

***A survey on the Present Status and Future Perspective of
Rheumatoid Arthritis Management at Dhamrai, Dhaka,
Bangladesh***



Daffodil
International
University

PROJECT REPORT

*[In the partial fulfillment of the requirements for the degree of Bachelor of
Pharmacy]*

Submitted To

The Department of Pharmacy
Faculty of Health & Life Sciences
Daffodil International University

Submitted By

Mahmud Reza Ridoy
Student ID: 201-29-383
Department of Pharmacy
Faculty of Health & Life Sciences
Daffodil International University

.....
April 2024

APPROVAL

This project paper, “**A survey on the Present Status and Future Perspective of Rheumatoid Arthritis Management at Dhamrai, Dhaka, Bangladesh**”, submitted to the Department of Pharmacy, Faculty of Health & Life Sciences, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Pharmacy and approved as to its style and contents.

BOARD OF EXAMINERS

.....

Dr. Muniruddin Ahmed
Professor and Head
Department of Pharmacy
Faculty of Health & Life Sciences
Daffodil International University

.....

Internal Examiner 1

.....

Internal Examiner 2

.....

External Examiner 3

DECLARATION

I hereby declare that this project report, “**A survey on the Present Status and Future Perspective of Rheumatoid Arthritis Management at Dhamrai, Dhaka, Bangladesh**”, is done by me under the supervision Md. A.K. Azad Assistant Professor, Department of Pharmacy Faculty of Health & Life Sciences Daffodil International University. I am declaring that this thesis is my original work. I also declare that neither this thesis nor any part therefore has been submitted elsewhere for the award of Bachelor degree.

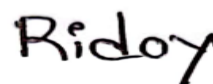
Supervised by



.....

Md. A.K. Azad
Assistant Professor
Department of Pharmacy
Faculty of Health & Life Sciences
Daffodil International University

Submitted By



.....

Mahmud Reza Ridoy
Student ID: 201-29-383
Department of Pharmacy
Faculty of Health & Life Sciences
Daffodil International University

ACKNOWLEDGEMENT

I might want to communicate my profound applause to the All-powerful Allah who has given me the capacity to finish my undertaking work and the chance to concentrate in this subject.

I'm a lot of thankful to my honorable project supervisor Md. A.K. Azad Assistant Professor, Faculty of Health & Life Sciences, Department of Pharmacy, Daffodil International University.

I would like to express my humble regards to Dr. Muniruddin Ahmed, Professor and Head, Department of Pharmacy, Daffodil International University.

I also wish to offer my respect to all of the teachers of Pharmacy Department, Daffodil International University and thankful to other members for their excellent cooperation with us.

Finally, I would like to express my gratitude towards my parents and other family members for their kind cooperation and encouragement which helped me in completion of this project.



My Parents,

The persons who always encourage me in every sphere of my life.

My teacher,

The persons who guided me in this process and the committee who kept me on track.

Abstract

This survey study aims to uncover the prevalence of rheumatoid arthritis (RA) in Dhamrai, providing insight into the local epidemiological landscape of this debilitating autoimmune condition. Employing a cross-sectional approach, the study utilizes a structured questionnaire and clinical assessments to gather data from a representative sample of Dhamrai population. The majority of survey respondents (67%) indicated a high level of familiarity with rheumatoid arthritis, while 27% reported being unfamiliar with it. Among the participants, 55% reported being affected by rheumatoid arthritis, while 45% stated they were not affected. Regarding symptoms, 25% reported experiencing tenderness and swelling in multiple joints, while 32% reported stiffness in various joints. Additionally, 45% of respondents reported feeling increased pain in the early morning, with 23% experiencing more pain at night and 25% feeling more pain during walking. Regarding treatment, 47% of participants reported using NSAIDs to relieve rheumatoid arthritis symptoms, while 30% used corticosteroids. Furthermore, 90% of respondents considered regular exercise necessary for preventing rheumatoid arthritis. Regarding vaccines, 30% of participants reported receiving a vaccine to improve or combat rheumatoid arthritis, with 60% receiving the pneumococcal (pneumonia) vaccine and 40% receiving the influenza vaccine. In this investigation 59% participants has been known that mediterranean diet, with lots of fruits and vegetables is good for Rheumatoid Arthritis patients. These findings emphasize the importance of addressing rheumatoid arthritis as a public health concern, highlighting the need for targeted interventions and increased awareness.

Contents

Chapter 1	1
Introduction	1
1. Introduction	2
1.1 History of Salmonella Typhi infection in the world.....	3
1.2 Pathogenesis of Typhoid fever by Salmonella Typhi.....	4
1.3 Etiology of Rheumatoid arthritis	7
1.4 Challenges and Future Directions of Rheumatoid arthritis	9
Chapter 2	11
Purpose of the study	11
2.1 Purpose of the study	12
Chapter 3	13
Literature Review	13
3.1 The prevalence of rheumatoid arthritis.....	14
3.2 Management of Rheumatoid Arthritis: An Overview	14
3.3 Therapeutic strategies for rheumatoid arthritis.....	15
Chapter 4	16
Methodology	16
4. Methodology.....	17
4.1 Data Collection:	17
4.2 Data Variables:	17
4.3 Sample size	17
4.4 Data analysis strategy	18
Chapter 5	19
Results & discussion	19

5.1 Age of Responders.....	20
5.2 Gender of Participants	20
5.3 Professional Status of Responders.....	21
5.4 Aware with Rheumatoid Arthritis	22
5.5 Affected ratio of Rheumatoid Arthritis	23
5.6 If yes, which type of symptoms have you suffered?	24
5.7 Kind of disease Rheumatoid Arthritis	25
5.8 Worsen time of pain	26
5.9 Taken medicine.....	27
5.10 Taken medicine without doctor suggestion	28
5.11 Family history.....	29
5.12 Do you feel that regular exercise is important?	30
5.13 Do you know that mediterranean diet, with lots of fruits and vegetables is good for Rheumatoid Arthritis patients?	31
5.14 Vaccine for Rheumatoid Arthritis	32
5.15 If, Yes which vaccine have you been taken?	33
Chapter 6	34
Conclusion	34
6.1 Conclusion	35
Chapter 7	36
Reference	36

List of Figures

Figure 1: Rheumatoid Arthritis Joint Pain VS Osteoarthritis Joint Pain	3
Figure 2: Pathogenesis of Rheumatoid arthritis.....	6
Figure 3: Progression of rheumatoid arthritis (RA) and osteoarthritis (OA).....	8
Figure 4: Age of Responders	20
Figure 5: Gender of Participants	20
Figure 6: Professional Status of Responders	21
Figure 7: Aware with Rheumatoid Arthritis.....	22
Figure 8: Affected ratio of Rheumatoid Arthritis	23
Figure 9: Symptoms of Rheumatoid Arthritis	24
Figure 10: Kind of disease Rheumatoid Arthritis	25
Figure 11: Worsen time of pain	26
Figure 12: Taken medicine	27
Figure 13: Taken medicine without doctor suggestion.....	28
Figure 14: Family history.....	29
Figure 15: Regular exercise	30
Figure 16: Mediterranean diet, with lots of fruits and vegetables	31
Figure 17: Vaccine for Rheumatoid Arthritis	32
Figure 18: Vaccine have you been taken	33

Chapter 1

Introduction

1. Introduction

Rheumatoid arthritis (RA) stands as one of the most challenging autoimmune diseases, characterized by chronic inflammation of the joints, leading to progressive disability and systemic complications. Its management requires a comprehensive approach encompassing pharmacological interventions, rehabilitation, and patient education. However, the clinical landscape of RA management often varies based on healthcare settings, geographical locations, and healthcare policies. Gonoshasthaya Nagar Hospital, as a prominent healthcare institution in Bangladesh, plays a pivotal role in addressing the healthcare needs of the population, including the management of RA [1]. Despite advancements in medical science and treatment modalities, there remains a crucial gap in understanding the current clinical practices employed in RA management at Gonoshasthaya Nagar Hospital. This survey aims to bridge this gap by providing insights into the prevailing clinical practices, challenges faced by healthcare providers, and potential areas for improvement in the management of RA at Gonoshasthaya Nagar Hospital. By elucidating the current landscape, this study seeks to contribute valuable data for optimizing patient care, enhancing treatment outcomes, and refining healthcare policies related to RA management [2]. Through a comprehensive analysis of clinical protocols, treatment modalities, healthcare infrastructure, and patient experiences, this survey endeavors to shed light on the strengths and weaknesses of the current approach to RA management at Gonoshasthaya Nagar Hospital. Moreover, by exploring the perspectives of healthcare providers and patients alike, this study aims to foster a collaborative environment conducive to delivering patient-centered care and improving the overall quality of life for individuals affected by RA. In essence, this survey serves as a cornerstone for understanding the dynamics of RA management at Gonoshasthaya Nagar Hospital, laying the groundwork for future research endeavors, clinical interventions, and policy reforms aimed at alleviating the burden of this debilitating disease on patients, caregivers, and the healthcare system at large [3].

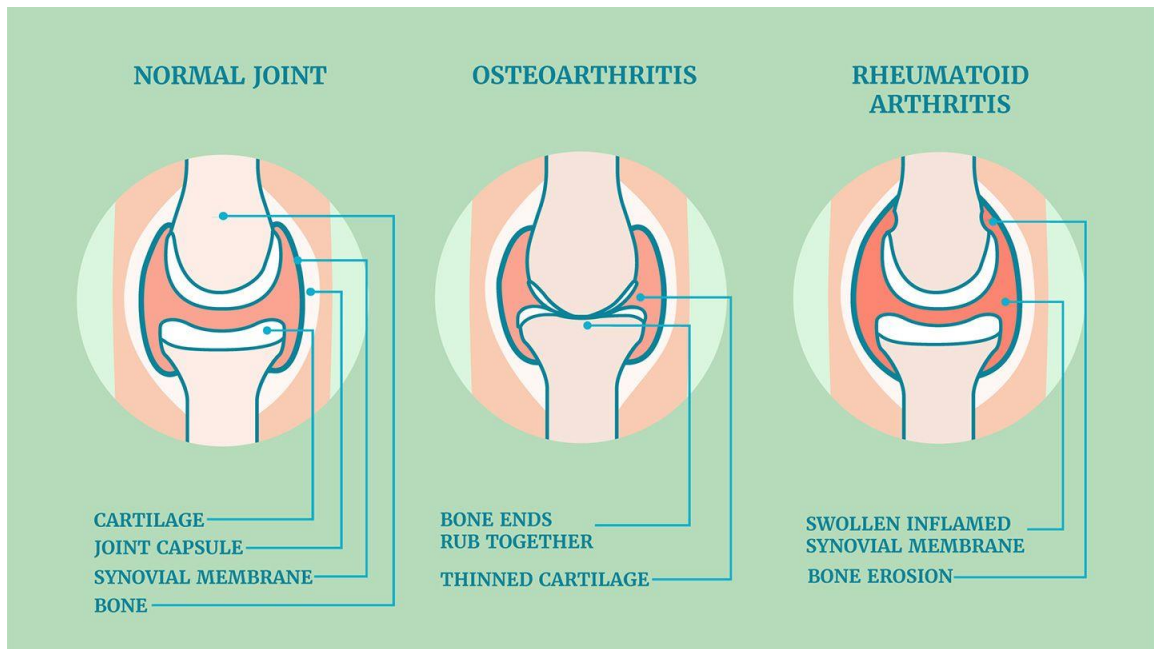


Figure 1: Rheumatoid Arthritis Joint Pain VS Osteoarthritis Joint Pain

1.1 History of Salmonella Typhi infection in the world

Salmonella Typhi, the bacterium responsible for causing typhoid fever, has had a significant impact on human populations throughout history. Here's an overview of its history:

Ancient Times: While the specific bacterium wasn't identified until later, historians believe that typhoid fever has been afflicting humans for millennia. There are accounts of illnesses resembling typhoid fever in ancient texts, though they may have been attributed to other causes at the time [4].

