REBUPLIC OF TURKEY
HACETTEPE UNIVERSITY
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INVESTIGATION OF FACTORS RELATED TO PHYSICAL ACTIVITY LEVEL IN PATIENTS WITH KNEE OSTEOARTHRITIS

PT. Hasan KILINÇ

Program of Physical Therapy and Rehabilitation
MASTER THESIS

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This thesis study has been approved and accepted as a Master dissertation in Physiotherapy and Rehabilitation Program by the assesment committee, whose members are listed below, on 02/05/2018

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Institute Manager

ETHICAL DECLARATION

In this thesis study, I declare that all the information and documents have been obtained in the base of the academic rules and all audio-visual and written information and results have been presented according to the rules of scientific ethics. I did not do any distortion in data set. In case of using other works, related studies have been fully cited in accordance with the scientific standards. I also declare that my thesis study is original except cited references. It was produced by myself in consultation with supervisor Gizem İrem KINIKLI, Assoc. Prof. PhD. PT. and written according to the rules of thesis writing of Hacettepe University Institute of Health Sciences .

Hasan KILINÇ

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ÖZET

Kılınç H., Diz Osteoartritli Hastalarda Fiziksel Aktivite Düzeyi ile İlişkili Faktörlerin İncelenmesi, Hacettepe Üniversitesi Sağlık Bilimleri Enstitüsü, Fizik Tedavi ve Rehabilitasyon Programı, Yüksek Lisans Tezi, 2018. Bu çalışmanın amacı, diz osteoartritli bireylerde ağrı, alt ekstremite fonksiyonları, fiziksel performans, hareket etme korkusu, anksiyete/depresyon seviyesi ve yaşam kalitesinin fiziksel aktivite düzeyi ile ilişkili faktörlerin incelenmesidir. Çalışma Şubat 2017 – Kasım 2017'de Yeni Mahalle Devlet Hastanesi'ne başvuran 40-65 yaşları arasında diz osteoartrit tanısı alan gönüllü bireyler üzerinde gerçekleştirildi. Normal eklem hareketi gonyometre ile değerlendirildi. Ağrı ve fonksiyonel durumun hasta perspektifinden değerlendirilmesi için Oxford Diz Skalası (ODS), fiziksel performansın değerlendirilmesi için Zamanlı Kalk ve Yürü Testi (ZKYT) ve 6-Dakika Yürüme Testi (6-DYT), hareket etme korkusunun değerlendirilmesi için Tampa Kinezyofobi Ölçeği (TKÖ), anksiyete ve depresyonun değerlendirilmesi için Beck Anksiyete Ölçeği (BAÖ) ve Beck Depresyon Ölçeği (BDÖ) kullanıldı. Fiziksel aktivite Uluslararası Fiziksel Aktivite Değerlendirme Anketi - Kısa Formu (*IPAQ-SF*) ile değerlendirildi. Son olarak yaşam kalitesinin değerlendirilmesinde Kısa Form-12 (KF-12) anketinden yararlanıldı. Çalışmanın sonucunda ODS'nin tüm puanları ile *IPAQ-SF* arasında negatif yönde anlamlı bir ilişki bulundu ($r=-0,550$; $p<0,001$). TKÖ puanları ile *IPAQ-SF* puanları arasında negatif yönde iyi derecede korelasyon bulunurken ($r=-0,693$; $p<0,001$); BAÖ ve BDÖ puanları ile *IPAQ-SF* puanları arasında negatif yönde orta dereceli bir ilişki tespit edildi ($r=-0,970$; $r=-0,429$; $p<0,001$). KF-12 fiziksel, mental ve toplam puanları ile *IPAQ-SF* arasında düşük bir korelasyon vardı ($r=0,217$; $p<0,001$). Doğrusal regresyon analizi, 6-DYT, TKÖ, BDÖ ve ODS parametrelerinin, diz OA'li bireylerde, *IPAQ-SF* ile değerlendirilen fiziksel aktivite düzeyini tahmin etmede en güçlü belirteçler olduğunu ortaya koydu. Sonuç olarak; diz OA'li hastaların yetersiz fiziksel aktivite seviyesine sahip olduğu göz önünde bulundurulduğunda, tedavi süresince kinezyofobi, depresyon seviyesi ve fonksiyonel seviyenin geliştirilmesine yönelik uygulamaların kullanılması fiziksel aktivite düzeyinin geliştirilmesi için önemlidir.

Anahtar Kelimeler: Diz**,** Osteoartrit, Fiziksel Aktivite, Kinezyofobi, Fiziksel Performans, Anksiyete, Depresyon

ABSTRACT

Kılınç H., Investigation of Factors Related to Physical Activity Level in Patients with Knee Osteoarthritis, Hacettepe University, Institute of Health Sciences, Physiotherapy and Rehabilitation Programme, Master Thesis, 2018. The aim of this study was to examine the relationship between pain, lower extremity functions, physical performance, fear of movement, level of anxiety/depression and quality of life in physical activity levels in individuals with knee osteoarthritis. The study was conducted on voluntary individuals who were diagnosed with knee osteoarthritis between the ages of 40 and 65 who applied to Yeni Mahalle State Hospital between February 2017 and November 2017. A goniometer was used to evaluate normal range of motion. The Oxford Knee Scale (OKS) was used to assess pain and functional status from the patient perspective. The Timed Up and Go Test (TUG) and the 6-Minute Walk Test (6-MWT) were used to assess physical performance. The Tampa Kinesiophobia Scale (TSK) was used to assess fear of movement. Beck Anxiety and Beck Depression Inventory (BAI/BDI) were used to assess anxiety and depression. The International Physical Activity Assessment Questionnaire-Short Form (*IPAQ-SF*) was used to assess physical activity. Finally, Short Form-12 (SF-12) was used to assess the quality of life. As a result of the study, all the scores of OKS and *IPAQ*-SF showed a significant negative correlation (r=-0,550; p<0,001). There was a good negative correlation between the TSK scores and the *IPAQ-SF* scores (r=-0,693; p<0,001)while a moderate negative correlation was found between the BAI/BDI scores and the *IPAQ-SF* scores (r=-0,970; r=-0,429, p<0,001). There was a low correlation between SF-12 physical, mental and total scores and *IPAQ-SF* (r=0,217; p<0,001).. Finally, the results of linear regression analysis revealed that the total score parameters of 6-MWT, TSK, BDI and OKS were the strongest predictors of knee OA individuals that affected the physical activity level assessed by *IPAQ-SF*. As a result; considering that patients with knee OA have inadequate physical activity levels, the use of practices for the improvement of kinesiophobia, depression level and function level during the treatment process may be recommended for improving the level of phyical activity.

Keywords: Knee, Osteoarthritis, Physical Activity, Kinesophobia, Physical Performance, Anxiety, Depression

CONTENTS

SIMILARS

6-MWT: 6 Minute Walking Test

Avg: Average

BAI: Beck Anxiety İnventory

BDI: Beck Depression İnventory

cm: Centimeters

IPAQ-SF: International Physical Activity Questionnaire Short Form

M: Meter

Max: Max

Min: Minimum

n: Number of individuals

OA: Osteoarthritis,

OKS: Oxford Knee Score

p: Statistical significance value

Sd: Standard Deviation

SF-12: Short Form-12

SPSS: Statistical Package for the Social Sciences

TSK: Tampa Scale for Kinesiophobia

TUG: Timed Up and Go Test

FIGURES

TABLES

INTRODUCTION

Physical activity involves complex human movements of all ages (1). To examplify physical activity; professional activities, housework (eg self-care, general cleaning), transportation (eg walking, cycling) and leisure activities (eg swimming, dancing) can be shown. Activities such as sleeping, sitting, lying, watching television and using computer, which do not significantly increase rest and energy expenditure, are called sedantary behaviors.

Hip and knee osteoarthritis (OA) is one of the most important causes of pain and physical disability associated with older ages. Primary OA is usually associated with aging and heredity while Secondary OA can be caused by factors such as obesity, joint trauma, or recurrent excessive joint loads (2). In knee OA, fear of movement due to pain and reduced function affect quality of life negatively with balance and loss of proprioception (3). At the same time, daily life activities (DLA) such as going up and down stairs, walking and standing are affected negatively and their dependence gets increased (4).

The aim of physiotherapy and rehabilitation applications in knee OA treatment is to maintain and improve function with muscle strengthening exercises, to control pain, to maintain joint, and to increase quality of life by keeping the damage to a minimum level (5, 6). Regular, mild and moderate physical activity is recommended for beneficial effects such as improved cardiovascular fitness, reduced risk of diabetes and obesity (7). Federation of Exercise and Physical Activity recommends moderate physical activity for at least 3 days a week for 30 minutes (≥3MET) for individuals with knee OA. According to the Chronic Diseases Risk Factor Study, 87% of women and 77% of men do not have enough physical activity (8).

Individuals with knee OA are usually recommended to avoid activities like climbing up stairs, going up and long-term walks which can possibly impose burden on knees (5). In addition, it is seen that there are many parameters affecting the level of physical activity in the literature but there are few studies evaluating these parameters together.

Furthermore, these studies have been found to be made with subjective methods. To this end, for a disease which comes out due to a number of factors such as OA ; it is thought that not only the physical activity level of the patient should be adhered to but also the parameters affecting this physical activity level should be considered.

The difficulty of the costs and availability of methods that directly measure the level of physical activity, such as accelerometers, for individuals with OA is a well known fact. For this reason, studies evaluating the physical activity level in individuals with OA in the clinical setting by subjective methods and examining the parameters that may affect the level of physical activity are inadequate (5).

Hypothesis 1: In individuals with knee OA, pain is associated with lower extremity functions and physical performance level of physical activity.

Hypothesis 2: Fear of moving in individuals with knee OA is associated with anxiety / depression level, quality of life and physical activity level.

The aim of this study is to examine the relationship between pain, lower extremity functions, physical performance, fear of movement, level of anxiety / depression, and quality of life, and find out the most convenient indicators of physical activity level in individuals with OA in the knee.

With the results obtained from the study, the most effective parameters on physical activity level and physical activity level in knee OA individuals were revealed. It is thought that the determination of the level of physical activity and the factors affecting it in the knee OA may be useful in evaluating and developing physiotherapy and rehabilitation programs, thus leading to physiotherapists and other health professionals working in this patient group.

2. GENERAL INFORMATION

Osteoarthritis (OA) is the most common joint disease in the world and is the most important cause of chronic musculoskeletal pain. OA is a degenerative joint disease characterized by joint pain, local tenderness, limitation of movement, crepitation, sometimes effusion, and local inflammation at various degrees without clinically systemic symptoms. We can describe the knee OA more closely by examining the anatomy of the knee (5,6).

2. 1. Knee Anatomy

Knee anatomy is very important for the movements of the body, especially for the movements in the standing position. This is why knee stability and painless range of motion is important in maintaining daily work. Most commonly, overuse, age and traumatic injuries cause structural damage that can limit the function of knee. For this reason, a thorough understanding of the anatomy of the knee is important for the accurate diagnosis and treatment of knee pathology (9).

2.1.1. Joint Capsule

The inside of the fibrous capsule is covered with synovium producing synovial fluid which is an important component of the synovial assembly. The joint capsule not only serves for lubrication and shock absorption, but also serves as a conduit for nutrients. It may also have hormonal and messenger functions. Nociceptors buried in the synovial fluid are also protected by the fluid. Normally the amount of synovial fluid is very small and is only a few centimeters. However, flexion and extension movements of the knee joint allow the articular surfaces to be continually washed by fresh synovial; thus allowing the cartilage to feed properly and lubricate the joint surfaces. The capsule encases the proximal part of the head of the two gastrocnemius and the tendon of the popliteus muscle. The joint capsule is folded on itself to form a suprapatellar bursa in the anterosuperior part of the femoral condyle (10, 11).

2.1.2. Bone Constructions

The convex face of the knee joint belongs to the femur condyle, and the concave face belongs to the upper end of the tibia. As the third bone, the frontal patella is also added to the joint (12).

Femur: It is the longest, the heaviest and the strongest bone in the whole human body. The femur is structurally classified as long bone and is an important component of the appendicular skeleton. The entire weight of the body is supported by femurs during many activities such as running, jumping, walking and standing. The distal femur extends significantly over the knee to form the medial and lateral condyles (12).

The medial and lateral condyles of the femur meet with the medial and lateral condyles of the tibia to form the articular surfaces of the knee joint. Between the condyles, there is a pit called the intercondylar fossa which provides space for anterior cruciate ligament and posterior cruciate ligaments cruciate that stabilizes the knee along the anterior / posterior axis (12).

Tibia: Tibia is bigger and stronger than the two bones in the lower leg. Tibia forms the knee joint with the femur. Many strong muscles that move the foot and lower leg are attached to the tibia. Tibia's support and movement is necessary for many activities performed by the legs, including standing, walking, running, jumping and supporting body weight. The smooth concave medial and lateral condyles, which form the femur and knee joint, namely the proximal end of the tibia are roughly plane. Between the condyles, there is an intercondylar region that contains tibial object and provides points for the knee to bind meniscus, anterior and posterior cruciate ligaments. At the lower edge of the lateral condyle, there is a small facet formed by the tibia for the proximal tibiofibular joint. This joint is a plane that allows the tibia and fibula to pass slightly and adjust the position of the lower leg (12).

2.1.3 Ligament

There are four main ligaments to prevent excessive movement; anterior cruciate ligament, posterior cruciate ligament, medial and lateral collateral ligaments.

Medial collateral ligament; medial to the knee joint and extends from the medial femoral epicondyle to the tibia. This prevents the tibia from displacing excessively laterally on the femur.

*Lateral collateral ligament;*is on the lateral part of the knee joint. It extends from the lateral femoral epicondyle to the beginning of the fibula. It prevents the Tibia from displacing excessively medially on the femur.

Anterior cruciate ligament; extends from the anteromedial aspect of the tibial plateau to the medial region of the lateral femur condyle. The task of this ligament is to prevent the tibia from moving too far forward on the femur.

The anterior fibrils of the ligament are loose in the knee extension, stretched in flexion. The back fibers are stretched in the extension. It provides posterior stability and helps the flexion of knee. In addition to providing mechanical stabilization, the anterior and posterior cruciate ligaments also play an important role in providing proprioception sensation through the mechanoreceptors in their structures. This suggests that damage to these ligaments has an adverse effect on the proprioceptive sensation (13).

Posterior cruciate ligament; stays from femoral condyle to posterolateral tibia platosum. It opposes the forces that want to push Tibia posteriorly considering the femur.

There are also three more ligaments in the knee. Patellar, oblique and arcuate popliteal ligaments.

Patellar ligament; It is a continuation of the quadriceps tendon and wraps the patella. Tibia advances as a patellar ligament to connect to the tuberosity.

Oblique popliteal ligament; connects to the upper edge of the intercondylar fossa and to the rear edge of the tibia head.

Arcuate popliteal ligament; is a large fibrous band (11, 12, 14) attached to the lateral condyle of the femur and blended with the posterior part of the capsule, which passes through the inferomedial route.

2.1.4. Meniscuses

Meniscuses are the shock absorbers of the knee. They are located horizontally between femur and tibia. In addition, these tissues are fibrous cartilaginous structures that synchronize with the anterior cruciate ligament, and play a crucial role in the functional integrity of the knee and are located on the proximal side of the tibia (12). The meniscus fills the gap between the flattened ends of the tibial bone, which the femur condyles sit on. The two meniscuses differ in shape and mobility.

Lateral meniscus; It is more oval shaped and quite mobile. It can slide forward and backward with the knee motion. The Popliteus tendon continues along an edge through the joint capsule and contributes to the mobility of this meniscus (12).

Medial meniscus; It is larger and more C-shaped and firmly attached to the capsule structure and to the medial collateral ligament. It moves slightly with the effect of knee movements. Therefore, the medial meniscus is more frequently torn than the lateral meniscus (11, 12, 14).

2.1.5. Bursae

The bursae are collected in three parts: anterior, lateral and medial. There are 4 bursae in each section. Bursa, which is located between the medial part of M. Gastrocnemius, M. Semimembranosus and the medial condyle of the tibia, is the most common form of effusion and inflammation.

2.1.6. Muscles

M. Quadriceps Femoris: Quadriceps femoris, the base of the knee joint, is the strongest and largest muscle of the human body. It is a 4-headed muscle of M. rectus femoris, Vastus medialis, Vastus lateralis and Vastus intermedialis (16).

M. Rectus Femoris: This muscle located on the anterior and middle parts of the M. quadriceps Femoris muscle begins by holding on to the upper side of the spina iliaca anterior inferiora and acetabulum with the upper extremity. It moves downward and joins the other heads and ends in the patella with the lower tip (17).

M. Vastus Lateralis: This muscle, located on the outer side of the M. quadriceps femoris muscle, begins with the upper part of the linea intertrochanterican, the outer part of the trochanter major and the upper part of the labium laterals of the linea aspera. As it goes down and forward, it merges with other heads and ends in the patella (17, 18).

Vastus Intermedius: Located in the middle of the M. quadriceps femoris muscle and behind the M. Rectus femoris, this muscle starts from under the linea intertrochanterican and from the anterior and lateral femur sides. As it moves downward, it merges with other heads. The common beam ends in the patella (17).

Vastus medialis: This fragment, located on the inner side of the M. Quadriceps femoris muscle, begins with a long line from the top of the trochanter to the lower part of the trochanter and to the labium mediales of the linea aspera. As it goes downwards it merges with other heads and ends in the patella (17).

