0.45	19.47[-100.64-135.67]	0.14			2-3	0.90
								2-4	0.15
								3-4	0.17
Area Gap Percentage (%)									
Group 1	20.22±6.72	10.51±9.89	***0.01***	-9.71[-25.85-3.13]	1.44	1.00	0.40	-	-
Group 2	9.01±11.37	8.61.12.33	0.95	-0.39[-19.33-32.60]	0.03				
Group 3	8.52±9.10	13.41±8.18	0.06	4.89[-6.45-16.74]	0.53				
Group 4	12.81±9.66	11.93±13.29	0.79	-0.87[-13.80-20.94]	0.09				

Medium Speed (°/sec)									
Group 1	15.96±3.01	13.03±4.17	***0.01***	-2.92[-7.26-3.26]	0.97			1-2	***0.006***
Group 2	10.34±2.61	10.25±4.54	0.96	-0.09[-4.92-11.38]	0.03	***4.07***	***0.01***	1-3	***0.005***
Group 3	10.13±2.52	10.85±2.31	0.29	0.72[-2.26-3.61]	0.28			1-4	0.13
Group 4	12.07±4.35	12.73±3.74	0.45	0.65[-3.35-4.53]	0.15			2-3	0.89
								2-4	0.15
								3-4	0.17
Medium Equilibrium Center-Anterior Posterior (°)									
Group 1	0.74±2.19	0.16±1.96	0.16	-0.58[-2.09-1.43]	0.26				
Group 2	0.70±2.11	-0.97±1.84	0.70	-0.27[-3.25-2.79]	0.79	2.15	0.11	-	-
Group 3	1.00±2.34	-0.34±2.94	0.09	-1.35[-4.61-1.89]	0.57				
Group 4	2.25±3.57	1.73±2.74	0.52	-0.52[-4.52-2.62]	0.14				
Medium Equilibrium Center-Medial Lateral (°)									
Group 1	-1.83±1.22	-2.14±1.74	0.55	-0.30[-3.05-1.45]	0.25				
Group 2	-0.84±1.84	-1.31±2.50	0.70	-0.47[-7.35-3.37]	0.25	0.90	0.45	-	-
Group 3	-1.23±1.88	-0.93±1.48	0.73	0.30[-3.41-6.81]	0.15				
Group 4	-0.70±2.24	-2.34±2.03	***0.03***	-1.63[-4.70-1.37]	0.73				

Group 1: Sensory Based Activity; Group 2: Mat Modified Pilates; Group 3: Active Control; Group 4: Sedentary Control.

Abbreviations: SD, Standart Deviation; CI, Confidence Interval; Sec, Second; LSD, Least Significant Difference.

*Repeated measure analysis of variance, the level of significance set at $p<0.05$.

**The level of significance was accepted as $p^{**}= 0.05/2=0.025$ after the Bonferroni correction.

4.6. Comparison of the posture within group and between groups after intervention

When the differences on posture values within groups were analized by Paired Sample t-test, this result found that the posture significantly merely improved within Group 1 (p=0.02) However there was no difference between other groups on ANOVA test (p>0.05) (Table 4.6.1).

Table 4.6.1 Comparison of the posture within group and between groups after intervention

	Baseline Mean±SD	After Intervention Mean±SD	Paired Sample t-test	*Within-group changes [95% CI]*	Effect Size	ANOVA			
			p*			F	p	LSD Group	LSD p**
New York Posture Rating Scale									
Group 1	51.00±5.81	56.20±3.01	***0.02***	5.20[-2.00-16.00]	0.89	0.86	0.46	-	-
Group 2	54.00±4.00	55.00±3.20	0.54	1.00[-6.00-6.00]	0.25				
Group 3	52.80±5.02	53.20±3.32	0.85	0.40[-6.00-14.00]	0.07				
Group 4	52.55±4.66	51.66±3.16	0.51	-0.88[-6.00-6.00]	0.19				

Group 1: Sensory Based Activity; Group 2: Mat Modified Pilates; Group 3: Active Control; Group 4: Sedentary Control.
Abbreviations: SD, Standart Deviation; CI, Confidence Interval; Sec, Second; LSD, Least Significant Difference.
*Repeated measure analysis of variance, the level of significance set at p<0.05.
The level of significance was accepted as p= 0.05/2=0.025 after the Bonferroni correction.

4.7. Comparison of the Quality of Life within Group and Between Groups after Intervention

According to Wilcoxon Signed-Rank test, there was only a statistically significant decrease in Emotional Reactions after 6-week interventions (p=0.02)(Table 4.7.1). In contrast, other parameters did not improve after interventions. Besides, there was no difference between groups (Table 4.7.1).

Table 4.7.1 Comparison of the Quality of Life within Group and Between Groups after Intervention

	Baseline Mean±SD	**After Intervention Mean±SD**	**Wilcoxon Signed-Rank test**	***Within-group changes [95% CI]***	**Effect Size**	**Kruskal Wallis test**			
			p*			**H**	**p**	**Mann Whitney U test**	
								Group	**p***
Nottingham Health Profile									
Energy									
Group 1	28.72±32.78	16.08±32.22	0.06	-12.64[-39.20-0.00]	0.38	1.69	0.63	-	-
Group 2	22.30±25.19	12.50±17.79	0.27	-9.80[-39.20-36.80]	0.38				
Group 3	15.04±26.46	24.56±24.76	0.46	9.52[-39.20-60.80]	0.35				
Group 4	27.55±34.76	20.80±33.15	0.59	-6.75[-63.20-39.20]	0.19				