19th Century: Typhoid fever was a significant public health concern during the 19th century, particularly in urban areas where overcrowding and poor sanitation facilitated its spread. Major outbreaks occurred in cities like London and New York, leading to thousands of deaths.

Discovery of the Bacterium: In 1880, Karl Joseph Eberth identified the bacterium Salmonella Typhi as the cause of typhoid fever. Later, in 1896, Almroth Edward Wright developed a vaccine against typhoid fever, providing a significant advancement in its prevention [5].

Typhoid Mary: Perhaps one of the most famous cases associated with *Salmonella Typhi* is that of Mary Mallon, also known as "Typhoid Mary." She was an asymptomatic carrier of the bacterium and unknowingly spread it to numerous people in the early 20th century, leading to several outbreaks in the United States.

Improvements in Sanitation and Hygiene: Throughout the 20th century, improvements in sanitation, hygiene, and the development of antibiotics led to a significant decline in the prevalence of typhoid fever in developed countries. However, it remains a concern in regions with poor sanitation and limited access to clean water [6].

Global Impact: Typhoid fever continues to be a significant health problem in many parts of the world, particularly in South Asia, Southeast Asia, and sub-Saharan Africa. It is estimated that there are millions of cases of typhoid fever worldwide each year, resulting in tens of thousands of deaths.

Challenges and Current Status: Challenges such as antibiotic resistance and limited access to clean water and sanitation facilities continue to hinder efforts to control typhoid fever in many parts of the world. However, initiatives such as vaccination campaigns and improvements in water and sanitation infrastructure are helping to reduce the burden of the disease in some regions [7].

1.2 Pathogenesis of Typhoid fever by *Salmonella Typhi*

The pathogenesis of rheumatoid arthritis is complex and involves a combination of genetic, environmental, and immunological factors. Here is an overview of the key aspects of the pathogenesis of rheumatoid arthritis:

Genetic Factors:

Genetic susceptibility plays a significant role in the development of rheumatoid arthritis. Certain genetic markers, such as certain human leukocyte antigen (HLA) genes (e.g., HLA-DR4), are associated with an increased risk of RA. Individuals with a family history of rheumatoid arthritis are more likely to develop the condition, suggesting a hereditary component [12].



Environmental Triggers:

Environmental factors, such as infections (e.g., viral or bacterial infections), smoking, and hormonal changes, may trigger the onset of rheumatoid arthritis in genetically susceptible individuals. These triggers can activate the immune system and contribute to the development of autoimmunity [13].



Immune System Dysregulation:

In rheumatoid arthritis, the immune system mistakenly identifies the synovium (the lining of the membranes surrounding the joints) as foreign and attacks it. Abnormal immune responses involve the activation of immune cells, particularly T cells and B cells. These cells infiltrate the synovial membrane, leading to chronic inflammation [14].



Inflammatory Cascade:

The activated immune cells release pro-inflammatory cytokines, such as tumor necrosis factor-alpha (TNF- α), interleukin-1 (IL-1), and interleukin-6 (IL-6). These cytokines contribute to the inflammatory process, promoting the recruitment of more immune cells and causing synovial tissue inflammation [15].



Synovial Hyperplasia and Pannus Formation:

Persistent inflammation in the synovium leads to synovial hyperplasia, an abnormal increase in the number of synovial cells. The formation of an invasive, tissue-destructive structure called pannus occurs. Pannus erodes cartilage and bone, leading to joint damage and deformities [16].



Cartilage and Bone Destruction:

Pannus invasion and the release of enzymes, such as matrix metalloproteinases (MMPs), contribute to the destruction of cartilage and bone in the affected joints. As a result, patients with rheumatoid arthritis may experience joint pain, swelling, and deformities [17].



Systemic Effects:

Rheumatoid arthritis can also have systemic effects, affecting organs and tissues throughout the body. This may lead to complications in the heart, lungs, skin, eyes, and blood vessels [18].

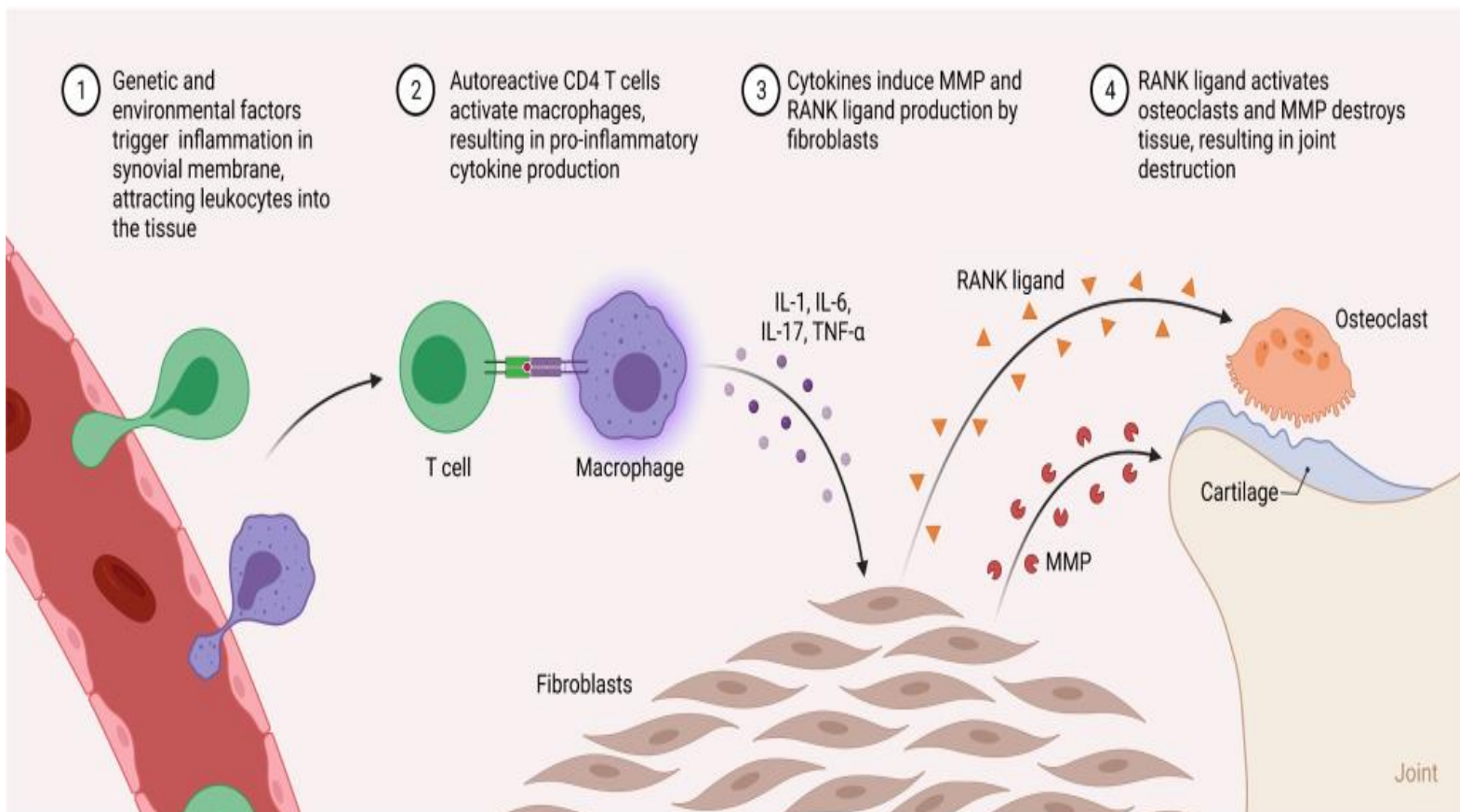


Figure 2: Pathogenesis of Rheumatoid arthritis

1.3 Etiology of Rheumatoid arthritis

Rheumatoid arthritis (RA) is a complex autoimmune disorder characterized by chronic inflammation of the joints. While the exact etiology of RA isn't fully understood, it's believed to involve a combination of genetic, environmental, and immunological factors.

Genetics: There's a significant genetic component to RA. Certain genetic variations, particularly within the HLA (human leukocyte antigen) region, are associated with an increased risk of developing RA. However, having these genetic markers doesn't guarantee that someone will develop the condition [18].

Immune system dysfunction: RA is primarily considered an autoimmune disorder, where the body's immune system mistakenly attacks its own tissues. In RA, the immune system targets the synovium, the lining of the membranes that surround the joints. This leads to inflammation, thickening of the synovium, and eventual damage to the cartilage and bone within the joint.

Environmental factors: While genetics predispose individuals to RA, environmental factors likely play a role in triggering the disease in susceptible individuals. Potential environmental triggers include smoking, infections, and certain occupational exposures. Smoking, in particular, is a well-established environmental risk factor for RA, and it can exacerbate the severity of the disease [19].

Hormonal factors: Hormonal changes may also influence the development and progression of RA, as the disease is more common in women than in men. Changes in hormone levels, such as those occurring during pregnancy or menopause, can affect the immune system and potentially contribute to the onset or worsening of RA symptoms.

Microbiome: Emerging research suggests that alterations in the gut microbiome may influence the development of autoimmune diseases like RA. Imbalances in the gut microbiota can lead to dysregulation of the immune system, potentially contributing to the initiation or exacerbation of RA.

Overall, the etiology of RA is likely multifactorial, involving a complex interplay between genetic predisposition, immune dysfunction, environmental triggers, hormonal influences,

and possibly alterations in the gut microbiome. Understanding these factors is crucial for developing more effective treatments and interventions for RA [20].

