Research Article

Impact on Dynamic Balance Dysfunction in Chronic Bilateral Knee Osteoarthritis During Locomotor Activities

Tejal Chavan, Dr. Satyam Bhodaji

HOD Geriatric Physiotherapy Department

Abstract

BACKGROUND: Chronic bilateral knee osteoarthritis (OA) is a progressive degenerative joint condition commonly associated with pain, stiffness, reduced range of motion, and functional limitations. One of the significant yet often underrecognized complications is dynamic balance dysfunction, which increases the risk of falls and impairs locomotor activities such as walking, stair climbing, and turning.

OBJECTIVE: This study aimed to find the impact on balance dysfunction during the locomotor activities of daily living in people who are diagnosed with bilateral knee osteoarthritis

METHOD: A selfmade questionnaire is used to find out balance dysfunction during locomotor activities of daily living in people who are diagnosed with bilateral knee osteoarthritis

RESULT: Among 140 patients the 52% females and 48% males are included

The study found hundred percentages of responses in which results are showing that female population is more affected by bilateral knee osteoarthritis. A Very few people having history of hip joint pain too. That importance is that of preventing obesity, maintaining body weight, good diet, exercise plan and also knowledge about life style modification is the growing need among middle age people due to avoid early age complications of osteoarthritis.

CONCLUSION: The study is showing female population is more affected than male due to lack of nutrition, exercise and changing of lifestyle. As well as only few patients were having the complaint of hip pain along knee pain. As well as the people who are having single knee osteoarthritis are also facing the balance issues in daily life.

KEY WORDS: balance, knee, osteoarthritis, dysfunction.

INTRODUCTION

OSTEOARTHRITIS

Osteoarthritis is non inflammatory, degenerative condition characterized by degeneration of articular cartilage and formation of new bone.

Pain, joint stiffness, swelling, crepitus are the clinical symptoms. Pain is more on weight bearing due to stress on synovial membrane. OA causes changes not only in the tissues within the articular cavity, but also the ligaments, tendons, and periarticular tissues, capsule including the muscles and most commonly affected joints include Neck-cervical, Lower back- Lumbar, Hands, Knee.

People with osteoarthritis usually have joint pain after rest or inactivity, weakened muscles of lower limb and joint stiffness for a short period of time.

The common risk factors for fall due to Osteoarthritis in Individual's are muscle weakness, impaired balance, presence of comorbidity and increased number of symptomatic joint's, obesity, osteoporosis.

Reduced Walking Speed, Stride Length, and Cadence: Patients with bilateral KOA often adopt a slower, more cautious gait with shorter steps, likely to reduce pain and increase perceived stability. This altered gait reduces momentum and limits the body's ability to recover from unexpected shifts in balance.

Reduced Knee Flexion and Extension: The limited range of motion in osteoarthritic knees restricts the natural shock absorption and propulsion mechanisms during gait, leading to a stiffer and less adaptable walking pattern.

Kinesthesia : Reduced awareness of joint movement further impedes the ability to react quickly and appropriately to changes in balance during locomotor tasks.

This incidence is increasing day by day as well as due to Age, Weight, Trauma and particular knee movement's like Kneeling, Squatting, Cross leg sitting.

BALANCE

Balance is defined as the ability to maintain the center of mass over the base of support. It's an important indicator of physical function and risk of falls.

Postural stability could be defined as control over body's position in space for orientation and balance purpose. To perform any