Pain									
Group 1	21.67±27.56	11.33±8.68	0.26	-10.34[-67.64-12.41]	0.37	4.29	0.23	-	-
Group 2	9.33±9.77	7.75±12.29	0.68	-1.57[-17.05-16.60]	0.16				
Group 3	8.33±17.00	7.36±11.08	0.68	-0.97[-20.86-12.91]	0.05				
Group 4	19.16±18.02	28.65±32.75	0.23	9.48[-10.49-53.51]	0.52				
Emotional Reactions									
Group 1	10.74±10.71	7.01±15.65	0.35	-3.72[-24.42-39.47]	0.34	4.11	0.24	-	-
Group 2	6.62±5.66	3.05±8.63	0.48	-3.57[-9.76-10.47]	0.63				
Group 3	5.24±7.42	0.00±0.00	0.05	-5.24[-21.03-0.00]	0.70				
Group 4	16.85±13.14	3.79±5.80	***0.02***	-13.05[-34.89-0.00]	0.99				
Sleep									
Group 1	26.71±29.75	14.26±24.06	0.13	-12.45[-52.49-16.10]	0.41	3.12	0.37	-	-
Group 2	3.59±6.72	9.45±15.52	0.28	5.86[-12.57-43.36]	0.87				
Group 3	7.76±20.51	2.51±5.29	0.65	-5.24[-65.06-12.57]	0.25				
Group 4	29.91±25.22	21.67±26.45	0.23	-8.23[-39.83-55.93]	0.32				

Social Isolation									
Group 1	4.45±14.08	2.01±6.36	0.31	-2.44[-24.41-0.00]	0.17	0.76	0.85	-	-
Group 2	1.99±5.64	3.99±7.39	0.31	1.99[0.00-15.97]	0.35				
Group 3	1.59±5.05	5.81±18.37	0.65	4.21[-15.97-58.11]	0.83				
Group 4	6.07±12.70	3.92±11.77	0.31	-2.15[-19.36-0.00]	0.16				
Physical Mobility									
Group 1	11.00±11.41	7.97±9.36	0.86	-3.03[-32.29-11.54]	0.26	1.31	0.72	-	-
Group 2	9.63±9.31	8.26±11.40	0.89	-1.37[-21.99-11.32]	0.14				
Group 3	15.76±11.20	5.62±7.87	0.59	-0.14[-12.61-11.54]	0.90				
Group 4	6.07±12.70	3.92±11.77	0.14	-4.56[-21.99-1.47]	0.16				

Group 1: Sensory Based Activity; Group 2: Mat Modified Pilates; Group 3: Active Control; Group 4: Sedentary Control.
Abbreviations: SD, Standart Deviation; CI, Confidence Interval.
*Kruskal-Wallis H test, the level of significance set at $p<0.05$.

4.8. Comparison of the Anxiety and Depression within Group and Between Groups after Intervention

Paired Sample t-test was used to analyze anxiety and depression level. Anxiety and depression level did not significantly reduce after interventions except for Group 3 (Table 4.8.1). There was no diffirance between groups according to ANOVA analysis test (p>0.05).

Table 4.8.1 Comparison of the Anxiety and Depression within Group and Between Groups after Intervention

	Baseline Mean±SD	After Intervention Mean±SD	Paired Sample t-test		Effect Size	ANOVA			
			p*	*Within-group changes [95% CI]*		F	p	LSD	
								Group	p*
Beck Anxiety Inventory									
Group 1	15.30±10.79	11.80±8.94	0.22	-3.50[-15.00-8.00]	0.32	1.75	0.17	-	-
Group 2	12.50±8.76	5.12±4.54	0.07	-7.37[-31.00-1.00]	0.84				
Group 3	7.90±7.46	5.50±6.96	***0.01***	-2.40[-7.00-1.00]	0.32				
Group 4	11.22±5.09	11.22±7.57	1.00	0.00[-9.00-7.00]	0				
Beck Depression Inventory									
Group 1	9.10±5.21	8.50±4.55	0.54	-0.60[-8.00-2.00]	0.11	1.86	0.15	-	-
Group 2	6.00±3.92	4.25±2.91	0.28	-1.75[-7.00-7.00]	0.44				
Group 3	7.30±6.11	6.20±3.58	0.45	-1.10[-9.00-5.00]	0.18				
Group 4	10.33±4.76	8.11±5.13	0.28	-2.22[-12.00-3.00]	0.46				

Group 1: Sensory Based Activity; Group 2: Mat Modified Pilates; Group 3: Active Control; Group 4: Sedentary Control.
Abbreviations: SD, Standart Deviation; CI, Confidence Interval; LSD, Least Significant Difference.
*Repeated measure analysis of variance, the level of significance set at p<0.05.

5. DISCUSSION

In this study, we compared the effectiveness of sensory-based activities and mat modified pilates exercises on balance, posture, quality of life, anxiety and depression in healthy women adults interesting amateur folk dance. The main outcome of this study is that sensory-based activities are affective in balance, posture, quality of life, anxiety and depression after a 6-week intervention. According to our results, Mat Modified Pilates exercises were also effective but it was not effective as sensory-based activities. But the effects of these activities and exercises in some parameters were not statistically meaningful.

The effectiveness of sensorial activities on static balance was observed in literature. Islam M. et al. studied on the older people 76 ages to find the effectiveness of sensory and muscular training, and they also found that this training method was effective on static balance of older people (102). Our results were not in accordance with that study. According to our findings, static and dynamic balance values were not different between groups and there was no statistically difference in the groups. After the interventions, it was observed that in the Group 1 (Sensory-Based Activity) increased the seconds passed while on right and left foot with eyes closed and opened, but it was not significantly meaningful (Table 4.4.1).

