Assessment of the factors on treatment non adherence and lifestyle practices among rheumatoid arthritis patients in selected hospitals at Kolkata

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Abstract: A study was undertaken on the assessment of lifestyle practices and factors influencing in treatment non-adherence of clients after being diagnosed with rheumatoid arthritis, attending the outdoor of rheumatology of IPGME&R, SSKM Hospital, Kolkata. One hundred patients were selected as the sample by non probability convenience technique used for this study. The main objectives of this study were to assess the factors influencing in treatment nonadherence and lifestyle practices of clients with rheumatoid arthritis. The theoretical framework adopted for the study was based on Myra Estrin Levine: the Conservation Model. A structured interview schedule, Health Assessment Qustionnaire-Disability Index (HAQ-DI) were utilised as the data collection tools. The findings revealed that 76% patients had perceived their life style practices as "average" and also showed that 45% patients had perceived their daily living activities as "severe to very severe disability". Majority of the patients had poor support from their family (68%), followed by co-morbid disease (54%) and side effect of drugs (54%). There was statistically significant association between demographic characteristics and treatment non-adherence factors like education level and lack of knowledge about medicine and disease of patients {4.76, $\chi 2$: 3.84, df (1), $p<0.05$}; age and co-morbid disease {5.13, $\chi 2$: 3.84, df (1), $p<0.05$}; gender, duration of illness and alternative therapy uses {6.36, 5.15, $\chi 2$: 3.84, df (1), $p<0.05$}.

CHAPTER I

Introduction

Background of the study:

The name "Rheumatoid Arthritis" itself was termed in 1859 by British rheumatologist Dr. Alfred Baring Garrod.[1]

Rheumatoid arthritis (RA) is a chronic, multisystem disease affecting the connective tissues of the whole body with focal involvement of the musculoskeletal system. It causes inflammatory synovitis of peripheral joints, leading to cartilage damage, bone erosions, and subsequent joint deformity.[2]

Rheumatoid arthritis is a chronic, systemic autoimmune disease characterized by inflammation of connective tissue in the synovial membrane of the joints, which is a typically destructive joint disease, characterized by painful, tenderness of joints.[3]

Pain, stiffness, fatigue, joint deformity, joint range of motion and muscle strength in RA leads to limitations in common daily living activities.[4]

In RA disease, extra-articular involvements are more common when patients have rheumatoid factors (RF) and/or are HLA-DR4 positive. Rheumatoid arthritis is a systemic disease with symmetrical inflammation of joints in the upper extremity and lower extremity.[5]

Rheumatoid arthritis (RA), occurs when the immune system attacks the lining of the membranes surrounding the joints (synovium). The joints become swollen, stiff, and aching with time which can cause severe disability. RA is three times more frequent in women, has a peak between 40 years and menopause; patients who suffer from RA generally lose some years of life.[6]

Rheumatoid arthritis (RA) is an inflammatory problem of unknown origin which involves the synovial membrane of the joints. Phagocytosis initiates enzymes within the joints. The enzymes give out the collagen, causing oedema, the proliferation of the synovial membrane and finally pannus formation. Pannus demolishes cartilage and erodes the bone. So, tendon and ligament elasticity along with the contractile power of joints are lost. RA is occurring in 1% of the population globally. Women have an incidence approximately 2-4 times more often than men.[7]

Women have much more functional disability, disease activity, and pain than men. A man is identified as a predictor of remission and women have lesser workability as they lose days of work and productivity. It has been found that female is a predictor of disability and that the progression of disability is three times more rapid in women. In the recent study, women had a higher HAQ-DI score and a higher prevalence of disability.[8]

Suppression of inflammation may be achieved effectively through the administration of NSAIDs, DMARDs and biologic therapies. It improves long-term outcomes in patients with RA. To achieve therapeutic goals, this strategy requires adequate patient adherence to physician recommendations. Non-adherence in patients with RA may result in substantial costs, disease progression, increased disability and additional medical therapy, and sometimes surgery. Enhancing adherence can, therefore, improve the effectiveness of medical recommendations and reduce health and financial costs associated with rheumatoid arthritis.[9]

Changing health-related behaviour is important in reducing the burden of disease and mortality. Lifestyle habits such as physical activity, diet, smoking and alcohol use are important factors that have an impact on long-standing diseases. Some patients remain unaware of their unhealthy habits. Lifestyle practices have the most important role in the management of chronic rheumatoid arthritis disease. Exercise is likely to reduce the risk of disability and there is increasing evidence to support its efficacy.[10]

Medication adherence in chronic diseases is very poor. The medications are not taken timely by maximum patients who are chronically ill. So, the consequences of non-adherence of treatment are occurred and increased healthcare costs. The great problem with medication adherence expands with various morbidity and comorbidity. Adherent patients have more appropriate results including best disease control, high remission rates, improved physical activities. Also, psychological and clinical factors have been proposed to influence the degree of adherence, including functional ability, individual rating of pain, the time span of disease, extent of self-efficacy, degree of social support, illness beliefs, and beliefs about medication, adverse medication effects, and coping strategies. Non-adherence boosts to bad clinical outcomes and more healthcare utilization and costs.[11]

Lifestyle interventions play a very important role in the management of rheumatoid arthritis. The main lifestyle practices for rheumatoid arthritis are regular physical exercise like walking, swimming, yoga, dietary intervention, weight reduction, adequate rest psychological intervention, etc.

Rheumatoid arthritis is a systemic auto-immune disease which leads to swelling (inflammation) of joints. The swelling destroys joints from within and causes everlasting deformities. For this common disease, effective treatments are now available. Prior identification and aggressive therapy can usually prevent permanent disability. This, unfortunately, does not happen in many cases. Physical exercise like range of motion (ROM) to improve muscle strength, endurance capacity to perform the normal daily activity. The main goal of the exercise is to prevent joint deformity and loss of muscle strength. Patients with rheumatoid arthritis must have a diet rich in vegetables and fruits and whole-grain and omega 3 fatty acids. Psychological distress is common in patients with rheumatoid arthritis and often exacerbates the experience of physical discomfort. This is generally true for chronic pain conditions. About 0.92% of the adult population in India are affected by Rheumatoid arthritis. There are about 20-40 new cases per lakh population each year and the disease occur more frequently in females. The arrival of the disease can be after delivery even though the disease remains silent in the course of pregnancy. Stress and environmental triggers can precipitate the onset of the disease. About 5% of first-degree relatives are at the possibility of developing RA. Cigarette smoking, coffee and oral contraceptive pills appear to increase the risk of development of rheumatoid arthritis.[12]

Rheumatoid arthritis is a systemic chronic disease, which characterizes by the diminution of bone joints health like joint pain, joint inflammation, muscle fatigue, cardiovascular disease and loss of muscle mass (muscle wasting). A silent feature of the RA disease is huge inflammation of the synovium membrane where there is a 3–100 times elevation of proinflammatory cytokines.[13]

Rheumatoid cachexia is the loss of muscle mass and strength due to rheumatoid arthritis. It is also known as muscle wasting. Almost two-thirds of RA patients suffer from this complication if their RA is not treated properly. Rheumatoid cachexia connects with tired, overworked muscle, achy feeling, heart disease for which, life becomes shorter than the average life span. Due to pain and difficulty in moving joints, RA patients are not interested to exercise which leads to muscle wasting.[14]

The most common form of systemic, chronic, inflammatory arthritis is RA. National Audit Office gives an estimation in 2009 that the disease affects 580000 people in England with 26000 new cases diagnosed each year .[15]

Need of the study:

The purpose of this study is to identify the factors influencing in treatment non adherence and lifestyle of rheumatoid arthritis patients. The most common type of inflammatory disease in adult is rheumatoid arthritis which affects about 1% of the population in developed countries[7]. About 0.92% of adult population in India are affected by Rheumatoid arthritis. Poor medication adherence has been observed in 30% to 80% of in the rheumatoid arthritis (RA) population, taking their medication as prescribed.[16]

To assess the prevalence of non-adherence to rheumatoid arthritis (RA) medication and identify the associated factors for non-adherence in RA patients. Many preventive factors help to decrease the frequency and severity of RA as well as varying some risk behaviours. It has been detailed all the available evidences for each of the relevant aspects in the precaution of RA. The first consider suggesting about changes in lifestyle, reduce burden of disease and improve quality of patients' life. It is important that the patient understands that regular exercise is their contribution to an investment in their future. patient most likely to exercise those who-

believe the positive benefits of exercise and feel confident about their ability to exercise. Patient need to be encouraged and motivated about regular exercise. That can be incorporated in to their lifestyle, some specific diseases require specific regimes the main aim in rheumatoid arthritis (RA) therapy is to reduce the symptoms and to inhibit joint deformities and related functional loss. The ability to perform nutrition related ADLs like physical activity, exercise, household work as well as an increase metabolic rate, the nutritional status of individuals suffering from RA are very much important.[17]

The World Health Organization (WHO) explains health as "a state of complete physical, mental and social wellbeing not merely an absence of disease or infirmity and the ability to lead a socially and economically productive life." World Health Organisation's study group has devised "operational definition" of health as "a condition or quality of human organism expressing the adequate functioning of the organism in given conditions, genetic or environmental." This concept is particularly important for persons who suffer from chronic disease or disability for a long time.[18]

Early diagnosis is the main key to avoid deformities with appropriate management. The main cause of functional disability and reduced quality of life is delay in diagnosis. Pharmacological and non-pharmacological management. The lifestyle interventions are well identified as important components of the treatment of early rheumatoid arthritis. The lifestyle of rheumatoid arthritis patients can be improved by physical exercise, healthy diet, psychological growth and education. Some peoples have treatment non-adherence and poor lifestyle practices due to low family support, low economic status, low knowledge about disease and treatment, side effects of drugs.[19]

There is a lack of specialised nursing care due to deficiency of skilled and potentially trained nurses, especially in orthopaedic (rheumatology) care centres in the hospitals of India. Hence the maintenance of nurse-patient ratio is impossible at the present situation.

Compliance with treatment procedures is important to make therapeutic regimen effective. Without compliance, the therapeutic goals cannot be achieved as it results in poor outcomes. Lack of information regarding adherence to the treatment makes it difficult for healthcare providers to determine the impact of treatments on health status.[20]

Non-adherence to treatment impacts negatively on treatment to achieve goals and disease outcomes in rheumatoid arthritis (RA). Therefore, it is crucial in optimising patient management for identifying and targeting potential factors influencing nonadherence.[21]

The study will be beneficial in identifying actual lifestyle practices of RA patients. Results of this study will increase knowledge regarding lifestyle practices as evidenced based research.

The researcher felt a need to assess the lifestyle practices and the factors influencing on treatment nonadherence of rheumatoid arthritis patients to identify the need of the patients and improve quality of life of rheumatoid arthritis patients.

Problem statement

Assessment of the factors on treatment non adherence and lifestyle practices among rheumatoid arthritis patients in selected hospitals at Kolkata.

Purpose of the study

To assess the factors influencing on treatment nonadherence and lifestyle practices of rheumatoid arthritis patients that helps to guide for availing facilities in health care system.

Objectives

1. To assess the lifestyle practices of rheumatoid arthritis patients.
2. To assess the factors influencing in treatment non adherence of rheumatoid arthritis patients.
3. To find out the association between factors influencing in treatment nonadherence with selected demographic variables.

Assumption

This study assumes that-

- The rheumatoid arthritis patients have poor knowledge about treatment adherence.
- The patients have practiced some poor quality of lifestyle with rheumatoid arthritis disease.

Delimitation of the study

The study is delimited to –

- This study will be delimited to a degree of treatment non adherence and life style practices of rheumatoid arthritis patients.
- Rheumatoid arthritis patients age is in between 30-60 years who are attending in the Rheumatology outpatient department of selected hospitals at the time of data collection.

Operational definition

- **Rheumatoid arthritis:** In present study rheumatoid arthritis refers to the severe joint damage which may cause stiffness in the joints, loss of function, pain, swelling, low-grade fever and disability. The disease may last from months to entire lifetime, and symptoms may improve and become worsen with time.
- **Treatment non adherence:** In this study treatment non-adherence refers to two types – one of them is active process where the patient chooses to deviate from the treatment regimen. Another is unintentional treatment non adherence which is a passive process in which the patient may be negligent or forgetful about adhering to treatment regimen. If the prescriber's orders are not followed correctly, the patient will experience decreased effectiveness of treatment which can lead to fatal condition.
- **Lifestyle practices:** In this study, the lifestyle practices are a pattern of behaviour, interaction, consumption, daily living activity and interests that describe how RA patients spend their time by physical exercise, nutritious food, proper sleep, and quality time spend with family and friends.

Conceptual framework

The process of developing and refining abstract ideas are referred by conceptualization framework. A conceptual model provides for logical thinking, for systematic observations and interpreting the observed data. Conceptual framework for the present study was conceptualized and modified from Myra Estrin Levine: The Conservation Model.

The product of adaption is conservation. The universal concept, conservation is a natural law which deals with system integrity and wholeness. Conservation elaborates how complex systems continue to function in the face of severe challenges; it also describes about current survival and future facing challenges in the most economical way possible.

Individuals are continuously protecting their wholeness to maintain together the life system. Individuals protect themselves in constant direct involvement with their environment, selecting appropriate economic, frugal, and energy-saving options that maintain their integrity. Conservation try to obtain a balance of energy supply and demand which is in range of the unique biological capabilities of the individual. But energy can't be directly monitored, the relevance of energy interchanges is predictable, recognizable, and manageable. Erikson defines the concept of wholeness as an open forum: "wholeness emphasizes a sound, organic. Progressive mutuality between diversified functions and parts within an entirely, the boundaries of which are open and fluid".