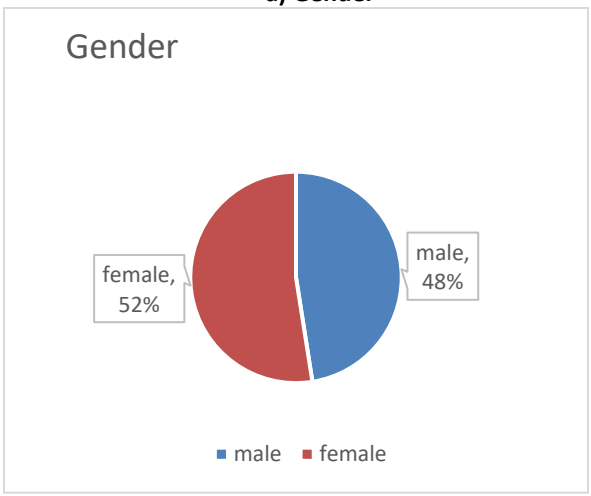
movement the most important thing is balance and stability.
Reduced balance function is associated with an increased risk of falling, which is one of the leading causes of hospital admissions of elderly people, and could lead to other consequences such as fracture, joint dislocations'.
Adequate balance helps to maintain posture and efficiently
People who are having knee OA are having lot amount of muscle impairment or muscle weakness as compared to the people without knee OA. Loss of proprioception may affect postural stability which can cause risk of fall.
Chronic bilateral knee osteoarthritis significantly impairs dynamic balance, which in turn profoundly affects locomotor activities and increases the risk of falls.
In chronic bilateral knee osteoarthritis factors such as Quadriceps weakness, Hamstring weakness, as well hip muscle weakness are commonly affected during bilateral knee osteoarthritis because this all are the factors which helps the body to maintain balance and to maintain good posture

MATERIALS AND METHODOLOGY: This type of study was observational in which we included the people who are above 40 age, both male and female gender and those people who are having bilateral knee osteoarthritis.
Duration of study was 6 month's The review was conducted with the approval of Ethical committee of the institution where the study was conducted. By reviewing the inclusion and exclusion criteria of the participant, the sample population was selected. The participants were told about the study and consent form was taken from them regarding the study. Questionnaire was distributed to participants through google forms. Participant's responses to the question were then recorded.

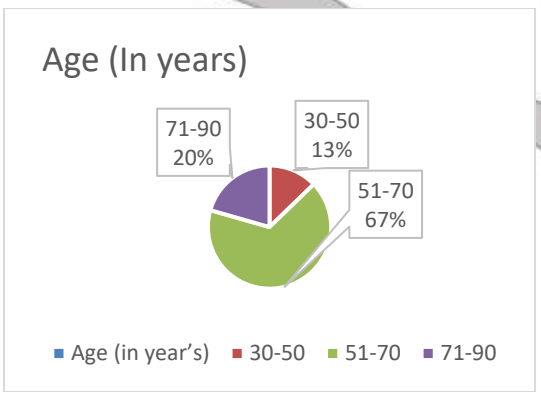
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RESULTS ARE DESCRIBED IN PIE DIAGRAM AS BELOW

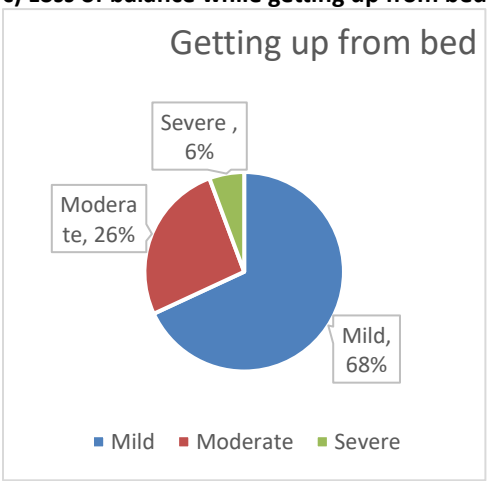
a) Gender



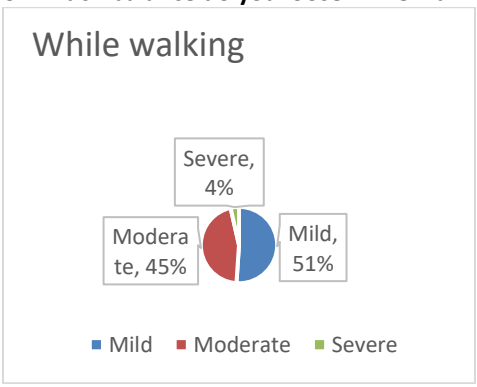
b) Age in years



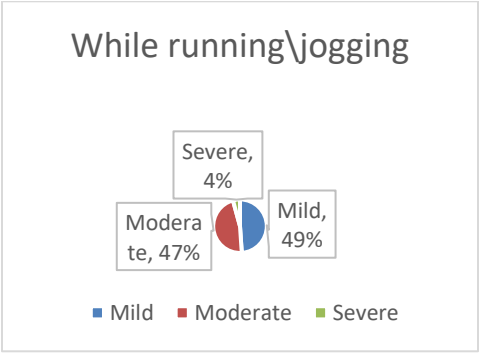
c) Loss of balance while getting up from bed