M. Quadriceps Femoris which functions for the extension of leg is the only extensor muscle of leg. In addition, M. Rectus femoris, as it holds spina iliaca anterior superior, enables the thigh for flexion movement (17).

M. Hamstrings: It is composed of M. Semitendinosus, M. Semimembranosus and M. Biceps femoris muscles on the back of the thigh.

M. Biceps femoris: This muscle located on the outer side of the rear group has two heads, the long head and the short head. The short head begins by holding the labium laterales of the linea asperan with the upper tip while the long head begins from the tuber ischiadicum and merges with the short head as it moves downward. Both heads attach to the fibula after meeting in the lower parts of the thigh and moving towards the outer side of the thigh (17). M. biceps femoris, a biarticular muscle, has hip extension (when the leg is fixed), leg flexion and brings the knee to external rotation while the leg is in flexion position (16, 18).

M. Semitendinosus: The femoris muscle, semimembranosus muscle, adductor magnus muscle, and gracilis muscle are located on the outer side of this muscle located on the inner side of the back of the thigh.

This muscle carries down the tube with the tuber ischiadicuma and joins together with the sartorius muscle and the gracilis muscle to form 'Pes anserinus' (17) which is also called the goose foot. The semitendinosus causes the hip to undergo extension, biceps flexion and brings the knee to internal rotation while in the leg flexion position (16).

M. Semimembranosus: It is located on the inner side of the back of the thigh and there is M. Biceps Femoris on the outer side, M. Adductor Magnus on the back, M. Semitendinosus on the back, and M. Gracilis on the inner side. This muscle begins with the upper end of the tuber ischiadicuma in a widespread beam and ends in the tibial medial condyle (17). It exhibits a function similar to that of M. Semitendinosus, but it is a much more powerful convent. It enables hip extension, leg flexion, and when the leg flexes, it brings the leg to internal rotation (16).

M. Gastrocnemius: It has two heads as lateral and medial. External lateral head which is called as lateral head; begins from the lateral condyle of the femur, joins the lateral head which is called as the inner lateral head starting from the medial epicondyle of femur and sticks to calcaneus via the tendon calcaneus (17).

The gastrocnemius, which is an important part of the plantar flexion of the foot, also has a knee joint flexion as a biarticular muscle in addition to its role as a supinator (16).

M. Sartorius: A superficial caste of approximately 5 cm wide, 50 cm long. Spina iliaca begins anterior superior and ends in pes anserinus. M. Sartorius, the longest muscle in the human body, is flexor, abductor and external rotator of the hip, flexor in the knee (16).

M. Gracilis: The gracilis muscle, a thin and long muscle located on the innermost side of the leg, starts with pubis and ends in pes anserinus (17). It is a two-jointed cast and enables hip joint flexion and internal rotation and flexion of the knee joint (16).

M. Popliteus: It is a superficial muscle. Starting from the lateral epicondyleof the femur attaches to the back of the tibia. It gives the leg the ability of internal rotation movement (17).

M. Tensor Fascia Latae: It begins from the Spina iliaca anterior superior. This muscle, expanding downward, becomes chirped under the trochanter major and ends up participating in the fascia latae structure (17). The swing phase brings the leg forward and abduction (16).

2.1.7. Biomechanics of Knee Joint

The movements of the knee joint take place in three planes rather than in a single plane. The knee joint is characterized by the presence of a trochoid (pivot) joint, even though it is a hinge (ginglymus) type joint. Flexion and extension movements take place in the frontal plane while adduction and abduction in the sagittal plane, and outward and inward rotation take place in the transverse plane (19). The knee joint can flex up to 140 ° active and passive 160 °. When knee is 90 ° in flexion; approximately 30 ° active, 30-35 ° passive internal rotation; 40 ° active and 45-50 ° passive external rotation can be seen. Abduction and adduction occurs passively after 30 ° of flexion and is less than 5 ° (18, 20).

Loads coming from the direction of string flexion-extension and varus-valgus are met by capsules and ligaments, contraction of agonist and antagonist muscles and geometry of joint faces. In the case of rotational loads, the role of muscles is very small and are covered by other structures. For this reason, rotational loads carry a greater risk of injury to the knee joint (21)

The movement of the patella in the knee flexion and extension is vertically displaced up and down. As the joint surface of the patella moves upwards in the extension, it tilts 35 ° downwards in the flexion. Patella increases the effectiveness of the M. quadriceps femoris muscle by extending the lever arm. It also provides a contact surface against the trochlea, enhances functional stability during loading and protects the femur condyles while the knee is in the flex. While the patella is moving freely in the knee extension position; the fact that the patella has shifted to the laterale, medial, or distant indicates that the joint is not fully functioning (22).

Q angle: An imaginary line drawn from the patella at the center of the tibial tubercle to the imaginary line drawn from the center of the patella to the spina iliaca anterior superior is called the Q angle. These two lines can also be measured when the knee is at full extension, as measured at 90 ° (23). The mean is 10-14 ° in males and 15-17 ° in females due to the wider pelvis (22, 24).

2.2. Osteoarthritis

2.2.1. Diagnostic Criteria of Osteoarthritis

The diversity of the etiology of OA has led to the establishment of separate diagnostic criteria for disease in different joint regions. The most commonly used one is proposed by the American College of Rheumatology (ACR) (25).

ACR Knee Osteoarthritis Diagnostic Criteria:

Clinically,

1. Knee pain on most days of previous month

2. Crepitation in active joint motion

3. ≤ 30 minutes morning malfunction.

4. Age ≥ 38

5. Bone growth in the tested knee

For OA diagnosis; The presence of 1, 2, 3, 4 or 1, 2, 5 or 1, 4.5 criteria is required.

Clinically and radiographically,

1. Knee pain on most days of the previous month, ,

2. Radiographic osteophytes on the sides of joints,

3. The synovial fluid should have at least two of the following findings; clear, viscous, leukocyte count <2000 cells / ml

4. Age ≥ 40

5. Morning malfunction for ≤ 30 minutes in the knee

6. Crepitation in active joint motion

For OA diagnosis; The presence of 1, 2 or 1, 3, 5, 6 or 1, 4, 5, 6 criteria is required (25).

2.2.2. Classification of Osteoarthritis

Radiography is the most useful and important imaging method in OA. Common findings in OA are asymmetric narrowing of the joint space, sclerosis of the subchondral bone, subchondral cysts and osteophytes near the joint. Deformities, subluxations and joint rats are more common in advanced cases. Generally, there is poor correlation between radiological findings and symptoms in OA.

Kellgren and Lawrence rate the most commonly used rating in OA assessment (26).

Kellgren and Lawrence Rating:

Stage 0: Normal

Stage 1: Suspicious narrowing of joint space, possible osteophyte

Stage 2: Definite osteophyte, possible narrowing of joint space

Stage 3: Reasonable Multiple osteophytes, definite narrowing of the joint space, the onset of sclerosis

Stage 4: Wide osteophyte, severe narrowing of the joint space, severe sclerosis

2.2.3. Etiology and Pathology of Osteoarthritis

Knee OA has a multi-factor etiology such as obesity, aging, and injury (27). Other less established risk factors include genetic, bone density metabolism, and biomechanical effects (28).

In the study of Neame et al., It was found that when people whose siblings had a knee OA and those whose siblings did not have it were compared, the former group had twice higher risk than the latter group, and 62% of the disease variants were genetically determined (29). Similarly, the study of Chitnavis et al. showed that persons with a family history of symptomatic knee OA and those with a knee OA in their siblings would normally require two or five times more total knee arthroplasty as they approach the final stage of OA. The study also concluded that 1/3 of the OA variance was genetically determined (30).

Finally, it was reported in the study of Spector et al. in which they explored the genetic variance of hand and knee OA in twins with or without single-twin twins, that genetics explains the 39% to 65% of the variance of hand and knee OA (31).

In a study by Sowers et al., It was determined that foods may also affect knee OA. Oxidative damage, effects of inflammatory responses, cellular differentiation, problems with bone and collagen synthesis all may be affected by inadequate intake of nutrients (32). In a study by McAlindon and Felson, a decrease in radiographic OA was detected in those who intake continuous and high amounts of vitamin C. The progression of OA can also be reduced to a minimum by taking sufficient amounts of beta-carotene and vitamin E. These nutrients are reactive oxygen species and provide antioxidant effects that react against the oxidative damage in the knee. The study also suggests that vitamin E acts as an inhibitor of synovial inflammation associated with OA by forming arachidic acid from phospholipids and inhibits lipoxygenase activity (33). Sowers et al. suggested that OA pathology was associated with skeletal calcification and that individuals with OA showed higher bone mineral density levels than non-OA patients (32). Similarly, Hart et al. showed that increases in the mean bone density of individuals with early stage knee OA were inversely related to each other (34).

Recognizing that the bone mineral density in the lumbar spine is higher and increases the risk of developing knee OA, Hochberg et al. confirmed that high-level mineral density leads to knee OA (35).

Changing biomechanical alignment due to knee injury may also be a risk factor for knee OA. Chaudhari et al., In a study of the biomechanics of the knee in patients with anterior cruciate ligament (ACL) injury, reported that the failure of an ACL was altering biomechanical properties, leading to the onset of OA (36).

In the case of ACL injuries, different tibiofemoral contact patterns, anterior tibial translation and varying tibial internal and external rotations can lead to the formation of knee OA. These changes lead to a kinematic shift in the knee where degenerative forces are placed on the cartilage. Lohmander et al reported in a survey of female footballers living with ACL injuries that they found radiographic knee OA in 51% of patients 12 years after injury (37).

2.2.4. Joint Cartilage Degeneration

Knee OA is characterized by articular cartilage degeneration (38). Early OA often shows changes in the superficial regions of the joint cartilage. These changes are accompanied by changes in collagen orientation and proteoglycan content. Joint cartilage deformities include the medial and lateral tibiofemoral and patellofemoral regions, which are usually the main areas of the knee. Knee OA is characterized by articular cartilage degeneration (21). Early OA often changes in the superficial regions of the joint cartilage. These changes are seen with changes in collagen orientation and proteoglycan content. In places where the collagen content changes, as the OA progresses, the arthritis advances to the deeper regions of the articular cartilage (23). Joint cartilage deformities may involve the medial / lateral tibiofemoral and patellofemoral regions, which are the main areas of the knee (24).

2.2.5. Bone Marrow Oedema

Subchondral trabecular bone marrow oedema is a consequence of knee OA. In some studies, subchondral trabecular bone marrow oedema lesions were shown in 57% of the osteoarthritic knees evaluated. Osteophytes, synovitis, subchondral cysts, and the presence of subchondral sclerosis have been described as physical markers of OA (38, 39). In a study that studied subchondral bone abnormalities and bone marrow oedema for one year, these changes have been shown to trigger the formation of chondropathy (40). In addition, although the exact source of pain seen in OA individuals is uncertain, it is suggested that bone and bone marrow oedema may be the main cause of OA because these structures are rich in nociceptive fibrils and nerve of cartilaginous tissue is not present (40). Finally, another study showed that the pain exhibited by subchondral trabecular bone marrow oedema was site-specific and that the pain was medial or lateral tibiofemoral (38).

The weakness of M. quadriceps femoris muscle is the primary clinical manifestation of knee OA. This muscle strength is crucial for performance in daily living activities, and daily activities such as walking and stair climbing are also difficult to achieve in case of its weakness (41). Another study reported that M. quadriceps femoris weakness was frequently seen in patients with OA, and that muscle weakness reflects itself to the clinic in the form of muscle atrophy or joint pain (27).

2.2.6. Decrease in Physical Activity in Osteoarthritis

Individuals with OA have lower levels of physical activity than their healthy counterparts. Interestingly, however, no significant relationship was found between the pain and the decrease in the level of physical activity (42). In another study, early stage knee OA patients were compared with accelerometer activity levels, and it was observed that only 30% of these patients passed the physical activity criteria (43). It has been determined that individuals with knee and hip OA in the final stage of the disease have a very low level of physical activity.

2.2.7. Treatment in Osteoarthritis

Since OA has many different treatment approaches, several guidelines have been prepared. OA guidelines published by the Osteoarthritis Research Society International (OARSI) in 2007, 2008, 2010 and 2014 are the most recent reports based on evidence (22, 44).

Current treatments to alleviate OA symptoms include both conservative and surgical precautions. Conservative treatment includes drug-free treatments such as weight loss, exercise and education, as well as medicated treatments such as oral pain relievers, anti-inflammatory drugs and corticosteroids. In surgical applications, the final stage is unilateral or bilateral knee arthroplasty. Treatment options with the most potent evidence level of knee OA are addressed on the basis of OARSI 2010 guidelines.

Evidence-based treatment approaches are as follows;

1-Drug Therapy

§ Glucosamine Hydrochloride,

§ The diacerein,

§ Lavage / Debridement

§ Acetaminophen,

Non-Steroid Anti-Inflammatory Drugs,

§ opioids,

Intraarticular corticosteroids,

§ Intrarticular Hyaluronic Acid,

§ Glucosamine Sulfate,

§ Chondroitin Sulphate,

2-Physical Therapy

§ Self management,

§ Training,

§ Information,

§ Communication,

§ Muscle strengthening exercises,

§ Balneotherapy

§ Weight loss,

§ Transcutaneous Electrical Stimulation,

§ Laser,

§ Ultrasound,

§ Hot / Cold Applications,

§ Acupuncture,

§ Insoles,

§ Bracing,

§ Electromagnetic therapy,

§ Spa / Sauna, Massage

3-Surgical Treatment

§ It has been identified as osteotomy

Treatment goals in knee OA are determined as follows;

• To reduce joint pain and stiffness,

• To protect and increase joint mobility,

• Reduce physical inadequacy and disability,

• To increase the quality of life,

• Limiting the progression of joint damage,

• To inform patients about the nature and management of the disease (45).

All of the above-mentioned treatment modalities are tailored to the specific needs of the patient and the OA level.

2.2.8. Osteoarthritis and Exercise

Exercise options for OA treatment include; aerobic exercises, resistance exercises, and a combination of different exercise methods. Patients may have patient-specific conditions such as pain, significant disability, difficulty in walking, etc., and the exercise type should be carefully selected accordingly. A systematic review of the efficacy of home strength training has shown that force training targeting especially the muscles of M. quadriceps femoris may be beneficial in reducing pain and disability in patients with knee OA (45). In another study, the OA patients were treated with a 12-week home exercise program followed by a 12-week empowerment exercise.

As a result; When the control group and the exercise group were compared, it was shown that the joint space of the patients participating in the exercise group was more open and pain decreased (31). There are studies in OA patients that suggest that implementing a quantitative and progressive exercise and rehabilitation program in terms of functional performance and muscle function is beneficial (45).

2.2.9. Invasive Treatment Approaches in the Treatment of Osteoarthritis

If conservative and pharmacological treatments fail, invasive techniques may be needed. In a questionnaire on orthopedic surgeons, as a general view; pain, functional restriction, and narrowing of the joint space are the main indications of total knee arthroplasty indications (46). However, in order to consider surgical intervention, the consensus on which phase of OA should be expected has not yet been reached. In surgical procedures, it is intended to replace the damaged bone and cartilage, or to support the surface with metal or plastic implants. Surgical procedures appear to improve indirectly by increasing mental health and self-perception and quality of life, usually by reducing the pain of patients, by providing mobility.

2.2.10. Osteoarthritis and Physical Activity

Physical activity is any bodily movement that is produced by the skeletal muscle and requires energy expenditure (World Health Organization, WHO, 2012). Although physical activity is recommended by more than one health care provider, most people do not get serious about their recommendations. According to WHO, inactivity is the 4th biggest cause of deaths.

Physical activity may be both protective and harmful to cartilage, but physical activity in sufficient quantity and intensity affects cartilage health in the positive direction, but also positively affects both healthy adults and adults at risk of OA. A large proportion of individuals with knee OA do not meet the recommended level of physical activity (43).

This is partly due to the fact that individuals with OA avoid pain or exercise, as they believe that cartilage will suffer more. However, being physically active has many benefits, such as reducing the risk of hypertension, cardiovascular disease, diabetes and obesity, as well as improving bone health and joint function (WHO, 2012). Physical activity can be considered as one of the most important parameters in reducing knee OA risk. Physical activity is also thought to help cartilage healing.

2.2.11. Relation of Physical Activity to Joint Cartilage

Physical activity has positive effects on joint health, especially in the knees. Exercise may increase cartilage volume; but does not increase the incidence or progression rate of OA (47). For example; in the cohort study performed by Framingham et al., it was shown that the rate of knee OA incidence was not increased by regular recreational physical activity (48). 1279 healthy participants participating in the study were radiographically examined and their physical activity levels were questioned. Tests were conducted at baseline and nine years later and the incidence of OA was not associated with the amount of physical activity performed. Participants who regularly exercise as part of their lifestyle do not increase the risk of progression of the disease. Regular exercises, however, have helped to reduce pain and improve physical function. Physically active children also have a 24.8% greater

joint cartilage as compared to sedentary children of the same age (49). In other words, the thickness of the cartilage is directly proportional to the exposure to the physical activity loaded up to the threshold. Many studies suggest that regular and moderate physical activity will increase cartilage health. In a cross-sectional study of individuals without OA, knee pain, or knee injury in the last 5 years, the medial tibial cartilage volume of healthy women exercising for at least 20 minutes daily was higher when compared to those of sedentary ones (47). In another review, magnetic resonance images of 297 participants without knee trauma or disease were looked at and high physical activity such as swimming and cycling at high intensity to cause dyspnea was reported to be associated with cartilage quality (50). Studies have shown that people who perform strong, difficult sports during the youth period have the highest volume of cartilage; indicating the importance of physical activity from the young age (51).

