6Prevalence and Severity of Osteoarthritis Knee Among Elderly in Nellanad Panchayat

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Post Graduate Student in MD COMMUNITY MEDICINE

Dissertation submitted to the

Kerala University of Health Sciences, Thrissur, Kerala

in partial fulfilment of the requirements **for the degree of MD IN COMMUNITY MEDICINE**

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PREVALENCE AND SEVERITY OF OSTEOARTHRITIS KNEE AMONG ELDERLY IN NELLANAD PANCHAYAT

Thesis submitted to the Kerala University of Health Sciences in partial fulfilment of the requirements of the rules and regulations for the award of M.D degree in Community Medicine

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Endorsement by the head of Institution

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This is to certify that the dissertation entitled "PREVALENCE AND SEVERITY OF OSTEOARTHRITIS KNEE AMONG ELDERLY IN NELLANAD PANCHAYAT" *is a bonafide and genuine research work done by* **Dr.JITHU SJ NATH** *in partial fulfilment of the requirement for the degree of* **MD in COMMUNITY MEDICINE.**

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THRISSUR

DECLARATION BY THE CANDIDATE

I hereby declare that this dissertation entitled **"**PREVALENCE AND SEVERITY OF OSTEOARTHRITIS KNEE AMONG ELDERLY IN NELLANAD PANCHAYAT**"** *is a bonafide and genuine research work carried out by me under the guidance of* **Dr.ANIL BINDHU S**, *Professor, Department of COMMUNITY MEDICINE, SreeGokulam Medical College and Research Foundation, Venjaramoodu, Trivandrum.*

This is submitted to the Kerala University of Health Sciences in partial fulfilment of the rules and regulations for the MS Degree Examination in Orthopaedics.

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Structured abstract

Title -"PREVALENCE AND SEVERITY OF OSTEOARTHRITIS KNEE AMONG ELDERLY PERSONS IN NELLANAD PANCHAYAT"

Introduction-   Osteoarthritis is a degenerative joint disease involving the cartilage and many of its surrounding tissues. Disease progression is usually slow but can ultimately lead to joint failure with pain and disability. osteoarthritis of knees tend to cause the greatest burden to the population as ,pain and stiffness in these large weight bearing joints often leads to significant disability requiring surgical intervention

Objectives-1. To determine prevalence of osteoarthritis of knee among elderly in Nellanadpanchayat using ACR CRITERIA(AMERICAN COLLEGE OF RHUEMATOLOGY).

2. To find out association between selected factors and knee osteoarthritis among elderly.

3. To scale the severity of osteoarthritis knee among elderly using WOMAC (WESTERN ONTARIO AND MCMASTER UNIVERSITIES OSTEOARTHRITIS INDEX).

Methodology-A cross sectional survey was conducted in NellanadPanchayat among 320 elderly after obtaining informed consent participants were interviewed based on structured proforma which contains study variables such as age, gender occupation,previous knee injury,occupation, physical activity,ACR criteria(pain, presence of crepitus on active motion,less than 30 minutes of morning stiffness, bony tenderness,

Study design –community based cross sectional study

Study setting-NELLANAD PANCHAYAT,It comes under Trivandrum district,under block Vamanapuram,area -

18.46 km^2·nellanad panchayat contains 16 wards.

Study period-November 2017 to November 2019

Study population-Elderly in Nellanad panchayat with age over 60

Severity (Pain,stiffness and difficulty in performing daily activities)was graded in 5 point Likert scale by using WOMAC INDEX for osteoarthritis. **Anthropometric examination and clinical examination of knee was conducted by the investigator.**

 Clinical examination of the study population with ACR clinical criteria was done.

SAMPLE SIZE –

P was taken from the study done in elderly population.

Reference-https://www.ncbi.nlm.nih.gov/pubmed/25386465[15]

Prevalence in the study done by Singh ak et al, in urban slum in delhi was 41.1 percent.