In all of life's challenges individuals will constantly attempt, retain, maintain or protect their integrity (health, wholeness, and unity). Levine says, the holistic person who is aware of the past and oriented to the future. The integrity of the individual (wholeness) demands the "individual life has meaning only in the context of social". The person reacts to change in an integrated, sequential, singular fashion with interaction with his environment. Levine define "the person" as a spiritual being, and God created man in his own image. Levine stated that psychological and behavioural responses are essential components of the activity. They are not parallel or simulations but part of the same whole. Conservation of structural integrity highlights on maintaining the anatomical structure of the body and healing. It refers to maintaining or restoring structure of the body preventing physical breakdown and promoting healing. Changes in structure finally after function, that structural integrity or wholeness may be compromised by pathophysiological processes, and that healing restores structural integrity or wholeness. If the individual becomes dependent, person's integrity can be compromised.[22]

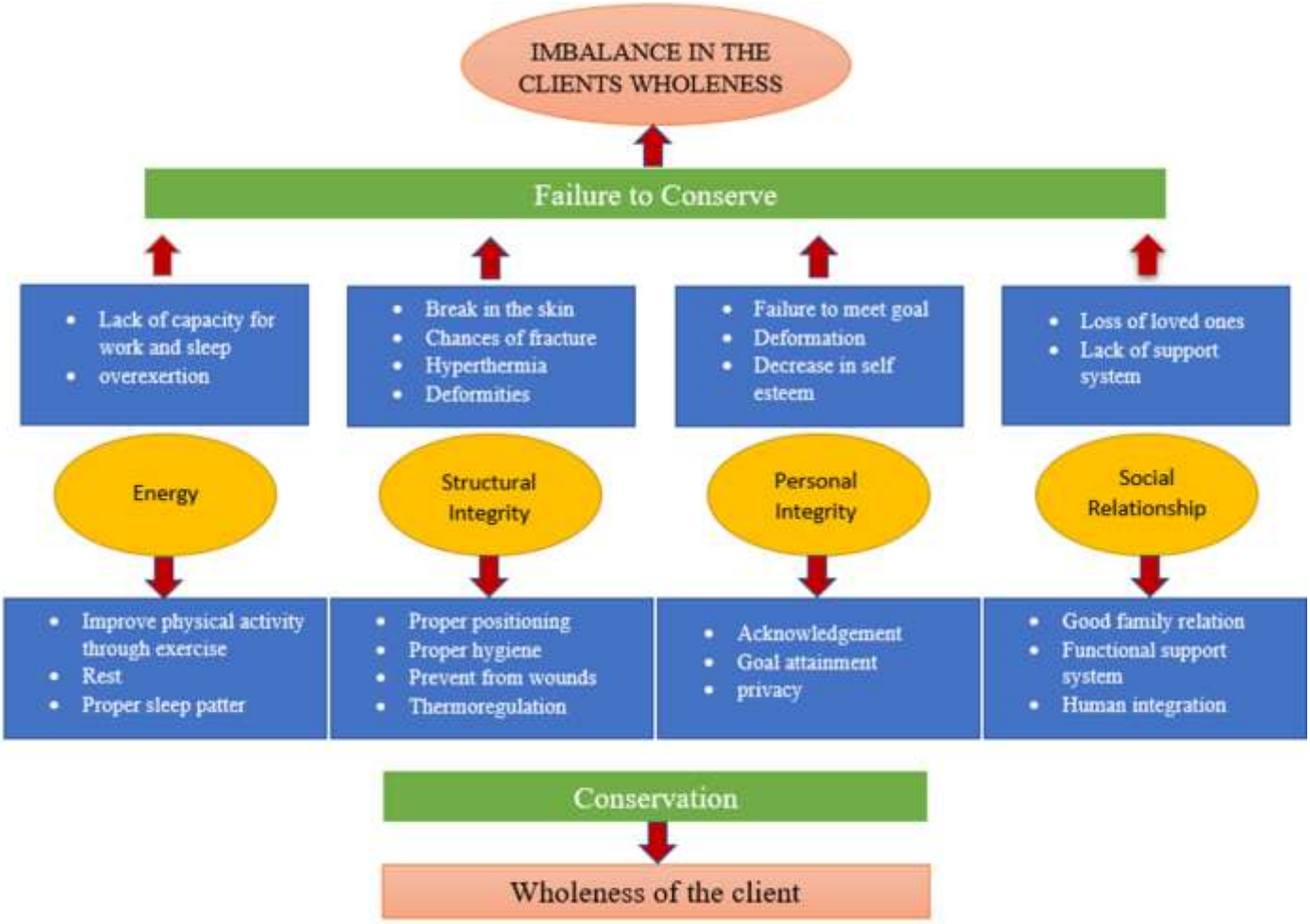

Fig 1: Conceptual framework using Myra Estrin Levine: The Conservation Model

Conclusion

The introductory chapter deals with background of the study, need of the study, statement of problem, purpose and objectives of the study, assumptions, delimitation, operational definitions, conceptual framework and conclusion of this chapter.

CHAPTER II

Review of Literature

The review of literature is a ladder to do step in research, which tells us the current scenario of the topic. The research project is strengthened by preceding studies conducted in the same area. Review of related research and theory on a topic has become a standard and virtually essential activity of all scientific research projects. In the development of a research project, the review of literature is an important step. It would help us to identify the problem, develop the conceptual framework of the study, assess feasibility, identify the methodology, select and develop tools for data collection as well as plan for statistical analysis. The literature review for this study has been organized and presented here.

Polit and Hungler defines (2002) the 'Review of literature' as "review of literature is a critical summary of research on a topic of interest generally prepared to put a research problem in context or to recognize gaps and weakness in studies so as to justify a new investigation".[23]

A review of literature is a significant step in the research project. It provides bases for further investigation; explains the need for study; throws light on the flexibility of study, reveals constraints of data collection, and reveals the findings from other studies with a hope to establish an extensive study of scientific knowledge in a professional discipline, from which valid theories developed. A literature helps to lay the foundation for the study and also inspire new research ideas.[24]

Review of Literature relevant to this present study is organized under the following headings:

1. Review of literature related to the factors influencing in treatment non adherence of rheumatoid arthritis patients.
2. Review of literature related to lifestyle practices of rheumatoid arthritis patients.

3. Review of literature related to the tool (HAQ-DI) used to assess daily living activity in patients with RA.

Section I

Review of Literature related the factors influencing in treatment non adherence of rheumatoid arthritis patients.

A study was conducted by author Annelieke Pasma, Charlotte V. on nonadherence to anti-rheumatic drugs related to higher disease activity in RA patients in the first year of the treatment.

Rheumatoid arthritis (RA) patients show insufficient therapeutic adherence resulting in bad health outcomes. Rheumatoid arthritis was diagnosed in this study. Adherer to the rheumatologist's prescription had a better outcome. It was shown by this study an important predictor of higher disease activity in the 6 months of treatment. The literature is necessary to reach remission as early as possible to prevent permanent deformities, so-called window of opportunity. Non-adherence needs more attention especially in the first year of treatment. Above all, when treating the patient and evaluating DMARD efficacy and side effects, rheumatologists should be aware that non-adherence is an important factor to take into account. Shared decision-making was seen as a very important overarching principle of care and added to the European League Against Rheumatism (EULAR) recommendations for the management of rheumatoid arthritis in 2010. A way in which the rheumatologist can improve patient adherence is to share decision-making. An open and trustworthy relationship with the patient, in which non-adherence can be openly discussed, and should be built by the rheumatologists in daily practice. The rheumatologist would be able to know if non-adherence is hampering the treatment goal, as soon as the rheumatologist has a trusting relationship with the patient.[25]

A quantitative, cross-sectional analytical study was conducted in a university hospital in Brazil by Authors Prudente L, Diniz J, Ferreira T, Lima D, Silva N, Saraiva G, Silveira, Dewulf N, Amaral R.

The most essential for the control of symptoms and progression of rheumatoid arthritis (RA) is medication adherence on treatment in outpatient department. The total number of patients were 92 included in the study. A Structured Questionnaire for patients' interviews and a form were used for the collection of data from medical records. The Morisky scale questionnaire assessed adherence to drug treatment. The Fisher's exact test and Pearson's chi-squared test were used for statistical and bivariate analyses. 16.4% of drug treatment was the prevalence of adherence in RA patients. Results of the analysis showed that duration of therapy for RA disease at the institution greater than 15 years and having more than six chronic comorbidities, high-cost pharmacy.[26]

A descriptive and comparative study was developed with a group of 50 men and group of 50 women with RA of a rheumatology centre in the city of Guayaquil, Ecuador by M. Intriago, to compare the clinical symptoms of a group of men and women with rheumatoid arthritis and make out the differences between genders. Data like clinical manifestations, comorbidities, duration of treatments, and disease activity were collected. Clinical activity differences between genders were analyzed.[27]

A study was conducted by author Mario F Merengo and Mario E-Saurez on improving treatment adherence in patients with rheumatoid arthritis. This study showed that low adherence is a prevalent and persistent healthcare problem, especially for clients with chronic diseases. Many rheumatoid arthritis patients show inadequate therapeutic adherence resulting in bad health results. Reasons for nonadherence can be unintentional or intentional. The patient-doctor interactions are also important but they have not well assess for patients with RA. Many educational and cognitive behavioural interventions have suggested improving adherence. The study about the use of mobile technologies are useful in other chronic diseases and for patients with RA in the future.[28]

A systematic review and meta-analysis was done by the author Li L, Cui Y, Yin R, Chen S, Zhao. Medication adherence had an impact on disease activity in RA. A total of seven identified studies had matched the inclusion criteria, which had reported a total of 1,963 adult RA patients in the analysis. The total score of Disease Activity Score (DAS-28) was less in adherent patients than in nonadherent subjects remarkably. It was suggested by the study that RA patients with higher medication adherence tended to have lower disease activity.[29]

A study by the author Amantha Joplin, Rick van der Zwan, and Peter K. K. Wong on the effects of education of patient, health literacy, and musculoskeletal ultrasound, educational interventions to medication adherence were reviewed. The goal of that review was to assess the effectiveness of measures to develop patient medication adherence. Studies with adherence to treatment in RA patients were recognized by searching five databases, PsycINFO, Medline, Cochrane, PubMed, and ProQuest for studies, which were published between Jan 2000 and Oct 2014. The Beliefs about Medications Questionnaire (BMQ) had been used in a cross-sectional study to describe the tension experienced by RA patients when assessing the importance of medication versus their concern regarding side effects. Maximum patients (344) out of 600 patients with RA agreed that medication was necessary for health in the postal survey. The study on thirty-three RA patients with illness duration less than a year and sixty-nine patients with illness duration more than 10 years found in both groups wanted more information about their educational interventions and medication adherence. Poor medication adherence is a complex issue. Limited health literacy and Low educational levels are responsible factors. Psychological models may assist in explaining medication nonadherence. It is suggested to increase patient knowledge of their disease seems sensible.[30]

A study with medication adherence in patients with tightly controlled rheumatoid arthritis by A Caliskan Uckun, FG Yurdakul, H Bodur; sixty-five women and seventeen men RA patients who visited regularly in the OPD were included. Socio-demographic

features and medical history were collected. The Morisky scale (MMAS-8) was used to evaluate adherence to the medication of RA. Health assessment questionnaire (HAQ), Disease activity score (DAS-28), Mini-Mental State Examination (MMSE) test and Beck Depression Inventory (BDI) were used to assess. According to the Morisky scale, 34.1%, 15.9% and 50% of our patients were marked as low, moderate and high adherence, respectively.[31]

A review on a cross-sectional descriptive study conducted on assessment of rheumatoid arthritis patients' adherence to treatment by Gadallah MA, Boulos DN, Gebrel A, Dewedar S, Morisky DE. Rheumatology outpatient clinic had carried the study on a sample of 140 patients with RA. Those reporting greater general satisfaction and younger patients were more likely to be adherent. Further, on-time refill rates of medication and disease activity were related with higher adherence scores and so validated the results of the adherence questionnaire.[32]

Section II

Review of Literature related to lifestyle practices of Rheumatoid arthritis patients.

A study was conducted by MP Schwellnus, DN Patel, C Nossel, M Dreyer, S Whitesman & EW Dormant, on the article of healthy lifestyle interventions in general practice Part 11: Lifestyle and arthritic conditions—rheumatoid arthritis.

In recent years, the early diagnosis and management of RA is important to prevent joint destruction, which has been shown to occur early on in the disease process, has been increasingly recognized. The initial effects of the RA disease on joints and muscles, inactivity physically, so it results in reduced joint range of motion, muscle weakness, depression, poor cardiovascular health and osteoporosis. Non-pharmacological and pharmacological management should be included in the principles of management of RA. The well-recognized as important components of the treatment of early arthritis, including RA are non-pharmacological modalities including lifestyle interventions. Physical exercise, dietary intervention, psychological intervention and education are the main lifestyle interventions for RA. The guidelines are reviewed for these lifestyle interventions in patients with RA.[19]

A phenomenographic study was conducted by Karian Malm, on Stefan Bergman Quality of life in patients with established rheumatoid arthritis. Diminished quality of life in several cases, such as physical health, environment and personal beliefs are recognized in rheumatoid arthritis patients compared with other healthy humans. There is a growing interest in the quality of life in clinical and medical interventions. Some studies have described patients' individual conceptions of quality of life and interviews can complement in quantitative studies. The explore of the variety of ways in which patients with established rheumatoid arthritis, understanding the concept of quality of life was the aim of the study. Various conceptions of quality of life reflect the complexity in the concept, as well as physical, psychological and social aspects. It is important to have in mind when the patients are supported by health professionals in enhancing their quality of life.[33]

A study was conducted by E. J Hurkmans, Mase. V, Degucht,K, Knittle A, J. Peteers H K, Ronday. This cross-sectional study was performed between October 2006 and April 2007 in the outpatient clinics of rheumatology of hospitals, Leiden University Medical Centre; Haga Hospital. All patients who were revisiting the outpatient department of rheumatology clinics in the past 12 months had been selected. To reduce the impact of the disease rheumatoid arthritis (RA), a good amount of physical activity is necessary. Results of the 271 patients (42%) who returned the questionnaire, 178 (66%) were female, their mean SD age was 14-62 years, and their mean SD disease duration was 8-10 years. Age, gender, higher educational level, short term treatment duration, lower disease activity and a more self-determining regulation are the factors and help in the treatment of RA patients. This finding might help by contributing to the further development of interventions to enhance the physical activity in RA patients.[34]

Section III

Review of literature related to the tool (HAQ-DI) used to assess daily living activity of patient with RA.