Conversely, some studies have focused on the consequence that physical activity damages cartilage because of the heavy burden of cartilage. These studies indicate that excessive use of the knee joint causes wear and damage to the cartilage due to this wear. In a study by McAlindon et al., the overuse of the cartilage, which leads to the deterioration of cartilage, has been evaluated. Physical activity has been looked at in many subcategories. As a result of eight years of research, 473 participants with radiographs of their knees showed greater risk of knee OA in intensive and heavy physical activity (52).

2.3. Kinesiophobia

The concept of kinesiophobia is described by Kori et al. As "excessive and unreasonable fear of physical activity, which in the end makes the activity vulnerable to injury or re-injury" (53). Vlaeyen et al. later turned this concept into a theoretical model (54). In literature, kinesophobia, fear of movement and fear of movement associated with pain are mostly used synonymously (55). However, there are psychological differences between these concepts (53). Many researchers such as Asmundson and Taylor (1996) and Crombez et al. (1999) nevertheless used these concepts synonymously. There are many substitutions in the literature due to the difficulty of this distinction and the many similarities of these three concepts (55).

Phobia in fear of movement is an unexplained and disproportionate reaction. Moreover, this reaction is completely involuntary. Later, people living with phobia change their behavior and lives to avoid threatening, even if they know they are overreacting. This anxiety state is found to be the primary emotional component of the phobia and has a high correlation with kinesophobia (53, 55).

2.3.1. Definition of Fear, Anxiety and Phobia

Concepts of fear associated with fear of movement and pain are seen as syndromes by researchers. While these concepts are used, it is possible to switch between the concepts when it is known for what purpose it is used. Also, knowing depression and anxiety conditions is necessary to define the relationship between fear, anxiety, and phobia.

Fear is one of our pure and simple feelings. Fear is often described as feeling an unpleasant sensation of real danger (56). Feelings like fear are reaction syndromes that are not defined by any single feeling or behavior; but can be recognized from multiple stimuli and response models (57). Anxiety is similar to a sense of fear, but comes out without having any source of danger (56, 58). Although there are distinctive differences between fear and anxiety, they are often used interchangeably (59, 60). Phobia on the other hand is the emergence of fear without being bound to danger. There is no explanation or valid reason. A large portion is involuntary and causes the avoidance of fear (56). According to the American Psychiatric Association, certain phobia is a persistent and irrational fear that arises against a particular object or situation (58).

Vlaeyen et al. Compared specific phobia (a particular object or situation-related fear) in the case of chronic pain with the underlying features of fear associated with pain and found many similarities parallel to Kori's original theory (61). The difference between certain phobia and fear related to pain is that many people with pain have convinced themselves that it is a protective function of pain, and that they do not think there is any excess (42), as the fear of people with phobia is awful and unreasonable.

2.3.2. Physiological Results of Kinesophobia Behavior

A consequence of avoidance behavior is to avoid physical activity. The negative consequences of physical inactivity have been known since ancient times. Since the 17th century, physicians have introduced resting principle to patients as a treatment principle. Although bed rest is considered to have some problems; the number of people who believe in this method is also increasing.

It is the first change in the last century that Jones and Lovett offered a contrary view to this situation in 1926. Jones and Lovett first put forward the view that "the patient should be encouraged to act as soon as possible and bed rest should be prohibited" (62). Unfortunately, this recommendation was not widely accepted at that time and continued to be recommended for patients with musculoskeletal pain. There is no definite description of physical inactivity in the literature. However, physical activity advice for an adult is at least 30 minutes per day. A physical activity less than 30 minutes a day can be expressed as a physical inactivity (63).

Fear of movement; has a great effect on the formation of physical inactivity (56, 58-60). Physical inactivity causes; cardiovascular weakness, obesity, musculoskeletal system fragility, depression and premature aging. However, it is not clear where obstacles stop in various fear avoidance models. A more detailed definition has been given by the World Health Organization (2001) with the title "International Functioning, Disability and Health Classification (ICF)".

As a result; knee OA is a common disease that causes many problems and is difficult to treat. Patients with OA suffer from pain, depression and anxiety, physical performance and quality of life negatively. So it is very important to know what these changes are in order to be able to treat OA individuals and to prepare appropriate treatment programs. In our study, the relationship between OA and fear of movement, which is rarely seen in the literature, has been evaluated. It also assessed many important parameters that could have an impact on the level of physical activity, which has great significance for OA individuals.

3. PATIENTS AND METHODS

This study was conducted to investigate the relationship between pain, lower extremity functions, physical performance, fear of movement, level of anxiety / depression and quality of life in physical activity level in patients with knee OA who consulted to Yeni Mahalle State Hospital, between February 2017 and November 2017. It was carried out on voluntary individuals who received OA diagnosis (Annex 1-Authorization Letters).

Hacettepe University Ethics Committee of Non-Interventional Clinical Investigations approved the decision of GO 17 / 85-05 on 31.01.2017 (Annex 2-Ethics Board Approval Certificate) for the purpose of our work.

3.1. Individuals

A total of 220 volunteers were enrolled, 130 of which were female and 90 were male, with an average age of 53.23 ± 5.99 years, and who were diagnosed as kne OA (bilateral) according to American Rheumatology Association criteria. However, during the tests, 13 people could not complete the physical performance tests and 7 people did not want to answer some questions in the tests. So the remaining 200 people continued to work.

Inclusion Criteria:

• Be between the ages of 40-65

• Kellgren Lawrence Classification: Level: II-IV

• Volunteering to participate in the work

Exclusion Criteria:

• Previously knee surgery

• Those with sensory impairment

• Those with a broken story

• Those with circulation problems

• Those with infection in areas near the knee joint

• Those with severe hearing loss or visual impairment

• Individuals with cognitive problems

• Uncontrolled high blood pressure

• Those with vestibular problems such as vertigo and balance problems

• Individuals who have a condition to be considered as an obstacle to the knee joint

At the beginning of the workshop, participants were informed in writing and verbally about the purpose, duration, evaluations to be done, inquiry forms to be used. An informed consent form was signed to the volunteers of the individuals involved in the study (Annex 3: Informed Consent Form).

3.2. Methodology

In this study, which is planned in a cross-sectional study in a single patient group, while the sample size is determined because of the use of linear regression analysis as independent variables (pain, lower extremity functions, physical performance, fear of movement, level of anxiety / depression, and life expectancy) affect the level of physical activity (dependent variable), quality (n = 200) of at least 5 times the independent variables were included in the study (64). The evaluations in the study were done day-to-day to avoid taking patients' time and to make the tests more objective.

3.2.1. Evaluations

The following evaluations were made for all the participants in the study:

(a) Physical and Sociodemographic Evaluation

(b) Evaluation of Normal Joint Movement

(c) Assessment of Pain and Functional Status

(d) Physical Performance Evaluation

(e) Assessment of the fear of movement

(f) Evaluation of anxiety and depression

(g) Assessment of Physical Activity Level

(h) Evaluation of Quality of Life

3.2.1.1. Physical Characteristics and Sociodemographic Evaluation: A patient assessment questionnaire was used to question the physical characteristics and sociodemographic knowledge of the individuals participating in the study (Annex 4-Evaluation Form). In this survey; age, height, weight, body mass index (BMI), the knee joint on the dominant side, the duration of all exercises performed by sitting or standing outside the daily activities of the individual were questioned.

3.2.1.2. Range Of Motion Assessment: Goniometric measurement, which is used objectively in the evaluation of range of motion (R.O.M.) in clinic, is also used to determine the treatment program, to determine the functional capacity and to determine the effectiveness of the treatment, in addition to assessing the joint motion limit. Goniometer is a universal, clinical, gravitational, graphical and electronic type that is easy to carry, simple and durable tool that can be easily used on every joint. In our study, all measurements were performed using a "universal goniometer" to evaluate range of motion. The goniometric measurement of index flexion and extension was performed while the patient was in a prone position; the pivot point of the goniometer was placed in the lateral condyle of the femur, parallel to the lateral midline of the fixed arm femur, with the moving arm following the fibula. In the measurements, each measurement was repeated 3 times and their arithmetic mean values were recorded in degrees (65)

3.2.1.3. Assessment of pain and functional status: The Oxford Knee Score (OKS) is a valid and reliable questionnaire that evaluates the pain and functional status of individuals with knee OA from their own perspectives (66, 67). It is scored between 0 (no) and 4 (severe) in the Likert system (0-48). In this questionnaire consisting of 12 questions, 2, 3, 7, 11, and 12 questions evaluated the functional status; Questions 1, 4, 5, 6, 8, 9, 10 assess the pain-related condition. OKS pain scores range from 0 to 28 points. The points to be taken from the OKS function dimension range from 0 to 20 points. Higher scores indicate worse pain and functional status.

3.2.1.4. Physical Performance Evaluation:

*Timed Up and Go Test (TUG)*This test, originally called "Timed Up & Go Test" (TUG), is frequently used in the measurement of functional status in OA. This test is also investigating the ability of cases to maintain their balance during transfers and walking.

In this test, it was requested that the feet should sit in contact with the floor in a standard armchair, 3 meters walk, 3 meters back from the marked place, walk back to the chair and sit on a chair (Figure 3-1). The time elapsed for the performance of the events was recorded with the stopwatch in seconds. The test was repeated 3 times and averaged (68).

Figure 3.1. Timed up and go test application

6 Minute Walking Test: The functional capacities of the individuals studied were evaluated with the 6 Minute Walking Test (6-MWT). 6-MWT is a simple test that measures the distance that an individual can walk on a flat, hard surface in 6 minutes. People were asked to walk as long as possible for 6 minutes in their own rhythm. The distance covered in six minutes was recorded in "meters" (69, 70).

3.2.1.5. Assessment of Fear of Movement: The Tampa Kinesophobia Scale (TSK), consisting of 17 questions, is a measure evaluating the fear of movement / re-injury from 17 to 68 points. In this scale, in which Turkish validity and reliability were performed, high scores indicate that fear of movement is also at a high level (54, 71).

3.2.1.6. Assessment of anxiety and depression: The Beck Depression and Anxiety Inventory (BDI-BAI) is a valid and reliable test and has also a used Turkish version that measures the anxiety and depression-related symptoms of people aged 13 years and older, with a 21-question. The questionnaire is scored between 0 and 63 separately for anxiety and depression dimensions. High scores indicate severe anxiety and depression (72).

3.2.1.7. Assessment of Quality of Life: Short-Form 12 (SF-12) SF-12 is a short version of SF-36 containing 12 questions. There are two subtitles: Physical Component Scale (PCS) and mental component (Mental Component Scale, MCS). SF-12 Physical Score includes subscales of physical function, physical role, body pain and general health while SF-12 Mental Score consists of vitality, social function, emotional role and mental health subscales. The Turkish validity study was conducted by Koçyiğit et al. in 1999. The scores on the scale are between 0-60 for the physical and mental component, and the quality of life increases as the score increases (73).

3.2.1.8. Assessment of Physical Activity Level: The International Physical Activity Questionnaire-Short Form (IPAQ-SF) whose Turkish version was also tested in terms of validity and relevance, was used to determine the level of physical activity of the participants in the study (74, 75). This short questionnaire, consisting of seven questions, assesses the amount of walking in the last week and the amount of moderate and challenging physical activity in work, transportation, home work, garden work and leisure activities. The sitting time is recorded separately on weekdays and weekends. The IPAQ is organized in two forms: special (work, transportation, home-garden work, leisure time) and activity specific (walking, moderate activity, severe activity)

- *Calculation on activity specific scoring* : Calculation is done by the addition of walking, moderate intense activity, intense activity in itself.The following values are used for the analysis of IPAQ data:

• Walk = 3,3 MET

• Moderate physical activity = 4,0 MET

• Rigorous physical activity = 8.0 MET

For example; MET-min / week score walking in a person walking 5 days 20 minutes a week is calculated as; 3,3x20x5 = 330 MET-min / week. The total walking score is obtained by gathering the scores related to walking within each area. In this way continuous data is obtained.

There are three levels of physical activity that are determined when categorized: 'inactive', 'minimally active' and 'very active' (physical activity that increases fitness). Categorical classification:

Inactive (Category 1): It is the lowest level of physical activity. Situations that do not meet the criteria for Category 2 or 3 are considered 'inactive'.

Minimal Active (Category 2): Any of the following 3 criteria can be classified as "minimal active":

a) Difficult activity to be done for 3 or more days, at least 20 minutes a day

b) moderate intensity activity for 5 or more days or at least 30 minutes per day for walking,

c) Combination of 5 or more days walking, moderate intensity and challenging activity providing a minimum of 600 MET- min / week.

It is stated that the individual who meets any of the above criteria achieves a minimal level of physical activity.

Active (Category 3): Minimum public health is calculated as a 'very active' separate category for people who have passed physical activity recommendations. This measurement equals a moderate activity of at least about one hour per day or more. This category is the level of activity required to provide health benefits. Category 3 is at the higher threshold of activity and it is useful to distinguish the difference from the other two groups.

There are two criteria for classifying as 'very active':

a) At least 3 days of tough activity providing a minimum of 1500 MET-min / week or,

b) 7 days walking, moderate intensity or at least 3000 MET-min/week or the combination of challenging activity.

IPAQ Sitting Question:

The IPAQ sitting question is an additional determinant. It is not part of the scoring of physical activity. There is little data on sedentary (sitting) behaviors and there is no accepted threshold value as a categorical level.

The categorical classification of IPAQ-SF, which is used to assess the subjective physical activity level of OA individuals participating in the current study is as follows:

0-599 MET-min/ week: Inactive

600-2999 MET-min/ week: Minimal Active

> 3000 MET-min/ week: Active

3.3. Statistical Analysis: Statistical analysis was performed by using IBM SPSS 22.0 (Statistical Package for the Social Sciences 22.0) package program. The normal distribution of variables was examined visually (histogram and probability graphs) and analytical methods (Kolmogorov-Smirnov / Shapiro-Wilk tests). Descriptive analyzes were expressed as mean and standard deviation for numerical variables, frequency tables for ordinal variables (n) and ratios (%).The relationship between pain, lower extremity functions, physical performance, fear of movement, level of anxiety / depression and quality of life scores were examined by Pearson Correlation Analysis. Before the Regression Analysis, Spearman Correlation Analysis was used to determine the variables associated with the level of physical activity. Correlation coefficients between 0.05 and 0.30 are low or insignificant correlation; Values between 0,30 and 0,40 are low middle correlations; The values between 0.40-0.60 are median correlation ; values between 0.60-0.70 are Good correlation and values between 0.70-1.0 are interpreted as perfect correlation (64). Independent variables (pain, lower extremity functions, physical performance, fear of movement, level of anxiety / depression and quality of life) affecting the level of physical activity (dependent variable) were calculated using the Multiple Linear Regression Analysis Model with stepwise-backward elimination. Those that do not provide linear regression assumptions are removed from the model candidate parameters. For the remaining parameters, Linear Regression Analysis was performed again and the inappropriate parameters were removed from the model for reasons such as not being able to contribute to the model. Four independent variables (fear of movement, pain and function total score, Beck depression score, and 6 minute walking test score) were entered into the final analysis and again as the best predictors of the level of physical activity in knee OA individuals in the final model. The probability of error was accepted as $p < 0.05$.

4. RESULTS

4.1. Descriptive Results

The study was designed to investigate the relationship between pain, lower extremity functions, physical performance, fear of movement, level of anxiety / depression and quality of life and physical activity level in knee OA subjects. For this purpose, a total of 200, 80 (40%) male and 120 (60%) women between 40-65 years old voluntary individuals who consulted to Yeni Mahalle State Hospital between February 2017 and November 2017 and diagnosed knee OA, were evaluated within the scope of our study. The physical characteristics of the individuals participating in the study are shown in Table 4.1.

Table 4.1. Physical properties of individuals

Physical Properties	**Average**
	X±SD
Age (year)	53.23±5.99
Height (cm)	164.50±10.16
Weight (kg)	72.52±12.90
Body Mass Index (kg/m^2)	27.22±4.11

n=number of participants, X=Average value; SD=Standard Deviation

The disease duration of the individuals involved in the study was 8,5 ± 3,9 years. When lower extremity dominance was questioned, it was recorded that 135 (67.5%) were dominant on the right side and 65 (32.5%) on the left side. According to Kellgren Lawrence radiological classification; 131 individuals with stage 2 OA (65.5%); 53 individuals (26.5%) with Stage 3 OA and 16 (8%) individuals with Stage 4 OA were identified. When there is no limitation in the knee joint extension movements of the individuals in the study; right knee flexion NEH average was 135.40 ± 6.66 °; the mean left knee flexion NEH was 135.91 ± 6.88 ° ($p > 0.05$).

When the exercise status of the individuals are covered by the study; It was found that 60 individuals did not exercise at all, 53 individuals exercised more than twice a month, 48 individuals exercised once a month, 23 individuals exercised once a week, and 16 individuals exercised two or more days a week. According to this result; only 8% of the participants in the study were exercising for two or more days per week, and it was found that there was no exercise habit in general. The ratios of individual daily exercise times are given in Figure 4.1.

