Nutritional Status and Assessment of Osteoarthritis among Selected Geriatric Patients in Dhaka City

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DECLARATION OF OWNERSHIP

I DECLARE THAT THE ATTACHED RESEARH WORK ENTITLED

NUTRITIONAL STATUS AND ASSESSMENT OF OSTEOARTHRITIS AMONG SELECTED GERIATRIC PATIENTS IN DHAKA CITY

IS ENTIRELY MY OWN AND THAT ALL SOURCES HAVE BEEN ACKNOWLEDGED.

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TO WHOM IT MAY CONCERN

THIS IS TO CERTIFY THAT MOHOSHINA KARIM AN M. PHIL SCHOLAR OF THE INSTITUTE OF NUTRITION AND FOOD SCIENCE, UNIVERSITY OF DHAKA, HAS COMPLETED HER M.PHIL THESIS ENTITLED

**NUTRITIONAL STATUS
AND ASSESSMENT OF OSTEOARTHRITIS AMONG SELECTED GERIATRIC
PATIENTS IN DHAKA CITY**

UNDER MY DIRECT SUPERVISION IT IS AN ORIGINAL WORK. I HAVE GONE THROUGH THE MANOSCRIPT OF THE THESIS AND RECOMMENDED IT FOR SUBMISSION TO THE UNIVERSITY OF DHAKA FOR THE AWARD OF THE M.PHIL DEGREE IN NUTRITION AND FOOD SCIENCE.

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List of Acronyms

BMI   - Body mass index

MNS   - Mini Nutritional Assessment

OA   - Osteoarthritis

SPSS   - Statistical Package for Social Science

WOMAC   - The Western Ontario and McMaster Universities Arthritis Index

Abstract

Background: Osteoarthritis is the leading cause of disability and a degenerative disease that worsen over time. This disease affects the knees, hips, hands, big toe and spine. A whole-joint condition, Pain, discomfort, and a lower quality of life can result from cartilage breakdown and inflammation. Malnutrition or poor diet is associated with osteoarthritis.

Objective: To find out nutritional status & assessment of osteoarthritis among selected geriatric patients in Dhaka city.

Methods: The study was conducted among old osteoarthritic population attending different hospital. A total of 311 geriatric individuals were interviewed. Data was gathered using pretested questionnaire. Standard methods to measures pain, stiffness, difficulties namely WOMAC and to assess nutritional status mini nutritional assessment (MNA) method was used.

Results: Among 311 respondents, 83.2% belong to 60-69 years. Sixty-four percent of the respondents were female and 36% were male. Regarding the educational level, highest (33.1%) respondents had passed primary level. Half of the respondent were housewife (50.8%) followed by retired person (16.4%), others (10.2%) respectively. Among study participant, 69.5% had low middle income (9622-37,963Tk). The highest 56.5% respondent were financially dependent on others and the majority of the respondents 97% were staying with relatives. Only 23 respondents (7.4%) received pensions. 65.2% reported a history of trauma and 55.9% had history of lost weight. The majority of respondents had diabetes (72.3%), hypertension (63.3%) and heart disease (19.9%) when it came to chronic conditions. Ninety-one percent of respondents went to a government hospital, 54% of the respondents undergo routine medical examinations. The existing healthcare system was rated unsatisfactory by 53.3% of respondents, 32 percent of the respondents said they didn't take recommended medications because they thought they were high priced, not useful, and couldn't be found at a local drugstore.

As per the WOMAC distribution of pain scores, the severe pain score 48% was followed by the extreme 26%, the moderate 23%, and the slight 3% (under medical treatment) . In terms of stiffness and difficulty performing daily activities (DPDA), 67% respondents were suffering from extreme stiffness. WOMAC index mean with SD was 68.717±10.01.

According to total MNA (Mini Nutritional Assessment) score around half of the respondents 181(58.2%) were at risk of malnourished, 97(31.2%) normal and 33(10.6%) were malnourished. Age group, gender, marital status, educational status, occupation and financial dependency were found to be significantly associated with nutritional status. The relationship between the WOMAC score and risk factors, such as co-morbidities, revealed that a history of trauma, diabetes, CNC issues, and a sedentary lifestyle were substantially related to the WOMAC score.

Conclusion: The majority of respondents in this survey were housewives. It suggests that OA affects housewives more severely. Patients who were dependent on family (63%) were more at risk of malnutrition than independent respondent (47.1%). Religion, educational status, occupation, financial dependency and income were found to be significantly associated with WOMAC score.

CHAPTER I

INTRODUCTION

1.1 Introduction

In the twenty-first century, the aging of the populace is a globally alarming occurrence. The Britannica dictionary defines aging as "the physiological changes that gradually occur over time and cause senescence in an organism or a decline in biological functions and the ability of an organism to respond to metabolic stress." Since illnesses, mishaps, and early fatalities have traditionally resulted in shorter life spans, the aging of the population is a milestone for people and a cause to honor the victory of public health, medical progress, and economic and social development. (United Nations,2019). That's why rising life expectancy functions as a driving element of population aging. The aging problem is seen as a normal result of the demographic transition from high fertility and mortality, which is referred to as the higher stationary stage of the demographic transition model, to low fertility and mortality, which is referred to as the lower stationary stage. (Mbamaonyeukwu,2001). Worldwide, both fertility and death are on the decline. Because of this, the global life span has increased to 72.3 years. (United Nations,2019). As a result, the age variety of people is quickly getting older around the globe, while the population of infants and young people is rapidly declining. The term "older person" refers to individuals 65 years of age and older, both in terms of total numbers and percentages.

From 841 million in 2013 to 2 billion in 2050, the number of people over 60 around the world is expected to double, accounting for 21 percent of the total global population. More people are living to old age, and by 2050 there will be 392 million people over the age of 80, which is 3 times the population in 2013 (United Nations, 2013). According to the United Nations (2019), women typically live longer than males. At a worldwide level, women have a 4.8-year advantage over men in terms of life expectancy at birth. In 2050, women will make up 54% of the global population aged 65 or later, according to estimates. Eastern and south-eastern Asia are where the majority of the elderly reside. This is where 37% of the world's senior citizens reside. It was anticipated that nothing would change in 2050 (United Nations, 2019). Changing age demographics and an increase in the elderly were also observed in developing nations. The alteration in the population's age distribution has revealed modifications to the aging process in emerging nations. (Abdullah & Nathan, 2010).This change in the world's population is a global problem that can affect

the economy, politics, labor market, and public health. For the first time in history, there will be more older people than young children. Most of this population growth will happen in developing countries [National Institute on Aging, 2011].

Bangladesh is a developing nation in southeast Asia. Bangladesh is extremely vulnerable to the problem of population aging's rapid rise in terms of both people and progress. (Uddin et al., 2012; Khanam et al., 2011; Hossain, 2005). Bangladesh's demographic shift from high fertility and mortality to low fertility and mortality has resulted in an aging population. Bangladesh's life expectancy is rising daily as a result of the decrease in mortality, particularly that of newborns and children. BBS (2020) estimates a 72.8-year life expectancy at birth. From 46 years in 1974 to 72.8 years in 2020, it grew. From 134 in 1993–1994, it dropped to 45 in 2017. (BDHS,2017). In terms of Bangladesh's shifting social, economic, and cultural landscape, the country's rapidly growing older population is a novel and significant group. 15,326.720 individuals are 60 years of age or older, according to the BBS for 2022).In 2011, there were 10,760,064 of them. Between these 11 years, the increase rate of elderly people is 4.24 percent on average. In 2050, Bangladesh's elderly population is expected to be close to 22%, according to UNFPA estimates. Women line up more frequently than males. Women's portion (0.92%) is higher than men's in people 80 and older. (BBS, 2020). The life expectancy at birth of women is 74.5 years which is 3.3 years more than men (BBS, 2020). However, all of these situations highlight the worrisome global trend of aging, which poses significant challenges for many emerging nations, including Bangladesh. The majority of Bangladesh's elderly people struggle to meet their most fundamental requirements, including lack of financial support, senile diseases, inadequate healthcare, and lack of Medicare assistance, neglect, deprivation, and socioeconomic instability. (Begum, 1970). According to a survey, nearly 15% of elderly people were working in agriculture, and 63% of them were unemployed. (Uddin et al., 2012). Nearly 44 percent of older persons resided in destitution. (Rahman, 2000). Because of the declining physiological processes associated with advancing age, the body is more vulnerable to disease. Due to poverty and a period of hardship, elderly people are more susceptible to illness, social isolation, and poverty (Munsur et al., 2010). Most older people rely on others for their food, clothing, housing, and medical treatment. (Flora, 2014). Although Bangladeshi society generally considers those 60 and older to be elderly, the truth is that people in this nation generally age earlier than 60 due to factors such as poverty, manual labor, incapacity, and illnesses brought on by malnutrition and geographic

conditions. (Rahman, 2010). An important part of leading a healthy existence is proper nutrition. At any age, it's crucial to maintain a good nutritional state. As a result, geriatric nutrition is defined as nutrition that manages the physical, psychological, and psychosocial conditions of the elderly individual while also assisting in reducing the impacts of aging and illness. (Naik et al., 1979).Because population and disease changes happen more quickly in developing countries. According to a survey done in a rural region, 26% of elderly people are malnourished, and 62% are at risk of becoming undernourished. (Ferdous et al., 2009). According to a different survey, 12% of elderly people are overweight, and 24% of them are underweight. (Haque et al., 2014). Another study shows, 12.2% of elderly people were underweight and nearly 32% were overweight. (Razon et al., 2022). Another study shows that overall 89% of Bangladeshi older person are malnourished (Mridha et al., 2021), and they are more likely to get one or more chronic diseases, such as lung disease, arthritis, stroke, depression, or dementia (Heuberger RA, Caudell K, 2011, Ortolani E et al., 2013). Osteoarthritis (OA) is the most common degenerative joint disease in older people and one of the main causes of musculoskeletal disorders, functional disabilities, and morbidity [Abdollahi A et al.,2018]. Most common symptoms are pain, stiffness, restriction of motion and loss of function [Clinton C.M et al.,2015]. Appetite, function, and swallowing can all be affected by these diseases, leading to changes in food intake and a decline in nutritional status [Heuberger R.A, Caudell K,2011, Ortolani E et al., 2013]. Loss of muscle mass and gain of abdominal fat are the two most prominent changes in body composition observed in the elderly, both of which have significant effects on their nutritional status and are associated with the development of non-communicable chronic diseases [Neto M.G et al.,2016]. Over 10% of the global population suffers from osteoarthritis. As it gets worse, severe joint pain makes it hard for people to move around [Fransen M et al.,2011]. This disease is thought to be the fourth most common reason why people can't work. Most of these disability problems are caused by problems with the hips or knees. Osteoarthritis is strongly linked to getting older, and people in Asia are getting older quickly. Also, osteoarthritis has been linked to jobs that require a lot of physical work, which is the case for people in remote areas of developing countries. However, obesity, which is also a key risk factor, may be less common, even though it is becoming more common. Recent research has compared city life to rural life and disadvantaged neighborhoods to affluent ones [Litwic A et al.,2013]. Histological or radiographic criteria can confirm the presence of osteoarthritis, however by age 80, only around half of patients with the condition report experiencing any symptoms. Definitions

of OA can be made pathologically, radiographically, or clinically (Zhang Y et al.,2010). Due to the aging population, OA will become increasingly common and will likely surpass all other causes of disability by the year 2030 (Mathiessen A et al., 2017). Osteoarthritis (OA) affects over 30 million adults in America [Jr G.K.L, 2020]. Due to common genetic and constitutional risk factors, EULAR recommends linking knee and other joint osteoarthritis. They note that the definition of knee osteoarthritis may change based on care levels and clinical considerations. [Kellgren J.H,1957]. In 1957, Kellgren and Lawrence devised a categorization scheme that classifies osteoarthritis into five radiographic findings; 1-Doubtful, 0-None 2-Mild, 3-Moderate, 4-Severe[Cooper C et al., 2014]. Pain and stiffness after inactivity are the most prevalent symptoms. Joint failure is likely the result of many disorders. Hands, feet, spine, and large weight-bearing joints like hips and knees are frequently impacted by this form of arthritis, which is also known as degenerative arthritis (Akinpelu A.O et al., 2009). WHO-ILAR COPCORD studies show that 7.5% of people in Bangladesh have one or more rheumatic diseases [Rahman M.M et al., 2014]. According to the Osteoarthritis Research Society International (OARSI) and the American Academy of Orthopaedic Surgeons (AAOS), physical measures, pharmacological therapy, and surgery are the mainstays of OA treatment. (Zhang W et al.,2008) Physical therapy is a straightforward, commonplace supplementary treatment. Loss of weight can correct the imbalance mechanical load, alleviate joint pain, and lower OA risk. Moderate exercise builds muscles and slows osteoarthritis (OA). Spa, massage, and acupuncture are beneficial alternatives, although insufficient research supports their effectiveness. Due to the invasive trauma and higher risks, surgery is only recommended for severe instances in which conservative therapy has failed. Total joint replacement, also called arthroplasty, is thought to be the best orthopedic surgery for people with advanced OA. It may reduce pain and improve joint function. Arthroplasty isn't suggested for young people because the artificial implant only lasts so long (usually 10-15 years). Pharmaceutical therapy includes acetaminophen, NSAIDs, opioid analgesics, SNRIs, and intra-articular injections. Its main goals are to relieve pain and reduce inflammation [Zhang W et al.,2016].

Over 100 million people worldwide suffer from OA, making it a leading cause of disability. Injury-induced OA can affect younger people. Over 50% of the world's population (>65) has OA in at least one joint, proving its ubiquity. In the Asia-Pacific area, the frequency of KOA is 7.50%. It is 5.78% in China, 12.4% in South Korea, 22.0% in rural India, 25.00% in rural North Pakistan, and 10.2% in Bangladesh [T Field et al.,(2015), SA Haq et al.,

(2005), S Lee., (2017)]. In addition to aging and obesity, other risk factors for KOA include gender, degree of physical exercise, hereditary susceptibility, and injury [G,G¨urer et al., 2016]. Recent studies (Bijlsma et al., 2011; Louati et al., 2015; Yusuf et al., 2010) have proposed a new categorization for phenotyping OA that incorporates metabolic syndrome, aging, and posttraumatic-related OA. Obesity may be the main pathomechanism in metabolic syndrome-related OA. Observational studies have, however, raised the possibility that other elements of the metabolic syndrome, such as hypertension, might operate as separate risk factors for knee OA (Yoshimura et al., 2012; Liu et al., 2016; Maddah et al., 2015; Shin D., 2014; Inoue et al., 2011; Kim et al., 2010). Depression, one of the most common comorbidities with osteoarthritis (OA), affects patient prognosis and quality of life. The total burden of sickness is also increased (Wang, and Ni, 2022). When compared to the sample without OA, Veronese et al., 2017 found that people with lower extremity OA and numerous OA sites were more likely to have depressive symptoms. Unadjusted analyses revealed that those with OA had higher probabilities of depressive symptoms after four years of follow-up compared to people without OA.

In the future, osteoarthritis prevalence will increase, especially in Asian countries, because the age-related burden of diseases like osteoarthritis will greatly increase in emerging countries (P Bhandarkar et al., 2017). While OA affects both sexes, it seems to be more common in those over 65 years of age [Bhatia D et al.,2013 & Liikavainio T et al., 2010]. It is essential to develop a therapy plan that takes into account the physiology of degenerative joint disease, but it should also take into account the requirements of the various age groups and populations. In this research, an attempt has been made to find out nutritional status and assessment of osteoarthritis among selected geriatric patients in Dhaka city.

1.2 Rationale of the study

Age increases one's risk of developing a variety of diseases and impairments, making proper nutrition consumption for seniors even more crucial. (Dean et al., 2009). Decreased immunity, frailty, and a number of non-communicable illnesses are just a few of the bodily dysfunctions that can be brought on by inadequate nutrition (nutrition excesses or deficits). The most prevalent non-communicable illnesses in Europe are cardiovascular diseases (including atherosclerosis, ischemic heart disease, and cerebrovascular diseases), which account for 35% of all mortality causes.(The European Health Report, 2012). According to World Health Organization (WHO), nutrition related diseases account for approximately 60 percent of all deaths and 43 percent of the global burden of disease (WHO, 2012), and the impact of nutrition related nom-communicable diseases is expected to increase to 73 percent of all deaths and 60 percent of the global burden of disease by 2020 (WHO,2010). According to the United Nations, 130 million people worldwide will suffer from osteoarthritis, and 40 million will be seriously crippled as a result. (Singhal S et al.,2022) Osteoarthritis is projected to have become one of the key concerns due to demographic changes (aging population) and the progressive increase of non-communicable diseases (double burden).(Marshall D.A et al.,2019). As one of the leading causes of population comorbidity, osteoarthritis will not only be a clinical morbidity, but it will also raise the morbidity of other health disorders, particularly among the elderly. While this has been a continuing worry for the health systems of industrialized countries, low- and middle-income countries (LMICs) will have extra hurdles to ensure that everyone has access to health care. (Allotey P et al.,2014) This proposed research seeks to find out nutritional status and assessment of osteoarthritis, as well as provide insight into the decrease of arthritis-related morbidity among the elderly population.

Due to the fact that osteoarthritis is one of the major conditions that limit the morbidity of older people, understanding the relationship between associated risk factors and one's dietary factors (i.e. pattern, components) has the potential to reverse the progression of this high-burden condition by preventing and managing the disease at the community level. Additionally, this will contribute to the present global effort to reduce NCDs, particularly in settings with limited resources.

Elderly malnutrition has several consequences. It can diminish functional status and increase medical conditions, lowering quality of life. Under nutrition worsens respiratory

and heart problems, Infections, DVT, ulcers, death, and organ failure. (Omran M.L et al.,2000) Several studies identify malnutrition as a risk factor for frailty, morbidity, and death, such Vellas, Hunt, Romero, Koehler, Baumgartner, and Garry. [Kabir Z.N et al.,2006]. The senior population (aged 60 and older) is fast growing worldwide, and the growth will be more dramatic in low-income than high-income regions. (Sudharsanan N et al.,2018) Bangladesh has about 15 million people aged 60 and above; by 2050, their number will increase to 36 million (22 percent of the total population). (Rahman A.,2020)

Nutrition-related health problems, disease morbidity, and older people's physical inability are on the rise [Haque M.M et al., 2014]. Most affected are from underdeveloped nations [Tamang M.K et al., 2019]. About one-third of these countries' residents are malnourished, including many older individuals (aged 60 years or more) [WHO-2000, United Nation-2017]. The societal burden of malnutrition tends to be defined by physical and psychological impairment [Müller O et al., 2005]. Malnourished seniors in the community or nursing homes are more likely to experience a variety of nutrition-related issues, which can ultimately render them unable to live independently and increasingly reliant on others [Mastronuzzi T et al., Agarwalla R et al.,2015]. Comorbidities and nutritional status are intermingled in the elderly because they are more likely to suffer from chronic diseases, which in turn increases their risk of malnutrition [Ferdous T et al.,(2009)]. Globally, many factors are associated with malnutrition of the older population [Wong M.M.H et al.,(2019)]. Gender, marital status, education, and expenditure of the family [Ghosh A et al., 2017], mental health status [Cabrera M.A.S et al.,(2007)], oral health quality [Cousson P.Y et al.,(2012)], comorbidities [Hickson M, (2006)], and food behavior [Sutradhar I et al.,(2019)] are some crucial factors that are causing malnutrition in that age group.

Identifying the factors responsible for the nutritional status of the older population and preventing them by timely social interventions may result in a better health prognosis and reduce the malnutrition burden [Beck A.M et al.,2011]. In Bangladesh, 7.5% of the total population are of older age group. Among them, 26.0% are malnourished, and 62.0% are at risk of malnutrition [Rahman K.M.T et al., 2021]. However, there are no comprehensive data regarding the factors associated with the nutritional status of the older population in Bangladesh.

It is important for all nutrition or diet interventions to look at the nutrition status of the person. A global evaluation of nutrition status is based on a combination of information, such as a clinical evaluation, a dietary history, an anthropometric evaluation, and a biochemical evaluation. (Mueller C et al., 2011].   This proposed research seeks to investigate the nutritional status and assessment of osteoarthritis of senior persons in Bangladesh and other risk factors linked with osteoarthritis, as well as provide insight into the decrease of arthritis-related morbidity among the elderly population.

1.3 Study Objectives:

General objective:

The goal of this study is to find out nutritional status & assessment of osteoarthritis among selected geriatric patients in Dhaka city.

Specific objectives:

1. To understand the socio-demographic distribution of geriatric people with osteoarthritis in Dhaka city

2. To assess the nutritional status of geriatric people with osteoarthritis in Dhaka city

3. To assess the risk factors of osteoarthritis

4. To assess the comorbidity status of geriatric people in Dhaka city

3. To determine the health seeking behavior of osteoarthritic patient

4. To assess the WOMAC score of osteoarthritis patients;

5. To determine the association among osteoarthritis, nutritional status and related socio-demographic characteristics of geriatric people with osteoarthritis in Dhaka city

CHAPTER II

LITERATURE REVIEW

Bangladesh has some of the highest rates of people who aren't getting enough food. More and more health problems caused by poor nutrition, high rates of disease, and the inability of older people to move around are coming to light [WHO-2002]. Worldwide as of 2015, there are 617.1 million older peoples above 65 years with almost 7.6% of the world Population (He Wan et al., 2015). Global health issues for older age include nutritional problems, chronic non-communicable diseases like heart disease, stroke, and others. A nutritional problem, especially under nutrition is one of the common public health problems in the older adults causing greater mortality and economic loss facing the older population in developing countries (WHO-2016).