A review by Rohini Handa, U.R.K. Rao, Juliana F. M. Lewis, Gautam Rambhad on literature of rheumatoid arthritis in India. Ten studies provided data on the functional abilities and/or quality of life of RA patients and seven studies provided data observed from administering the Stanford Health Assessment Questionnaire (HAQ) disability index. The scores for HAQ DI can be between 0 (no disability) and 3 (completely disabled). From 0 to 1 scores are representing 'mild to moderate difficulty', 1 to 2 scores are representing 'moderate to severe disability', and 2 to 3 scores are representing 'severe to very severe disability'. The average scores reported are 0.49 for the general population and 1.2 for RA patients from a population-based study previously. Here, the mean scores are from 0.7 to 1.2 among RA patients, categorized moderate disability by HAQ scores. The study is conducted on hospital-based in Mumbai. The difference in mean HAQ scores among RA patients and healthy controls with the same age to cases with no history of illness or infection within the last months was statistically significant.[35]

A study on a five-year follow up of hand function and activities of daily living (ADL) in rheumatoid arthritis patients was conducted by Dellhag B, Bjelle A.

Mean age 53.7 years and mean disease duration 7.5 years of patients (28 women and 15 men), were included. The Grip Ability Test (GAT), the Keitel Function Test (KFT) and the Health Assessment Questionnaire (HAQ) scales were used. In the HAQ, the need for personal assistance was recorded as ADL dependence. Hand disability (Grip Ability Test) upgraded in the male RA group,

although hand impairment (grip strength, Keitel Function Test) was constant. Over one-fourth of each gender group had developed a new handicap (dependence).[36]

Another study was conducted by Nordenskiöld U on daily activities in women with rheumatoid arthritis. The difficulties in activities of daily living (ADL) of women with rheumatoid arthritis patients were identified and indicated the effect of interventions. Methods for measuring grip force were developed by the Grip pit instrument, and find out Activity Daily Living without and with assistive devices. Effects of interventions were investigated, and the need for new solutions concerning daily living activities was recognized. The study on seventy-three women with rheumatoid arthritis and fourteen women having fibromyalgia were included in the grip force measurements, and 187 women and 65 men, those who were healthy, selected as a reference group. The Evaluation of Daily Activity Questionnaire (EDAQ) can be used to assess both intrinsic (without assistive devices) and actual (with such assistance) disability. The EDAQ consists of 102 questions set out in 11 dimensions. Without assistive devices/altered working methods, the range of the number of activities with perceived difficulty ranged between 13 and 99 and after interventions the ranged between 6 and 57 in RA women. In the dimensions eating, cooking and toileting, assistive devices were most effective. Only some devices were identified in the dimensions dressing, cleaning and washing/clothes care. The research analysis was used to transform the ordinal score from EDAQ to obtain linear measures. An acceptable model was constructed with items ranging from "hard" to "easy". Shopping and cleaning the kitchen floor were found to be the hardest items and walking indoors and using telephone were the easiest ones. Women with RA have affected their performance of daily activities due to decreased grip force and pain. The ADL items evaluated with the EDAQ.[37]

A study by Yosuke Hattori,Daihei Kida & Atsuhi Kaneko was developed on physical function in early RA patients treated with biologics for one year who have low disease activity. That study investigate whether clinical remission was suitable for suppressing physical dysfunction in early rheumatoid arthritis patients. The study was conducted on all 75 RA patients (less than 2 years of onset) who were under treatment for 12 months with biologics in the hospital by the Disability Index of the Health Assessment Questionnaire (HAQ-DI), Simplified Disease Activity Index (SDAI) at three, six, and twelve months from the initiation of biologics therapy. HAQ-DI scores in the low disease activity (LDA) group were significantly higher than those in the clinical remission group at 6 and 12 months. In the LDA group, the findings emphasized the importance of achieving LDA at least by six months after commencing biologics therapy and attaining clinical remission in order to reduce physical dysfunction in patients with early Rheumatoid Arthritis.[38]

Conclusion

This chapter deals with review of literature related to treatment nonadherence and lifestyle practices and the effect of daily living activities of rheumatoid arthritis patients. The tool Health assessment questionnaire (HAQ) is used to assess the daily living activities of a client with rheumatoid arthritis.

CHAPTER III

Research Methodology

This chapter describes the details of the methodology adopted for the study.

The methodology of the research indicates the general plan, the procedures together valid and reliable data on the problem and investigation.[39] This chapter is planned to present a way to systematically solve the research problem. It includes the description of research approach, research design, variables, the description of the research setting, population, sampling technique, sample size, selection, development and description of the tools, validity and reliability of tools, pilot study and its findings, data collection procedure and plan for the data analysis.

The objectives of the present study were to assess the factors influencing in treatment non-adherence of rheumatoid arthritis patients, to assess the lifestyle practices of rheumatoid arthritis patients, to find out the association between factors influencing on treatment nonadherence with selected demographic variables.

Research approach

According to Treece (1986) evaluation research is commonly conducted to rate the extent to which a program has attained its goals.[40] Descriptive survey approach was adopted to collect data from the rheumatoid arthritis clients of rheumatology IPGME&R, Kolkata.

Research Design

Research design is the overall plan or blueprint of the study under investigation. It provides a framework for the study. With the broad sense it refers to the portion of research investigation that is concerned with sampling, decision about data collection and plans for data analysis.

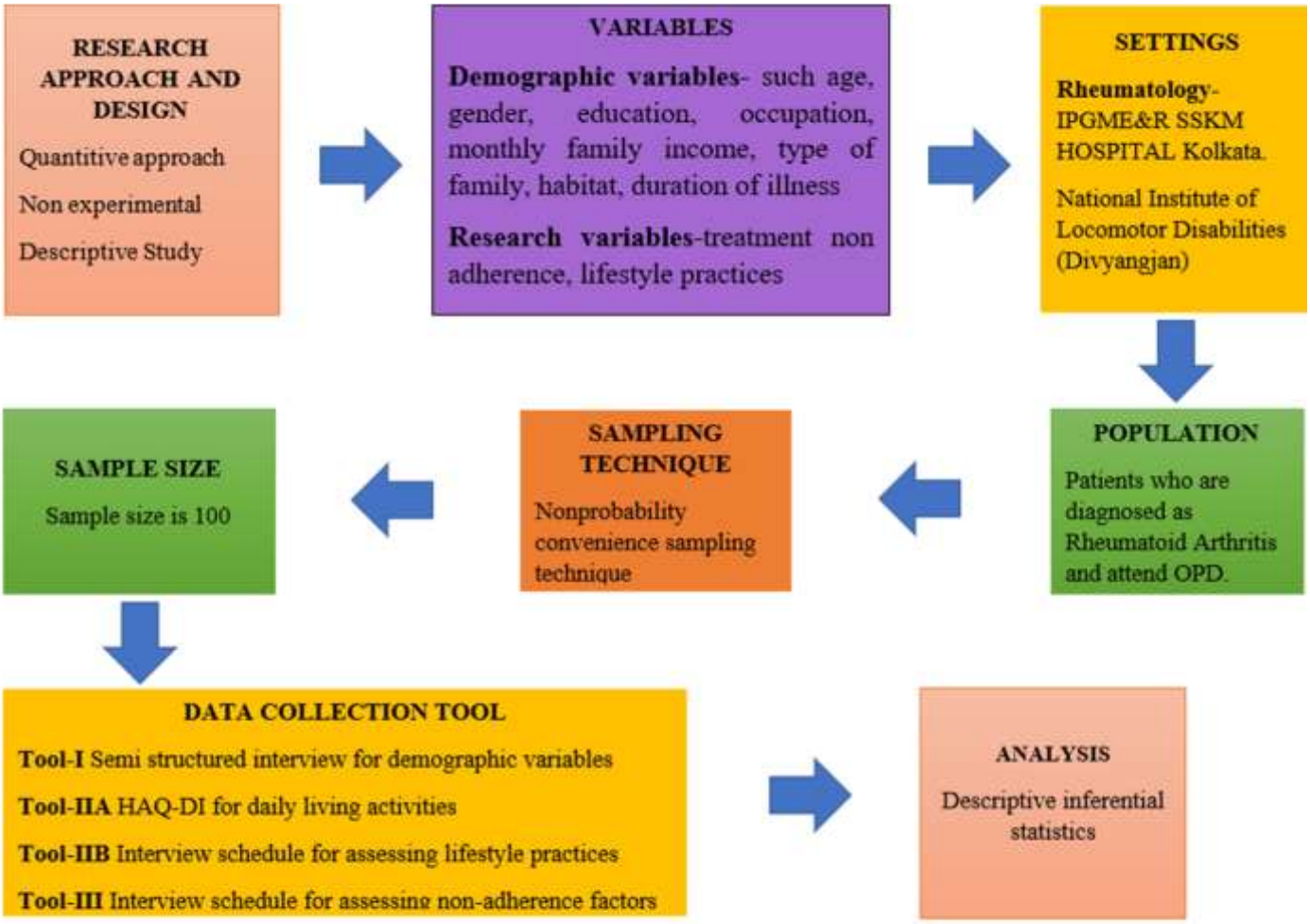

Fig 2: Schematic presentation of Research Methodology adopted for present study

Variables of the study

In the present study, variables were as below-

Research variables:

Treatment nonadherence and lifestyle practises of patient with rheumatoid arthritis.

Demographic variables:

- Age
- Gender
- Education
- Occupation
- Type of family,
- Monthly family income
- Habitat
- Duration of illness

Setting of the study

The setting of the study is defined as the physical location and condition in which data collection takes place in a study. It is the place where the researcher conducted the research study and from where data collection took place. The selection of an appropriate setting is important because the setting can influence the way people behave or feel and how they respond.[41]

Since the present study is intended to collect data from outpatient departments, it is conducted in the outpatient department of rheumatology IPGME&R (SSKM) Hospital, Kolkata.

The rationale for selection the settings

- Availability of the sample.
- Familiarity with the settings.
- Co-operation from the authority.
- Accessibility and feasibility of conducting the study
- The economy of time.
- The economy of easy accessibilities.

Population

According to Polit and Beck (2008)," the population is the entire set of individuals or objects having common characteristics".42 The population is the aggregation of all the units in which the researcher is interested. It is the aggregate of all the cases with a certain phenomenon about which a researcher would like to generalize.

In the present study population was patients with rheumatoid arthritis attending the rheumatology outpatient department IPGME&R, SSKM Hospital, Kolkata.

Sample

According to Polit and Beck, a sample is a subject of population elements, which are the most basic units about which are collected. In nursing research, elements are usually humans.[42]

A subset of the population is known as a sample that is selected for a selected study. In the present study sample comprised of the patients diagnosed as having rheumatoid arthritis attending OPD of selected hospitals for treatment and follow up.

Sample technique

The process of selecting a representative part of the population under study is called sampling. The selection of sampling technique mostly depends on the availability and accessibility of the sample.[43]

For the present study selection of sampling technique was non-probability convenient method of sampling based on of their inclusion criteria because the researcher felt that the samples were representative of the target population.

Sample size

In the present study the sample size was 20 for pilot study and 100 for final study.

Sample selection criteria

Inclusion criteria

- Subjects who are available during the research study period.
- Patients who are already diagnosed as rheumatoid arthritis.
- Non- attenders to follow up visits at the rheumatology clinic over a time period of at least 9 months.
- Patients with age group between 30-60yrs.
- Subjects who are willing to be a part of the study.

Exclusion criteria

- Rheumatoid arthritis patients who are not interested to participate in the study.
- Subjects who can't understand, speak and read Bengali or English languages
- Patients who are mentally ill.

Selection and development of the study instrument

A systematic collection and analysis of data are most important to any research study. According to Beck (2008), "the instrument is a written device that researcher uses to collect data."[42] One important aspect of any specific research is to systematically collect observable evidence from which study variables can be adequately accurate inferences could be drawn.

Table 1 Data collection tools and techniques

Tools	Variables to be measured	Techniques
Tool -I Semi structured interview schedule for demographic variables	Personal information of rheumatoid arthritis patients.	Interviewing
Tool -IIA HAQ-DI assess for daily living activities	Assessment of ability to function in daily life.	Questioning
Tool -IIB Interview schedule for assessing lifestyle practices	Assessment of lifestyle practices of RA.	Interviewing
Tool – III Interview schedule for assessing non-adherence factors	Information about factors influencing on treatment non-adherence.	Questioning

Development and description of the tool

Following steps were adopted by the researcher for the development of the tools for the present study:

- Reviewing the research and non-research literature on various aspects.
- Preparation of the first draft of the tool after discussion with guide and co-guide.
- Establishing validity from the experts.
- Translation of English tool to Bengali and retranslation to English with the help of language experts.
- Preparation of final draft of the tool.

Tool – I

Demographic tool

It was developed for collecting the personal data of rheumatoid arthritis patients. It described the demographic characteristics of samples consisting of 08 (eight) items such as age, gender, education, occupation, monthly family income, type of family, habitat, duration of illness.

Tool -IIA

Health Assessment Questionnaire Disability Index (HAQ-DI)

Health Assessment Questionnaire Disability Index (HAQ-DI) tool is a standard tool to assess the daily living activities of rheumatoid arthritis, osteoarthritis, juvenile rheumatoid arthritis, lupus, scleroderma, ankylosing spondylitis, fibromyalgia, psoriatic arthritis, in aging and HIV/AIDS.44

The Health Assessment Questionnaire (HAQ) was originally constructed in 1978 by James F. Fries, MD, and colleagues at Stanford University. HAQ is the first self-report disability status and has become the commanding instrument in many disease sectors, like arthritis.

The eight groups evaluate by the Disability Index are a) dressing and grooming, b) arising, c) eating, d) walking, e) hygiene, f) reach, g) grip and h) common daily activities. For each of these groups, patients inform the depth of difficulty they have in executing two or three particulars activities. The time frame for the disability questions in the past week.[45]

Validity

Since the HAQ-DI 20 item assessment of ability to function in daily life, it was a standardized tool further validity was not required.

Scoring System

Scoring customizes for the Disability Index. The Disability Index questions can be categorized into four possible responses:

Without ANY difficulty = 0

With SOME difficulty = 1

With MUCH difficulty =2

UNABLE to do =3

0 to 1 represent mild to moderate difficulty.

1 to 2 represent moderate to severe disability.

2 to 3 represent severe to very severe disability.

Tool -IIB

Interview Schedule for assessing lifestyle practices

There are 10 (ten) questions regarding exercise, diet, sleep, smoking habit, alcohol consumption, stress and occupational job difficulty.