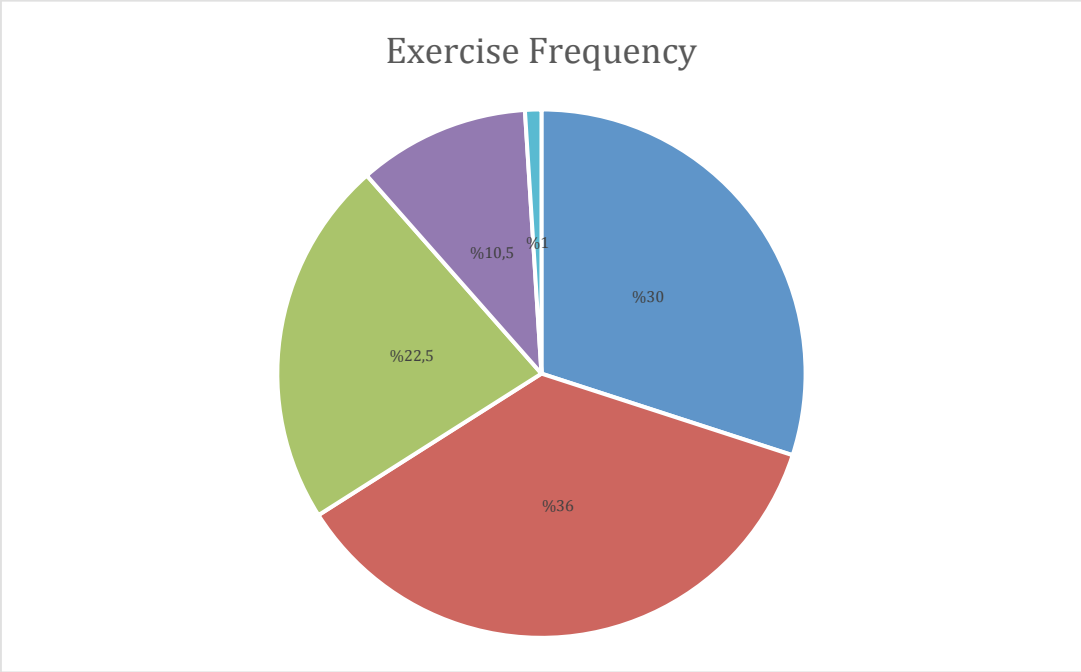

Figure 4.1. Daily Exercise Ratios of Individuals

4.2. Pain and Functional Status Results

Average scores of the Oxford Knee Score (OKS), which assessed pain and functional status from the perspective of the subjects studied, are shown in the table below (Table 4.2). Individuals can get a minimum of 0 points and a maximum of 48 points from the OKS.

Table 4.2. Individuals' OKS averages

n=200	Min. - Max.	X±SD
OKS-Pain (0-28)	0-26	13,75±4,79
OKS-Function (0-20)	0-20	10,48±4,05
OKS-Total (0-48)	0-44	24,08±8,03

n=number of participants, OKS=Oxford Knee Score, Min.-Max.=Minimum-Maximum, X=Average Value, SD=Standard Deviation

The relationship between OKS total score, OKS pain and OKS function scores, Beck Anxiety and Depression Scale, KF-12 mental and physical scores, and TSK scores are given in Table 4.3.

Table 4.3. Relation of OKS scores to anxiety / depression, quality of life and kinesophobia scores

(n=200)	BDI r	BAI r	SF-12 Physical r	SF-12 Mental r	TSK r
OKS-Pain	.377*	.384*	-.318*	-.137	.509*
OKS-Function	.340*	.358*	-.297*	-.094	.382*
OKS-Total	.385*	.396*	-.335*	-.133	.495*

Pearson Correlation Analysis, *p=0,001, n=Number of Participants, r= Correlation Coefficient, OKS=Oxford Knee Score, Min.-Max.=Minimum-Maximum, X=Average Value SD=Standard Variation, BDI=Beck Depression Inventory, BAI=Beck Anxiety Inventory, SF-12= Short Form-12, TSK=Tampa Kinesophobia Scale

There was a low-to-moderate positive correlation between OKS total, OKS pain and OKS function scores and BDI, BAI, TSK scores (r = 0,385; r = 0,377; r = 0,340 and r = 0,396; r = 0,384; r = 0,358 and r = 0,495; r = 0,509; r = 0,495; p = 0,001). According to this result; it has been seen that individuals with knee OA have increased psychological status as their pain increases and functional status improves.

There was not a statistically significant relation between OKS Total scores (r = -0,133; p = 0,061), OKS pain (r = -0,317; p = 0,052) and OKS function scores (r = -0,094; p = 0,186) and SF-12 mental status scores while a significant low correlation was found between SF-12 physical status scores on the negative side (r = -0,297; -r = 0,335; p = 0,001). According to this, changes in pain or functional status of individuals with knee OA have not been found to have an impact on quality of life.

The relationship between all subgroup scores of the OKS and the physical activity level IPAQ-SF, ZQT and 6-MWT scores is given in Table 4.4.

Table 4.4. The relationship between OKS scores and IPAQ-SF, ZQT and 6-MWT scores

n=200	**IPAQ-SF** **r**	**TUG** **r**	**6-MWT** **r**
OKS-Pain	-.528*	.445*	-.438*
OKS-Function	-.457*	.377*	-.426*
OKS-Total	-.550*	.451*	-.461*

Pearson Correlation Analysis, * p = 0.001, n = Number of Individuals, r = Correlation Coefficient, ODS = Oxford Knee Score, IPAQ-SF = Short Form of International Physical Activity Questionnaire, TUG: Timed Up and Go Test, 6- MWT = 6 Minute Walking Test

There was a negative low to moderate relation (r = 0.426, r = -0.550) between all subgroup scores of OKS and IPAQ-SF and 6-MWT scores; There was a significant positive correlation between the TUG scores in the positive direction (r = 0377; r = -0,451; p = 0.001). As a result of these analyzes, it was seen that the physical activity levels and physical performances of the individuals decreased as the pain of individuals with knee OA increased and their functionalities decreased.

4.3. Physical Performance Results

The mean scores of TUG and 6-MWT used in the evaluation of physical performance are given in Table 4.5.

Table 4.5. Average scores of physical performance tests

n=200	Min.-Max.	Average
		X±SD
TUG (sec)	6,00-17,20	9,69±2,15
6-MWT (min)	254-742	532,68±101,04

n = Number of Individuals, X = Mean Value; SD = Standard Deviation, Min.-Max. = Minimum-Maximum, TUG: Timed Up and Go Test, 6-MWT: 6 Minute Walk Test

There was a statistically significant negative correlation between individuals' TUG durations and 6-MWT intervals (r = -0,862; p = 0.001).

The relationship between TUG and 6-MWT scores and physical activity level IPAQ-SF is given in Table 4.6.

Table 4.6. The relationship between TUG and 6-MWT scores and physical activity level IPAQ-SF

n=200	TUG	6-MWT
	r	r
IPAQ-SF	**-.600***	**-.561***

Pearson Correlation Analysis, * p <0,001, n = Number of Individuals, r = Correlation Coefficient, IPAQ-SF = Short Form of International Physical Activity Questionnaire, TUG: Timed Up and Go Test, 6-MWT = 6 Minute Walking Test

There was a statistically significant negative and moderate correlation between TUG and 6-MWT scores and physical activity level IPAQ-SF (r = -0.561, p = 0.001) (Table 4.6). Based on the results, it was seen that as the physical performance of individuals with knee OA increased, physical activity levels decreased.

4.4. Results of Tampa Kinesiophobia Scale

There was no statistically significant difference in the distribution of TSK scores according to genders (mean: 31.78 ± 10.36) for the study subjects (p = 0,35). A minimum of 17 points and a maximum of 68 points can be obtained from the Tampa Kinesiophobia Scale.

The relationship between TSK scores and BAI, BDI, KF-12 mental and physical scores is shown in Table 4.7

Table 4.7. Relationship between TSK scores and physical and mental scores of BAI, BDI, SF-12

n=200	**BDI** **r**	**BAI** **r**	**SF-12 Physical** **r**	**SF-12 Mental** **r**
TSK	.426**	.428**	-.185*	-.155*

Pearson Correlation Analysis, **p<0,001, *p<0,05, n=Number of Individuals, r= Correlation Coefficient, BDI=Beck Depression ınventory, BAI=Beck Anxiety Inventory, SF-12= Short Form-12, TSK=Tampa Kinesophobia Scale

There was a positive moderate relationship between TSK scores and BDI and BAI scores (r = 0.426, r = -0.428, p <0.001); There was a weak correlation between TSK scores and physical and mental scores of KF-12 (r = -0,185, r = -0,155, p <0,05). According to this result; as the fear of moving individuals with knee OA increased, depression and anxiety states increased, but the quality of life did not change much.

The correlation between the TSK scores and the IPAQ-SF, TUG and 6-MWT scores is shown in Table 4.8.

Table 4.8. Relationship between TSK scores and IPAQ-SF, TUG and 6-MWT scores

n=200	IPAQ-SF r	TUG r	6-MWT r
TSK	-.693*	.456*	-.356*

Pearson Correlation Analysis, * p <0.001, n = Number of Individuals, r = Correlation Coefficient, TSK = Tampa Kinesophobia Scale, IPAQ-SF = Short Form of International Physical Activity Questionnaire, TUG: Timed Up and Go Test, 6- MWT = 6 Minutes Walk Test

There was a good correlation between the TSK scores and the IPAQ-SF scores on the negative side (r = -0.693); There was a low median correlation between TSK scores and TUG and 6-MWT scores (r = 0.456, r = -0.365, p <0.001). As a result of this analysis, it was seen that the physical activity levels and physical performance of the individuals with knee OA increased as their fear of moving decreased.

4.5. Results of Anxiety and Depression Assessment

BAI and BDI averages are given in Table 4.9 for the evaluation of anxiety and depression status of the subjects who are employed. A minimum of 0 points and a maximum of 63 points can be obtained from BAI and BDI tests.

Table 4.9. Averages of BAI and BDI scores of the subjects

n=200	Min.-Max.	X±SD
BAI (0-63)	2-52	12,88±8,58
BDI (0-63)	2-48	11,63±7,16

n = Number of Individuals, X = Mean Value; SD = Standard Deviation, Min.-Max. = Minimum-Maximum, BAI: Beck Anxiety Inventory, BDI: Beck Depression Inventory

The relationship between the BAI and BDI scores of the individuals studied and the scores of the physical and mental dimensions of the TSK and SF-12 are given in Table 4.10.

Table 4.10. Relationship between BAI and BDI scores and the physical and mental scores of TSK and SF-12

n=200	TSK R	SF-12 Physical r	SF-12 Mental r
BAI	.428**	-.450**	-.469**
BDI	.426**	-.418**	-.410**

Pearson Correlation Analysis, ** p <0.001, n = Number of Individuals, r = Correlation Coefficient, BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, SF-12 = Short Form-12, TSK = Tampa Kinesophobia Scale

There was a moderate correlation between the BAI and BDI scores and the physical and mental dimension scores of SF-12 and TSK (r = 0,428, r = -0,450, r = -0,469 and r = 0,426, r = -0,418, r = -0,410, p <0.001). According to this; It has been determined that when anxiety and depression levels of individuals with knee OA increased, their kinesiophobia increased as well and this decreased their quality of life.

The relationship between the BAI and BDI scores of the subjects studied and the IPAQ-SF, TUG and 6-MWT scores is given in Table 4.11.

Table 4.11. Relationship between BAI and BDI scores and IPAQ-SF scores

n=200	*IPAQ-SF* r	TUG r	6-MWT r
BDI	-.429**	.260**	-.209**
BAI	-.397**	.264**	-.228**

Pearson Correlation Analysis, **p<0,001, n=Number of Individuals, r= Correlation Coefficient, BDI= Beck Depression Inventory, BAI= Beck Anxiety ınventory, IPAQ-SF= ınternational Physical Activity Questionaire Short Form, TUG= Timed Up and Go Test, 6-MWT=6 Minutes Walk Test

While a moderate correlation was found between the BAI and BDI scores and IPAQ-SF scores on the negative side; There was a low correlation between the BAI and BDI scores and the TUG and 6-MWT scores ($r = 0.264$, $r = -0.228$, $r = -0.429$, $r = -0.260$, $p < 0.001$). Looking at the findings, it was seen that the anxiety and depression situations of the individuals with knee OA increased and the physical activity levels of the individuals decreased.

4.6. Findings About Assessing Quality of Life

In order to evaluate the quality of life of the individuals who are employed, SF-12 physical, mental and total point averages are given in Table 4.12. Individuals SF-12 have a minimum score of 0 and a maximum of 60 points in each of the physical and mental subgroups, with a total score of 0-120.

Table 4.12. SF-12 physical, mental and total point average of individuals

n=200	Min.-Max.	X±SD
SF-12 Physical	20,10-58,60	36,15±9,18
SF-12 Mental	13,30-55,60	35,84±9,08
SF-12 Total	40,00-107,10	71,99±16,67

n = Number of Individuals, X = Mean Value; SD = Standard Deviation, Min.-Max. = Minimum-Maximum, SF-12: Short Form-12

The relationship between SF-12 physical, mental and total scores of the subjects taken into the study and the scores of the TSK, BDI and BAI scores are given in Table 4.13.

Table 4.13. Relationship between SF-12 physical, mental and total scores and TSK, BDI and BAI scores

n=200	TSK r	BDI r	BAI r
SF-12-Physical	-.185**	-.418**	-.450**
SF-12-Mental	-.155**	-.410**	-.469**
SF-12 Total	-.186**	-.453**	-.503**

Pearson Correlation Analysis, ** p <0,001, n = Number of Individuals, r = Correlation Coefficient, SF-12 = Short Form-12, TSK = Tampa Kinesophobia Scale, BDI = Beck Depression Inventory, BAI = Beck Anxiety Inventory

While there was a moderate correlation between SF-12 physical, mental and total scores and BAI and BDI scores on the negative side, There was a low correlation between SF-12 physical, mental and total scores and TSK scores (r = -0,185, r = -0,155, r = -0,186, p <0,001). According to these results, depression and anxiety states were reduced as a result of decreased quality of life of individuals with knee OA, but this did not affect the fear of moving.

The relationship between SF-12 physical, mental and total scores and IPAQ-SF, TUG and 6-MWT scores is shown in Table 4.14.

Table 4.14. The relationship between SF-12 physical, mental and total scores and IPAQ-SF, TUG and 6-MWT scores

n=200	IPAQ-SF r	TUG r	6-MWT r
SF-12-Physical	.213**	-.166*	.190*
SF-12-Mental	.183	-.074*	.115*
SF-12 Total	.217**	-.132*	.167*

Pearson Correlation Analysis ** / * p <0,001, n = Number of Individuals, r = Correlation Coefficient, SF-12 = Short Form-12, IPAQ-SF = Short Form of International Physical Activity Questionnaire, TUG= Timed Up and Go Test, 6-DYT = 6 Minute Walk Test

Although the SF-12 physical, mental and total scores were significant at p <0.001 between the IPAQ-SF, TUG and 6-MWT scores, as shown in Table 4.14, it can be said that there is a weak correlation between SF-12 physical, mental and total scores and IPAQ-SF, TUG and 6-MWT scores because of the very small correlation coefficients (r = 0,217, r = -0,132, r = 0.176; p & lt; 0.001). Looking at the resulting data; it was determined that any change in the quality of life of individuals with knee OA had no effect on physical performance and physical activity levels.

4.7. Findings of Assessment of Physical Activity Level

IPAQ-SF scores of the subjects were between (Min = 270; Max = 3900) and the mean score was 1946.99 ± 894.67 MET-min / week. The homogeneous distribution of IPAQ-SF scores, which indicates the level of physical activity of the patients, also increased the standard deviation of the mean. Findings related to the categorical classification of IPAQ-SF scores are given in Table 4.15.

Table 4.15. Categorical classification of IPAQ-SF scores

IPAQ-SF	**n**	**%**
Inactive (0-599 points)	12	6
Minimal Active (600-2999 points)	156	78,0
Active (3000 points and over)	32	16,0

IPAQ-SF = International Physical Activity Questionnaire Short Form, n = Number of Individuals,% = Percentage

Physical activity levels according to the genders of the subjects are shown in Table 4.16.

Table 4.16. Individuals' levels of physical activity by gender

n=200			IPAQ-SF Categories			p
			Inactive	**Minimal Active**	**Very Active**	
Gender	**Male**	**Number (n)**	2	64	14	0,23**
		Percentage (%)	2,5	80	17,5	
	Female	**Number (n)**	10	92	18	
		Percentage (%)	8,3	76,7	15	

Chi-Square Test, ** p <0,05 significant, IPAQ-SF = International Physical Activity Questionnaire Short Form, n = Number of Individuals,% = Percentage

The categorical classification of the physical activity levels according to the genders of the participants was found to be similar to the physical activity levels (p = 0,23) (Table 4.16).

4.8. Findings of Evaluating the Parameters Affecting the Level of Physical Activity

Before the linear regression analysis, the relation between IPAQ-SF scores and OKS, TUG, 6-MWT, TSK, BAI, BDI and SF-12 scores was assessed by Spearman Correlation Analysis (Table 4.17).