Maintaining better physical as well as emotional health requires eating a balanced diet. Eating a range of foods and limiting intake of sodium, sugar, saturated fat, and Trans fats are all components of a healthy diet. (WHO, 2010). Dietary patterns are described as the amounts, ratios, varieties, or mixtures of various foods and drinks in diets as well as the regularity with which they are regularly eaten. (McGuire, 2016). Studies have repeatedly shown a connection between nutrition and health, including in older people, and dietary habits are a significant and readily modifiable risk factor for disease prevention. (Jong et al., 2014). It guards against a variety of persistent non-communicable illnesses, such as cancer, diabetes, and heart disease (WHO, 2010). Elderly people who eat insufficiently become malnourished. (De Vriendt et al., 2009). According to Govindaraju et al. (2018), eating habits have an impact on a person's quality of life. Another piece of research discovered that smoking and unhealthy eating were the root causes of depression. (Berk et al., 2013). Poor eating habits cause nutritional deficiencies, and deficiencies in nutrients cause malnutrition. (Anwar et al., 2022). Poor dietary habits contribute to the progression of many illnesses. (Volkert et al., 2019). According to research, senior people's eating habits were strongly correlated with every cause of death. (Anderson et al., 2011). Therefore, it is crucial to keep better dietary habits in order to guarantee better health and enjoy a higher standard of living. (Jungiohann et al., 2005).

Socially, malnutrition seems to be defined by a dramatic shift in the decline of both physiological and psychological markers of health [Mastronuzzi T et al., 2015]. Malnourished seniors in the community or nursing homes are more likely to experience a variety of nutrition-related issues, which can ultimately render them unable to live independently and increasingly reliant on others [Agarwalla R et al.,2015]. Comorbidities and nutritional status are intertwined

in the elderly because of the increased prevalence of chronic diseases, which in turn contribute to additional malnutrition, creating a vicious cycle [Ferdous T et al., 2009].

Older people's malnutrition is a worldwide problem that has numerous causes [Wong MMH et al 2019]. Gender, marital status, education, and expenditure of the family, mental health status, oral health quality, comorbidities, and food behavior are some crucial factors that are causing malnutrition in that age group (Sutradhar I et al.,2019, Milne AC et al., 2009).

Obesity increases the production and release of proinflammatory cytokines (such as IL-6, IL-1, and TNF-), adipokines, and persistent low-grade inflammation in adipose tissue. (e.g., leptin, adiponectin, and visfatin). It has been demonstrated that IL-1 and TNF- have a role in the pathophysiology of OA, perhaps through altering the production of matrix-degrading proteases in chondrocytes. Adipokines have a role in the control of cartilage and have been connected to the onset of OA. The synovial fluid of joints with OA contains the hormone leptin, and studies have found that high levels of this hormone in the synovial fluid are highly correlated with the radiographic severity of OA. Obesity is associated with elevated plasma levels of leptin, although it is unclear if there is a causal correlation or any underlying pathophysiologic relationship between leptin and the severity of OA. Another adipokine is adiponectin; however, there is debate about how it affects OA. According to one study, patients with erosive OA had greater levels of adiponectin than those with non-erosive OA (Piva SR et al., 2015).

Identifying the issues affecting the older population's nutrition and preventing them through social actions may improve their health and minimize malnutrition [Beck AM et al., 2011]. In Western civilizations, older folks are more likely to be malnourished. Poor diet, both in terms of quality and quantity, is caused by a number of functional, psychological, economic, and social factors that hurt the nutritional status of older people. Malnutrition in older people is also said to be caused by not eating enough, having a serious illness, being a woman (women are more likely to be malnourished), and being poor [Kabir Z.N et al.,2006]. Under nutrition in older people has a lot of effects. It can make people less able to do things and make medical problems worse, which is bad for health-related quality of life. Being undernourished raises the risk of breathing and heart problems, infections, deep vein thrombosis, pressure ulcers, death during surgery, and failure of multiple organs. Several other studies show that malnutrition increases the risk of being weak, getting sick, and even dying [Akner G et al., 2001]. The number of people who are 60 or older is growing quickly all over the world, and the growth will be much more dramatic in low-income regions of the world

than in high-income regions (United nation-2002). Bangladesh has a population of almost 144 million people, and more than 7 million of them are 60 or older. Bangladesh will have 14 million older people by 2020, making it one of the 10 countries with the older people. In low-income countries like Bangladesh, it is hard to find and document information about how well older people eat. So far, most research and public health activities in Bangladesh have been about the nutrition of children and women of childbearing age [WHO-2004]

In Bangladesh, people over 65 make up 7.5% of the total population. 26.0% of them are malnourished, and 62% are at risk of becoming malnourished [Kabir Z.N et al.,2006]. But there isn't a lot of information about the factors that affect the nutrition of the older people in Bangladesh. To find these risk factors, the Mini Nutritional Assessment (MNA) is a quick and easy tool for evaluating the nutritional state of elderly people. If needed, nutritional intervention and/or diet changes can be made.

During the second half of the 20th century, the number of older people grew quickly. Aging is a complicated process that involves physical and mental changes that are linked to social situations. Widowed individuals had poor nutritional quality. (Elsner, 2002). Another study revealed that widowed women and older males who were alone practiced less healthy eating. (Li, 2017). Studies by Han et al. (2009) and Mokhber et al. (2011) found a favorable correlation between elderly people's financial freedom and dietary practices. People from the middle class typically had better diets than people from lesser classes did. (Dubois & Girard, 2001). In Cox's Bazar, researchers discovered a substantial relationship between respondents' monthly income and their dietary practices. They discovered that respondents with higher monthly incomes had better dietary habits. (Anwar et al., 2022). The expense of living had an impact on eating habits. (Li, 2017). According to a research, elderly people's dietary habits were affected by their academic level. (Lin & Lee, 2005). In Taiwan, elderly individuals with less education typically consume lower-quality foods. (Lin et al., 2022). According to Shalaby et al. (2016), a nutrition instruction initiative had a beneficial effect on dietary practice. (Agbozo et al., 2018). According to research done in Bangladesh, most participant's ingested rich food two to three times per day. Ten and twenty respondents, respectively, reported eating milk and fish between two and three times per day. Eggs and meat were typically consumed once per week. Soybeans and vegetables were selected by chance. Butter, as well as ghee, were not regularly eaten. Once per week, the pulse was measured. No soft beverages were chosen. (Haque et al., 2014).

The nutrition status of the elderly is also affected by their social situation (for example, a widowed elderly woman living alone on a limited budget) and by the long-term effects of chronic disease and the use of medications, which can sometimes interact with nutrients in ways that aren't good. The physiologic changes of aging, including perceptual, endocrine, gastrointestinal, renal, and muscular changes, may also affect nutrition needs. Dietary allowances are set to meet the nutritional needs of a healthy population. They don't take into account diseases or other problems that are common in older people. The survey results show that some older people are at a higher risk of not getting enough nutrients because they can't meet this need. (Guigoz Y et al.,1996)

Aging causes alterations in the body composition, organ functions, adequate energy intake and ability to eat or access food. Abdominal obesity or weight loss together with sarcopenia cause immobility, skeletal disorders, insulin resistance, hypertension, atherosclerosis and disorders of the glucose/lipid metabolism. Chronic diseases (diseases that interfere with the ability of the person to eat food such as stroke and dental problems, malabsorption syndromes, cardiac cachexia, chronic obstructive pulmonary disease, malignancies, hyper metabolic state, neurologic disorders, dementia and drugs such as anti-neoplastic drugs), psychological disturbances and social problems can result in decreased food intake. Therefore, early detection of malnutrition should be a key component of the geriatric assessment to stop this vicious cycle. Mini Nutritional Assessment (MNA) was developed as a reliable screening test to detect malnutrition in old-aged people. Without any laboratory data, nutritional status of the patients can be easily predicted with questions and anthropometric measurements. Because of its validity in screening malnutrition, MNA was integrated in our Comprehensive Geriatric Assessment (CGA) tool.(Saka B et al.,2010) Based on the MNA test, it was found that the number of malnourished older persons living alone is low. [Ülger Z et al., 2010, Sanlıer N et al., 2006]. In the study, the MNA scores show that about one-third of the elderly are at risk of being malnourished or are already malnourished. Researchers found that 5.8% of the population was malnourished and that 49.2% were at risk for malnutrition [Kaya P.S, (2015)]. There was a 13% prevalence of malnutrition and a 32% prevalence of risk for malnutrition among the aged patients followed up from a geriatric outpatient clinic using the MNA test. The prevalence of sadness, fecal incontinence, cognitive decline, and physical reliance was shown to be significantly higher in malnourished patients compared to those who were not [Saka B et al., 2010]. The rate of malnutrition was 13.8% among nursing home residents, according to Kaiser et al., but just 5.8% among community-dwelling seniors [Kaiser M.J et al., 2010]. Male

malnutrition was found to be 6.5% in an Ankara study, whereas female malnutrition was 8.8% [Küçükerdönmez O et al.,2005]. Another survey found that 2.4% of nursing home residents, 0.4% of those living with family at home, and 5.4% of those living alone were malnourished according to the MNA [Sanlıer N et al., 2006]. The likelihood of being malnourished rises with age (p0.05). Those over the age of 85 have the highest risk of malnutrition. Weakness becomes more common as people get older [Kvamme J.M et al.,2011]. The elderly often eat less as a result of physiological anorexia, a condition that develops with age. The quality of life declines when people lose weight and become malnourished, a condition known as sarcopenia, which causes muscle atrophy and disability [Salva A et al.,2001]. Malnutrition or the threat of it can make geriatric patients' conditions worse, lessen the effectiveness of their treatments, and drive up healthcare expenditures.

It is estimated that about 80% of seniors living alone and 90% of those in nursing homes have at least one chronic health condition. Nursing facility residents were more likely to have high blood pressure than their home-dwelling counterparts, whereas elderly people with osteoporosis and other conditions were more likely to be in their own environments. There is a direct correlation between the growing older population and the rise in the prevalence of chronic diseases. In contrast to the home setting, where the prevalence of multiple diseases was 78.2%. [Kaya P.S, (2015)].

Kaya P.S,(2015) found that diseases were more common in women (79.5%) than in men (75%) and in people who lived in their own homes (91.1%) than in people who lived in a nursing home (70.8%). The result show how important it is to look into chronic diseases when looking for nutritional problems in older people.

Using the discriminant analysis equations and the clinical status as a reference standard, the classification potential of the MNA was found by cross-classifying the subjects of the 1991 and 1993 Toulouse studies. The equations from the development study were used to sort the people living in Toulouse in 1993. By using this method, 78 percent (90 out of 115) of the people were correctly categorized, which means that they had the same clinical status. The inverse analysis showed that these results were correct. Using the equations from the validation study, the population of Toulouse in 1991 was put into groups. Using the clinical status, 72% of the subjects, or 100 out of 139, were put into the same group. But 25% to 30% of the subjects were in the middle of the MNA score range. They are older people who are at risk of malnutrition and need more tests, like a biochemical or clinical evaluation, to find out exactly

how their nutrition is. These results show that the MNA can be used without biochemistry to classify 70–75% of the subjects as normal (well-nourished) or undernourished. (Guigoz Y et al., 1996) In high-income countries, 30–70% of elderly people who live in institutions have malnutrition, which is a lot higher than in other places. [Saletti A et al., 2000] Institutionalizations in these contexts indicates requiring intensified care due to sickness or frailty. In Bangladesh, there are no special places for this group of older people, so they all live at home unless they are sick and need to go to the hospital. So, the number of older people in Bangladesh with PEM is the same as the number of older people with chronic illnesses who live in institutions or hospitals in rich countries. (Kabir Z.N et al., 2006) Using MNA, Persson et al., [2002] report similar prevalence of PEM (26%) and moderate PEM or at risk of being PEM (56%) among Swedish geriatric patients as found in our study. Thomas et al., (2002) describe malnutrition to have reached epidemic proportions in a sub-acute care facility in St. Louis, USA, with the prevalence of either malnourished or at risk of malnutrition among its geriatric patients reported as more than 90%. In studies of older people who don't live in an institution in the United States and Europe, 18–41% were found to be at nutritional risk, but no one was found to be malnourished. (Saletti A et al., 2005) In Asia, a population-based study in Taiwan that used the MNA found that between 1.9% and 3.6% of older people had a moderate or high risk of malnutrition, which is similar to what was found in Europe (Tsai A.C et al., 2004)

Researchers discovered that elderly people have poor eating habits (Marshall et al., 2001; Sharkey et al., 2002; Ryan et al., 1992; Agarwalla et al., 2015; Han et al., 2009; and Mokhber et al., 2011). A study discovered that elderly people who followed a high-protein, vegetable-based diet had better diets. (Lin et al., 2022). Poor eating habits were practiced by more than half of the elderly in Ghana. (Agbozo et al., 2018). Further research discovered Serbian seniors' eating habits (Stosovic et al., 2012). Iranian older people in the countryside consumed more fat and carbs than those in the cities. (Iranagh et al., 2014). Older people in cities have worse food habits. (Lin et al., 2022). Taiwanese seniors eating habits were impacted by racial disparities. (Lin & Lee, 2005). Culture has an impact on eating practices, according to Anderson et al. (2011) and Lin & Lee (2005).

According to certain research (Ryan et al., 1992; Watanbe et al., 2004; and Nnakwe, 1997), social isolation, unemployment, housing conditions, loved one loss, and migration all affect food quality. Another study discovered a connection between social isolation, poor eating habits, and a high risk of malnutrition. (Murphy et al., 2001). A study discovered that social

network status had a favorable impact on healthier eating habits. Mahajan et al., 1993). There was a significant positive relationship between social support and dietary changes in a study where older adults were encouraged to eat more fiber, vegetables and fruits, and less fat. The term "social support" can refer to either the frequency of contact or the characteristics of networks and relationships (Murphy). According to research, taste and smell disorders are associated with poor appetite, weight loss, unhealthful meal selections, and poorer nutritional intake in elderly people. (Schiffman & Graham, 2000). A loss of appetite is brought on by the loss of a loved one. (Elsner, 2002). Another piece of research discovered that elderly people's decreased appetite was caused by illnesses and drugs. (Al Riyami et al., 2010). According to a study, older people's appetites decline with time. (Agbozo et al., 2018). Drug use for illness has a negative influence on diet since it reduces taste. (Hermann, 2017). Another study revealed that eating habits were impacted by depression. (Buxon & Aiken, 1981). Alcohol use by older drinkers was associated with worse eating habits. (Agbozo et al., 2018).

In contrast to previous dietary practices, Anderson et al. (2011) discovered that eating a diet high in food categories such as vegetables, fruits, whole grains, chicken, fish, and low-fat dairy products lowers mortality. Another survey revealed that 73.7 percent of respondents used carbs, about 53 percent used protein, around 42% used fat, and the remaining respondents used other nutrients. (Anwar et al., 2022). In Ghana, the most common daily foods consumed were vegetables, cereals, and fish. (Agbozo et al., 2018). According to the findings of a survey done in Bangladesh, the majority of respondents consumed vegetables, eggs, fruits, and legumes on a regular basis. In contrast, 61% of men and 75% of women reported never eating or drinking meat. (Razon et al., 2022). Another survey conducted in Dhaka indicated that 78% of respondents were aware of the dietary restrictions recommended by doctors, 54% drank filtered or boiled water, and almost 87% consumed fruit naturally. Additionally, nearly 75% of respondents reported eating five times per day, and around 52% reported exercising. (Ahmed, 1993).

CHAPTER III

RESEARCH METHODOLOGY

3.1 Study design:

It was a cross sectional descriptive type of study.

3.2 Study place:

This study was conducted at Dhaka Medical college Hospital, BIRDEM and Comfort Hospital.

3.3 Study period:

The study period was conducted for two years started from January 2020 to December 2021

3.4 Study population:

The study was conducted among old osteoarthritis population attending Dhaka Medical college Hospital, BIRDEM and Comfort Hospital for treatment purposes.

3.5 Study sample:

Sample size for the study was decided by following equation. $n=z^2 \times pq/d^2$

Here,

n= desired sample size

z= Value of standard normal distribution as given level of significant (confidence level) usually considered value 1.96% confidence interval (CI)

Prevalence of OA more than 50 years (27.1%) (Venkatachalam J et al., 2011)

p= 27.1% or. 27.1, q= 1-P= (1 – .27.1) = 0.729

d= degree of accuracy desired usually set at 5% (0.05)

So by this equation

N= $(1.96)^2$ x {(0.27.1) x (0.729)}/ $(0.05)^2$ = 0.7585/0.0025

Sample size was n= 303.4

Considering non response, missing data, finally 311 samples were selected for this study.

3.6 Inclusion Criteria:

- Patient with osteoarthritis of either gender
- Age 60 yes and above
- Those who met the requirements of the American College of Rheumatology (ACR) recommendations for Osteoarthritis in the Knee osteoarthritis.

3.7 Exclusion Criteria:

- Very sick and mentally retarded as well as not willing to participate in the study.
- Other inflammatory joint illnesses (including rheumatoid arthritis, ankylosing spondylitis, psoriasis, gout, and neuropathy, congenital, or metabolic disorders that affect joints)
- Past history of any orthopaedic surgery

3.8 Sampling method:

This study was conducted as per non-randomized, purposive sampling technique, also known as judgmental, selective, or subjective sampling, is a form of non-probability sampling in which researchers rely on their own judgment when choosing members of the population to participate in their surveys.

3.9 Data Collection Method:

Data were collected by using a pre designed semi-structured questionnaire. Data collecting tools included WOMAC and MNA. The questionnaire was created after consulting with experts in medical research and reading relevant literature. Along with socio-demographic details, information on health condition, nutritional status, and food pattern was also gathered.

3.10 The Mini Nutritional Assessment (MNA)

The Mini Nutritional Assessment (MNA) instrument was utilized in this study to assess respondents' nutritional status. This instrument has so far been accepted as the gold standard in geriatric nutrition. This instrument has a 98% specificity and 96% sensitivity. This test consists of 18 components, including anthropometric measures, nutritional questionnaires, assessments of social and global health, and subjective evaluations of nutrition and health. The range of the MNA's overall score is 0 to 30. The MNA score of 24 indicates that the participants have excellent nutritional status; the score of 17 to 23.5 indicates that people are at risk of malnutrition; and the MNA score of less than 17 indicates protein caloric deficiency. (Salva A

et al., 2009 & Volkert D et al., 2010) We used Geriatric depression scale for scaling dementia/depression. [Heerema E, 2022]

3.11 The Western Ontario and McMaster Universities Arthritis Index (WOMAC)

The Western Ontario and McMaster Universities Arthritis Index (WOMAC) is widely used in the evaluation of Hip and Knee Osteoarthritis. It is a self-administered questionnaire consisting of 24 items divided into 3 subscales: [McConnell S et al., 2001]

Pain (5 items): during walking, using stairs, in bed, sitting or lying, and standing upright

Stiffness (2 items): after first waking and later in the day

Physical Function (17 items): using stairs, rising from sitting, standing, bending, walking, getting in / out of a car, shopping, putting on / taking off socks, rising from bed, lying in bed, getting in / out of bath, sitting, getting on / off toilet, heavy domestic duties, light domestic duties. The WOMAC Index was developed in 1982 by Western Ontario and McMaster Universities. More than 65 languages are supported by WOMAC, which has received linguistic certification. [Ebrahimzadeh MH et al., 2014]. The WOMAC may be completed online, over the phone, or on paper and takes around 12 minutes. Between the computerized and mobile versions of the test and the paper form, there are no obvious changes. [Bellamy N et al., 2011]

The test questions are graded from None (0), Mild (1), Moderate (2), Severe (3), and Extreme (4) on a scale of 0-4.With a potential score range of 0-20 for pain, 0-8 for stiffness, and 0-68 for physical function, the results for each subscale are added up. There are numerous ways to combine scores outside the traditional approach of adding the scores from each of the three subscales. Higher scores on the WOMAC indicate worse pain, stiffness, and functional limitations.

All study participants were also subjected to the American College of Rheumatology's (ACR) clinical classification criteria14. This standard states that individuals with knee pain and at least three of the following six symptoms are said to have knee OA: [Peat G et al., 2006]

1. Age >50 years old

2. Morning stiffness<30 minutes

3. Crepitus on knee motion

4. Bony tenderness

5. Bony enlargement

6. No palpable warmth.

As every individual was older than 60 years old, the presence of just two of the last five variables was sufficient for diagnosis.

3.12 Data Collection Technique:

Face-to-face interviews with respondents using a semi-structured questionnaire that has already been created. The BSMMU Hospital, NITOR, and Comfort Hospital all hosted the fieldwork. The responders who fulfilled the inclusion and exclusion criteria were chosen one after the other.

3.13 Ethical approval and patient consent: Informed consent was obtained from each participant included in this study. Ethical approval was taken from director of Dhaka Medical College, the purpose of the study was explained to each participant prior to interview and all the patients accepted to participate in the study.

3.14 Statistical analysis:

Version 23.0 of the Statistical Package for Social Science (Chicago) was used. For subsequent analysis, all obtained data were coded and entered into SPSS-23. There were both descriptive and inferential statistics used. Included in descriptive statistics were graphs, tables, and figures as well as frequency distribution, percent, mean, and standard deviation. The Chi-square ($x2$) test was used in inferential statistics to determine the connection between independent and dependent variables.