Scoring system

Yes- 2

No -1

Maximum score -20 Minimum score-10

Lifestyle practices

Poor : <Mean - 1 SD

Average : Mean - 1 SD to Mean + 1 SD

Good : > Mean +1 SD

Reliability

There use split half for reliability, divide items of research instrument/tool in equal parts through odd number questions. Administer two subparts of the tool simultaneously and compute the correlation. Reliability is 0.8

Tool – III

Interview schedule for assessing non-adherence factors

Structured interview schedule to the assessment of factors influencing in treatment non-adherence. Total items are ten (10) e.g. Lack of knowledge about medicine & disease, poor physician-patient interaction, co-morbid disease, Non-availability of health care facilities, poor family support, long term treatment, alternative therapy use, side effects of drugs, economic problem, forgetfulness of taking medications.

Scoring system

Y for Yes and N for No.

Content validity of the tools

Polit and beck said that "content validity is concerned with the sampling adequacy of the content area being measured."[42]

Tool: demographic proforma:

To ensure the content validity, the structured interview schedule for collecting demographic data of the patients was submitted to seven experts in the field of medical surgical nursing, head of the department of orthopaedic surgery, head of the department of rheumatology. The experts were requested to go through the items for relevance, clarity, appropriateness of the content areas. There was 100% agreement in all the items of the tool. A minor modification was made in the language according to their suggestions. The tools were translated into Bengali by the investigator and were submitted to a language expert and there was total agreement on all items. The standard tool is used after taken permission from Mapi Research Trust and translated form is taken from them also.

Outcome of the validity

Tool -1 Demographic proforma

There is 98% agreement on all items. After the discussion with the guide, two(2) items were included.

Ethical consideration

Ethical permission was taken from the 'Ethical committee of NILD, Kolkata.

It was confirmed that there would be no inference of the treatment of patients with rheumatoid arthritis.

Consent was taken from the study participants (patients with RA).

The anonymity of the samples and confidentiality of the data was maintained.

Pilot study

A Pilot study is a limited size or trial run version designed to trial the methods to be used on a larger scale, a more meticulous study which is sometimes referred to as the parent study. The purpose of the pilot study is to make an improvement in the research project and to detect the problem that must be eradicated before the major study conducted.

A pilot study was conducted on 20 (Twenty) rheumatoid arthritis patients of OPD of N.I.L.D., Kolkata,

- The data of the pilot study was collected according to the plan of the final study.
- The subject was collected by non- probability convenience sampling.
- Investigator introduced herself and the purpose of the study was explained and consent was obtained from the respondents.
- Approximately 25 minutes were taken for completing each data collection procedure.
- The data collection procedure was terminated by thanking each participant for their participation and cooperation.

Data Collection procedure for the final study

The final data collection procedure was conducted in the outpatient department of rheumatology of IPGME&R,SSKM hospital, Kolkata on the patients of Rheumatoid arthritis who attending the clinic of rheumatology. Data collection from 17th November, 2019 to 30th December, 2019. Before conducting the final study, all formalities were completed.

- Approval from the ethical committee was obtained from National Institute for Locomotor Disabilities, Bonhoogly, Kolkata-90.
- Administrative permission was taken from the head of the department of Rheumatology of IPGME&R, SSKM Hospital, Kolkata.
- Convenience sampling technique was adopted while keeping in mind the inclusion criteria to get the sample size 100 for the final study.
- The introduction was made by the investigator herself to explain the purpose of the study, the establishment of rapport was done to the patients and staff of the institution. To obtain free and frank responses.
- The purposes and objectives of the study were explained in easy language to each participant separately and consent was obtained from the respondents.
- Confidentiality of their responses was assured to the Rheumatoid arthritis patient.
- On an average 25 minutes time was required for the data collection from each sample. Among 100 patients participated in the study.
- Interview was as per schedule. A structured interview schedule was distributed to the samples

Plan for data analysis

The obtained data were planned to be analysed with the help of descriptive inferential statistics based on the objectives of the study. The plan for data analysis was as follows:

- Demographic data were analysed in terms of frequency percentage.
- The daily living activities of rheumatoid arthritis patients data analysed by frequency and percentage by using the Health Assessment Questionnaire Disability Index (HAQ-DI).
- Lifestyle practices data were analysed in terms of frequency percentage.
- Factors influencing in Treatment non-adherence data were analysed in terms of frequency percentage of the rheumatoid arthritis patients
- A Chi-square test was applied to find out the association between demographic variables and factors influencing treatment nonadherence.

Summary

This chapter dealt with the research methodology which consisted of research approach and design, variables under study, research setting population, sample and sampling technique, sample size. Ethical consideration, pilot study, the procedure of data collection and plan for data analysis.

CHAPTER -IV

Analysis and Interpretation of Data

The research data need to be proceeding and analysed in some systematic manner so that trends and patterns of relationship can be detected and interrupted. The data analysis is designed while developing the research plan. The word "analysis" means the organising categorising and summarizing the data satisfying to obtain answers to research questions.

C.R. Kothari (1989) defines that the analysis is the computation of measures along with searching for patterns of relationship that exist among data groups.

Interpretation means to draw the result of data analysis, make inference about its occurrence or relations and draw conclusions. The researcher attempts to explain the findings in light of prior evidence, theory and their own clinical experiences. Interpretation also relates to determining how these findings can be most suitable to use in clinical practices.

The purpose of the analysis is to minimize data to intelligible and interpretable form so that the relations of research variables can be studied and checked.

In the present study, the data were gathered through an interview schedule and questionnaire methods from the rheumatoid arthritis patients. This study aimed to assess the factors influencing on treatment nonadherence and lifestyle practices of rheumatoid arthritis patients that help to guide for availing facilities in the health care system.

Objectives of the study

The objectives of the study were:

- To assess the lifestyle practices of rheumatoid arthritis patients.
- To assess the factors influencing treatment nonadherence of rheumatoid arthritis patients.
- To find out the association between factors influencing treatment nonadherence with selected demographic variables.

All the items in the data collection tools were coded and transferred to the master sheet.

The descriptive and inferential statistics used for analysis are given below:

1. Frequency and percentage were calculated to analyse the demographic profiles.
2. Frequency and percentage of scores by using the Health Assessment Questionnaire Disability Index (HAQ-DI).
3. Mean, median and standard deviation were calculated to analyse of lifestyle practices of rheumatoid arthritis patients.
4. Percentage were calculated to analyse the factors influencing on treatment non-adherence of RA.
5. Findings related to the association between factors of treatment non adherence and selected demographic variables.

Organisation of the study findings

Data were organised, tabulated and interpreted using descriptive and inferential statistics and presented in the following sections:

Section I: This section deals with the demographic characteristics of the Rheumatoid Arthritis (RA) patients which were analysed by frequency and percentage.

Section IIA: This section deals with the daily living activities of rheumatoid arthritis patients analysed by frequency and percentage by using the Health Assessment Questionnaire Disability Index (HAQ-DI).

Section IIB: This section deals with lifestyle practices of rheumatoid arthritis patients under exercise, diet, sleep pattern, addiction, stress and career by frequency and percentage and Mean, median and standard deviation scores.

Section IIIA: This section deals with the factors influencing treatment nonadherence of rheumatoid arthritis patients.

Section IIIB: This section deals with the association between selected demographic variables and factors influencing in treatment non adherence of rheumatoid arthritis patients.

Section I This section deals with the demographic characteristics of the Rheumatoid Arthritis (RA) patients which were analysed by frequency and percentage.

Table 2 Frequency and percentage distribution of rheumatoid arthritis patients by their age and gender.

N = 100

Demographic characteristic	Frequency	Percentage
AGE (YEARS)		
30 – 44	38	38
45 – 60	62	62
GENDER		
MALE	15	15
FEMALE	85	85

Data presented in table 3 shows that majority 62 (62%) of the patients belongs to the age group of 45 - 60 years. But there are 38 (38%) patients who suffer from rheumatoid arthritis of age group of 30 - 44 years.

It was also depicted from the above table that majority 85 (85%) patients were female and 15 (15%) were male.

N = 100

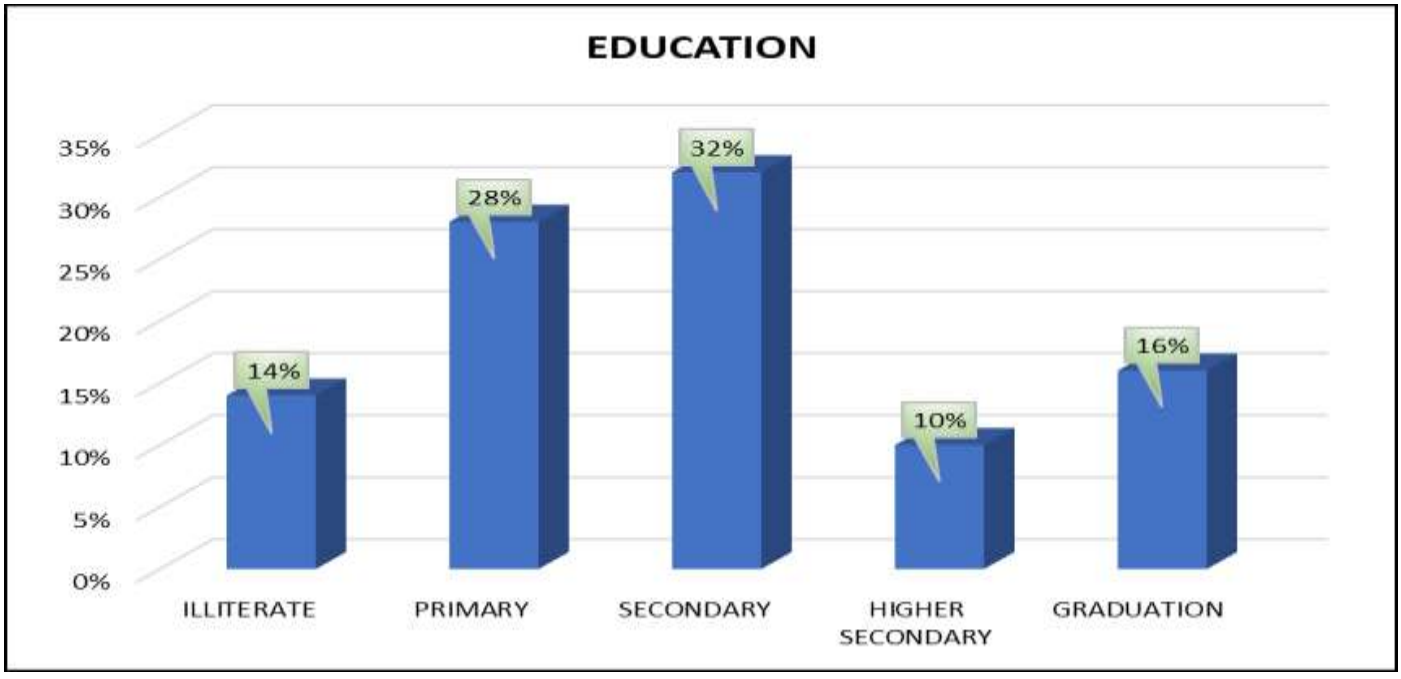

Figure 3 Bar diagram showing the percentage distribution of rheumatoid arthritis patients by their education.

Data presented in the figure 3 showed that majority 32 (32%) of the patients had completed education up to secondary and followed by 28 (28%) up to primary level. Some percentages of the patients (10%) had higher secondary of education. sixteen (16%) were having graduate degree and Fourteen (14%) were illiterate.

= 100

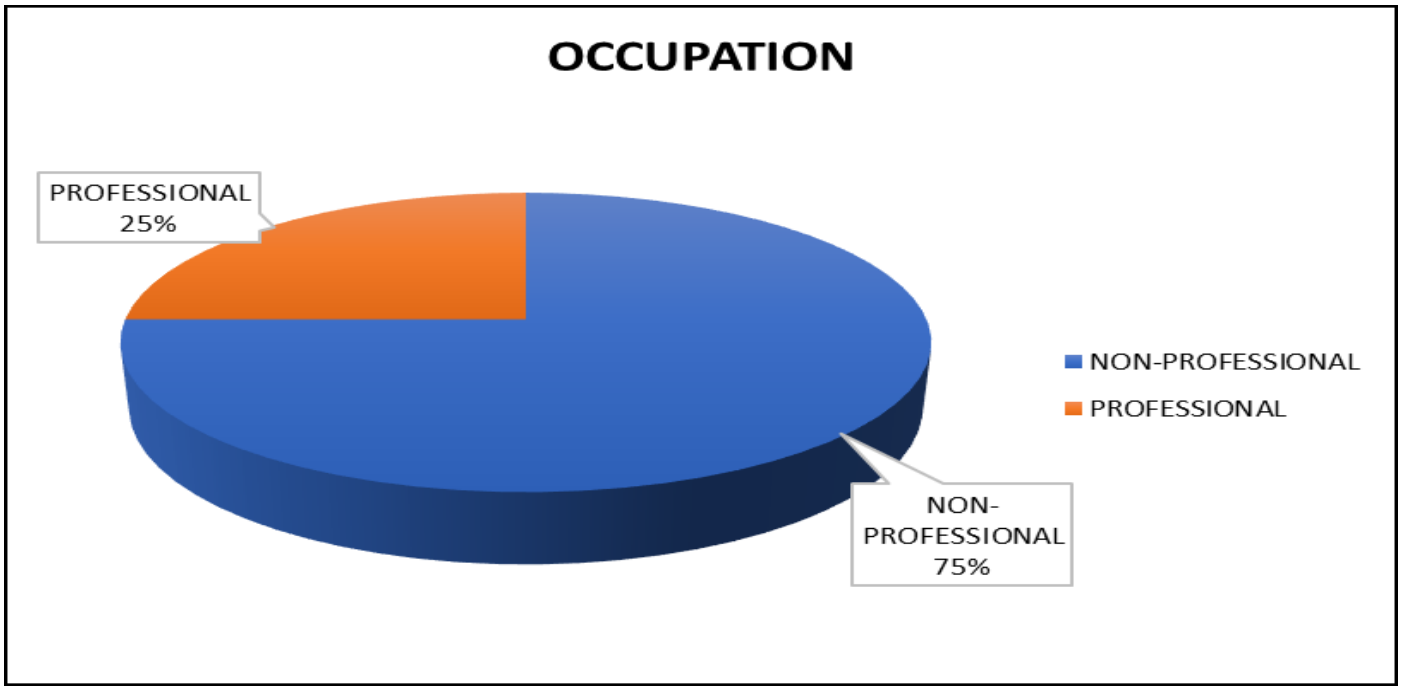

Figure 4 Pie diagram showing the percentage distribution of rheumatoid arthritis patients by their occupation.