The importance of integration of vestibular, somatosensorial and visual inputs was reflected in text books. Because to create balance control, it is essential to integrate the sensorial feedbacks (33). According to the study of Fil A. (2013), the sensory integration therapy was found an effective method in balance and postural contol of patients with Parkinson (41). Moreover, the effectiveness of pilates methods on dynamic balance was also found by the researchers. Ju, H. et al. studied on the elderly people and they researched the effects of mat pilates exercises. In the exercises, they also used different unstable surfaces. In this way, they provide balance changes and also strengthening of the muscles. And, they found that the mat pilates exercises can be safe and chosen as an intervention to improve dynamic balance control (38). On this basis, in our study, also consistent with hypothesis, we found the same results with these studies. The dynamic balance results of our study showed that after the interventions, the PL, AGP, and MS parameters of dynamic balance on bipedal position changed positively in the sensory based activity and mat modified pilates exercises groups and the effect size of these changes were moderate ($p>0.05$). The AGP values of these groups meaningfully decreased after interventions and its effect size was high. Besides, when we compared the groups, the Sensory-based activity group showed significantly decreasing in the MS value from other groups

($p<0.05$) (Table 4.5.1). This means that this group provide dynamic balance control more quickly from other groups. Also, the PL, AGP, and MS values on left foot decreased in the Group 1 after sensory-based activites and the meaningful difference was found between the Group 1 and the others ($p<0.05$) (Table 4.5.3).

The sensorial inputs provide body awareness and postural control by using vestibular, visual and somatosensory systems. Therefore, the exercises which contain these inputs provide good posture (4, 103). While some researches conducted by using pilates methods give positive results about posture, some researches did not give positive results about the impact of the mat pilates exercises. For example, in a study conducted by Kloubec, j. in 2010, the pilates exercises, which do not require equipment and was done by healthy fifty 25-65 years, did not show improvement in posture (27). According to the results of our study, we observed that after sensory-based activities, the posture of the Group 1 was improved and its effect size was found high ($p<0.05$) (Table 4.6.1). Also, the improvement in the posture of the Group 2 and Group 3 was also seen, but it was not statistically significant.

Some studies conducted by using sensory-based activities or pilates method showed improvement in quality of life by enhancing posture, balance, body awareness and participating in social life (63, 104). No statistically significant improvement was found in all groups after the activity and the same results were obtained in group comparisons. But, we observed that there was an improvement in the quality of life in Group 1 after sensory-based activities. ($p>0.05$) (Table 4.7.1).

The researches showed that positively changes in the anxiety and depression level are observed after exercises. For example, Oeland, A. et al. studied with forthy eight psychiatric patients who participated in group exercises during twenty weeks. And it was found that the exercise methods are effective in the achievement of anxiety and depression (105). Also, Batya and Winnie demonstrated that by improving the sensory processing, the level of anxiety and depression can be decreased (68). Moreover, Essam and Manal searched the effect of pilates on depression degree in battered women, and found that the pilates exercises increase the serotonin level and decrease anxiety and depression level (106). Consistent with these studies, the level of anxiety and depression was not significantly changed after interventions. In the Group 1 and Group 2, a reducing in the level of anxiety and depression level after training methods, but it was not statistically meaningful ($p>0.05$) (Table 4.8.1).

There can be limitations of our study to affect the statistical meaningfulness of our results. First, the number of the participants can be more to prove significantly the effects of

exercises methods. Second, the durations of interventions may be longer than six week and the number of session may be more than one in a week.

6. CONCLUSION AND SUGGESTIONS

It can be concluded that the sensory-based activities are effective on dynamic balance in physically active healthy adult female.

The sensory-based activites can be used as a training method or routine activities to improve physical health.

For the future studies, the duration and the number of session of the sensory-based activities and mat modified pilates exercises can be increased to assess the long term effectiveness of these method on balance, posture, quality of life, anxiety and depression level.

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8. APPENDIX

APPENDIX 8.1: ETHICAL COMMITTEE APPROVAL

T.C. YEDİTEPE ÜNİVERSİTESİ

Sayı : 37068608-6100-15-1488 **17/05/2018**
Konu: Klinik Araştırmalar
Etik kurul Başvurusu hk.

İlgili Makama (Burçin Çolakoğlu)

Sağlık Bilimleri Üniv. Fizyoterapi ve Rehabilitasyon Bölümü Yrd. Doç. Dr. Zuhal Didem Takinacı'nın sorumlu olduğu **"Amatör Halk Oyunu Oynayan Sağlıklı Kadınlarda Duyusal Temelli Aktivitelerin ve Mat Modifiye Pilates Egzersizlerinin Denge, Postür, Yaşam Kalitesi, Anksiyete ve Depresyon Düzeyleri Üzerine Etkisi"** isimli araştırma projesine ait Klinik Araştırmalar Etik Kurulu (KAEK) Başvuru Dosyası (**1463** kayıt Numaralı KAEK Başvuru Dosyası), Yeditepe Üniversitesi Klinik Araştırmalar Etik Kurulu tarafından **16.05.2018** tarihli toplantıda incelenmiştir.

Kurul tarafından yapılan inceleme sonucu, yukarıdaki isimi belirtilen çalışmanın yapılmasının etik ve bilimsel açıdan uygun olduğuna karar verilmiştir (**KAEK Karar No: 847**).

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

Yeditepe Üniversitesi 26 Ağustos Yerleşimi, İnönü Mahallesi Kayışdağı Caddesi 34755 Ataşehir / İstanbul
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APPENDIX 8.2: INFORMED WRITTEN CONSENT

BİLGİLENDİRİLMİŞ GÖNÜLLÜ OLUR FORMU

"Amatör Halk Oyunu Oynayan Sağlıklı Kadınlarda Duyusal Temelli Aktivitelerin ve Mat Modifiye Pilates Egzersizlerinin Denge, Postür, Yaşam Kalitesi, Anksiyete ve Depresyon Düzeyleri Üzerine Etkisi " isimli yüksek lisans araştırma çalışması Care Oyun Akademisi ve IKS Akademi de yapılacaktır.

Araştırma Yeditepe Üniversitesi Fizyoterapi ve Rehabilitasyon Anabilim Dalı tez çalışmasıdır. Bu çalışmanın amacı planlanmış olan hem duyusal temelli aktivitelerin hem de mat modifiye pilatesin denge, postür üzerinde nasıl bir etkisi olduğunu ve bununla birlikte yaşam kalitesinin, anksiyete ve depresyon düzeylerinin nasıl etkileneceğini araştırmaktır. Çalışmaya sağlıklı, gönüllü amatör halk oyunlarına devam eden 30 erişkin kadın ve rutin günlük aktivitelerine devam eden 10 erişkin kadın dahil edilecektir.