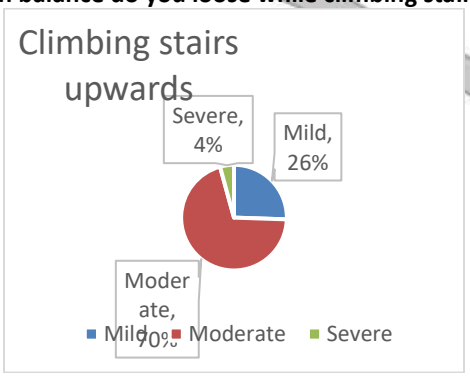
d) How much balance do you loose while walking ?



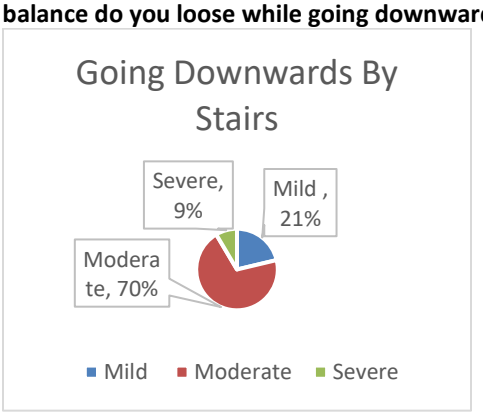
e) How much balance do you loose while running ?



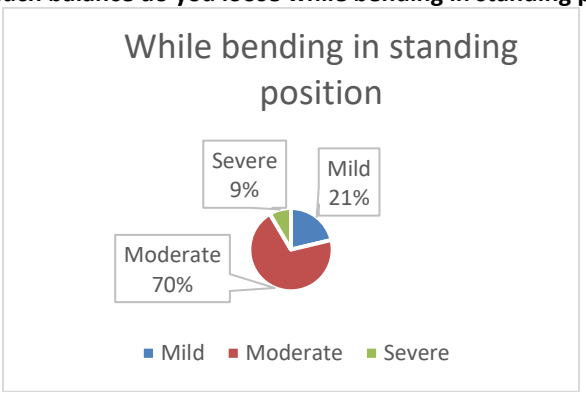
f) How much balance do you loose while climbing stairs upwards?



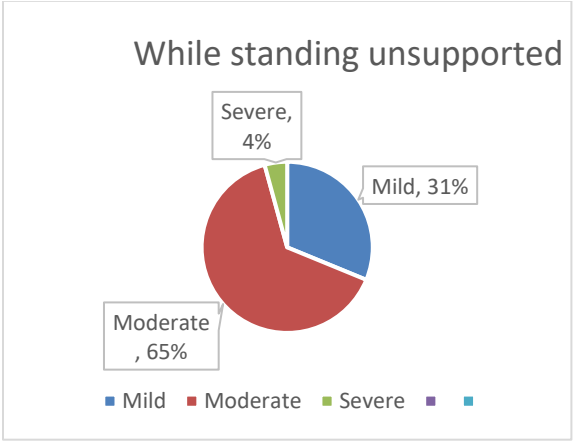
g) How much balance do you loose while going downwards by stairs ?



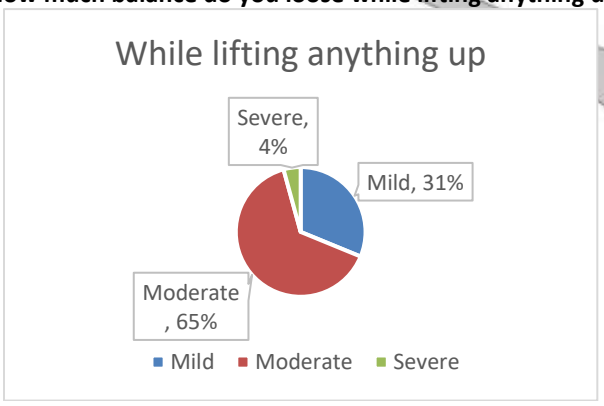
h) How much balance do you loose while bending in standing position ?



