INFLUENCE OF MENOPAUSE ON RHEUMATOID ARTHRITIS IN MENOPAUSAL WOMEN ATTENDING CONSULTANT OUT- PATIENT DEPARTMENT IN UNIVERSITY OF BENIN TEACHING HOSPITAL

BY

EHIOGHAE PRECIOUS OSAVBIE

BMS2005062

FACULTY OF NURSING SCIENCES

COLLEGE OF MEDICAL SCIENCE

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IN PARTIAL FULFILMENT OF THE AWARD OF DEGREE OF BACHELOR OF NURSING SCIENCE,FACULTY OF NURSING SCIENCE, UNIVERSITY OF BENIN,BENIN CITY.

OCTOBER, 2025

DECLARATION

This is to declare that this research project titled **"INFLUENCE OF MENOPAUSE ON RHEUMATOID ARTHRITIS IN MENOPAUSAL WOMEN ATTENDING CONSULTANT OUT- PATIENT DEPARTMENT IN UNIVERSITY OF BENIN TEACHING HOSPITAL"** was carried out by **EHIOGHAE PRECIOUS OSAVBIE.** It is solely the result of my work except where acknowledged as being derived from other person(s) or resources.

FACULTY/COLLEGE: FACULTY OF NURSING SCIENCE

Signature:_____

Date: _____

CERTIFICATION/APPROVAL

This is to certify that this project was carried out by **EHIOGHAE PRECIOUS OSAVBIE** with matriculation number **BMS2005062**, FACULTY OF NURSING SCIENCE, under the supervision of **MRS M. A. INIOMOR.**

EHIOGHAE PRECIOUS OSAVBIE _____

Student Sign & Date

Mrs M. A. INIOMOR

_____

Project Supervisor Sign & Date

PROF. (MRS) C.E OMOROGBE _____

Head of Department (Medical Surgical Nursing). Sign & Date

_____ _____

External Examiner Sign & Date

ABSTRACT

This study investigates the influence of menopause on rheumatoid arthritis (RA) in menopausal women attending the Consultant Outpatient Department at the University of Benin Teaching Hospital (UBTH), Nigeria. Rheumatoid arthritis, a chronic autoimmune disorder, disproportionately affects women, with hormonal changes during menopause potentially exacerbating disease activity. The study aimed to assess the prevalence of RA among menopausal women, examine the perceived impact of menopause on RA symptoms, evaluate changes in disease progression post-menopause, and identify coping strategies for symptom management. A descriptive cross-sectional survey design was employed, with data collected from 144 menopausal women diagnosed with RA using a structured questionnaire. Convenience sampling was utilized, and statistical analysis was performed using SPSS version 27.0, incorporating descriptive and inferential statistics (Chi-square tests). Results revealed that 70.8% of respondents were menopausal at the time of RA diagnosis, with 83.3% reporting a formal RA diagnosis. Menopause was significantly associated with worsened joint pain (mean score = 4.64), increased stiffness, and heightened fatigue. A strong correlation (p = 0.000) was observed between menopausal status and RA diagnosis. Common coping strategies included dietary adjustments (mean = 4.34) and seeking emotional support (mean = 4.33). The study concludes that menopause significantly exacerbates RA severity and symptom progression, highlighting the need for integrated healthcare strategies that address both hormonal changes and RA management. Recommendations include improving patient-provider communication, developing tailored treatment plans, and further research into the biological mechanisms linking menopause and RA.

Keywords: Menopause, Rheumatoid Arthritis, Disease Activity, Coping Strategies, Hormonal Changes, Nigeria.

DEDICATION

This work is dedicated to Almighty God for his grace through the period of this research and to my dear parents.

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TABLE OF CONTENTS

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Rheumatoid arthritis (RA) is a chronic inflammatory autoimmune disorder that predominantly affects women, especially during their reproductive years and post-menopause. This disease is characterized by the body's immune system attacking its own joints, leading to pain, stiffness, swelling, and potential joint deformities (Desai, Federico, & Baker, 2022). As one of the most prevalent autoimmune diseases, RA significantly impairs the quality of life of those affected. Although RA can affect individuals of all ages, its prevalence and severity are notably higher in women, particularly postmenopausal women. This demographic is especially vulnerable to the combined effects of RA and the hormonal changes associated with menopause, leading to increased inflammation and disease progression (Finckh et al., 2022; Venetsanopoulou et al., 2023).

Menopause marks the end of a woman's reproductive years and is defined by the cessation of menstruation for 12 consecutive months. It typically occurs between the ages of 45 and 55 and is associated with a significant decrease in estrogen production by the ovaries (Motta, Di Simone, & Selmi, 2025). Estrogen, a key female sex hormone, has long been known to play a significant role in modulating immune function. Its decline during menopause is hypothesized to contribute to the exacerbation of autoimmune diseases such as RA (Raine & Giles, 2022). In RA patients, the deficiency of estrogen may lead to increased production of pro-inflammatory cytokines and activation of immune cells, promoting joint damage and disease flare-ups (Ali et al., 2024). There is substantial evidence suggesting that menopause affects RA in multiple ways. Studies indicate that postmenopausal women experience an increase in disease activity, with higher rates of joint pain, stiffness, and fatigue compared to their

premenopausal counterparts (Cutolo & Gotelli, 2023; Salliot et al., 2021). Moreover, early onset of menopause, whether natural or surgical, has been linked to an increased risk of developing RA and poorer disease outcomes (Yang et al., 2024; Park et al., 2023). These findings point to the possible influence of hormonal changes on the immune system, suggesting that estrogen has a protective effect against the inflammatory processes that characterize RA. In addition to hormonal factors, other variables such as genetics, lifestyle, and environmental exposures play a role in the development and progression of RA in menopausal women. For instance, women with a history of prolonged hormone replacement therapy (HRT) have been observed to have different disease trajectories compared to those without such treatment (Desai et al., 2022). Lifestyle factors such as diet, exercise, and stress management may also influence the severity of RA symptoms. Recent studies have highlighted the importance of these factors in modifying disease outcomes, with physical activity programs demonstrating significant benefits in reducing inflammation and improving overall function in postmenopausal women with RA (Yun et al., 2023; Chandra et al., 2024).

The clinical implications of the menopause-RA link are particularly relevant in the context of healthcare settings like the University of Benin Teaching Hospital (UBTH), where a significant number of patients seek care for RA and related conditions. The outpatient department (OPD) at UBTH serves as a critical healthcare service for women in the region, providing both preventive and therapeutic interventions. However, the specific impact of menopause on RA in women attending the UBTH OPD remains underexplored. This gap in the literature calls for focused research on how menopause influences the experience of RA in this population, considering unique cultural, environmental, and healthcare factors specific to Benin City, Edo State.

Research has shown that while menopause is a universal biological process, its effects can vary significantly across populations due to differences in genetics, access to healthcare, and socio-

economic conditions (Zhu et al., 2021). In Nigeria, there is limited research on the intersection of menopause and RA, particularly within the setting of a teaching hospital like UBTH. Therefore, investigating how menopause influences RA among women attending the UBTH outpatient department can provide crucial insights into disease management, treatment outcomes, and the specific needs of this patient group.

Moreover, the importance of personalized care cannot be overstated in the management of RA in menopausal women. While general treatment guidelines for RA exist, factors such as the timing of menopause, age at disease onset, comorbidities, and hormonal status must be integrated into treatment plans to ensure the best outcomes (Carmona et al., 2023). With the increasing burden of RA in older women, particularly in developing regions, addressing these nuanced issues in clinical practice could improve quality of care and provide a more comprehensive approach to managing RA in postmenopausal women. This study, therefore, aims to investigate the influence of menopause on rheumatoid arthritis in menopausal women attending the outpatient department of the University of Benin Teaching Hospital. By exploring the relationship between menopausal status and RA symptomatology, treatment response, and quality of life, the study seeks to contribute valuable data to the management and understanding of RA in this unique population.

1.2 Statement of the Problem

Rheumatoid arthritis (RA) is a chronic autoimmune disorder that predominantly affects women, especially postmenopausal women, due to hormonal changes. The influence of menopause on the onset, severity, and progression of RA in menopausal women is a critical issue that remains underexplored in the context of African populations. While RA is known to cause inflammation, pain, and joint damage, the hormonal shifts that occur during menopause are suspected to exacerbate these symptoms. However, there is limited empirical evidence on

the specific relationship between menopause and RA, particularly among women in Nigeria. This gap in knowledge points to a need for a focused study in this demographic.

Rheumatoid arthritis (RA) is a condition that primarily affects women, with a higher prevalence observed in postmenopausal individuals. The autoimmune nature of RA, combined with hormonal changes during menopause, may contribute to the worsening of symptoms or the acceleration of disease progression (Finckh et al., 2022). Menopause marks the end of a woman's reproductive period, characterized by a significant reduction in estrogen levels, which plays a role in immune system regulation (Cutolo & Gotelli, 2023). Estrogen deficiency has been linked to altered immune responses, potentially increasing the risk of autoimmune diseases like RA (Carmona et al., 2023). In postmenopausal women, the interaction between menopause and RA is further complicated by other factors such as age, genetic predisposition, and lifestyle factors (Venetsanopoulou et al., 2023). Previous studies suggest that early menopause may lead to more severe RA symptoms, including increased pain, joint damage, and disability (Park et al., 2023; Namavari et al., 2024). Yet, many studies focus on populations in Western countries, and there is a paucity of research in African settings, particularly in Nigeria. The lack of region-specific studies prevents a comprehensive understanding of how menopause influences RA in these women, thus limiting the development of tailored health interventions.

RA is a major health burden in Nigeria, with a growing number of women diagnosed each year. According to recent reports, the prevalence of RA in Nigerian women is substantial, though there is no specific data on its interaction with menopause (Zhu et al., 2021). It is estimated that 1 in 100 women globally will develop RA, with the condition often becoming more pronounced after menopause (Finckh et al., 2022). In Nigeria, the menopausal age typically occurs around 50 years, which coincides with the peak age for RA development in women (Zhou et al., 2025). The interaction between these two factors in Nigerian women is poorly

understood, suggesting that this problem could have significant health and social implications for affected individuals. Failure to address the influence of menopause on RA in Nigerian women may lead to delayed diagnosis, poor disease management, and unnecessary suffering. As menopause progresses, the hormonal imbalance may exacerbate the inflammatory processes associated with RA, increasing the risk of joint deformities, functional disability, and chronic pain (Zhu et al., 2021). This can result in a decline in quality of life, making it difficult for affected women to maintain their daily activities and employment (Bucourt et al., 2021). Furthermore, the economic burden on families and healthcare systems could be substantial if effective interventions and management strategies are not developed. In addition to physical health risks, there is a social burden, as women with chronic RA may experience stigma, discrimination, and isolation. The lack of specialized care and awareness regarding menopause-related RA challenges exacerbates this situation, especially in under-resourced settings like Nigeria. These consequences underscore the urgency of conducting this research to identify potential links between menopause and RA in Nigerian women.

While several studies have explored the connection between menopause and RA in Western populations (Carmona et al., 2023; Cutolo & Gotelli, 2023), there is a noticeable lack of research focused on the African context. Specifically, there is insufficient evidence regarding how menopause influences RA symptoms and disease progression in Nigerian women. The existing studies, such as those by Namavari et al. (2024) and Park et al. (2023), mainly emphasize demographic groups outside of Africa, leaving a critical gap in understanding the unique challenges faced by African women with RA. Additionally, studies on the prevalence and epidemiology of RA in Nigeria often fail to address the influence of menopause on the condition (Finckh et al., 2022). This gap in the literature highlights the need for localized research to better inform healthcare practices and intervention strategies for menopausal women with RA in Nigeria. This study seeks to address the identified knowledge gap by

exploring the impact of menopause on the onset, severity, and management of RA among women attending the outpatient department of the University of Benin Teaching Hospital. By assessing the clinical outcomes and lifestyle factors of these women, the study aims to contribute valuable data that can inform healthcare policies and lead to the development of more effective, tailored treatments. This research will also provide insights into how menopausal status may influence RA progression, leading to better healthcare strategies and support systems for menopausal women living with RA. Furthermore, the study's findings could enhance the understanding of the intersection between menopause and RA, informing future research and improving patient outcomes in Nigeria and similar settings.

1.3 Objectives of the study

The general objective of the study is to assess the Influence of menopause on rheumatoid arthritis in menopausal women.

The specific objectives are:

1. To assess the prevalence of rheumatoid arthritis amongst menopausal women attending consultant out- patient clinic in UBTH.
2. To examine the perceived influence of menopause on rheumatoid arthritis (RA) disease activity among menopausal women attending consultant out- patient clinic in UBTH.
3. To assess menopausal women's perceptions of changes in rheumatoid arthritis symptoms following the onset of menopause attending consultant out- patient clinic in UBTH.
4. To identify coping strategies adopted by menopausal women in managing rheumatoid arthritis symptoms attending consultant out- patient clinic in UBTH.

1.4 Research questions

1. What is the prevalence of rheumatoid arthritis amongst menopausal women attending consultant out- patient clinic in UBTH?

2. What are the perceived influence of menopause on rheumatoid arthritis (RA) disease activity among menopausal women attending consultant out- patient clinic in UBTH?
3. What are the perceptions of menopausal women attending consultant out- patient clinic in UBTH of changes in rheumatoid arthritis symptoms following the onset of menopause?
4. What are the coping strategies adopted by menopausal women attending consultant out-patient clinic in UBTH in managing rheumatoid arthritis symptoms?

1.5 Hypothesis

1. There is no significant relationship between menopause and rheumatoid arthritis in menopausal women women attending consultant out- patient clinic in UBTH.

1.6 Significance of the Study

To the Nursing Profession

The findings from this study will contribute to the body of knowledge about the intersection between menopause and rheumatoid arthritis (RA) in Nigerian women. By examining how menopause influences RA progression, nurses, especially those working in outpatient and chronic disease management settings, can better understand the specific needs of menopausal women with RA. The study will provide valuable insights into the challenges faced by this population, enabling nurses to develop more individualized care plans that take into account the hormonal and physiological changes occurring during menopause. This could lead to improved patient outcomes, better disease management, and enhanced quality of life for women living with both RA and the challenges of menopause. Moreover, the study will highlight the importance of considering gender and age-specific factors when designing nursing interventions for chronic conditions, ultimately advancing the nursing profession's role in holistic care.