$\dfrac{(Z\alpha)^2\, pq}{}=$ $(1.96)^2$x 41.1 x (100-41.1) = 9315/67.24=138.53 . L^2 (20% of p)2

Design effect= multiplyBy 2=276

$Z\alpha$= 1.96
P=41.1%
L= 20% of p

Final sample size = 276 plus 10% non respondents =303

Final sample size ~ 303

SAMPLING METHOD – Cluster sampling was done. There were 16 wards,Each ward was divided into 2 clusters.16 wards were divided into 32 clusters. In each day of data collection one cluster was completed .one cluster had 10 households . from each ward .First house from the cluster was selected using lottery method and consecutive houses with elderly was included in the study selected till 10 elderly was selected from each cluster .Data was collected using interviewer administered semi structured Proforma .Face to face interview was conducted by the investigator with the participant after informed consent..If one house contains more than one elderly ,the selection was done by lottery method.

Results- Prevalence of osteoarthritis knee as per ACR criteria was found to be 41.9 %.The prevalence in females was 50.3% and in males 33.3 %

Among the study participants 2.185% had very high severity,32.5 % had high severity, 7.187 % had moderate severity and no one with low severity among those participants who were having knee osteoarthritis.5.2% were having very high severity,77.6% high severity,17.2% were having moderate severity. significant association was obtained between age group, obesity, education, socioeconomic class, female gender,previous history of knee surgery, diabetes mellitus and history of hand osteoarthritis and knee osteoarthritis.

Conclusions- The overall prevalence of knee osteoarthritis was as high as 41.9% ,in elderly population of Nellanadpanchayat. Higher age group, female gender, lower socioeconomic class, education, history of hand osteoarthritis, previous knee surgeries,diabetes mellitus had significant association with osteoarthritis knee.

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INTRODUCTION

Osteoarthritis is a disease involving the joint and cartilage and many of its surrounding areas.Even though the disease progress very slowly,it can ultimately lead to joint failure with pain and disability. osteoarthritis of knees tends to cause the greatest burden to the population aspain and stiffness in these large joints often leads to significant disability requiring surgical procedures.[1]

Osteoarthritis is the most common cause of morbidity in older adults, and most patients with the problem will be managed in the community and primary care.[2] Arthritis make it hard for individuals to be physically active which will also lead to financial loss and subsequently a financial burden for their family. It is a common cause of elderly visit to outpatient departments [3]. Largely because of pain, lower extremity OA is well-recognized as the leading cause of mobility impairment in older adults.[4]People with osteoarthritis are at risk of cardiovascular and stroke

Osteoarthritis is associated with aging and it has both modifiable and non-modifiable risk factors.[5]The increase in life expectancy has increased proportion of aged population and hence the risk of associated co-morbid conditions . According to the United Natiions by 2050 people who are more than 60 would be 20 percent of the total population. This means that by 2050, 130 million people will have OA, of whom 40 million will be severely disabled by the disease.[6]Financial burden associated with OA include costs for adaptive aids and devices, medicines, surgery, and time off at work. Osteoarthritis is the single most common cause of disability in older adults.[7]osteoarthritis has been listed as the 11th largest contributor to world disability[8].About 250 million (3.6% of the population) people worldwide have had knee OA.[9] The majority of them living in low- and middle-income countries[10].

Objectives

1. To determine prevalence of osteoarthritis of knee among elderly in Nellanad Panchayat using ACR CRITERIA.(AMERICAN COLLEGE OF RHUEMATOLOGY)

2. To find out association between selected factors and knee osteoarthritis among elderly

3. To scale the severity of osteoarthritis knee among elderly using WOMAC (WESTERN ONTARIO AND MCMASTER UNIVERSITIES OSTEOARTHRITIS INDEX)

Osteoarthritis (OA) is a disorder with multifactorial causation. the various features- include loss of cartilage, hypertrophy of bone at the margins, subchondral sclerosis, and a range of biochemical and morphological alterations of the synovial membrane and joint capsule.[11] Synovial inflammation also may occur. Os has been divided into primary OA and secondery OA .[12]Primary osteoarthritis related to aging..Secondary osteoarthritis is caused by another disease or condition.[13]. OA is more common in women than men, but the prevalence increases dramatically with age[12].