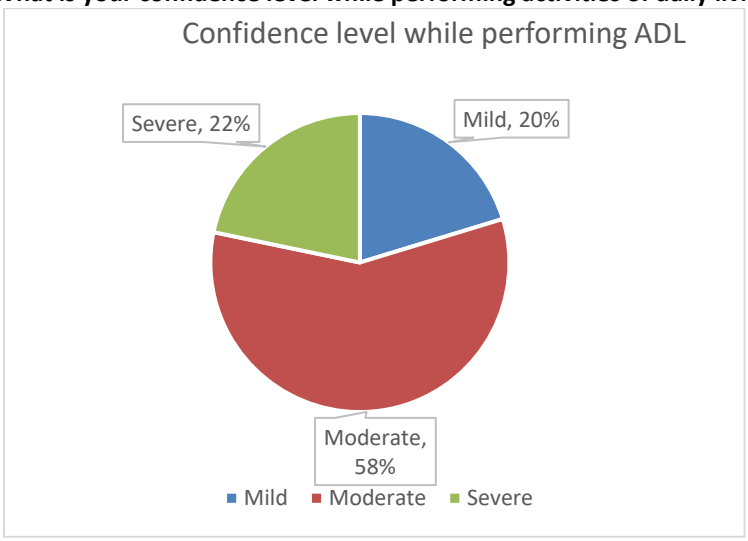
i)How much balance do you loose while standing unsupported ?



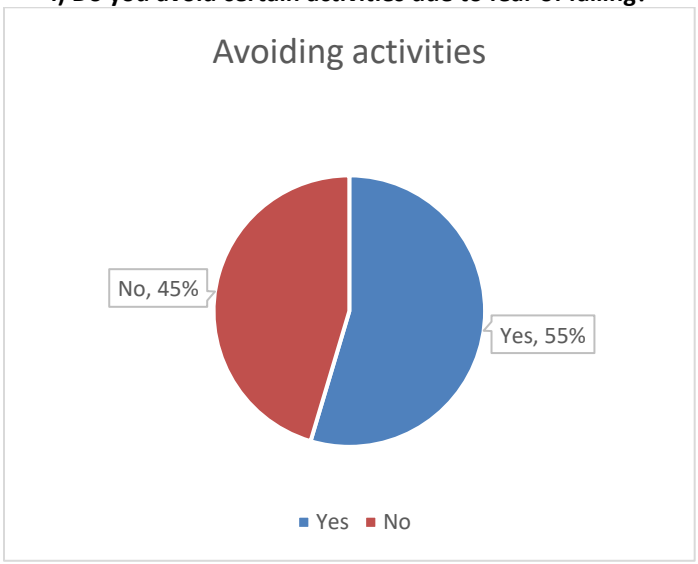
j) How much balance do you loose while lifting anything up ?



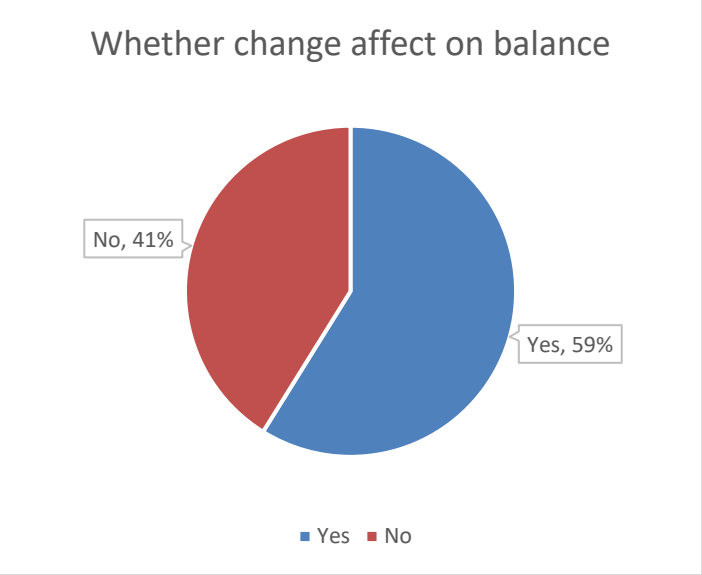
k) What is your confidence level while performing activities of daily living?



l) Do you avoid certain activities due to fear of falling?