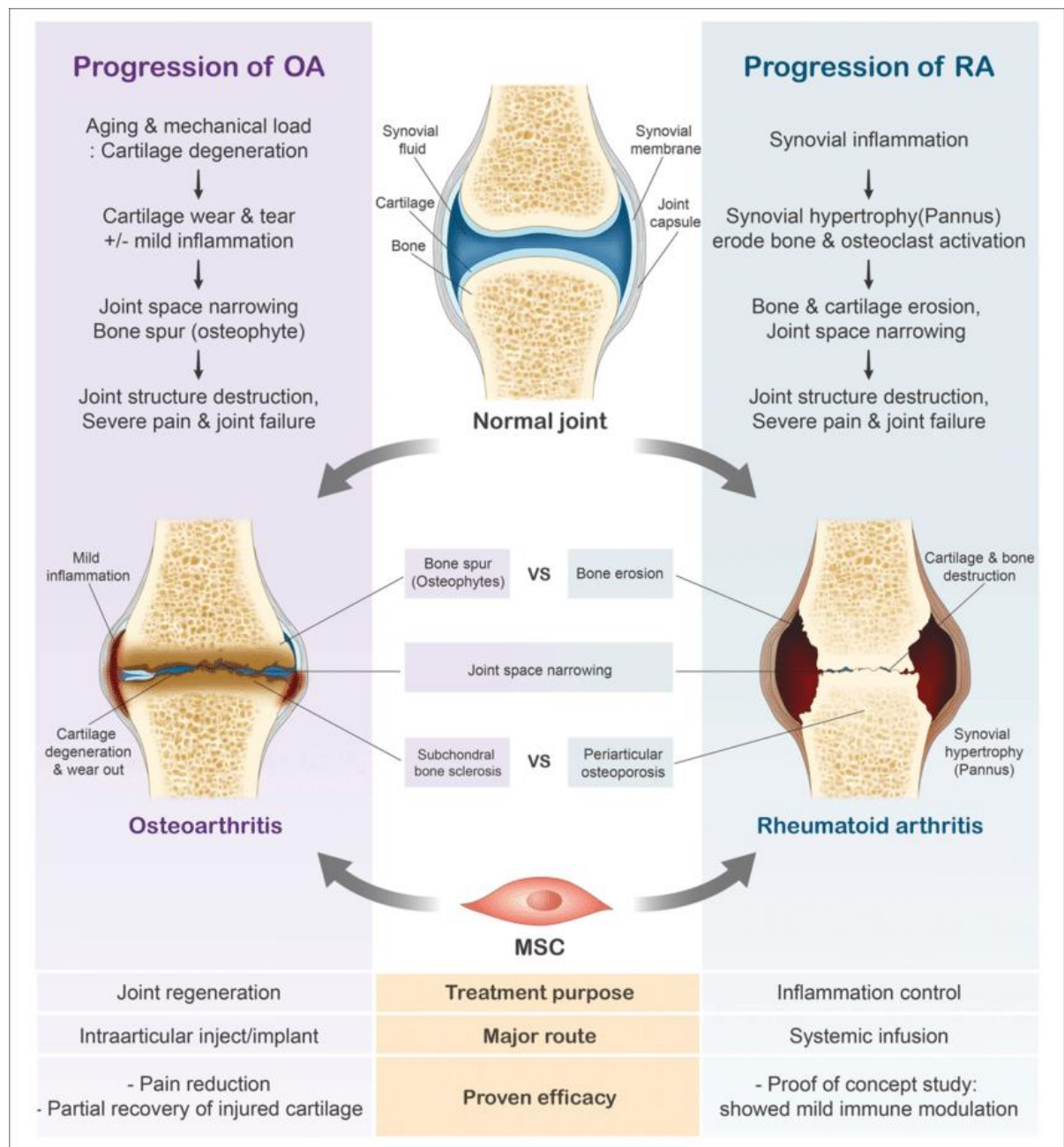


Figure 3: Progression of rheumatoid arthritis (RA) and osteoarthritis (OA).

1.4 Challenges and Future Directions of Rheumatoid arthritis

Rheumatoid arthritis (RA) presents several challenges in its management and treatment, while future directions focus on advancements in diagnosis, personalized medicine, and targeted therapies. Here are some key challenges and potential future directions:

Challenges:

1. **Early Diagnosis:** One of the biggest challenges in RA is the delay in diagnosis, which can lead to irreversible joint damage. Improving early detection through biomarkers and imaging techniques is crucial [21].
2. **Treatment Response Variability:** Not all patients respond similarly to existing treatments like disease-modifying Antirheumatic drugs (DMARDs) or biologics. Understanding the factors contributing to treatment response variability can aid in developing personalized treatment plans.
3. **Joint Damage and Disability:** Despite treatment, many patients still experience progressive joint damage and disability. Preventing structural damage and preserving joint function remain significant challenges [22].
4. **Comorbidities:** RA is associated with various comorbidities such as cardiovascular disease, osteoporosis, and infections. Managing these conditions alongside RA adds complexity to treatment.
5. **Cost and Access:** Some of the newer biologic therapies for RA can be expensive, limiting access for some patients. Finding cost-effective treatment options and improving access to care are ongoing challenges [23].

Future Directions:

1. **Precision Medicine:** Advances in genetics and biomarker research can lead to personalized treatment approaches tailored to an individual's genetic makeup, disease subtype, and response to therapy.
2. **Targeted Therapies:** Developing therapies that target specific pathways involved in RA pathogenesis, such as cytokines or immune cells, can improve treatment efficacy while reducing side effects [24].

3. **Regenerative Medicine:** Investigating the potential of regenerative therapies, such as stem cell therapy or tissue engineering, to repair damaged joints and tissues in RA patients.
4. **Digital Health and Telemedicine:** Utilizing digital health technologies and telemedicine platforms can improve monitoring, management, and communication between patients and healthcare providers, especially in remote or underserved areas.
5. **Lifestyle Interventions:** Promoting lifestyle interventions like diet, exercise, and stress management can complement pharmacological treatments and improve overall health outcomes for RA patients [25].
6. **Immunomodulation:** Exploring novel immunomodulatory approaches, including immune tolerance induction or manipulation of gut microbiota, to regulate the immune response and reduce inflammation in RA.
7. **Patient-Centered Care:** Emphasizing patient-centered care approaches that consider individual preferences, values, and goals when making treatment decisions can enhance patient satisfaction and treatment adherence.

Addressing these challenges and advancing in these future directions can significantly improve the management and outcomes of rheumatoid arthritis for patients worldwide [26].

Chapter 2

Purpose of the study

2.1 Purpose of the study

The primary aim of this study is to comprehensively evaluate the clinical practices of rheumatoid arthritis management at Gonoshasthaya Nagar Hospital.

- To assess the prevalence and severity of rheumatoid arthritis cases presenting at Gonoshasthaya Nagar Hospital.
- To investigate the pharmacological interventions commonly prescribed for RA patients, including disease-modifying antirheumatic drugs (DMARDs), nonsteroidal anti-inflammatory drugs (NSAIDs), and corticosteroids.
- Explore the utilization of adjunctive therapies such as physiotherapy, occupational therapy, and psychological support in RA management.
- Assess patient satisfaction and perceived efficacy of the management strategies employed at Gonoshasthaya Nagar Hospital for rheumatoid arthritis.

Chapter 3

Literature Review

3.1 The prevalence of rheumatoid arthritis

The purpose of this research was to determine the incidence of RA in an overall adult population in Sweden. A total of 3928 participants, selected at randomly from two localities in the region of Halland, received a questionnaire regarding chronic pain. Everyone who responded in the affirmative to inquiries meant that all identified RA patients received an invitation to a clinical evaluation. As long as the patients met two or more of the five clinical requirements of the 1987 ARACriteria, X-rays of the hands and feet as well as assays of rheumatoid factor and C reactive protein were carried out. In an additional effort to find further cases, non-participants were looked up in a patient registry and in local rheumatology unit medical records [27].

3.2 Management of Rheumatoid Arthritis: An Overview

A complex autoimmune illness with an unclear cause, rheumatoid arthritis (RA) primarily affects the joints, though it can also cause extra-articular symptoms. Good RA care necessitates an integrated strategy due to its complexity, which is based on a pathophysiological process that is not fully understood. The latest advances in diagnosis and treatment of RA have improved the clinical condition of patients by preventing systemic consequences and reducing disease activity. The development of disease-modifying anti-rheumatic medicines (DMARDs), which include standard synthetic, biologic, and targeted synthetic medications, has produced the most exciting outcomes. In addition, continuous medication development has produced molecules with enhanced effectiveness and safety characteristics; nonetheless, additional investigation is required before RA becomes a pathology that can be treated. By consolidating the data from a large body of writing, we supply an in-depth perspective on the management of RA in the current work. We stress the significance of an early and accurate diagnosis along with the best possible customized therapy to improve results for RA patients. This study also makes recommendations for future directions in RA treatment studies that may result in improved safety and effectiveness profiles as well as lower costs [28].

3.3 Therapeutic strategies for rheumatoid arthritis

Significant progress has been made in the past few years in our comprehension of the clinical and fundamental components of rheumatoid arthritis. Improved understanding of the disease's natural course, the creation and approval of outcome indicators for clinical trials, and creative trial designs have all contributed to advances in clinical practice. Simultaneously, fundamental studies has yielded insights into the pathogenic mechanisms causing rheumatoid arthritis, while advancements in biotechnology have enabled the creation of novel treatment categories. Here, we highlight the results of these developments: novel ways to employ currently available, established beneficial Antirheumatic medications; recently authorized novel agents; and further directions that are now being researched or have longer term potential [29].

Chapter 4

Methodology

4. Methodology

Choose a cross-sectional survey design to gather data from a representative sample of the population at Dhamrai in Dhaka, Bangladesh.

- I have started work for this survey in February 2024.

4.1 Data Collection:

- Develop a structured questionnaire based on validated scales and existing literature related to Unveiling the Prevalence of Rheumatoid Arthritis.
- Translate the questionnaire into Bengali for better understanding by the local population. Train a team of data collectors on the questionnaire and ethical considerations.
- Conduct face-to-face interviews, phone interviews, or online surveys, depending on the accessibility of the respondents. Ensure informed consent and data confidentiality.
- Some important data has been collected by reviewed number of related article paper from different website like Google scholar, research gate and PubMed.

4.2 Data Variables:

- Collect demographic information, including age, gender, educational background, occupation, and residence.
- Gather information related to Unveiling the Prevalence of Rheumatoid Arthritis, such as the presence of symptoms, family history, triggers, severity, and healthcare utilization.
- Explore lifestyle factors, including smoking habits, dietary patterns, and physical activity.
- Assess environmental factors, such as air quality, housing conditions, and proximity to potential allergens.

4.3 Sample size

The test had 15 short-answer questions and took roughly four to five minutes to finish.

- I have tried my best to collect all data from different profession people for gathering different types of information.
- The examination is led by a questionnaires oriented survey, **100 populations** was being responded for this assessments.

4.4 Data analysis strategy

Data analysis is the methodical application of statistical and/or logical tools for describing and illustrating, condensing and summarizing, and evaluating data. Use appropriate statistical software to analyze the collected data. Employ descriptive statistics to summarize demographic and prevalence data.

