Survey on the Prevalence, Risk Factors, and Treatment Patterns of Osteoarthritis in Dhaka, Bangladesh

[Project Report]

(In partial Fulfilment of the requirements for the degree of bachelor of pharmacy)

Submitted To

Department of Pharmacy

Faculty of Health & Life Science

Daffodil International University

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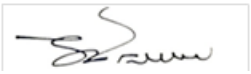
Approval

This confirms that the project, "Survey on Prevalence, Risk Factors and Treatment Patterns of Osteoarthritis in Dhaka, Bangladesh," satisfies the requirements for a Daffodil Bachelor of Pharmacy degree and was accepted in terms of style and content. International University, Department of Pharmacy, Faculty of Health and Life Sciences.

Board of Examines

Chairman



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Professor Dr. Muniruddin Ahmed

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Examiners

……. Internal Examiner 1

……. Internal Examiner 2

……. External

Acknowledgement

First and foremost, I would want to express my heartfelt appreciation to the Almighty for providing me with knowledge, strength, peace of mind, and good health, as well as allowing me to persevere in the face of adversity and complete this project.

I am appreciative of **Mr. Md. Mizanur Rahman**, Assistant Professor of Pharmacy at Daffodil International University, who serves as both my mentor and supervisor. His unwavering support, invaluable help, and inspiration were essential to my project's successful completion. I will always be appreciative of his kindness and assistance.

Throughout my life, my parents have offered me spiritual guidance and support, and I will always be appreciative of that. To be quite honest, I believe that none of my initiatives could have been completed to the best of my abilities without their constant support and encouragement.

I will always be appreciative of my parents for their support and spiritual direction in my life. Sincerely, I think that my success was a result of their unwavering support and direction, since the entire would not have been possible without it.

Declaration

I hereby declare that I have fulfilled the requirements for the degree of Bachelor of Pharmacy (B. Pharm) by completing this project report under the supervision of "Mr. Md. Mizanur Rahman, Assistant Professor, Department of Pharmacy, Faculty of Health & Life Sciences, Daffodil International University." I hereby declare that this project is original to me.

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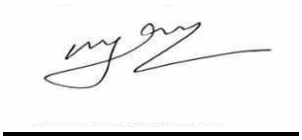
Certificate

This is to confirm that the results discussed in this thesis are original and haven't been submitted before for any degree or certificate at this university. The current work was turned in as a thesis in order to meet a portion of the requirements for a pharmacy bachelor's degree.

Supervised By



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Dedication

Dedicated to all of my wonderful teachers and parents who have helped me during my B.Pharm journey.

Abstract

Osteoarthritis (OA) is a degenerative joint disease that primarily affects articular cartilage and has a complex origin. Knee osteoarthritis reduces quality of life by generating physical symptoms that make daily activities difficult to do. Most people put off visiting medical institutions to receive treatment for diseases related to their musculoskeletal system. A complex interaction between genetic predisposition, biochemical changes in joint tissue, mechanical stress, and inflammation characterizes the pathogenesis. Common symptoms of osteoarthritis (OA) include joint stiffness after inactivity, pain during movement, and, in more severe situations, joint deformity. Age, obesity, joint damage, and heredity are risk factors. A mix of imaging techniques, including x-rays, joint fluid tests, and clinical patient evaluation, are used to make the diagnosis. The goals of management techniques are to enhance joint function, lessen pain, and maintain quality of life. Weight control, physical therapy, exercise, and assistive technology are examples of non-pharmacological interventions. Pharmacological therapies such intra-articular injections, NSAIDs, and analgesics are examples of pain management techniques. In more severe situations, surgical procedures—including joint replacement surgery—may be taken into consideration. Although osteoarthritis is an enduring and chronic condition, individuals with it can greatly improve their quality of life and minimize their symptoms with prompt diagnosis and vigorous treatment. Better treatment strategies and ongoing research on disease processes and therapeutic approaches are contributing to the improvement of care for individuals with this condition. This research is necessary to track ongoing surveillance and research trends, identify new risk factors, and deliver targeted medicines in order to mitigate the consequences of OA on affected individuals and Bangladesh's healthcare system.

Keywords: OA, Treatment pattern, Physiotherapy, Risk factors.

Table of Content

Chapter One
Introduction

Introduction

1.1 Introduction

The most common type of rheumatic disease and a leading cause of disability is osteoarthritis (OA). More than 10% of people worldwide suffer from OA. Patients with severe joint pain are unable to perform physical activities when their OA worsens [1]. Osteoarthritis (OA) is estimated to be the fourth most prevalent cause of disability. Hip or knee involvement accounts for a large portion of this load of impairment. Asian populations are aging quickly, and OA and aging are intimately related. Moreover, OA has been linked to high levels of physical occupational activity, which is required in rural developing nations for many individuals to make a living. Obesity, another important risk factor, may not be as prevalent even though it is rising. Numerous recent studies have contrasted urban and rural areas, as well as wealthy and impoverished populations [2,3]. By the time they turn 80 years old, between 50% to 80% of people with OA have symptoms, even when radiography or histology indicate the condition. OA can be diagnosed radiographically, clinically, or pathologically [6]. By 2050, there will be twice as many people aged 65 and up as children under the age of five, according to forecasts. This figure is likely to triple by the year 2100. Because OA is predominantly associated with aging, its prevalence is predicted to increase rapidly, and by 2030, it is expected to be a significant contributor to frailty among the general population.

Osteoarthritis (OA), the most prevalent kind of arthritis, affects millions of people in the US. According to EULAR, prevalent genetic and constitutional risk factors for osteoarthritis in the knee can also lead to osteoarthritis in other joints. Depending on the clinical requirements and level of treatment needed, there are variations in the definition of osteoarthritis in the knee [6].

Kellgren and Lawrence developed a classification system in 1957. It outlines several radiographic features that are regarded to be indicative of osteoarthritis and assigns five grades to the condition: Four are profound, three are moderate, two are modest, and one is suspicious. The Osteoarthritis Research Society International refined and classified the radiographic features of osteoarthritis of the knee in 2007 as follows: joint space constriction of the medial

compartment and lateral compartment; occurrence of marginal osteophytes on the lateral femoral condyle, medial tibial plateau, medial femoral condyle, and lateral tibial plateau (JSN). The most common clinical symptom is discomfort, which typically gets worse when one is moving more and bearing more weight. Conversely, stiffness typically goes away with inactivity. The most common cause of joint dysfunction [8]. Physical interventions are the cornerstone of osteoarthritis management, according to the American Academy of Orthopedic Surgeons (AAOS) and the Osteoarthritis Research Society (OARSI). Medical attention and surgery. Adjuvant physical therapy is a standard medical procedure that is easy to use. Losing weight reduces joint discomfort, balances mechanical stress imbalances, and decreases the risk of developing osteoarthritis. Mild exercise helps build muscle and slow the progression of osteoarthritis. Despite their benefits, alternative therapies including massage, acupuncture, and spa treatments are not supported by research. Because surgery carries a higher risk and involves invasive trauma, it is only considered in extreme circumstances where conservative therapy has failed. The most effective orthopedic treatment for severe OA is considered to be total joint replacement, or arthroplasty. It could get better. Once a person has osteoarthritis of the knee, the disease advances gradually for a number of years. There are currently no easily available treatments that reduce the condition's course, which is often characterized by a progressive loss of cartilage. Numerous modifiable risk factors include obesity, infections, trauma, and repetitive joint motion [9]. The job requires a lot of physical activity, including kneeling, 18–25-degree climbing, and heavy lifting. Obesity, a prior knee injury history, and a family history of the condition are the three main risk factors for knee OA. In regards to the impacts of knee OA, individuals who experience symptoms could be more likely than those who do not to take proactive steps to halt the illness's progression. This is especially true when it comes to radiographic proof of the condition. Researchers and people with knee OA are especially interested in risk factors linked to radiographic OA progression since this information will be crucial for secondary prevention [11].