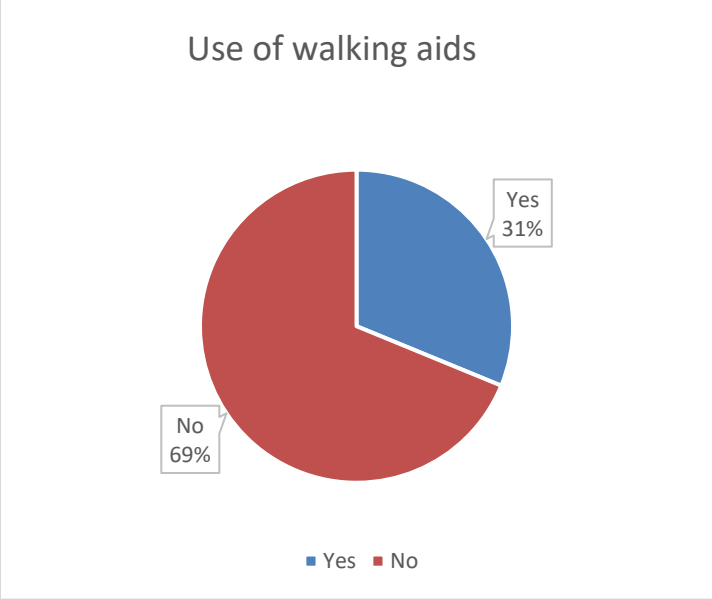
m) Does change in whether affects your balance?



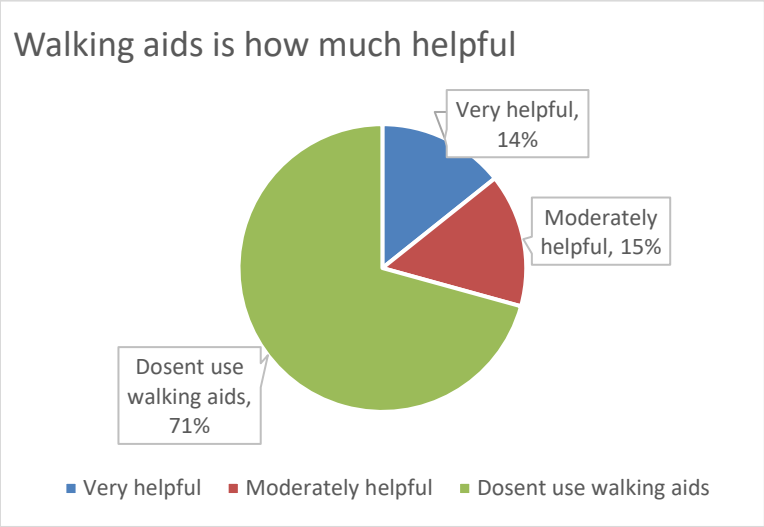
n) Does balance dysfunction affected on your social confidence



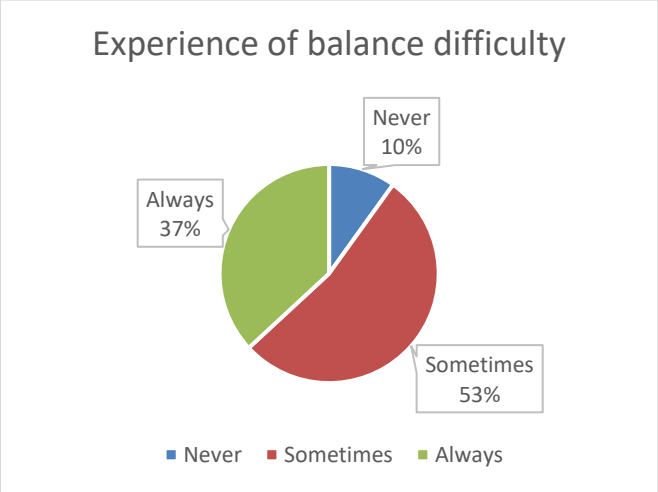
o) Do you use walking aids?