To Healthcare Providers

This research will be of great value to healthcare providers, including physicians, physiotherapists, and clinical researchers. By exploring the influence of menopause on RA, healthcare providers will gain a clearer understanding of how hormonal changes can affect the severity and progression of rheumatoid arthritis in postmenopausal women. The findings may inform clinical decision-making, including more tailored treatment options and interventions that address both the inflammatory aspects of RA and the complications associated with menopause. Additionally, healthcare providers will be better equipped to educate women on how menopause may impact their RA symptoms, enabling them to provide more effective counselling and preventive strategies. This could lead to the development of new, integrated treatment protocols that consider both menopausal and autoimmune disease management.

To Society

On a broader scale, the significance of this study extends to society at large. RA and menopause affect a significant portion of the female population globally, with a substantial number of Nigerian women at risk. By addressing the impact of menopause on RA, this research has the potential to increase public awareness about the complex relationship between these two conditions, particularly in African settings where such studies are limited. Public health policies can be shaped by the findings, leading to the development of community-based interventions and health education campaigns aimed at improving the early detection and management of RA in menopausal women. Additionally, societal understanding of how menopause can exacerbate RA symptoms may reduce the stigma associated with both conditions and promote empathy and support for those affected. Ultimately, the study will contribute to the overall well-being of women, ensuring that they receive timely and appropriate care that addresses both their menopausal and rheumatoid arthritis-related health needs.

1.7 Scope of the Study

This study will focus on the influence of menopause on rheumatoid arthritis (RA) in menopausal women attending the outpatient clinic at the University of Benin Teaching Hospital, Benin City, Edo State, Nigeria. The research will specifically examine how menopausal hormonal changes affect the severity and progression of RA symptoms. Data will be collected from a sample of menopausal women diagnosed with RA, exploring factors such as age at menopause onset, disease duration, medication use, and quality of life**.**

1.8 Operational Definition of Terms

Menopause: A natural biological process marking the cessation of a woman's menstrual periods for 12 consecutive months, typically occurring between the ages of 45 and 55, due to a decline in ovarian function. In this study, menopause will be defined as the absence of menstrual periods for at least one year without any other medical cause.

Rheumatoid Arthritis (RA): A chronic inflammatory autoimmune disease that primarily affects the joints, leading to pain, stiffness, swelling, and potential joint deformities. RA diagnosis will be based on the American College of Rheumatology criteria for classification.

Outpatient Clinic (OPC): The section of the University of Benin Teaching Hospital where patients with non-emergency medical conditions are treated and monitored without being admitted to the hospital. Participants in this study will be recruited from the RA clinic within the OPC.

Menopausal Women: Women who have experienced the natural biological transition of menopause, defined as the cessation of menstrual periods for at least 12 consecutive months. This phase is characterized by a decrease in ovarian function and a reduction in estrogen and progesterone production. In this study, menopausal women will refer to those who are either in the peri-menopausal stage (the transitional period leading up to menopause) or have completed menopause, defined as 12 months without menstruation.

CHAPTER TWO

LITERATURE REVIEW

This chapter focuses on the review of related literature under the following headings; conceptual review, theoretical review and empirical review. Necessary literature would be gotten from published and unpublished works, articles and journals in this study.

2.1 Conceptual review

2.1.1 Concept of Menopause

Menopause is a natural biological process that signifies the permanent cessation of menstruation due to the depletion of ovarian follicles and the consequent decline in estrogen production. It is clinically diagnosed after twelve consecutive months of amenorrhea without any pathological or physiological causes. Typically, menopause occurs between the ages of 45 and 55 years, with the average age being around 51 years (World Health Organization [WHO], 2022). This transition marks the end of a woman's reproductive years and is often accompanied by a variety of physiological and psychological changes. These may include hot flashes, night sweats, mood swings, sleep disturbances, vaginal dryness, and a general decline in physical energy. While menopause is a normal phase in a woman's life, it can also be associated with increased vulnerability to various chronic health conditions, including osteoporosis, cardiovascular diseases, and autoimmune disorders like rheumatoid arthritis (Santoro, 2021).

2.1.2 Concept of Rheumatoid Arthritis (RA)

Rheumatoid arthritis (RA) is a chronic, systemic autoimmune disease primarily affecting the synovial joints. It is characterized by persistent inflammation of the synovial membrane, which leads to joint swelling, pain, stiffness, and progressive joint destruction if left untreated. RA may also affect other organ systems, including the lungs, heart, and eyes, making it a multi-

systemic condition (Finckh et al., 2022). The exact etiology of RA remains unclear, but it is believed to result from a complex interplay of genetic, environmental, and hormonal factors that trigger immune system dysfunction. The disease is more prevalent in women than men, with a female-to-male ratio of approximately 3:1, and its onset is often seen between the ages of 30 and 60 years (Venetsanopoulou et al., 2023). Importantly, hormonal changes, especially those related to estrogen levels, have been implicated in the pathogenesis and progression of RA, suggesting a potential link between menopause and worsening disease activity in affected women.

2.1.3 Hormonal Changes during Menopause

Menopause is accompanied by significant hormonal changes, the most notable being the decline in circulating estrogen and progesterone levels due to reduced ovarian function. Estrogen, which plays a crucial role in regulating various physiological systems, including the reproductive, cardiovascular, skeletal, and immune systems, gradually diminishes as a woman transitions into menopause (Zhu et al., 2021). The reduction in estrogen leads to a hormonal imbalance that can have systemic effects. For instance, low estrogen levels are known to contribute to increased bone resorption, altered lipid metabolism, and vascular changes, thereby raising the risk of osteoporosis and cardiovascular disease. Moreover, estrogen has anti-inflammatory and immunomodulatory properties; hence, its deficiency is thought to enhance the inflammatory processes associated with autoimmune diseases such as rheumatoid arthritis (Zhou et al., 2025). This hormonal shift may not only influence the onset of RA but also exacerbate its severity and frequency of flare-ups in menopausal women.

2.1.4 Pathophysiology of Rheumatoid Arthritis (RA)

Rheumatoid arthritis (RA) is a complex, chronic autoimmune disease marked by persistent inflammation of the joints and systemic involvement that can lead to significant disability. The

pathophysiology of RA is primarily driven by an abnormal immune response that targets the synovial membrane—the lining of the joints. The disease process begins when antigen-presenting cells activate CD4+ T-cells, which in turn stimulate the release of pro-inflammatory cytokines such as tumor necrosis factor-alpha (TNF-α), interleukin-1 (IL-1), and interleukin-6 (IL-6). These cytokines recruit and activate other immune cells, including macrophages and B-cells, intensifying the inflammatory response within the joint (Venetsanopoulou et al., 2023).

This cascade of inflammation leads to synovial hyperplasia, commonly known as pannus formation, where the synovial lining becomes thickened and infiltrated with immune cells. The pannus invades and erodes cartilage and bone, causing joint deformity and loss of function over time. Additionally, activated B-cells produce autoantibodies such as rheumatoid factor (RF) and anti-citrullinated protein antibodies (ACPAs), which further contribute to immune complex formation and chronic inflammation (Finckh et al., 2022).

Importantly, RA is not confined to the joints; systemic manifestations can involve the lungs, heart, eyes, and blood vessels. Chronic inflammation increases the risk of cardiovascular disease, anemia of chronic disease, and interstitial lung disease, among other complications. The pathophysiology of RA is therefore not only joint-destructive but also systemically disabling, with a broad impact on overall health and quality of life.

2.1.5 Relationship between Hormones and Immune Function

The interplay between the endocrine and immune systems plays a critical role in the modulation of immune responses. Hormones, particularly sex hormones like estrogen and progesterone, exert significant effects on immune function, which may help explain gender differences in the prevalence and progression of autoimmune diseases such as RA. Estrogen, for instance, has both immunostimulatory and immunosuppressive effects, depending on its concentration and the immune cell type involved. At physiological levels, estrogen enhances humoral immunity

by stimulating B-cell activation and antibody production, while also modulating the activity of T-cells and macrophages (Zhu et al., 2021).

During the reproductive years, the relatively stable levels of estrogen are believed to help maintain immune homeostasis. However, in menopause, estrogen levels decline sharply, leading to a shift in immune balance. This decline can result in an increase in pro-inflammatory cytokines such as TNF-α, IL-1, and IL-6—key mediators in RA pathogenesis. Furthermore, estrogen normally inhibits the expression of adhesion molecules and chemokines that promote leukocyte infiltration into tissues. When estrogen levels drop, this inhibition is lost, potentially increasing immune cell migration into the synovial membrane and exacerbating inflammation (Zhou et al., 2025).

The hormonal changes associated with menopause may therefore explain why women with RA often experience disease onset or exacerbation during this stage of life. Additionally, studies have shown that women who enter menopause early, either naturally or surgically, have a higher risk of developing RA (Zhu et al., 2021). This connection underscores the importance of considering hormonal status in the clinical management of RA and further highlights the intricate link between hormones and immune function.

2.1.6 Epidemiology and Prevalence of Rheumatoid Arthritis in Women

Rheumatoid arthritis (RA) is a major public health concern worldwide, affecting approximately 0.5% to 1% of the global population. It is characterized by chronic inflammation of the joints, which, if left untreated, can lead to significant disability and a diminished quality of life. The epidemiology of RA reveals notable variations across different populations, influenced by genetic, environmental, and hormonal factors.

Globally, women are disproportionately affected by RA compared to men, with a female-to-male ratio of about 3:1 (Finckh et al., 2022). This gender disparity is especially prominent in women during and after the menopausal transition, suggesting a potential link between sex

hormones and immune function. According to global data, the highest prevalence of RA is observed in North America and Northern Europe, with increasing rates being reported in developing countries as diagnostic capabilities improve. For instance, in a recent global review, Finckh et al. (2022) reported that RA prevalence in developed countries ranges between 0.5% and 1%, while it may be underreported in low-income regions due to limited access to healthcare services and diagnostic tools.

In the local context, data from Nigeria and other Sub-Saharan African countries are relatively scarce, but emerging studies indicate a rising trend. According to Zhou et al. (2025), there is a growing burden of RA in countries like China, with projections showing a significant increase in prevalence through 2030. Similarly, limited but growing data from West African regions show that RA, though once considered rare, is now being diagnosed more frequently due to increased awareness and improved diagnostic capacity.

Age is another critical determinant in the epidemiology of RA. While the disease can manifest at any age, its onset most commonly occurs between the ages of 40 and 60. The incidence tends to increase with age, particularly among women. Postmenopausal women are at a significantly higher risk, potentially due to the hormonal changes that occur during this period. Research by Zhu et al. (2021) highlighted that the decline in estrogen following menopause may contribute to heightened immune activation, thereby increasing the risk of developing RA. Furthermore, women who experience early menopause have been shown to have an even higher risk of developing RA, reinforcing the link between reproductive hormones and autoimmune disease susceptibility.

In terms of gender distribution, the reasons for female predominance in RA are not yet fully understood but are thought to be multifactorial. Genetic susceptibility, particularly variations in the HLA-DRB1 gene, combined with hormonal influences, may account for much of the increased risk in women. Additionally, the immune systems of females are generally more

robust and reactive than those of males, which, while advantageous in fighting infections, may predispose women to autoimmune diseases like RA.

2.1.7 Impact of Menopause on the Onset and Progression of Rheumatoid Arthritis

Menopause, a natural biological transition marked by the cessation of menstruation and a significant decline in ovarian hormone production, particularly estrogen, has profound implications on various physiological systems—including the immune and musculoskeletal systems. Among its most notable effects is its influence on the onset and progression of autoimmune diseases such as rheumatoid arthritis (RA). A growing body of evidence suggests that the hormonal changes occurring during menopause play a pivotal role in the initiation and worsening of RA symptoms in women.

One of the critical hormonal influences during menopause is the reduction of estrogen levels. Estrogen is known to have both anti-inflammatory and immunomodulatory effects, playing a protective role in joint health. During a woman's reproductive years, adequate levels of estrogen help regulate immune responses, limit excessive inflammation, and promote the maintenance of bone and joint tissues. However, with the onset of menopause, the decline in estrogen removes this protective effect, leading to increased joint vulnerability and inflammation. This hormonal shift can trigger the onset of RA in predisposed individuals and may also accelerate the disease course in those already diagnosed.

Hormonal influence on joint inflammation is significant in this context. Estrogen deficiency has been associated with increased production of pro-inflammatory cytokines such as tumor necrosis factor-alpha (TNF-α), interleukin-1 (IL-1), and interleukin-6 (IL-6), which are key mediators in the inflammatory cascade characteristic of RA. These cytokines promote synovial inflammation, pannus formation, and subsequent joint destruction—hallmarks of the disease. Additionally, the absence of estrogen may lead to increased activation of osteoclasts, contributing to bone erosion, a common complication in RA.

The relationship between estrogen and immune function also extends to the regulation of B and T lymphocytes, the immune cells central to the development of autoimmune diseases. Estrogen plays a role in maintaining a balanced immune response, suppressing autoreactive T-cells and promoting the survival of regulatory T-cells that prevent autoimmunity. In menopausal women, the loss of estrogen results in immune dysregulation, favoring autoantibody production and the persistence of inflammatory responses. This immune imbalance is a key factor in the pathogenesis and exacerbation of RA symptoms post-menopause.

Several studies support the link between menopause and increased RA risk. For example, Zhu et al. (2021) demonstrated through Mendelian randomization that women who undergo early menopause are at a higher risk of developing RA compared to those who experience menopause at a later age. This suggests that the duration of estrogen exposure may be inversely related to RA risk. Furthermore, observational data indicate that women often report an intensification of joint pain and stiffness around the time of menopause, aligning with the biological changes in hormonal levels.

2.1.8 Clinical Manifestations of Rheumatoid Arthritis in Menopausal Women

Rheumatoid arthritis (RA) is a chronic, systemic autoimmune disorder that primarily targets synovial joints but also has widespread systemic effects. In menopausal women, the clinical presentation of RA can be particularly complex due to the interaction between autoimmune processes and hormonal changes associated with menopause. The overlapping symptoms of menopause and RA, such as fatigue, mood disturbances, and musculoskeletal discomfort, often make diagnosis and management more challenging in this population.

The hallmark feature of RA is **persistent joint inflammation**, which most commonly affects the small joints of the hands, wrists, and feet. In menopausal women, these symptoms often present as morning stiffness lasting longer than 30 minutes, symmetrical joint pain, swelling,

warmth, and limited range of motion. Joint stiffness and pain are typically more pronounced upon waking or after periods of inactivity, and may become progressively worse if untreated. The menopausal transition, characterized by estrogen deficiency, can exacerbate these joint symptoms by promoting inflammation and reducing the body's ability to repair joint tissues.