1.2 Symptoms

Osteoarthritis symptoms often appear slowly and worsen over time. Osteoarthritis signs and symptoms include:

Pain: It is possible for the afflicted joint to hurt while moving or after. rigidity When you wake up or after being inactive may be the worst times to notice joint stiffness.

Sensitivity: Your joint could feel sore to the touch when you put light pressure on it. diminished ability to adapt. It's possible that your joint can't move through its entire range of motion.

Swelling:

In addition to the grating feeling, you might hear a popping or crackling sound when using the joint.

Spurs attached to the bone: These additional osseous pieces, which feel like a hard lump, can form around the wounded joint. Inflammation of the soft tissues surrounding the joint may be the cause of this [9].

1.3 Cause

A gradual deterioration of the cartilage lining the ends of the bones in your joints can lead to osteoarthritis. Cartilage is a smooth, long-lasting substance that makes joint motion nearly frictionless. Bone will rub against bone if there is no more cartilage. The phrase "wear and tear disease" is commonly used to describe osteoarthritis. However, osteoarthritis destroys the joint as a whole in addition to causing cartilage loss. It causes changes in the skeletal structure as well as deterioration of the connective tissues that support joints and attach muscles to bones. Inflammation of the joint lining is another effect of this [10].

1.4 Risk Factors

The following variables may raise your risk of developing osteoarthritis:

As people age, osteoarthritis becomes more prevalent.

Sex: Women are more likely than men to get osteoarthritis, while the cause is unknown. Still available for purchase.

Excess body weight aggravates osteoarthritis in multiple ways; the risk increases with body weight.

Carrying additional weight puts more strain on your weight-bearing joints, such as your knees and hips.

Furthermore, the region surrounding your joints may become extremely inflamed due to the proteins released by adipose tissue.

Damage to the joints: Trauma, such as that received in an accident or while participating in sports, can raise the risk of osteoarthritis. Even injuries that appear to have healed in the past can lead to osteoarthritis.

Joints being strained frequently. If a joint is subjected to repetitive stress from sports or job, osteoarthritis may eventually develop in that joint. Molecular Biology Some people are predisposed to osteoarthritis via genetics aberrant bone structure. Some people have damaged cartilage or malformed joints from birth specific metabolic conditions. These include diabetes and hemochromatosis, a condition where your body has an excess of iron [9].

1.5 Treatment

The following medications can help alleviate osteoarthritis symptoms, particularly pain:

Acetaminophen. Some persons with mild to severe osteoarthritis pain have been demonstrated to benefit from acetaminophen (included in several medications, including Tylenol). Liver damage might result from acetaminophen dosages that are higher than recommended.

Nonsteroidal anti-inflammatory medications, or NSAIDs. Over-the-counter nonsteroidal anti-inflammatory medicines (NSAIDs) including ibuprofen (Advil, Motrin IB, and others) and

naproxen sodium (Aleve) typically lessen osteoarthritis pain when used as prescribed. Stronger NSAIDs are available with prescriptions.

NSAIDs may result in bleeding issues, upset stomach, damage to the kidneys and liver, and cardiovascular issues. NSAID gels are less likely to cause side effects and can be just as efficient in alleviating pain when applied to the skin over the injured joint.

Duloxetine or Cymbalta. This medication, which is frequently prescribed as an antidepressant, is authorized to treat chronic pain, particularly osteoarthritis-related discomfort.

Therapy

Physiotherapy. A physical therapist can provide you with exercises to improve your flexibility, strengthen the muscles surrounding your joint, and ease pain. Walking or swimming are two common forms of mild exercise that you can perform on your own that can be just as beneficial. **Occupational medicine**. An occupational therapist can assist you in learning how to perform daily activities without adding further strain to your joint, which is already painful. For example, if you have osteoarthritis in your hands, using a toothbrush with a large handle may be easier. If you suffer from osteoarthritis in your knees, a bench in your shower may help reduce the discomfort of standing.

Transcutaneous Electrical Nerve Stimulation is referred to as TENS. By using low voltage electric current, it reduces discomfort. It offers momentary comfort to certain people with osteoarthritis of the hips and knees.

Injections of cortisone. Injections of corticosteroids into your joint may help relieve pain momentarily. Doctor will numb the region surrounding joint before injecting medication into it with a needle. Because cortisone tends to worsen joint degeneration over time, often only permitted three or four injections per year.

Pumping in lubricant: Hyaluronic acid injections may provide some cushioning for your knee, which helps with pain management. However, other study indicates that the injections are no more helpful than a placebo. A similar chemical that is commonly present in your joint fluid is hyaluronic acid [12].

Chapter Two
Purpose of My Study

2.1 Purpose of the Study

To investigate the risk factor, prevalence, and treatment pattern for patients suffering from osteoarthritis; to gather sociodemographic data about the patient; to compare the number of affected genders; to ascertain the patient's preferred method of pain; to ascertain the treatment's percentage; and to determine the treatment's outcome.

The purpose of research is

- ✓ To identify OA patients.
- ✓ To determine the amount of individuals who are aware of this ailment,
- ✓ Their daily exercise program,
- ✓ Their medication regimen,
- ✓ To measure their level of OA awareness.

Chapter Three
Methodology

3.1 Methodology

Data were collected during hospital visits in May and June 2024. During this time, I contacted all patients and paid frequent visits to get physician-approved information. Following consent from the relevant physician, data were gathered through an interview with the OA. Patients were asked direct questions regarding their daily activities, nutrition, medications, and routines, and their answers were recorded.

3.2 Question

Trial Patient agreed to take part in this study

Name of the patient:_____

1.Age:_____

□Under 30 □30-49 □50-69 □70 & above

2.Gender

□Female □Male

3.Residence Area

□Urban □Rural

4.Religious

□ Islam □Hindu □ Christian □others

5.Education Level:

□No formal education □Primary education □Higher Education □postgraduate

6.Occupation :

□self-employed □unemployed □student □ Homeworker

7.**Monthly income range**

□Below 10,000 □10,000-29,999 □30,000-49,999 □50,000 & above

8.**How long have you been diagnosed with Osteoarthritis**?

□Less than 1year □1-3 years □4-6 years □More than 6years

9.Level of pain?

□None □Moderate □Mild □severe

10.How often do you experience osteoarthritis pain?

□Daily □Weekly □Monthly □Rarely

11.Which joints are most affected by Osteoarthritis

□Knees □Hands □Hips □spine □Other

12.Do you engage in regular exercise?

□Yes □No

If yes,What types of exercise?

□Walking □ Yoga □Swimming □Others

13.Do you find that exercise helps relieve your symptoms?

□Yes □No

14.Weight management

□Under weight □Overweight □Normal weight

15.Do you believe that being overweight impact your osteoarthritis symptoms?