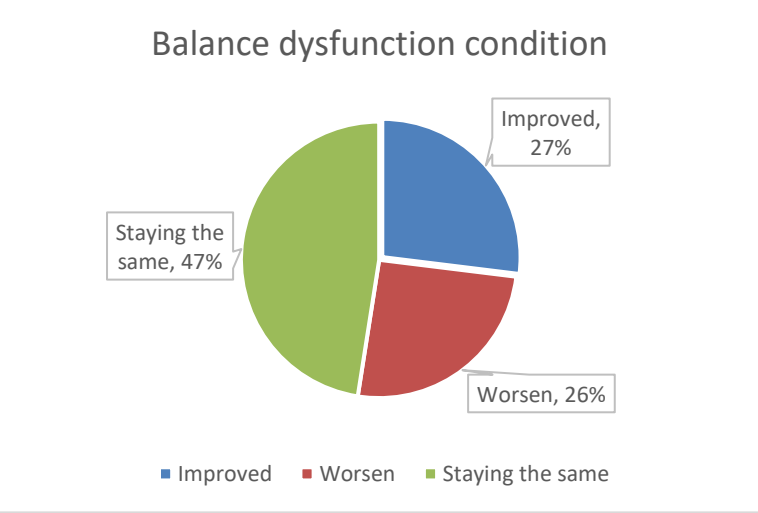
p) Walking aids is how much helpful?



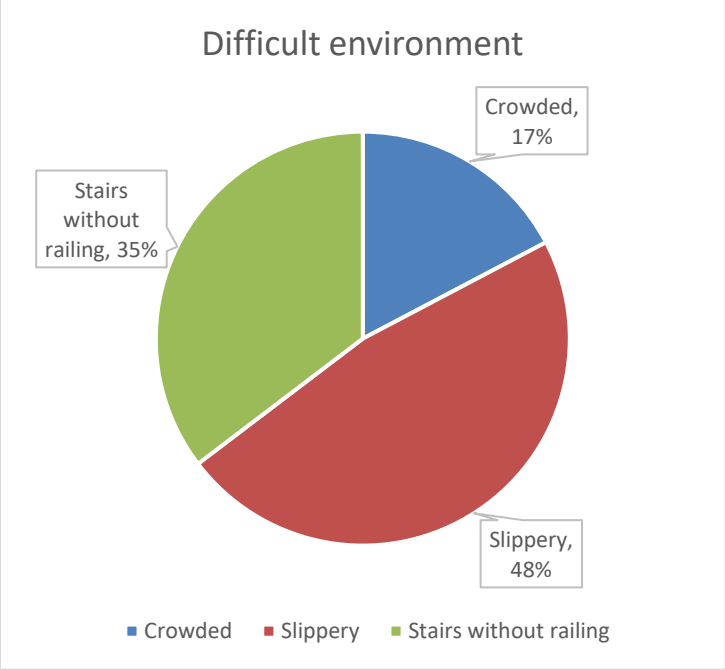
q) Do you experience balance difficulty in daily life?