Chapter IV
Results

4.1 Socio-demographic characteristics of Geriatric patients:

Figure 1: Distribution of the respondents by age (N=311)
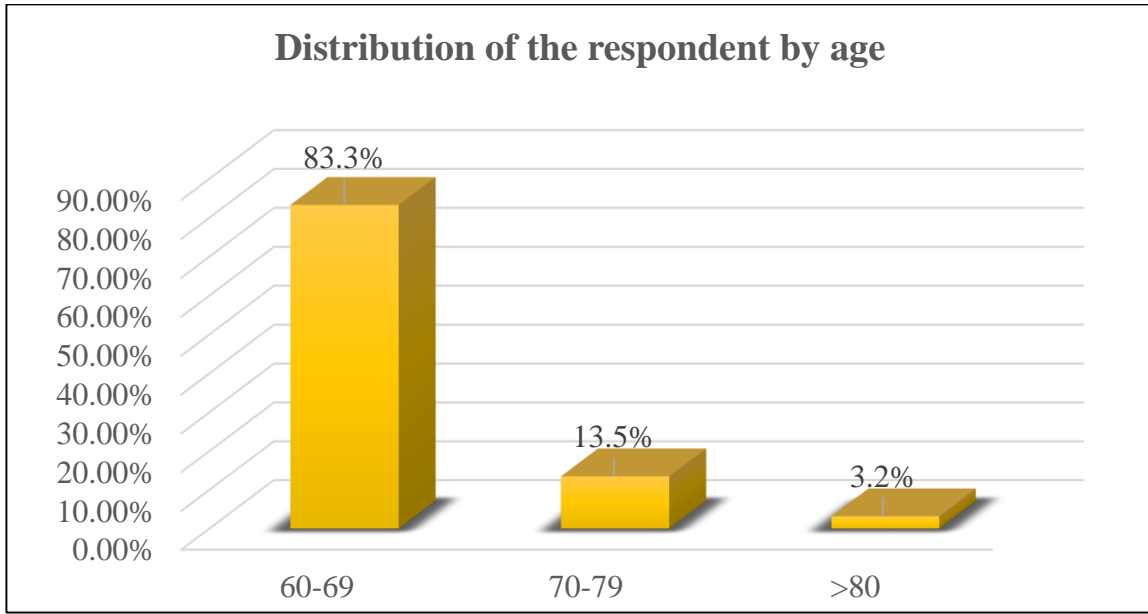
Figure 1: Out of the total 311 respondents, the 60-69 years age group constituted 83.3% whereas 13.5% was 70-79 years and the rest 3.2% was above 80 years age group. Mean age 63.77±5.62.

Figure 2: Distribution of the respondents by gender (N=311)

Distribution of the respondent by sex

Male
36%

Female
63.9%
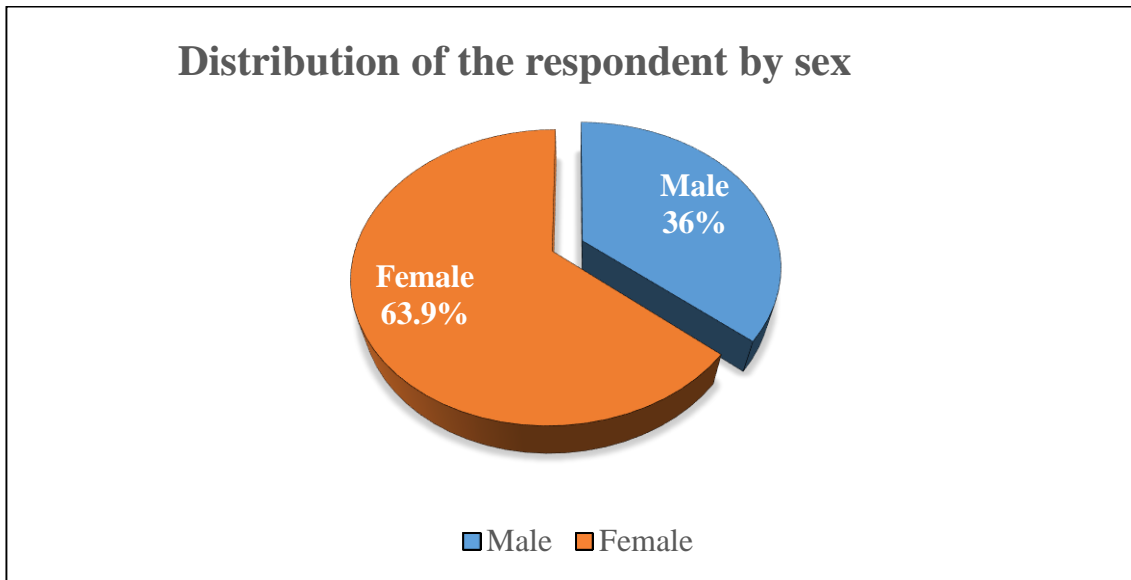
☐ Male ☐ Female

Figure 2 shows that among 311 participants, 36% (112) were male and 63.9% (199) were female. There were more female participants involved in this study.

Figure 3: Distribution of the respondents by religion (N=311)

Distribution of the respondents by religion

5.4%

94.5%
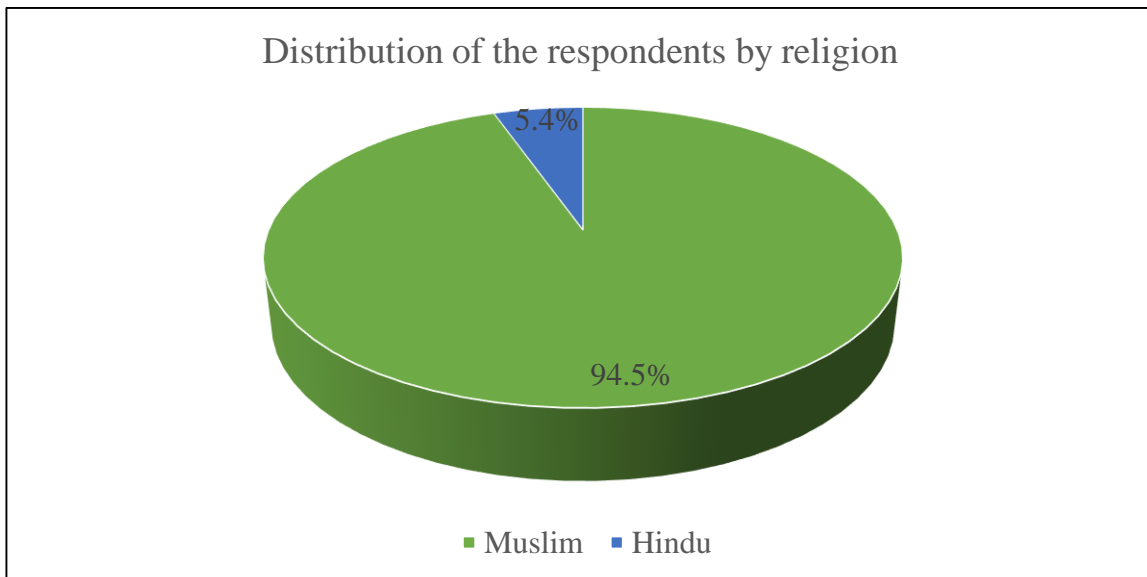
■ Muslim ■ Hindu

Figure 3 shows there were relatively more Muslim i.e 94.5% (294) among the study population. Hindu were found less i.e 5.4% (17) only.

Figure 4: Distribution of the respondents by marital status (N=311)
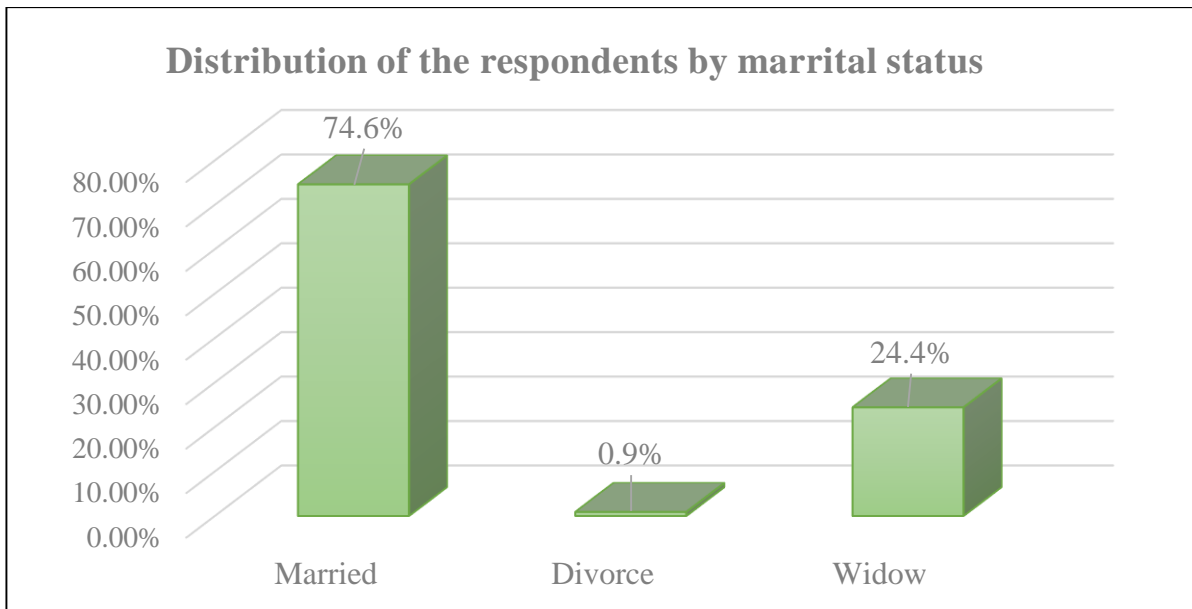
Figure 4 illustrate that majority of the study population were married 74.6% (232), 24.4% (76) were widow and 0.9% (3) were divorce.

Table 1: Distribution of the respondents by educational status (N=311)

Educational status	Frequency	%
Illiterate	97	31.1%
Primary	103	33.1%
Secondary	82	26.3%
Higher secondary	15	4.8%
Degree	9	2.8%
Post graduate and above	5	1.61

Regarding the educational level, highest (33.12%) respondents had primary passed followed by illiterate (31.19%), secondary (26.37%), higher secondary (4.82%), degree (2.89%) and post graduate (1.61%).

Figure 5: Distribution of the respondents by occupational status (N=311)

Distribution of the respondents by occupational status
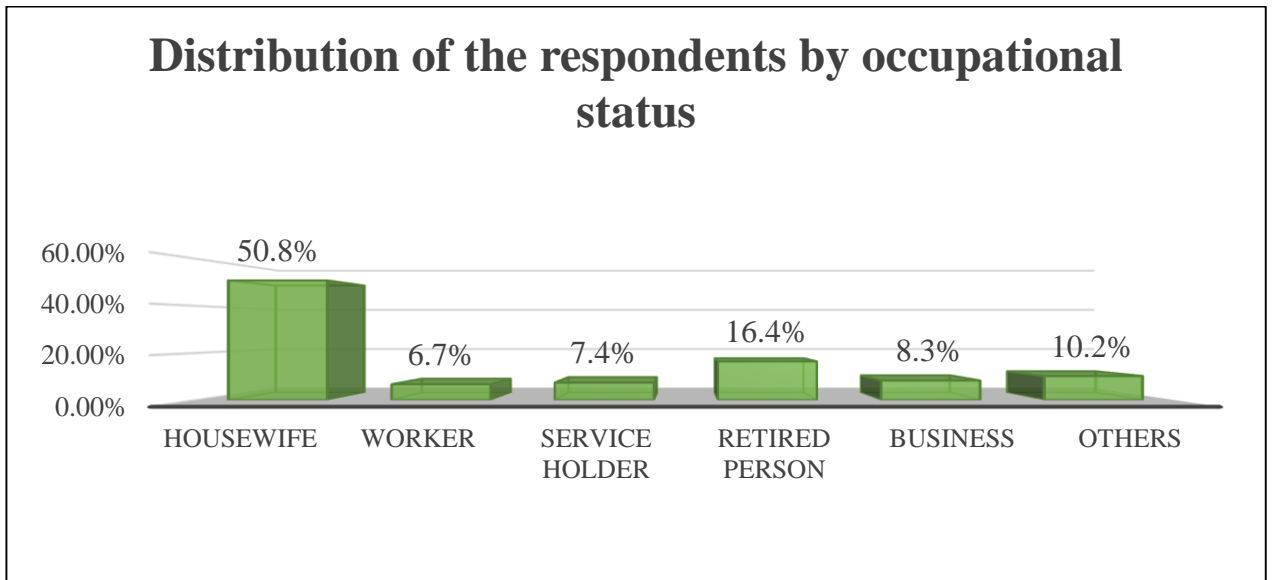
Half of the respondent were housewife (50.8%) followed by retired person (16.4%), others (10.2%) and businessman (8.3%) respectively.

Table 2: Distribution of the respondents by income status (N=311)

Income Distribution	Frequency	%
Low Income	24	7.7%
Low middle income	216	69.5%
Upper middle income	60	19.3%
Upper	11	3.5%
Mean ± SD	42096.46±51730.041	

https://blogs. worldbank.org , Jul 1, 2022

Table 2 shows that among study participant, 69.50% had low middle income, 19.30% had upper middle income and 7.70% had low income. Mean of this group is 42096.46±51730.041

Figure 6: Distribution of the respondents by financial dependency (N=311)
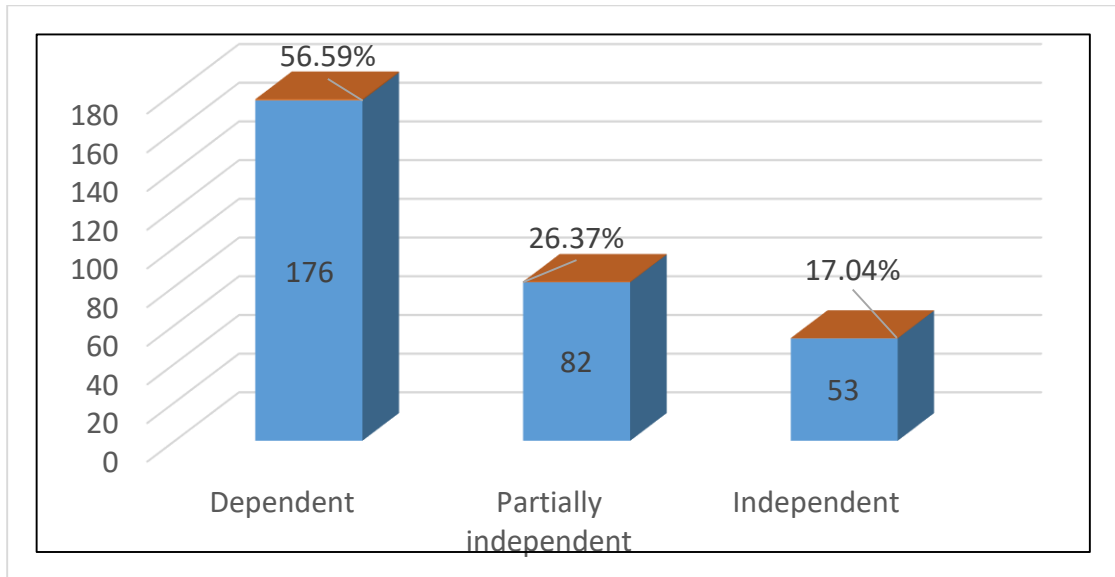
Figure 6: Explore that highest 56.59% respondent were financially dependent on others, 26.37% partially independent and 17.04% were independent respectively.

Figure 7: Distribution of the respondents by staying with family (N=311)
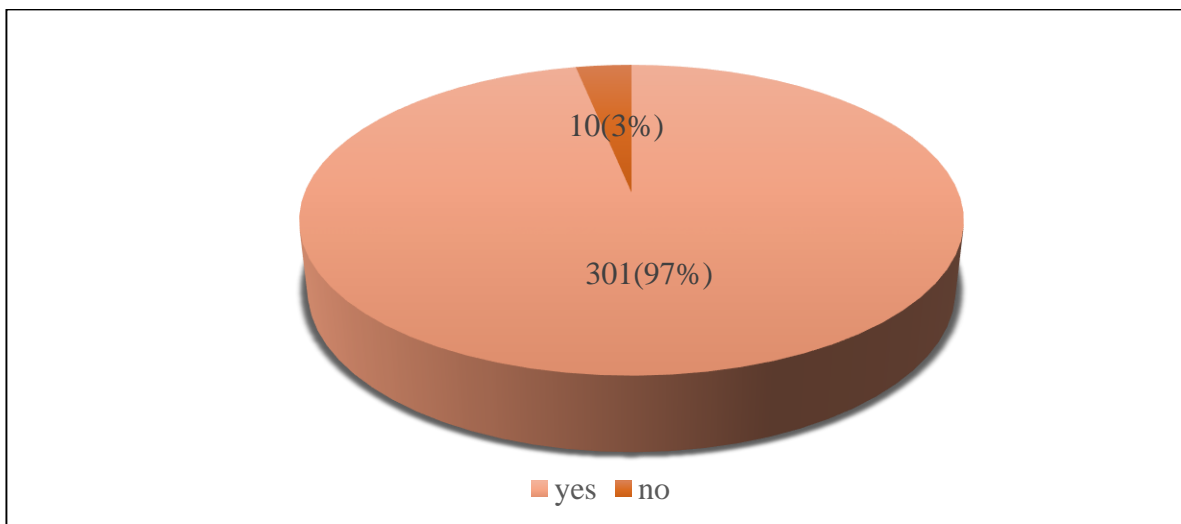
Figure 7 reflects that the majority of respondents 301 (97%) were staying with relatives, while only 10(3%), were not.

Figure 8: Distribution of the respondents by Pension Status (N=311)
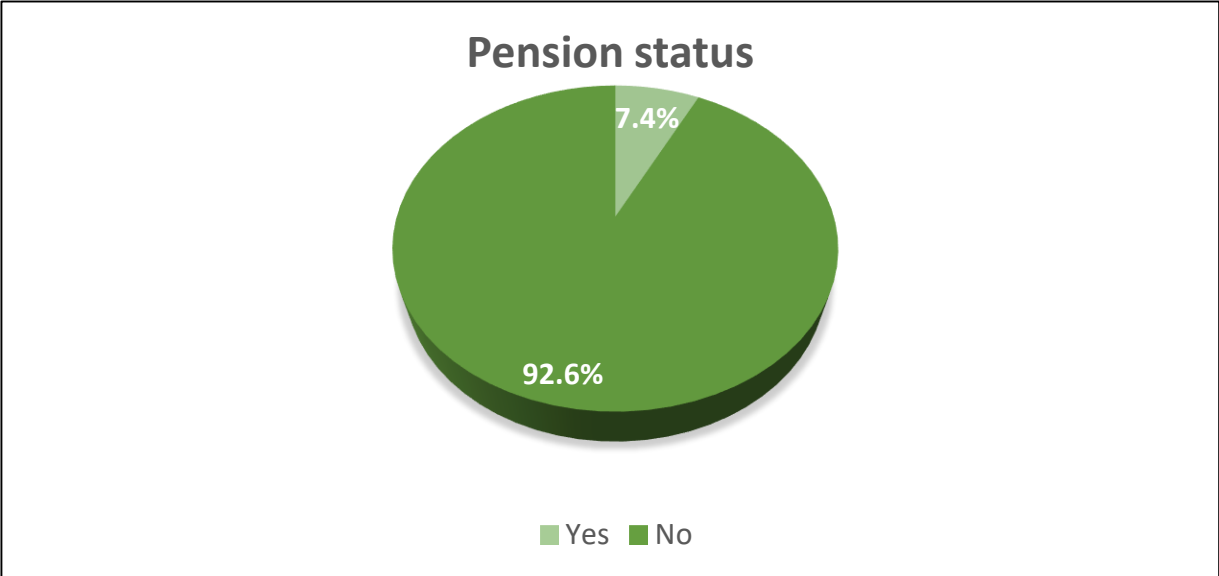
Figure 8 describe that 288(92.6%) respondent did not get pension whereas only 23(7.4%) got pension.

4.2. Risk factors of osteoarthritis

Table 3: Risk factors of osteoarthritis (N=311)*

Risk factors	**<u>n</u>**	**<u>%</u>**
H/o Trauma	203	65.27
Any weight loss(last 12 mᵒ)	174	55.95
Over weight	159	51.13
Tobacco use	107	34.41
Smoking	42	13.5
Disability	22	7.07

*(multiple response)

Table 3 shows more than half of the respondent had history of trauma, 55.96% had weight loss history, 51.13% over weight and 34.41% respondent used tobacco respectively.

4.3. Chronic diseases of the respondents (multiple response)

Table 4: Chronic diseases of the respondents (N=311)*

Chronic disease	**<u>n</u>**	**<u>%</u>**
Diabetes	225	72.3%
Hypertension	197	63.3%
Kidney disease	56	18.0%
Heart disease	62	19.9%
CNS problem	36	11.5%

Table 4 shows that majority of the respondents had diabetes (72.35%), hypertension (63.34%), heart disease (19.94%) and kidney disease (18.01%).