Another prominent and often debilitating symptom of RA in menopausal women is **fatigue**. This fatigue is not simply tiredness; it is profound and persistent, often described as overwhelming physical and mental exhaustion that is not relieved by rest. It is thought to result from a combination of chronic systemic inflammation, hormonal imbalance, poor sleep quality, and the psychological burden of living with a chronic illness. The co-occurrence of menopausal symptoms such as night sweats, insomnia, and mood swings further amplifies fatigue, reducing overall quality of life and daily functioning.

In addition to joint-related symptoms and fatigue, **comorbidities** are a significant concern in menopausal women with RA. The inflammatory nature of RA places patients at increased risk for a range of comorbid conditions. Cardiovascular disease is one of the most serious complications, as systemic inflammation contributes to atherosclerosis, while estrogen loss during menopause further increases cardiovascular risk. Osteoporosis is another prevalent comorbidity due to the combined effects of inflammation, reduced physical activity from joint pain, and estrogen deficiency, which accelerates bone loss. As a result, menopausal women with RA are at heightened risk for fractures and reduced bone density.

Other common comorbidities include depression and anxiety, which are often underdiagnosed in this population. The emotional toll of chronic pain, fatigue, body image concerns, and loss of functional independence contributes to poor mental health outcomes. Moreover, menopausal women with RA may also face increased risk of metabolic syndrome, diabetes, and obesity, which can further complicate disease management and exacerbate joint symptoms.

2.1.9 Management and Coping Strategies for Rheumatoid Arthritis in Menopausal Women

Managing rheumatoid arthritis (RA) in menopausal women presents unique challenges due to the complex interplay between hormonal changes and autoimmune mechanisms. Effective management requires a comprehensive approach that addresses not only the inflammatory processes of RA but also the physiological and psychosocial effects of menopause. Treatment and coping strategies typically encompass pharmacological interventions, lifestyle and behavioural modifications, and the support of a coordinated healthcare team, with nurses playing a pivotal role in patient care.

Pharmacological Interventions

Pharmacological treatment is the cornerstone of RA management. The primary goal of medical therapy is to control inflammation, relieve symptoms, prevent joint damage, and preserve functional ability. The main classes of drugs used in RA include nonsteroidal anti-inflammatory drugs (NSAIDs), corticosteroids, disease-modifying antirheumatic drugs (DMARDs), and biologic agents.

NSAIDs are commonly prescribed to reduce pain and inflammation, offering quick relief for symptoms. However, long-term use is associated with gastrointestinal, renal, and cardiovascular risks, especially in older women. **Corticosteroids**, such as prednisone, are used to manage acute flare-ups and provide rapid anti-inflammatory effects but can contribute to osteoporosis and other side effects when used chronically—an important consideration in menopausal women who already face increased bone loss.

Conventional DMARDs, such as methotrexate, are used to slow disease progression by targeting the immune system. These drugs are effective in reducing joint damage but require regular monitoring due to potential liver and blood toxicity. Biologic DMARDs and targeted synthetic DMARDs represent a more advanced therapeutic option. These agents, including

tumor necrosis factor (TNF) inhibitors and interleukin blockers, offer significant improvements in patients with moderate to severe RA who do not respond well to conventional therapies.

In menopausal women, pharmacological treatment plans must also consider hormonal therapy. Estrogen replacement therapy (ERT) has been explored for its potential benefits in alleviating menopausal symptoms and reducing joint pain; however, its use remains controversial due to associated risks such as breast cancer and cardiovascular disease. Therefore, any hormonal therapy must be carefully evaluated on a case-by-case basis.

Physical Activity and Lifestyle Modifications

Non-pharmacological strategies are essential to complement drug therapy and promote overall well-being. Regular **physical activity** is highly beneficial for managing RA symptoms, improving joint mobility, enhancing muscle strength, and reducing fatigue. Low-impact exercises such as walking, swimming, and yoga are especially recommended for menopausal women with RA, as they are gentle on the joints while helping to maintain cardiovascular health and bone density.

Lifestyle modifications also include maintaining a healthy diet rich in anti-inflammatory foods like fruits, vegetables, omega-3 fatty acids, and whole grains. Weight management is crucial, as excess body weight increases stress on joints and contributes to systemic inflammation. In addition, adequate sleep, stress reduction techniques (such as mindfulness and meditation), and smoking cessation play a critical role in managing symptoms and improving long-term outcomes.

2.1.10 Role of Nursing and Multidisciplinary Care

The role of nurses and a **multidisciplinary care team** is fundamental in the holistic management of RA in menopausal women. Nurses are often the primary point of contact for patients and play an essential role in assessment, education, counselling, and monitoring of

disease progression and treatment side effects. They educate patients about medication adherence, symptom tracking, self-care strategies, and lifestyle adjustments.

A multidisciplinary team may include rheumatologists, endocrinologists, physical therapists, dietitians, and mental health professionals. This collaborative approach ensures that the physical, emotional, and social needs of the patient are addressed. For instance, physiotherapists can design exercise programs tailored to an individual's limitations, while dietitians can help optimize nutrition to support immune function and bone health.

Furthermore, psychological support is vital for coping with chronic illness and the emotional impact of menopause. Support groups, counselling services, and mental health professionals can provide the emotional resilience needed to manage the daily challenges of living with RA.

2.2 Theoretical review

The study adopted The Biopsychosocial Model, developed by George Engel in 1977, offers a comprehensive framework for understanding health and illness by integrating biological, psychological, and social dimensions. Unlike traditional biomedical models that focus solely on physical or biological causes of disease, the biopsychosocial approach recognizes that health outcomes are the result of complex interactions among physiological processes, individual behaviours, mental states, and social contexts.

At the core of this model is the belief that an individual cannot be fully understood or treated in isolation from their emotional and environmental context. This is especially relevant in chronic illnesses like rheumatoid arthritis (RA), which affect not just physical health but also emotional well-being and social functioning. Similarly, menopause is not merely a biological transition, but a life phase that intersects with psychological changes and shifts in social roles and identity.

From the biological perspective, the model considers hormonal fluctuations during menopause—especially estrogen deficiency—as significant contributors to the immune

system's behaviour and the inflammatory processes underlying RA. Estrogen has known anti-inflammatory properties, and its decline in menopausal women has been linked to the worsening of autoimmune conditions, including RA.

The psychological component of the model highlights the mental health challenges faced by menopausal women dealing with RA. These may include stress, anxiety, depression, and fatigue, which can all exacerbate disease symptoms and impact quality of life. Pain perception, motivation for self-care, and coping mechanisms are all shaped by psychological factors, making them essential in disease management.

The social aspect of the model focuses on factors such as access to healthcare, support from family and community, cultural attitudes toward menopause and chronic illness, and socio-economic conditions. These factors can influence treatment adherence, health-seeking behaviour, and overall disease outcomes. For example, women who have strong family or social support systems may cope better with the dual challenges of RA and menopause than those who are isolated or stigmatized.

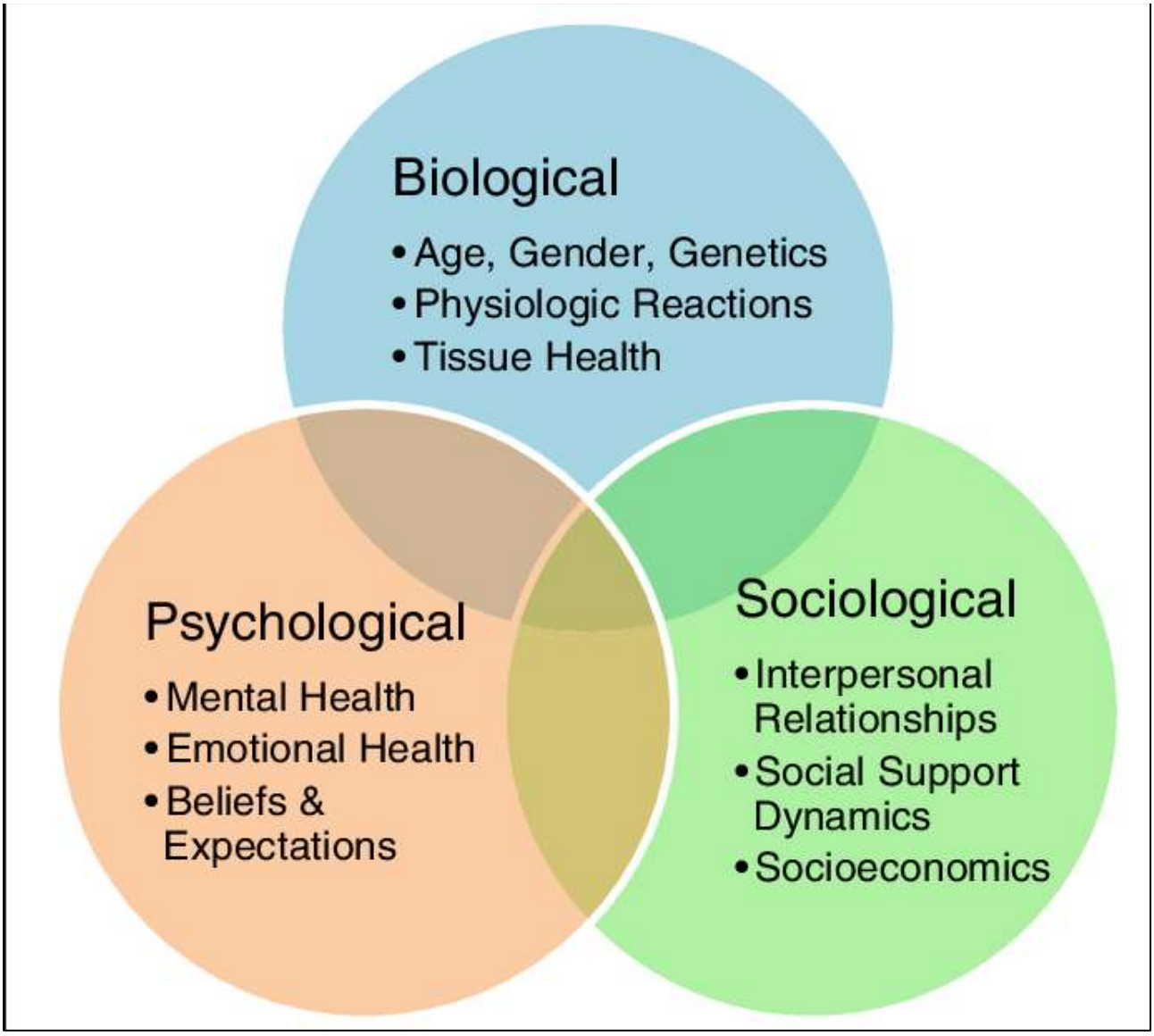


Figure 1: The Biopsychosocial Model

2.2.2 Application of the Theory.

The Biopsychosocial Model, originally proposed by George Engel, offers a holistic approach to understanding health and illness by integrating biological, psychological, and social dimensions. This model is particularly relevant to this study, which investigates the influence of menopause on rheumatoid arthritis (RA) in menopausal women attending the consultant out-patient clinic of the University of Benin Teaching Hospital, Benin City, Edo State. Each of the study's specific objectives aligns with a facet of this model, offering a

comprehensive framework for analyzing the multifactorial nature of RA during menopause.

The first objective, to assess the prevalence of rheumatoid arthritis among menopausal women, falls primarily within the biological dimension of the Biopsychosocial Model. This component considers genetic predisposition, hormonal fluctuations, immune function, and the physiological changes that occur during menopause, which can contribute to the onset or exacerbation of RA. Understanding the prevalence helps to identify the scale of the biological burden within this population and informs health planning and resource allocation.

The second objective, to examine the perceived influence of menopause on rheumatoid arthritis (RA) disease activity among menopausal women, reflects an intersection of both biological and psychological domains. Biologically, menopause triggers estrogen deficiency, which can influence immune modulation and joint inflammation. Psychologically, women's perceptions of their condition may be shaped by pain sensitivity, mood disturbances, or anxiety related to both menopause and chronic illness. The model thus allows for an integrated assessment of physiological symptoms and the subjective experience of disease activity.

The third objective, to assess menopausal women's perceptions of changes in rheumatoid arthritis symptoms following the onset of menopause, aligns closely with the psychological domain. The Biopsychosocial Model emphasizes the importance of individuals' perceptions and interpretations of their symptoms. These perceptions may be influenced by personal expectations, emotional resilience, mental health status, and previous experiences with RA, all of which affect symptom reporting and health behavior.

The fourth objective, to identify coping strategies adopted by menopausal women in managing rheumatoid arthritis symptoms, is embedded within the psychosocial aspect of

the model. Coping mechanisms—whether pharmacological, behavioral, or social—are shaped by access to healthcare, social support systems, cultural beliefs, and individual resilience. This model enables exploration of how social interactions, community support, health education, and nursing interventions contribute to symptom management and quality of life in menopausal women living with RA.

2.3 Empirical Review

2.3.1 The prevalence of rheumatoid arthritis amongst menopausal women

In an extensive global review conducted by Finckh et al. (2022), the researchers analyzed patterns in the prevalence, risk factors, and progression of rheumatoid arthritis (RA) across various geographic and socio-economic settings. Drawing on epidemiological data from numerous studies and health databases, the authors emphasized that RA is a chronic autoimmune disorder with increasing prevalence, particularly in industrialized nations. The study discussed how demographic shifts, including aging populations and better diagnostic criteria, have contributed to the observed increase in RA cases. Importantly, the authors noted that RA disproportionately affects women, and the prevalence among postmenopausal women appears notably high. The review further identified key risk factors such as hormonal changes, genetic susceptibility (e.g., HLA-DRB1 shared epitope), and environmental exposures, all of which are particularly relevant for menopausal populations. By synthesizing global trends, this study lays a foundational understanding of how menopause intersects with the broader landscape of RA prevalence, suggesting the need for targeted screening and preventive strategies for this demographic.

A comprehensive epidemiological analysis by Venetsanopoulou et al. (2023) delved into the multifactorial causes of RA and their distribution across different populations. This review highlighted the disproportionately higher incidence of RA in women compared to men, with a striking female-to-male ratio of 3:1. The authors explored how hormonal fluctuations,

particularly the decline in estrogen during menopause, might exacerbate immune dysregulation and inflammatory responses, thereby contributing to the increased risk of RA in menopausal women. The study also emphasized the synergistic interaction between genetic predispositions—especially the shared epitope HLA-DR—and lifestyle and environmental factors like smoking, obesity, and pollution. By integrating findings from both genetic and environmental research, this study underscored the importance of a holistic approach to understanding RA risk among menopausal women, advocating for prevention efforts that consider this life stage as a critical window for intervention.