□Yes □No

16.Treatment pattern

□Weight control □Rest and joint care □medication □surgery

17.Are you currently taking any medication for OA?

□Yes □No

If yes, what type of medication are you taking?

□NSAIDS □corticosteroid □Hyaluronic acid Injection □Pain reliever (Acetaminophen) □Other

18.Have you experienced any side effects from your medication?

□Yes □No

If yes, what side effects have you experienced?

□Gastrointestinal issues □Dizziness □Allergic reaction □Others

19.Have you consulted a physiotherapist for your osteoarthritis?

□Yes □No

20.do you find the physiotherapy sessions beneficial for your OA?

□Yes □No

□Not sure

21.Have you tired complimentary and alternative therapies?

□Yes □No

If yes specify which ones

□Assistive material □Thermotherapy □ physiotherapy and thermotherapy □physiotherapy

22. What is the most challenging aspect of living with OA for you?

□pain management □financial Barden □Limited mobility □emotional impact

23. Do you think that medication can cure your OA problem permanently?

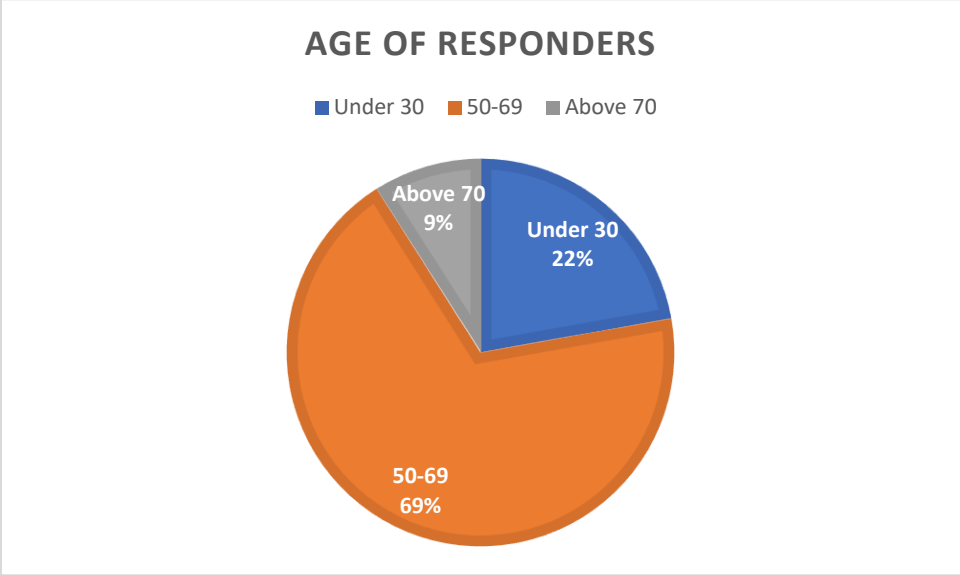
□Yes □No

24.Outcome of treatment

□Satisfied □No improvement □Non satisfied

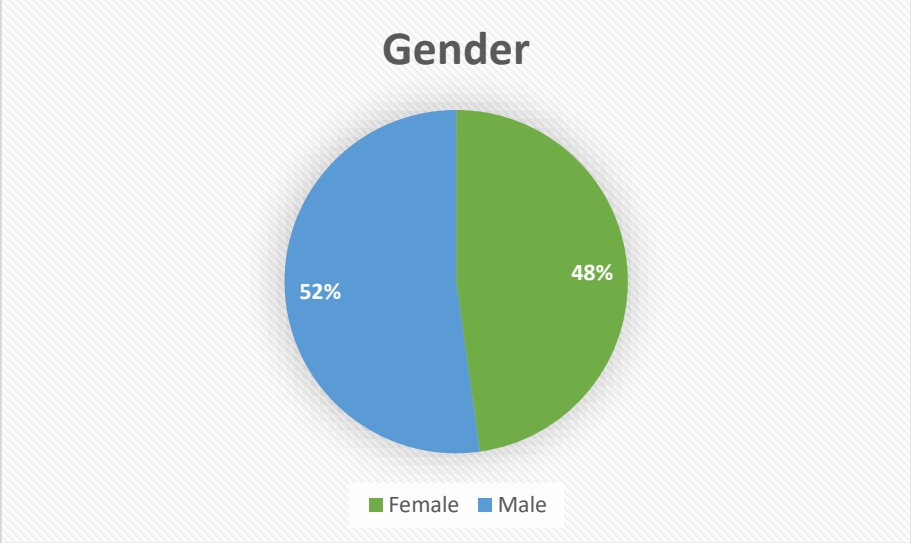
Chapter Four
Result & Discussion

1. **Age**



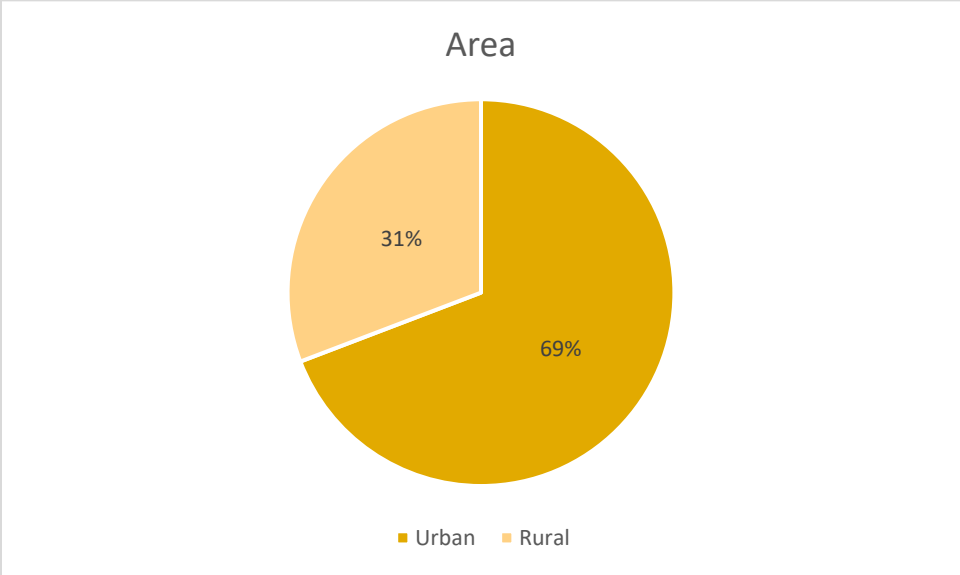
In response to this survey it is shown that the age range between 50 to 69 were participated the most, and under age of 30 there was 22% participants, as well as above 70 years old people participated 9% out of 100%.