Table 5: Distribution of the respondents by gender and chronic diseases

Gender of the respondents	Chronic disease				
	Yes		No		Total
Male	107	95.5%	5	4.5%	112(100.0%)
Female	199	100.0%	0	0.0%	199((100.0%)
Total	306	98.4%	5	1.6%	311(100%)

Table 5 shows that 95.5% of the male respondents and 100.0% female respondents had chronic diseases whereas 4.5% male patient had no chronic diseases.

Table 6: Distribution of the respondents by gender and hypertension

Gender of the respondents	Hypertension				
	Yes		No		Total
Male	66	58.9%	46	41.1%	112(100.0%)
Female	131	65.8%	68	34.2%	199(100.0%)
Total	197	63.3%	114	36.7%	311(100%)

Table 6 reflects the hypertension and the gender characteristics of the respondents. Total numbers of respondents were 311 in this study. Among them 58.9% of the male respondents and 65.8% female patient had hypertension whereas 41.1% male patient had no hypertension.

Table 7: Distribution of the respondent by gender and diabetes

Gender of the respondents	Diabetes				
	Yes		**No**		**Total**
Male	75	67.0%	37	33.0%	112(100.0%)
Female	150	75.4%	49	24.6%	199((100.0%)
Total	225	72.3%	86	27.7%	100%

Table 7 shows that 67.0% of the male respondents and 75.4% female respondents had diabetes whereas 33.0% male patient had no diabetes.

4.4. Health seeking behavior of the respondents

Figure 9: Place of health facility (N=311)*
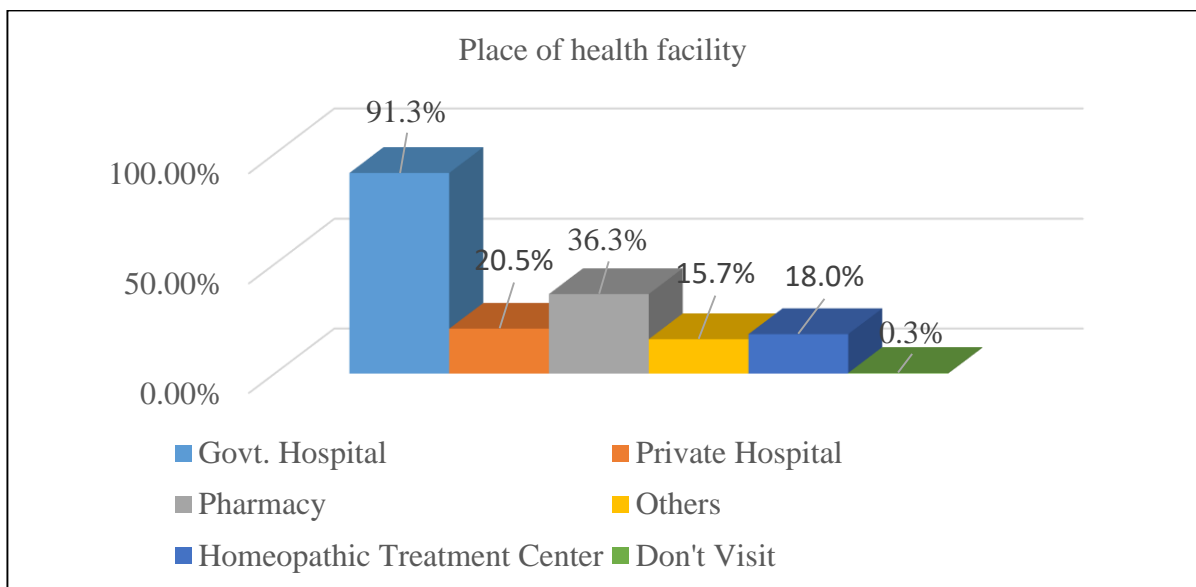
*(multiple response)

Figure 9 shows that 284(91.32%) responded visited government hospital, 113(36.33%) pharmacy, 64(20.58%) from private hospital.

Figure 10: Health check up of the respondent's (N=311)
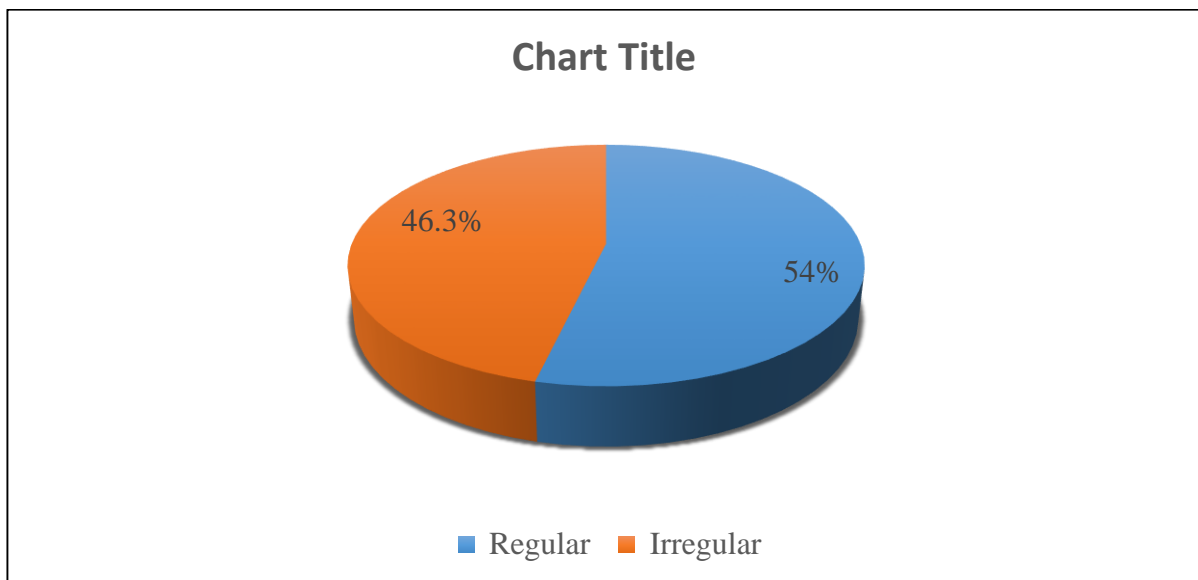
Figure 10 shows little above fifty percent (54%) of the respondents had regular health checkup and 46% irregularly take a look at up their fitness.

Table 8: Distribution of the respondent by regularity of taking prescribed treatment (N=311)

Regularity of taking prescribed treatment	Frequency	%
Yes	191	61.4%
No	120	38.5%
Total	311	100%

Table 8 shows 61.41% of the respondents used to take prescribed treatment in step with doctor's recommendation and 38.59% had now not.

Figure 11: Reason for not taking prescribed treatment (N=311)
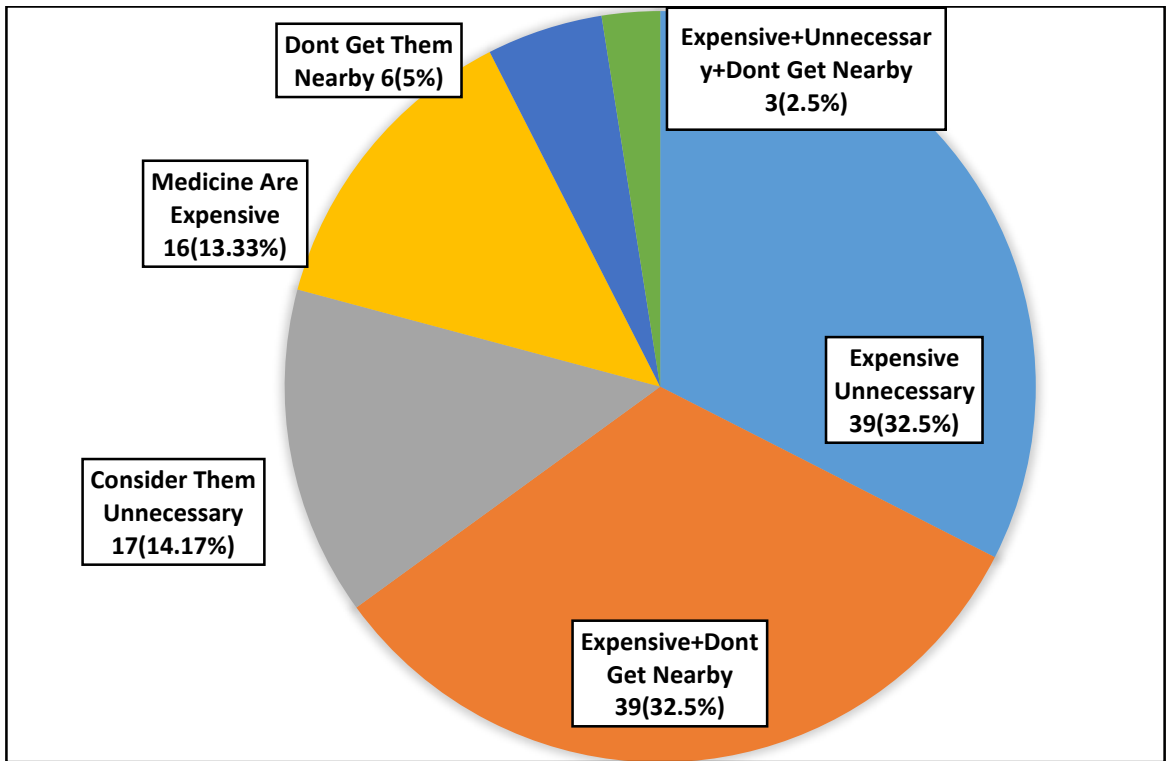
Figure 11: shows 32.5% of the respondents did not taking prescribed remedy because they think these have been unnecessary, expansive and also don't get nearby pharmacy.

Table 9: Satisfaction with available health care system (N=311)

Satisfaction with available health care system	Frequency	%
Yes	145	46.6%
No	166	53.3%
Total	311	100%

According to Table 9, around 53.3% of respondents were unsatisfied with the current health care system, while 46.6% were satisfied.

Figure 12: Reason for not satisfied health care system (N=166)

Health care system is far away (25.6%)

Service provider not available (19.1%)

HCS far away & service provider not available (16.6%)

Poor attitude & service provider not available (10.7%)

Far away & poor attitude (10.1%)

Poor attitude of health care provider (9.5%)
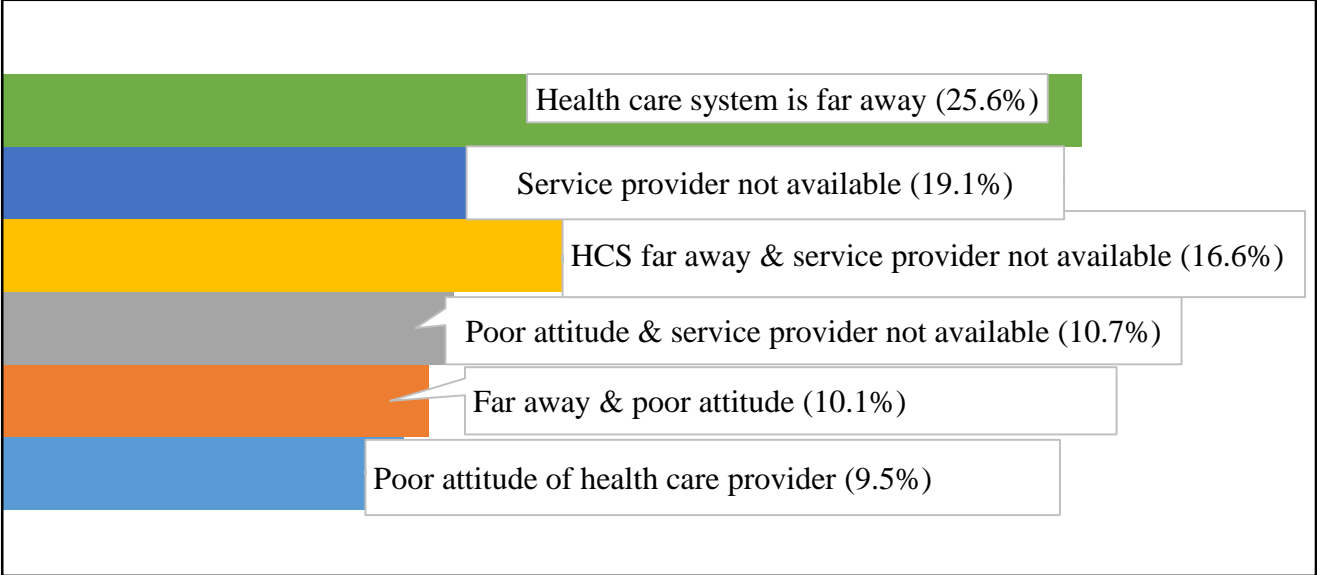
Figure 12 explores that 43(25.6%) respondents were dissatisfied because the healthcare system was far away, whereas 32(19.05%) respondents remarked that service providers weren't always available.

4.5. Life style related information

Table: 10: Distribution of the respondent according to nature of work (N=311)

Nature of work	Frequency	%
Sitting	166	53.3%
Standing	109	35.0%
Bending	4	1.2%
Sitting and standing	19	6.1%
Sitting, standing and bending	12	3.8%
Not doing anything	1	0.3%
Total	311	100%

Table 10: explores that out of 311 respondents, 166(53.3%) were seated and 109(35%) were standing, depending of their nature of work.

Figure :13 Sedentary life style of the respondents (n=311)
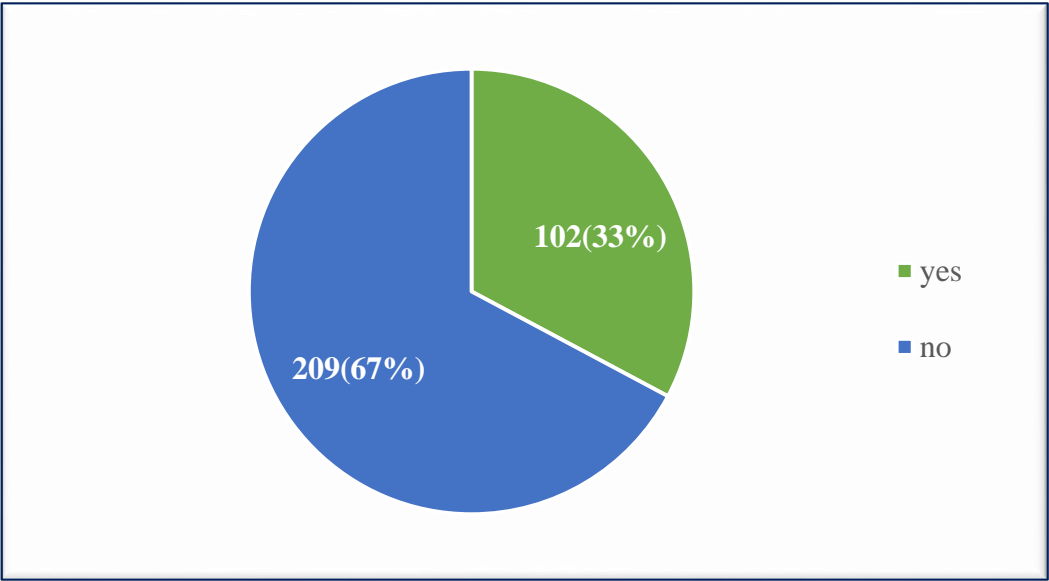
Figure 13 explores that more than sixty percent of older adult did not behave sedentary
style whereas 102(33%) behaved sedentary behavior.

4.6. WOMAC Osteoarthritis Index

1. Pain

Figure :14 Pain score of the respondent's

The pain status of the respondent in WOMAC is shown in following figures:

PAIN SCORE (N=311)
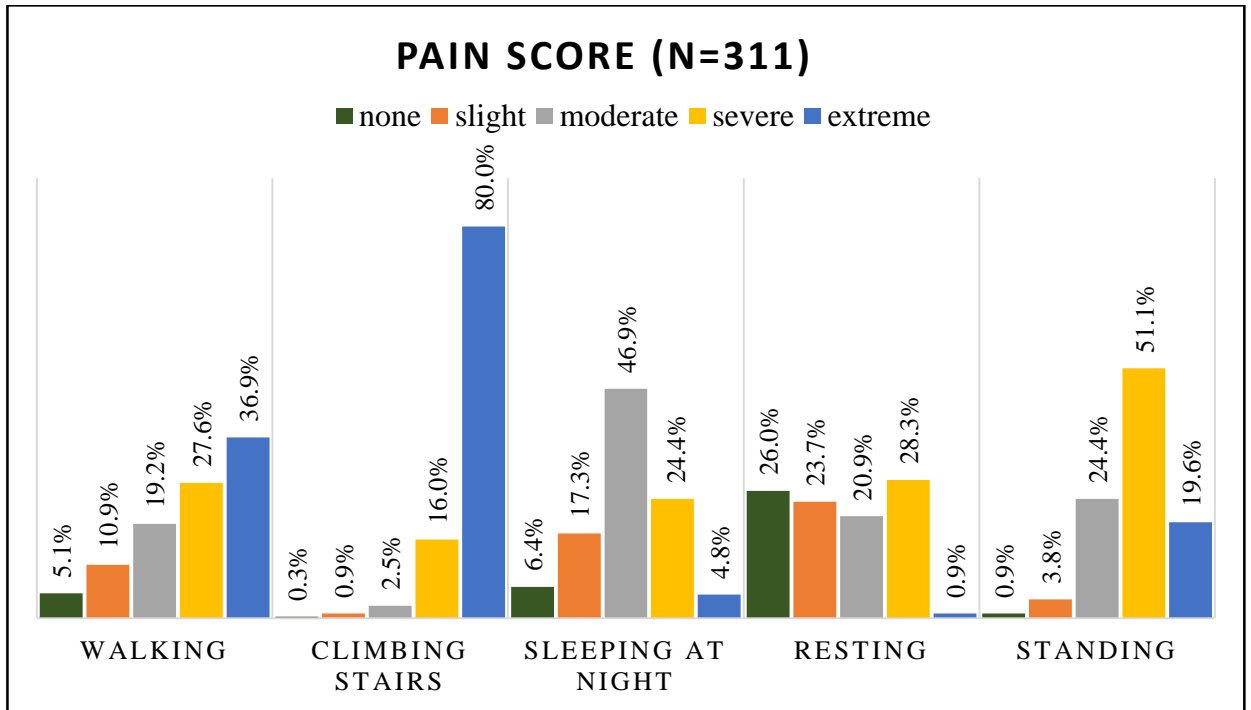
Figure 14 Explores that the highest 115(36.9%) respondents were suffering from extreme pain followed by severe 86(27.6%), moderate 60(19.2%), slight 34(10.9%) and none had pain when walking was reported 16(5.1%). It also reveals that the highest 249(80.0%) respondents were suffering from extreme pain when climbing stairs followed by severe 50(16.08%), moderate 8(2.5%), slight 3(0.96%). The highest 146(46.9%) respondents were suffering from moderate pain when sleeping at night followed by severe 76(24.4%), slight 54(17.36%), extreme 15(4.8%) and 20(6.4%) was reported who had none of the pain. The highest 88(28.3%) respondents were suffering from severe pain while at resting followed by none 81(26.0%), slight 74(23.79%), moderate 65(20.9%) and 3(0.96%) was reported who had extreme pain at all. The highest 159(51.13%) respondents were suffering from severe pain while at standing followed by moderate 76(24.4%), extreme 61(19.6%), slight 12(3.8%) at all.

2. Stiffness

Figure :15 Stiffness score of the respondents (N=311)
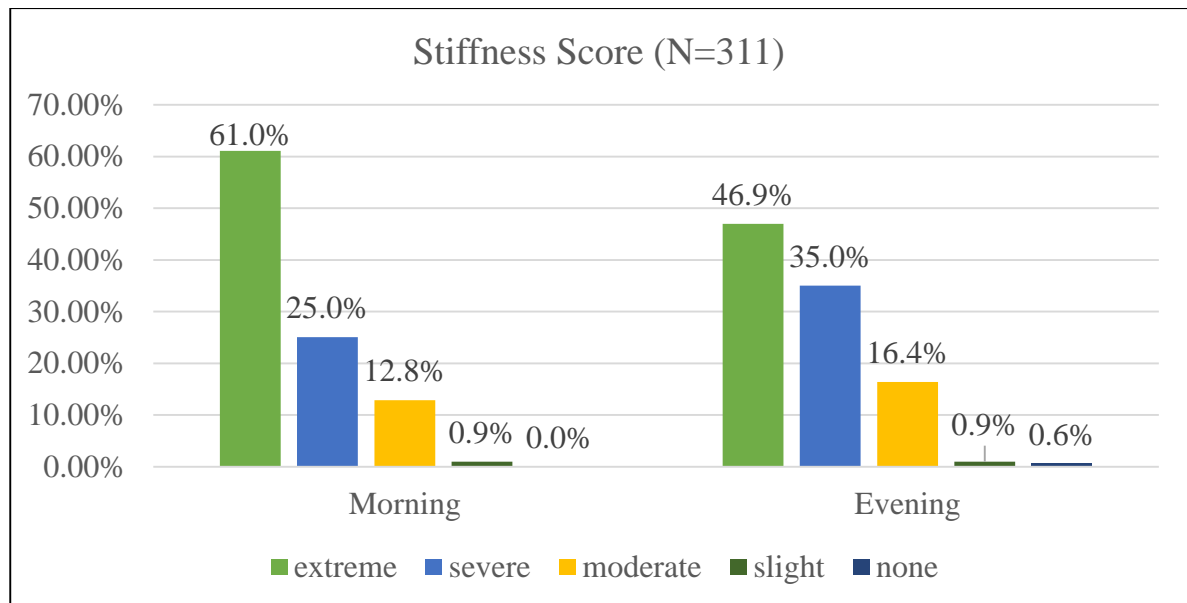
Figure 15 reveals that the extreme morning stiffness was most common among 190 respondents (61.0%), followed by severe stiffness (78.0%) and moderate stiffness (40.8%).