Chapter 5

Results & discussion

5.1 Age of Responders

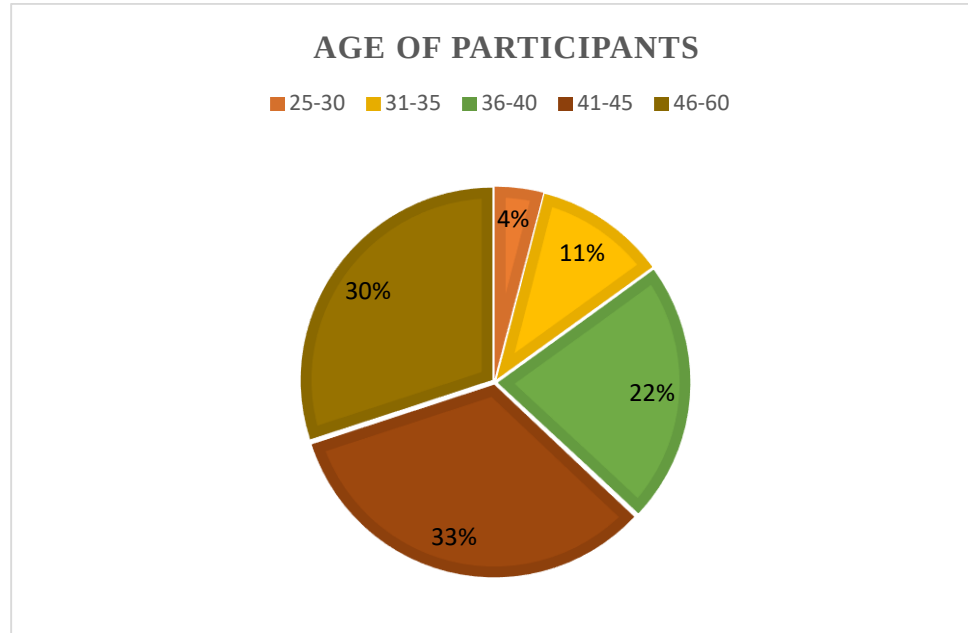


Figure 4: Age of Responders

Based on the survey findings, 33% of those surveyed fall within the 41-45 age range, while 30% belong to the 46-60 age bracket. It appears that the predominant age group among respondents is between 41 and 60 years old.

5.2 Gender of Participants

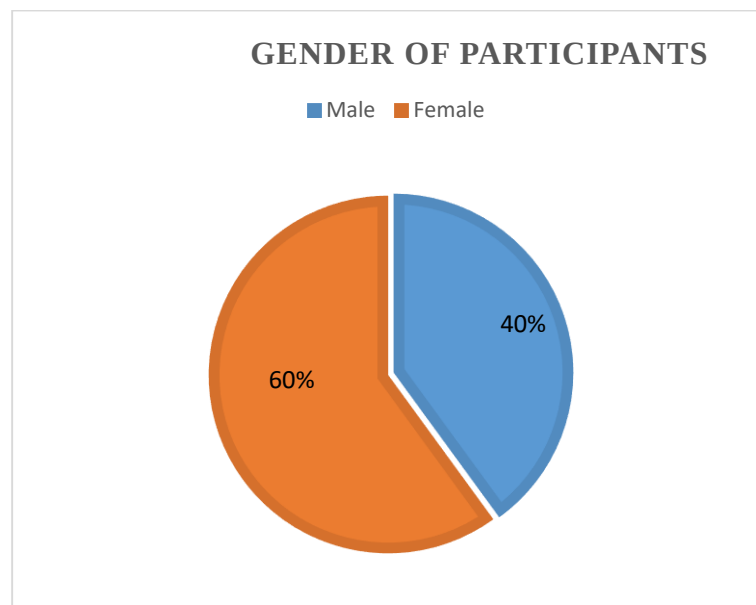


Figure 5: Gender of Participants

The survey demonstrates varied gender representation, with 40% of participants being male and 60% being female.

5.3 Professional Status of Responders

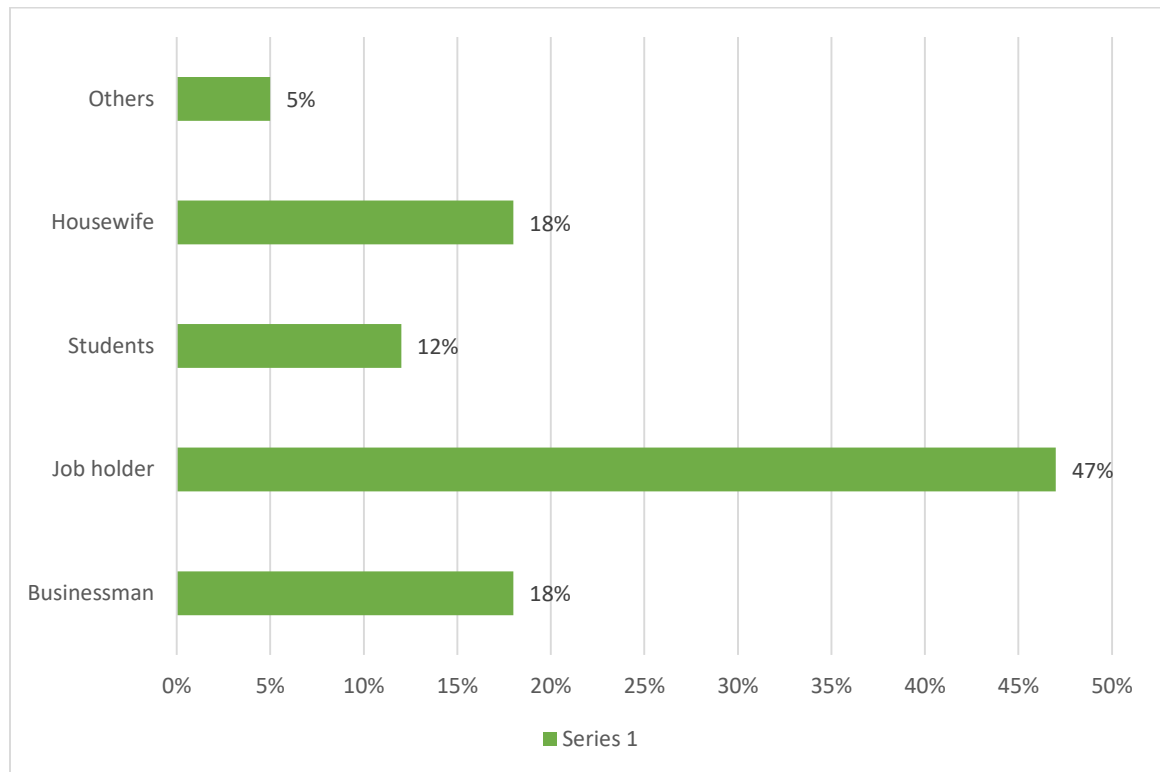


Figure 6: Professional Status of Responders

Various professionals were selected for participation in this survey. As indicated in figure 6, a majority of participants (47%) are employed, while 18% are identified as businessman.

5.4 Aware with Rheumatoid Arthritis

Q: How familiar are you with Rheumatoid Arthritis?

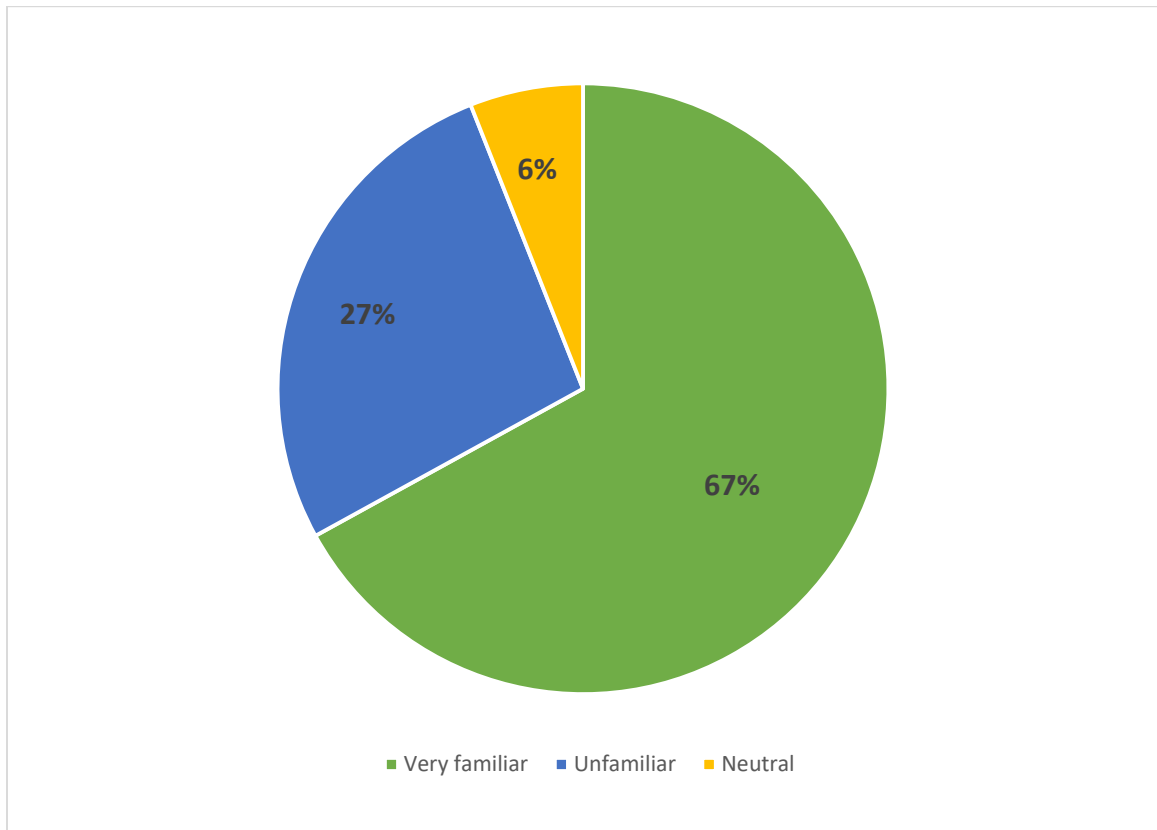


Figure 7: Aware with Rheumatoid Arthritis

Rheumatoid arthritis, commonly abbreviated as RA, is a condition characterized by inflammation and autoimmunity. It occurs when the immune system mistakenly attacks healthy cells, causing painful swelling in affected parts of the body. The poll results showed that a large majority of respondents (67%) reported being highly knowledgeable about Rheumatoid Arthritis, while 27% stated they were not familiar with it.

5.5 Affected ratio of Rheumatoid Arthritis

Q: Have you ever been affected by Rheumatoid Arthritis?