The study done in UK found out that Knee osteoarthritis sufficiently severe to consider joint replacement represents a minority of all knee pain and disability suffered by older people. Healthcare provision in primary care needs to focus on this broader group to impact on community levels of pain and disability.

The study done in New Delhi has found, the prevalence of osteoarthritis was estimated to be 41.1% (95% C.I., 36.7-45.6). Female sex and age >= 70 y were found to be independent risk factor for osteoarthritis knee. Among those having knee pain, presence of crepitus and tenderness were the most sensitive factors whereas bone overgrowth and bone warmth were most specific factors.[15]

The prevalence of osteoarthritis knee was high among this elderly population and increased with age. Overall, individual factors of ACR criteria were both sensitive and specific in diagnosing osteoarthritis knee. In resource constrained setting of urban India, it can be an effective tool in clinical diagnosis of osteoarthritis knee[15]

In the study"determinants of disability in osteoarthritis of knee" it was found that Quadriceps strength,knee pain, and age are more important determinants of functional impairment inelderly subjects than the severity of knee osteoarthritis as assessed radiographically.Strategies designed to optimise muscle strength may have the potential to reduce a vast burden of disability, dependency, and cost.[17]

Anatomy

Fig.1 BASIC ANATOMY

Front View   Side View
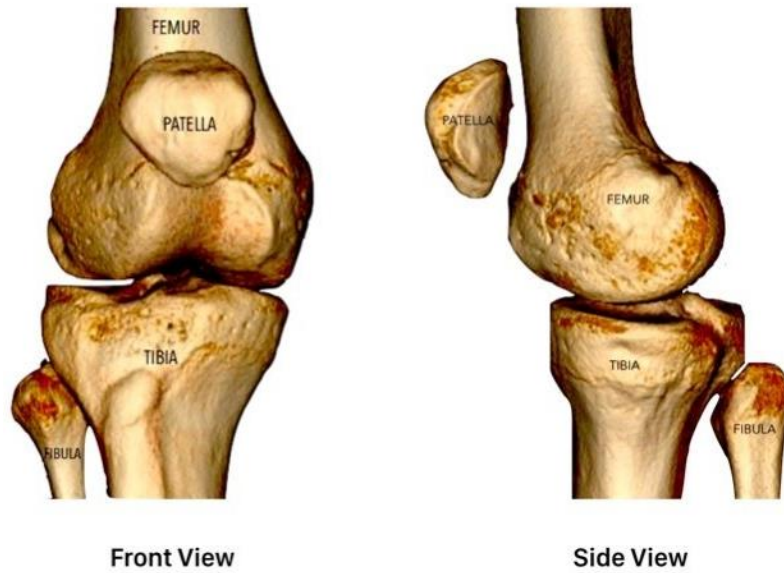
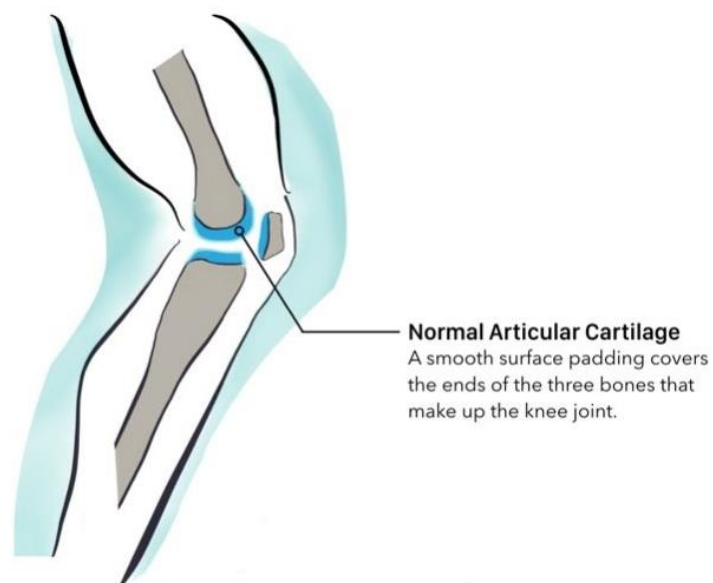## A Bony hinge