Table 4.17. The relationship between IPAQ-SF scores and OKS, TUG, 6-MWT, TSK, BAI, BDI and SF-12 scores

IPAQ-SF	**r**	**p**
Oxford Knee Scale-Pain Subheading	-.528**	0,000
Oxford Knee Scale-Function Subheading	-.457**	0,000
Oxford Knee Scale-Total	-.550**	0,000
Timed Up and Go Test	-.600**	0,000
6 Minute Walk Test	-.561**	0,000
Tampa Kinesophobia Scale	-.693**	0,000
Beck Anxiety Inventory	-.397**	0,000
Beck Depression Inventory	-.429**	0,000
Short Form 12- Physical Status	.193	0,000
Short Form 12-Mental Status	.174	0,000
Short Form-12 Total	.204**	0,000

Spearman Correlation Analysis, ** p <0.001, n = Number of individuals, r = Correlation coefficient, IPAQ-SF = Short Form of International Physical Activity Questionnaire.

The relation between IPAQ-SF score and the subscales of OKS and the total scores of TUG, 6-MWT, TSK, BAI and BDI, SF-12 were statistically significant (r = -0,600, r = -0,561, r = R = -0,362; r = -0,429; r = 0,204, p & lt; 0.001). There was no statistically significant correlation between physical and mental dimensions of SF-12 and IPAQ-SF scores (r = 0,193, r = 0,174, p> 0,001) (Table 4.17). As a result of all these analyzes; It has been determined that as the physical activity levels of knee OA individuals increase, their pain decreases, their functionalities increase, their physical performance decreases, their fear of movement decreases, their anxiety and depression situations decrease but their quality of life does not change much.

Statistically significant independent variables (OKS Pain, OKS Function, OKS Total, TUG, 6-MWT, TSK, BAI / BDS and SF-12) affecting the level of physical activity (IPAQ-SF-dependent variable)) was introduced into stepwise-backward elimination multicollinear regression analysis model (Table 4.18).

Table 4.18. Variables entering the model in Linear Regression Analysis

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**P**
1	**Regression**	99806744,656	9	11089638,295	35,422	,000[b]
	Residual	59483166,339	190	313069,297		
	Total	159289910,995	199			
a. Dependant Variable: *IPAQ-SF*						
b. Indicators: SF-12 Physical, SF-12 Mental, TUG, OKS pain, OKS Function, TSK, BAI, BDI, 6 MWT						

IPAQ-SF = International Physical Activity Questionnaire Short Form, OKS = Oxford Knee Score, TUG= Timed Up and GoTest, 6-MWT = 6 Minute Walk Test, TSK = Tampa Kinesiophobia Scale, BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, SF-12 = Short Form-12

As a result of Regression analysis Model 1, the variables entering the model at 0.05 significance level are given in Table 4.19.

Table 4.19. Significant independent variables in regression analysis

The Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	p
		B	**Std. Error**	**Beta**		
1	***IPAQ-SF***	3286,268	790,438		4,158	,000
	OKS Pain	-12,327	12,808	-,066	-,962	,337
	ODS Function	-17,933	14,361	-,081	-1,249	,213
	TUG	-60,161	38,925	-,145	-1,546	,124
	6-MWT	1,753	,811	,198	2,160	**,032**
	TSK	-39,417	4,926	-,456	-8,001	**,000**
	BDI	-23,702	10,955	-,190	-2,164	**,032**
	BAI	11,131	9,484	,107	1,174	,242
	SF-12 Physical	-5,760	6,227	-,059	-,925	,356
	SF-12 Mental	7,282	6,292	,074	1,157	,249

a.Dependant Variable: *IPAQ-SF*

IPAQ-SF = International Physical Activity Questionnaire Short Form, OKS = Oxford Knee Score, TUG= Timed Up and GoTest, 6-MWT = 6 Minute Walk Test, TSK = Tampa Kinesiophobia Scale, BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, SF-12 = Short Form-12

The explanatory power of the 3 independent variables in Model 1 (6-MWT, TSK, BDI) was R2 = 0.610 for the dependent variable (IPAQ-SF). As a result of the F test (F = 102,111), the model was found to be significant at a significance level of 0.05. The results of the Linear Regression Analysis in Model 1 revealed that the parameters of 6-MWT, TSK and BDI were significant predictors of R2 = 0,610 predictability of physical activity level assessed by IPAQ-SF in individuals with knee OA ($p < 0.001$).

Because the independent variables in Model 1 (BAI, SF-12 Physical, SF-12 Mental, OKS-Pain, OKS-Function) did not make a statistically significant contribution to the explanation of dependent variables, they were excluded from the regression model, which was established in the regression analysis. The independent variables of 6-MWT, TSK and BDI were statistically significant in Model 1; IPAQ-SF (dependent variable) to the regression model (Table 4.20).

Table 4.20. Regression model with independent variables BDI, 6-MWT, TSK

ANOVA[a]						
Model		***Sum of Squares***	**df**	***Mean Square***	**F**	**P**
1	**Regression**	97138430,987	3	32379476,996	102,111	**,000**[b]
	Residual	62151480,008	196	317099,388		
	Total	159289910,995	199			
a. Independant Variable: *IPAQ-SF*						
b. Indicators: (*IPAQ-SF*), BDI, 6-MWT, TSK						

p <0,005, IPAQ-SF = International Physical Activity Questionnaire Short Form, ODS = Oxford Knee Score, TUG = Timed UP and Go Test, 6-MWT = 6 Minute Walk Test, TSK = Tampa Kinesiophobia Scale, BAI = Beck Anxiety Scale, = Beck Depression Scale, SF-12: Short Form-12

Since the OKS scores in Model 1 were not significant when analyzed with subheadings; In Model 2, OKS total scores were included in the regression analysis this time. Thus, in the linear regression analysis, the independent variables in the model 2 at the significance level of 0.05 were OKS total, BDI, 6-MWT, and TSK scores (Table 4.21).

Table 4.21. Significant variables in Model 2 in Linear Regression Analysis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	p
		B	**Std. Error**	**Beta**		
1	**(*IPAQ-SF*)**	2287,572	343,302		6,663	,000
	6-MWT	2,746	,446	,310	6,153	**,000**
	TSK	-40,535	4,645	-,469	-8,727	**,000**
	BDI	-14,302	6,247	-,114	-2,290	**,023**
	OKS Total	-14,484	6,138	-,131	-2,360	**,019**

a. **Independant Variable:** *IPAQ-SF*

p <0.005, IPAQ-SF = Short Form of International Physical Activity Questionnaire, OKS = Oxford Knee Score, 6-MWT = 6 Minute Walking Test, TSK = Tampa Kinesiophobia Scale, BDI = Beck Depression Inventory

The explanatory power of the 4 independent variables (6-MWT, TSK, BDI, OKS Total) entering model 2 was R2 = 0.621 for the dependent variable (IPAQ-SF) . As a result of the F test (F = 79,761), the model was found to be significant at "p = 0.00" significance level. The summary of the models in which the independent variables included in the multiple linear regression analysis are shown in determining the parameters that affect the level of physical activity are given in Table 4.22.

Table 4.22. Summary of Models according to Physical Activity Levels

Model	Variables	R^2	Standard Deviation	F	p
1	**6-MWT TSK BDI**	,610	563,11579	102,111	,000
2	**6-MWT TSK BDI OKS Total**	,621	556,66597	79,761	,000

OKS = Oxford Knee Score,TUG = Timed Up and Go Test,6-MWT = 6 Minute Walking Test, TSK = Tampa Kinesophobia Scale, BDI = Beck Anxiety Inventory, BDI = Beck Depression Inventory,

Linear Regression Analysis revealed that the total scores of the 6-MWT, TSK, BDI and OKS were the strongest predictors of knee OA individuals (R2 = 0,621) that affected the physical activity level assessed by IPAQ-SF ($p < 0.001$).

5. DISCUSSION

The results of this study on the examination of the parameters affecting the level of physical activity in knee OA individuals; showed that the level of physical activity was moderately related to pain, lower extremity functions, physical performance, fear of movement, level of anxiety / depression, and quality of life. In addition, the results of our work revealed that; physical performance (6-MWT), fear of movement (TSK), depression level (BDI), and pain and functional status (OKS) from the patient's perspective were the most influential predictors in predicting the physical activity level.

5.1. Physical Characteristics

Knee OA is known to be 4 times more common in females than males (76). In our study, 60% of the individuals were women; 40% were male, supporting the literature (77-79). Moreover, when we look at the average age of the individuals in our study, it is seen that they are similar to the average age in many studies (77, 79-81). Obesity is one of the primary causes of knee OA. In the literature, it is known that pain and high BMI values in knees with symptomatic knee OA are associated with low knee joint flexion (82). It was seen that the individuals in our study had similarly high BMI values.

It is known that physical features and sociodemographic findings as well as radiological findings are important in OA. According to the Kellgren-Lawrence radiological classification of participating individuals, OA severity at 92% was at Level 2-3 and was not very advanced. Regarding the exercise status of the individuals, 8% were exercising two or more times a week and 30% were not exercising at all. When we look at the literature, it is reported that OA individuals have low physical activity levels and low exercise rates (83, 84).

5.2. Range of Motion

Decreased joint range of motion is a characteristic feature of knee OA (85). While knee extension limitations are not observed in the participants of the current study; knee flexion joint range of motion was in the normal range. The normal range of motion of the joint may be due to the fact that the majority of our study consisted of individuals with early stage knee OA and a low average age.

5.3. Pain and Functional Status

In our study, a valid and relevant Turkish OKS was used in order to evaluate the pain and functional status in individuals with knee OA from the perspective of the individual (67). In a study done by Davis et al., the overall average OKS of patients with knee OA was reported to be 16.8 (81). Different studies show that the OKS total score is 33 (86, 87). High scores from OKS indicate the worst of the patient's perception of pain and functional status. When we look at the average OKS scores of the individuals in our study, it is seen that the scores are at the middle-high level (Avg: 24,1). There was no significant difference between the OKS scores of the individuals in terms of gender ($p > 0.05$).

Since 1, 4, 5, 6, 8, 9, 10 questions from the subheadings of the OKS assessed the individual's pain-related perception, no separate scale was used to assess pain severity in our study. The occurrence of individuals with early stage knee OA in our study may have caused the OKS pain subscale to have a lower score from the patient perspective, thus leading to better OKS overall score averages. Similarly, as a result of a study by Holden et al. In 2234 patients aged 50 years and older living in the UK to find the relationship between physical activity and pain, pain complaints were also observed in patients with decreased physical activity levels [88]. In our study, a significant relationship between the level of physical activity and the pain subdimension of the OKS was found to be moderate in the negative direction, and as the level of physical activity of the individuals increased, the severity of pain decreased.

The results of a review by Quicke et al. also support the existence of a relationship between physical activity level and pain severity (89).

When we look at the relationship between the functional sub-dimension of OKS and the level of physical activity, we found a negative moderately significant relationship between these two variables in our study. According to this, it is seen that the functional sense, which is one of the OKS sub-dimensions in OA individuals, affects the physical activity level. In a similar study by Peeler et al., 31 patients aged 55-75 years with pain at normal daily activities were evaluated (90). As a result of the study, it was observed that as the level of physical activity increased, patients with knee OA could perform their functions in daily life activities better and more effectively. As a result of this result; the patient's muscle mass was either preserved or strengthened with the continuity of physical activity, and this change in muscle mass was also positively associated with function (90).

5.4. Physical Performance

In the evaluation of physical performance in our study, 6-MWT and TUG, which were frequently used in patients with knee OA, were used (91). The high correlation between these two performance tests was also found in our study in accordance with the literature. Low physical performance is also known to increase the progression of chronic diseases such as OA (92-94). The reason for this is that low physical performance is reported to be caused by negative factors such as low muscle intensity and prolonged recovery time. In solving these problems, increasing the level of physical activity has great importance. Many studies in the literature also show that physical activity and physical performance are two interrelated factors (92, 95-98). In our study, differently from the literature, physical performance was related to the level of physical activity; it was observed that individuals with high physical activity scores had worse outcomes in performance tests.

The high level of physical performance has a positive effect on individuals with knee OA. Therefore, physical performance should be considered clinically during treatment. The study by Osaki et al. On the evaluation of physical performance of knee OA individuals showed that the treatment processes were more positive and faster in the individuals who were assessed physical performance in the pre-treatment clinic than those who were not.

5.5. Fear of Movement

Fear of movement or kinesophobia; is described as the fear-avoiding situation from activity or physical movement which results from the feeling of sensitivity against painful injury and repeated injury (99). The fear of movement of the participating individuals was evaluated with the Tampa Kinesiophobia Scale (TSK), which has the Turkish validity and reliability in the literature. There was no difference between the genders in terms of kinesophobia scores of the subjects studied. It was observed that the individuals involved in our study had moderate fears of moving and that this was also related to the level of physical activity and performance tests.

In a study by Erden et al., in which kinesophobia of 80 patients with knee OA, aged 50-80 years, was assessed, it is also indicated that there was a moderate fear of moving siilar to the current study (99). Again, Scopaz et al. (100) have shown that kinesophobia and anxiety affect physical activity levels in a study of individuals with knee OA (100).

A study by Filardo et al in 200 patients with total knee arthroplasty showed that kinesophobia was significantly associated with depression, especially when avoiding motion (101). Similarly, in our study, fear of movement and depression and anxiety parameters were moderately related; there was a weak relationship between quality of life and kinesophobia in the negative direction. Because fear of movement was a parameter that directly affected performance and functionality, it was not expected to be associated with low quality of life. It is also believed that this poor association between kinesophobia and quality of life is due to the inadequate quality of SF-12 in patients with knee OA in terms of life quality assessment.

Another reason is that even though individuals with knee OA are afraid to move, the SF-12 test asked individuals to respond positively to questions in the physical subparameter. However, when we look at the relationship between the level of physical activity and the fear of moving, the level of physical activity is observed to decrease as the fear of moving increases. In a study conducted by Güney-Deniz et al,on 46 total knee arthroplasty patients underwent surgery, the effect of kinesophobia on functionality early after surgery was evaluated (102).

As a result of the study, patients with low kinesophobia were reported to have better physical activity, pain severity, and normal joint motion results than patients with high kinesophobia (102). Similarly, in a study of 110 patients who underwent knee prosthesis operation by Monticone et al., It was reported that the fear of movement of patients starting regular physical activity decreased with time (103). In a cohort study conducted by Doury-Panchout et al., it was found that patients with high kinesophobia walk less in 6-MWT (104). In addition; in a 12-month follow-up study of Sullivan et al., patients with kinesophobia have been shown to be slower to recover (105). In a similar vein, it has emerged as a parallel result in the literature that participating individuals also get worse results in performance tests as their fear of moving increases.

5.6. Anxiety and Depression Level

It was observed that the individuals in our study were depressed even if they were at low level when the depression status was examined. Similarly, in a one-year follow-up study conducted by Calfas et al., 40 patients with knee OA showed that depression levels of patients are falling over time in the 2, 6, and 12 month evaluations from the beginning of treatment (106). It was also determined that the pain perception assessed by OKS was moderate in individuals who participated in the current study, and that there was also a significant relationship between the pain perception and the depression status of the individuals. Similar studies in the literature suggest that there is a significant relationship between pain and depression (107,108).

In addition, when we look at the relationship between depression and physical activity level in our study, depression level decreased as the physical activity level of the individuals increased. Again, Deforche et al. emphasized that psychological state is very important at the end of the study and that individuals should be directed to some activities that they want in order to increase their physical activity levels (96). In a cohort study conducted by Harris et al. on 424 participants to evaluate the effect of physical activity on depression level, physical activity has been shown to reduce depression despite all other variables (109).

There are many studies in the literature that emphasize the positive effects of physical activity on mental health (110-112). It is even reported by Blumenthal et al. that physical activity was as effective as antidepressant therapy on depression (113). As it is seen in this study, it is necessary to evaluate the psychological status of the patients applying to the clinic for treatment, especially the level of depression and to determine the appropriate treatment schedule. This will accelerate the recovery of both knee OA and ensure that the patient's psychological state is better.

Individuals who participated in the current study were found to have low level of anxiety (Avg: 12,87). Similarly, in a study conducted by Özçetin et al. on 1054 patients, the effect of anxiety on daily living in patients with knee OA was examined. Patients with knee OA have been shown to have high levels of anxiety (114). In a meta-analysis study conducted by Rebar et al., physical activity has been shown to have little effect on anxiety (115). It has also been shown in a study by Fitzgerald et al. who focused on the effects of physical activity on patients with knee OA that physical activity has no effect on anxiety (116). In our study, although the anxiety level was associated with a lower level of physical activity level, it was thought that the individuals with the mean disease duration of 8.5 years in our study had a chronic low depression level by OA's nature, but this did not reflect much to their anxiety levels . Similarly, in the regression analysis, the level of depression was found to be a more significant indicator than the level of anxiety, among the indicators of physical activity level of individuals with knee OA.

5.7. Quality of Life

In our study, the quality of life assessed by SF-12 was found to be moderate-high. When the mental and physical components of SF-12 were examined separately, it was determined that they were both moderate. SF-12 test in our study was chosen thanks to its structural simplicity and suitability in determining the quality of life among other tests in terms of required time. Dias et al. in a study by which they analysed life quality and physical activity levels of 50 patients with knee OA, reported that increasing physical activity level increases the quality of life as well (117). In our study, there was also a significant positive correlation between quality of life scores and physical activity scores.