2. **Gender**



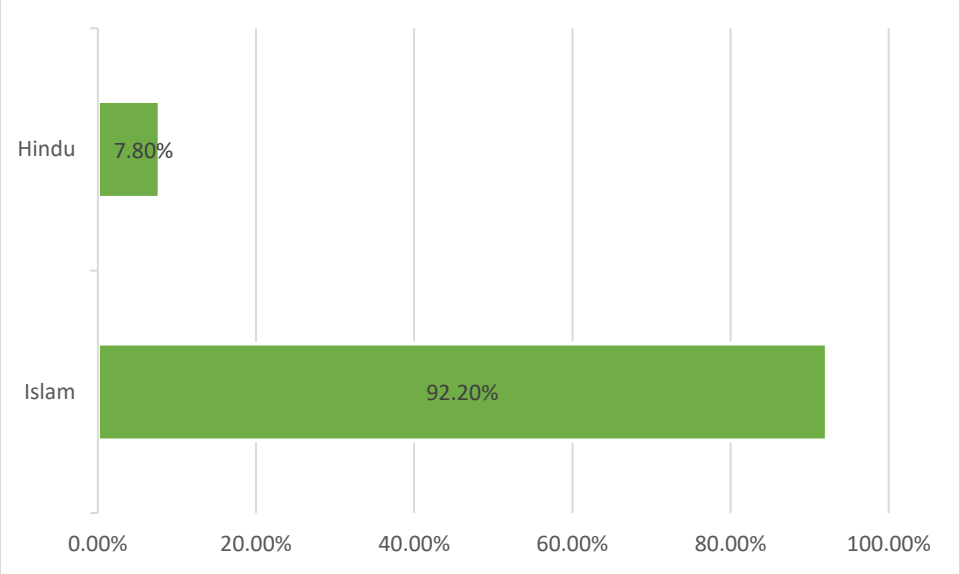
Data analysis shown that there was 52% male patient and 48% female patient.

3. Area



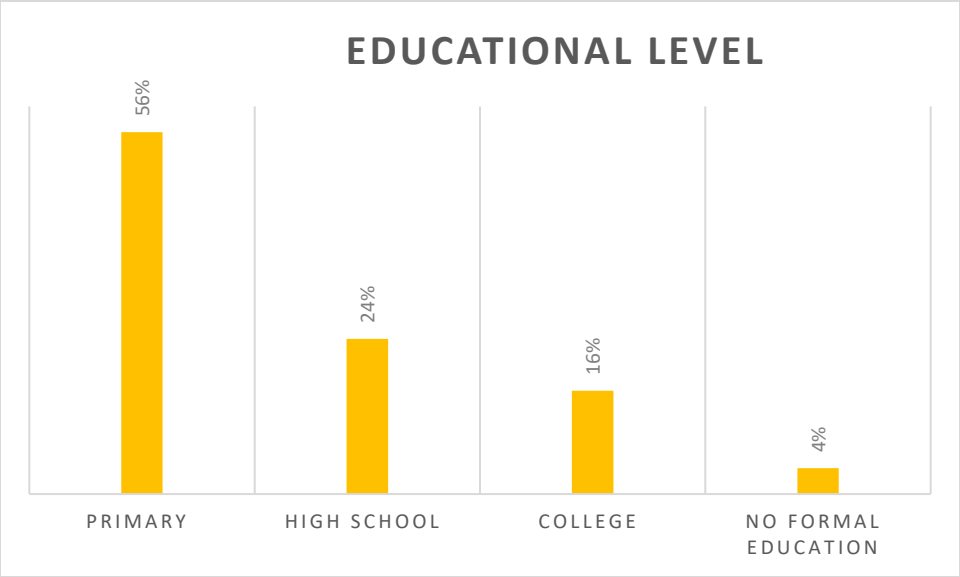
Here the analysis shows that 31% of responders living in rural area and 69% are living in the urban site.

4. Religious



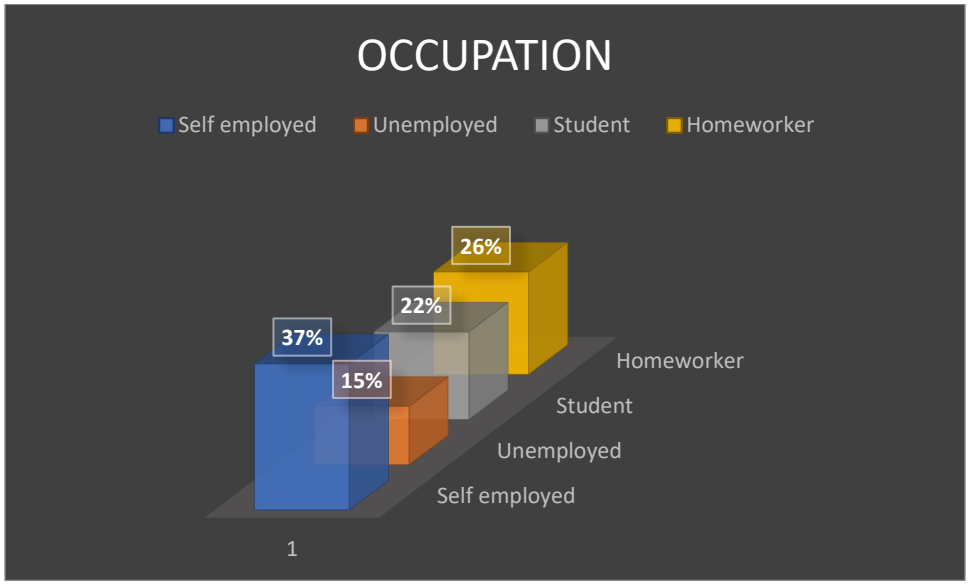
In total participants, 92.20% were Islam and Hindu were 7.80%.

5. Educational level



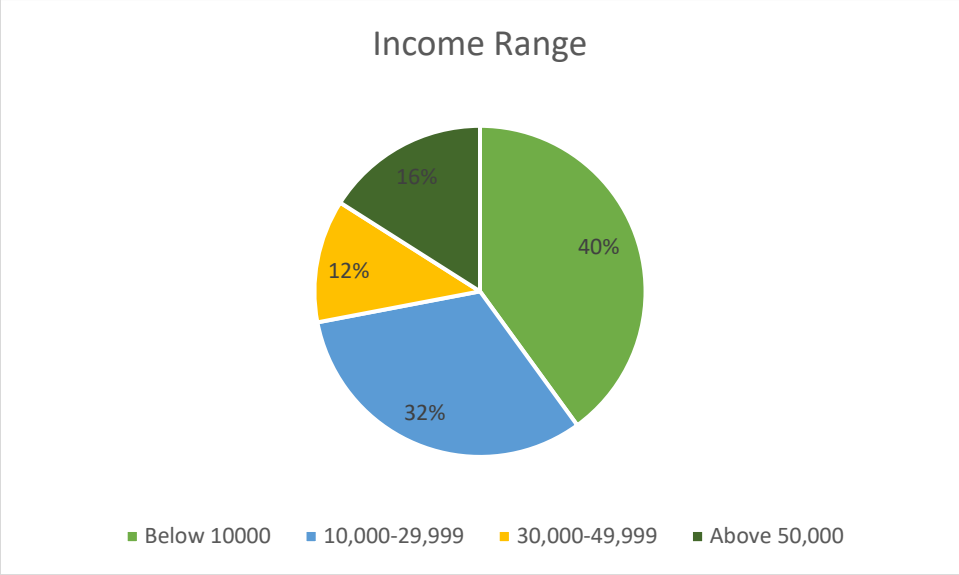
In total responders, most of the participants have passed only primary level. Which is 56%, and about 24% participants have studied till high school, and 16% have educated till college level. On another only 4% of participants have no formal education.