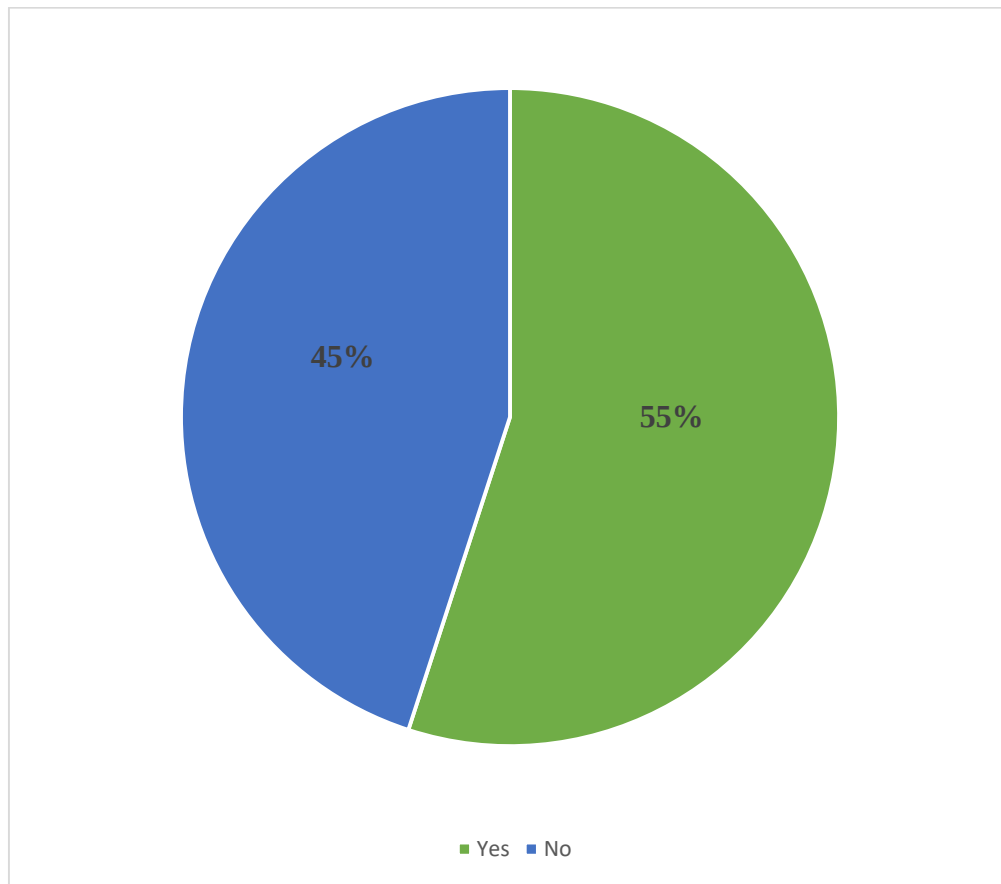


Figure 8: Affected ratio of Rheumatoid Arthritis

The majority of individuals diagnosed with Rheumatoid Arthritis (RA), a persistent inflammatory condition, are women. In this study, 55% of respondents reported being affected by Rheumatoid Arthritis, while 45% stated they were not affected by it.

5.6 If yes, which type of symptoms have you suffered?

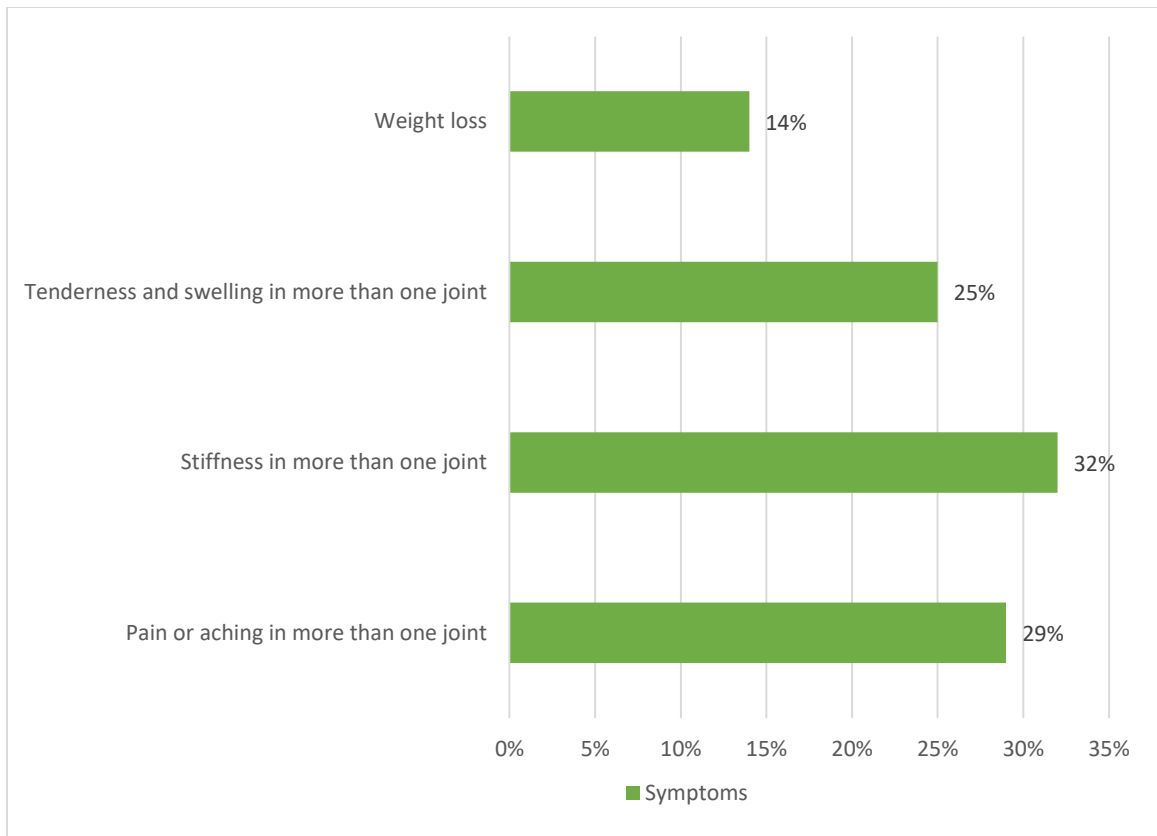


Figure 9: Symptoms of Rheumatoid Arthritis

Some of the affected individuals mentioned having different symptoms. Among them, 29% noted feeling pain or discomfort in multiple joints. Participant feedback showed that 25% experienced tenderness and swelling in various joints, and 32% felt stiffness in multiple joints.

5.7 Kind of disease Rheumatoid Arthritis

Q: Do you know what kind of disease Rheumatoid Arthritis is?

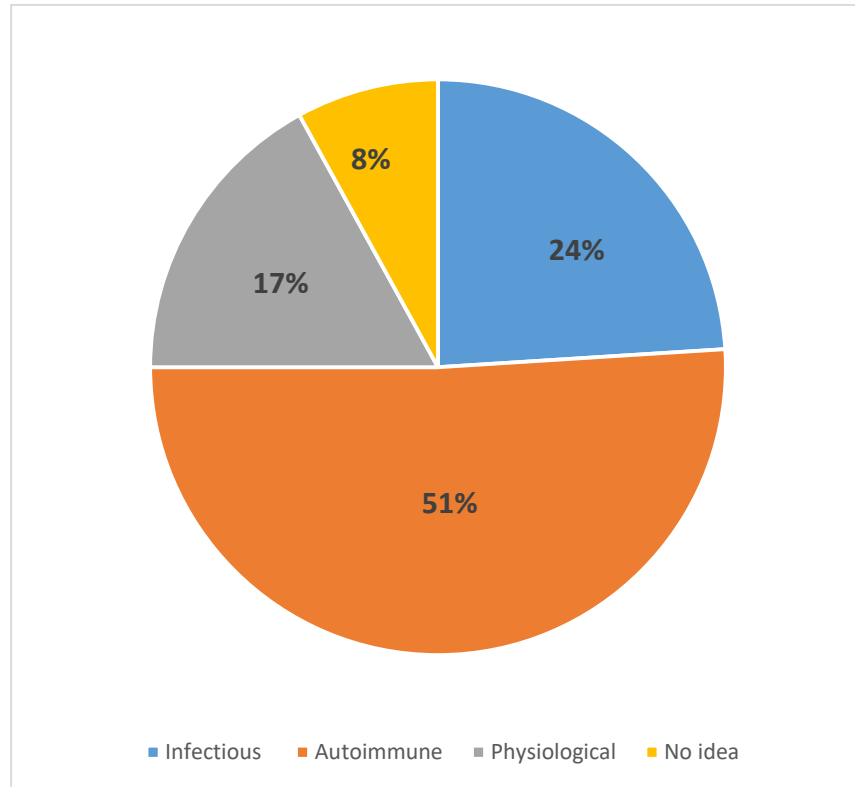


Figure 10: Kind of disease Rheumatoid Arthritis

Rheumatoid arthritis, commonly referred to as RA, is a condition characterized by inflammation and autoimmunity. It occurs when the immune system mistakenly attacks healthy cells, resulting in painful swelling in the affected parts of the body. According to the survey findings, the majority of respondents (51%) identified Rheumatoid Arthritis as an autoimmune disorder. Among them, 8% indicated they were unsure about this classification.

5.8 Worsen time of pain

Q: At what time of day is the pain worse?

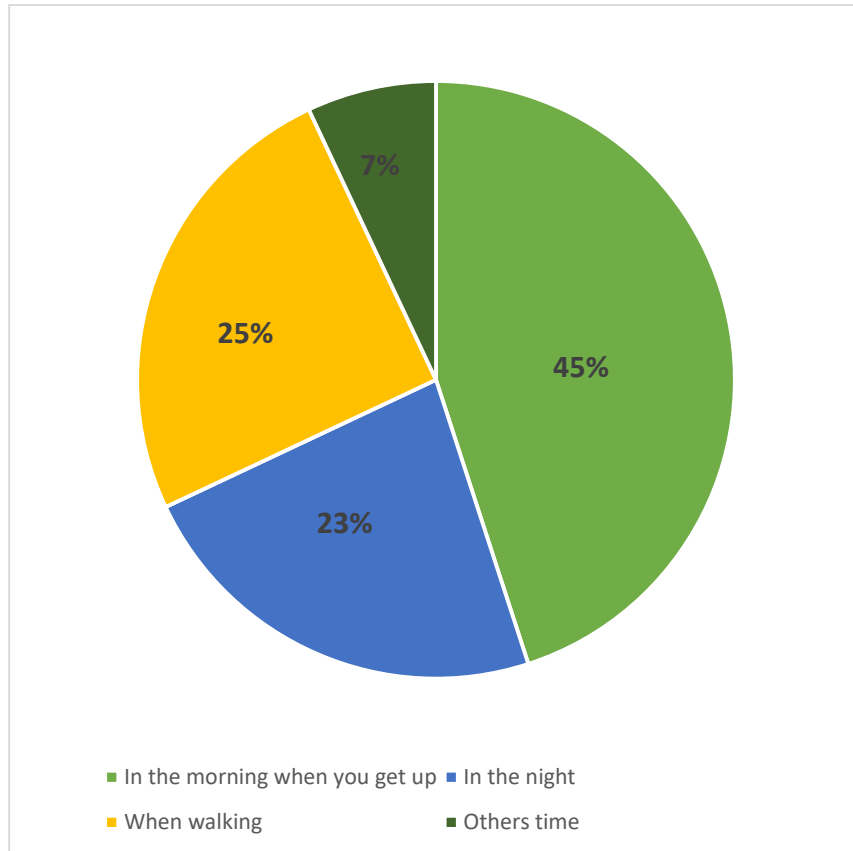


Figure 11: Worsen time of pain

For individuals with rheumatoid arthritis (RA), the early morning is usually the most challenging time, marked by stiffness in the joints, discomfort, and decreased functionality. Nearly half of the respondents (45%) reported feeling increased pain upon waking up. Meanwhile, 23% mentioned experiencing heightened pain during the night, and 25% indicated feeling more pain while walking.

5.9 Taken medicine

Q: Which type of medicine have you been used for relieving Rheumatoid Arthritis?