Duysal temelli aktiviteler ve mat modifiye pilates 6 hafta süreyle, haftada 1 gün, 40 dakika grup egzersizleri şeklinde yapılacaktır. Bu egzersizlerin sağlıklı bireylerde, haftada 1 gün yapılmasında risk bulunmamaktadır.

Bu araştırmaya katılıp katılmama kararını vermeden önce, araştırmanın neden ve nasıl yapılacağını bilmeniz gerekmektedir. Bu nedenle bu formun okunup anlaşılması büyük önem taşımaktadır. Eğer anlayamadığınız ve sizin için açık olmayan şeyler varsa, ya da daha fazla bilgi isterseniz bize sorunuz. **Cevaplarınız bizim için değer taşımaktadır.**

Bu çalışmaya katılmak tamamen gönüllülük esasına dayanmaktadır. İstediğiniz zaman çalışmayı sonlandırabilirsiniz.

Ulaşım ve sarf malzeme(mat) ücretleri araştırmacı tarafından karşılanacaktır. Bu formlardan elde edilecek bilgiler tamamen araştırma amacı ile kullanılacaktır. Araştırmada yapılan değerlendirmelerin sonuçları yalnızca araştırma kapsamındaki çalışmalarda ve sadece sorumlu araştırmacı tarafından kullanılacaktır. **Kişisel bilgileriniz herhangi bir amaçla, kurum yöneticileri veya üçüncü kişilerle kesinlikle paylaşılmayacaktır. Bu çalışma için gönüllü katılımcıdan, özel ya da devlete ait sağlık ödeneklerinden hiçbir şekilde ücret talep edilmeyecektir.**

Katılımınız için teşekkür ederiz.

Araştırmacı: Fzt. Burçin ÇOLAKOĞLU

Danışman Öğretim Üyesi: Yrd. Doç. Dr. Zuhal Didem TAKİNACI

"Amatör Halk Oyunu Oynayan Sağlıklı Kadınlarda Duyusal Temelli Aktivitelerin ve Mat Modifiye Pilates Egzersizlerinin Denge, Postür, Yaşam Kalitesi, Anksiyete ve Depresyon Düzeyleri Üzerine Etkisi " isimli çalışmada katılımcıya/gönüllüye verilmesi gereken bilgileri okudum ve katılmam istenen çalışmanın kapsamını ve amacını, gönüllü olarak üzerime düşen sorumlulukları tamamen anladım. **Çalışma hakkında yazılı ve sözlü açıklama ,adı belirtilen araştırmacı tarafından yapıldı.** Bu çalışmayı istediğim zaman ve herhangi bir neden belirtmek zorunda kalmadan bırakabileceğimi ve bıraktığım takdirde herhangi bir olumsuzluk ile karşılaşmayacağımı anladım.

Bu koşullarda söz konusu araştırmaya kendi isteğimle, hiçbir baskı ve zorlama olmaksızın katılmayı kabul ediyorum.

Gönüllünün Adı /Soyadı /İmzası /Tarih

Açıklama Yapan Kişinin Adı /Soyadı /İmzası /Tarih

Fzt. Burçin ÇOLAKOĞLU

APPENDIX 8.3: SENSORY-BASED ACTIVITIES PROGRAM

Duyusal Temelli Aktivite Programı

Vestibular Sistem odaklı;

-Dönme

-Açısal Sallanma

-Lineer Sallanma (otururken ve ayakta kişinin kendini sallaması (bu sırada propriyoseptif uyaranıda hem üst hem alt ekstremiden sağlama))

-Yüzüstü yatarak yapılan aktiviteler

-Denge tahtasından geçip hedefe yönelik obje atma (Görsel sistem için aktiviteli)

Propriyoseptif Sistem odaklı;

-Trambolinde zıplama ve bu sırada top yakalama (Görsel sistem için aktiviteli)

-Terapi(pilates) topu üzerinde hareketler ve bu sırada sallanan objeye de vurma (Görsel sistem için aktiviteler)

- Gözler kapatılar verilen işitsel yönergelerle hedefe ulaşma

- Tünelden geçme

Taktil Sistem odaklı;

-Wilberger protokolü

-Ağıziçi fırçalama

-Sakız çiğneme

İşitsel Sistem odaklı;

-Aktivitelerin müzik eşliğinde yapılması ve şarkı söyleme

APPENDIX 8.4: MAT MODIFIED PILATES EXERCISES PROGRAM

1.Hafta: - 5 element - Hundereds seviye 1 (yatarak) - Tek bacak germe seviye 1 (yatarak) - Kalça çevirme seviye 1 (yatarak) - Spine twist (yatarak)
2.Hafta: - Hundereds seviye 2- 3 (yatarak) - Tek bacak tekme seviye 1 (yatarak) - Clam seviye 1 (yatarak) - Spine twist (oturarak) - Hundereds seviye 1 (ayakta) - Tek bacak germe seviye 2 (ayakta)
3.Hafta: - Hundereds seviye 1 (ayakta) - Tek bacak germe seviye 2 (ayakta) - Tek bacak tekme seviye 1 -2 (ayakta) - Clam seviye 1 (ayakta) - Roll up (sandalye) - Spine twist (ayakta) - Kol açma seviye 1 (ayakta)
4.Hafta: - Hundereds seviye 2 (ayakta) - Çift bacak germe (ayakta) - Tek bacak tekme seviye 2 (ayakta) - Clam seviye 1 (ayakta) - Kalça çevirme seviye 1 (ayakta) - roll up (oturarak) - spine twist (ayakta) - Kol açma seviye 2 (ayakta)