Figure 4 showing from the above table that majority 75 (75%) patients were non-professional and 25 (25%) were professional.

N = 100

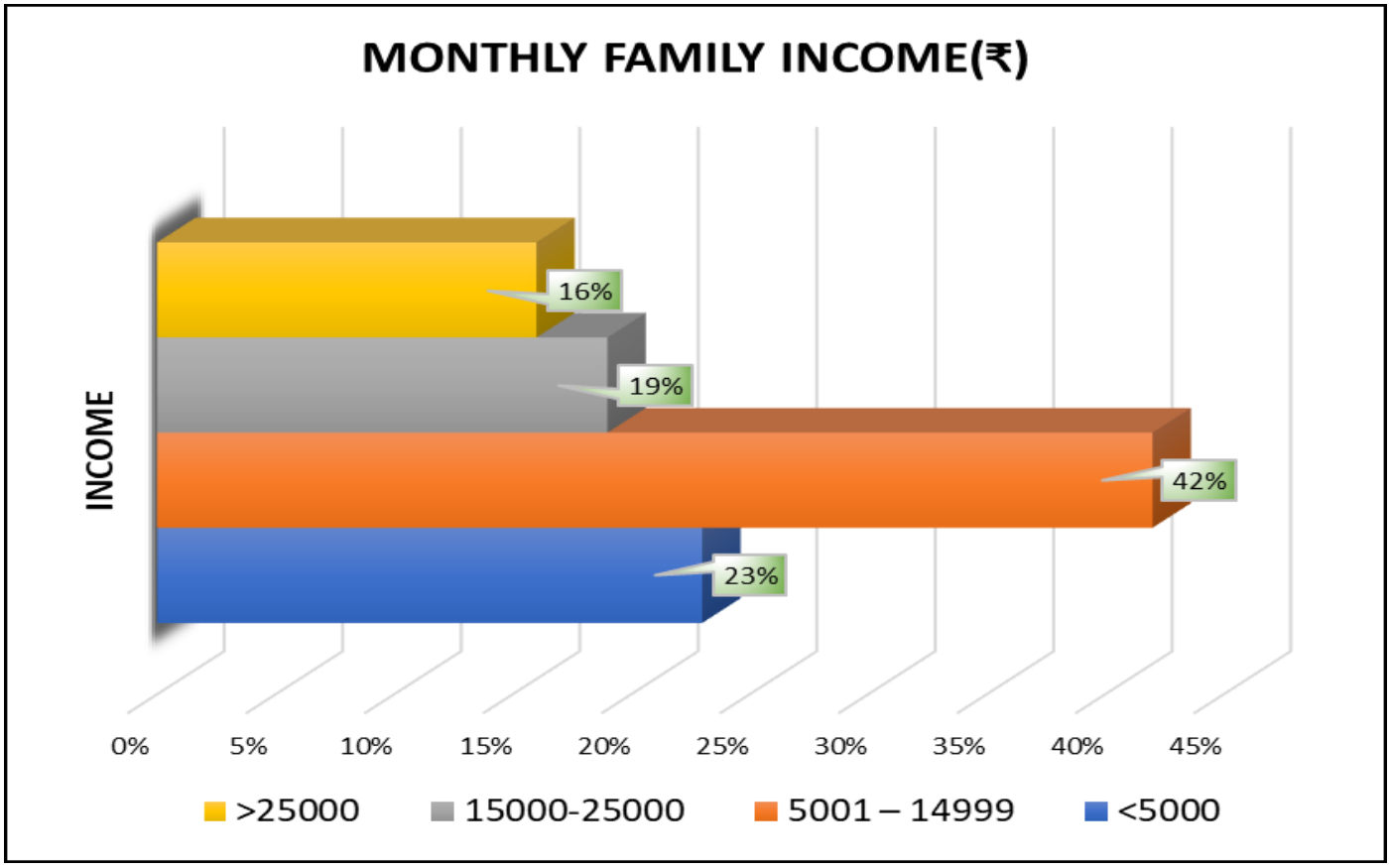

Figure 5 Bar diagram showing percentage distribution of rheumatoid arthritis patients by their monthly family income.

Data presented in the figure 5 showed that majority 42 (42%) rheumatoid arthritis patients presented with monthly family income from Rs. 5001 to Rs. 14999 and 16 (16%) patients are more than Rs.25000, 19 (19%) patients belonged to the range of Rs 15000 – Rs. 25000 and 23 (23%) patient's monthly family income were below Rs. 5000.

N = 100

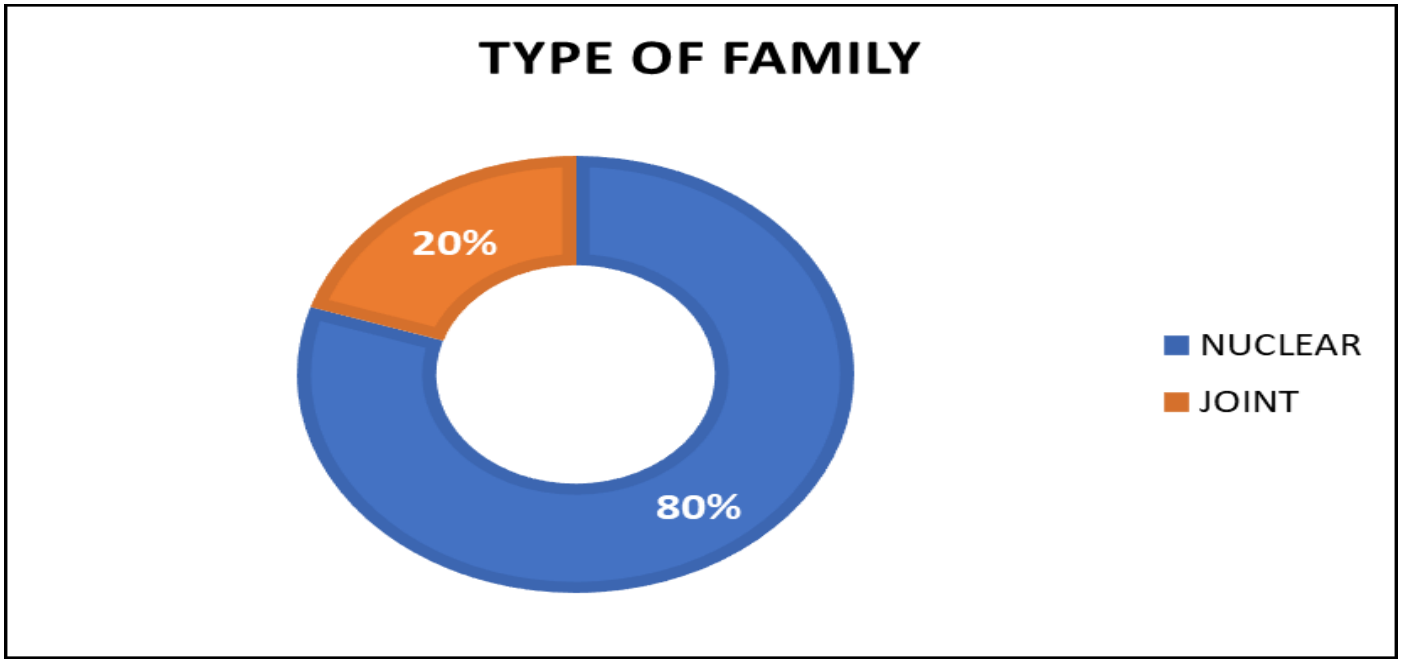

Figure 6 Pie diagram showing percentage distribution of rheumatoid arthritis patients by their type of family.

Figure 6 showing that maximum number 80 (80%) of the rheumatoid arthritis patients had nuclear family followed by 20 (20%) patients from joint family.

N = 100

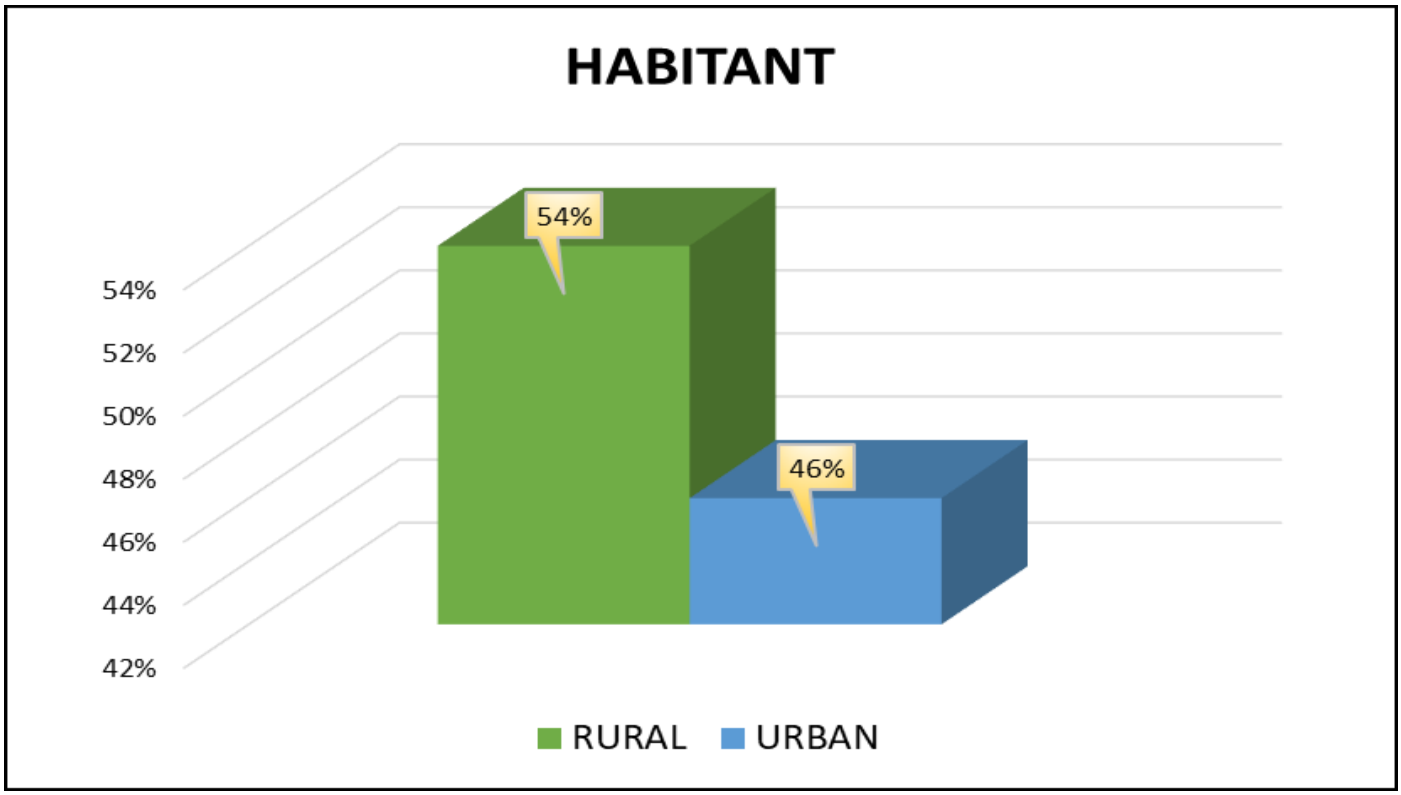

Figure 7 Bar diagram showing percentage distribution of rheumatoid arthritis patients by their habitant.

Data presented in the figure 7 showed that majority 54 (54%) rheumatoid arthritis patients were staying in rural area and rest 46 (46%) patients were from urban.

N = 100

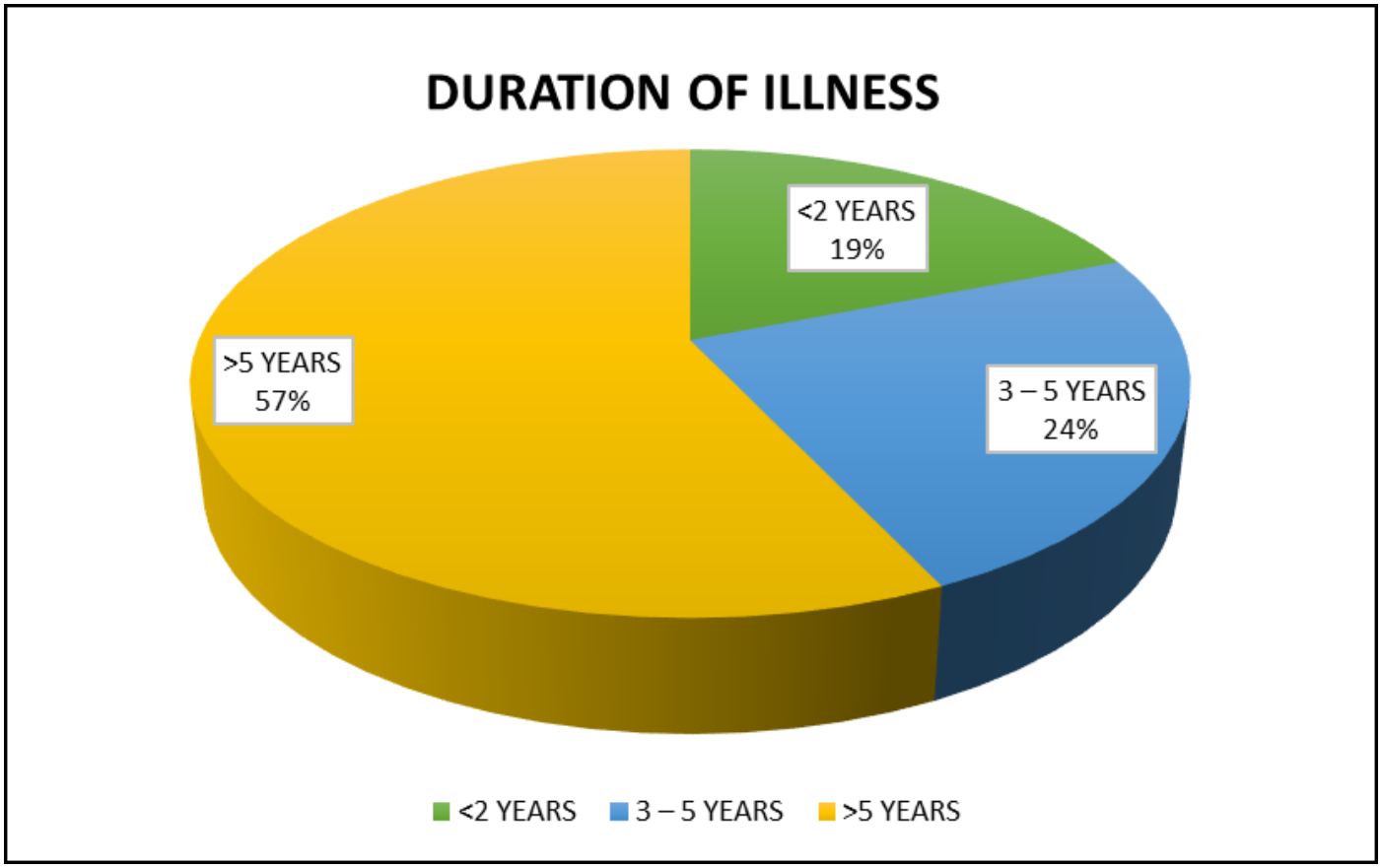

Figure 8 Pie diagram showing percentage distribution of rheumatoid arthritis patients by their duration of illness.