In a study conducted by Rejeski and Mihalko, it is stated that individuals feel enjoyed after physical activity, which in turn affects the quality of life positively (118). Similarly, in our study there was a moderate correlation between quality of life and anxiety and depression in the negative direction.

In a clinical study of 750 patients by Elley et al., it was found that at the end of 12 months, the quality of life of the group of physical activity increased significantly compared to the control group (119). Furthermore, in some studies it is stated that the level of physical activity does not directly affect the quality of life, it increases the quality of life indirectly by the effect of the self-confidence emerging after the activity and the physical strengthening (120, 121).

As a result of the regression analysis of our study, the level of physical activity of the quality of life parameter, which is one of the independent variables modeled, may be due to the fact that SF-12 can not assess the quality of life and disease in patients with OA. In addition, despite the fact that in the regression analysis a model was created by many tests, the SF-12 test did not appear to be a marker when compared to the other tests in our study. Similarly, in a study of McAuley et al on 250 female subjects, explaining the relationship between physical activity and quality of life; it has been reported that it should be seen as a stable path that can be improved, changed, time sensitive, slowing the bad transition for health (121).

5.8. Physical Activity Level

In the categorical classification of physical activity levels in the daily lives of the individuals who were employed, it was observed that 6% were inactive, 78% were minimal active and 16% were very active. In terms of the general point average of physical activity, it was determined that the physical activity levels of the individuals were in the middle level. Similarly, in a study conducted by Rosemann et al., physical activity levels were found to be moderate when the physical activity levels of patients with knee OA were examined (122).

As a result of the regression analysis in our study, it was seen that the total OKS score, which assessed pain and functional status from the patient's perspective, was one of the important predictors of the level of physical activity. Similarly, in a study conducted by Naal et al., they looked which ones among many assessment scales were better to understand the physical activity level and they showed that OKS gave one of the best results for the knee (123). However, many surveys also state that pain and function alone will not be sufficient to determine the level of physical activity (124, 125).

A study by Tonelli et al in a 208-knee OA patient, who said that the pain alone was not sufficient to determine the level of physical activity, showed that physical activity levels may be similar, albeit with significant differences between patients' pain (125).

When it comes to the literature on the relationship between physical performance and physical activity, Dunlop et al. have shown that there is a perfect correlation between physical performance and physical activity level in knee OA individuals in a cohort study [126]. In the regression analysis we conducted, a similar significant relationship was found between physical activity level and physical performance, suggesting that 6-MWT is an important predictor of the level of physical activity of individuals with knee OA. In a similar study conducted by Ko et al. on 32 patients who had undergone total knee arthroplasty, it was reported that 6-MWT and TUG may be indicative of early physical activity level (127).

In our study, Spearman Correlation Analysis revealed that 6-MWT and TUG were associated with physical activity level, but in the regression model that established for the level of physical activity, only 6-MWT had a significant correlation. Likewise, the literature recommends the use of 6-MWT in assessing physical performance of individuals with knee OA (128)

Fear of movement in our study (as a result of regression analysis showing a significant association with the level of physical activity) was shown to be an important predictor for estimating the level of physical activity. Similarly, Roaldsen et al reported that fear of moving in a study might be used as a marker for the level of physical activity (129).

In addition to the level of physical activity, the psychological state of the patient during physical activity is also very important. In the results of regression analysis of the current study, depression was found to have an important role in determining the level of physical activity. A similar study by De Mello et al. it was found that physical activity levels of patients with high levels of depression and anxiety were also low (130). In a similar study by Kuehlein et al., it was shown that the greatest cause of the low level of physical activity on the 1021 OA patient was due to the psychological state of the patients (131).

In addition, the study by Summers et al., on 65 OA individuals, showed a significant association between depression and physical activity parameters (132). Again, Salaffi et al. found a relationship between depression and physical activity levels in a study of 61 female participants with knee OA (133).

As a result; when determining treatment programs for individuals with knee OA, it is necessary to concentrate on efforts to increase physical activity levels. Therefore, it is very important to determine the current physical and psychological conditions of knee OA individuals who come to the clinic. At the conclusion of our discussion, in specifying the level of physical activity; physical performance, depression, and fear of moving, are important parameters.

5.9. Limitations

The greatest limitation of our study is that the levels of physical activity of the individuals taken into the study were assessed by the subjective questionnaire method and only according to the physical activity levels of the patients in the last week. It is thought that the level of physical activity can be analyzed better by making measurements with technologically advanced devices (such as 3D walking analysis systems, 3D force plates, accelerometer). Despite the large number of samples in the quality of life assessments, there is a very low correlation with the level of physical activity and the results obtained using the scales assessing the specific quality of life for OA can be better interpreted. Although pain perception in OA individuals was assessed within the OKS subscale from the patient perspective, it is thought that the severity of pain is not assessed on a different scale, such as VAS, may affect the results of correlation analysis. According to the regression analysis, although kinesophobia seems to be one of the determinants of physical activity in knee OA, a disease-specific questionnaire that can assess fear of movement in knee OA has not been developed yet limits the reliability and generality of our results.

6. CONCLUSION

The results of this study on the relationship between pain, lower extremity functions, physical performance, fear of movement, level of anxiety / depression, and quality of life on physical activity levels in individuals with knee OA are as follows;

1. The physical activity levels of the 200 knee OA subjects included in this study were found to be more than half (n = 156) active in the middle level. When the exercises performed by the individuals covered in the study are examined, 30% of the individuals do not exercise at all; 26.5% had more than two exercises per month, 24% had exercises once a month; 11.5% had exercised once a week, and 8% had two or more exercises per week. In this case, the importance of exercise in the knee OA was once again revealed to be prominent.

2. Individuals participating in the study had knee extension without limitation of joint range of motion and joint range of motion at knee flexion were found to be normal values. This has shown us that it is not so important to give much importance to knee joint range of motion in patients with knee OA in the clinic.

3. From the patient's perspective, there was a significant positive correlation between pain and functional perception and depression, anxiety, and kinesophobia. Accordingly, if the patient experiences psychological disturbances such as less anxiety and depression, the pain becomes less. On the other hand, there was no statistically significant relationship between the mental status sub-dimension of quality of life. There was a significant negative correlation between the quality of life physical status scores. There was also a significant relationship between pain and function perception and physical activity level and physical performance from the patient's perspective. In line with the expectation, the physical activity levels and physical performances of the patients with less pain were better.

4. There was a significant relationship between physical performance and physical activity level in our study. Accordingly, it was seen that OA patients with high physical activity level were more successful in physical performance tests.

5. There was no statistically significant difference in the fear of moving of the working people according to their genders. This suggests that each patient with knee OA may be afraid to move without notice. There was a positive moderate relationship between depression, anxiety and fear of moving. In this case, psychological illness such as fear of moving could increase anxiety and depression. Therefore, the treatment of fear of moving in the clinic will also allow for the psychological relief of the patient. There was also a low negative relationship between physical and mental scores of life quality and fear of moving. There is a good correlation between the fear of moving and the level of physical activity on the negative side; there was a low-to-moderate correlation between physical performance. Physical activity levels and physical performances of patients with knee OA with more fear of moving were found to be very low. Therefore, if the patient is afraid to move in the clinic, it will be more beneficial for the patient to do the first-line treatment.

6. The anxiety and depression status of the subjects who participated in this study were generally low. There was a moderate correlation between anxiety and depression level and fear of moving, quality of life. While there is a moderate correlation between anxiety and depression level and physical activity level on the negative side, there was a low correlation between physical performance. While a moderate correlation was found between the quality of life and anxiety and depression level in the negative direction; a low correlation was found between fear of moving. It can be said that there is a low or insignificant correlation between the quality of life and physical activity level, physical performance.

7. In the categorical classification of physical activity levels in the daily lives of the individuals, it was observed that 6% were inactive, 78% were minimal active and 16% were very active. In terms of the general point average of physical activity, it was determined that the physical activity levels of the individuals were moderate (minimal active). It was seen that the physical activity levels were similar in the categorical classification of the physical activity levels according to the genders of the participants.

8. In our study, regression analysis revealed that physical activity (6-MWT), fear of movement (TSK), level of depression (BDI), pain and functional status from patient perspective (OKS) were the most effective indicators to predict the level of physical activity.

According to these results; our first hypothesis that the relation of pain in individuals with knee OA, lower extremity functions, and physical performance with the level of physical activity and its effect on physical activity were accepted. Our second hypothesis; fear of moving in individuals with knee OA, the relation of depression level with physical activity levels and its effect on physical activity were accepted; however when the results of the study are taken into account it was noticed that anxiety and life quality affected the level of physical activity insignificantly with a very low correlation; but it is partially accepted because it may indirectly affect psychological factors such as depression and kinesophobia.

When all these results are evaluated, it is considered that our work is a prerequisite and carries an important potential. We also assessed the quality of life of individuals with knee OA in this study, it is thought that the disagreement because of the use of the SF-12 test is likely to be overcome by using different tests in further studies. In addition, although the results are subjective, new techniques and devices can be used for further studies. Finally; researchers who would like to conduct such studies in the future should not forget that there may be other markers indicating the level of physical activity of patients with knee OA.

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8.ANNEXES

ANNEX 1- Institutıonal Permission

15.03.2017
08-1174

ANKARA YILDIRIM BEYAZIT ÜNİVERSİTESİ
YENİMAHALLE EĞİTİM ARAŞTIRMA HASTANESİ
ANKARA YILDIRIM BEYAZIT ÜNİVERSİTESİ
YENİMAHALLE EĞİTİM ARAŞTIRMA HASTANESİ
06/03/2017 11:10 - 33373887 - 771 - E.2043

T.C.
SAĞLIK BAKANLIĞI
TÜRKİYE KAMU HASTANELERİ KURUMU
Ankara İli 3. Bölge Kamu Hastaneleri Birliği Genel Sekreterliği
Yıldırım Beyazıt Üniversitesi Yenimahalle Eğitim ve Araştırma Hastanesi

Sayı : 33373887-771
Konu : Tez Uygulama İzni (Gizem İrem KINIKLI)

DAĞITIM

İlgi: TKHK Ankara İli 3. Bölge Genel Sekreterliği'nin 28/02/2017 tarih ve E.1130 sayılı yazısı.

İlgide yazı ile anılan çalışmanın, hizmeti aksatmayacak şekilde bizzat Hacettepe Üniversitesi Sağlık Bilimleri Fakültesi Fizyoterapi ve Rehabilitasyon Anabilim Dalı Öğretim Üyesi Doç.Dr. Gizem İrem KINIKLI ve doktora öğrencisi Hasan KILINÇ tarafından yürütülmesi, katılımların gönüllülük esasına dayandırılarak katılımcıların yazılı onamlarının alınması, çalışma sonucunun Bakanlığımızın bilgisi dışında ilan edilmemesi, başka bir amaçla kullanılmaması ve başka makam, kişilere verilmemesi, ayrıca söz konusu çalışma sonucunun 1 örneğinin ilgili üniversite tarafından Genel Sekreterliğimize gönderilmesi kaydıyla, çalışmanın Kurumumuzda yapılmasında sakınca yoktur.

Gereğini bilgilerinize arz ederim.

S.B.F. FİZYOTERAPİ VE REHABİLİTASYON BÖLÜMÜ
Tarih : 16.3.2017
Sayı : 275
Sev.

Doç.Dr.Gülten KIYAK
Hastane Yöneticisi / Başhekim

Belgenin Aslı Elektronik İmzalıdır 07.03.2017

DAĞITIM:
TKHK Ankara İli 3.Bölge Kamu Hastaneleri Birliği Genel Sekreterliği
Hacettepe Üniversitesi Sağlık Bilimleri Fakültesi Fizyoterapi ve Rehabilitasyon ABD

FTR

Yenimahalle Eğitim Araştırma Hastanesi
Enver BALCI

Bilgi için:Dilek BAĞCI
Unvan:Veri Hazırlama ve Kontrol İşlt.
Telefon No:0312 587 20 00

Yeni Dalı Mah. 2026. Cad. Batıkent - Yenimahalle / ANKARA
Faks No: 587 24 37
e-Posta:dilek.bagci@saglik.gov.tr İnt.Adresi:

Bu belgenin elektronik imzalı suretine http://e-belge.saglik.gov.tr adresinden 5f543fef-ba4b-4ac5-a3ad-0e94a9ba4d5b kodu ile erişebilirsiniz.
Bu belge 5070 sayılı elektronik imza kanuna göre güvenli elektronik imza ile imzalanmıştır.

ANNEX 2: Ethics Committee Approval Certificate

T.C.
HACETTEPE ÜNİVERSİTESİ
Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu

Sayı : 16969557 – 540
Konu :

ARAŞTIRMA PROJESİ DEĞERLENDİRME RAPORU

Toplantı Tarihi	: 4 NİSAN 2017 SALI
Toplantı No	: 2017/09
Proje No	: GO 17/85 (Değerlendirme Tarihi: 31.01.2017)
Karar No	: GO 17/85– 05

Üniversitemiz Sağlık Bilimleri Fakültesi Fizyoterapi ve Rehabilitasyon Bölümü öğretim üyelerinden Yrd. Doç. Dr. Gizem İrem KINIKLI' nın sorumlu araştırmacı olduğu, Fzt. Hasan KILINÇ' ın yüksek lisans tezi olan, GO 17/85 kayıt numaralı ve ***"Diz Osteoartritli Hastalarda Fiziksel Aktivite Düzeyini Etkileyen Faktörlerin İncelenmesi"*** başlıklı proje önerisi araştırmanın gerekçe, amaç, yaklaşım ve yöntemleri dikkate alınarak incelenmiş olup, etik açıdan uygun bulunmuştur.

1.Prof. Dr. Nurten AKARSU	(Başkan)	10 Prof. Dr. Oya Nuran EMİROĞLU	(Üye)
2. Prof. Dr. Sevda F. MÜFTÜOĞLU	(Üye)	11 Yrd. Doç. Dr. Özay GÖKÖZ	(Üye)
3. Prof. Dr. M. Yıldırım SARA	(Üye)	12. Doç. Dr. Gözde GİRGİN	(Üye)
4. Prof. Dr. Necdet SAĞLAM	(Üye)	13. Doç. Dr. Fatma Visal OKUR	(Üye)
5. Prof. Dr. Hatice Doğan BUZOĞLU	(Üye)	14.Yrd. Doç. Dr. Can Ebru KURT	(Üye)
6. Prof. Dr. R. Köksal ÖZGÜL	(Üye)	İZİNLİ 15. Yrd. Doç. Dr. H. Hüsrev TURNAGÖL	(Üye)
7. Prof. Dr. Ayşe Lale DOĞAN	(Üye)	16. Öğr. Gör. Dr. Müge DEMİR	(Üye)
İZİNLİ 8. Prof. Dr. Elmas Ebru YALÇIN	(Üye)	17. Öğr. Gör. Meltem ŞENGELEN	(Üye)
9. Prof. Dr. Mintaze Kerem GÜNEL	(Üye)	18. Av. Meltem ONURLU	(Üye)

Hacettepe Üniversitesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu
06100 Sıhhiye-Ankara
Telefon: 0 (312) 305 1082 • Faks: 0 (312) 310 0580 • E-posta: goetik@hacettepe.edu.tr
Ayrıntılı Bilgi için:

ANNEX 3: Informed Consent Form

Dear participants,

The aim of this study is to investigate the factors affecting the level of physical activity in patients with knee calcification. This research is carried out by the Department of Physiotherapy and Rehabilitation of Hacettepe University Faculty of Health Sciences. The results of your answers will help to determine the level of physical activity in patients with arthritis of the knee and to determine the factors that affect physical activity levels. Thus, physiotherapy due to knee calcification and the development of exercise programs to be recommended for rehabilitation are thought to be a guide for physiotherapists. For this reason, it is very important that you respond to the questions thoroughly and sincerely. Participation in the research is based on volunteerism. Information obtained through this form will remain confidential and will be used solely for research purposes (or "for scientific purposes"). You can choose not to participate in the study or you can quit it if you do not want to fill out the survey.

Do not write your name and surname on the questionnaire.

Specify your answers by circling or typing in the appropriate options under the questions.If you have more than one option to select, select all the options that suit you. If the answer to the question has the option "other" and your answer is not among the available choices, then write your answer in the blank in the other option.

Thank you for responding to the survey.

You can contact the following person when you have problems with the work:

Responsible Investigator: Assoc. Prof. Pt. KINIKLI ,G. İREM

Hacettepe University Faculty of Health Sciences

Physiotherapy and Rehabilitation Department Assistant Professor

Phone: 03123052525/208

ıf you agree to participate in the study, mark the following box with X and continue.

I do not accept ☐

I accept ☐

APENDIX 4: Evaluation form

Evaluation date :

Name surname:

Gender : **date of birth:**

height :

weight : **BMI :**

Educational statues:

Working status:

Marital status:

Radiological classification: KL 1___ KL 2____ KL 3____ KL4___

Duration of symptoms (month):_____

Dominant foot;

right ☐ left ☐

do you have any chronic disease?

yes ☐ no ☐

Do you have a drug you regularly use ?

yes ☐ no ☐

Have you had a medical operation before?

yes ☐ Bölge ve işlem :

no ☐

Do you do exercise? If so, how often?

yes ☐ one times a mont ☐ twice a month or more

One times a week ☐ 2-3 times a week ☐

4-5 times a week ☐ everyday ☐ no ☐

How long does it take to your exercise?