5.Hafta: - Omuz köprüsü - Hundereds seviye 2 (ayakta) (tek ayak stabil olmayan zemin / yükselti de) - roll up (oturarak) - Çift bacak germe (ayakta) - Swimming seviye 1-2 (ayakta) - Side kick (ayakta) - Spine twist (ayakta) - Alt-üst ekstremite koordinasyon (kalça çevirme + kollarla daire çizme)
6.Hafta: - Omuz köprüsü - Hundereds seviye 2 (ayakta) (tek ayak stabil olmayan zemin / yükselti de) - Swimming seviye 2-3 (ayakta) - Kalça çevirme (ayakta) - Alt-üst ekstremite koordinasyon (kalça çevirme + kollarla daire çizme) - Side kick (ayakta) - Spine twist (ayakta) - Kol açma (ayakta)

APPENDIX 8.5: IPAQ-SHORT FORM

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

   _____ **days per week**

   ☐ No vigorous physical activities → ***Skip to question 3***

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

   _____ **hours per day**

   _____ **minutes per day**

   ☐ Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

   _____ **days per week**

   ☐ No moderate physical activities → ***Skip to question 5***

SHORT LAST 7 DAYS SELF-ADMINISTERED version of the IPAQ. Revised August 2002.

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

_____ **days per week**

☐ No walking → ***Skip to question 7***

6. How much time did you usually spend **walking** on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

This is the end of the questionnaire, thank you for participating.

SHORT LAST 7 DAYS SELF-ADMINISTERED version of the IPAQ. Revised August 2002.

APPENDIX 8.6: STRUCTURED QUESTIONNAIRE

DEMOGRAFİK ÖZELLİKLER VE GENEL SAĞLIK DURUMU ANKETİ

Tarih : … /…/…

1) Katılımcının Adı Soyadı:

Telefon Numarası (Cep/Ev):

Adres:

2) Yaş:

3) Cinsiyet: ( ) Kız ( ) Erkek

4) Çalışma durumu:

5) Medeni hali:

6) Boy uzunluğu (cm):

7) Vücut ağırlığı (kg) :

8) BMI:

9) Dominant taraf: El ( ) sağ ( ) sol

Ayak ( ) sağ ( ) sol

10) a) Sigara kullanıyor musunuz?

( )Hiç içmedim ( )Sigara içtim ama bıraktım ( )Halen içiyorum

b) Günde kaç adet sigara içiyorsunuz? adet/gün

Sigara: Paket/Yıl

11) Alkol kullanıyor musunuz? ( ) Evet ( ) Hayır

Cevabınız ‘’evet’’ ise hangi sıklıkla kullanıyorsunuz:

12) Gözlük kullanıyor musunuz? ( )Evet ( ) Hayır

13) Herhangi bir sürekli hastalığınız var mı? Varsa hangileri?

( ) Sürekli bir hastalığım yok

( ) Romatizma ( ) Ortopedik hastalık ( ) Nörolojik problemler

( ) Travma ( ) Diğer:……

14) Şu an herhangi bir ağrı kesici ilaç kullanıyor musunuz? ( ) Evet ( ) Hayır
Evet ise ne zamandır?

15) Herhangi bir ameliyat geçirdiniz mi? ( ) Evet: ..... ( ) Hayır

16) Halk oyunlarına ne zamandır devam ediyorsunuz?
17) Halk oyunlarına haftada kaç gün devam ediyorsunuz?
18) Fiziksel aktivite/egzersiz/spor yapıyor musunuz? Yapıyorsanız ne sıklıkta? (Halk oyunları dışında)

( ) Yapmıyorum
( )Ayda bir kez den az ( ) Ayda 2 kez ve fazla ( )Haftada 1 kez
( )Haftada 2-3kez ( )Haftada 4-5 kez ( )Her gün

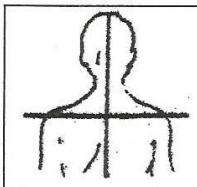
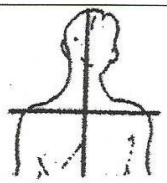
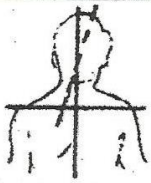
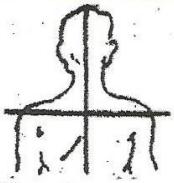
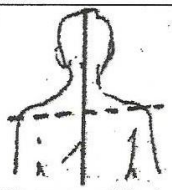
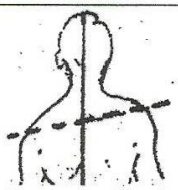
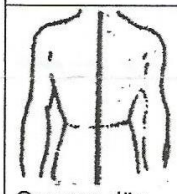
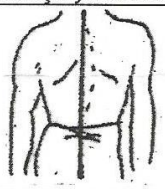
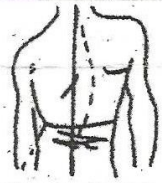
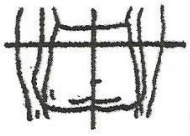
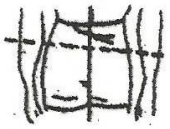
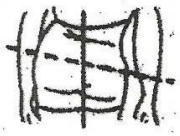
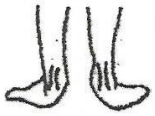
19) (Egzersiz yapanlar için) Yaptığınız egzersiz her seferinde kaç dakika sürüyor ?

( )20 dk az ( )20-30 dk ( )30 – 60 dk ( )60 dk. dan fazla

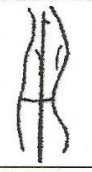
APPENDIX 8.7: NEW YORK POSTURE SCALE

NEW YORK POSTÜR DEĞERLEME TESTİ

Adı: **Soyadı:** **Yaş:** **Cinsiyet:**

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

Birinci Sayfa Toplamı

				1	2	3
G	 Boyun dik çene içeride, baş omuz üstünde dengede	 Boyun hafif önde çene hafif dışarıda	 Boyun ileri derecede önde çene ileri derecede dışarıda			
H	 Göğüs yukarıda sternum vücut önünde ileride	 Göğüs hafif derecede çökmüş	 Göğüs ileri derecede çökmüş (düz)			
I	 Omuzlar merkezde	 Omuzlar hafif ileride	 Omuzlar protrakte			
J	 Üst sırt normal	 Üst sırt hafif yuvarlak	 Üst sırt ileri derecede yuvarlak			
K	 Gövde dik	 Gövde hafif geriye açılı	 Gövde geriye ileri derece açılanmış			
L	 Karın düz	 Karın protrake	 Karın protrake ve sarkmış			
M	 Alt sırt normal	 Alt sırt hafif çukur	 Alt sırt ileri derecede çukur			
5 normal		3 orta seviyede	1 ileri seviyede			
			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