The pie diagram showing that maximum number 57 (57%) of the rheumatoid arthritis patients had illness more than 5 years, 19 (19%) patients were suffering less than 2 years and 24 (24%) patients had illness duration of 3 to 5 years.

Section IIA This section deals with the daily living activities of rheumatoid arthritis patients analysed by frequency and percentage by using Health Assessment Questionnaire Disability Index (HAQ-DI) scale.

Table 3 Frequency and percentage distribution of the rheumatoid arthritis patients according to their daily living activities.

N = 100

Daily Living Activities (HAQ DI Scores)	Frequency	Percentage
Mild to moderate difficulties (0-1)	12	12
Moderate to Severe Disability (1-2)	43	43
Severe to Very severe Disability (2-3)	45	45

Data presented in the table 3 showed that majority of the patients **(45%)** had perceived their daily living activities as **"Severe to Very Severe Disability"**, and followed by **43%** perceived their daily living activities as **"Moderate to Severe Disability"**, **12%** respondents perceived their daily living activities as **"Mild to Moderate Difficulties"** after they developed rheumatoid arthritis.

Section IIB This section deals with life style practices of rheumatoid arthritis patients under exercise, diet, sleep pattern, addiction, stress and career by frequency and percentage and Mean, median and standard deviation scores.

Table 4 Mean, median and standard deviation scores of life style practices of rheumatoid arthritis patients.

N = 100

Variable	Range	Mean	Median	SD
Life style practice	10 - 20	15.14	15	1.96

Maximum Score 20
Minimum Score 10

Data presented in table 4 reveal that scores of the life style practices of the rheumatoid arthritis patients of the present study ranges from 10 to 20, mean is 15.14 with a standard deviation of 1.96 and the median is 15.

Table 5 Frequency and percentage distribution of the rheumatoid arthritis patients according to their life style practices.

N = 100

Lifestyle Practices	Frequency	Percentage
Poor (<Mean – 1 SD)	16	16
<13.18		
Average (Mean – 1 SD to Mean + 1 SD)	76	76
13.18 - 17.10		
Good (> Mean +1 SD)	8	8
>17.10		

Data presented in the table 5 showed that majority of the clients (76 %) had perceived their life style practices as **"average"**, 16 % respondents perceived their life style practices as **"poor"** and 8% perceived their life style practices as **"good"** after they developed rheumatoid arthritis.

Section IIIA This section deals with the factors influencing in treatment non adherence of rheumatoid arthritis patients.

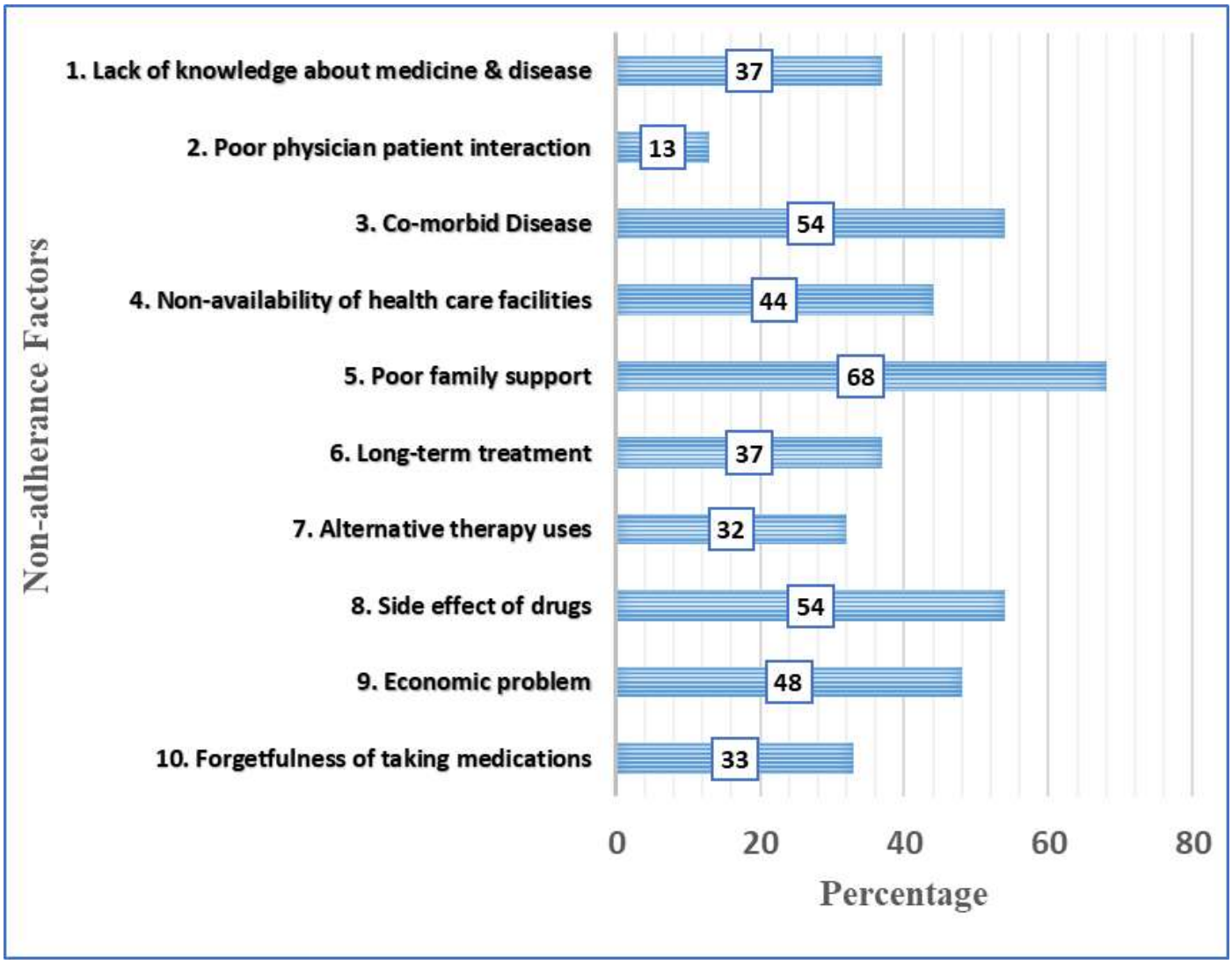

Figure 9 Bar diagram showing percentage distribution of non-adherence factors influencing in treatment of rheumatoid arthritis patients.

The bar diagram is showing the percentage distribution of various non-adherence factors influencing in treatment of Rheumatoid arthritis patients.

Data presented that majority of the patients had poor support from their family (68%), followed by suffering from co-morbid disease (54%) and side effect of drugs (54%). The other non-adherence factors like economic problem (48%), non-availability of health care facilities (44%), lack of knowledge about medicine & disease (37%), long term treatment (37%), forgetfulness of taking medicines (33%), alternative therapy uses (32%), poor physician patient interaction (13%) influenced in treatment non adherence of rheumatoid arthritis patients.

Section IIIB This section deals with association between different demographic variables and factors influencing in treatment non adherence of rheumatoid arthritis patients.

Table 6 Chi square test of association between the lack of knowledge about medicine & disease (Non-adherence factor) of rheumatoid arthritis patients and age, gender, type of family of patients.

N = 100

Demographic variables	Lack of knowledge about medicine & disease			
	YES	NO	TOTAL	($\chi 2$)
AGE (Years)				
30 – 44	13	25	38	0.20
45 – 60	24	38	62	
TOTAL	37	63	100	
GENDER				
Female	32	53	85	0.75
Male	05	10	15	
TOTAL	37	63	100	
TYPE OF FAMILY				
NUCLEAR	28	52	80	0.69
JOINT	09	11	20	
TOTAL	37	63	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 6 reveal chi square tests of association are computed between lack of knowledge about medicine & disease of rheumatoid arthritis patients and age, gender, type of family of patients.

The calculated chi-square value (0.20) is less than tabled chi-square value i.e. 3.84. So, no statistically significant association is found between lack of knowledge about medicine & disease of rheumatoid arthritis patients and age.

The calculated chi-square value (0.75) is less than tabled chi-square value i.e. 3.84. So, no statistically significant association is found between lack of knowledge about medicine & disease of rheumatoid arthritis patients and gender.

The calculated chi-square value (0.69) is less than tabled chi-square value i.e. 3.84. So, no statistically significant association is found between lack of knowledge about medicine & disease of rheumatoid arthritis patients and type of family.

So, it can be concluded that lack of knowledge about medicine & disease of rheumatoid arthritis patients of the present study are not dependent on their age, gender, type of family.

Table 7 Chi square test of association between the lack of knowledge about medicine& disease (Non-adherence factor) of rheumatoid arthritis patients and monthly income, educational level, duration of illness of patients.

N = 100

Demographic variables	Lack of knowledge about medicine & disease			
	YES	NO	TOTAL	(χ2)
MONTHLY INCOME (Rs.)				
≤15000	27	41	68	0.67
>15000	10	22	32	
TOTAL	37	63	100	
EDUCATION				
Up to Secondary	32	42	74	**4.76***
Above Secondary	05	21	26	
TOTAL	37	63	100	
DURATION OF ILLNESS				
Less than or equal to 5 yrs.	16	27	43	0.02
More than 5 years	21	36	57	
TOTAL	37	63	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 7 reveal chi square tests of association are computed between lack of knowledge about medicine & disease of rheumatoid arthritis patients and monthly income, educational level, duration of illness, of patients.

The calculated chi-square value (4.76) is more than tabled chi-square value 3.84. So, statistically significant association is found between lack of knowledge about medicine & disease of rheumatoid arthritis patients and education level.

So, it can be concluded that lack of knowledge about medicine & disease of rheumatoid arthritis patients of the present study are not dependent on their monthly income and duration of illness but dependent on their education level .

Table 8 Chi square test of association between the poor physician patient interaction (Non-adherence factor) of rheumatoid arthritis patients and age, gender, type of family of patients.

N = 100

Demographic variables	Poor physician patient interaction			
	YES	NO	TOTAL	($\chi 2$)
AGE (Years)				
30 – 44	07	31	38	1.59
45 – 60	06	56	62	
TOTAL	13	87	100	
GENDER				
Female	08	77	85	**6.45***
Male	05	10	15	
TOTAL	13	87	100	
TYPE OF FAMILY				
NUCLEAR	08	72	80	3.18
JOINT	05	15	20	
TOTAL	13	87	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 8 reveal chi square tests of association are computed between poor physician & patient interaction and patient's age, gender, type of family.

The calculated chi-square value (6.45) is more than tabled chi-square value 3.84. So, statistically significant association is found between poor physician & patient interaction and gender.

So, it can be concluded that poor physician & patient interaction of the present study are not dependent on their age, and type of family but dependent on their gender.

Table 9 Chi square test of association between poor physician patient interaction (Non-adherence factor) of rheumatoid arthritis patients and monthly income, educational level, duration of illness, of patients.

N = 100

Demographic variables	Poor physician patient interaction			
	YES	NO	TOTAL	(χ2)
MONTHLY INCOME (Rs.)				
≤15000	05	63	68	**5.99***
>15000	08	24	32	
TOTAL	13	87	100	
EDUCATION				
Up to Secondary	06	68	74	**6.02***
Above Secondary	07	19	26	
TOTAL	13	87	100	
DURATION OF ILLNESS				
Less than or equal to 5 yrs.	07	36	43	0.72
More than 5 years	06	51	57	
TOTAL	13	87	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 9 reveal chi square tests of association are computed between poor physician & patient interaction and patient's monthly income, education and duration of illness.

The calculated chi-square value (5.99) is more than tabled chi-square value 3.84. So, statistically significant association is found between poor physician & patient interaction and monthly income.

The calculated chi-square value (6.02) is more than tabled chi-square value 3.84. So, statistically significant association is found between poor physician & patient interaction and educational level.

So, it can be concluded that poor physician & patient interaction of the present study are dependent on their monthly income, educational level but not dependent on their duration of illness.

Table 10 Chi square test of association between the co-morbid disease (Non-adherence factor) of rheumatoid arthritis patients and age, gender, type of family of patients.

N = 100

Demographic variables	Co-morbid Disease			
	YES	NO	TOTAL	($\chi 2$)
AGE (Years)				
30 – 44	26	12	38	**5.13***
45 – 60	28	34	62	
TOTAL	54	46	100	
GENDER				
Female	46	39	85	0.01
Male	08	07	15	
TOTAL	54	46	100	
TYPE OF FAMILY				
NUCLEAR	44	36	80	0.16
JOINT	10	10	20	
TOTAL	54	46	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 10 reveal chi square tests of association are computed between the co-morbid disease and patient's age, gender, type of family.

The calculated chi-square value (5.13) is more than tabled chi-square value 3.84. So, statistically significant association is found between the co-morbid disease and age.

So, it can be concluded that the co-morbid disease of the present study is dependent on their age but not dependent on their gender, type of family.

Table 11 Chi square test of association between the co-morbid disease (Non-adherence factor) of rheumatoid arthritis patients and monthly income, educational level, duration of illness of patients.

N = 100

Demographic variables	Co-morbid Disease			
	YES	NO	TOTAL	(χ2)
MONTHLY INCOME (Rs.)				
≤15000	40	28	68	1.99
>15000	14	18	32	
TOTAL	54	46	100	
EDUCATION				
Up to Secondary	39	35	74	0.19
Above Secondary	15	11	26	
TOTAL	54	46	100	
DURATION OF ILLNESS				
Less than or equal to 5 yrs.	27	16	43	2.35
More than 5 years	27	30	57	
TOTAL	54	46	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 11 shows that chi square tests of association are computed between the co-morbid disease and patient's monthly income, education and duration of illness.