The three bones the**femur**(thighbone),the**tibia**(shinbone),andthe**patella**(kneecap) forms the bony hinge.The**fibula**, the fourth bone servesprimarilyasasiteformuscularattachment

Fig.2

Normal Articular Cartilage
A smooth surface padding covers the ends of the three bones that make up the knee joint.

Smooth, durable tissue that facilitates low-friction joint motion. The bones that meet to form the knee joint are covered with alayer of **articular cartilage**. Cartilageabsorbs shock and provides almost frictionless joint motion.Articularcartilageisavascular(lackingbloodvessels) and aneural(lackingnerves).[18]

CHONDROCYTES AND MATRIX

Fig-3
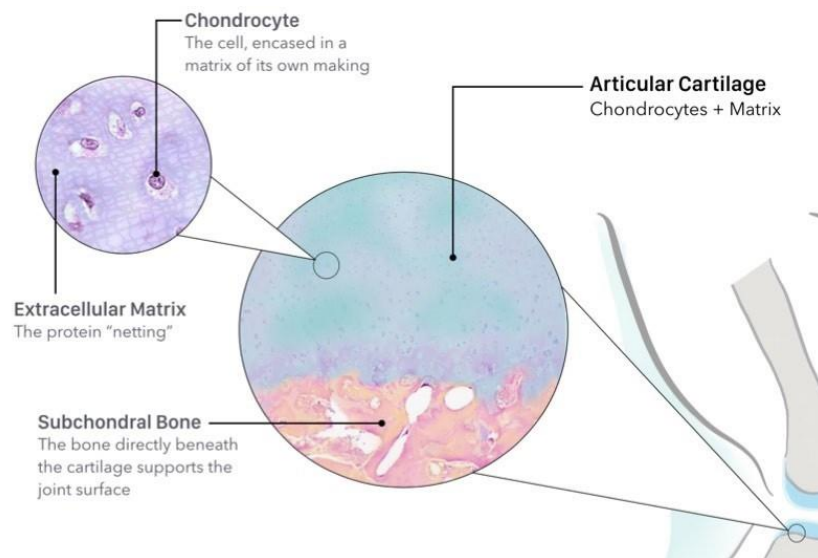
ARTICULAR CARTILAGE UNDER MICROSCOPE

Articularcartilageismade upofadense proteinaceous"netting"calledthe **extracellular matrix I**t provides cartilage its durable structure, and is produced by a small number of highly-specialized cells called **chondrocytes**, that are scattered throughout the cartilage. The major functionof each chondrocyteisto help the plot of extra cellular matrix which surrounds it.

Fig-4BOUNCE AND FLOW

No Load
Cartilage at rest

Load
With compression
water initially flows
out of the matrix, then
becomes trapped