APPENDIX 8.8: NOTTINGHAM HEALTH PROFILE

Hastanın Adı Soyadı: _____ Tarih: ____/____/____

Aşağıda insanların günlük hayatta karşılaşabilecekleri bazı problemler sıralanmıştır. Listeye bakınız ve şu anda sahip olduğunuz problem için Evet, olmadığınız problem için Hayır kutucuğunu işaretleyiniz. Lütfen her soruyu cevaplayınız. Emin değilseniz, şu anda en doğru olduğunu düşündüğünüz cevabı işaretleyiniz.

	Ağrı	Evet	Hayır
1	Merdivenleri inerken ve çıkarken ağrım oluyor.	❑ 05.83	❑ 0
2	Ayakta durduğum zaman ağrım oluyor.	❑ 08.96	❑ 0
3	Pozisyonumu değiştirirken ağrım oluyor.	❑ 09.99	❑ 0
4	Oturduğum zaman ağrım oluyor.	❑ 10.49	❑ 0
5	Yürüdüğüm zaman ağrım oluyor.	❑ 11.22	❑ 0
6	Geceleri ağrım var.	❑ 12.91	❑ 0
7	Dayanılmaz ağrılarım var.	❑ 19.74	❑ 0
8	Sürekli ağrılar içindeyim	❑ 20.86	❑ 0
	Alt Bölüm Toplam Puanı (0-100)	------	

	Duygusal Reaksiyonlar	Evet	Hayır
1	Olaylar beni zorluyor	❑ 10.47	❑ 0
2	Beni neyin neşelendirdiğini bile unuttum	❑ 09.31	❑ 0
3	Kendimi uçurumun kenarında hissediyorum	❑ 07.22	❑ 0
4	Günler zor geçiyor	❑ 07.08	❑ 0
5	Bugünlerde sık sık hiddetleniyorum	❑ 09.76	❑ 0
6	Kendimi kontrol edemeyeceğimi hissediyorum	❑ 13.99	❑ 0
7	Endişelerim gece uyumama engel oluyor	❑ 13.95	❑ 0
8	Hayatın çekilmez olduğunu düşünüyorum	❑ 16.21	❑ 0
9	Uyanınca kendimi depresyonda hissediyorum	❑ 12.01	❑ 0
	Alt Bölüm Toplam Puanı (0-100)	------	

	Uyku	Evet	Hayır
1	Uyku ilacı alıyorum	❑ 22.37	❑ 0
2	Sabah erken saatte istemeden uyanıyorum	❑ 12.57	❑ 0
3	Gece uykum kaçıyor	❑ 27.26	❑ 0
4	Uyumakta güçlük çekiyorum	❑ 16.10	❑ 0
5	Gece uykum çok kötü	❑ 21.70	❑ 0
	Alt Bölüm Toplam Puanı (0-100)	------	

S. M. Hunt, J. McEwen (1985) J R Coll Gen Pract. 1985 Apr; 35(273): 185–188

1. Bölüm Toplam Profil Puanı (0-600): _____

	Sosyal İzolasyon	Evet	Hayır
1	Kendimi yalnız hissediyorum	❑ 22.01	❑ 0
2	İnsanlarla ilişki kurmakta güçlük çekiyorum	❑ 19.36	❑ 0
3	Kendimi hiç kimseye yakın hissetmiyorum	❑ 20.13	❑ 0
4	İnsanlara yük olduğumu düşünüyorum	❑ 22.53	❑ 0
5	İnsanlarla geçinmek güç geliyor	❑ 15.97	❑ 0
	Alt Bölüm Toplam Puanı (0-100)	------	

	Fiziksel Aktivite	Evet	Hayır
1	Yalnız ev içinde yürüyebiliyorum	❑ 11.54	❑ 0
2	Eğilmek benim için çok zor	❑ 10.57	❑ 0
3	Hiç yürüyemiyorum	❑ 21.30	❑ 0
4	Merdiven inip çıkmakta zorlanıyorum	❑ 10.79	❑ 0
5	Bir yere uzanmakta güçlük çekiyorum	❑ 09.30	❑ 0
6	Giyinirken zorlanıyorum.	❑ 12.61	❑ 0
7	Uzun süre ayakta duramıyorum	❑ 11.20	❑ 0
8	Sokakta yürümek için yardım gerekiyor	❑ 12.69	❑ 0
	Alt Bölüm Toplam Puanı (0-100)	------	

	Enerji	Evet	Hayır
1	Enerjim Kısa sürede tükeniyor.	❑ 24.00	❑ 0
2	Her şey çaba harcamamı gerektiriyor.	❑ 36.80	❑ 0
3	Her zaman yorgunum	❑ 39.20	❑ 0
	Alt Bölüm Toplam Puanı (0-100)	------	

Bölüm 2	Toplam Skor (0-7)	------	
	Sağlık durumunuz nedeniyle aşağıdaki durumlarda problem yaşıyor musunuz?	Evet	Hayır
1	Çalıştığınız işte	❑ 1	❑
2	Yemek, temizlik, tamir gibi işlerinde	❑ 1	❑
3	Dışarı çıkmak, arkadaş ziyareti, sinema gibi sosyal faaliyetlerde	❑ 1	❑
4	Evdeki diğer insanlarla ilişkilerde	❑ 1	❑
5	Cinsel hayatınızda	❑ 1	❑
6	Hobi gibi aktiviteler yapmakta	❑ 1	❑
7	Tatil zamanlarında	❑ 1	❑

2. Bölüm Toplam Profil Puanı (0-7): _____

ftronline

www.ftronline.com

Tasarım ve düzenleme: Dr. Ender Selbaş 2018

APPENDIX 8.9: BECK ANXIETY INVENTORY

Beck Anksiyete Ölçeği

Hastanın Soyadı, Adı:..... **Tarih:**.....