6. Occupation



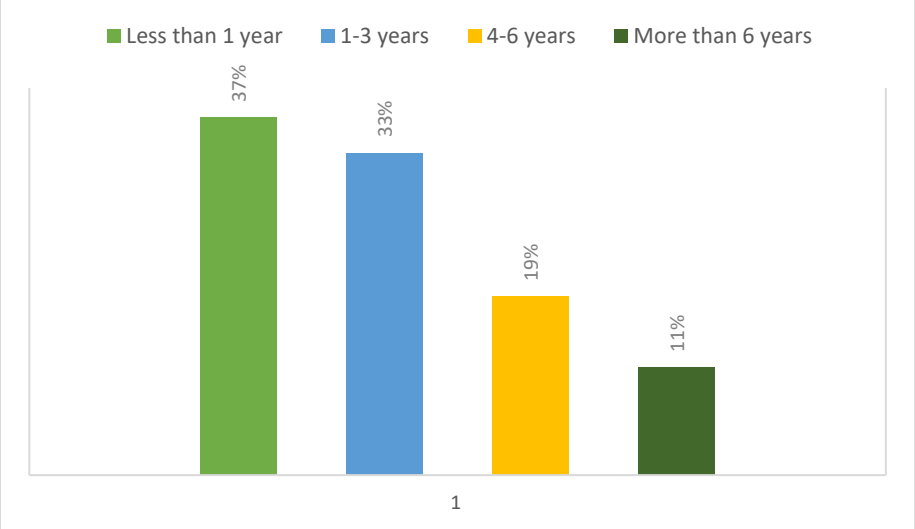
Various professionals have been selected to participate in this survey study. Among them 15% are unemployed, about 37% are self-employed, 22% are students and lastly 26% are homeworker.

7. **Income Range**



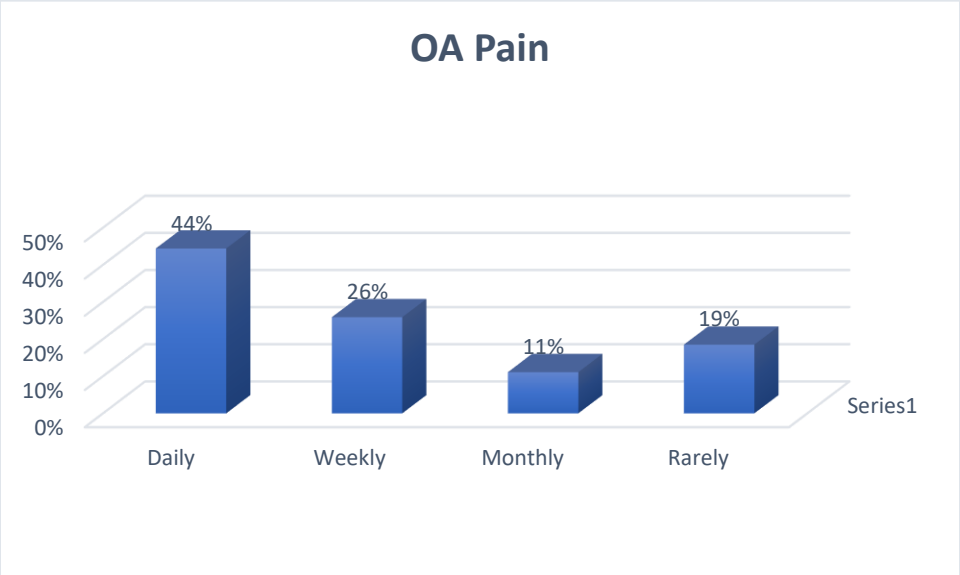
This analysis shows that most of the participant's income range is below 10000, on another least amount of participant's income is above 50000, which is about 16%.

8. **How long have you been diagnosed with Osteoarthritis?**



This analysis shows how often patient have been diagnosed with OA. About 37% of participants were diagnosed within one year, and been long period of time that is more that 6 years there about 11% of participants diagnosed. On another, 19% within 1-3 years and about 33% within 1-3 years.

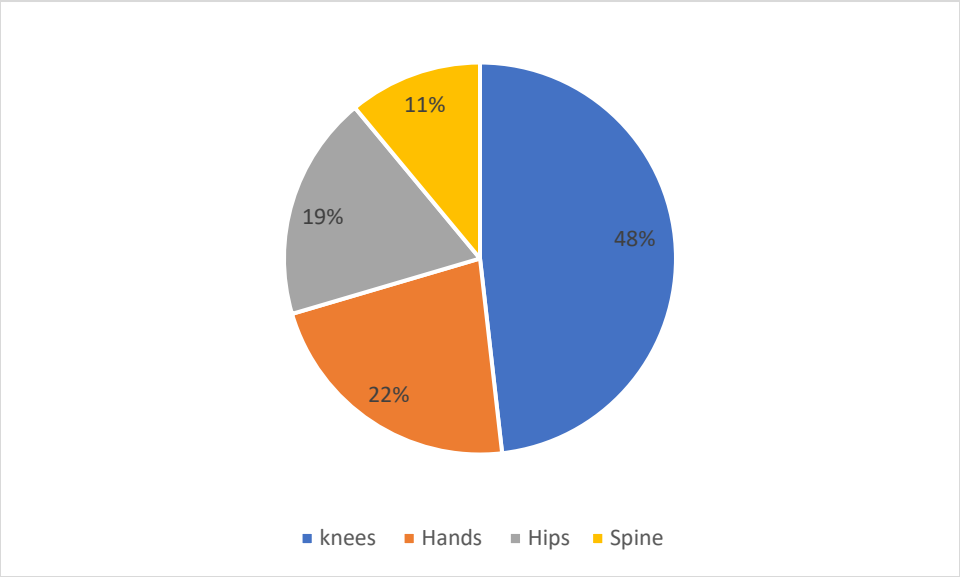
9. How often do you experience osteoarthritis pain?



People with osteoarthritis (OA), which is characterized by the degeneration of joint cartilage, frequently experience discomfort. This pain can significantly impair daily activities.

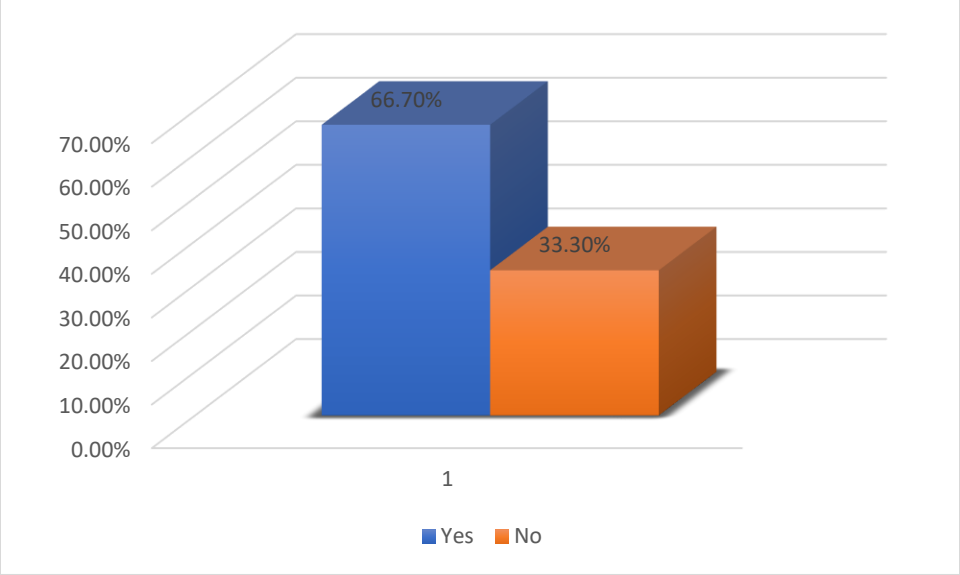
In this analysis it is shows that, daily pain feel in about 44% of participants, least amount of people can feel the pain monthly and rarely about 19%.