Less than 20 min ☐ 20-30 min ☐ 30-60 min ☐ 60 min. Or more ☐

R.O.M	Right (°)	Left (°)
Flexion		
Extansion		

OXFORD KNEE SCALE - PAİN (1,4,5,6,8,9,10. QUESTİON)	
OXFORD KNEE SCALE - FUNCTİON (2,3,7,10,12. QUESTİON)	
OXFORD KNEE SCALE - TOTAL (0-48)	

TAMPA SCALE FOR KİNESİOPHOBİA (17-68)	
BECK'S DEPRESSİON İNVENTORY (0-63)	
BECK'S ANXİETY İNVENTORY(0-63)	

SF-12	
PHYSİCAL SCORE (0-60)	
MENTAL SCORE (0-60)	

PHYSICAL PERFORMANCE EVALUATION	
THE TIMED UP AND GO TEST (METER)	
6-MİN WALK TEST(METR)	

IPAQ SCORE (SHORT FORM)	

Annex 5-Poster Presentation and Verbal Presentation

gün olarak saptandı. Hastaların hastanede kalış süreleri ile yakınlarının stres düzeyleri arasında pozitif yönde ilişki belirlenirken (r=0,297; p=0,002), hastaların hastanede kalış süreleri ile yakınlarının anksiyete düzeyleri arasında ilişki saptanamamıştır (p=0,077). Hastaların eşlerinin stres düzeylerinin kardeşlerin stres düzeylerinden fazla olduğu belirlendi (p=0,036). **Tartışma:** Çalışmamızın sonuçları hastaların hastanede kalış süreleri arttıkça hasta yakınlarının özellikle hasta eşlerinin stres düzeyinin arttığını göstermiştir.

Investigation of the relationship between the patients' length of hospital stay in surgical services and the stress and anxiety levels of the patients' relatives

Purpose: Our study was planned to investigate the relationship between the length of stay in the hospital and the stress and anxiety levels of the relatives in surgical services. **Methods:** Between November 2016 and December 2016, 110 volunteer patients (45 males, 65 females, mean age:46,44±13,01 years) were included in the study at Pamukkale University Hospitals surgical services. Anxiety levels (Beck Anxiety Inventory) and stress levels (Perceived Stress Scale) were assessed after demographic data of all participants were recorded. **Results:** Patients' length of stay in the hospital was 8.36±8.96 days. No relationship was found between patients' length of stay in the hospital and anxiety levels of their relatives (p=0.077), while positive relationship was determined between patients' length of stay in the hospital and stress levels of their relatives (r=0.297; p=0.002). The stress levels of the spouses of the patients were found to be higher than the sibling stress levels (p=0.036). **Conclusion:** The results of our study showed that as the length of hospital stay in patients increased, the stress levels of patient relatives, especially the patient's spouse, increased.

P079

Hastanede takip edilen hipomobilite sendromlu olguda fizyoterapi ve rehabilitasyon sonuçları

Doğan PORSNOK, Gülsen SIRTBAŞ, Halil ALKAN, Bilge Nur YARDIMCI, Akmer MUTLU, Ayşe LİVANELİOĞLU

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Amaç: Çalışmamızda Hipomotilite Sendrom (HS)'lu bir olgunun hastanede yatış süresi boyunca uygulanan fizyoterapi ve rehabilitasyon programının etkisini ortaya koymak ve sonuçlarını tartışmak amaçlanmıştır. **Yöntem:** HS teşhisli olgu, Gelişimsel ve Erken Fizyoterapi Ünitesi'nden istenen konsültasyon ile ilk kez 8 aylıkken hastanede görülmüş ve tarafımızca takibe alınmıştır. Son 6 aydır haftada 5 gün-1 saat Nörogelişimsel Tedavi (NDT) prensiplerine göre fizyoterapi programına alınmış, değerlendirmeler tedavi başlangıcında ve 6 ay sonunda yapılmıştır. Olgunun motor, dil ve kognitif seviyesini belirlemek için Bayley Bebek ve Çocuk Gelişimi Değerlendirme Ölçeği-3 (Bayley-III), kaba motor fonksiyon seviyesini belirlemek için Kaba Motor Fonksiyon Değerlendirme Ölçeği (GMFM), kas tonusunu değerlendirmek için Modifiye Ashworth Skalası (MAS) kullanılmıştır. Olgunun anne ve babasına, aile eğitimi ve ev programı verildi ve düzenli takiplerle kontrol edildi. Hastane odasında gerekli çevresel düzenlemeler yapıldı. **Sonuçlar:** Olgumuzun tedavi başlangıcında ve 6 ay sonra Bayley-III değerlendirmesinden elde edilen sonuçları sırasıyla; ince motor 16,23; kaba motor 16,29; kognitif 19,35; alıcı dil 10;15; ifade edici dil bölümü 9,13'tür. GMFM değerlendirmesinin toplam skor sonuçları sırasıyla %17,3 ve %37,6 olarak bulunmuştur. Her iki değerlendirmede de kas tonusu MAS'a göre normal bulunmuştur. **Tartışma:** Hastane ortamında tıbbi takip ve tedavisi devam eden HS'li olguda, günlük fizyoterapi programı fonksiyonel gelişimin her basamağında ilerleme göstermiştir. Hastanede yatan ve fizyoterapiye ihtiyacı olan çocukların günlük fizyoterapi programı ile desteklenmesi gerektiği düşünülmüştür.

Physiotherapy and rehabilitation results in an inpatient case with hypomotility syndrome

Purpose: It was aimed to show the effects of physiotherapy and rehabilitation program and to discuss the results of those applied during the inpatient period in a case with Hypomotility Syndrome (HS). **Methods:** The 8 months old case with HS diagnosis was firstly seen in the hospital and followed-up during the hospitalisation period. The case was undertaken to physiotherapy program according to the principles of Neurodevelopmental Therapy (NDT), for 5 days, 1 hour per day. The assessments were performed before treatment and at the end of 6 month. The Bayley Scales of Infant and Toddler Development Screening Test (Bayley-III)was applied to determine motor, language, cognitive levels, Gross Motor Function Measurement (GMFM) to determine gross motor function level, Modifiye Ashworth Scale (MAS) to evaluate muscle tone. Family education and home programs were given, necessary environmental settings were made in the hospital room. **Results:** The results of the Bayley-III were respectively as follows: for fine motor 16.23; gross motor 16.29; cognitive 19.35; receptive language 10.15; expressive language section are 9.13 before treatment and at the end of 6 months. The total scores of the GMFM were 17.3% and 37.6%, respectively. Muscle tone was normal according to MAS in both assessments. **Conclusion:** In the case of HS with ongoing medical follow-up and treatment in the hospital setting, the daily physiotherapy program has improved at every step of functional development. It is thought that children in hospital who needs physiotherapy should be supported by a daily physiotherapy program.

P080

Primer diz osteoartritinde fiziksel aktivite seviyesinin fonksiyonel performans ile ilişkisi

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Amaç: Bu çalışmanın amacı, primer diz osteoartritinde, fiziksel aktivite ile fonksiyonel performans arasındaki ilişkinin incelenmesidir. **Yöntem:** Primer diz osteoartriti olan toplam 26 hasta çalışmaya dahil edildi. Çalışmamıza katılan bireylerin fiziksel aktivite seviyeleri Uluslararası Fiziksel Aktivite Anketi (UAFAA)'nin kısa formu kullanılarak değerlendirildi. Yedi sorudan oluşan anket, yürüme, orta-şiddetli ve şiddetli aktivitelerde harcanan zaman hakkında bilgi sağlar. Anketin puanlanması yürüme, orta şiddetli aktivite ve şiddetli aktivitenin süre (dakikalar) ve frekans (günler) olarak toplamını içerir. Hastaların fonksiyonel performansı 6 dk yürüme testi (6-DYT) ile metre cinsinden kaydedildi. **Sonuçlar:** Çalışmaya katılan hastaların yaş ortalaması 51,19±4,93 yıl; vücut kitle indeksi ortalaması 27,32±2,34 kg/m² idi. Sağ diz eklemi fleksiyon hareket açıklığı ortalaması 130,12±9,46° iken sol diz eklemi fleksiyon hareket açıklığı ortalaması 130,11±9,49° idi. Hastaların kısa form UAFAA ortalaması 1806, 15±634,31 MET-dk idi. Hastaların 6-DYT ortalamaları 367,03±50,03 m idi. Kısa form UAFAA skorları ile 6-DYT skorları arasında istatistiksel olarak anlamlı bir ilişki vardı (r=0,459; p<0,018). **Tartışma**: Çalışmanın sonuçları fiziksel aktivite seviyesinin primer diz osteoartritli hastalarda fonksiyonel performansla ilişkili olduğunu göstermiştir. Fiziksel aktivite yetersizliği günlük yaşam aktivitelerinde fonksiyonel performansa da yansımaktadır. Bu yüzden hastaların tedavi programlarının fiziksel aktivite seviyelerinin arttırılmasına yönelik günlük yaşam aktiviteleriyle bütünleştirilmesi önerilmektedir.

Relationship between physical activity and functional performance in primary osteoarthritis

Purpose: The aim of this study was to examine the relationship between physical activity and functional performance in primary knee osteoarthritis. **Methods:** A total of 26 patients with primary knee osteoarthritis were included in the study. The physical activity levels of the patients were assessed using the short form of the International Physical Activity Questionnaire (IPAQ-SF). The 7-question questionnaire provides information about time spent on walking, moderate-severe and violent activities. Scoring of the questionnaire includes walking, moderate activity and intensity activity as time (minutes) and frequency (days). The functional performance of the patients was recorded using the 6-min walk test (6-MWT) in meters. **Results:** The average age of the patients participating in the study was 51.19±4.93 years; the mean body mass index was 27.32±2.34 kg/m². The mean knee flexion range of motion was 130.12±9.46 °, while the flexion range of motion of the left knee joint was 130.11±9.49°. Mean score of the short-form IPAQ of the patients was 1806.15±634.31 MET-min. The 6-MWT averages of the patients were 367.03±50.03 m. There was a statistically significant correlation between the short form IPAQ scores and the 6-MWT scores (r=0.459, p<0.018). **Conclusion:** The results of the study showed that the level of physical activity was related to functional performance in patients with primary knee osteoarthritis. Physical activity deficits also reflect functional performance in daily life activities. Therefore, it is recommended that patients' treatment programs might be integrated

ANNEX 6 - Verbal Statement from Thesis

8. Ulusal Ortopedi ve Travmatoloji Hemşireliği Kongresi

24 – 29 Ekim 2017
Sueno Belek Kongre Merkezi, Antalya

Kongre Başkanı
Dr. Hayriye Ünlü
Ortopedi ve Travmatoloji Hemşireleri Derneği Başkanı

Kongre Genel Sekreteri
Dr. Merdiye Şendir
Ortopedi ve Travmatoloji Hemşireleri Derneği Başkan Yardımcısı

Kongre Sekreterleri
Çiğdem Canbolat Seyman *(OTHED Sekreteri)*
Funda Büyükyılmaz *(OTHED Yönetim Kurulu Üyesi)*

Üyeler
Hem Özlem Pınar *(OTHED Saymanı)*
İlknur Yazgan *(OTHED Yönetim Kurulu Üyesi)*
Yasemin Bıyıkoğlu *(OTHED Yönetim Kurulu Üyesi)*
Zahide Baysarı *(OTHED Yönetim Kurulu Üyesi)*

Kongre Onursal Başkanları
Fethiye Erdil
Sevgi Hatipoğlu

8. Ulusal Ortopedi ve Travmatoloji Hemşireliği Kongresi

Sözlü Bildiriler

Sözlü Bildiri Oturumu 1

SB1-1 Total diz protezi uygulanan hastalarda ağrının günlük yaşam aktiviteleri üzerine etkisi ve ağrı kontrolüne yönelikhemşirelerden beklentilerinin incelenmesi

Zelha Türk[1], Abdurraif İleri*[1], Serpil Türker[2], Mustafa Şahin[3]

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Amaç: Bu araştırma diz protezi uygulanan hastalarda ağrının özellikleri, etkileyen faktörler, ağrı nedeniyle günlük yaşam aktivitelerinde engellenme durumunu ve ağrı yönetiminde hemşireden beklentileri araştırmak amacıyla yapılmıştır.

Yöntem: Tanımlayıcı kesitsel türde yapılan bu çalışmanın evrenini Ocak- Nisan 2017 tarihleri arasında özel bir sağlık kuruluşunda tedavi gören hastalar, örneklemini ise çalışmaya katılmayı kabul eden 40 hasta oluşturmaktadır. Çalışma öncesinde kurumdan, kurum izni ve etik kurul izni, ankete katılmak isteyen hastalardan ise aydınlatılmış onam formu alınmıştır. Veriler literatür taraması sonucunda araştırmacılar tarafından geliştirilen "Genel Bilgi Formu, Ağrının Günlük Yaşam Aktivitelerine Etkisi Formu, Hastaların Ameliyat Sonrası Ağrı Kontrolüne Yönelik Hemşirelerden Beklentileri Formu' kullanılarak toplanmıştır. Araştırmada elde edilen veriler değerlendirilirken yüzdesel analiz yöntemi kullanılmıştır.

Bulgular: Araştırmaya katılan hastaların yaşları 48-84 arasında değişmekte olup ortalaması 68.7±7.81 olup yaşlılık dönemindedirler. Hastaların %67.5'ü 70 yaş ve üstü, %87.5'i kadın, %100'ü evli, %52.5'i ilköğretim mezunudur. Hastaların %100'ünün tanısı gonartroz, %67.5'ine tek diz protezi uygulanmış, %77.5'inin kronik hastalığı vardır ve %80'i daha önce ameliyat olmuştur. Ağrının bazı yaşam aktiviteleri üzerine etkileri incelenmiştir. Buna göre ağrı sebebiyle en fazla etkilenen aktivite %100 ile hareket etme, %92.5 ile iştah ve %87.5 ile uyku gelmektedir. En az etkilenen aktivitede ise %7.5 ile kişiler arası ilişkiler, %22.5 ile yıkanma (banyo yapma), %32.5 ile duygusal durum yer almaktadır. Çalışmada hastaların %40'ı yürümekle %30'u egzersiz ile %17.5'i pozisyon ile ağrılarının arttığı belirlenmiştir. Hastaların %55'i ilaç uygulaması, %27.5' i buz uygulaması, %12.5'i yatma ve dinlenmekle ağrısının azaldığını ifade etmişlerdir. Hastaların ağrı kontrolüne yönelik hemşirelerden beklentileri incelendiğinde, hemşirenin ağrıyı azaltmak için soğuk uygulama yapması ve ağrının azalma durumunu takip etmesi %97.5'luk oran ile ilk sırada yer almaktadır. Hemşirenin ağrıyı azaltacak uygun bir pozisyon vermesi %95, ağrıya neden olan hareketler sırasında nasıl davranılması gerektiği ve ağrı süresini değerlendirmesi %82.5 olarak bulunmuştur.

Çıkarımlar: Total diz protezi uygulanan hastalarda ağrıdan dolayı hareket etmede isteksiz oldukları, özellikle oturma ve kalkma gibi aktivitelerden dolayı çok ağrı yaşadıkları, post-op dönemde mide bulantısı olduğu ve bu nedenle yemek yiyemedikleri bulundu. Hastaların ağrıdan dolayı uyku düzenlerinde ciddi bir şekilde bozulma olduğu belirlendi. Hastaların ağrı kontrolüne yönelik hemşirelerden beklentilerinde ise, soğuk uygulama yapması ve hemşirenin ağrının azalma durumunu takip etmesi ilk sırada yer aldı. Ağrı kontrolünde nanfarkolojik ve farmakolojik yöntemlerin etkinliğinin değerlendirilmesi önerilmektedir.

SB1-2 Ortopedi ameliyatı olan hastaların yaşadıkları psikososyal sorunlar ve yaşam kaliteleri

Elif Akyüz*[1], Hayriye Ünlü[2], Ziyafet Uğurlu[2], Azize Karahan[2], Nalan Özhan Elbaş[2]

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Amaç: Yaşlı nüfüsun artmasıyla birlikte kas iskelet sistemi hastalıkları ve ortopedik cerrahide artmaktadır. Ameliyat sonrası süreçlerde fiziksel kısıtlılığın uzun sürmesi veya fiziksel aktivite sırasında yardıma gereksinim duyma hastaların yaşam kalitesini azaltmakta, psikososyal sorunlara ve strese neden olmaktadır. Hemşireler ortopedi hastalarının, fiziksel kısıtlılığa uyumlarında ve yaşadıkları sorunlarla başetmelerinde oludukça önemli rol oynarlar. Fiziksel kısıtlılığa sahip ortopedi hastalarının ortaya çıkan psikosoyal problemlerle baş edebilmeleri için yaşadıkları psikososyal problemlerin ve buna bağlı yaşam kalitesinde meydana gelen değişikliklerin tanımlanması gerekmektedir. Amaç: Bu çalışma ortopedi ameliyatı olan hastaların yaşadıkları psikososyal sorunlarının ve yaşam kalitelerinin belirlenmesi amacıyla yapılmıştır.

Yöntem: Çalışma Başkent Üniversitesi Ankara Hastanesi'nde ortopedi ameliyatı olan hastalarla yapılmıştır. Çalışma kapsamına 20 Mart- 15 Haziran 2017 tarihinde ortopedi ameliyatı olan ve çalışmaya katılmayı kabul eden 55 erişkin hasta alınmıştır. Çalışma Başkent Üniversitesi Tıp ve Sağlık Bilimleri Araştırma Kurulu ve Etik Kurulu tarafından onaylanmıştır (KA1765). Veriler araştırmacılar tarafından literatür incilenerek oluşturulan veri toplama formu ve hastaların yaşam kalitesini saptamak amacı ile geliştirilmiş olan SF36 kısa formu kullanılarak toplanmıştır.