A large-scale prospective cohort study by Jiang et al. (2024) investigated whether hormonal and reproductive milestones such as age at menarche, age at natural menopause (ANM), and age at first birth are causally linked to the development of RA. The study analyzed data from 223,526 women of European ancestry using a Mendelian randomization (MR) approach, leveraging genome-wide association studies (GWAS) to reduce bias from confounding and reverse causality. Despite the robust methodological framework, the study found no convincing evidence of a causal link between these reproductive variables and RA risk. For example, the odds ratio for RA per standard deviation increase in ANM was 1.05 (95% CI: 0.98–1.11), indicating a lack of statistical significance. Although these results challenge previous observational findings, the authors acknowledged limitations, including the modest phenotypic variance explained by genetic instruments and the limited ability to capture complex hormonal changes. The study called for further investigations incorporating hormonal biomarkers and longitudinal data to clarify these relationships, especially in postmenopausal populations where hormone-related immune changes are more pronounced.

In a large-scale prospective cohort study, Jiang et al. (2024) explored the relationship between hormonal and reproductive factors and the development of rheumatoid arthritis (RA) in women, utilizing data from 223,526 participants in the UK Biobank. The study employed Cox

proportional hazard models and restricted cubic spline functions to assess RA risk across a range of hormonal exposures. Over a median follow-up of 12.39 years, 3,313 cases of RA were identified. The study revealed that women who experienced early menopause (before age 45) had a significantly increased risk of RA (HR: 1.46), and those with shorter reproductive years (<33 years) were also at elevated risk (HR: 1.39). Furthermore, surgical menopause (through hysterectomy or oophorectomy) was associated with higher RA risk, as was the use of hormone replacement therapy (HRT) (HR: 1.46). These findings indicate that menopausal transitions and hormonal changes have a measurable impact on RA disease development and activity, possibly through the loss of estrogen's immunomodulatory effects. Although the study focused primarily on risk rather than perceptions, its large sample size and longitudinal design make it highly relevant for understanding how menopause biologically influences RA onset and possibly symptom escalation post-menopause.

In a two-sample Mendelian randomization (MR) study, Zhu et al. (2021) investigated whether genetically predicted reproductive traits—including age at menarche, age at natural menopause, and age at first birth—were causally linked to the risk of RA. The researchers analyzed summary statistics from large genome-wide association studies (GWAS): AAM (n=329,345), ANM (n=69,360), AFB (n=251,151), and RA (n=14,361 cases and 43,923 controls), all of European ancestry. Despite strong genetic instruments and multiple MR methods (e.g., inverse-variance weighted, MR-Egger), the study did not find statistically significant evidence of causal associations between these reproductive milestones and RA. For example, the odds ratio per standard deviation increase in age at menopause was 1.05 (95% CI: 0.98–1.11). Although the results contrast observational findings, the authors note limitations in power and genetic variance explained. Importantly, the study adds nuance by showing that not all reproductive factors exert a direct genetic causal effect on RA, suggesting that

environmental or hormonal mechanisms around menopause may still drive disease activity changes even if genetics do not.

While not directly measuring menopause, Hu et al. (2021) conducted a cross-sectional study of 405 RA patients and 198 healthy controls to examine the prevalence of bone loss and its risk factors. Using logistic regression and machine learning methods (LASSO and random forest), they found that RA patients—especially older women—were significantly more likely to have osteopenia and osteoporosis, with lumbar spine bone density declining earlier than in healthy individuals. Postmenopausal women, who naturally face bone mineral density (BMD) decline due to estrogen loss, may face compounding risks when RA is present. The study highlighted protective factors such as vitamin D levels and tumor necrosis factor inhibitor (TNFi) usage, and risk factors including older age, low BMI, and high uric acid levels.

A pivotal contribution to this discourse comes from Salliot et al. (2021), who utilized data from the long-standing French E3N-EPIC cohort, comprising nearly 99,000 women aged 40–65 years. In this prospective study, the researchers identified 698 incident RA cases and used multivariable Cox regression models to analyze the impact of various hormonal factors. Their findings indicate that women who experienced early menopause (before age 45) had a 40% increased risk of developing RA compared to those undergoing menopause at age 53 or later. Similarly, women who had their first pregnancy before the age of 22 also demonstrated a higher risk of RA. Interestingly, nulliparous women (those who had never given birth) who never smoked had a markedly lower risk of RA, suggesting a protective interaction between reproductive history and lifestyle. Additionally, use of progestogen-only therapy during perimenopause for over 24 months appeared to have a protective effect, reducing RA risk. The study's consideration of both endogenous (natural hormonal changes) and exogenous (hormonal treatments) exposures reinforces the notion that hormonal milieu plays a central role in shaping autoimmune susceptibility.

2.3.2 The perceived influence of menopause on rheumatoid arthritis (RA) disease activity among menopausal women

A broader conceptual framework is offered by Motta et al. (2025), whose narrative review synthesizes existing knowledge on the impact of menopause on autoimmune and rheumatic diseases, with a focus on RA and systemic lupus erythematosus (SLE). The review outlines how estrogen plays a modulatory role in the immune system by interacting with estrogen receptors present in most immune cells. These hormonal fluctuations, particularly the decline in estrogen during menopause, are hypothesized to shift immune regulation in a way that may trigger or exacerbate autoimmune conditions. For RA specifically, the authors point out that menopausal changes may contribute to disease onset or increase disease activity, potentially explaining the peak RA incidence observed around menopausal age. Despite highlighting estrogen's immunological significance, the review emphasizes a critical gap in the literature, noting that menopause's role in inflammatory arthritis remains understudied, especially in conditions beyond RA and SLE. The authors call for more targeted research to unravel how menopause-driven hormonal shifts interact with immune pathways and contribute to the phenotypic expression and trajectory of rheumatic diseases in women.

In a systematic review and meta-analysis conducted by Namavari et al. (2024), researchers aimed to clarify the relationship between menopause and the risk of developing RA. The study reviewed literature from major medical databases including PubMed, Scopus, and Web of Science, synthesizing data from multiple cross-sectional and cohort studies. The pooled analysis showed that postmenopausal women had a 35% higher likelihood of developing RA compared to their premenopausal counterparts (Odds Ratio [OR]: 1.35; 95% CI: 1.04–1.67). More strikingly, the study found that women who experienced early menopause (before age 45) had nearly three times the odds of developing RA (OR: 2.97; 95% CI: 1.73–4.22). These findings suggest a robust association between menopausal status and RA risk, potentially

mediated by the loss of estrogen's protective immunomodulatory effects. The study concluded by emphasizing the clinical importance of recognizing menopause—particularly early menopause—as a significant risk marker for RA, and called for increased awareness and surveillance in this high-risk group.

In a study conducted by Cutolo and Gotelli (2023), examined how oestrogen levels and the timing of menopause influence rheumatoid arthritis (RA) outcomes in women. Building on data from Park et al., they found that women who experienced early menopause (EM, <45 years) had significantly worse RA disease activity and patient-reported outcomes (PROs) over a five-year period compared to those with usual menopause (UM, ≥45 years). The study highlights that the decline in oestrogen levels after menopause—especially during EM—leads to a loss of oestrogen's immunomodulatory effects, contributing to more severe RA. Oestrogens have both anti- and pro-inflammatory roles depending on their concentration and immune cell type involved. High levels tend to suppress inflammation, particularly in T-cell mediated conditions like RA, while low levels may enhance autoimmunity. The authors also explored how hormonal life events (e.g., pregnancy, postpartum, breastfeeding) and treatments (e.g., hormone replacement therapy, oral contraceptives) impact RA. Pregnancy typically improves RA symptoms due to high oestrogen levels, while postpartum and menopause often trigger flares. EM was associated with a higher risk of RA, especially seronegative RA, and increased prevalence of gynecological cancers, which may worsen overall health outcomes.Cutolo and Gotelli concluded that menopausal age is a key factor in RA progression and should be considered in clinical management. The hormonal changes of menopause, particularly reduced lifetime oestrogen exposure, likely contribute to more severe disease in women with EM.

In a comprehensive review conducted by Raine & Giles (2022), the relationship between sex hormones and the pathogenesis of rheumatoid arthritis (RA) was critically examined. RA, the

most prevalent inflammatory rheumatic disease, demonstrates a significant female predominance with an approximate female-to-male ratio of 3:1. This sex-based disparity in prevalence has long been a focus of rheumatology research, originating from the seminal observations by Philip Hench in the 1930s, who noted the spontaneous amelioration of RA symptoms during pregnancy—a period marked by heightened estrogen and progesterone levels. Building upon these historical insights, Raine and Giles integrated evidence from basic science, epidemiological data, and clinical trials to provide a nuanced understanding of how sex hormones influence RA. Their review highlighted the well-documented immunomodulatory effects of sex hormones such as estrogen, progesterone, and androgens. These hormones have been shown to regulate both innate and adaptive immune responses. For instance, estrogen can exert both pro-inflammatory and anti-inflammatory effects, depending on its concentration and the immune cell type it interacts with. High concentrations of estrogen, as seen during pregnancy, tend to suppress proinflammatory T helper 1 (TH1) and TH17 responses, while promoting regulatory T cells and TH2 cytokines such as IL-4 and IL-10. Conversely, lower estrogen levels, such as those experienced during the postpartum period or menopause, may tip the balance toward a proinflammatory state, potentially triggering or exacerbating autoimmune conditions like RA. Despite strong mechanistic evidence from in vitro and animal studies, clinical trials targeting sex hormones as a therapeutic approach for RA have largely been inconclusive or unsuccessful. Moreover, epidemiological findings have been inconsistent, with conflicting results regarding the protective or detrimental effects of both endogenous hormonal changes (e.g., menarche, pregnancy, menopause) and exogenous interventions (e.g., hormone replacement therapy, oral contraceptives). However, Raine and Giles emphasized that the decline in estrogen and/or progesterone during menopause and the postpartum period consistently emerges as a significant risk factor for the onset and worsening of RA symptoms.

Similarly, Ramachandran et al. (2023) provided a focused overview of the menopausal transition and its implications for the development of RA. Their work reinforced the notion that hormonal shifts, particularly those occurring during menopause, are critical to understanding sex-specific vulnerability to RA. Menopause is characterized by a rapid and sustained decline in ovarian function and a concomitant reduction in systemic estrogen levels. This hormonal disruption is associated with a heightened inflammatory state, marked by elevated levels of proinflammatory cytokines such as interleukin-6 (IL-6), tumor necrosis factor-alpha (TNF-α), and interleukin-1 beta (IL-1β). These cytokines are key mediators in the pathophysiology of RA, driving synovial inflammation, joint degradation, and systemic symptoms. Ramachandran et al. further argued that the hormonal milieu during menopause interacts with genetic and environmental factors to influence the risk and progression of autoimmune diseases, including RA. For instance, genetic predispositions affecting hormone receptor sensitivity or immune regulation may amplify the impact of declining estrogen levels. Environmental exposures such as smoking, diet, and stress may also modulate hormonal effects on immune function.

2.3.3 To assess menopausal women's perceptions of changes in rheumatoid arthritis symptoms following the onset of menopause.

Building on the biological association between menopause and RA, Yang et al. (2024) provide crucial patient-centered insights into how early menopause (EM) affects clinical outcomes and patient-reported outcomes (PROs) among women with RA. Conducted as a cross-sectional study in China, this research included 557 postmenopausal women with RA, categorizing them into early menopause (≤45 years) and usual menopause (>45 years) groups. Their findings were striking: among those with RA onset after menopause, women with EM reported significantly worse PROs, including higher scores on the pain visual analogue scale (VAS), patient global assessment (PtGA), and disability index (HAQ-DI). They also had higher tender joint counts

and clinical disease activity index (CDAI), suggesting that while radiographic damage did not differ between groups, women with EM experienced more severe and debilitating symptoms. Conversely, these differences were not observed among those whose RA onset preceded menopause, highlighting the distinct pathophysiological or psychosocial burden of postmenopausal RA among early menopausal women. This study underscores that the timing of menopause in relation to RA onset significantly shapes the subjective disease experience, with early menopause potentially compounding symptom severity and functional limitations.

In a study conducted by Petford et al. (2024), the researchers explored the impact of menopause on rheumatoid arthritis (RA) patients in the UK through a national survey. The study aimed to examine patient-reported changes in arthritis symptoms around the time of menopause, recognizing the hormonal influences on arthritis, particularly the onset of RA during times of hormonal change and improvement during pregnancy. This cross-sectional survey, conducted by the National Rheumatoid Arthritis Society (NRAS), involved participants who self-identified as peri-menopausal, menopausal, or post-menopausal, and provided insights into their experiences with RA, menopause, hormone replacement therapy (HRT), and their interactions with healthcare providers. A total of 779 participants responded to the survey, with the majority being Caucasian and in their 50s, with the onset of menopausal symptoms typically beginning in their 40s. Notably, 80% of respondents reported worsening arthritis during menopause, with 10% indicating a significant exacerbation of their symptoms. Approximately 47% of participants had taken HRT, with 80% experiencing improvements in menopausal symptoms and 30% reporting a moderate to large improvement in their arthritis symptoms. However, the study revealed a concerning statistic: 93% of respondents had never discussed menopause with their healthcare providers. For those who did have such discussions, the primary focus was often on HRT and osteoporosis, rather than the potential impacts on RA. The qualitative analysis of free-text responses identified several key themes: the lack of

proactive discussion about menopause by healthcare providers, conflicting advice regarding HRT, overlap and confusion between RA and menopausal symptoms, and a perceived link between menopause and the onset or worsening of arthritis. The study concluded that patients strongly believed there was a connection between menopause and changes in arthritis, and emphasized the need for better education and training for rheumatology teams regarding menopause in the context of RA.

In another study, Hesker (2024) investigated the attitudes towards menopause among women of different age groups. The study aimed to compare how younger and older women perceive menopause and its impact on their health. A total of 60 women participated, divided into two age groups: younger women (30 participants) and older women (30 participants). Data was collected through an online survey that included the Attitudes towards Menopause (ATM) scale and open-ended questions to capture participants' views on menopause. The thematic analysis revealed four key themes: general perceptions of menopause, physical and psychological effects, emotional responses, and social challenges. The study found that older women had more positive attitudes toward menopause compared to younger women, who reported more distress and discomfort associated with menopausal symptoms. Younger women were more likely to feel marginalized and uninformed about menopause due to societal taboos and misconceptions. The quantitative analysis confirmed that older women tended to view menopause more positively, which was linked to their experience of physical and psychological changes. The study suggested that addressing societal misconceptions and providing better education could help reduce distress and isolation among younger women experiencing menopause.