In evening, the highest 146(46.9%) respondents had extreme stiffness while 109(35.0%) had severe stiffness, 51(16.4%) had moderate stiffness and 3(1%) had slight stiffness at all.

3. Difficulties performing daily activities:

Figure :16 Difficulty score of the respondents (N=311)

DIFFICULTY SCORE (N=311)

Legend: ■ extreme ■ severe ■ moderate ■ slight ■ none

Activity	extreme	severe	moderate	slight	none
DESCENDING STAIRS	71.0%	23.1%	4.8%	0.6%	0.3%
ASCENDING STAIRS	86.8%	10.6%	2.2%	0.0%	0.3%
RISING FROM SITTING	31.8%	54.9%	11.2%	1.6%	0.3%
DIFFICULTY IN STANDING	15.7%	58.8%	20.9%	3.2%	1.2%
BENDING TO FLOOR	51.4%	37.9%	7.7%	0.9%	1.9%
WALKING ON EVEN FLOOR	0.6%	9.6%	39.5%	20.2%	29.9%
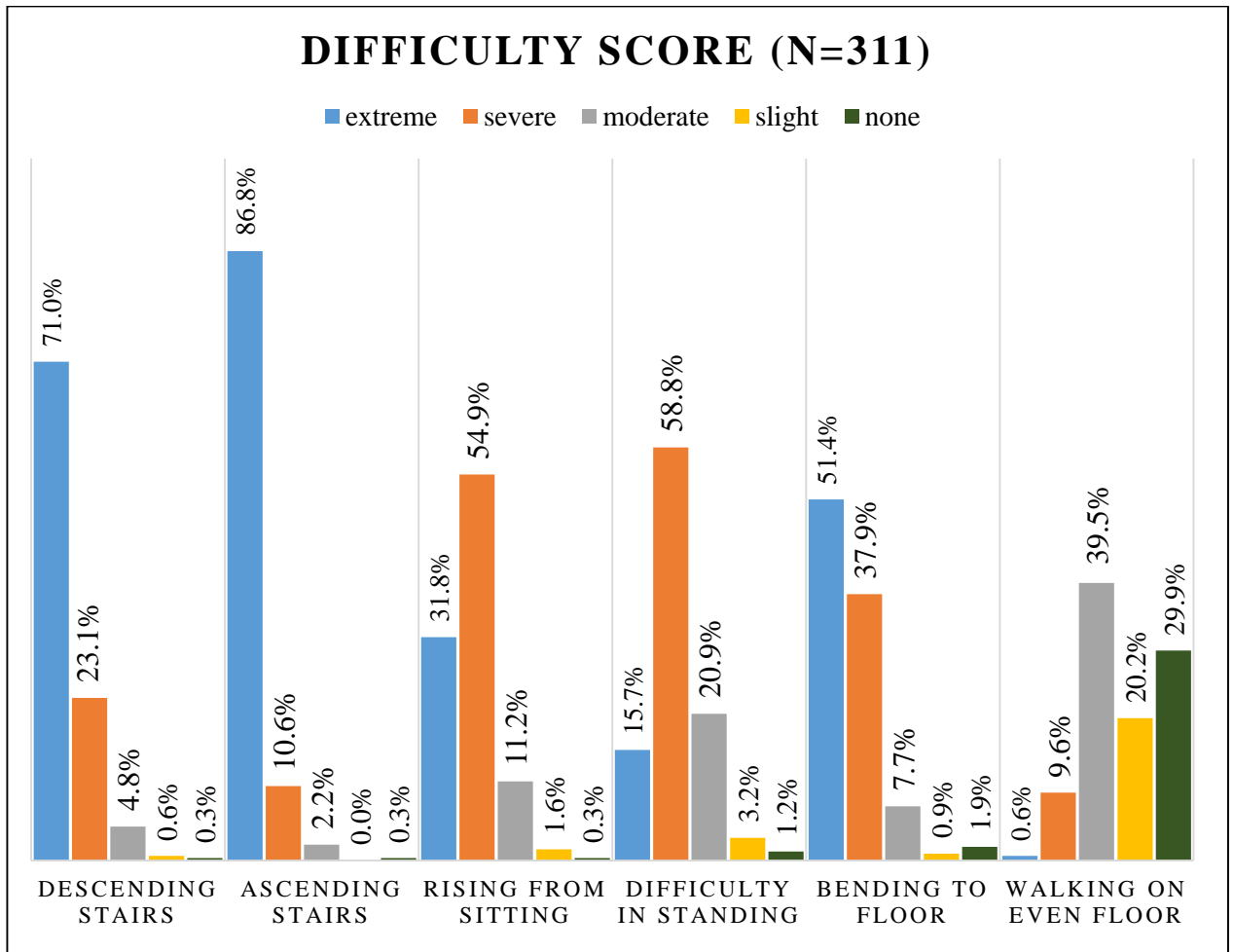
Figure 16A explores that the highest 71.0% respondents had extreme difficulties when ascending the stairs, while 23.1% had severe difficulties, 4.8% had moderate difficulties. The highest 86.82% respondents had extreme difficulties when descending the stairs, while 10.6% had severe difficulties, 2.2% had moderate difficulties. While rising up from sitting the highest 54.9% respondents had severe difficulties, 31.8% had extreme difficulties. The highest 58.8% respondents had severe difficulties while standing, 20.9% had moderate difficulties, and 15.7% had extreme difficulties. 51.4% of respondents reported having extreme difficulty bending to the floor, followed by 37.9% and 7.7% who reported having severe and moderate difficulty. Walking on an even surface presented moderate difficulties for the majority of respondents (39.5%), while just 29.9% had no problems and 20.2% had only slight issues.

DIFFICULTY SCORE (N=311)
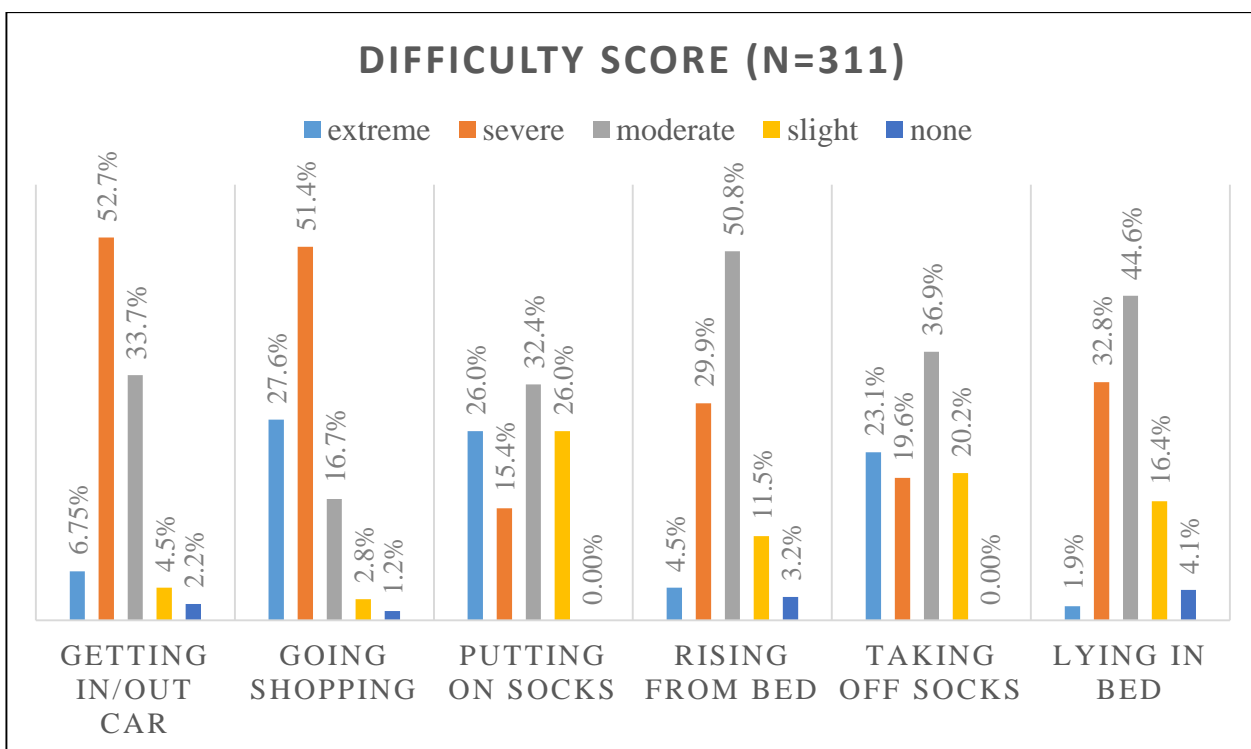
Figure 16B depicts the graphical representation of the data obtained from the difficulty scenarios such as getting in and out of car, going shopping, putting on socks, rising from bed, taking off socks, lying in bed. The results according to the above mentioned difficulties revealed, 164(52.7%) respondents had severe difficulties, 105(33.7%) had moderate difficulties, 21(6.7%) had extreme difficulties while getting in and out of car; 160(51.4%) had severe difficulties, 86(27.6%) had extreme difficulties, 52(16.7%) had moderate difficulties while going shopping; 101(32.4%) had moderate difficulties, 81(26.05%) reported both extreme and slight pain when putting on socks; the highest 158(50.8%) of the respondents had moderate difficulties, 93(29.9%)had severe difficulties and 36(11.5%) had slight difficulties while rising from bed; the highest 115(36.9%) had moderate difficulties, 72(23.1%) had extreme difficulties, 63(20.2%) had slight difficulties, 61(19.6%) had severe difficulties while taking off socks; the highest 139(44.6%) had moderate difficulties, 102(32.8%) had severe difficulties, 51(16.4%) had slight difficulties while lying in bed.

DIFFICULTY SCORE (N=311)
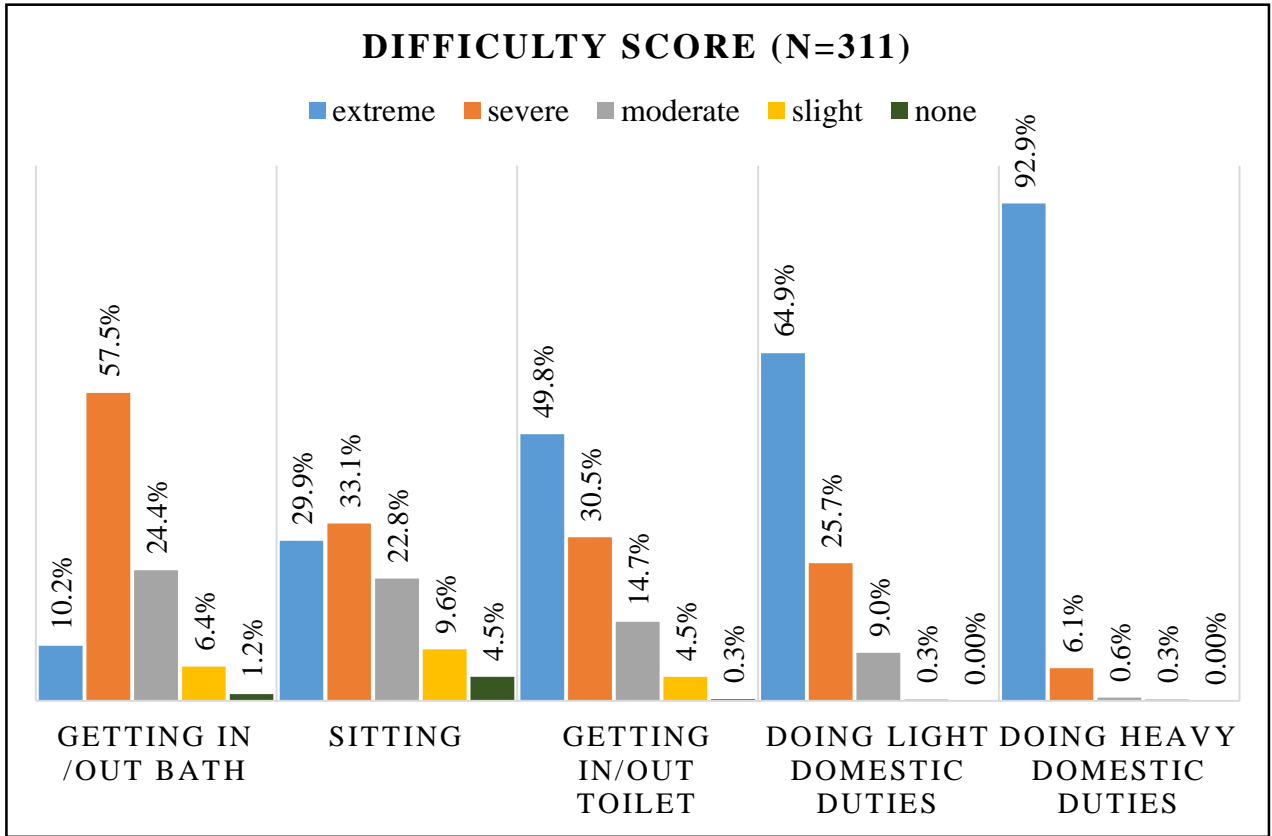
Figure 16 C shows that the highest 179(57.5%) of the respondents had severe difficulties, 76(24.4%) had moderate difficulties, 32(10.2%) had extreme difficulties while in or out of bath; While in sitting, the highest 103(33.1%) had severe difficulties, 93(29.9%) had extreme difficulties, 71(22.8%) had moderate difficulties. In case of getting in and out from toilet the highest 155(49.8%) of the respondents had extreme difficulties while the second highest 95(30.5%) had no difficulties and 46(14.7%) had moderate difficulties.

When doing domestic duties like cooking or dusting the highest 202(64.9%) of the respondents had extreme difficulties, 80(25.7%) had severe difficulties and 28(9.00%) had moderate difficulties; 289(92.9%) of the respondents had extreme difficulties when doing heavy domestic duties while the second highest 19(6.1%) had severe difficulties.

Figure 17: Total Pain score of the respondent's (N=311)
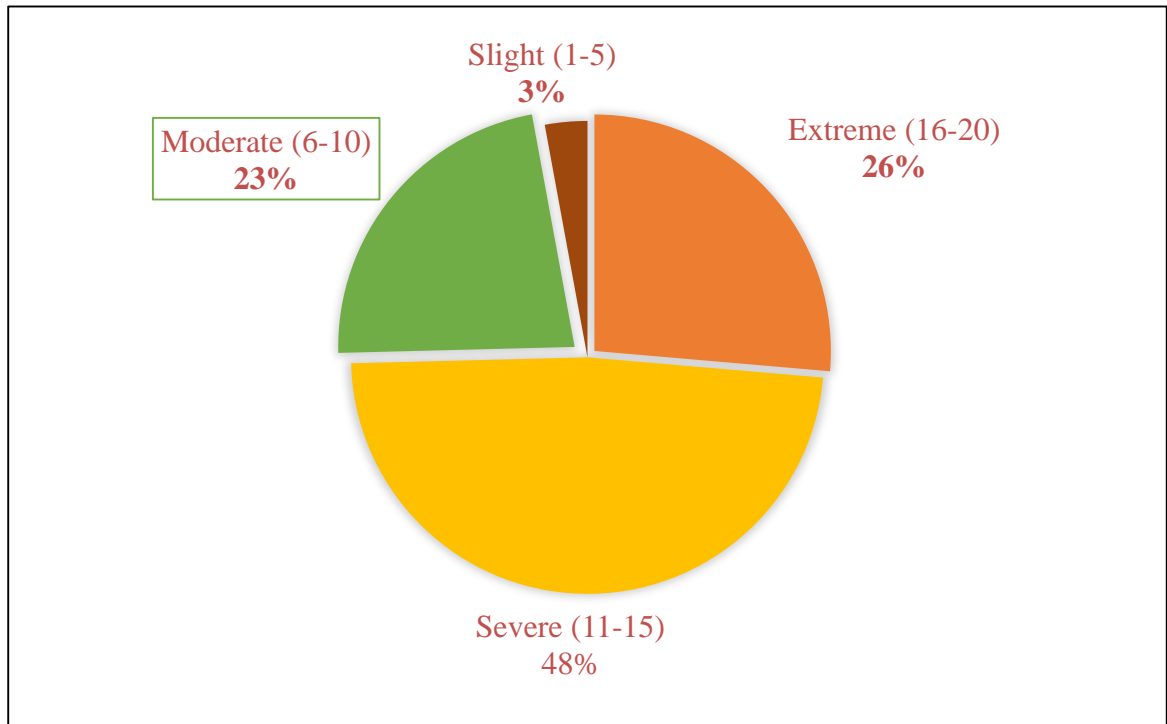
Figure 17: Explores the distribution of pain scores, finding that severe pain scored (48%) was followed by extreme (26%), moderate (23%), and slight pain scoring (3%).

(Figure 18: Total Stiffness Score of the Respondent's (N=311)
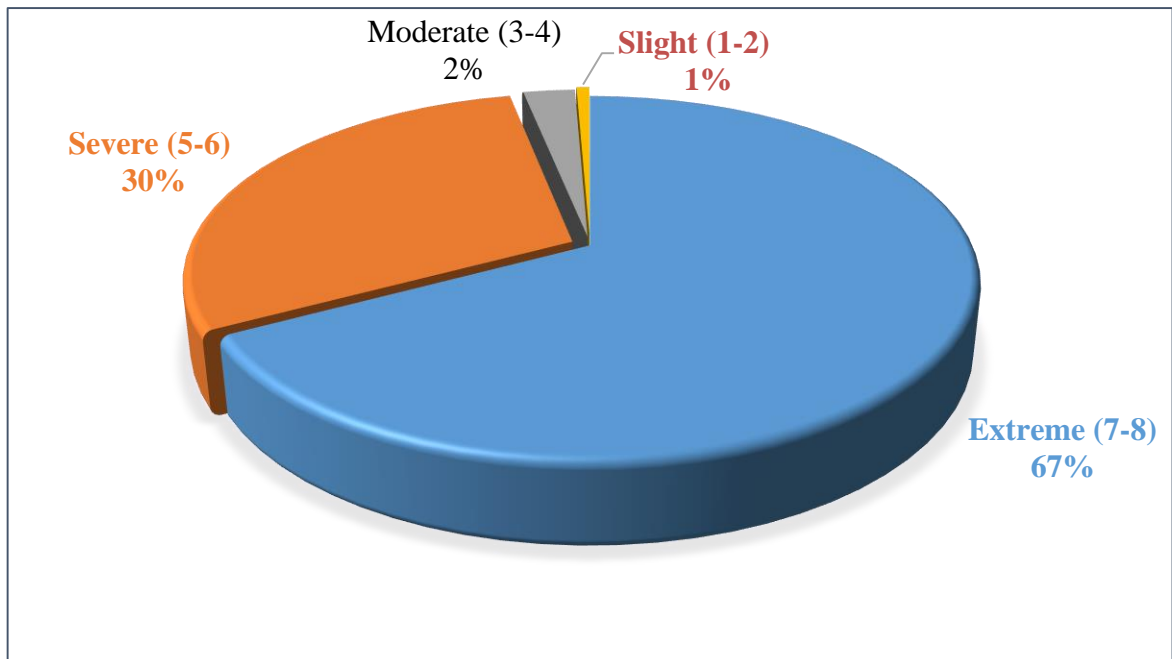
Figure 18: Explores that (67%) respondents were suffering from extreme stiffness followed by severe (30%), moderate (2%) and slight (1%).

(Figure 19: Total Difficulties Performing Daily Activities (DPDA) (N=311)
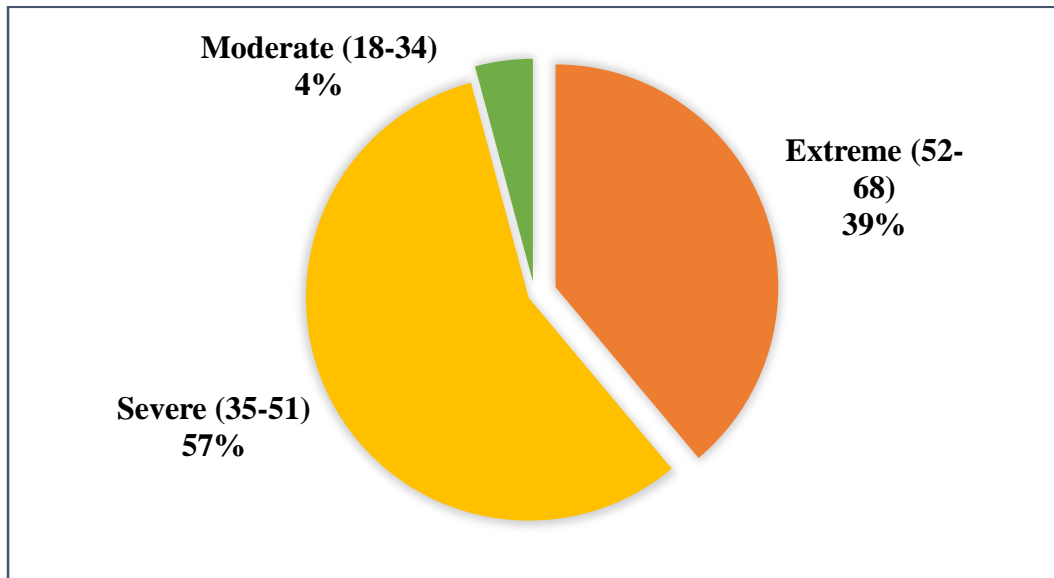
Figure 19: Explore that the severe (57%) difficulty performing daily activities (DPDA) criteria, which is trouble performing on a daily basis, followed by extreme (39%) and moderate (4%).