Aşağıda insanların kaygılı ya da endişeli oldukları zamanlarda yaşadıkları bazı belirtiler verilmiştir.
Lütfen her maddeyi dikkatle okuyunuz. Daha sonra, her maddedeki belirtinin **BUGÜN DAHİL SON BİR (1) HAFTADIR** sizi ne kadar rahatsız ettiğini yandakine uygun yere (x) işareti koyarak belirleyiniz.

	Hiç	Hafif düzeyde Beni pek etkilemedi	Orta düzeyde Hoş değildi ama katlanabildim	Ciddi düzeyde Dayanmakta çok zorlandım
1. Bedeninizin herhangi bir yerinde uyuşma veya karıncalanma				
2. Sıcak/ ateş basmaları				
3. Bacaklarda halsizlik, titreme				
4. Gevşeyememe				
5. Çok kötü şeyler olacak korkusu				
6. Baş dönmesi veya sersemlik				
7. Kalp çarpıntısı				
8. Dengeyi kaybetme duygusu				
9. Dehşete kapılma				
10. Sinirlilik				
11. Boğuluyormuş gibi olma duygusu				
12. Ellerde titreme				
13. Titreklik				
14. Kontrolü kaybetme korkusu				
15. Nefes almada güçlük				
16. Ölüm korkusu				
17. Korkuya kapılma				
18. Midede hazımsızlık ya da rahatsızlık hissi				
19. Baygınlık				
20. Yüzün kızarması				
21. Terleme (sıcaklığa bağlı olmayan)				

Toplam BECK-A skoru:.....

designed by Emrah SONCUR M.D.

APPENDIX 8.10: BECK DEPRESSION INVENTORY

BECK DEPRESYON ENVANTERİ

1
(0) Üzgün ve sıkıntılı değilim.
(1) Kendimi üzüntülü ve sıkıntılı hissediyorum.
(2) Hep üzüntülü ve sıkıntılıyım. Bundan kurtulamıyorum.
(3) O kadar üzgün ve sıkıntılıyım ki, artık dayanamıyorum.

2
(0) Gelecek hakkında umutsuz ve karamsar değilim.
(1) Gelecek için karamsarım.
(2) Gelecekten beklediğim hiçbir şey yok.
(3) Gelecek hakkında umutsuzum ve sanki hiçbir şey düzelmeyecekmiş gibi geliyor.

3
(0) Kendimi başarısız biri olarak görmüyorum.
(1) Başkalarından daha başarısız olduğumu hissediyorum.
(2) Geçmişe baktığımda başarısızlıklarla dolu olduğunu görüyorum.
(3) Kendimi tümüyle başarısız bir insan olarak görüyorum.

4
(0) Her şeyden eskisi kadar zevk alıyorum.
(1) Birçok şeyden eskiden olduğu gibi zevk alamıyorum.
(2) Artık hiçbir şey bana tam anlamıyla zevk vermiyor.
(3) Her şeyden sıkılıyorum.

5
(0) Kendimi herhangi bir biçimde suçlu hissetmiyorum.
(1) Kendimi zaman zaman suçlu hissediyorum.
(2) Çoğu zaman kendimi suçlu hissediyorum.
(3) Kendimi her zaman suçlu hissediyorum.

6
(0) Kendimden memnunum.
(1) Kendimden pek memnun değilim.
(2) Kendime kızgınım.
(3) Kendimden nefrete ediyorum.

7
(0) Başkalarından daha kötü olduğumu sanmıyorum.
(1) Hatalarım ve zayıf taraflarım olduğunu düşünmüyorum.
(2) Hatalarımdan dolayı kendimden utanıyorum.
(3) Her şeyi yanlış yapıyormuşum gibi geliyor ve hep kendimde kabahat buluyorum.

8
(0) Kendimi öldürmek gibi düşüncülerim yok.
(1) Kimi zaman kendimi öldürmeyi düşündüğüm oluyor ama yapmıyorum.
(2) Kendimi öldürmek isterdim.
(3) Fırsatını bulsam kendimi öldürürüm.

9
(0) İçimden ağlamak geldiği pek olmuyor.
(1) Zaman zaman içimden ağlamak geliyor.
(2) Çoğu zaman ağlıyorum.
(3) Eskiden ağlayabilirdim ama şimdi istesem de ağlayamıyorum.

10
(0) Her zaman olduğumdan daha canı sıkkın ve sinirli değilim.
(1) Eskisine oranla daha kolay canım sıkılıyor ve kızıyorum.
(2) Her şey canımı sıkıyor ve kendimi hep sinirli hissediyorum.
(3) Canımı sıkan şeylere bile artık kızamıyorum.

REVİZYON KAPSAMI:

11
(0) Başkalarıyla görüşme, konuşma isteğimi kaybetmedim.
(1) Eskisi kadar insanlarla birlikte olmak istemiyorum.
(2) Birileriyle görüşüp konuşmak hiç içimden gelmiyor.
(3) Artık çevremde hiç kimseyi istemiyorum.

12
(0) Karar verirken eskisinden fazla güçlük çekmiyorum.

(1) Eskiden olduğu kadar kolay karar veremiyorum.
(2) Eskiye kıyasla karar vermekte çok güçlük çekiyorum.
(3) Artık hiçbir konuda karar veremiyorum.

13 (0) Her zamankinden farklı göründüğümü sanmıyorum.
(1) Aynada kendime her zamankinden kötü görünüyorum.
(2) Aynaya baktığımda kendimi yaşlanmış ve çirkinleşmiş buluyorum.
(3) Kendimi çok çirkin buluyorum.