In a study conducted by H. & Djafarian (2024), the effects of intermittent fasting (IF) on quality of life, clinical symptoms, inflammation, and oxidative stress were investigated in overweight and obese postmenopausal women with rheumatoid arthritis (RA). RA, a chronic autoimmune

disorder primarily affecting the synovial joints, leads to pain and functional limitations, with diet shown to have beneficial effects on symptoms and oxidative stress. The study aimed to assess the impact of IF, a dietary regimen involving cycles of fasting and eating, on RA outcomes. The randomized controlled trial included 44 postmenopausal women with mild to moderate RA, who were randomly assigned to either an IF intervention group or a usual diet control group for a duration of 8 weeks. Key outcome measures included anthropometric indicators, biochemical markers (such as erythrocyte sedimentation rate (ESR), c-reactive protein (CRP), total oxidant capacity (TOC), and antioxidant capacity (TAC)), disease severity using the Disease Activity Score-28 (DAS-28) and Clinical Disease Activity Index (CDAI), and functional disability using the Health Assessment Questionnaire-Disability Index (HAQ-DI). The study hypothesized that IF could have a positive impact on inflammatory markers and health outcomes in postmenopausal women with RA, contributing to improved disease management and quality of life.

In another nationwide survey conducted by Walker et al. (2024), the interaction between menopause and rheumatoid arthritis (RA) was explored through a survey of RA patients. The study aimed to understand the patient perspective on how menopause affects their arthritis symptoms and the need for more education on this issue. The survey, organized by the National Rheumatoid Arthritis Society (NRAS), included 779 participants who identified as peri-menopausal, menopausal, or post-menopausal.

Results showed that 80% of respondents reported a worsening of their arthritis symptoms during menopause, with 10% experiencing a significant increase in symptom severity. Among those who had used hormone replacement therapy (HRT), 72% reported improvement in menopausal symptoms, and 30% observed a moderate to good improvement in their arthritis symptoms. Notably, 92% of respondents had never discussed menopause with their healthcare providers, and for those who did, the discussions primarily focused on HRT and osteoporosis

rather than the potential link to RA. Many patients expressed confusion regarding the overlap of RA and menopausal symptoms, and 84% felt that rheumatology teams should receive more training on menopause in the context of RA. The survey concluded that patients perceive a strong link between menopause and the worsening of arthritis, and there is a critical need for more research and better communication between patients and healthcare providers about menopause's impact on RA.

2.3.4 To identify coping strategies adopted by menopausal women in managing rheumatoid arthritis symptoms

In a study conducted by Chandra et al. (2024), the impact of coping strategies on pain intensity in patients with rheumatoid arthritis (RA) was explored. The study aimed to investigate the demographic, psychosocial, and clinical aspects of RA patients, focusing on coping strategies, pain experiences, and mental health. A total of 93 RA patients participated, with data collected on their demographic characteristics, coping strategies (using the Brief-Coping Orientation to Problems Experienced (COPE) scale), prevalence of depression and anxiety, pain levels (assessed by the Mankoski Pain Scale), and diagnostic markers including Disease Activity Score (DAS-28), Rheumatoid Factor (RF), and Anti-Cyclic Citrullinated Peptide (ACCP).

The study revealed that the age distribution of the participants was bimodal, with a gender distribution that aligns with the typical prevalence patterns of RA. In terms of coping strategies, patients tended to employ adaptive strategies, such as religious coping, active coping, and positive reframing, although there was variability in the use of maladaptive strategies. Mental health burdens were also evident, with 14% of patients experiencing depression and 18.3% experiencing anxiety. Pain experiences varied widely, with elevated disease activity indicated by diagnostic markers, particularly in the RF and ACCP subcategories. The study concluded that personalized coping and pain management strategies are essential for improving patient

outcomes, emphasizing the importance of addressing the multifaceted nature of RA, including its psychological impact.

In another study by Bucourt et al. (2021), the impact of rheumatoid arthritis on quality of life, psychological adjustment, and the use of coping strategies was compared with other chronic rheumatic diseases, such as fibromyalgia, spondyloarthritis, and Sjögren's syndrome. The study involved 165 women with these rheumatic conditions, who completed various questionnaires assessing emotional distress, fatigue, disease impact, coping strategies, and comorbid mental health disorders. The results showed that patients with fibromyalgia experienced more anxiety and depression, along with higher levels of disease impact, pain, and fatigue compared to those with rheumatoid arthritis. Additionally, fibromyalgia patients reported greater difficulty adjusting to the disease and tended to use more maladaptive coping strategies, such as catastrophizing. In contrast, rheumatoid arthritis patients were found to use more adaptive coping strategies, including distancing themselves from pain and ignoring pain sensations. The study concluded that fibromyalgia had a greater impact on daily life and that patients with fibromyalgia generally employed poorer coping strategies compared to those with rheumatoid arthritis and other rheumatic conditions.

In a study conducted by McCready et al. (2023), the impact of psychosocial variables on sexual function and distress in women with Sjögren's syndrome (SS) was investigated. The study aimed to explore the role of coping strategies, illness perceptions, and relationship dynamics in influencing sexual function and distress. A total of women with SS completed an online survey that assessed sexual function, sexual distress, disease-related symptoms, coping strategies, illness perceptions, relationship satisfaction, and partners' behavioral responses. Multiple linear regression was employed to identify factors significantly associated with sexual function (measured by the Female Sexual Function Index (FSFI)) and sexual distress (measured by the Female Sexual Distress Scale). The results highlighted the significant role

that coping strategies and relationship dynamics play in sexual health, suggesting that a comprehensive approach to SS treatment should consider these psychosocial aspects.

Pinto et al. (2024) conducted a randomized controlled trial to investigate the effects of reducing sedentary behavior in postmenopausal women with rheumatoid arthritis (RA). The study focused on a 4-month intervention targeting sedentary behavior, which aimed to improve clinical parameters, cardiometabolic risk factors, inflammatory markers, and health-related quality of life. However, the results indicated that the intervention did not significantly reduce sedentary behavior or improve clinical and cardiometabolic outcomes. Interestingly, among responders who reduced sedentary time by more than 30 minutes per day, IL-10 levels showed a tendency to decrease, and there was an improvement in general health and physical health. This suggests that while the intervention did not lead to major changes, it had some positive effects for certain patients.

Carmona et al. (2023) reviewed sex- and gender-related differences in rheumatoid arthritis (RA) and emphasized the importance of tailoring treatment strategies accordingly. The study noted that RA occurs more frequently in women and that differences in clinical expression, prognosis, and psychosocial outcomes based on sex and gender have been underexplored. By considering these differences, personalized treatment strategies can be developed to address unmet needs and improve patient outcomes. This approach highlights the critical need for a gender-sensitive framework in RA care.

In a study by Ebina et al. (2024), the differential therapeutic effects of romosozumab (ROMO) on postmenopausal osteoporosis patients with and without rheumatoid arthritis (RA) were examined. The study revealed that the therapeutic effects of ROMO on bone mineral density (BMD) were less pronounced in patients with RA compared to those without. Specifically, patients with RA showed lower increases in BMD at the lumbar spine and total hip after 12 months of treatment. The study suggested that RA-related factors, such as disease activity and

ACPA titer, may attenuate the efficacy of ROMO, underscoring the need for a tailored approach in treating osteoporosis in postmenopausal women with RA.

2.4 Summary of Literature review

The empirical and theoretical review of this study highlights the complex relationship between menopause and rheumatoid arthritis (RA) in menopausal women. Empirical findings demonstrate a significant intersection between hormonal changes during menopause and the progression of RA. Studies have shown that estrogen deficiency, which occurs during menopause, plays a critical role in immune dysregulation and inflammation, thereby exacerbating RA symptoms. Prevalence data indicates that RA is more prevalent in women, and its onset or exacerbation is often observed in the menopausal transition, suggesting a biological link between hormonal changes and disease activity. Additionally, studies have explored the psychosocial aspects, such as the perception of symptom changes following menopause, and the coping strategies women adopt, including pharmacological treatments, physical activity, and social support.

On the theoretical front, the study draws upon the Biopsychosocial Model to frame its investigation. This model offers a holistic perspective by integrating biological, psychological, and social factors in understanding the lived experience of RA in menopausal women. The biological dimension explains how hormonal shifts affect the immune system and joint inflammation. The psychological component underscores how women's perceptions of menopause and RA influence their symptom management and disease progression. Lastly, the social aspect addresses how external factors, such as healthcare access, social support, and lifestyle changes, contribute to coping strategies and quality of life.

CHAPTER THREE

METHODOLOGY

This chapter describes the methodology that the researcher intends to adopt in conducting this study. The various components of research methodology will be discussed under their respective headings, including research design, study setting, target population, sample and sampling technique, instruments of data collection, validity and reliability of instruments, method of data collection, method of data analysis, and ethical considerations.

3.1 Design

The study utilized a descriptive cross-sectional survey design. This non-experimental approach is suitable for gathering information on the Influence of menopause on rheumatoid arthritis in menopausal women in tertiary health institution at a specific point in time. The descriptive cross-sectional survey method allows for the exploration of relationships between various influencing factors and compliance levels. It is cost-effective and efficient, providing valuable insights that can inform interventions aimed at improving immunization rates (Aleid et al., 2023)

3.2 Setting

The research was carried out at the Consultant Outpatient Clinic (COPC) University of Benin Teaching Hospital. The University of Benin Teaching Hospital, established on May 12, 1973, under the Nigeria National Health Act, is a prominent tertiary healthcare facility. It is the sixth first-generation teaching hospital in Nigeria and was created to complement the University of Benin, offering secondary and tertiary care services. Situated along the Benin-Lagos expressway in Egor Local Government Area of Edo State, the hospital comprises various departments and units, including the infant welfare clinic, in vitro-fertilization unit, nursing services, pharmaceutical services, radiological services, intensive care unit, and other medical

facilities. The radiotherapy/clinical oncology department was established in 2007 as part of the Federal Government of Nigeria/Vamped Engineering Rehabilitation of Teaching Hospitals project during the presidency of Olusegun Obasanjo. This clinic provides specialized clinical services at the local and national levels, with patient assessments conducted through the Accident and Emergency Unit. Consultant outpatient clinics are held on Mondays from 8:am to 4:00 pm, while the Endocrinology clinic runs on Mondays, and Fridays every week.

3.3 Target Population

The target population for this study comprises menopausal women aged 40 years and above who attend the Consultant Outpatient Clinic of the University of Benin Teaching Hospital (UBTH) in Benin City, Edo State, Nigeria. These women represent a specific demographic that may experience varying degrees of symptoms and disease progression related to rheumatoid arthritis (RA) due to the hormonal changes associated with menopause.

Table 3.1: Weekly Attendance of Women Aged 40years above at Consultant Outpatient Clinic (UBTH)

Week	**Monday**	**Friday**
Week 1	15	13
Week 2	16	10
Week 3	18	14
Week 4	12	11
Week 5	17	13
Week 6	14	16
Week 7	19	12
Week 8	11	15
Total	122	104
Grand total	**226**	

Source: medical clinic register, April 2025

Statistics of women for the month of February 2025 – March 2025 in COPC, UBTH

The average number of women aged 40year and above seen for the period of February 2025 to March 2025 was 226.

3.4 Sample Size and Formula

The Taro Yamane method was used in determining the sample size. This method was formulated in the year 1967.

The formula is given as follows

$$n = \frac{N}{1+N(e)^2}$$

Where

n = Signifies the sample size

N = Signifies the population under study

e = Signifies the margin error it could be 0.10, 0.05 or 0.01)

$$n = \frac{N}{(1+N(e)^2}$$

$$n = \frac{226}{1 + 226\,(0.05)^2}$$

$$n = \frac{226}{1 + 226\,(0.0025)}$$

$$n = \frac{226}{1+0.565}$$

$$n = \frac{226}{(1.565)}$$

$$n = 144.41$$

With attrition of 10% = 14.4+144.4 = 158.8

Therefore, the sample size is approximately 160

3.5 Sampling Technique

The sampling technique employed is convenience sampling. Convenience sampling is a non-probability sampling technique where participants are selected based on their easy accessibility and proximity to the researcher. This method involves choosing individuals who are readily available and willing to participate, rather than selecting a random sample from the entire population (Adeoye, 2023).

3.6 Instrument for Data Collection

The instrument for data collection in this study was a self-structured questionnaire (Appendix I). A self-structured questionnaire is a data collection instrument designed by researchers to gather information directly from respondents without the need for an interviewer. It consists of a series of standardized questions that are formulated in advance, allowing respondents to provide their answers independently. This type of questionnaire can include various question formats, such as closed-ended questions (which offer predefined response options) and open-ended questions (which allow for free-form responses (Ojo-Agbodu et al., 2022). The questionnaire will be developed based on the objectives of the study. It will consist of five sections with carefully drafted, sequenced, and constructed items designed to gather in-depth, useful, and relevant information for the study.

- **Section A**: Demographic data (e.g, age, marital status, educational level).
- **Section B**: The prevalence of rheumatoid arthritis amongst menopausal.
- **Section C**: the perceived influence of menopause on rheumatoid arthritis (RA) disease activity among menopausal women
- **Section D**: menopausal women's perceptions of changes in rheumatoid arthritis symptoms following the onset of menopause
- **Section E:** coping strategies adopted by menopausal women in managing rheumatoid arthritis symptoms.

3.7 Validity of the Instrument

Validity refers to how well an instrument measures what it is intended to measure (Polit & Beck, 2018). The instrument was validated through face and content validity. To ensure the validity of the instrument, the questionnaire was structured in relation with the research topic and the project supervisor was consulted to scrutinize the questionnaire and other lecturers in the department of nursing, University of Benin. Due corrections was made before it was distributed. The questionnaire measured what it was supposed to measure and this ensured its face and content validity.

3.8 Reliability of the Instrument

This refers to the consistency of a measure according to Nwachukwu, (2015). To ensure the reliability of the instrument, the reliability of instrument was determined through test re-test method. 10% of the sampled population which is 14.4 approximately 15 were administered questionnaire. The population comprised patients attending Outpatient clinic at Edo Specialist Hospital (which are not part of the study) outside the sample size. A correlation coefficient of 0.8 was obtained, hence it was considered satisfactory enough to establish that the instrument is reliable for the study.

3.9 Method of Data Collection

A well-structured questionnaire was administered to participants until the required sample size of 160 was reached. With approval from the unit head, the study's purpose was explained to patient attending the clinic, and they were invited to complete the questionnaire. Data collection took place during regular clinic days over a two-week period. The researcher administered the questionnaires directly and ensure that all completed forms were collected on the same day.