Figure 20: WOMAC Osteoarthritis Index (N=311)
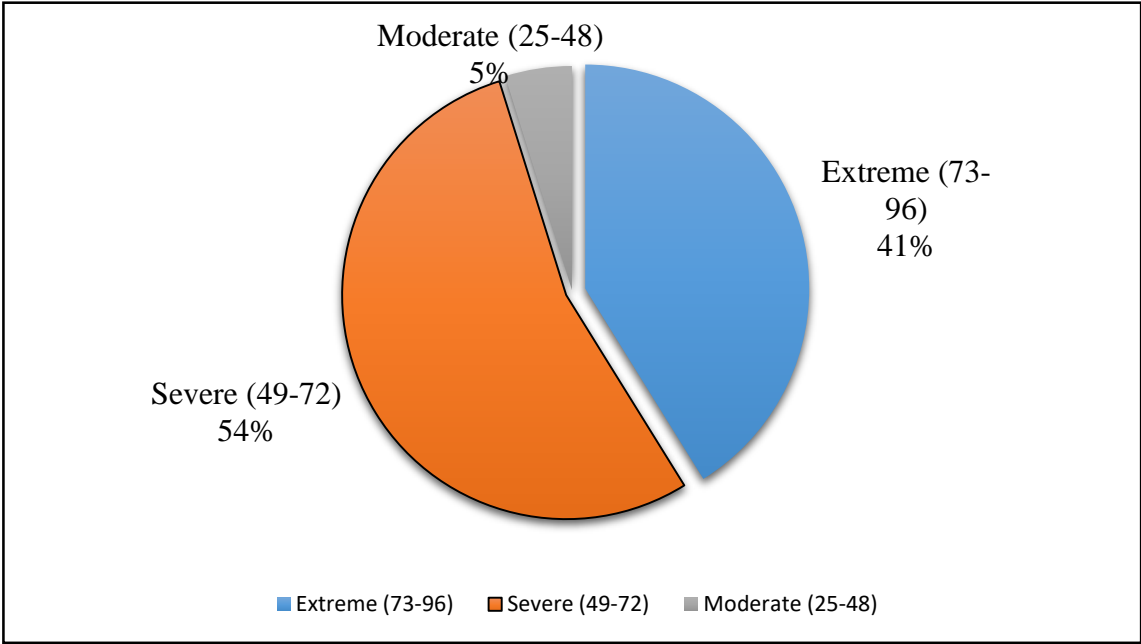
Figure 20: Explores that the severe WOMAC osteoarthritis index is (54%) followed

by extreme (41%), moderate (5%). Mean with SD 68.717±10.01

4.7. Mini Nutritional Assessment (MNA)

Figure 21: Screening score (MNA) of the respondents
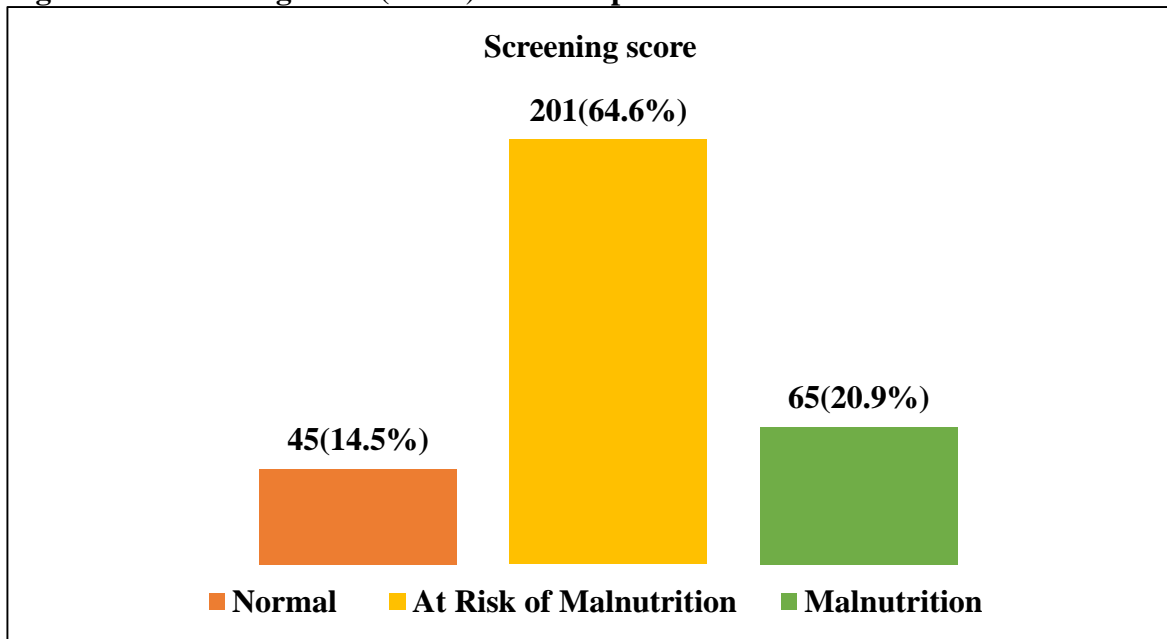
According to screening score, at risk of malnutrition was (64.6%) followed by malnourished (20.9%) and normal (14.5%).

Table: 11 MNA (Mini Nutritional Assessment)

Total MNA Score	Frequency	Percentage (%)
Normal nutritional status (24 to30)	97	31.2%
At risk of malnutrition (17 to 23.4)	181	58.2%
Malnourished (Less than 17)	33	10.6%
Total	311	100%

Table 11 showed that around half of the respondents 181(58.2%) were at risk of malnourished and 97(31.2%) were normal. However, only 33(10.6%) respondents were malnourished.

4.8. Association between dependent and independent variables
Table 12: Nutritional status according to demographic variable

	Normal Nutritional Status	At Risk of Malnutrition	Malnourished	Total	Chi Square Value	P-Value
Age (Years)	97	181	33	311		
60-69	87(33.5%)	152 (58.6%)	20 (7.7%)	259(83.2%)		
70-79	9 (21.4%)	23 (54.7%)	10 (23.8%)	42 (13.5%)	15.778	0.003
>80	1 (10%)	6 (60%)	3 (30%)	10 (3.2%)		
Gender						
Male	48(42.8%)	56 (50.0%)	8 (7.1%)	112(36.0%)	11.645	0.003
Female	49(24.6%)	125 (62.8%)	25 (12.5%)	199(63.9%)		
Religion						
Muslim	92(31.2%)	169 (57.4%)	33 (11.2%)	294(94.5%)	2.401	0.301
Hindu	5 (29.4%)	12 (70.5%)	-	17 (5.4%)		
Marital status						
Married	82(35.3%)	131 (56.4%)	19 (8.1%)	232(74.6%)		
Divorce	1 (33.3%)	2 (66.6%)	-	3 (0.9%)	11.708	0.02
Widow	14(18.4%)	48 (63.1%)	14 (18.4%)	76 (24.4%)		
Educational Background						
Illiterate	17(17.5%)	65 (67.0%)	15 (15.4%)	97 (31.1%)		
Primary	25(24.2%)	64 (62.1%)	14 (13.5%)	103(33.1%)		
Secondary	38(46.3%)	40 (48.7%)	4 (4.8%)	82 (26.3%)		
Higher Secondary	7 (46.6%)	8 (53.3%)	-	15 (4.8%)	35.747	0.000
Degree	6 (66.6%)	3 (33.3%)	-	9 (2.8%)		
Postgraduate and above	4 (80%)	1 (20%)	-	5 (1.6%)		
Occupation						
Housewife	36(22.7%)	101 (63.9%)	21 (13.2%)	158(50.8%)		
Worker	5 (23.8%)	13 (61.9%)	3 (14.2%)	21 (6.7%)		
Service Holder	18(78.2%)	5 (21.7%)	-	23 (7.4%)	35.342	0.000
Retired Person	19(37.2%)	29 (56.8%)	3 (5.8%)	51 (16.4%)		
Business	11(42.3%)	14 (53.8%)	1 (3.8%)	26 (8.3%)		
Others	8 (25%)	19 (59.3%)	5 (15.6%)	32 (10.2%)		
Stay With Family						
Yes	94(31.2%)	175 (58.1%)	32 (10.6%)	301 (96.78)	0.014	0.993
No	3 (30%)	6 (60%)	1 (10%)	10 (3.22)		
Financial Dependence						
Dependent	37 (21%)	111 (63%)	28 (15.9%)	176(56.5%)		
Partially Independent	32 (39%)	45 (54.8%)	5 (6.1%)	82 (26.3%)	29.239	0.000
Independent	28(52.8%)	25 (47.1%)	-	53 (17%)		

	Normal Nutritional Status	At Risk of Malnutrition	Malnourished	Total	Chi Square Value	P-Value
ncome	97	181	33	311		
≤10000	4 (16.6%)	16 (66.6%)	4 (16.6%)	24 (7.7%)		0.084
10001-40000	61 (28.2%)	130 (60.1%)	25 (11.5%)	216(69.4%)	11.148	
40001-100000	27 (45%)	29 (48.3%)	4 (6.6%)	60 (19.2%)		
>100000	5 (45.4%)	6 (54.5%)	-	11 (3.5%)		
Pension Status						
Yes	10 (43.4%)	11 (47.8%)	2 (8.7%)	23 (7.4%)	1.748	0.417
No	87 (30.2%)	170 (59%)	31 (10.7%)	288(92.6%)		
Sedentary Lifestyle						
Yes	22 (21.5%)	58 (56.8%)	22 (21.5%)	102(32.8%)	21.726	0.000
No	75 (35.8%)	123 (58.8%)	11 (5.2%)	209(67.2%)		

Table 12 shows the association of various socio-demographic characteristics with nutritional status among the study population. Age group, gender, marital status, educational status, occupation and financial dependency were found to be significantly associated with nutritional status, while religion, stay with family and pension status were not. Patients who were dependent (63.0%) were more at risk of malnutrition than independent respondent (47.1%), and female patients (62.8%) were more at risk of malnutrition than male patients (50%).

Table 13: Nutritional status of older adult according to health / physical variables

Has food intake declined over the past 3 m	Normal Nutritional Status	At Risk of Malnutrition	Malnourished	Total	Chi Square Value	P-Value
	97	181	33	311		
Severe Decrease	2 (4.0%)	28 (56%)	20 (40)	50 (16.0%)		
Moderate Decrease	32 (22.2%)	100(69.4%)	12(8.3%)	144(46.3%)	93.234	0.000
No Decrease	63 (53.8%)	53 (45.3%)	1 (0.8%)	117 (37.6%)		
Wt Loss During Last 3 M						
Wt Loss>3 Kg	-	7 (35.0%)	13(65.0%)	20 (6.4%)		
Does Not Know	1 (6.2%)	12 (75.0%)	3 (18.7%)	16 (5.1%)		
Wt Loss Bet^w 1 & 3 Kg	23 (18.7%)	88 (71.5%)	12 (9.7%)	123 (39.5%)	102.669	0.000
No Wt Loss	73 (48.0%)	74 (48.6%)	5 (3.2%)	152 (48.8%)		
Mobility						
Bed/Chair Bound	-	-	2 (100%)	2 (0.6%)		
Able To Get Out Bed/Chair but Does Not Go Out	1 (2.5%)	22 (55.0%)	17 (42.5%)	40 (12.8%)	75.003	0.000
Goes Out	96 (35.6%)	159(59.1%)	14 (5.2%)	269 (86.5%)		
Has Suffered Psychological Stress Or Acute Disease In Past 3M						
Yes	11 (8.9%)	83 (67.4%)	29(23.5%)	123(39.5%)	67.537	0.000
No	86 (45.7%)	98 (52.1%)	4 (2.1%)	188(60.4%)		
Neuropsychological Problem						
Severe Dementia/Depression	4 (5.2%)	46 (60.5%)	26(34.2%)	76 (24.4%)		
Mild Dementia	92(39.3%)	135(57.6%)	7 (2.9%)	234(75.2%)	76.315	0.000
No Psychological Problems	1 (100%)	-	-	1 (0.3%)		
BMI						
BMI <19	-	12 (46.1%)	14 (53.8%)	26 (8.3%)		
BMI 19 to<21	1 (4.3%)	18 (78.2%)	4 (17.3%)	23 (7.4%)	77.846	0.000
BMI 21 to <23	16 (26.2%)	37 (60.6%)	8 (13.1%)	61(19.6%)		
BMI 23 Or Greater	80 (39.8%)	114(56.7%)	7 (3.4%)	201(64.6%)		
Calf circumference						
CC <31	0	11 (50.0)	12 (50.0%)	22 (7.0%)	42.274	0.000
CC 31 or greater	97 (33.5%)	170(58.8%)	22 (7.6%)	289 (92.9%)		
Mid Arm Circumference in Cm						

Mac <21	-	10 (71.4%)	4 (28.5%)	14 (4.5%)		
Mac 21 To22(0.5)	2 (5.2%)	24 (63.1%)	12 (31.5%)	38 (12.2%)	39.732	0.000
Mac >22(1.0)	95 (36.6%)	147(56.7%)	17 (6.5%)	259 (83.2%)		

Among subjects who reported moderate decrease in food intake during the last 3 months, 69.4 % and 8.3% were at risk of malnutrition and malnourished respectively and the association was statistically significant. Almost two-thirds of subjects with weight loss >3 kg in the last 3 months were "malnourished" while one-third were at risk. Among the mobile patient, more than half were at the risk of malnutrition and 5.2% were malnourished. However, 60.5% and 57.6% of elderly adults with severe and mild dementia, respectively, were at risk of malnutrition. A far lower percentage, 34.2% and 2.9%, of participants with severe and mild dementia, respectively, were truly malnourished. Sixty seven percent of those with psychological stress were at risk while 23.58% were actually malnourished. Among subjects with BMI 19 to <21 kg/m2, 78.26% were at risk and 17.39% were malnourished while half of the elders with calf circumference <31 cm were at risk and malnourished. All health-related variables showed statistical significance with regard to nutritional status.

Table 14: Nutritional status of older adult with life style and morbidity pattern

	Normal Nutritional Status	At Risk of Malnutrition	Malnourished	Chi Square Value	P-Value
Smoking					
Yes	20(47.6%)	19 (45.2%)	3 (7.1%)	6.154	0.046
No	77(28.6%)	162 (60.2%)	30 (11.1%)		
Overweight					
BMI<25	34(21.3%)	100 (62.8%)	25 (15.7%)	19.274	0.000
BMI>25	63(41.4%)	81 (53.2%)	8 (5.2%)		
H/O Trauma					
Yes	68(33.5%)	111 (54.6%)	24 (11.8%)	3.051	0.217
No	29(26.8%)	70 (64.8%)	9 (8.3%)		
Any Wt Loss Last 12 M					
Yes	39(22.4%)	109 (62.6%)	26 (14.9%)	18.079	0.000
No	58(42.3%)	72 (52.5%)	7 (5.1%)		
Disability					
Yes	3 (13.6%)	13 (59.0%)	6 (27.2%)	8.536	0.014
No	94(32.5%)	168 (58.1%)	27 (9.3%)		
Chronic Disease					
Yes	95(31.0%)	178 (58.1%)	33 (10.7%)	0.669	0.716
No	2 (40.0%)	3 (60.0%)	-		
Diabetes					
Yes	71 (31.5%)	129 (57.3%)	25 (11.1%)	0.332	0.847
No	26 (30.2%)	52 (60.4%)	8 (9.3%)		
Hypertension					
Yes	58 (29.4%)	115 (58.3%)	24 (12.1%)	1.781	0.411
No	39 (34.2%)	66 (57.8%)	9 (7.8%)		
Kidney Disease					
Yes	11 (19.6%)	38 (67.8%)	7 (12.5%)	4.244	0.12
No	86 (33.7%)	143 (56.0%)	26 (10.2%)		
Heart Disease					
Yes	9 (14.5%)	40 (64.5%)	13 (20.9%)	15.261	0.000
No	88 (35.3%)	141 (56.6%)	20 (8.0%)		
CNS Problem					
Yes	13 (36.1%)	18 (50.0%)	5 (13.8%)	1.199	0.549
No	84 (30.5%)	163 (59.2%)	28 (10.1%)		
Respiratory Problem					
Yes	13 (26.5%)	34 (69.3%)	2 (4.0%)	3.993	0.136
No	84 (32.0%)	147 (56.1%)	31 (11.8%)		

Table 14 displays the relationship between older adults' nutritional status and lifestyle factors and morbidity patterns, where smoking, being overweight, losing weight (last 12month), being disabled, and heart disease were statistically significant.

Table 15: Association of WOMAC score according to demographic variable

Age	Moderate 15	Severe 168	Extreme 128	Total 311	Chi-Square Value	P-Value
60-69	15 (4.8%)	139 (44.6%)	105 (33.7%)	259 (83.2%)	4.264	0.372
70-79	-	22 (7.0%)	20 (6.4%)	42 (13.5%)		
>80	-	7 (2.2%)	3 (0.9%)	10 (3.2%)		
Gender						
Male	7 (2.2%)	65 (20.9%)	40 (12.8%)	112 (36.0%)	2.522	0.283
Female	8 (2.5%)	103 (33.1%)	88 (28.3%)	199 (63.9%)		
Religion						
Muslim	12 (3.8%)	157(50.4%)	125(40.1%)	294(94.5%)	8.927	0.012
Hindu	3 (0.9%)	11 (3.5%)	3 (0.9%)	17 (5.4%)		
Educational Background						
Illiterate	1 (0.3%)	47 (15.1%)	49(15.7%)	97 (31.1%)	74.198	0.000
Primary	3 (0.9%)	58 (18.6%)	42 (13.5%)	103(33.1%)		
Secondary	6 (1.9%)	46 (14.7%)	30 (9.6%)	82 (26.3%)		
Higher Secondary	1 (0.3%)	8 (2.5%)	6 (1.9%)	15 (4.8%)		
Degree	-	8 (2.5%)	1 (0.3%)	9 (2.8%)		
Post Graduate And Above	4 (1.2%)	1 (0.3%)	-	5 (1.6%)		

Occupation					
Housewife	6 (1.9%)	80 (25.7%)	72 (23.1%)	158 (50.8%)	
Worker	-	11 (3.5%)	10 (3.2%)	21 (6.7%)	
Service Holder	5 (1.6%)	13 (4.1%)	5 (1.6%)	23 (7.4%)	
Retired Person	2 (0.6%)	27 (8.6%)	22 (7.0%)	51 (16.4%)	22.685	0.012
Business	2 (0.6%)	16 (5.1%)	8 (2.5%)	26 (8.3%)	
Others	-	21 (6.7%)	11 (3.5%)	32 (10.2%)	
Financial Dependence					
Dependent	6 (1.9%)	97 (31.1%)	73 (23.4%)	176 (56.5%)	
Partially Independent	-	42 (13.5%)	40 (12.8%)	82 (26.3%)	24.381	0.000
Independent	9 (2.8%)	29 (9.3%)	15 (4.8%)	53 (17.0%)	
Income					
≤10000	1 (4.1%)	14 (58.3%)	9 (37.5)	24 (7.72)	
10001-40000	6 (2.7%)	111(51.3%)	99 (45.8%)	216(69.0%)	17.897	0.006
40001-100000	8 (13.3%)	34 (56.6%)	18 (30.0%)	60 (19.2%)	
>100000	-	9 (81.8%)	2 (18.1%)	11 (3.5%)	

Table 15 shows the association of various socio-demographic characteristics with WOMAC score among the study population. Religion, educational status, occupation, financial dependency and income were found to be significantly associated with WOMAC score, while age, sex, marital status, stay with family and pension status were not. Patients with dependent status (31.19%) suffered from severe osteoarthritis compared to independent respondents (9.32%), and one third female patients (33.12%) suffered severe osteoarthritis than male patients (20.9%).

Table 16: Association of WOMAC score according to risk factors

	Moderate	Severe	Extreme	Total	Chi-Square Value	P-Value
H/O Trauma						
Yes	4 (1.29%)	97 (31.19%)	102 (32.8%)	203 (65.2%)	25.804	0.000***
No	11 (3.54%)	71 (22.83%)	26 (8.36%)	108 (34.7%)		
Diabetes						
Yes	15 (4.82%)	116 (37.3%)	94 (30.23%)	225 (72.3%)	6.724	0.035**
No	-	52 (16.7%)	34 (10.9%)	86 (27.6%)		
Hypertension						
Yes	10 (3.22%)	106 (34.08%)	81 (26.05%)	197 (63.34)	0.076	0.963
No	5 (1.61%)	62 (19.94%)	47 (15.11%)	114 (36.66)		
Tobacco Use						
Yes	4 (1.29%)	55 (17.68%)	48 (15.43%)	107 (34.41)	1.148	0.563
No	11 (3.54%)	113 (36.33%)	80 (25.72%)	204 (65.59)		
CNS Problem						
Yes	5 (1.61%)	22 (7.07%)	9 (2.8%)	36 (11.5%)	9.899	0.007***
No	10 (3.2%)	146 (46.9%)	119(38.2%)	275(88.4%)		
Sedentary Life Style						
Yes	3 (0.96%)	47 (15.1%)	52 (16.7%)	102 (32.8%)	6.445	0.04**
No	12 (3.86%)	121(38.9%)	76 (24.4%)	209 (67.2%)		

Table 16 shows the association of WOMAC score with risk factors including co-morbidities among the study population. H/o trauma, diabetes, CNC problem and sedentary life style were found to be significantly associated with WOMAC score, while tobacco use and hypertension were not.