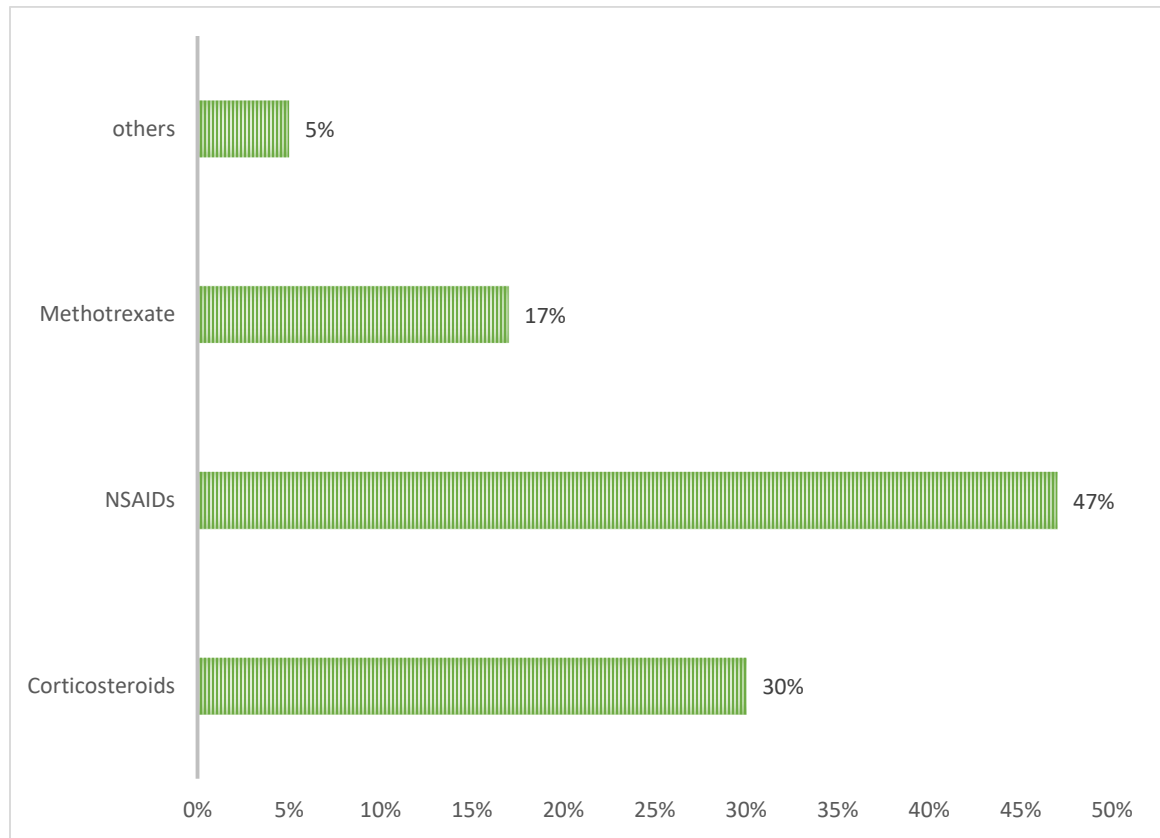


Figure 12: Taken medicine

NSAIDs are the most efficacious oral medications for Rheumatoid Arthritis. As per the survey findings, a significant portion of participants (47%) reported using NSAIDs to alleviate symptoms of Rheumatoid Arthritis. Additionally, 30% of respondents stated they had used Corticosteroids for symptom relief. Despite potential drawbacks, methotrexate is widely regarded as one of the safest medications for arthritis. Fifteen percent of participants indicated they had used Methotrexate to relieve symptoms of Rheumatoid Arthritis.

5.10 Taken medicine without doctor suggestion

Q: Have you ever been taken medicine without doctor suggestion?

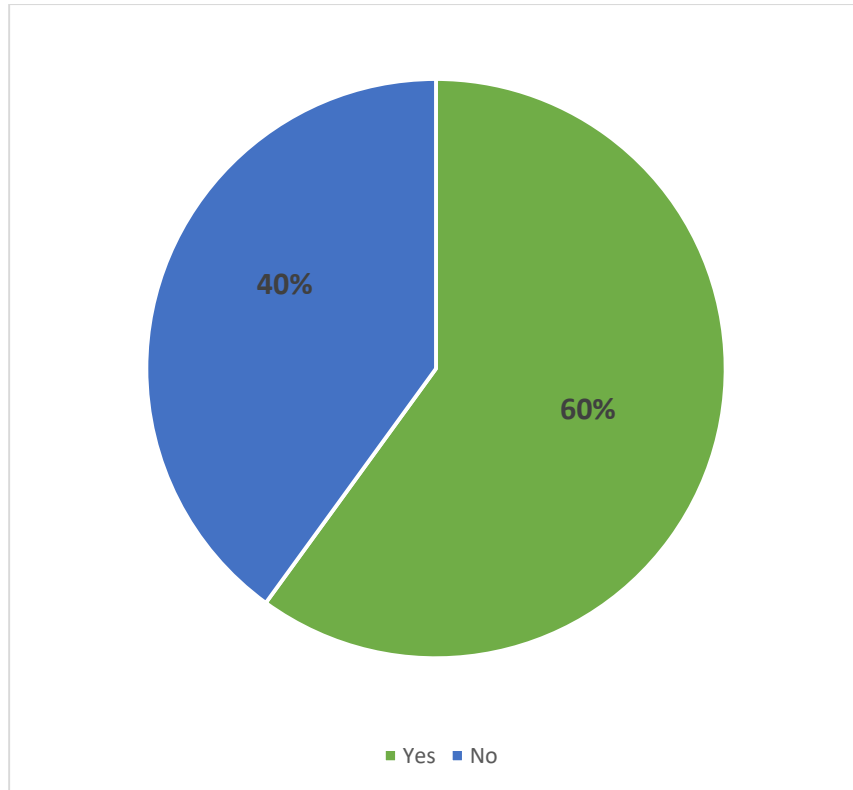


Figure 13: Taken medicine without doctor suggestion

Using medication without consulting a doctor can pose serious health risks, including severe complications or death. One major danger of self-medicating is the possibility that it may not effectively address the underlying condition. Many people lack awareness of over-the-counter medications. A significant majority of respondents in the study (60%) admitted to taking medication without a doctor's prescription.

5.11 Family history

Q: Do you have a family history (like father, mother and siblings) who has or had rheumatoid arthritis?

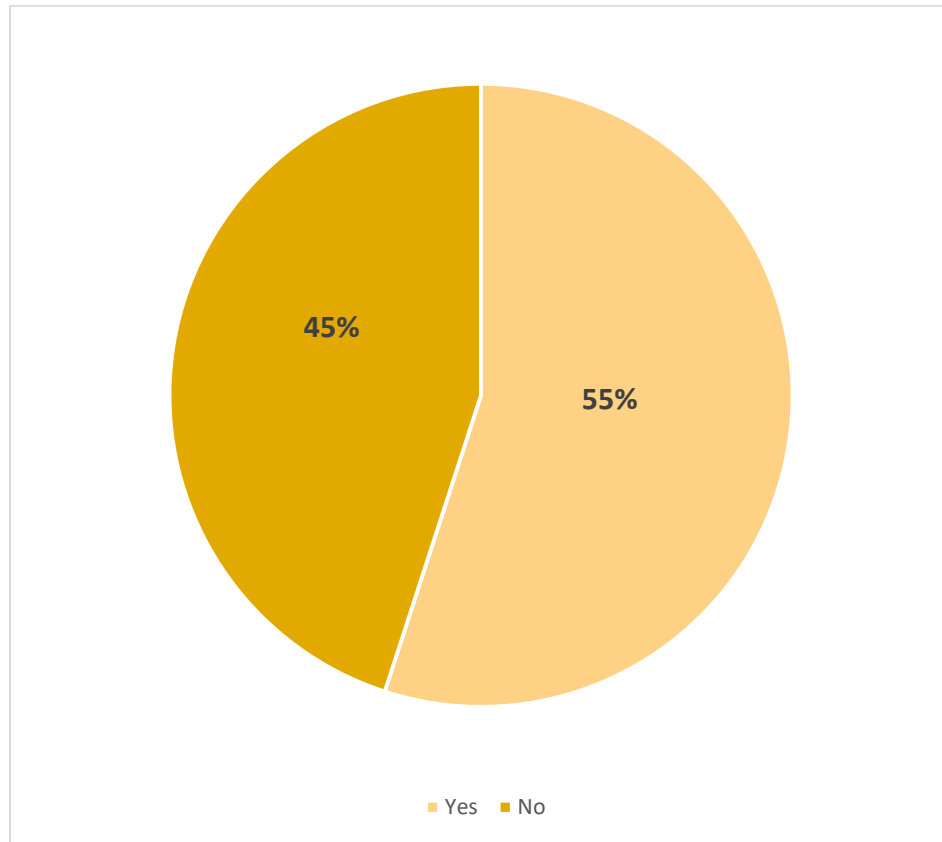


Figure 14: Family history

Rheumatoid arthritis is not contagious. There's a possibility that exposure to a common microbe might provoke an abnormal immune reaction in susceptible individuals, leading to the development of rheumatoid arthritis. In this study, the majority of respondents (55%) reported having a family member with rheumatoid arthritis.

5.12 Do you feel that regular exercise is important?

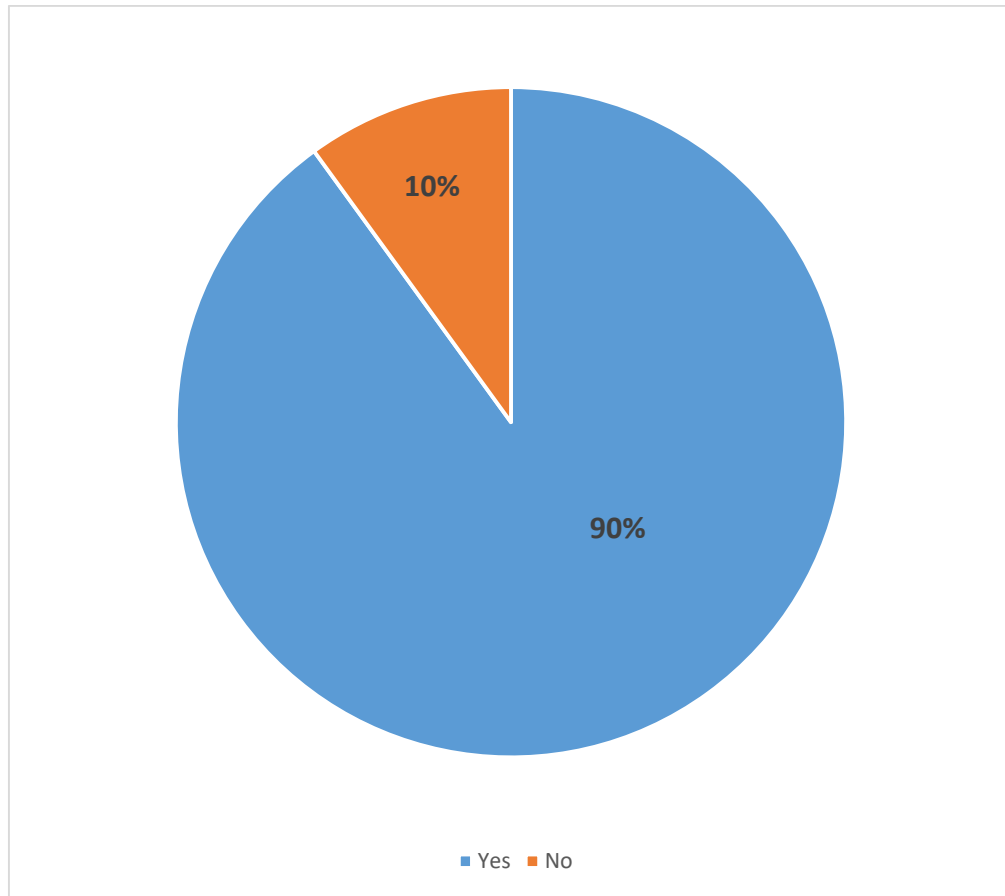


Figure 15: Regular exercise

Regular exercise can be advantageous for individuals with rheumatoid arthritis, as it can enhance strength and flexibility. Improved flexibility may aid in joint function, while stronger muscles can provide better support to the joints. The survey revealed that 90% of respondents believed regular exercise was essential for preventing rheumatoid arthritis.