3.10 Method of Data Analysis

Data collected from completed questionnaires was analyzed using Statistical Package for Social Sciences (SPSS) version 27.0. Descriptive statistics such as means, frequencies, and percentages were used to summarize demographic data and responses related to knowledge and compliance levels. Inferential statistics, including Chi-square tests, examined associations between demographic factors and compliance levels, with significance set at $p < 0.05$.

3.11 Ethical Considerations

Ethical approval for this study was obtained from the Health Research Ethics Committee of the University of Benin Teaching Hospital, Benin City, Edo State. Participation in the study was voluntary, and no personal identifiers were recorded on the questionnaires to ensure participants' anonymity.

Informed Consent: Before the administration of the questionnaire, the researcher verbally explained the study's objectives to the participants. They were encouraged to ask any questions to clarify any uncertainties and were only provided with information they are comfortable with.

Confidentiality: All information provided by participants were treated as confidential, regardless of whether legal protection is afforded to it. Participants' identities remained anonymous, and their responses was. kept confidential throughout the study.

Autonomy: Participation was entirely voluntary, with no coercion or undue influence. Participants' rights, dignity, and autonomy was respected at all times. An autonomous participant is one who is free to make decisions about their participation based on full understanding.

Veracity: Accurate and truthful information about the study was provided to participants, ensuring no vital details are withheld or misrepresented.

Beneficence and Non-maleficence: The researchers ensured that no participant is harmed in any way—physically, emotionally, socially, or psychologically. The well-being of participants was a priority throughout the study.

Principle of Justice: Every participant was treated fairly, and equal attention was given to all respondents, ensuring no bias or discrimination in the process.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction

This Chapter entails the result of the responses of respondents used in the study. The analyses are illustrated with discussions and tables. In analyzing the data, mean is used to determine which item expressed a positive or negative attitude of respondents. It will be discussed under the following headings:

- Percentage of Demographic Data
- Answering of Research Question
- Discussion of Findings

4.1 Percentage of Demographic Data

SECTION A: DEMOGRAPHIC INFORMATION

The demographic data was analyzed using frequency and simple percentage. The result are presented in Table 4.1

Table 4.1: Sociodemographic Characteristics of Respondents (N = 144)

Variable	Category	Frequency	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Age (Years)	40–45	32	22.2	22.2	22.2
	46–50	19	13.2	13.2	35.4
	51–55	42	29.2	29.2	64.6
	56–60	27	18.8	18.8	83.3
	61 and above	24	16.7	16.7	100.0
	Total	144	100.0	100.0	
Marital Status	Single	42	29.2	29.2	29.2
	Married	68	47.2	47.2	76.4
	Divorced	34	23.6	23.6	100.0
	Total	144	100.0	100.0	
Tribe	Bini	49	34.0	34.0	34.0
	Esan	27	18.8	18.8	52.8
	Igbo	40	27.8	27.8	80.6
	Yoruba	28	19.4	19.4	100.0
	Total	144	100.0	100.0	
Religion	Christianity	104	72.2	72.2	72.2
	Islam	40	27.8	27.8	100.0
	Total	144	100.0	100.0	
Educational Background	Primary	6	4.2	4.2	4.2
	Secondary	9	6.3	6.3	10.4
	Undergraduate	77	53.5	53.5	63.9
	Masters	52	36.1	36.1	100.0
	Total	144	100.0	100.0	