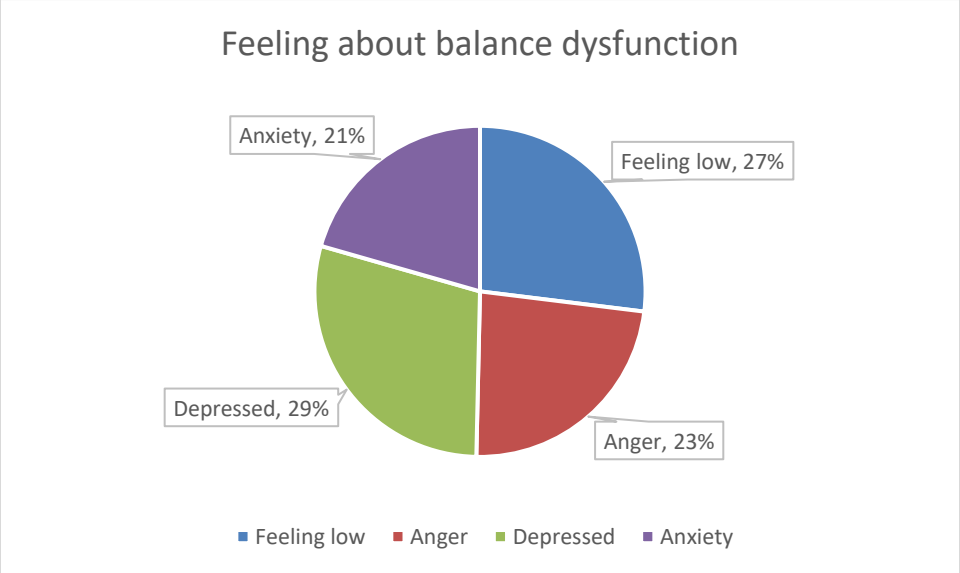
r) What is condition of your balance dysfunction?



s) Which is most difficult environment for balance dysfunction?



t) What do you feel about for balance dysfunction?



DISCUSSION:

This is observational study aimed to find out how much balance is loose in patients with bilateral knee osteoarthritis.

The impairment of dynamic balance in bilateral knee OA is strongly correlated with an increased risk of falls, particularly during transitional movements such as getting up from bed, while walking, while running, sit-to-stand, turning and how weather changes are affecting the balance of people.

People with chronic bilateral knee OA usually change the way they walk to avoid pain. They may take smaller steps, walk slower, or keep their knees more straight while walking. These changes might reduce pain, but they can also make balance worse.

When doing activities like going up or down stairs, people with OA may avoid bending their knees too much. Instead, they use their hips or ankles more, which can make balancing harder. Over time, this unusual way of moving can lead to more joint or muscle problems in other parts of the body, like the hips or lower back.

Due to chronic bilateral knee osteoarthritis the fear of falls are common in each age Increased fear of falling is also a significant concern. This fear can lead to activity avoidance, further deconditioning, and worsening of balance and mobility. This vicious cycle contributes to greater disability and loss of independence in older adults with chronic knee OA.

This study aimed to evaluate the impact on dynamic balance dysfunction on individuals with chronic bilateral knee osteoarthritis

during locomotor activities. The results demonstrate a significant compromise in dynamic balance among patients with chronic bilateral knee osteoarthritis -+, which likely contributes to functional limitations and increased fall risk.

We conduct survey about 18-19 questions among 140 osteoarthritis patients. According to result among 140 participants 67 females and 74 males.

A qualitative studies state that females are more prone to bilateral knee osteoarthritis then male. Out of 100% the 52% are female population and remaining are 48% of male population.

Individuals of bilateral knee osteoarthritis can prevent the complications by knowing and participating healthy life in early age. This can help to analyze and resolve arising problems in early age. Characteristics of life style modification such as good diet plan, maintaining weight and exercise plan are strong measures to prevent osteoarthritis in early age.

Dynamic balance dysfunction in bilateral knee osteoarthritis not only impairs locomotor efficiency but also significantly increases the risk of falls, which can lead to further disability. This highlights the importance of dynamic balance loss. So educating patients about osteoarthritis and the risk factors and the further complications.

In conclusion, dynamic balance dysfunction is a key concern in the functional management of chronic bilateral knee osteoarthritis. Addressing this impairment through early intervention may reduce the risk of falls, improve mobility, and enhance quality of life in affected individuals.

CONCLUSION:

The study found hundred percentages of responses. A very few people having history of hip joint pain too. That importance is that of preventing obesity, maintaining body weight, good diet, exercise plan and also knowledge about life style modification is the growing need among middle age people due to avoid early age complications of osteoarthritis. Among 140 patients 67 of them were females and 74 males. Out of 100% the population of 52% of females and 48% of males were suffering the balance dysfunction issues due to bilateral knee osteoarthritis

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