There is no statistically significant association is found between the co-morbid disease and their monthly income, educational level and duration of illness. So, it can be concluded that the co-morbid disease of the present study is not dependent on their monthly income, educational level and duration of illness.

Table 12 Chi square test of association between the non-availability of health care facilities (Non-adherence factor) of rheumatoid arthritis patients and age, gender, type of family of patients.

N = 100

Demographic variables	Non-availability of health care facilities			
	YES	NO	TOTAL	($\chi 2$)
AGE (Years)				
30 – 44	13	25	38	2.38
45 – 60	31	31	62	
TOTAL	44	56	100	
GENDER				
Female	38	47	85	0.11
Male	06	09	15	
TOTAL	44	56	100	
TYPE OF FAMILY				
NUCLEAR	37	43	80	0.82
JOINT	07	13	20	
TOTAL	44	56	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 12 shows chi square tests of association are computed between the non-availability of health care facilities and patient's age, gender, type of family.

There is no statistically significant association is found between the non-availability of health care facilities and patient's age, gender, type of family. So, it can be concluded that the non-availability of health care facilities of the present study is not dependent on their age, gender and type of family.

Table 13 Chi square test of association between the non-availability of health care facilities (Non-adherence factor) of rheumatoid arthritis patients and monthly income, educational level, duration of illness of patients.

N = 100

Demographic variables	Non-availability of health care facilities			
	YES	NO	TOTAL	(χ2)
MONTHLY INCOME (Rs.)				
≤15000	29	39	68	0.16
>15000	15	17	32	
TOTAL	44	56	100	
EDUCATION				
Up to Secondary	30	44	74	1.38
Above Secondary	14	12	26	
TOTAL	44	56	100	
DURATION OF ILLNESS				
Less than or equal to 5 yrs.	22	21	43	1.57
More than 5 years	22	35	57	
TOTAL	44	56	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 13 shows chi square tests of association are computed between the non-availability of health care facilities and patient's monthly income, education and duration of illness.

There is no statistically significant association is found between the non-availability of health care facilities and their monthly income, education and duration of illness. So, it can be concluded that the non-availability of health care facilities of the present study is not dependent on their monthly income, educational level and duration of illness.

Table 14 Chi square test of association between the poor family support (Non-adherence factor) of rheumatoid arthritis patients and age, gender, type of family of patients.

N = 100

Demographic variables	Poor family support			
	YES	NO	TOTAL	($\chi 2$)
AGE (Years)				
30 – 44	25	13	38	0.14
45 – 60	43	19	62	
TOTAL	68	32	100	
GENDER				
Female	59	26	85	0.52
Male	09	06	15	
TOTAL	68	32	100	
TYPE OF FAMILY				
NUCLEAR	54	26	80	0.05
JOINT	14	06	20	
TOTAL	68	32	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 14 shows chi square tests of association are computed between the poor family support and patient's age, gender, type of family.

There is no statistically significant association is found between the poor family support and their age, gender, type of family. So, it can be concluded that the poor family support of the present study is not dependent on their age, gender and type of family.

Table 15 Chi square test of association between the poor family support (Non-adherence factor) of rheumatoid arthritis patients and monthly income, educational level, duration of illness of patients.

N = 100

Demographic variables	Poor family support			
	YES	NO	TOTAL	(χ2)
MONTHLY INCOME (Rs.)				
≤15000	42	26	68	3.79
>15000	26	06	32	
TOTAL	68	32	100	
EDUCATION				
Up to Secondary	51	23	74	0.11
Above Secondary	17	09	26	
TOTAL	68	32	100	
DURATION OF ILLNESS				
Less than or equal to 5 yrs.	27	16	43	0.90
More than 5 years	41	16	57	
TOTAL	68	32	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 15 shows chi square tests of association are computed between the poor family support and patient's monthly income, education and duration of illness.

There is no statistically significant association is found between the poor family support and patient's monthly income, education and duration of illness. So, it can be concluded that the poor family support of the present study is not dependent on their monthly income, educational level and duration of illness.

Table 16 Chi square test of association between the long-term treatment (Non-adherence factor) of rheumatoid arthritis patients and age, gender, type of family of patients.

N = 100

Demographic variables	Long-term treatment			
	YES	NO	TOTAL	($\chi 2$)
AGE (Years)				
30 – 44	13	25	38	0.21
45 – 60	24	38	62	
TOTAL	37	63	100	
GENDER				
Female	31	54	85	0.07
Male	06	09	15	
TOTAL	37	63	100	
TYPE OF FAMILY				
NUCLEAR	31	49	80	0.53
JOINT	06	14	20	
TOTAL	37	63	100	

Table value of Chi square: 3.84, df (1), $p<0.05$

Data presented in table 16 shows chi square tests of association are computed between the long-term treatment and patient's age, gender, type of family.

There is no statistically significant association is found between the long-term treatment and patient's age, gender, type of family. So, it can be concluded that the long-term treatment of the present study is not dependent on their age, gender and type of family.

Table 17 Chi square test of association between the long-term treatment (Non-adherence factor) of rheumatoid arthritis patients and monthly income, educational level, duration of illness of patients.

N = 100

Demographic variables	Long-term treatment			
	YES	NO	TOTAL	(χ2)
MONTHLY INCOME (Rs.)				
≤15000	25	43	68	0.005
>15000	12	20	32	
TOTAL	37	63	100	
EDUCATION				
Up to Secondary	28	46	74	0.09
Above Secondary	09	17	26	
TOTAL	37	63	100	
DURATION OF ILLNESS				
Less than or equal to 5 yrs.	15	28	43	0.1
More than 5 years	22	35	57	
TOTAL	37	63	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 17 shows chi square tests of association are computed between the long-term treatment and patient's monthly income, education and duration of illness.

There is no statistically significant association is found between the long-term treatment and their monthly income, education and duration of illness. So, it can be concluded that the long-term treatment of the present study is not dependent on their monthly income, educational level and duration of illness.

Table 18 Chi square test of association between the alternative therapy (Non-adherence factor) of rheumatoid arthritis patients and age, gender, type of family of patients.

N = 100

Demographic variables	Alternative therapy uses			
	YES	NO	TOTAL	($\chi 2$)
AGE (Years)				
30 – 44	13	25	38	0.13
45 – 60	19	43	62	
TOTAL	32	68	100	
GENDER				
Female	23	62	85	**6.36***
Male	09	06	15	
TOTAL	32	68	100	
TYPE OF FAMILY				
NUCLEAR	27	53	80	0.56
JOINT	05	15	20	
TOTAL	32	68	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 18 shows chi square tests of association are computed between the alternative therapy uses and patient's age, gender, type of family.

The calculated chi-square value (6.36) is more than tabled chi-square value i.e. 3.84. So, statistically significant association is found between the alternative therapy uses and gender.

So, it can be concluded that the alternative therapy uses of the present study is dependent on their gender but not dependent on their age and type of family.

Table 19 Chi square test of association between the alternative therapy (Non-adherence factor) of rheumatoid arthritis patients and monthly income, educational level, duration of illness of patients.

N = 100

Demographic variables	Alternative therapy uses			
	YES	NO	TOTAL	($\chi 2$)
MONTHLY INCOME (Rs.)				
≤15000	23	45	68	0.32
>15000	09	23	32	
TOTAL	32	68	100	
EDUCATION				
Up to Secondary	21	53	74	1.72
Above Secondary	11	15	26	
TOTAL	32	68	100	
DURATION OF ILLNESS				
Less than or equal to 5 yrs.	19	24	43	**5.15***
More than 5 years	13	44	57	
TOTAL	32	68	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 19 shows chi square tests of association are computed between the alternative therapy uses and patient's monthly income, education and duration of illness.

The calculated chi-square value (5.15) is more than tabled chi-square value i.e. 3.84. So, statistically significant association is found between the alternative therapy uses and duration of illness.

So, it can be concluded that the alternative therapy uses of the present study is dependent on duration of illness but not dependent on their monthly income and education.

Table 20 Chi square test of association between the side effects of drugs (Non-adherence factor) of rheumatoid arthritis patients and age, gender, type of family of patients.

N = 100

Demographic variables	Side effects of drugs			
	YES	NO	TOTAL	(χ2)
AGE (Years)				
30 – 44	25	13	38	3.43
45 – 60	29	33	62	
TOTAL	54	46	100	
GENDER				
Female	46	39	85	0.003
Male	08	07	15	
TOTAL	54	46	100	
TYPE OF FAMILY				
NUCLEAR	45	35	80	0.82
JOINT	09	11	20	
TOTAL	54	46	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 20 shows chi square tests of association are computed between the side effects of drugs and patient's age, gender, type of family.

There is no statistically significant association is found between the side effects of drugs and their age, gender, type of family. So, it can be concluded that the side effects of drugs is not dependent on their age, gender and type of family in the present study.

Table 21 Chi square test of association between the side effects of drugs (Non-adherence factor) of rheumatoid arthritis patients and monthly income, educational level, duration of illness of patients.

N = 100

Demographic variables	Side effects of drugs			
	YES	NO	TOTAL	(χ2)

MONTHLY INCOME (Rs.)				
≤15000	38	30	68	0.30
>15000	16	16	32	
TOTAL	54	46	100	
EDUCATION				
Up to Secondary	39	35	74	0.19
Above Secondary	15	11	26	
TOTAL	54	46	100	
DURATION OF ILLNESS				
Less than or equal to 5 yrs.	30	13	43	**7.55***
More than 5 years	24	33	57	
TOTAL	54	46	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 21 shows chi square tests of association are computed between the side effects of drugs and patient's monthly income, education and duration of illness.

The calculated chi-square value (7.55) is more than tabled chi-square value i.e. 3.84. So, statistically significant association is found between the side effects of drugs and duration of illness.

So, it can be concluded that the side effects of drugs are dependent on duration of illness but not dependent on their monthly income, educational level in the present study.

Table 22 Chi square test of association between the economic problem (Non-adherence factor) of rheumatoid arthritis patients and age, gender, type of family of patients.

N = 100

Demographic variables	**Economic problem**			
	YES	NO	TOTAL	(χ2)
AGE (Years)				
30 – 44	17	21	38	0.26
45 – 60	31	31	62	

TOTAL	48	52	100	
GENDER				
Female	42	43	85	0.45
Male	06	09	15	
TOTAL	48	52	100	
TYPE OF FAMILY				
NUCLEAR	39	41	80	0.09
JOINT	09	11	20	
TOTAL	48	52	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 22 shows chi square tests of association are computed between the economic problem and patient's age, gender, type of family.

There is no statistically significant association is found between the economic problem and their age, gender, type of family. So, it can be concluded that the economic problem is not dependent on their age, gender and type of family in the present study.

Table 23 Chi square test of association between the economic problem (Non-adherence factor) of rheumatoid arthritis patients and monthly income, educational level, duration of illness of patients.

N = 100

Demographic variables	**Economic problem**			
	YES	NO	TOTAL	(χ2)
MONTHLY INCOME (Rs.)				
≤15000	30	38	68	1.28
>15000	18	14	32	
TOTAL	48	52	100	
EDUCATION				
Up to Secondary	33	41	74	1.32
Above Secondary	15	11	26	

TOTAL	48	52	100	
DURATION OF ILLNESS				
Less than or equal to 5 yrs.	21	22	43	0.02
More than 5 years	27	30	57	
TOTAL	48	52	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 23 shows chi square tests of association are computed between the economic problem and patient's monthly income, education and duration of illness.

There is no statistically significant association is found between the economic problem and their monthly income, education and duration of illness. So, it can be concluded that the economic problem is not dependent on their monthly income, educational level and duration of illness in the present study.

Table 24 Chi square test of association between the forgetfulness of taking medications (Non-adherence factor) of rheumatoid arthritis patients and age, gender, type of family of patients.

N = 100

Demographic variables	**Forgetfulness of taking medications**			
	YES	NO	TOTAL	(χ2)
AGE (Years)				
30 – 44	13	25	38	0.04
45 – 60	20	42	62	
TOTAL	33	67	100	
GENDER				
Female	28	57	85	0.0009
Male	05	10	15	
TOTAL	33	67	100	
TYPE OF FAMILY				
NUCLEAR	26	54	80	0.05
JOINT	07	13	20	
TOTAL	33	67	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 24 shows chi square tests of association are computed between the forgetfulness of taking medications and patient's age, gender, type of family.

There is no statistically significant association is found between the forgetfulness of taking medications and their age, gender, type of family. So, it can be concluded that the forgetfulness of taking medications is not dependent on their age, gender and type of family in the present study.

Table 25 Chi square test of association between the forgetfulness of taking medications (Non-adherence factor) of rheumatoid arthritis patients and monthly income, educational level, duration of illness of patients.

N = 100

Demographic variables	Forgetfulness of taking medications			
	YES	NO	TOTAL	(χ2)
MONTHLY INCOME (Rs.)				
≤15000	17	51	68	**6.15***
>15000	16	16	32	
TOTAL	33	67	100	
EDUCATION				
Up to Secondary	20	54	74	**4.59***
Above Secondary	13	13	26	
TOTAL	33	67	100	
DURATION OF ILLNESS				
Less than or equal to 5 yrs.	14	29	43	0.007
More than 5 years	19	38	57	
TOTAL	33	67	100	

Table value of Chi square: 3.84, df (1), p<0.05

Data presented in table 25 shows chi square tests of association between the forgetfulness of taking medications with patient's monthly income, education and duration of illness.

The calculated chi-square value (6.15) is more than tabled chi-square value i.e. 3.84. So, statistically significant association is found between the forgetfulness of taking medications and monthly income.

The calculated chi-square value (4.59) is more than tabled chi-square value i.e. 3.84. So, statistically significant association is found between the forgetfulness of taking medications and educational level.

So, it can be concluded that the forgetfulness of taking medications is dependent on their monthly income and educational level but not dependent on duration of illness in the present study.

Summary

This chapter deals with the analysis and interpretation of data collection from 100 clients with rheumatoid arthritis, using descriptive statistics in the form of frequencies, percentages, mean, bar diagram, pie diagram, chart diagram and inferential statistics in the form of significant correlation was used to find out significant association between treatment nonadherence factors and selected demographic variables. The next chapter would present major findings, discussions in relation to other studies, conclusion and limitations in the present study, implications and recommendations for future research.