5.13 Do you know that mediterranean diet, with lots of fruits and vegetables is good for Rheumatoid Arthritis patients?

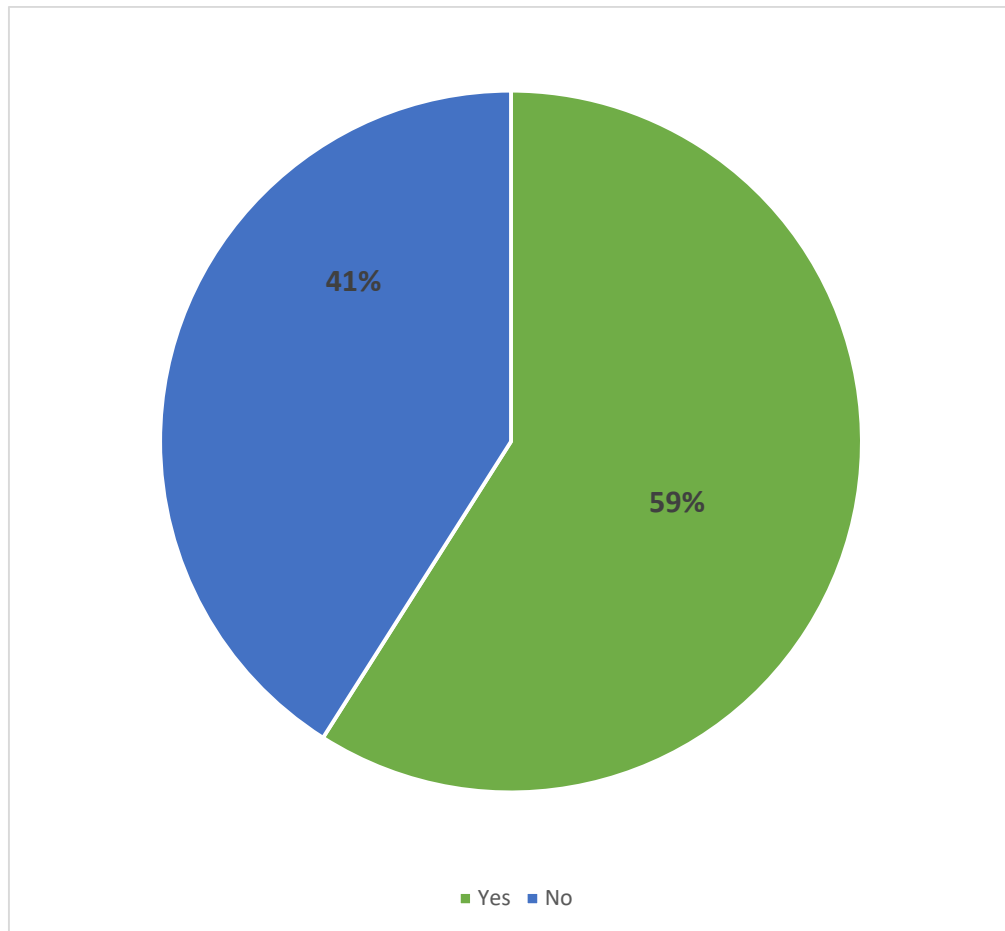


Figure 16: Mediterranean diet, with lots of fruits and vegetables

In this investigation 59% participants has been known that mediterranean diet, with lots of fruits and vegetables is good for Rheumatoid Arthritis patients.

5.14 Vaccine for Rheumatoid Arthritis

Q: Did you take/ get any vaccine for improving your immunity which actually improves/fights against Rheumatoid Arthritis?

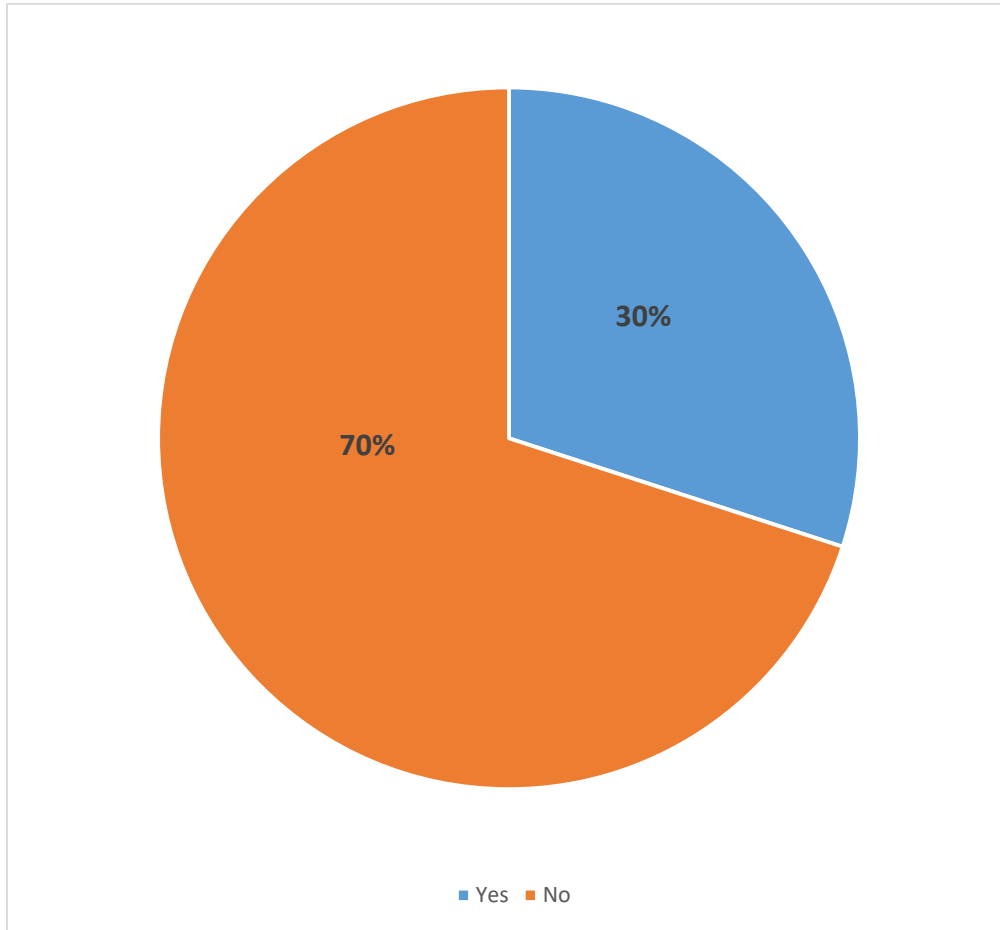


Figure 17: Vaccine for Rheumatoid Arthritis

According to the survey, 30% responders said they have been taken vaccine for improves/fights against Rheumatoid Arthritis.

5.15 If, Yes which vaccine have you been taken?

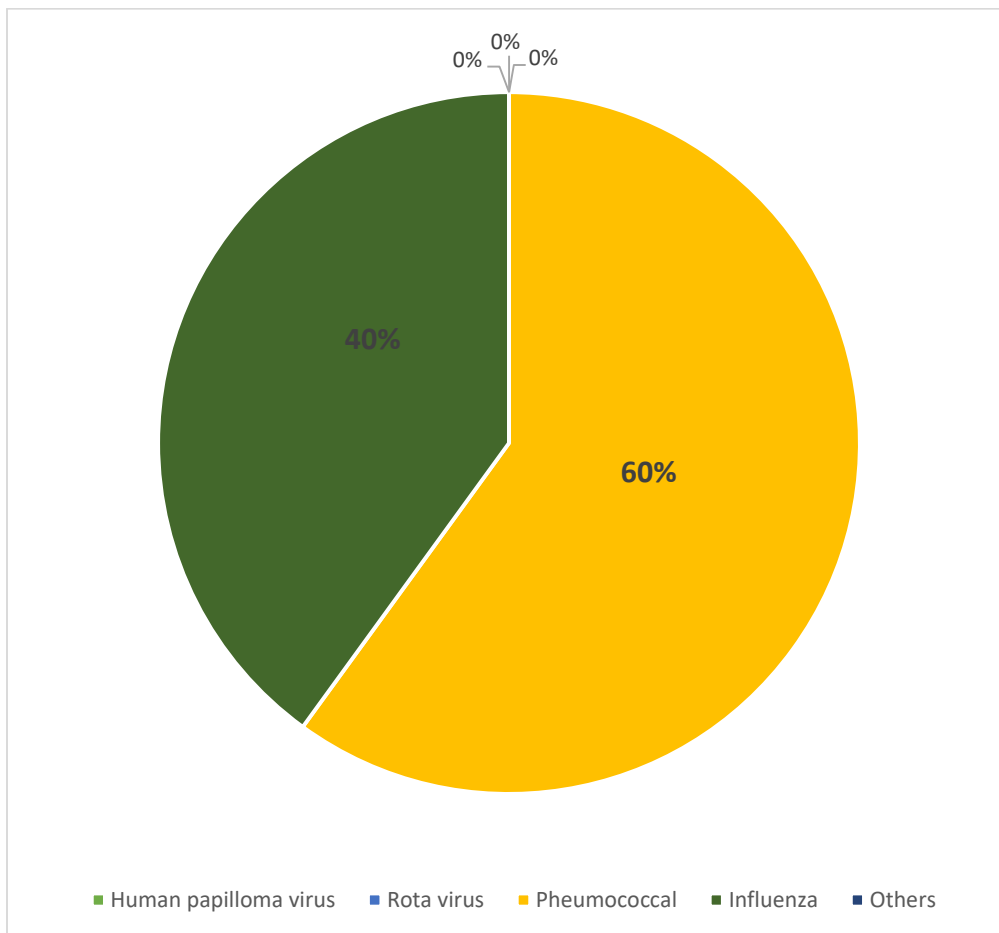


Figure 18: Vaccine have you been taken

Patients with musculoskeletal and rheumatic conditions are advised to receive the influenza (flu) vaccine annually. Additionally, individuals using immunosuppressive drugs for rheumatoid arthritis and musculoskeletal disorders may consider getting the influenza vaccine and the pneumococcal (pneumonia) vaccine. According to the survey, 60% of respondents reported having received the pneumococcal (pneumonia) vaccine, while 40% stated they had received the influenza vaccine to help manage or combat rheumatoid arthritis.