10. Which joints are most affected by Osteoarthritis pain?



From analysis it is clear that most of the participants suffer from Knees pain, second most is hands and hips and lastly Spine pain.

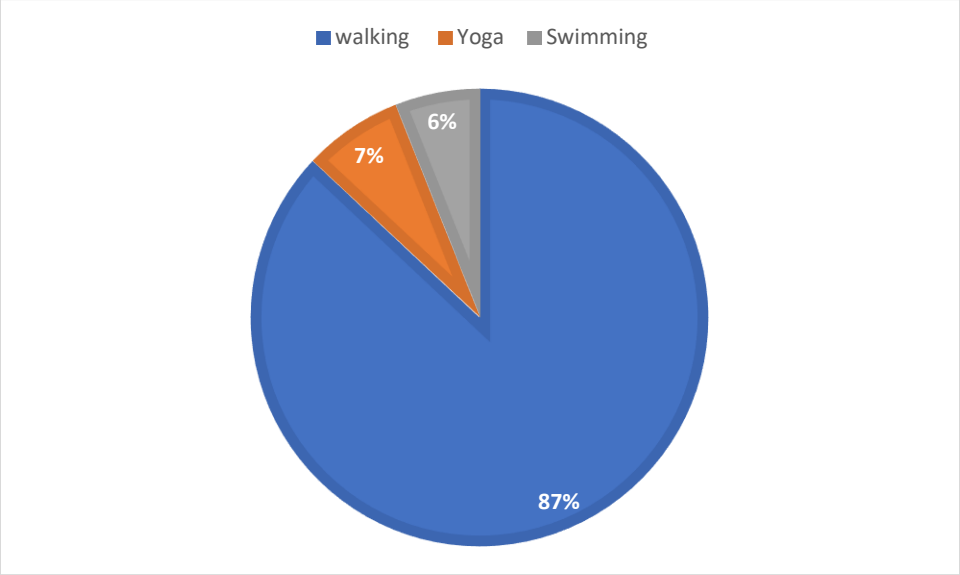
11. Do you engage in regular exercise?



Exercise enhances range of motion, reduces pain, and strengthens the muscles around the joint.

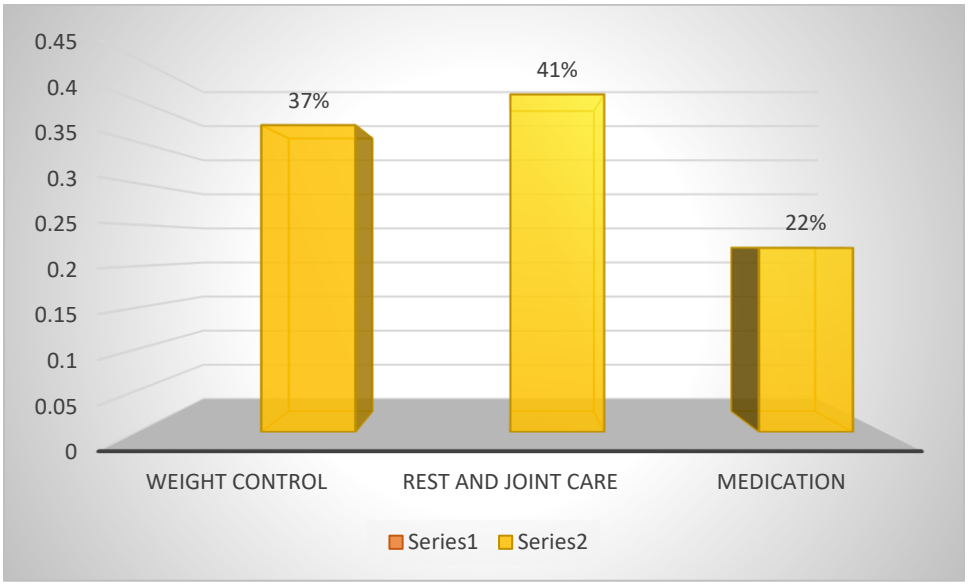
To reduce joint tension, physical therapists can create personalized training regimens and techniques. From the responders there were about 67% participants who have engaged with physical exercise. Rest of 33% are not engaged.

12. what types of exercise?



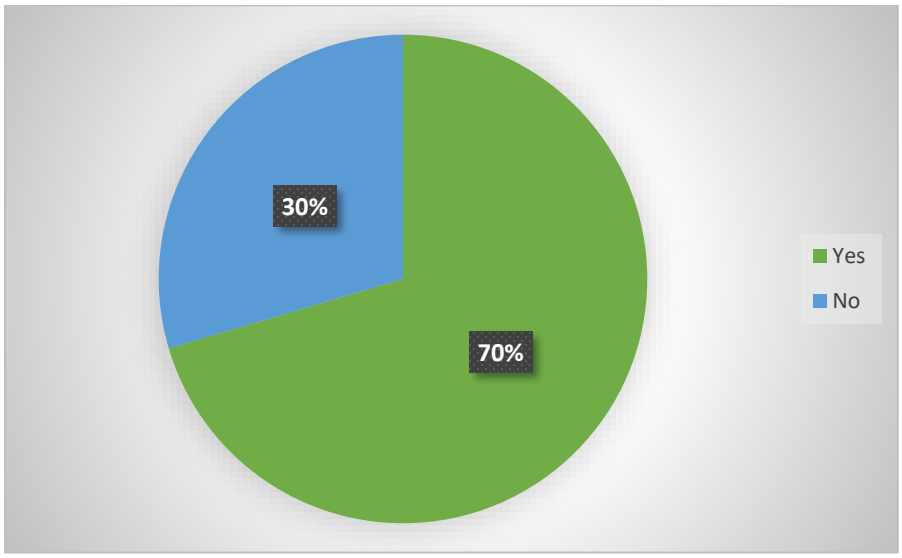
About 87% of participants do exercise by walking, on the other hand only 6 & 7 % of participants do yoga and swimming accordingly.