Bulgular: Araştırmada yer alan hastaların %47.3'ü 42-65 yaş aralığında olup, %66.7'si kadındır. Hastaların %76.4'ünün fiziksel işlevlerde kısıtlılığı olduğu, %50.9'unun aktiviteleri sırasında başka kişilerin yardımına ihtiyacı olduğu, %49.1'inin rol ve sorumluluklarını yerine getirmede zorlandıkları belirlenmiştir. Hastaların %41.8'inin geçirdikleri ortopedik ameliyata ilişkin psikolojik olarak etkilendikleri, %60'ının sosyal destek kaynaklarından beklentilerinin olduğu belirlenmiştir. Hastaların yaşam kalitesi ölçeği alt puanlarına bakıldığında en düşük puanı fiziksel fonksiyon (35.27+ 30.85) ve fiziksel rol güçlüğü (35, 90+ 33.80) alanlarında aldıkları ve en çok bu alanlarda desteklenmeye gereksinim duydukları saptanmıştır. Ölçeğin alt grupları ile ameliyat bölgesi karşılaştırıldığında; üst ve alt ekstiremite ameliyatlarına kıyasla kalça ameliyatı olan hastaların fiziksel fonksiyon puan ortalamasının düşük olduğu belirlenmiştir (12.72+ 13.10).

Çıkarımlar: Araştırmanın sonucunda ortopedi ameliyatı olan hastaların psikososyal problem yaşadıkları, destek kaynaklarına ihtiyaç duydukları belirlenmiştir. Hastaların çoğunlukla ölçek puanlarının düşük olduğu ve en düşük puanların fiziksel fonksiyon ve fiziksel rol güçlüğü alt boyut puanlarından alındığı bu nedenle bağımlı olmanın hastaların psikolojilerini olumsuz etkileyebileceği ve bu açıdan desteklenmeleri gerektiği söylenebilir.

SB1-3 Primer diz osteoartritli hastalarda kinezyofobinin fonksiyonel performans ve fiziksel aktivite seviyesi ile ilişkisi

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Amaç: Bu çalışmanın amacı, primer diz osteoartritli hastalarda fonksiyonel performansın ve fiziksel aktivite seviyesinin kinezyofobi ile ilişkisinin incelenmesidir.

Yöntem: Primer diz osteoartriti olan toplam 54 hasta (Erkek: 25; Kadın:29; Hastalık durasyonu: 54.98±3.45 ay) çalışmaya dahil edildi. Çalışmamıza katılan bireylerin fiziksel aktivite seviyeleri Uluslararası Fiziksel Aktivite Anketi (UAFAA)'nin kısa formu kullanılarak değerlendirildi. Yedi sorudan oluşan anket, yürüme, orta-şiddetli ve şiddetli aktivitelerde harcanan zaman hakkında bilgi sağlar. Anketin puanlanması yürüme, orta şiddetli aktivite ve şiddetli aktivitenin süre (dakikalar) ve frekans (günler) olarak toplamını içerir. Hastaların fonksiyonel performası 6 dk yürüme testi (6-DYT) ile metre cinsinden kaydedildi. Kinezyofobileri 17 sorudan oluşan Tampa Kinezyofobi Ölçeği (TKÖ) ile değerlendirildi. TKÖ ortalamalarının kısa form UAFAA ve 6-DYT ortalamaları ile olan ilişkisine Pearson korelasyon analizi ile bakıldı. Analiz sonucunda çıkan değerlerde $p<0.05$ istatistiksel olarak anlamlı kabul edildi.

Bulgular: Çalışmaya katılan hastaların yaş ortalaması 52.24±5.02 yıl; vücut kütle indeksi ortalaması 27.32±2.34 kg/m² idi. Sağ diz eklemi fleksiyon hareket açıklığı ortalaması 131.94±8.18° iken sol diz eklemi fleksiyon hareket açıklığı ortalaması 131.89±8.03° idi. Hastaların kısa form UAFAA ortalaması 1671.98±890.21 MET-dk idi. Hastaların 6-DYT ortalamaları 369.17±65.37 m idi. Hastaların ortalama kinezyofobi skoru (TKÖ: 37.07±7.27) ile kısa form UAFAA skorları ($r=-0.375$; $p=0.005$) ve 6-DYT skorları arasında istatistiksel olarak anlamlı bir ilişki vardı ($r=-0.568$; $p<0.001$).

9.CURRICULUM VITAE

Personal Information

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Place Of Birth: ANKARA

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Education Information

Postgraduate: Hacettepe Üniversity-physiotherapy and rehabilitation 2015-2018

University: Yeditepe Üniversity- physiotherapy and rehabilitation 2010-2015

High school: Mimar Sinan high school 2006-2010

Job Experience

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2015-2017 Özel Batıkent Yaşam Fizik Tedavi Merkezi / Ankara

Seminars And Courses

- Neuroplasticity motor learning 1. Neurological physiotherapy and reh. Symposium
- National physiotherapy and student congress
-
- Spanish Language Training Course (4 courses)

- Yeditepe University Career Days Seminars

Meetings that have been submitted with the thesis and / or poster presentation

1) A poster entitled "The Relation of Physical Activity Level to Functional Performance in Primary Knee Osteoarthritis" at the National Congress of Physiotherapy and Rehabilitation held in Ankara on May 4-6, 2017

2) Verbal presentation entitled "Functional Performance and Attitude Toward Physical Activity of Cognizophobia in Patients with Osteoarthritis of the Priest" in the Congress of "7th Orthopedics and Traumatology Nursing" held in Antalya between 24-29 October 2017.

PROBLEMS WITH YOUR KNEE

During the past 4 weeks..

✓tick one box for every question

1 *During the past 4 weeks*.....

How would you describe the pain you usually have from your knee?

None	Very mild	Mild	Moderate	Severe
❑	❑	❑	❑	❑

2 *During the past 4 weeks*.....

Have you had any trouble with washing and drying yourself (all over) because of your knee?

No trouble at all	Very little trouble	Moderate trouble	Extreme difficulty	Impossible to do
❑	❑	❑	❑	❑

3 *During the past 4 weeks*.....

Have you had any trouble getting in and out of a car or using public transport because of your knee? (whichever you would tend to use)

No trouble at all	Very little trouble	Moderate trouble	Extreme difficulty	Impossible to do
❑	❑	❑	❑	❑

4 *During the past 4 weeks*.....

For how long have you been able to walk before pain from your knee becomes **severe**? (*with or without a stick)*

No pain/ More than 30 minutes	16 to 30 minutes	5 to 15 minutes	Around the house only	Not at all - pain severe when walking
❑	❑	❑	❑	❑

5 *During the past 4 weeks*.....

After a meal (sat at a table), how painful has it been for you to stand up from a chair because of your knee?

Not at all painful	Slightly painful	Moderately painful	Very painful	Unbearable
❑	❑	❑	❑	❑

6 *During the past 4 weeks*.....

Have you been limping when walking, because of your knee?

Rarely/ never	Sometimes, or just at first	Often, not just at first	Most of the time	All of the time
❑	❑	❑	❑	❑

/P.T.O

During the past 4 weeks...

✓tick one box for every question

7 *During the past 4 weeks.....*

Could you kneel down and get up again afterwards?

Yes, Easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, Impossible
❑	❑	❑	❑	❑

8 *During the past 4 weeks.....*

Have you been troubled by pain from your knee in bed at night?

No nights	Only 1 or 2 nights	Some nights	Most nights	Every night
❑	❑	❑	❑	❑

9 *During the past 4 weeks.....*

How much has pain from your knee interfered with your usual work *(including housework)*?

Not at all	A little bit	Moderately	Greatly	Totally
❑	❑	❑	❑	❑

10 *During the past 4 weeks.....*

Have you felt that your knee might suddenly 'give way' or let you down?

Rarely/ never	Sometimes, or just at first	Often, not just at first	Most of the time	All of the time
❑	❑	❑	❑	❑

11 *During the past 4 weeks.....*

Could you do the household shopping on your own?

Yes, Easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, Impossible
❑	❑	❑	❑	❑

12 *During the past 4 weeks.....*

Could you walk down one flight of stairs?

Yes, Easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, Impossible
❑	❑	❑	❑	❑

Tampa Scale for Kinesiophobia

(Miller , Kori and Todd 1991)

1 = strongly disagree
2 = disagree
3 = agree
4 = strongly agree

1. I'm afraid that I might injury myself if I exercise	1	2	3	4
2. If I were to try to overcome it, my pain would increase	1	2	3	4
3. My body is telling me I have something dangerously wrong	1	2	3	4
4. My pain would probably be relieved if I were to exercise	1	2	3	4
5. People aren't taking my medical condition seriously enough	1	2	3	4
6. My accident has put my body at risk for the rest of my life	1	2	3	4
7. Pain always means I have injured my body	1	2	3	4
8. Just because something aggravates my pain does not mean it is dangerous	1	2	3	4
9. I am afraid that I might injure myself accidentally	1	2	3	4
10. Simply being careful that I do not make any unnecessary movements is the safest thing I can do to prevent my pain from worsening	1	2	3	4
11. I wouldn't have this much pain if there weren't something potentially dangerous going on in my body	1	2	3	4
12. Although my condition is painful, I would be better off if I were physically active	1	2	3	4
13. Pain lets me know when to stop exercising so that I don't injure myself	1	2	3	4
14. It's really not safe for a person with a condition like mine to be physically active	1	2	3	4
15. I can't do all the things normal people do because it's too easy for me to get injured	1	2	3	4
16. Even though something is causing me a lot of pain, I don't think it's actually dangerous	1	2	3	4
17. No one should have to exercise when he/she is in pain	1	2	3	4

Reprinted from:
Pain, Fear of movement/(re) injury in chronic low back pain and its relation to behavioral performance, 62, Vlaeyen, J., Kole-Snijders A., Boeren R., van Eek H., 371.

Beck's Depression Inventory

This depression inventory can be self-scored. The scoring scale is at the end of the questionnaire.

1.
- 0 I do not feel sad.
- 1 I feel sad
- 2 I am sad all the time and I can't snap out of it.
- 3 I am so sad and unhappy that I can't stand it.

2.
- 0 I am not particularly discouraged about the future.
- 1 I feel discouraged about the future.
- 2 I feel I have nothing to look forward to.
- 3 I feel the future is hopeless and that things cannot improve.

3.
- 0 I do not feel like a failure.
- 1 I feel I have failed more than the average person.
- 2 As I look back on my life, all I can see is a lot of failures.
- 3 I feel I am a complete failure as a person.

4.
- 0 I get as much satisfaction out of things as I used to.
- 1 I don't enjoy things the way I used to.
- 2 I don't get real satisfaction out of anything anymore.
- 3 I am dissatisfied or bored with everything.

5.
- 0 I don't feel particularly guilty
- 1 I feel guilty a good part of the time.
- 2 I feel quite guilty most of the time.
- 3 I feel guilty all of the time.

6.
- 0 I don't feel I am being punished.
- 1 I feel I may be punished.
- 2 I expect to be punished.
- 3 I feel I am being punished.

7.
- 0 I don't feel disappointed in myself.
- 1 I am disappointed in myself.
- 2 I am disgusted with myself.
- 3 I hate myself.

8.
- 0 I don't feel I am any worse than anybody else.
- 1 I am critical of myself for my weaknesses or mistakes.
- 2 I blame myself all the time for my faults.
- 3 I blame myself for everything bad that happens.

9.
- 0 I don't have any thoughts of killing myself.
- 1 I have thoughts of killing myself, but I would not carry them out.
- 2 I would like to kill myself.
- 3 I would kill myself if I had the chance.

10.
- 0 I don't cry any more than usual.
- 1 I cry more now than I used to.
- 2 I cry all the time now.
- 3 I used to be able to cry, but now I can't cry even though I want to.

11.

0 I am no more irritated by things than I ever was.
1 I am slightly more irritated now than usual.
2 I am quite annoyed or irritated a good deal of the time.
3 I feel irritated all the time.

12.

0 I have not lost interest in other people.
1 I am less interested in other people than I used to be.
2 I have lost most of my interest in other people.
3 I have lost all of my interest in other people.

13.

0 I make decisions about as well as I ever could.
1 I put off making decisions more than I used to.
2 I have greater difficulty in making decisions more than I used to.
3 I can't make decisions at all anymore.

14.

0 I don't feel that I look any worse than I used to.
1 I am worried that I am looking old or unattractive.
2 I feel there are permanent changes in my appearance that make me look unattractive
3 I believe that I look ugly.

15.

0 I can work about as well as before.
1 It takes an extra effort to get started at doing something.
2 I have to push myself very hard to do anything.
3 I can't do any work at all.

16.

0 I can sleep as well as usual.
1 I don't sleep as well as I used to.
2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
3 I wake up several hours earlier than I used to and cannot get back to sleep.

17.

0 I don't get more tired than usual.
1 I get tired more easily than I used to.
2 I get tired from doing almost anything.
3 I am too tired to do anything.

18.

0 My appetite is no worse than usual.
1 My appetite is not as good as it used to be.
2 My appetite is much worse now.
3 I have no appetite at all anymore.

19.

0 I haven't lost much weight, if any, lately.
1 I have lost more than five pounds.
2 I have lost more than ten pounds.
3 I have lost more than fifteen pounds.

20.

0 I am no more worried about my health than usual.
1 I am worried about physical problems like aches, pains, upset stomach, or constipation.
2 I am very worried about physical problems and it's hard to think of much else.
3 I am so worried about my physical problems that I cannot think of anything else.

21.

0 I have not noticed any recent change in my interest in sex.
1 I am less interested in sex than I used to be.
2 I have almost no interest in sex.
3 I have lost interest in sex completely.

INTERPRETING THE BECK DEPRESSION INVENTORY

Now that you have completed the questionnaire, add up the score for each of the twenty-one questions by counting the number to the right of each question you marked. The highest possible total for the whole test would be sixty-three. This would mean you circled number three on all twenty-one questions. Since the lowest possible score for each question is zero, the lowest possible score for the test would be zero. This would mean you circles zero on each question. You can evaluate your depression according to the Table below.

Total Score	Levels of Depression
1-10	These ups and downs are considered normal
11-16	Mild mood disturbance
17-20	Borderline clinical depression
21-30	Moderate depression
31-40	Severe depression
over 40	Extreme depression

Beck Anxiety Inventory (BAI)

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past month, including today, by circling the number in the corresponding space in the column next to each symptom.

	Not at all	Mildly, but it didn't bother me much	Moderately – it wasn't pleasant at times	Severely – it bothered me a lot
Numbness or tingling	0	1	2	3
Feeling hot	0	1	2	3
Wobbliness in legs	0	1	2	3
Unable to relax	0	1	2	3
Fear of worst happening	0	1	2	3
Dizzy or lightheaded	0	1	2	3
Heart pounding / racing	0	1	2	3
Unsteady	0	1	2	3
Terrified or afraid	0	1	2	3
Nervous	0	1	2	3
Feeling of choking	0	1	2	3
Hands trembling	0	1	2	3
Shaky / unsteady	0	1	2	3
Fear of losing control	0	1	2	3
Difficulty in breathing	0	1	2	3
Fear of dying	0	1	2	3
Scared	0	1	2	3
Indigestion	0	1	2	3
Faint / lightheaded	0	1	2	3
Face flushed	0	1	2	3
Hot / cold sweats	0	1	2	3

SF-12 Health Survey

This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. **Answer each question by choosing just one answer**. If you are unsure how to answer a question, please give the best answer you can.

1. **In general, would you say your health is**:

☐1 Excellent ☐2 Very good ☐3 Good ☐4 Fair ☐5 Poor

The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

	YES, limited a lot	YES, limited a little	NO, not limited at all
2. **Moderate activities** such as moving a table, pushing a vacuum cleaner, bowling, or playing golf.	☐1	☐2	☐3
3. Climbing **several** flights of stairs.	☐1	☐2	☐3

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

	YES	NO
4. **Accomplished less** than you would like.	☐1	☐2
5. Were limited in the **kind** of work or other activities.	☐1	☐2

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

	YES	NO
6. **Accomplished less** than you would like.	☐1	☐2
7. Did work or activities **less carefully than usual**.	☐1	☐2

8. **During the past 4 weeks, how much did pain interfere with your normal work (including work outside the home and housework)?**

☐1 Not at all ☐2 A little bit ☐3 Moderately ☐4 Quite a bit ☐5 Extremely

These questions are about how you have been feeling during the past 4 weeks.
For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the past 4 weeks…

	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
9. Have you felt calm & peaceful?	☐1	☐2	☐3	☐4	☐5	☐6
10. Did you have a lot of energy?	☐1	☐2	☐3	☐4	☐5	☐6
11. Have you felt down-hearted and blue?	☐1	☐2	☐3	☐4	☐5	☐6

12. **During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?**

☐1 All of the time ☐2 Most of the time ☐3 Some of the time ☐4 A little of the time ☐5 None of the time

Patient name: Date: PCS: MCS:

Visit type (circle one)
Preop 6 week 3 month 6 month 12 month 24 month Other:_____

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***

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.