Figure 4.1 Bar chart of Age statistics

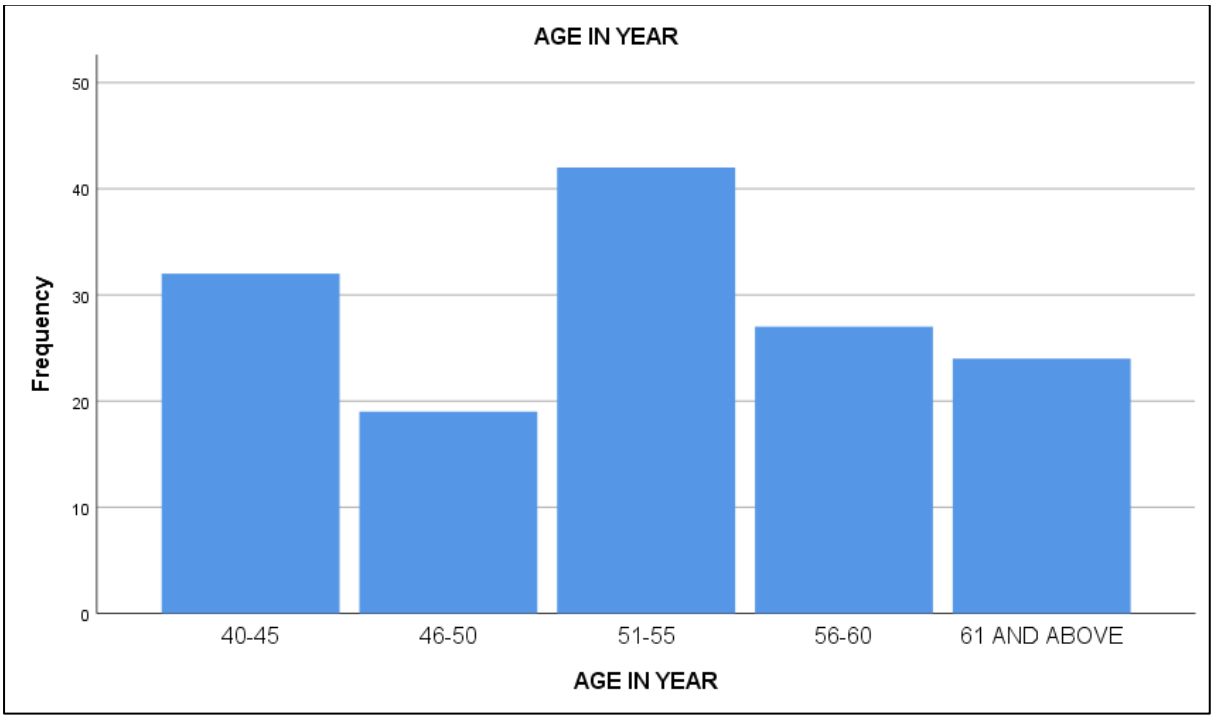


Figure 4.2 Bar chart of Marital Status

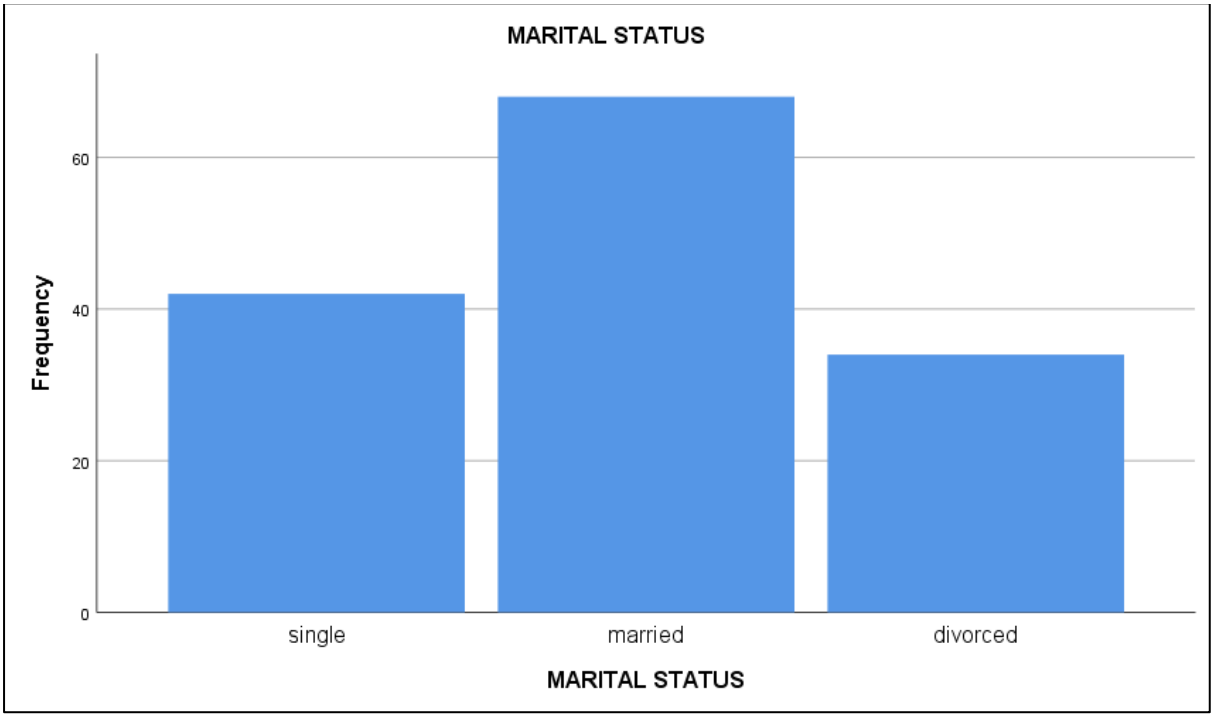


Figure 4.3 Bar chart of Ethnicity

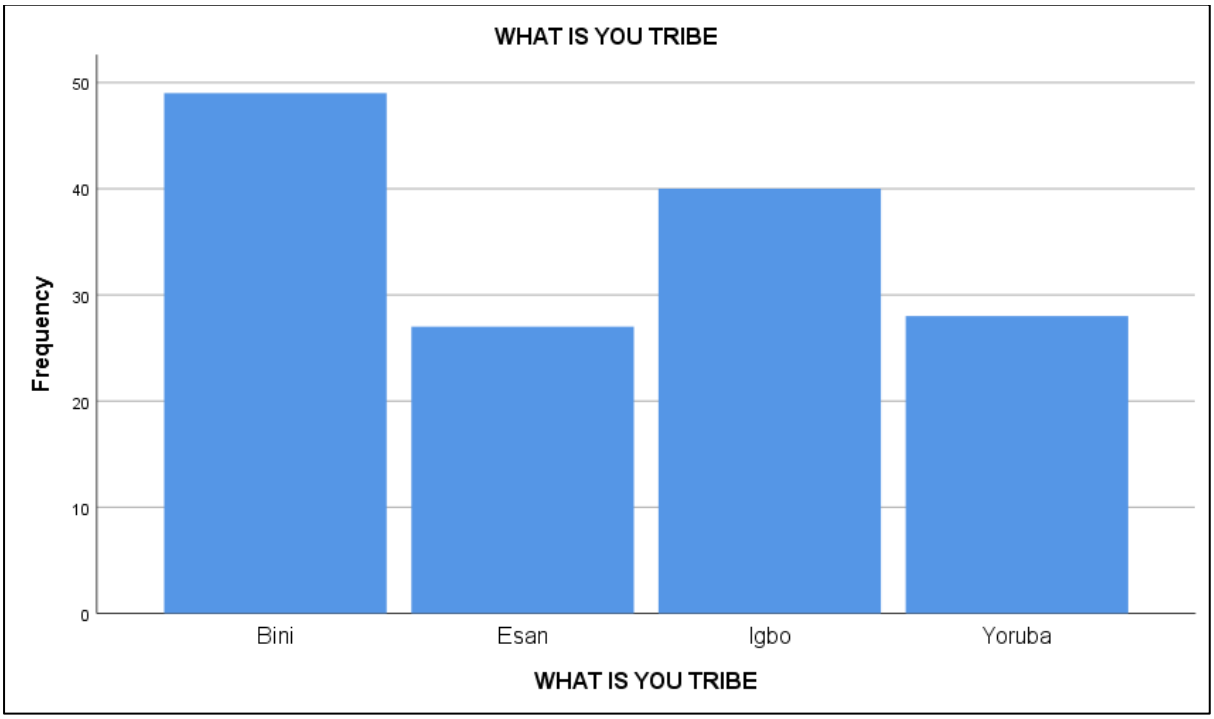


Figure 4.4 Bar chart showing Religion Statistics

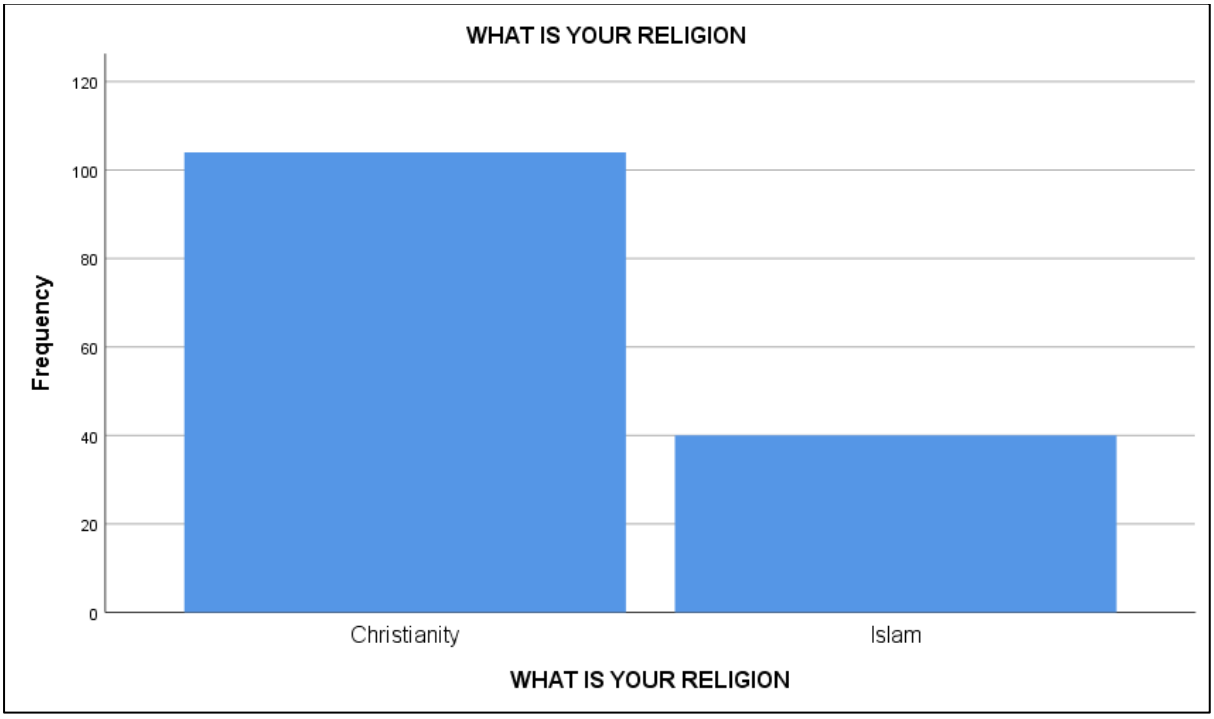
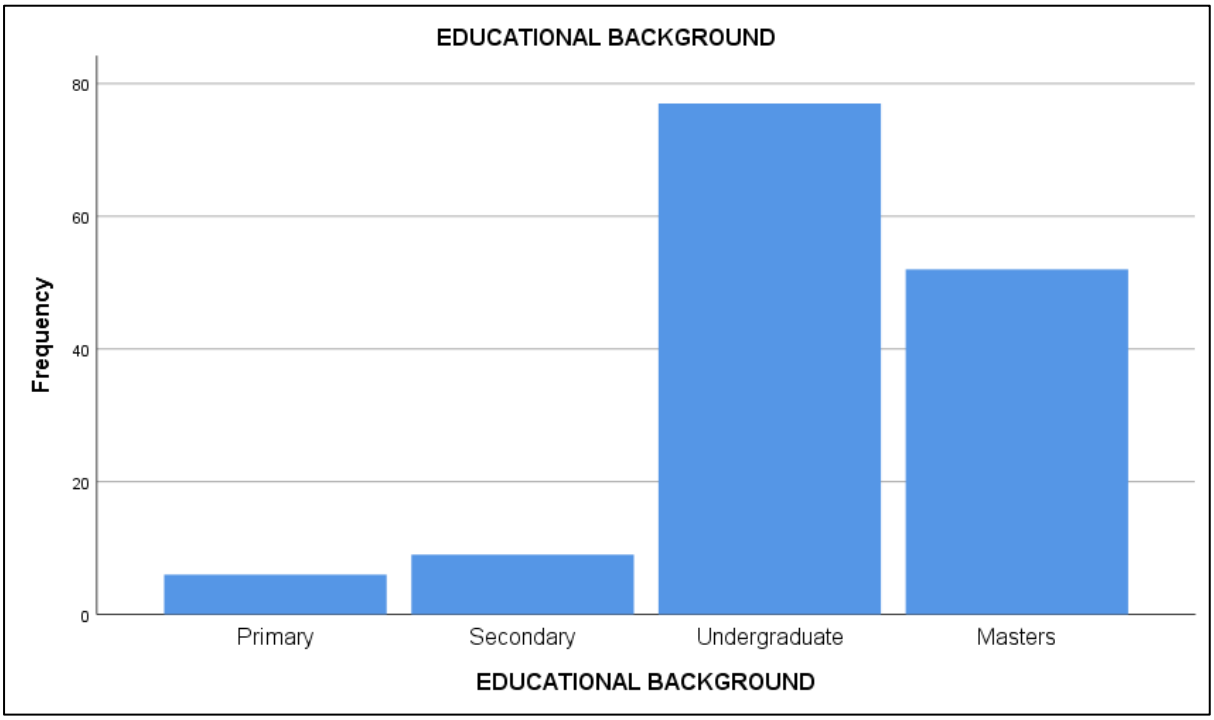


Figure 4.5 Bar chart showing Statistics for Educational Background



The demographic profile shows that the largest age group among respondents was 51–55 years (29.2%), followed by those aged 40–45 (22.2%) and 56–60 (18.8%), indicating a concentration in the mid to late menopausal range. Most participants were married (47.2%), and the dominant ethnic groups were Bini (34.0%) and Igbo (27.8%), reflecting cultural diversity. Christianity was the prevalent religion (72.2%), suggesting strong Christian influence in health beliefs. In terms of education, a majority (53.5%) had undergraduate qualifications, and 36.1% held master's degrees, indicating high health literacy levels within the population. These sociodemographic features are essential for understanding how menopause and rheumatoid arthritis are experienced and managed among this group.

4.2 Answers to the Research Questions

Table 4.2: Assessment of the Prevalence of Rheumatoid Arthritis Amongst Respondents (N = 144)

Variable	Category	Frequency	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Have you ever been diagnosed with RA by a healthcare professional?	Yes	120	83.3	83.3	83.3
	No	24	16.7	16.7	100.0
	Total	144	100.0	100.0	
At what age were you first diagnosed with rheumatoid arthritis?	Below 40 years	16	11.1	11.1	11.1
	40–49 years	14	9.7	9.7	20.8
	50–59 years	88	61.1	61.1	81.9
	60–69 years and above	23	16.0	16.0	97.9
	Not applicable	3	2.1	2.1	100.0
	Total	144	100.0	100.0	
Were you already menopausal at the time of your RA diagnosis?	Yes	102	70.8	70.8	70.8
	No	31	21.5	21.5	92.4
	Not applicable	11	7.6	7.6	100.0
	Total	144	100.0	100.0	
How long have you been living with rheumatoid arthritis?	Less than 1 year	73	50.7	50.7	50.7
	1–3 years	37	25.7	25.7	76.4

	4–6 years	23	16.0	16.0	92.4
	More than 6 years	8	5.6	5.6	97.9
	Not applicable	3	2.1	2.1	100.0
	Total	144	100.0	100.0	
Are you currently experiencing any of the following symptoms?	Joint pain	62	43.1	43.1	43.1
	Morning stiffness > 30 minutes	40	27.8	27.8	70.8
	Swelling of joints	34	23.6	23.6	94.4
	Fatigue	5	3.5	3.5	97.9
	None of the above	3	2.1	2.1	100.0
	Total	144	100.0	100.0	
Do you know other menopausal women with RA in your family or community?	Yes	111	77.1	77.1	77.1
	No	25	17.4	17.4	94.4
	Not sure	8	5.6	5.6	100.0
	Total	144	100.0	100.0	
Has your healthcare provider discussed the menopause–RA relationship?	Yes	101	70.1	70.1	70.1
	No	33	22.9	22.9	93.1
	I don't remember	10	6.9	6.9	100.0
	Total	**144**	**100.0**	**100.0**	

Table 4.2 explores the prevalence, diagnosis, symptoms, and awareness of rheumatoid arthritis (RA) among 144 menopausal women. Most respondents (83.3%) had been diagnosed with RA, with the majority (61.1%) diagnosed between ages 50–59, coinciding with menopause. Over 70% were already menopausal at diagnosis, supporting a possible link between hormonal changes and RA onset. Many (50.7%) were diagnosed within the past year, suggesting a recent rise or better detection. Common symptoms included joint pain (43.1%), morning stiffness (27.8%), and swelling (23.6%). Awareness was high, with 77.1% knowing other menopausal women with RA. Notably, 70.1% had discussed menopause-RA connections with healthcare providers, emphasizing the need for more education and early intervention.

4.3 Descriptive Statistics on Data Collected

Data collected to answer the research question was answered using mean and standard deviation. The result was shown in Table 13

Section C: **perceived influence of menopause on rheumatoid arthritis (RA) disease activity among menopausal women**

Table 4.3

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Menopause has worsened the severity of my joint pain	144	2.00	5.00	4.6389	.74431
Menopause has contributed to increased stiffness in my joints	144	2.00	5.00	4.3958	.73111
I have noticed a reduction in my physical mobility since entering menopause	144	2.00	5.00	4.3958	.75927
I believe that menopause directly influences the intensity of my RA symptoms since entering menopause	144	2.00	5.00	4.3958	.86274
I am more emotionally affected by my RA symptoms since entering menopause	144	2.00	5.00	4.2361	.79321
Since menopause, my response to RA medication has changed	144	2.00	5.00	4.1875	.90815
I feel menopause has played a role in increasing inflammation in my body	144	1.00	5.00	4.0972	1.20209
Since the onset of menopause, i have experienced more frequent RA flare-ups	144	1.00	5.00	3.8542	1.27903
Fatigue related to RA has increased since i became menopause	144	1.00	5.00	3.7917	1.58611
My morning joint stiffing has worsened since menopause began	144	1.00	5.00	4.5486	.93741

My ability to perform daily tasks has declined since menopause due to worsening RA symptoms	144	2.00	5.00	4.4444	.81745
There has been no noticeable change in my RA symptoms since menopause	144	1.00	5.00	4.1667	.87706
I believe menopause has contributed to a decline in my overall physical function	144	1.00	5.00	4.1319	.88694
I now experience more fatigue related to RA than before menopause	144	2.00	5.00	4.2569	.81718
I have experienced more joint pain since the onset of menopause	144	1.00	5.00	3.9028	1.07300
I feel my RA flare-ups last longer than they did before menopause	144	1.00	5.00	3.7153	1.19827
Menopause has made my RA symptoms more difficult to manage	144	1.00	5.00	3.8403	1.29368
I have experienced more joint pain since the onset of menopause	144	1.00	5.00	3.4028	1.48333
I seek emotional support from family and friends in managing my RA symptoms	144	1.00	5.00	4.3264	1.04333
I have adjusted my diet to help reduce RA related symptoms	144	1.00	5.00	4.3403	.96196
I avoid activities that trigger or worsen my RA symptoms	144	1.00	5.00	4.1597	.99413
I regularly attend medical check-ups for the management of my RA	144	1.00	5.00	4.1458	.99628
I get enough rest and sleep to help my body cope with RA	144	2.00	5.00	4.2431	.98412
I discuss changes in my RA symptoms with my healthcare provider	144	1.00	5.00	4.1181	1.13123

I feel confident in my ability to manage RA symptoms despite menopausal changes	144	1.00	5.00	3.8542	1.28449
I regularly attend medical check-ups for the management of my RA	144	1.00	5.00	4.0903	1.35829
I use prescribed medications consistently to relieve my RA symptoms	144	1.00	5.00	4.0347	1.43099
Valid N (listwise)	144				

Table 4.3 presents the descriptive statistics for the assessment of the impact of menopause on various aspects of rheumatoid arthritis (RA) symptoms. The table shows a range of responses, with means ranging from 3.40 to 4.64 across different statements, suggesting a generally strong agreement that menopause has worsened various aspects of RA. The highest mean of 4.64 is seen for "Menopause has worsened the severity of my joint pain," indicating a strong perception of worsening symptoms. The standard deviations also vary, reflecting differences in how individuals perceive the changes in their RA symptoms due to menopause. The data reveals that menopause has significantly affected multiple dimensions of RA management, such as joint pain, stiffness, and fatigue.

4.4 HYPOTHESIS

Table 4.4

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Were you already menopausal at the time of your RA diagnosis * Have you ever been diagonised with rheumatoid arthritis (RA) by a healthcare professional	144	100.0%	0	0.0%	144	100.0%

Table 4.4: The Case Processing Summary shows that all 144 cases were valid, with no missing data. This indicates that the analysis is based on the complete set of respondents, ensuring no gaps in the dataset for the specified variables.

Table 4.5

Were you already menopausal at the time of your RA diagnosis * Have you ever been diagnosed with rheumatoid arthritis (RA) by a healthcare professional Crosstabulation

Count

		Have you ever been diagonised with rheumatoid arthritis (RA) by a healthcare professional		
		yes	no	Total
Were you already menopausal at the time of your RA diagnosis	yes	96	6	102
	no	16	15	31
	not applicable	8	3	11
Total		120	24	144

Table 4.5: The Crosstabulation between menopausal status at the time of RA diagnosis and RA diagnosis by a healthcare professional shows that a significant number of respondents (96) who were already menopausal at the time of their RA diagnosis reported being diagnosed with RA. In contrast, fewer respondents (6) who were menopausal at diagnosis were not diagnosed with RA. Similarly, for those who were not menopausal at the time of diagnosis, 16 were diagnosed, and 15 were not.

Table 4.6

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	31.890[a]	2	.000
Likelihood Ratio	28.289	2	.000
Linear-by-Linear Association	19.073	1	.000
N of Valid Cases	144		

a. 1 cells (16.7%) has an expected count less than 5. The minimum expected count is 1.83.

Table 4.6: The Chi-Square Test results indicate a statistically significant association between the timing of menopause and RA diagnosis ($p = 0.000$), suggesting that whether a respondent was menopausal at the time of their RA diagnosis is strongly related to their RA diagnosis. This implies that the likelihood of being diagnosed with rheumatoid arthritis is influenced by whether a woman had already entered menopause at the time of diagnosis. The Likelihood Ratio test, which also shows statistical significance, further supports the existence of a relationship between these two variables. Additionally, the Linear-by-Linear Association value of 19.073 ($p = 0.000$) suggests a direct trend between menopausal status and RA diagnosis, further solidifying the conclusion that menopause could play a role in the timing of an RA diagnosis. This evidence underscores the importance of considering menopausal status when evaluating the onset and diagnosis of rheumatoid arthritis in women

Table 4.7

Correlations

		Have you ever been diagnosed with rheumatoid arthritis (RA) by a healthcare professional	Were you already menopausal at the time of your RA diagnosis
Have you ever been diagnosed with rheumatoid arthritis (RA) by a healthcare professional	Pearson Correlation	1	.365**
	Sig. (2-tailed)		.000
	N	144	144
Were you already menopausal at the time of your RA diagnosis	Pearson Correlation	.365**	1
	Sig. (2-tailed)	.000	
	N	144	144

Correlation is significant at the 0.01 level (2-tailed).

Table 17: The Correlation table reveals a moderate positive correlation (r = 0.365) between the timing of menopause and RA diagnosis, indicating that women who were menopausal at the time of RA diagnosis are moderately more likely to have received an RA diagnosis. The correlation is statistically significant (p = 0.000), confirming the strength of the relationship.

4.5 Discussion of Findings

The findings of this study provide insightful connections between menopause and rheumatoid arthritis (RA) symptoms among menopausal women, particularly within the context of Nigerian healthcare. The discussion below delves into the key findings from the demographic data, statistical analyses, and hypothesis testing, highlighting their implications for both medical practice and future research. Demographic Characteristics and the Timing of Menopause The majority of respondents in this study were between the ages of 51 and 55, which is consistent with the expected age range for menopause onset (29.2%). This reflects the typical timing of menopause, which occurs in the early 50s, aligning with prior research indicating that the mid to late 50s are critical years for menopausal transition. Notably, the age distribution of respondents indicates that the study sample represents women in the key age range for both menopause and rheumatoid arthritis onset. Furthermore, the majority of participants (70.8%) were already menopausal at the time of their RA diagnosis, which aligns with prior studies suggesting that hormonal changes during menopause might influence the onset or progression of RA.