13. Treatment Pattern



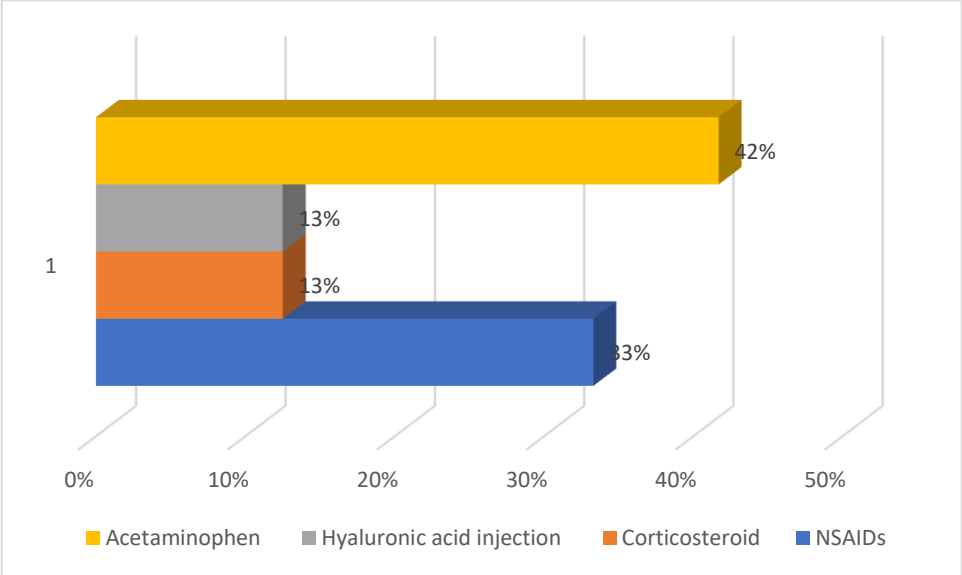
The primary goals of treating osteoarthritis (OA) are to alleviate symptoms, improve joint function, and stop the disease's progression. The treatment plan includes a combination of medications, physical therapy, dietary changes, and, on occasion, surgery. Here about 41% participants taking care of joint and take rest. And about 37% of participants control weight and 22% taking medicine.

14. Medicine taking



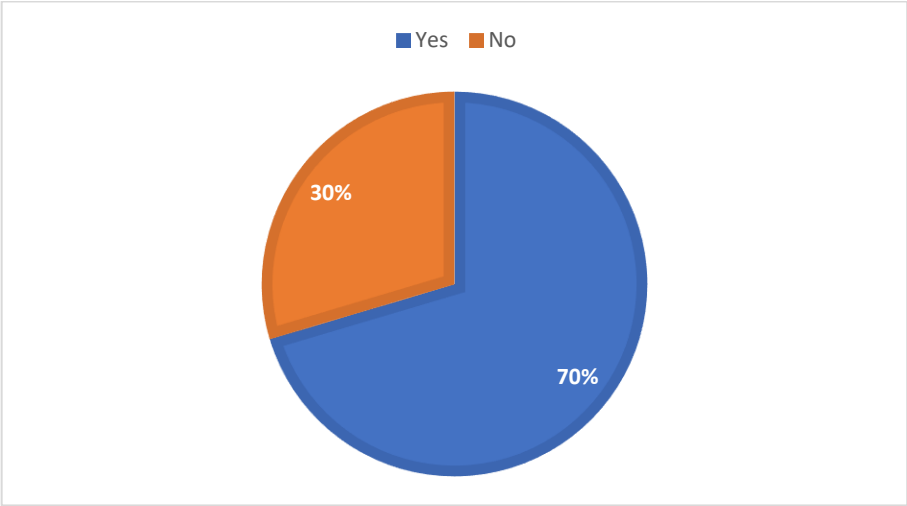
About 70% of participants, taking medicine to treat OA.

15. Types of medication



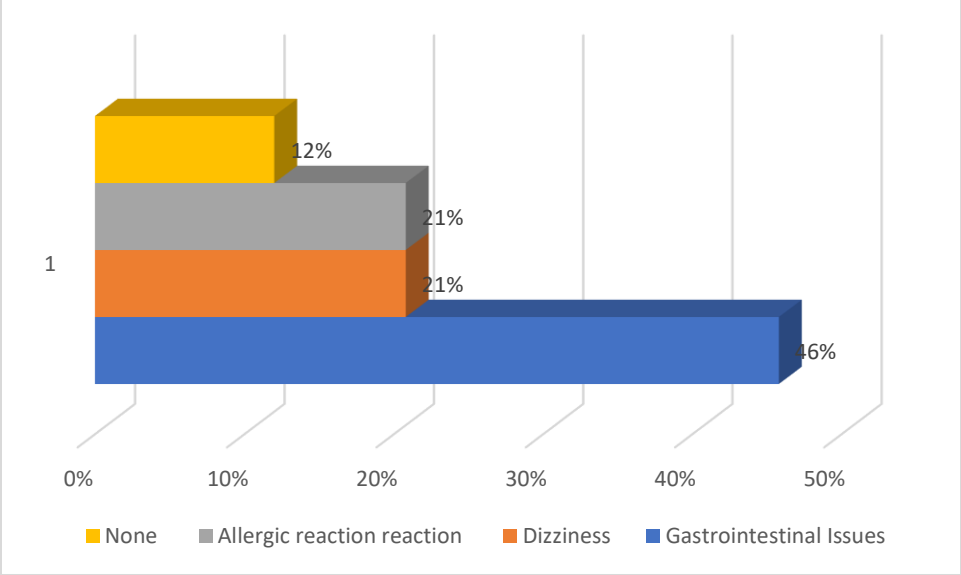
In this analysis, most of the participants which is about 42% is taking acetaminophen to reduce the pain, second least about 33% of participants taking NSAIDs and most last amount of participants taking Corticosteroid and Hyaluronic acid injection to treat OA.

16. Side effect



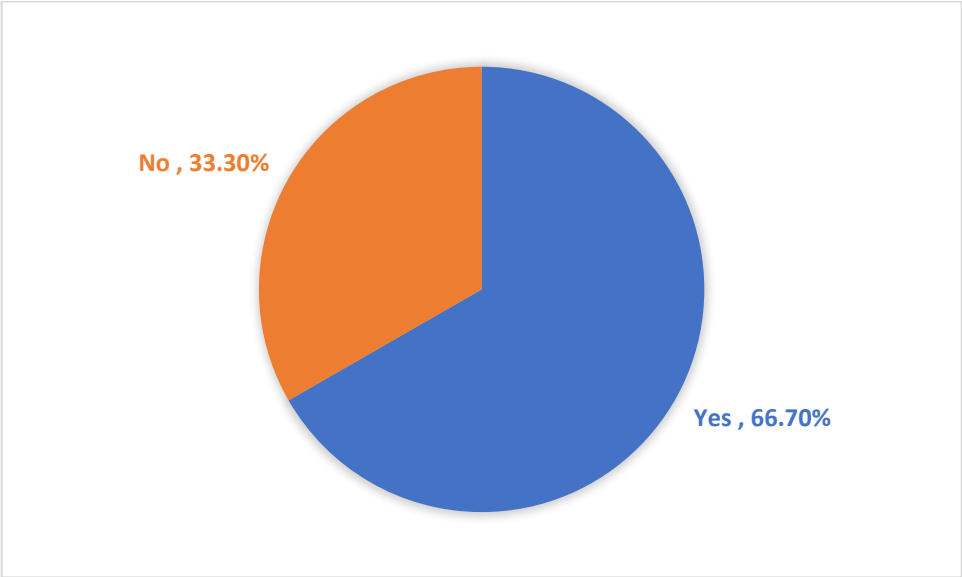
About 70% of participants have been suffer from side effects of OA. And about 30% of participants haven't been suffered from any kind of side effects.