Table 17: Association of WOMAC score with American College of Rheumatology (ACR criteria)

Which Side Involved	Moderate	Severe	Extreme	Total	Chi-square	P-value
Left	8 (2.5%)	44 (14.1%)	25 (8.04%)	77 (24.7%)		
Right	4 (1.2%)	35 (11.2%)	15 (4.8%)	54 (17.3%)	17.79	0.001***
Both	3 (0.96%)	89 (28.6%)	88 (28.3%)	180(57.8%)		
Morning Stiffness<30 Min						
Yes	11 (3.5%)	160 (51.4%)	123 (39.5%)	294(94.5%)	13.811	0.001***
No	4 (1.2%)	8 (2.57%)	5 (1.61%)	17 (5.47)		
Crepitus On Active Movement						
Yes	3 (0.96%)	106 (34.08%)	98 (31.5%)	207(66.5%)	21.269	0.000***
No	12 (3.8%)	62 (19.9%)	30 (9.6%)	104(33.4%)		
Bony Tenderness						
Yes	15 (4.82%)	153 (49.2%)	124 (39.8%)	292(93.8%)	5.291	0.071*
No	-	15 (4.8%)	4 (1.2%)	19 (6.11)		
Bony Overgrowth						
Yes	8 (2.5%)	40 (12.8%)	17 (5.4%)	65 (20.9%)	14.899	0.001***
No	7 (2.2%)	128(41.1%)	111 (35.6%)	246(79.1%)		

Table 17 shows the association of WOMAC score with American College of Rheumatology (ACR criteria) among the study population. Almost all criteria were statistically significant with WOMAC score.

Table 18: Correlation of dependent and independent variables

Variables	Variables	r-value	p-value
Age	Total MNA	-0.143	0.011
Income	Total MNA	0.189	0.001
BMI	Total MNA	0.335	0.000
Daily working duration	Total MNA	0.196	0.001
Total WOMAC	Total MNA	0.167	0.003

Table 18 Result found that total MNA negatively influence age (P=0.000, r=0.197), whereas positively influences income (P=0.001,r=0.189) , BMI (P=0.000,r=0.335) , total duration of work (P=0.001,r=0.196) and also total WOMAC score. (P=0.003,r=0.167) and these findings were statistically significant.

4.9. Logistic regression

Table 19: Distribution of the respondents by binary logistic regression of WOMAC score with BMI

Dependent variables	Covariates	P-value	Exp (B)/Odds
Moderate WOMAC	Under nutrition	1.000	1.000
	Normal	1.000	1.000
	Over weight	0.995	24580
	Obese	0.993	0.000
Severe WOMAC	Under nutrition	**0.055**	**1.167**
	Normal	0.802	1.11
	Over weight	0.558	1.18
	Obese	0.395	0.816
Extreme WOMAC	Under nutrition	0.640	0.819
	Normal	0.703	0.842
	Over weight	0.317	0.739
	Obese	**0.054**	**1.284**

Table 19 shows that under nutrition (P= 0.055 and Odds= 1.167) and obesity (P= 0.054 and Odds= 1.284) influenced significantly on severe and extreme disability of OA knee. These disabilities were measured by WOMAC scale.

Table 20: Distribution of the respondents by binary logistic regression of WOMAC score with nutritional status

Dependent variables	Covariates	P-value	Exp (B)/Odds
Moderate	Normal	0.045	1.982
	At risk	0.996	0.000
	Malnourished	0.998	0.000
Severe	Normal	0.679	1.182
	At risk	0.826	1.087
	Malnourished	0.760	0.894
Extreme	Normal	0.330	0.783
	At risk	0.559	1.147
	Malnourished	**0.059**	**1.217**

Table 20 demonstrates that extreme impairment from OA knee was strongly impacted by malnutrition (P = 0.059 and odds = 1.217). The WOMAC scale was used to assess these difficulties.

Table 21: Distribution of the respondents by binary logistic regression of WOMAC score with demographic variable

Dependent variables	Covariates	P-value	Exp (B)/Odds
Moderate	60-69	0.998	6261.3
	70-79	0.998	0.000
	80 and above	0.999	0.000
Severe	60-69	0.318	0.496
	70-79	0.320	0.471
	80 and above	0.312	2.029
Extreme	60-69	0.508	1.591
	70-79	0.320	2.121
	80 and above	0.470	0.603
Moderate	Male	0.999	0.145
	Female	0.995	0.000
Severe	Male	0.027	1.289
	Female	0.287	0.777
Extreme	Male	0.144	0.701
	Female	0.044	1.427
Severe	Income (Upper)	0.080	3.991
Extreme	**Lower Middle**	**0.012**	**1.926**
	Upper Middle	0.053	0.549

Table 21 demonstrates that Upper class (P= 0.080 and odds= 3.991) and lower middle class (P = 0.012 and odds = 1.926) influenced significantly on severe and extreme disability respectively. The WOMAC scale was used to assess these difficulties.

Table 22: Distribution of the respondents by binary logistic regression of WOMAC score with comorbidity

Dependent variables	Covariates	P-value	Exp (B)/Odds
Moderate	Diabetes	0.995	0.000
	Hypertension	0.996	7866.7
	Kidney disease	0.998	0.000
	Heart disease	0.997	0.000
	CNS problem	0.998	0.000
Severe	Diabetes	0.184	0.707
	Hypertension	**0.044**	**2.008**
	Kidney disease	0.635	0.868
	Heart disease	0.290	0.739
	CNS problem	0.019	1.380
Extreme	Diabetes	**0.058**	**1.066**
	Hypertension	0.939	0.982
	Kidney disease	0.399	1.288
	Heart disease	0.151	1.517
	CNS problem	0.042	0.436

Table 22 demonstrates that while diabetes (P = 0.058 and odd = 1.066) influences extreme osteoarthritis disability, hypertension (P = 0.044 and odd = 2.008) influences severe osteoarthritis disability. The WOMAC scale was used to evaluate these impairments.

Table 23: Logistic regression analysis of association between osteoarthritis and independent variables

Dependent Variables	Independent variables	Standardized regression coefficient β	P value
Moderate (WOMAC)	**Educational background**		
	Illiterate	-14.037	0.000
	Primary	-13.583	0.000
	2ndary	-13.308	0.000
	Higher 2ndary	-13.143	0.000
Severe (WOMAC)	Illiterate	-819.901	0.000
	Primary	-819.585	0.000
	2ndary	-819.431	0.000
	Higher 2ndary	-819.843	0.000
	Degree	-819.946	0.000
Extreme (WOMAC)	Illiterate	-516.108	0.000
	Primary	-516.432	0.000
	2ndary	-516.654	0.000
	Higher 2ndary	-516.554	0.000
Moderate (WOMAC)	Age	12.544	-
	BMI	0.522	0.179
	Monthly income	0.000	0.350
Severe (WOMAC)	Age	-0.007	0.730
	BMI	0.031	0.250
	Monthly income	0.000	0.089
Extreme (WOMAC)	Age	-0.008	0.692
	BMI	0.039	0.159
	Monthly income	**1.094**	**0.050**

Table 23 shows that extreme osteoarthritis positively influence on monthly income (1.094 unit times) measured by WOMAC scale. In addition, a significant negative correlation between educational background and total WOMAC score was established.

Table 24: Logistic regression analysis of association between nutritional assessment score and independent variables

Dependent	Independent	Standardized regression coefficient β	P value
Total assessment score	Under weight	0.359	0.000
	Normal weight	0.164	0.001
	Overweight	0.068	0.056
	Obese	-0.294	0.000
	Weight loss bet^w 1& 3 kg	2.310	0.001
	Had suffered acute disease in past 3 m^o	2.450	0.000
	Severe dementia	11.607	0.001
	Heart disease	1.805	0.005

Table 24 suggest that there are significant positive relationship between weight loss (β -2.310 unit, P <0.001), acute disease (β -2.450, P <0.000), severe dementia (β -11.607, P <0.001) and heart disease (β -1.805, P <0.005) with nutritional assessment score.

CHAPTER V

DISCUSSION

The present study focused on the nutritional status & assessment of osteoarthritis among selected geriatric patients in Dhaka city. In our study, out of the total 311 respondents, the 60-69 years age group constituted 83.28%. Mean age 63.77±5.62. This is in line with the conclusions of a research done by Gupta S et al., (2016).Whereas a significant number of them (823/1000 or 82.3%) belonged to the 60- to 69-year-old age category. Among elderly people 63.99% of the respondents were female and 36.01% were male. The percentage of females among the elderly is higher than that of men, according to a survey by the Age Well Foundation, (2012) which is consistent with our findings. In a related research, 423 elderly participants from Bangladesh were divided into 186 men and 237 females. (Ali et al. 2013).The majority of the study population was Muslim (94.53%) and currently married was 232(74.60%). Our results, however, were far greater than those of O Joymati et al., (2018) research in Manipur.

Regarding the educational level, highest (33.12%) respondents had primary passed followed by illiterate (31.19%), secondary (26.37%), higher secondary (4.82%), degree (2.89%) and post graduate (1.61%). Seniors' high rates of ignorance, particularly among females, are a major contributor to their low social standing. Education promotes reasonable and sensible thought. It is a significant instrument for self-empowerment that can raise one's financial and social standing and influence the demographic choices an individual makes. Without it, a person is more vulnerable. As per NSSO (national sample organization) 2007-08 23% males and 56% females were illiterate in urban areas (Central Statistics of India, 2011). A survey carried out in Samsun City, Turkey, where 48.3% of people lack literacy. (Kaya PS, 2015) Half of the respondent were housewife (50.8%). The highest number of patient of our study come from low middle income (69.50%), 19.30% from upper middle income and 7.70% had low income. According to Alam S et al.,(2021) the respondents' "per month family income" fell into three categories: lower class (9000.00 BDT), middle class (9000-20000 BDT), and upper class (20,000 BDT). The majority hails from lower and middle socioeconomic classes, which is consistent with our study.

Highest 56.59% respondent were financially dependent on others, 26.37% partially independent and 17.04% were independent respectively. Similar results were obtained by Gupta S et al., (2016) in their study, which found that 660 (66.0%) senior people relied heavily on finances.

In the present study, 288(92.6%) respondent did not get pension whereas only 23(7.40%) got pension. In terms of risk factors, more than half of respondents had a history of trauma, 55.96 % had a history of losing weight, 51.1 % were overweight, and 34.41% used tobacco and 13.5 percent were smokers, respectively. In this study, majority of the respondents had diabetes (72.35%), hypertension (63.34%), heart disease (19.94%) and kidney disease (18.01%). This is consistent with the findings of a similar study conducted in Bangladesh, which found 40.3% had normal weight, 46.9% overweight and the rest were obese (Begum, et al., 2018). Other than that, Venkatachalam et al., (2017) mentioned the same risk factors for knee osteoarthritis. Diabetes (72.35%), hypertension (63.34%), heart disease (19.94%), and kidney disease (18.01%) affected the bulk of responses. O Joymati et al.,(2018) in his study got the similar findings .

According to a survey, the majority of subjects had at least one health issue, and the most common illnesses among elderly people were hypertension, diabetes mellitus, arthritis, joint discomfort, and hearing loss. (Adhikari et al., 2010 and Sharma et al.,2013).The coexistence of OA and T2DM is common in the elderly population and can result in increased economic burden and impairment. People with T2DM appear to have an increased tendency to develop OA. It's unclear why arthritis affects so many people with T2DM at such a high rate. Obesity and advanced age are two risk factors for both OA and T2DM, which may help to explain why OA is more common among diabetics. Recent research has shown that OA is linked to systemic metabolic abnormalities that are frequently observed in T2DM, indicating that diabetes affects the pathophysiology of OA irrespective of whether a person is fatty or old. It has been suggested that there is an underlying connection between OA and T2DM that stems from these metabolic changes. (Piva SR et al., 2015). In the current study, 284(91.32%) responded visited government hospital, 113(36.33%) pharmacy, 64(20.58%) from private hospital. Little above fifty percent (54%) of the respondents had regular health checkup and 46% irregularly take a look at up their fitness. Around two third (61.41%) of the respondents used to take prescribed treatment in step with doctor's recommendation and 38.59% had now not. Our study revealed 32.5% of the respondents did not taking prescribed remedy because they think these have been unnecessary, expansive and also don't get nearby pharmacy. Around 53.38% of respondents were unsatisfied with the current health care system, while 46.62% were satisfied. 43(25.6%) respondents were dissatisfied because the healthcare system was far away, whereas 32(19.05%) respondents remarked that service providers weren't always available. Sixty two percent (61.9%) of the interviewees in a cross-sectional survey at Probin Hospital, Agargoan in Dhaka (Halim KMA et al., 2010) reported receiving medical care for their condition from specialists, 35.9% from

Ayurvedic medicine, and 31.5% from homeopathy. Little above sixty percent (61.7%) of the respondents had regular health checkup and 80.4% of them used to take medicine regularly according to doctor's order. This findings correlate more or less with our study. More than sixty percent of older adult did not behave sedentary style whereas 102(33%) behaved sedentary behavior.

We observed the pain mode in different stages where severe pain scored (48%) was followed by extreme (26%), moderate (23%), and slight pain scoring (3%).Two third (67%) respondents were suffering from extreme stiffness followed by severe (30%), moderate (2%) and slight (1%). The majority of respondents had severe (57%) difficulty performing daily activities (DPDA) criteria followed by extreme (39%) and moderate (4%). According to the results of another study, the majority of individuals experienced mild to moderate pain (Jahan I et al., 2017). This outcome contradicts our study due to the different age groups. In this current study, the severe WOMAC osteoarthritis index was (54%) followed by extreme (41%), moderate (5%) with mean SD 68.717±10.01. In accordance with our research, another study found that the Mean SD WOMAC Score was 64.40 ±15.2 (Sathiyanarayanan S et al., 2017). Thirty one percent (31.2%) of the respondents were normal, while 58.2% of the respondents were at risk of malnutrition. Only 10.6% of respondents, however, were malnourished. The current research's findings were similar to those of another study, which showed that 61% of people were at risk of malnutrition and 24% were malnourished (Santosh A et al., 2017).

Similar findings were obtained from research done in Bikaner, Rajasthan: where approximately 11.6% elderly were malnourished while 46% were at risk of malnutrition and 42.4% were well nourished (Shivaj M et al., 2014). Another study also found the MNA scale classified 14% as malnourished and 49% at risk of malnutrition (Vedantam A et al. 2009). All these studies including our study show that larger proportions of the elderly people were at risk of malnourishment.

In the current study showed the association of various socio-demographic characteristics with nutritional status among the study population. Age group, gender, marital status, educational status, occupation and financial dependency were found to be significantly associated with nutritional status, while religion, stay with family and pension status were not. The current study's findings were in line with the findings of the previous two studies, which found that lower MNA scores were independently linked with older age (p <0.001) and low literacy level (p <0.001) (Santosh A et al., 2017 and Lahari S et.al, 2015).

The relationship between married status and nutritional condition was examined in cross-sectional research among older adults in Tabriz, Iran, who were not hospitalized. In accordance with our study, they found that older married pairs were more likely than older lone people to have average nutritional conditions (Zeinalhajlou AA et al., 2017).

Patients who were dependent (63.07%) were more at risk of malnutrition than independent respondent (47.17%). Similar finding were observed in another research which discovered a statistically significant association between economic dependency status and nutritional status of elderly (Khandhedia S et al., 2015).

Among subjects who reported moderate decrease in food intake during the last 3 months, 69.4 % and 8.3% were at risk of malnutrition and malnourished respectively and the association was statistically significant. Almost two-thirds of subjects with weight loss >3 kg in the last 3 months were "malnourished" while one-third were at risk. Among the mobile patient, more than half were at the risk of malnutrition and 5.2% were malnourished. However, 60.5% and 57.6% of elderly adults with severe and mild dementia, respectively, were at risk of malnutrition. A far lower percentage, 34.2% and 2.9%, of participants with severe and mild dementia, respectively, were truly malnourished. Sixty seven percent of those with psychological stress were at risk while 23.58% were actually malnourished. Among subjects with BMI 19 to <21 kg/m2, 78.26% were at risk and 17.39% were malnourished while half of the elders with calf circumference <31 cm were at risk and malnourished. All health-related variables showed statistical significance with regard to nutritional status. In accordance with a 2017 Iranian study, all health-related variables had statistical significance in relation to nutritional status (Zeinalhajlou AA et al., 2017).

Increases in many issues, including possible endocrine shifts and digestive illnesses, can be linked to increases in malnutrition and the risk of malnutrition with age. Endocrine system changes control digestion, desire, and hunger. These may reduce food consumption and appetite, causing weight reduction. For instance, cholecystokinin levels rise as individuals' age, making them more susceptible to the hormones satiating benefits. (Zeinalhajlou AA et al., 2017).

The probability of malnutrition was greater in individuals with a BMI of less than 19, or a weight reduction >3 kg in the previous three months, or severe illness or stress within the previous three months, which is consistent with a previous research conducted in Turkish care homes. (Basibuyuk G O et al., 2019).

The association of various socio-demographic characteristics with WOMAC score among the study population. Religion, educational status, occupation, financial dependency and income were found to be significantly associated with WOMAC score, while age, sex, marital status, stay with family and pension status were not. Patients with dependent status (31.19%) suffered from severe osteoarthritis compared to independent respondents (9.32%), and one third female patients (33.12%) suffered severe osteoarthritis than male patients (20.9%).

According to a study in India showed that osteoarthritis knee was found to be significantly associated with female sex and age 60 years and above (Singh A K et al., 2014). Both studies (Zeng et al., 2006; Sharma et al., 2007) discovered that knee osteoarthritis was more common in women and the senior age group. Another study in Dhaka found that women were most likely to experience knee osteoarthritis, with 77 (39%) of the patients being housewives (Jahan I et al., 2017). This might be as a result of women frequently lowering their knees, which is common in our culture. Additionally, it has been proven that some physically demanding job duties raise the risk of osteoarthritis (Anderson JJ et al., 1988; Blagojevic M et al., 2010; Ricci JA et al., 2005). Housewives are more prone to KOA than women who labor outside the home, according to research by Dahaghin S et al. (2009).

Regarding how the study population's co-morbidities and risk variables were related to WOMAC score, WOMAC score was found to be substantially correlated with H/o trauma, diabetes, CNC issue, and sedentary lifestyle, but not with cigarette use, smoking, being overweight, hypertension, or renal illness. Sivachidambaram K, (2017) and his associated found both smoking and drinking alcohol had a protective impact on knee pain. As there were no Indian studies to support it, this finding was novel in that country. Even so, a number of research from countries other than India demonstrate that smoking has a preventive effect against knee discomfort (Silverwood V et al., Basibuyuk GO et al., 2019). It is commonly established that knee discomfort was related to age, sex, and BMI. The study's new findings include the protective effects of drinking alcohol and smoking, as well as the link between diabetes and hypertension and the incidence of knee discomfort. These recent discoveries were seen in various Asian and Western research that were not from India. These correspond to our study.

There is conflicting evidence linking hypertension to the development of knee OA, with some studies finding a strong positive correlation and others finding none at all (Blagojevic M et al., 2010). It was discovered that other chronic conditions had no impact at all on WOMAC ratings. Moreover, there is no proof connecting these to OA (Kulandaivelan S et al., 2017).

In the present study, the association of WOMAC score with American College of Rheumatology (ACR criteria) among the study population shown almost all criteria were statistically significant with WOMAC score. Another study comparing WOMAC score percentages with ACR criteria for knee OA, found statistically substantial agreement, demonstrating the WOMAC index's diagnostic efficacy (Sathiyanarayanan S et al., 2017). As the ACR criteria are a well-known method for clinically detecting knee OA, we may depend on the WOMAC score to identify high risk people who can be further tested for OA.

According to the study, there was a significant relationship between respondents' nutritional status, overall WOMAC score, and duration of employment, as shown by Pearson's Correlation with P-Value testing (0.000). Obesity (P = 0.054 and Odds = 1.284) and under nutrition (P = 0.055 and Odds = 1.167) significantly influenced the severe and extreme levels of knee OA impairment among the 311 elderly. Extreme impairment from OA knee was strongly impacted by malnutrition (P = 0.059 and odds = 1.217). Upper class (P= 0.080 and odds= 3.991) and lower middle class (P = 0.012 and odds = 1.926) influenced significantly on severe and extreme disability respectively. According to this study, hypertension (P = 0.044 and odd = 2.008) affects severe osteoarthritis disability, whereas diabetes (P = 0.058 and odd = 1.066) affects extreme osteoarthritis disability. The WOMAC scale was used to evaluate these impairments.