Prevalence of Rheumatoid Arthritis and Symptom Perception Findings from Table 9, "How long have you been living with rheumatoid arthritis," show that a substantial proportion (50.7%) of respondents had been living with RA for less than one year, followed by 25.7% with 1-3 years, and 16.0% with 4-6 years. This suggests that many respondents are still within the early stages of RA, where symptom management and disease progression are critical concerns. Additionally, symptoms such as joint pain, morning stiffness, and swelling were most frequently reported, reinforcing the established connection between menopause and exacerbation of RA symptoms. This is particularly noteworthy given that menopause is

typically associated with increased joint discomfort, as evidenced by the high frequency of symptoms reported in this study.

Impact of Menopause on RA Symptoms The results of the descriptive statistics (Table 13) suggest a strong correlation between menopause and worsened RA symptoms. The majority of respondents (with a mean score above 4 on a 5-point scale) reported that menopause worsened the severity of joint pain, increased stiffness, and reduced physical mobility. These findings echo the hypothesis that menopause, by inducing hormonal changes, can aggravate RA symptoms, leading to more severe manifestations of the disease. Particularly, the statistically significant mean scores for increased fatigue, reduced ability to perform daily tasks, and more frequent flare-ups underscore the complex relationship between menopause and RA. The combination of hormonal fluctuations and immune system changes during menopause may contribute to increased disease activity in RA patients. Association Between Menopause and RA Diagnosis Tables 14, 15, and 16 provide statistical insights into the relationship between the timing of menopause and RA diagnosis. The Chi-Square test (Table 16) reveals a significant association ($p = 0.000$) between whether a respondent was menopausal at the time of their RA diagnosis. This highlights that women diagnosed with RA while menopausal or post-menopausal experience different disease trajectories compared to those diagnosed earlier in life. The likelihood ratio supports the validity of this finding, while the linear-by-linear association ($p = 0.000$) suggests a direct trend linking menopausal status with RA diagnosis. These results imply that the onset of menopause might play a crucial role in the development or exacerbation of RA in some women.

Healthcare Provider Discussions on Menopause and RA Table 12 shows that 70.1% of participants reported that their healthcare providers had discussed the relationship between menopause and RA with them, indicating a positive trend toward increasing awareness among

healthcare professionals. However, a notable 22.9% of respondents had never had such discussions, which suggests room for improvement in patient-provider communication. This is particularly important given the interconnected nature of hormonal changes during menopause and the autoimmune processes in RA. Increased dialogue between healthcare providers and patients could enhance management strategies for menopausal women suffering from RA.

Coping Strategies and Symptom Management Data from Table 13 reveal that the majority of participants reported engaging in coping strategies, such as adjusting their diet (mean score of 4.34), seeking emotional support (mean score of 4.33), and attending regular medical check-ups (mean score of 4.14). These findings suggest that women are proactive in managing their RA symptoms despite the challenges posed by menopause. This aligns with research suggesting that emotional support and lifestyle adjustments are critical in managing chronic illnesses like RA, particularly during life-altering events like menopause.

Correlation Between Menopausal Status and RA Diagnosis The correlation analysis in Table 17 shows a moderate positive relationship between being diagnosed with RA and the timing of menopause (Pearson correlation = 0.365, $p = 0.000$). This correlation reinforces the findings from the Chi-Square tests, emphasizing that the menopausal stage at the time of RA diagnosis is an important factor influencing disease outcomes. These results suggest that further research should focus on the mechanisms by which menopause might trigger or exacerbate RA, particularly looking at hormonal changes and their impact on immune function. The results of this study indicate a clear relationship between menopause and rheumatoid arthritis, with many menopausal women experiencing worsened RA symptoms. The statistical analyses underscore the significance of the timing of menopause in relation to RA diagnosis and progression, highlighting the need for targeted interventions to manage both menopausal symptoms and RA effectively. These findings suggest that healthcare providers should place greater emphasis on

educating menopausal women about the potential impact of hormonal changes on RA and provide comprehensive care strategies to improve their quality of life. Future research should explore the underlying biological mechanisms that link menopause and RA, potentially leading to better management protocols for women suffering from both conditions.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

5.1 Discussion on Findings

This study explored the impact of menopause on the prevalence and severity of Rheumatoid Arthritis (RA) in menopausal women attending the Consultant Outpatient Department at the University of Benin Teaching Hospital (UBTH). The findings reveal significant relationships between menopause and the exacerbation of RA symptoms, with a substantial number of participants reporting increased joint pain, stiffness, and fatigue since entering menopause.

According to the results from the descriptive statistics and chi-square tests, menopause appears to worsen RA symptoms, particularly in joint pain and stiffness. A majority of the respondents (70.8%) indicated that they were already menopausal at the time of their RA diagnosis, which suggests that menopausal hormonal changes may have a significant role in the onset or progression of RA symptoms. Additionally, respondents who experienced menopause before their RA diagnosis reported a higher severity of symptoms, particularly fatigue, morning stiffness, and joint swelling. The Chi-square test further confirmed that the timing of menopause significantly correlates with RA diagnosis, with a p-value of 0.000. This finding underscores the possible influence of menopause on the onset of RA or the worsening of its symptoms, especially as menopause alters hormonal levels and immune function.

5.2 Summary of Major Findings

The study found several key insights regarding the relationship between menopause and rheumatoid arthritis (RA):

1. **Timing of Menopause and RA Diagnosis**: A significant number of participants (70.8%) were already menopausal when diagnosed with RA, indicating that menopause

may influence the development or progression of RA symptoms.

2. **Exacerbation of RA Symptoms Post-Menopause**: Many women reported that their RA symptoms, particularly joint pain, stiffness, and fatigue, worsened after menopause. The mean scores for questions relating to the severity of joint pain and stiffness were high, suggesting a clear correlation between menopausal changes and worsening RA symptoms.

3. **Increased Symptom Frequency**: Participants reported experiencing more frequent RA flare-ups and longer durations of joint pain since menopause, with many acknowledging a decline in their physical mobility and daily function.

4. **Healthcare Awareness**: While the majority of respondents (70.1%) reported that their healthcare providers had discussed the link between menopause and RA, a portion of the population (22.9%) had never received this information, suggesting gaps in patient education and awareness.

These findings suggest that menopause can significantly affect the severity and management of RA symptoms, highlighting the need for further research and improved clinical management of menopausal women with RA.

5.3 Implications for Nursing

This study has significant implications for nursing practice, especially in managing menopausal women with rheumatoid arthritis. Nurses play a crucial role in patient education, symptom management, and coordination of care. The findings emphasize the need for tailored interventions for menopausal women with RA to manage symptoms more effectively. Nurses

should be trained to recognize the symptoms of both conditions and provide holistic care that addresses the physical, emotional, and psychological aspects of RA exacerbated by menopause.

Additionally, given that many women reported increased fatigue, joint pain, and stiffness post-menopause, it is vital for nurses to advocate for more comprehensive care plans that incorporate menopausal management alongside RA treatment. Nurses should also work closely with healthcare providers to ensure that patients are informed about the potential relationship between menopause and RA, fostering better communication and collaboration in care delivery.

5.4 Limitations of the Study

Despite the insightful findings, this study faced some limitations. First, the sample size of 144 participants, although adequate for the scope of the study, may not fully represent the broader population of menopausal women with rheumatoid arthritis. The study was conducted at a single institution, which limits the generalizability of the results to other regions or healthcare settings.

Second, the study relied on self-reported data, which may introduce biases such as recall bias or misreporting of symptoms. Participants may have overemphasized or underestimated the severity of their symptoms based on personal experiences. Additionally, the cross-sectional design of the study does not allow for the examination of causal relationships between menopause and RA progression over time.

Finally, while the study assessed symptom prevalence, it did not explore other factors such as comorbidities, medication adherence, or lifestyle habits that may also contribute to the worsening of RA symptoms in menopausal women.

5.5 Conclusion

In conclusion, this study highlights the significant impact of menopause on the severity and progression of rheumatoid arthritis symptoms. It reveals that menopausal women experience worsened RA symptoms, including joint pain, stiffness, and fatigue, which may be linked to hormonal changes. The findings also suggest a need for increased awareness and education regarding the relationship between menopause and RA, both for patients and healthcare providers. The study emphasizes the importance of personalized care for menopausal women with RA to improve their quality of life and manage symptoms effectively.

5.6 Recommendations

Based on the findings of this study, the following recommendations are made:

1. **Increased Awareness**: There should be increased awareness and education for both healthcare providers and patients about the relationship between menopause and rheumatoid arthritis. This will help in early diagnosis and more effective management of symptoms.
2. **Comprehensive Care Plans**: Healthcare providers, including nurses, should develop comprehensive care plans that address both menopause and rheumatoid arthritis. These plans should consider hormonal therapies, symptom management, and lifestyle modifications to help mitigate the exacerbation of RA symptoms post-menopause.

3. **Holistic Nursing Care**: Nurses should adopt a holistic approach to care, focusing not only on the physical symptoms of RA but also on the psychological and emotional well-being of menopausal women. This includes addressing issues such as fatigue, depression, and anxiety that may accompany both RA and menopause.

4. **Further Research**: Further studies should be conducted to explore the long-term effects of menopause on RA and investigate other potential factors, such as comorbidities, that may contribute to the worsening of symptoms. Longitudinal studies would be particularly useful in understanding the cause-and-effect relationship between menopause and RA.

5.7 Suggestions for Further Research

Further research is needed to better understand the complex relationship between menopause and rheumatoid arthritis. Future studies should consider a longitudinal approach to track the progression of RA symptoms before, during, and after menopause. Additionally, studies that explore the impact of different treatments for menopause, such as hormone replacement therapy (HRT), on RA symptom management could provide valuable insights.

Research into the psychological impact of menopause on women with RA is also warranted, as many participants reported feeling more emotionally affected by their symptoms. Investigating the role of support systems and counseling in managing both menopause and RA could further enhance patient care. Lastly, larger, multi-center studies could help to generalize the findings to broader populations, providing a more comprehensive understanding of how menopause influences RA across different demographic groups.

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APPENDIX

QUESTIONNAIRE

DEPARTMENT OF NURSING SCIENCES

SCHOOL OF BASIC MEDICAL SCIENCES

UNIVERSITY OF BENIN,

BENIN CITY, EDO

Dear Respondent,

I am a 500level student of the department of Nursing in the above-named institution. I am carrying out a research study on the topic; "**INFLUENCE OF MENOPAUSE ON RHEUMATOID ARTHRITIS IN MENOPAUSAL WOMEN ATTENDING CONSULTANT OUT- PATIENT DEPARTMENT IN UNIVERSITY OF BENIN TEACHING HOSPITAL**". Please kindly assist me by indicating your opinion where necessary

Yours faithfully,

Socio-Demographic Data

SECTION A: DEMOGRAPHIC INFORMATION

1: Age in year ( ) 40 - 45 ( )46-50 ( )51- 55 ( )56 - 60 ( ) 61 and above

2: Marital status ( ) single ( )married ( ) divorced ( )

3: what is your tribe Bini ( ) Esan ( ) (C)Igbo ( ) Yoruba ( ) Others ( )

4: What is your religion Christianity ( ) (B)Islam ( ) (C) Traditional worshiper ( ) (D) other ()

5: Educational Background (A) Primary ( ) (B)Secondary (C)Undergraduate (D) Masters

Section B: Assessment of the Prevalence of Rheumatoid Arthritis Amongst Menopausal Women

1. Have you ever been diagnosed with rheumatoid arthritis (RA) by a healthcare professional? Yes ( ) No ( )Not sure ( )

2. At what age were you first diagnosed with rheumatoid arthritis? Below 40 years ( ) 40 – 49 years ( ) 50 – 59 years ( ) 60 years and above ( ) Not applicable ( )

3. Were you already menopausal at the time of your RA diagnosis? Yes ( ) No ( ) Not sure ( ) Not applicable ( )

4. How long have you been living with rheumatoid arthritis? Less than 1 year ( ) 1 – 3 years ( ) 4 – 6 years ( ) More than 6 years ( ) Not applicable ( )

5. Are you currently experiencing any of the following symptoms? (You may tick more than one) Joint pain ( ) Morning stiffness lasting more than 30 minutes ( ) Swelling of joints ( ) Fatigue ( ) None of the above ( )

6. Do you know other menopausal women who have rheumatoid arthritis (in your family or community)? Yes ( ) No ( ) Not sure ( )

7. Has your healthcare provider ever discussed the relationship between menopause and rheumatoid arthritis with you? Yes ( ) No ( ) I don't remember ( )

Section C: **perceived influence of menopause on rheumatoid arthritis (RA) disease activity among menopausal women**

s/n	Items	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Menopause has worsened the severity of my joint pain.					
2.	Menopause has contributed to increased stiffness in my joints.					
3.	I have noticed a reduction in my physical mobility since entering menopause.					
4.	I believe that menopause directly influences the intensity of my RA symptoms.					
5.	I am more emotionally affected by my RA symptoms since entering menopause.					
6.	Since menopause, my response to RA medication has changed.					
7.	I feel menopause has played a role in increasing inflammation in my body.					
8.	Since the onset of menopause, I have experienced more frequent RA flare-ups.					
9.	Fatigue related to RA has increased since I became menopausal.					

Section D: menopausal women's perceptions of changes in rheumatoid arthritis symptoms following the onset of menopause.

s/n	Items	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	My morning joint stiffness has worsened since menopause began.					
2.	My ability to perform daily tasks has declined since menopause due to worsening RA symptoms.					
3.	There has been no noticeable change in my RA symptoms since menopause.					
4.	I believe menopause has contributed to a decline in my overall physical function.					
5.	I now experience more fatigue related to RA than before menopause.					
6.	I have experienced more joint pain since the onset of menopause.					
7.	I feel my RA flare-ups last longer than they did before menopause.					
8.	Menopause has made my RA symptoms more difficult to manage.					
9.	I have experienced more joint pain since the onset of menopause.					

Section E: coping strategies adopted by menopausal women in managing rheumatoid arthritis symptoms.

s/n	Items	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	I seek emotional support from family and friends in managing my RA symptoms					
2.	I have adjusted my diet to help reduce RA-related inflammation.					
3.	I avoid activities that trigger or worsen my RA symptoms.					
4.	I regularly attend medical check-ups for the management of my RA.					
5.	I get enough rest and sleep to help my body cope with RA.					
6.	I discuss changes in my RA symptoms with my healthcare provider.					
7.	I feel confident in my ability to manage RA symptoms despite menopausal changes.					
8.	I regularly attend medical check-ups for the management of my RA.					
9.	I use prescribed medications consistently to relieve my RA symptoms.					