17. Side effects they have experienced.



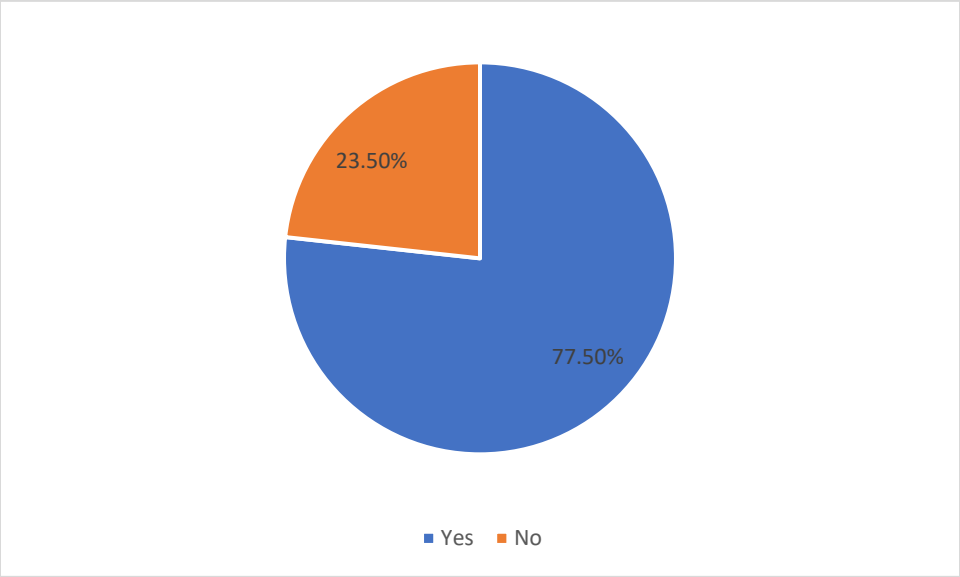
Medication for osteoarthritis (OA) might help reduce pain and inflammation, but it can also have unintended consequences. It is crucial to detect these side effects and get advice from a medical professional to determine the best course of action to manage them. About 46% of participants have been suffered from gastrointestinal issues. And about 21% of participants have accordingly Allergic reaction and Dizziness.

18. Consulting with physiotherapist



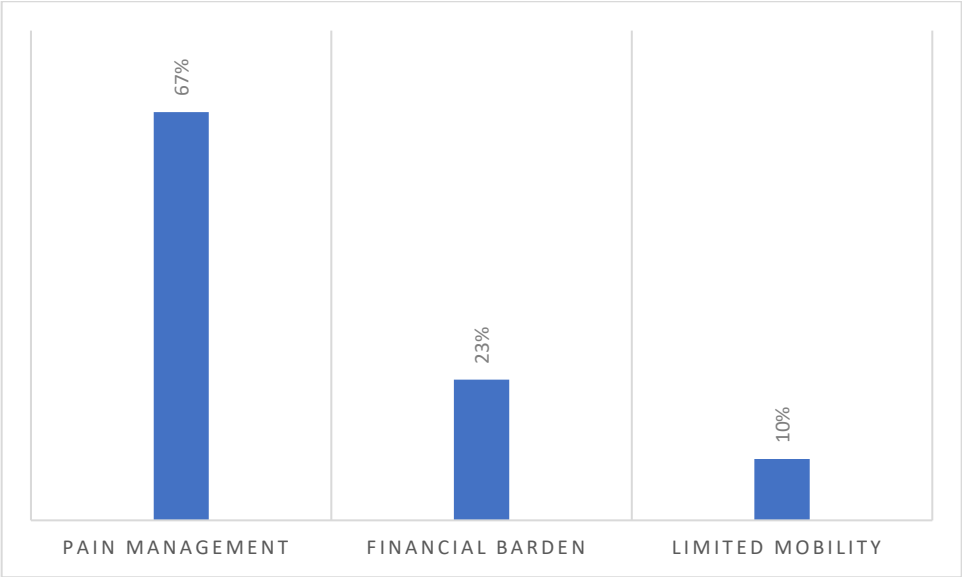
Osteoarthritis (OA) can be controlled and quality of life improved by visiting a physiotherapist. Physiotherapists are skilled in using a variety of therapy approaches to improve joint function, pain management, and overall patient mobility.

19. Physiotherapy session could be beneficial for OA or not?



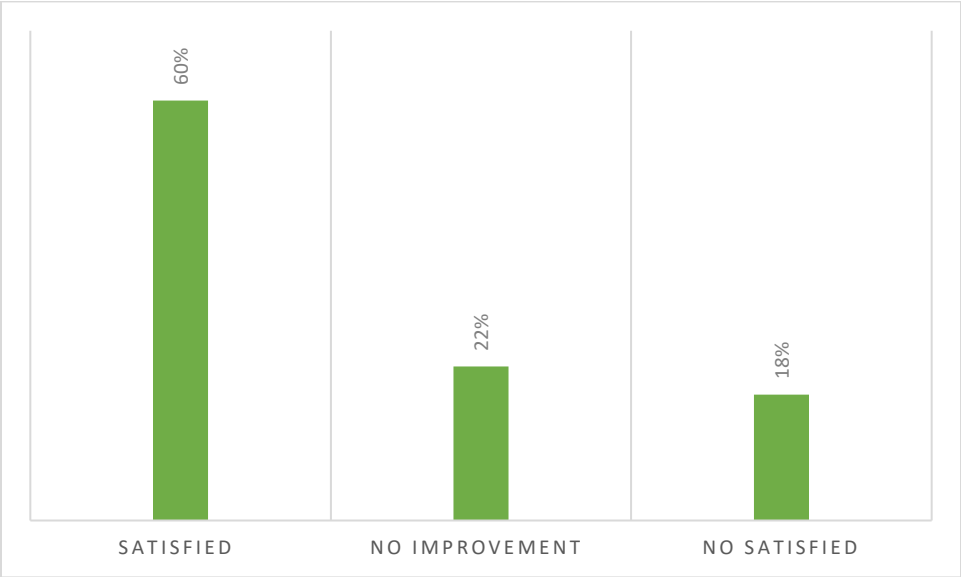
About 77.5% of participant have told that they have got benefits from physiotherapy session and about 23.50% of patient have told they don't believe that by doing session with physiotherapist they can get relief from OA.

20. Most challenging aspect of living with OA



Most of the participants have said that which is about 67%, pain management is the most challenging aspect of living with this problem.

21. Outcome of treatment



About 60% of participant have told that they are satisfied from the treatment they have taken. And about 22% of participants said they haven't got any improvement. On the other hand about 18% of participants are not satisfied.

Chapter Five
Conclusion

5.1 Conclusion

In conclusion, the results of this survey study demonstrated the prevalence and severity of osteoarthritis in the studied group. Empirical data indicates that mitigating the effects of OA requires a significant increase in awareness, improved management strategies, and focused interventions. The quality of life for those with osteoarthritis can be improved by improving the support network for those affected by the condition and addressing recognized risk factors.

The purpose of the survey study was to examine osteoarthritis (OA) in the target group, including its prevalence, risk factors and implications. This highlights the degree to which the community being studied is impacted by OA. Studies have shown a substantial correlation between osteoarthritis (OA) and age, obesity, physical inactivity, and a history of joint damage. This suggests that in order to enhance the quality of life for those affected, efficient management strategies are needed. Around least amount participant taking medicine acetaminophen to reduce joint pain.

The results of the study demonstrated that participants' knowledge and understanding of OA management were deficient. Despite their high frequency, only few amount of respondents were aware of effective management methods, which emphasizes the need for more educational initiatives and materials.

Chapter Six
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