14 (0) Eskisi kadar iyi iş güç yapabiliyorum.
(1) Her zaman yaptığım işler şimdi gözümde büyüyor.
(2) Ufacık bir işi bile kendimi çok zorlayarak yapabiliyorum.
(3) Artık hiçbir iş yapamıyorum.

15 (0) Uykum her zamanki gibi.
(1) Eskisi gibi uyuyamıyorum.
(2) Her zamankinden 1-2 saat önce uyanıyorum ve kolay kolay tekrar uykuya dalamıyorum.
(3) Sabahları çok erken uyanıyorum ve bir daha uyuyamıyorum.

16 (0) Kendimi her zamankinden yorgun hissetmiyorum.
(1) Eskiye oranla daha çabuk yoruluyorum.
(2) Her şey beni yoruyor.
(3) Kendimi hiçbir şey yapamayacak kadar yorgun ve bitkin hissediyorum.

17 (0) İştahım her zamanki gibi.
(1) Eskisinden daha iştahsızım.
(2) İştahım çok azaldı.
(3) Hiçbir şey yiyemiyorum.

18 (0) Son zamanlarda zayıflamadım.
(1) Zayıflamaya çalışmadığım halde en az 2 Kg verdim.
(2) Zayıflamaya çalışmadığım halde en az 4 Kg verdim.
(3) Zayıflamaya çalışmadığım halde en az 6 Kg verdim.

19 (0) Sağlığımla ilgili kaygılarım yok.
(1) Ağrılar, mide sancıları, kabızlık gibi şikayetlerim oluyor ve bunlar beni tasalandırıyor.
(2) Sağlığımın bozulmasından çok kaygılanıyorum ve kafamı başka şeylere vermekte zorlanıyorum.
(3) Sağlık durumum kafama o kadar takılıyor ki, başka hiçbir şey düşünemiyorum.

20 (0) Sekse karşı ilgimde herhangi bir değişiklik yok.
(1) Eskisine oranla sekse ilgim az.
(2) Cinsel isteğim çok azaldı.
(3) Hiç cinsel istek duymuyorum.

21 (0) Cezalandırılması gereken şeyler yaptığımı sanmıyorum.
(1) Yaptıklarımdan dolayı cezalandırılabileceğimi düşünüyorum.
(2) Cezamı çekmeyi bekliyorum.
(3) Sanki cezamı bulmuşum gibi geliyor.

Toplam BECK-D skoru:.....

9. CV

Kişisel Bilgiler

Adı	Burçin	**Soyadı**	ÇOLAKOĞLU KILIÇ
Doğum Yeri	İSTANBUL	**Doğum Tarihi**	1992
Uyruğu	T.C.	**TC Kimlik No**	
E-mail	colakogluburcin@gmail.com	**Tel**	05352556927

Öğrenim Durumu

Derece	Alan	Mezun Olduğu Kurumun Adı	Mezuniyet Yılı
Doktora	-		
Yüksek Lisans	Fizyoterapi ve Rehabilitasyon	**Yeditepe Üniversitesi**	2020
Lisans	Fizyoterapi ve Rehabilitasyon	**Yeditepe Üniversitesi**	2014
Lise	Sayısal	**Hazım Kulak Anadolu Lisesi**	2009

Bildiği Yabancı Dilleri	Yabancı Dil Sınav Notu
İngilizce	YDS (2014) – 68,75
İspanyolca	Orta
Rusça	Başlangıç

İş Deneyimi (Sondan geçmişe doğru sıralayın)

Görevi		Süre (Yıl - Yıl)
Fizyoterapist (Kurum sahibi)	Akıllı Bedenler Fizyoterapi Danışmanlık Hizmetleri - Didim/AYDIN	2020-…
Fizyoterapist	Care Oyun Akademisi - İSTANBUL	2014-2019

Bilgisayar Bilgisi

Program	Kullanma becerisi
Microsoft Office Programları	İyi

*Çok iyi, iyi, orta, zayıf olarak değerlendirin

Bilimsel Çalışmaları

SCI, SSCI, AHCI indekslerine giren dergilerde yayınlanan makaleler

-
-

Diğer dergilerde yayınlanan makaleler

-
-

Uluslararası bilimsel toplantılarda sunulan ve bildiri kitabında (*Proceedings*) basılan bildiriler

-
-

Hakemli konferans/sempozyumların bildiri kitaplarında yer alan yayınlar

-
-

Diğer (Görev Aldığı Projeler/Sertifikaları/Ödülleri)

Sensory Integration Certification Program Course 1 - (2014) - İstanbul
Sensory Integration Certification Program Course 2 - (2015) - İstanbul
Trigger Point and Intra Muscular Manual Therapy - (2015) - Kocaeli
Theratogs Sertifikasyonu - (2015) – İstanbul
Sensory Integration Certification Program Course 3 - (2015) - İstanbul
Fonksiyonel Bantlama Kursu - (2015) - İstanbul
Sensory Integration Certification Program Course 4 - (2016) - İstanbul
İşaret Dili Kursu - (2016) - İstanbul
DIR/FLOORTIME (101) Başlangıç Düzeyi Kursu - (2016) - İstanbul
DIR/FLOORTIME (201) Kursu - (2017) - İstanbul
Sensory Integration Certification of Completion - (2017) - İstanbul
APPI Matwork Modified Pilates Course (Level 1) - (2018) - İstanbul
Haliç Üniversitesi ''Duyu Bütünleme ve Floortime Yaklaşımları'' Bilgilendirme Dersi (Eğitmen) - (2018) - İstanbul
DIR/FLOORTİME (202) Kursu - (2019) - İstanbul
Okan Üniversitesi ''Duyu Bütünleme ve Floortime Yaklaşımları'' Bilgilendirme Dersi (Eğitmen)
Mulligan Concept Alt Kadran Kursu - (2020) - İstanbul
LÖSEV Lösemili Çocuklar Vakfı (Gönüllü üye) - (2010-…)
''Çocuk Modu Projesi'' (Gönüllü eğitmen) - (2017) - İstanbul