Bhoia T et al., 2021, found that extended family structure, low socioeconomic position, being both underweight and overweight, and diabetes mellitus had a strong correlation with OA knee.
Age >50 years, female gender, high BMI, lower SES level, and squatting-related activities were identified by Das et al., (2018) as risk factors for OA knee among rural Odisha residents.
A strong correlation between OA knee and variables including higher socioeconomic class, high BMI, a sedentary lifestyle, and menopause was identified by Kaur et al. in 2018 in community-based cross-sectional research. The risk factors for OA were identified as being older age, female gender, obesity, osteoporosis, low education, family history of OA, and smoking in a scoping study for the Asian population (Zamri NAA et al., 2019). Older peoples OA knees were substantially correlated with factors including female gender, low education, unemployment, high BMI, hypertension, and diabetes mellitus. (Mat S et al., 2020). A systematic review and meta-analysis had discovered the most explored risk variables that were connected with OA of the knee, such as older age, high BMI, female gender, and knee injury. (Blagojevic M et al., 2010) The odds ratio for OA knee in older persons with hypertension and

diabetes mellitus was 1.72 and 1.48, respectively (Mat S et al., 2020) which was similar in the current investigation.

Cross-sectional studies among OA knee patients in clinical settings have found an association between factors such as older age, female gender, and high BMI, while factors like family history, occupational knee bending, and knee injury were less common. (Oboirien M et al., 2020) & Patil PS et al., 2012)

Among various risk variables for OA knee patients in Kerala, a cross-sectional study indicated that advanced age is the most statistically significant factor, followed by female gender Balasubramanian T. et al. (2018). Cardiovascular risk variables such as advanced age, female gender, high BMI, and diabetes all significantly correlated with OA knee. (Kulandaivelan S et al., 2017) similar to ours in certain ways.

Zhang Y et al. (2017) discovered that metabolic variables such as hypertension, blood glucose, and hypercholesterolemia were related to knee OA independently of obesity as an explanation for the correlations between hypertension and knee OA risk. According to Puenpatom and Victor (2009), those with OA were more likely to have metabolic syndrome (MetS)-related conditions such as hypertension, abdominal obesity, and hyperglycemia than people without OA (Niu J et al., 2017).

Obesity, increased mass and joint load, changed proinflammatory factor adipokine production, and joint load all contribute to the persistent low-grade inflammatory condition in joint tissues that characterizes OA and MetS. Additionally, a buildup of cholesterol in the cartilage might hinder its ability to expel waste products, leading to OA (Veronese, N., Haj Hamad, W., et al. 2016).

CHAPTER VI

Conclusion and Recommendation

Ageing is a natural part of human existence. Everybody ages at a certain point. This study demonstrated that malnutrition risk and osteoarthritis are prevalent in older adults, with females being more affected than males. The majority of respondents in this survey were housewives. It suggests that OA affects housewives more severely. Additionally, this research project highlights the overall demographics of OA patients in Dhaka city, including age group, gender distribution, weight variation, socioeconomic status, occupation, risk factors, chronic diseases, pain style, stiffness, and difficulties. In conclusion, osteoarthritis is a serious public health issue, particularly for elderly people. In this study, it was found that osteoarthritis and MNA, WOMAC, physical activity are significantly correlated. To reduce OA and malnutrition, there is a need for more knowledge, adequate treatment and management, a proper diet, and a modified lifestyle.

Limitations: There were some limitations of this study**.** Firstly, the study was conducted only in one divisions of the country Dhaka division, which was not nationally representative. Secondly, the study used purposive sampling which has its own limitation that researcher's conscious or unconscious bias can go into the data being collected. Lastly because of the time and resource limitations more respondents couldn't be included.

CHAPTER VII

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APPENDICES

<u>তথ্য প্রদানের সম্মতি পত্র</u>
(Consent Form)

আসসালামু আলাইকুম,

ঢাকা বিশ্ববিদ্যালয়ের পুষ্টি ও খাদ্য বিজ্ঞান ইনস্টিটিউটের পক্ষ থেকে আমি (ডা. মোহসিনা করিম) এসেছি। আপনি জানেন যে, ঢাকা বিশ্ববিদ্যালয়ের এই পুষ্টি ও খাদ্য বিজ্ঞান ইনস্টিটিউট ছাত্র-ছাত্রীদের পাঠদান ছাড়াও দেশের বিভিন্ন বড় বড় জরিপ কাজ পরিচালনা করে থাকে। এই জরিপ কাজের মাধ্যমে দেশের জনগণের পুষ্টিগত অবস্থা, হাঁড় ক্ষয় ও অন্যান্য বিষয়ে তথ্য উদঘাটিত হবে। আমি এই জরিপে আপনার অংশ গ্রহণের জন্য আমন্ত্রণ জানাচ্ছি। আমি আপনার মতামতকে প্রাধান্য দিব। আপনার সহযোগিতা আমার কজের জন্য অত্যন্ত গুরুত্বপূর্ণ।

এই সাক্ষাতকার নিতে এক ঘন্টা সময় লাগবে। এই কাজে আপনার আর্থিকভাবে কোন ক্ষতি হবে না, শুধু কিছু সময় দিতে হবে। আপনি স্বেচ্ছায় এই জরিপে অংশ গ্রহণ করতে পারেন ও যে কোন সময় নিজেকে প্রত্যাহার করতে পারেন বা কোন বিশেষ প্রশ্নের উত্তর নাও দিতে পারবেন। আপনার দেয়া তথ্যের সম্পূর্ণ গোপনীয়তা রক্ষা করা হবে। আপনার অংশ গ্রহণকে আমি স্বাগত জানাই। আপনার দেওয়া তথ্যটি আমার গবেষণাটি সফল করতে সাহায্য করবে এবং স্বাস্থ্য খাতে কল্যাণ বয়ে আনতে পারে।

জরিপকারী আমাকে উক্ত তথ্য পড়ে শুনিয়েছেন ও মৌখিকভাবে এই জরিপের উদ্দেশ্যে ব্যাখ্যা করেছেন। সবকিছু জেনে স্বেচ্ছায় এই করিপ কাজে অংশ গ্রহণে রাজি হয়েছি।

<u>তথ্যদানকারীর স্বাক্ষর</u>   <u>জরিপকারীর স্বাক্ষর</u>

তারিখ: তারিখ:

মোবাইল নম্বর: মোবাইল নম্বর:

Questionnaire

Nutritional status and assessment of osteoarthritis among Geriatric Patients in Dhaka City

উত্তর দাতার নাম: ফোন নং-

বিভাগ ক: সামাজিক-জনসংখ্যাগত তথ্য

ক্রমিক নং	প্রশ্ন	প্রতিক্রিয়া
০১	বয়স	…………………………বছর
০২	লিঙ্গ	১. পুরুষ ২. মহিলা
০৩	ধর্ম	১. মুসলিম ২. হিন্দু ৩. খ্রিস্টান ৪. বৌদ্ধ
০৪	বৈবাহিক অবস্থা	১. বিবাহিত ২. অবিবাহিত ৩. তালাকপ্রাপ্ত ৪. বিধবা
০৫	শিক্ষাগত যোগ্যতা	১. নিরক্ষর ২. প্রাইমারী ৩. মাধ্যমিক ৪. উচ্চ মাধ্যমিক ৫. ডিগ্রী ৬. স্নাতকোত্তর এবং তার উপরে
০৬	পেশা	১. গৃহিণী ২. কর্মী ৩. চাকুরীজিবী ৪. অবসরপ্রাপ্ত ব্যাক্তি ৫. ব্যাবসা ৬. অন্যান্য-
০৭	পরিবারের সাথে আছে কি না	০১. আছে ০২. নাই
০৮	আর্থিক নির্ভরতা	১. নির্ভরশীল ২. আংশিক নির্ভরশীল ৩. নির্ভরশীল না
০৯	মাসিক পারিবারিক আয়	…………………………টাকা
১০	আপনি কি পেনশন পান ?	১.হ্যাঁ ২. না

অস্টিওয়ারথ্রাইটিস এর ঝুঁকি সমূহ :

১। তামাক সেবন করেন কি?   হ্যাঁ   না

২। ধুমপান করেন কি?   হ্যাঁ   না

৩। শারীরিক ওজন   - BMI < 25

                                  - BMI > 25

৪। ১ বছরে ওজন কমেছে কি?   হ্যাঁ   না

৫। শারীরিক আক্ষমতা আছে কি ?   হ্যাঁ   না

জটিল রোগঃ

১। দীর্ঘস্থায়ী রোগ আছে কি?   হ্যাঁ   না

২। যদি থাকে কি রোগঃ

ডায়াবেটিস   হ্যাঁ   না

হাইপারটেনশন   হ্যাঁ   না

কিডনি রোগ   হ্যাঁ   না

হৃদরোগ   হ্যাঁ   না

স্নায়ু রোগ   হ্যাঁ   না

অন্যান্ন   হ্যাঁ   না

স্বাস্থ্য সেবা চাওয়ার ধরন (একাধিক প্রতিক্রিয়া)

ক্রমিক	প্রশ্ন		উত্তর
১	স্বাস্থ্য সেবার জায়গাঃ		
	কোথাও সেবা নেন না		
	ব্যক্তিগত চিকিৎসক		
	সরকারী হাসপাতাল		
	হোমিও প্যাথিচিকিৎসা কেন্দ্র		
	ফার্মেসি		
	অন্যান্ন		
২	স্বাস্থ্য পরীক্ষা		
	নিয়মিত		
	অনিয়মিত		
৩	চিকিৎসকের নির্দেশ মত চিকিৎসা নেন কি না?		
		হ্যাঁ	
		না	

৪	যদি না নেন এর কারন কি?		
	ঔষধের দাম বেশী		
	অপ্রয়োজনীয় মনে করেন		
	কাছা কাছি পাওয়া যায় না		
৫	স্বাস্থ্য ব্যবস্থা নিয়ে সন্তোস কি না	হ্যাঁ	
		না	
৬	সন্তুষ্ট না হলে এর কারন কি?		
	স্বাস্থ্য সেবা কেন্দ্র দূরে অবস্তিত কি?		
	স্বাস্থ্য সেবাদানকারীর ব্যবহার ভাল নয় কি?		
	সেবা প্রদানকারী সবসময় উপস্তিত থাকেন না কি?		

জীবন ধারা সম্বন্ধে তথ্যঃ

১। কাজের প্রকৃতি:   বসে কাজ করেন কি?

                                                                দাঁড়িয়ে কাজ করেন কি?

                                                                ঝুঁকে কাজ করেন কি?

২। দৈনিক কত ঘন্টা কাজ করেনঃ   ....   ঘন্টা

৩। বছরে কত ঘন্টা কাজ করেনঃ   ....   ঘন্টা

৪।আসীন জীবন যাপন করেন কি?   হ্যাঁ   না

ACR কতৃক নির্ধারক লক্ষন সমূহঃ

১/ হাটুঁতে ব্যাথা   হ্যাঁ   না

২/ কোন হাটুঁতে ব্যাথা   বাম   ডান

৩/ বিছানা থেকে উঠার সময় নাড়াতে অসুবিধা হয় কি না?

(< ৩০ মি: কম)   হ্যাঁ   না

৪/ চলাফেরার সময় শব্দ হয় কি না?   হ্যাঁ   না

৫/ চাপ দিলে ব্যাথা লাগে কি না ?   হ্যাঁ   না

৬/হাড়ে অতিরিক্ত বৃদ্ধি আছে কিনা?   হ্যাঁ   না

৭/ জয়েন্টে গরম অনুভব হয় কি না?   হ্যাঁ   না

অস্টিওআর্থারাইটিসের স্কোরিং (WOMAC স্কেল)

আপনার ব্যথার হার, যখন...	None	Slight	Moderate	Severe	Extreme	Investigator use only
হাঁটা	০	১	২	৩	৪	
সিঁড়ি আরোহণ	০	১	২	৩	৪	
রাতে ঘুমানোর সময়	০	১	২	৩	৪	
বিশ্রাম	০	১	২	৩	৪	
দাঁড়ানো অবস্থায়	০	১	২	৩	৪	

আপনার দৃঢ়তার হার						
সকালে	০	১	২	৩	৪	
সন্ধ্যায়	০	১	২	৩	৪	

আপনার কাঠিন্যর হার, যখন						
সিঁড়ি উঠতে	০	১	২	৩	৪	
সিঁড়ি নামতে বসা থেকে উঠতে	০	১	২	৩	৪	
দাঁড়ানো অবস্থায়	০	১	২	৩	৪	
মেঝেতে নুয়জ্ঞ হলে	০	১	২	৩	৪	
সমান মেঝেতেও হাঁটলে	০	১	২	৩	৪	
গাড়িতে উঠা নামার সময়	০	১	২	৩	৪	
কেনাকাটা করার সময়	০	১	২	৩	৪	

মোজা পড়তে						
বিছানা থেকে উঠতে						
মোজা খুলতে						
বিছানায় শয়ন						
স্নানের মধ্যে/ শেষে						
বসা অবস্থায়						
টয়লেটে প্রবেশ/বাইরে যাওয়া						
হালকা ঘরোয়া দায়িত্ব পালন করা (রান্না করা, ধুলাবালি পরিষ্কার কর)						
ভারী ঘরোয়া দায়িত্ব পালন (আসবাব সরানো)						
মোট স্কোর (৯৬ এর মধ্যে)						
রোগীর স্বাক্ষর			তারিখ			
তদন্তকারী দ্বারা পর্যালোচনা			তারিখ			

পুষ্টি মূল্যায়ন :

স্ক্রীনিং			
ক	ক্ষুধা হ্রাস, হজমের সমস্যা, চিবানো বা গিলতে অসুবিধার কারণে গত ৩ মাসে কি খাদ্য গ্রহণের পরিমাণ কমে গেছে	খাদ্য গ্রহণের তীব্র হ্রাস = ০ খাদ্য গ্রহণ মাঝারি হ্রাস = ১ খাদ্য গ্রহণে কোন হ্রাস নেই = ২	
খ	গত ৩ মাসে ওজন হ্রাস	৩ কেজির বেশি ওজন হ্রাস (৬.৬ পাউন্ড) = ০ জানি না = ১ ১ থেকে ৩ কেজির মধ্যে ওজন হ্রাস (২.২ এবং৬.৬ পাউন্ড) =২ ওজন হ্রাস হয়নি = ৩	
গ	সক্রিয়তা	বিছানা বা চেয়ার আবদ্ধ =০ বিছানা/চেয়ার থেকে উঠতে সক্ষম কিন্তু বাইরে যায় না =১ বাইরে যাওয়া হয় = ২	
ঘ	গত ৩মাসে মানসিক চাপে বা তীব্র রোগ ভুগেছেন	হ্যা-০ না = ১	
ঙ	নিউরোসাইকোলজিকাল সমস্যা	গুরুতর ডিমেনশিয়া বা বিষণ্নতা =০ হালকা ডিমেনশিয়া = ১ কোন মানসিক সমস্যা নেই - ২	
চ	বডি মাস ইনডেক্স (বিএমআই) = ওজন কেজি/(মিটারে উচ্চতা)	বিএমআই ১৯ এর কম- ০ বিএমআই ২১ থেকে ২৩ এর কম = 2 বিএমআই ১৯ থেকে ২১ এর কম=১ বিএমআই ২৩ বা তার বেশি = ৩	
স্ক্রীনিং স্কোর (সর্বমোট সর্বোচ্চ ১৪ নম্বর)			
	১২-১৪ নম্বর: স্বাভাবিক পুষ্টির অবস্থা ৮-১১ নম্বর: অপুষ্টির ঝুঁকিতে ০৭ নম্বর: অপুষ্টি		
ছ	স্বাধীনভাবে বাস করে (নার্সিংহোম নয় বা হাসপাতাল নয়)	হ্যা=১ না=১	
জ	প্রতিদিন ৩টির বেশি নির্দেশনা অনুজায়ী ওষুধ গ্রহন	হ্যা = ০ না = ১	
ঝ	চাপের ঘা বা ত্বকের আলসার	হ্যা = ০ না = ১	
ঞ	রোগী দৈনিক কতবার পূর্ণ খাবার খান?	১ খাবার = 0 ২ খাবার = ১ ৩ খাবার = ২	

ট	প্রোটিন গ্রহন ; - প্রতিদিন কমপক্ষে একটি দুগ্ধজাত পণ্য (দুধ, পনির, দই) পরিবেশন -সপ্তাহে দুই বা ততোধিক ডাল বা ডিম পরিবেশন - প্রতিদিন মাংস, মাছ বা মুরগি হ্যা ০.০ = যদি ০ বা ১ হ্যাঁ হয় ০.৫ = যদি ২ হ্যাঁ 1.0=যদি ৩ হ্যাঁ হয়	○ হ্যাঁ ○ না ○ হ্যাঁ ○ না ○ হ্যাঁ ○ না	
ঠ	প্রতিদিন দুই বা ততোধিক ফল বা সবজি	হ্যাঁ না	
ড	কতটুকু পানি খান?(চা, পানি, কফি,দুধ)		
	০.০- ৩ কাপের কম ০.৫ – ৩ থেকে৫ কাপ ১.০- ৫ কাপের বেশি		
ঢ	খাওয়ানোর ধরণ	সাহায্য ছাড়া খেতে অক্ষম - ০ কিছু অসুবিধা সঙ্গে স্ব-খাওয়া= ১ কোনো সমস্যা ছাড়াই স্ব-খাওয়া= ২	
ণ	পুষ্টির অবস্থার নিজস্ব দৃষ্টিভঙ্গি	নিজেকে অপুষ্টির শিকার বলে মনে করেন = = 0 পুষ্টির অবস্থা অনিশ্চিত= ১ নিজেকে কোনো পুষ্টি সমস্যা নেই বলে মনে করেন = ২	
ত	রোগী কিভাবে তার স্বাস্থ্য অবস্থাবিবেচনা করে সমবয়সী অন্যান্য মানুষের সাথে তুলনা করে ?	ভালো না – ০১ জানি না= ০.৫ ভালো না = ১.০ উত্তম = ২.০০	
থ	মধ্য বাহুর পরিধি (এমএসি) সেমি	এমএসি ২১ থেকে কম ০.০ এমএসি ২১ থেকে ২২ = ০.৫ এমএসি ২২ থেকে বেশি = ১.০	
দ	পায়ের গুলের পরিধি (সিসি) সেমি	সিসি ৩১ থেকে কম = ০ সিসি ৩১ বা তার বেশি = ১	
	মূল্যায়ন (সর্বোচ্চ ১৬)= স্ক্রীনিং স্কোর =		

	মোট মূল্যায়ন		
	২৪ থেকে ৩০ নম্বর স্বাভাবিক পুষ্টির অবস্থা ১৭ থেকে ২৩.৫ নম্বর: অপুষ্টির ঝুঁকিতে ১৭ নম্বরের কম: অপুষ্টি		

Geriatric Depression scale:

১/আপনি কি মূলত আপনার জীবন নিয়ে সন্তুষ্ট হ্যাঁ না

২/ আপনি কি আপনার অনেক কার্যকলাপ এবংআগ্রহবাদ দিয়েছেন হ্যাঁ না

৩/ আপনি কি আপনার জীবন শূন্য মনে করেন হ্যাঁ না

৪/ আপনি কি প্রায়ই বিরক্ত হন হ্যাঁ না

৫/ আপনি কি বেশির ভাগ সময় ভাল মেজাজে থাকেন? হ্যাঁ না

৬/ আপনি কি ভয় পাচ্ছেন যে আপনার সাথে খারাপ কিছু ঘটতে চলেছে? হ্যাঁ না

৭/ আপনি কি বেশির ভাগ সময় খুশি হন? হ্যাঁ না

৮/ আপনি কি প্রায়ই অসহায় বোধ করেন? হ্যাঁ না

৯/ আপনি কি বাইরে যেয়ে কিছু করার চেয়ে বাড়িতে থাকতে পছন্দ করেন? হ্যাঁ না

১০/ আপনি কি মনে করেন যে আপনার স্মৃতিতে সবচেয়ে বেশি সমস্যা আছে? হ্যাঁ না

১১/ আপনি কি মনে করেন এখন বেঁচে থাকাটা চমৎকার? হ্যাঁ না

১২/ আপনি এখন কি নিজেকে মূল্যহীন মনে করেন? হ্যাঁ না

১৩/ আপনি কি শক্তি পূর্ণ মনে করেন? হ্যাঁ না

১৪/ আপনি কি মনে করেন যে আপনার অবস্থা আশাহীন ? হ্যাঁ না

১৫/ আপনি কি মনে করেন যে বেশির ভাগ লোকেরা আপনার চেয়ে ভাল? হ্যাঁ না

Of the 15 items, 10 indicated the presence of depression when answered positively, while the rest (question numbers 1, 5, 7, 11, 13) indicated depression when answered negatively. Scores of 0-4 are considered normal, depending on age, education, and complaints; 5-8 indicate mild depression; 9-11 indicate moderate depression; and 12-15 indicate severe depression

১৫ টির মধ্যে ১০ টি ইতি বাচক উত্তর দিলে বিষন্নতা আছে নির্দেশ করে। (১,৫,৭,১১,১৩=নেতিবাচক উত্তর দিলেও বিষন্নতা প্রমান করে)

০-৪ = স্বাভাবিক বিষন্নতা

৫-৮= মৃদু বিষন্নতা

৯-১১= মাঝারি বিষন্নতা

১২-১৫= তীব্র বিষন্নতা

Nutritional Status and Assessment of Osteoarthritis among Selected Geriatric Patients in Dhaka City

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10/05/2023

18 MAY 2023

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