Chapter 6

Conclusion

6.1 Conclusion

The survey conducted on Rheumatoid Arthritis (RA) prevalence in Dhamrai has yielded valuable insights into the impact of this chronic autoimmune condition on the community. The majority of respondents (67%) were highly familiar with RA, while 27% were not familiar with it. Among the participants, 55% reported being affected by RA, while 45% were not affected. Regarding symptoms, 25% experienced tenderness and swelling in multiple joints, while 32% reported stiffness. Additionally, 45% felt increased pain in the early morning, 23% at night, and 25% while walking. In terms of treatment, 47% used NSAIDs, and 30% used Corticosteroids to alleviate symptoms. Moreover, 90% recognized regular exercise as essential for RA prevention. Regarding vaccination, 30% received a vaccine specifically targeting RA, while 60% received the pneumococcal vaccine, and 40% received the influenza vaccine to combat RA-related issues. In this investigation 59% participants has been known that mediterranean diet, with lots of fruits and vegetables is good for Rheumatoid Arthritis patients. These findings highlight the importance of addressing RA as a significant public health issue, necessitating targeted interventions and heightened awareness.

Chapter 7

Reference

References

- Conforti, A.; di Cola, I.; Pavlych, V.; Ruscitti, P.; Berardicurti, O.; Ursini, F.; Giacomelli, R.; Cipriani, P. Beyond the joints, the extra-articular manifestations in rheumatoid arthritis. *Autoimmun. Rev.* 2021, 20, 102735.
- Cojocaru, M.; Cojocaru, I.M.; Silosi, I.; Vrabie, C.D.; Tanasescu, R. Extra-articular manifestations in rheumatoid arthritis. *Mædica* 2010, 5, 286–291.
- Joseph, A.; Brasington, R.; Kahl, L.; Ranganathan, P.; Cheng, T.P.; Atkinson, J. Immunologic rheumatic disorders. *J. Allergy Clin. Immunol.* 2010, 125, S204–S215.
- Kurowska, W.; Kuca-Warnawin, E.H.; Radzikowska, A.; Maśliński, W. The role of anti-citrullinated protein antibodies (ACPA) in the pathogenesis of rheumatoid arthritis. *Cent. J. Immunol.* 2017, 42, 390–398.
- Wegner, N.; Lundberg, K.; Kinloch, A.; Fisher, B.; Malmström, V.; Feldmann, M.; Venables, P.J. Autoimmunity to specific citrullinated proteins gives the first clues to the etiology of rheumatoid arthritis. *Immunol. Rev.* 2010, 233, 34–54.
- Chaurasia, N.; Singh, A.; Singh, I.L.; Singh, T.; Tiwari, T. Cognitive dysfunction in patients of rheumatoid arthritis. *J. Fam. Med. Prim. Care* 2020, 9, 2219–2225.
- Lassere, M.N.; Rappo, J.; Portek, I.J.; Sturgess, A.; Edmonds, J.P. How many life years are lost in patients with rheumatoid arthritis? Secular cause-specific and all-cause mortality in rheumatoid arthritis, and their predictors in a long-term Australian cohort study. *Intern. Med. J.* 2013, 43, 66–72.
- Hootman, J.M.; Helmick, C.G.; Brady, T.J. A public health approach to addressing arthritis in older adults: The most common cause of disability. *Am. J. Public Health* 2012, 102, 426–433.
- Theis, K.A.; Steinweg, A.; Helmick, C.G.; Courtney-Long, E.; Bolen, J.A.; Lee, R. Which one? What kind? How many? Types, causes, and prevalence of disability among U.S. adults. *Disabil. Health J.* 2019, 12, 411–421.

Lanes, S.F.; Lanza, L.L.; Radensky, P.W.; Yood, R.A.; Meenan, R.F.; Walker, A.M.; Dreyer, N.A. Resource utilization and cost of care for rheumatoid arthritis and osteoarthritis in a managed care setting. The importance of drug and surgery costs. *Arthritis Rheum.* 1997, 40, 1475–1481.

Cooper, N.J. Economic burden of rheumatoid arthritis: A systematic review. *Rheumatology* 2000, 39, 28–33.

Guo, Q.; Wang, Y.; Xu, D.; Nossent, J.; Pavlos, N.J.; Xu, J. Rheumatoid arthritis: Pathological mechanisms and modern pharmacologic therapies. *Bone Res.* 2018, 6, 1–15.

Singh, J.A.; Saag, K.G.; Bridges, S.L.; Akl, E.A.; Bannuru, R.R.; Sullivan, M.C.; Vaysbrot, E.; McNaughton, C.; Osani, M.; Shmerling, R.H.; et al. 2015 American college of rheumatology guideline for the treatment of rheumatoid arthritis. *Arthritis Rheumatol.* 2016, 68, 1–26.

Moura, M.D.G.; Lopes, L.C.; Silva, M.T.; Barberato-Filho, S.; Motta, R.H.L.; Bergamaschi, C.C. Use of steroid and nonsteroidal anti-inflammatories in the treatment of rheumatoid arthritis: Systematic review protocol. *Medicine* 2018, 97, e12658.

Safiri, S.; Kolahi, A.A.; Hoy, D.; Smith, E.; Bettampadi, D.; Mansournia, M.A.; Almasi-Hashiani, A.; Ashrafi-Asgarabad, A.; Moradi-Lakeh, M.; Qorbani, M.; et al. Global, regional and national burden of rheumatoid arthritis 1990–2017: A systematic analysis of the global burden of disease study 2017. *Ann. Rheum. Dis.* 2019, 78, 1463–1471.

Stojanovic, R.S.; Vlajinac Stojanovic, H.; Palic, D.; Palic, P.; Obradovic, O.; Evic Obradovic, S.J. Prevalence of rheumatoid arthritis in Belgrade, Yugoslavia. *Br. J. Rheumatol.* 1998, 37, 729–732.

Silman, A.J.; Hochberg, M. Descriptive epidemiology of rheumatoid arthritis. In *Rheumatoid Arthritis*; Hetherington, P., Ingram, J., Forgiione, L., Eds.; Mosby: Maryland Heights, MO, USA; Elsevier: Philadelphia, PA, USA, 2009; pp. 15–22. ISBN 978-0323054751.

Guillemin, F.; Saraux, A.; Guggenbuhl, P.; Roux, C.H.; Fardellone, P.; Le Bihan, E.; Cantagrel, A.; Chary-Valckenaere, I.; Euller-Ziegler, L.; Flipo, R.M.; et al. Prevalence of rheumatoid arthritis in France: 2001. *Ann. Rheum. Dis.* 2005, 64, 1427–1430.

Cimmino, M.A.; Parisi, M.; Moggiana, G.; Mela, G.S.; Accardo, S. Prevalence of rheumatoid arthritis in Italy: The Chiavari study. *Ann. Rheum. Dis.* 1998, 57, 315–318.

Shichikawa, K.; Inoue, K.; Hirota, S.; Maeda, A.; Ota, H.; Kimura, M.; Ushiyama, T.; Tsujimoto, M. Changes in the incidence and prevalence of rheumatoid arthritis in Kamitonda, Wakayama, Japan, 1965–1996. *Ann. Rheum. Dis.* 1999, 58, 751–756.

Spindler, A.; Bellomio, V.; Berman, A.; Lucero, E.; Baigorria, M.; Paz, S.; Garrone, N.; Torres, A.I.; Romano, O.; Carraccio, A.; et al. Prevalence of rheumatoid arthritis in Tucumán, Argentina. *J. Rheumatol.* 2002, 29, 1166–1170.

Zlatković-Švenda, M.I.; Stojanović, R.M.B.; Šipetić-Grujičić, S.; Guillemin, F. Prevalence of rheumatoid arthritis in Serbia. *Rheumatol. Int.* 2013, 34, 649–658.

Rossini, M.; Rossi, E.; Bernardi, D.; Viapiana, O.; Gatti, D.; Idolazzi, L.; Caimmi, C.; DeRosa, M.; Adami, S. Prevalence and incidence of rheumatoid arthritis in Italy. *Rheumatol. Int.* 2014, 34, 659–664.

Kojima, M.; Nakayama, T.; Tsutani, K.; Igarashi, A.; Kojima, T.; Suzuki, S.; Miyasaka, N.; Yamanaka, H. Epidemiological characteristics of rheumatoid arthritis in Japan: Prevalence estimates using a nationwide population-based questionnaire survey. *Mod. Rheumatol.* 2019, 30, 941–947.

Tian, X.; Wang, Q.; Li, M.; Zhao, Y.; Zhang, Z.; Huang, C.; Liu, Y.; Xu, H.; Chen, Y.; Wu, L.; et al. 2018 Chinese guidelines for the diagnosis and treatment of rheumatoid arthritis. *Rheumatol. Immunol. Res.* 2021, 2, 1–14.

Scublinsky, D.; Venarotti, H.; Citera, G.; Messina, O.D.; Scheines, E.; Rillo, O.; Arturi, A.; Hofman, J.; Somma, L.F.; Casado, G.; et al. The prevalence of rheumatoid arthritis in Argentina: A capture-recapture study in a city of Buenos Aires Province. *J. Clin. Rheumatol.* 2010, 16, 317–321.

Carmona, L.; Villaverde, V.; Hernández-García, C.; Ballina, J.; Gabriel, R.; Laffon, A. The prevalence of rheumatoid arthritis in the general population of Spain. *Rheumatology* 2002, 41, 88–95.

Silva-Fernández, L.; Macía-Villa, C.; Seoane-Mato, D.; Cortés-Verdú, R.; Romero-Pérez, A.; Quevedo-Vila, V.; Fábregas-Canales, D.; Antón-Pagés, F.; Añez, G.; Brandy, A.; et al. The prevalence of rheumatoid arthritis in Spain. *Sci. Rep.* 2020, 10, 1–9.

Akar, S.; Birlik, M.; Gurler, O.; Sari, I.; Onen, F.; Manisali, M.; Tirpan, K.; Demir, T.; Meral, M.; Akkoç, N. The prevalence of rheumatoid arthritis in an urban population of Izmir-Turkey. *Clin. Exp. Rheumatol.* 2004, 22, 416–420.

Tuncer, T.; Gilgil, E.; Kaçar, C.; Kurtaiş, Y.; Kutlay, Ş.; Bütün, B.; Yalçın, P.; Akarirmak, Ü.; Altan, L.; Ardiç, F.; et al. Prevalence of rheumatoid arthritis and spondyloarthritis in Turkey: A nationwide study. *Arch. Rheumatol.* 2018, 33, 128–136.

Smolen, J.S.; Aletaha, D.; McInnes, I.B. Rheumatoid arthritis. *Lancet* 2016, 388, 2023–2038.

Guillemin, F.; Briançon, S.; Klein, J.M.; Sauleau, E.; Pourel, J. Low incidence of rheumatoid arthritis in France. *Scand. J. Rheumatol.* 2009, 23, 264–268.

Doran, M.F.; Pond, G.R.; Crowson, C.S.; O’Fallon, W.M.; Gabriel, S.E. Trends in incidence and mortality in rheumatoid arthritis in Rochester, Minnesota, over a forty-year period. *Arthritis Rheum.* 2002, 46, 625–631.