CHAPTER -V

Discussion

This chapter deals with summary and major findings of the study, discussion in relation to the other studies, implications of the findings in the field of nursing practice, nursing education, nursing administration and nursing research. The researcher also tries to list certain limitations of the present study and recommendation for future studies. Limitations faced during the study has been shared. Some suggestions and recommendations for future research studies on associated topics also have been presented. Lastly the conclusion of the study prepared.

The discussion section is devoted to a thoughtful (and it is hoped, insightful) analysis of the findings, leading to a discussion of their clinical and theoretical utility.

Major findings of the study

Findings related to demographic characteristics of the rheumatoid arthritis patients

- Most of the patients were belonging to the 45-60 years of age group that was (62%).
- Majority (85%) of the patients were female.
- Majority (32%) of the patients were belonging to secondary level of education.
- Majority (75%) of the patients were non-professional.
- Majority of the patients (42%) were belonging to Rs. 5000 to Rs. 14999 monthly family income.
- (80%) of the rheumatoid arthritis patients were belonging to nuclear family.
- Majority (54%) of rheumatoid arthritis patients were staying in rural area.
- Maximum numbers (57%) of the rheumatoid arthritis patients were suffering from illness for more than 5 years.

Finding related to daily living activities of rheumatoid arthritis patients

- Majority of the patients (45%) had perceived their daily living activities as “Severe to Very severe Disability”, 43% patients perceived their daily living activities as “Moderate to Severe Disability” and 12% respondents perceived their daily living activities as “Mild to moderate difficulties” after they developed rheumatoid arthritis.

Findings related to lifestyle practices of rheumatoid arthritis patients

- The life style practices scores of the rheumatoid arthritis patients of the present study ranges from 10 to 20, mean is 15.14 with a standard deviation of 1.96 and the median is 15.
- Majority of the clients (76%) had perceived their life style practices as “average”, 16 % respondents perceived their life style practices as “poor” and 8% perceived their life style practices as “good” after they developed rheumatoid arthritis.

Findings related to factors influencing in treatment non-adherence

- Majority of the patients had poor support from their family (68%), followed by suffering from co-morbid disease (54%) and side effect of drugs (54%) which are influencing in treatment nob-adherence.
- The other non-adherence factors like economic problem (48%), non-availability of health care facilities (44%), lack of knowledge about medicine & disease (37%), long term treatment (37%), forgetfulness of taking medicines (33%), alternative therapy uses (32%), poor physician patient interaction (13%) are influencing in treatment non adherence of rheumatoid arthritis patients.

Findings related to the association between factors influencing in treatment nonadherence with selected demographic variables

- The calculated chi-square value showed that there was statistically significant association between lack of knowledge about medicine & disease of rheumatoid arthritis patients and education level.

- The calculated chi-square value showed that there were statistically significant association between poor physician & patient interaction and gender, monthly income, educational level.
- The calculated chi-square value showed that there was statistically significant association between the co-morbid disease and age.
- The calculated chi-square value showed that there were statistically significant association between the alternative therapy uses and gender, duration of illness.
- The calculated chi-square value showed that there was statistically significant association between the side effects of drugs and duration of illness.
- The calculated chi-square value showed that there are statistically significant association between the forgetfulness of taking medications and monthly income, educational level.

Discussion in relation to the other study

The study was conducted with the core purposes of assessing the factors influencing treatment nonadherence and its association with selected demographic variables and lifestyle practices of rheumatoid arthritis patients.

A descriptive design was used. The sample concluded 100 clients of rheumatoid arthritis undergoing deferent treatment modalities. A discussion on the basis of the findings of the present study in relation to other studies is presented below:

Another similar findings was found in another study by Annelike Pasma, Charlotte V. Schenk, Reinier Timman, on non-adherence to anti-rheumatic drugs is related with higher disease activity in RA patients in the first year of the treatment. This study showed that non-adherence is an important forecaster of higher disease activity in the initial six months of treatment. Since it is known from the review that it is important to reach remission as early possible to avoid permanent harm, so-called window of opportunity. So non-adherence requires more attention in the treatment of first year. Rheumatologists should consider that non-adherence is a major factor to take into account when treating the patient and assessing DMARD efficacy and side effects.[25]

In present study it was shown that the majority (85%) of the clients with rheumatoid arthritis were female and Most of the patients were belonging to the 45-60 years of age group that was (62%). Another similar finding was found in another study was conducted in university hospital in Brazil by Authors Prudente L, Diniz J, Ferreira T, Lima D, Silva N, Saraiva G, Silveira, Dewulf N, Amaral R. Female patients were maximum, 85 (92.39%), their age between 41 years and 59 years. The prevalence of medication adherence in RA patients was 16.4%. The socioeconomic and demographic data as well as the bivariate analyses between these variables and adherence are shown that drug treatment was significantly associated with the education qualification in the RA group and with acquisition of medications at the high-cost of medicine. No association significantly between medication adherence and health care service was observed. Adherence was significantly associated with the number of co-morbidities in the RA patients and closely significant in the RA patients. No associations between duration of treatment and complexity of the disease were noticed in the rheumatology arthritics patients. Adherence to medication was not associated with patients' perception or knowledge about the drug therapy, education level, occupation, city of origin, high-cost pharmacy, duration of therapy for rheumatic disease at the institution, and number of chronic comorbidities.[26]

A similar study from a rheumatology centre in the city of Guayaquil, Ecuador on Rheumatoid Arthritis by M. Intriago, G. Maldonadoand C. also showed that females were more involved in housework (66%), while men consumed more tobacco (34%) and alcohol (38%). Fatigue (60%), loss of appetite (54%), and weight loss (44%) were more common in females. No differences were found in comorbidities or treatment. Females had higher values of DAS-28, HAQ-DI, ESR, painful joints, swollen joints, and overall physician assessment. The results are the same as other publications that establish that women have greater activity with more aggressive disease and disability.[27]

Another similar finding was found in another study by Mario F Merengo and Mario E-Saurez Nonadherence behaviour can conceptually be categorized into unintentional or intentional. Forgetfulness is an important factor of unintentional nonadherence, on the other hand lack of understanding of proposed illnesses or events. Some patients decide to stop or modify the treatment without doctor's permission. This type of non-adherence is intentional nonadherence. e.g., lower dosages than those advised. Intentional nonadherence is changed by the patients' beliefs about the effectiveness of the healthcare suggestions, their knowledge regarding the disease and their self-confidence to achieve proposed health targets. Nonadherence is not only filling a prescription, many factors like not taking a correct dose or taking the medication at wrong times (underuse and overuse), stopping the treatment without a physician's or healthcare provider's suggestions (secondary noncompliance) and failing to make or attend recommended healthcare appointments.[28]

Another supported study by the author Amantha Joplin, Rick van der Zwan, and Peter K. K. Wong on medication adherence in patients with Rheumatoid Arthritis shows that Poor medication adherence is a complex issue. Low educational levels and limited health knowledge are important factors. Psychological models may assist in explaining medication nonadherence. Increasing patient knowledge of their disease seems sensible. Having educational interventions appear ineffective at improving medication adherence.[30]

The present study finding shows similarity with another study by A Caliskan Uckun, FG Yurdakul, H Bodur. As per the Morisky scale, 34.1%, 15.9% and 50% of our patients were grouped as low, moderate and high adherence, respectively. It is observed that non-adherence factors were forgetting medication, inadequate knowledge about instructions, side effects of drugs. demographic

features, duration of disease, type and number of drugs/days, co-morbid diseases, body mass index, smokers and alcoholic drinkers were not associated with treatment adherence, whereas low MMSE and high BDI score were significantly associated with low medication adherence. The study resulted that disease activity was significantly higher in non-adherent cases. It should be kept in mind that tight control and adequate communication increase medication adherence but different parameters may also be effective.[31]

The findings of the present study were also supported by Gadallah MA, Boulos DN, Gebrel A, Dewedar S, Morisky DE on the assessment of rheumatoid arthritis patients' adherence to treatment. As per Morisky's scale, 90.6% and 9.4% of RA patients were recorded as low and moderately adherent to treatment. respectively, none was recorded as highly adherent to treatment. Important barriers to adherence reported were fear of side effects, non-availability of free drugs in hospital pharmacy and cost of medications.[32]

The findings of the present study were also supported by MP Schwellnus, DN Patel, C Nossel , S Whitesman , EW Derman on healthy lifestyle interventions in general practice Part 11. Initially, the RA disease affects joints and muscles, which results in reduced joint range of motion, muscle strength and physical activity. So, it develops mental depression, low cardiovascular health and osteoporosis. The non-pharmacological and pharmacological management should be included in the principles of management of RA. Non-pharmacological as lifestyle interventions are important components of the treatment of the initial stage of arthritis, including RA. The main lifestyle interventions for RA are physical exercise, dietary intervention, psychological intervention and education.[19]

The findings of the present study were also supported by E. J. Hurksman, S. Maes, V. Degucht, K. Knittle, A. J. Peeters, findings indicate that patients' regulation style is related to their daily physical activity level. Age, gender, higher educational level, short term treatment duration, lower disease activity and a more self-determining regulation are the factors to help in the treatment of RA patients. This study therefore suggests that increasing patients' intrinsic motivation (autonomous regulation), perhaps through the use of motivational interviewing, may result in increased levels of physical activity among patients with RA.[34]

Another supported study by Carolin berner, Ludwig Erlacher, Karl H. Fenzl and Thomas E. Dorner, the descriptive statistics for demographic and clinical characteristics are presented on one hundred and twenty patients, most of them were women with an average age of 54 years and the majority of the patients were between 45 and 65 years. The result of this study was about half (N=63, 52.5%) of the total samples. The study was observed as fully medication adherent. However, in multivariate regression models, age, sex, monthly net income, and duration of disease were associated with nonadherence on medication among RA patients.[16]

The findings of the present study were also supported by Nordenskiöld U on daily living activities in women with rheumatoid arthritis. In this study, assistive devices did not affect the ratings by using the Health Assessment Questionnaire (HAQ) and grip force was correlated to more ADL. The Evaluation of Daily Activity Questionnaire (EDAQ) can be used to assess disability both without assistive devices and with some assistance. The EDAQ comprises of 102 items laid down in 11 dimensions. Assistive devices are much effective in dimensions like eating, cooking and toileting. The dimensions like dressing, washing or clothes care and cleaning are done by a few useful devices. The dimensional activities are arranged by ranging from "hard" to "easy" after analysis of the scores from EDAQ. The hardest items like shopping, cleaning of the kitchen floor and the easiest are walking indoors using a telephone. Women with RA have affected their performance of daily activities due to decreased grip force and pain.[37]

Implications:

The present study was conducted to know the lifestyle practices and influencing factors of treatment nonadherence which has become a quality indicator of the care offered and treatment adherence by the clients. The findings of the present study can be applied in various areas of nursing practice, nursing administration and nursing research.

Nursing practice:

- The findings will enable the nursing personnel working in the rheumatology and orthopaedic, physical medicine and outpatient department to be more focused, sensitive and competent in those areas.
- From the study findings after its publication, the nurse should earnestly gain knowledge about the lifestyle practices of rheumatoid arthritis patients.
- The study results help the nursing personnel about the need for information regarding the clinical manifestations, investigations, treatment modalities and follow up care.
- For the community health nurse, it will be very helpful for early identification and follow up care like other chronic diseases.
- The family members of the clients with rheumatoid arthritis also need to be educated on the various factors that will influence treatment adherence and good lifestyle practices.

Nursing education:

- Findings from the study indicate that the nurses are the primary caregiver and ones who provide orthopaedic and rehabilitative nursing care and hence their course should ideally include in-depth the centred approach of care of clients with rheumatoid arthritis patients.
- The lifestyle practices and treatment adherence are important aspects of most of the chronic diseases.

- The findings will be enabling the nurse administrators and nursing teachers to educate the nursing personnel by conducting in-service education regarding the lifestyle practices of RA.

Nursing administration:

Nursing administrators supervise and manage the nursing profession. The nursing administrators formulate the policies for assessment of factors influencing and good lifestyle of clients with rheumatoid arthritis. They can arrange workshops and continuing nursing education for staff nurses who will teach the clients in different settings for maintaining a better lifestyle. The administrators can arrange several programmes for the family members of the clients. They can help the clients for maintaining the treatment adherence and lifestyle in a better way at home. Nursing administrators also provide the facilities for self-help group and can provide teaching different methods through pamphlets, booklets, computers or video film.

Nursing Research:

One of the main aims of nursing research is to contribute knowledge to the body of nursing to expand and broaden the scope of nursing. This is possible only if a nurse is taking the initiative to conduct further research. Nursing is seeking to improve the practice of its members to enhance its professional status for continuous development of the relevant body of knowledge. Therefore, there is a further need to conduct an extensive study for more evidence-based information regarding this aspect. The result of this study, tool and methodology may provide guidelines for future research.

Limitation

The study findings could not be generalised because of the following causes:

- The study was limited to clients with rheumatoid arthritis in a selected setting.
- The Study was limited to the subjectivity of self-reports by the clients regarding their medical adherence and lifestyle practice
- The population was relatively small restricting the generalization of the findings.

Recommendations

On the basis of the study findings, the investigator makes the following recommendations.

- A similar study can be conducted with the larger sample on a long term and periodic basis to validate the findings and on treatment adherence factors and lifestyle at various points of management modalities.
- In-depth qualitative research can be employed to explore the experiences of the patients during illness and treatment and also to determine the important variable that influence treatment adherence.
- Studies can be done to compare the treatment adherence among clients with rheumatoid arthritis with modern allopathic modalities and alternative therapy.
- Studies can be done to compare the lifestyle of rheumatoid arthritis clients treated in the public and private sectors.
- A study can be conducted using different grades of rheumatoid arthritis.
- Long term follows up studies can be done.
- Studies can be employed to test the effectiveness of nursing interventions to improve the medical management and lifestyle of chronic conditions of the clients.

Conclusion

From this study it is shown that the study was done on one hundred (100) patients with rheumatoid arthritis. The majority of the findings revealed that most of the clients with rheumatoid arthritis experienced an average lifestyle. It was also highlighted that there were few demographic characteristics which had an impact on treatment nonadherence. Most of the clients were interested to share their lifestyle modification which was they adapted.

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