Load removed
Water flows back
into the cartilage

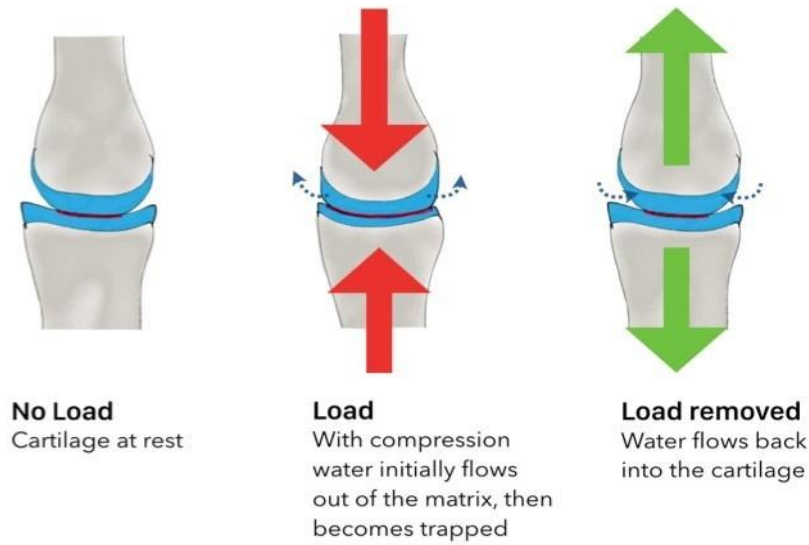## SHOCK ABSORBING CAPACITY OF CARTILAGE

Articular cartilagea water-soaked, thinsponge.When the knee holds weight during low-impactaction, the "sponge" flattensaswateris squeezedout, distributing the load morebroad lyacrossitssurfacearea.With wideimpact, however, articular cartilageresponds differently. It holds its water, providing a protective"bounce"that protects the matrix from extreme force.

Healthy cartilage can withstand decades of repetitive force by controlling the flow off luid through its matrix. [19,20]

Capsule
A thin, tough
membrane encloses
the knee joint
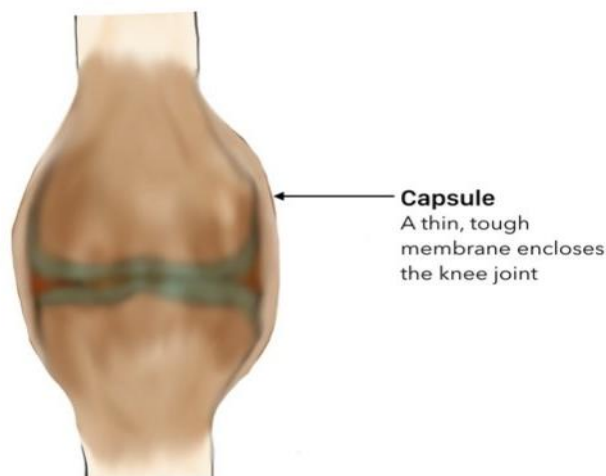
Fig- 5A watertight sleeve

The joint is covered by a thin, tough, fibroustissue called the **capsule**. Capsuleisasleeve pulled over the joint and sealed both above and below, creating a watertight space

Fig 6SYNOVIUM AND SYNOVIAL FLUID
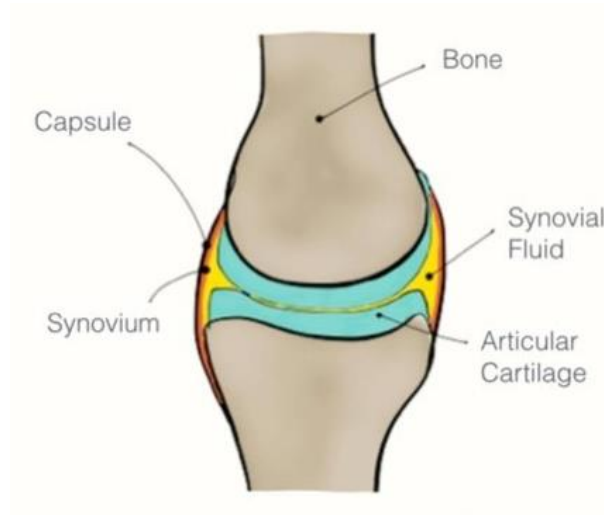
THE JOINT'S NATURAL LUBRICANT

Thecapsule is made up of aninner lining of very-thin and translucent**synovium**, which makes and secretes **synovial fluid**. It is straw coloured stringy,likeegg white,synovialfluidnourishesand lubricates thearticularcartilage.It is because of this synovial fluid thekneejointworks withoneofthelowest coefficients of friction measured for any material, organic or not. The basic amount of synovial fluid in a healthy knee joint is less than a teaspoon.[21],[22]

Fig 7THE MENISCUS
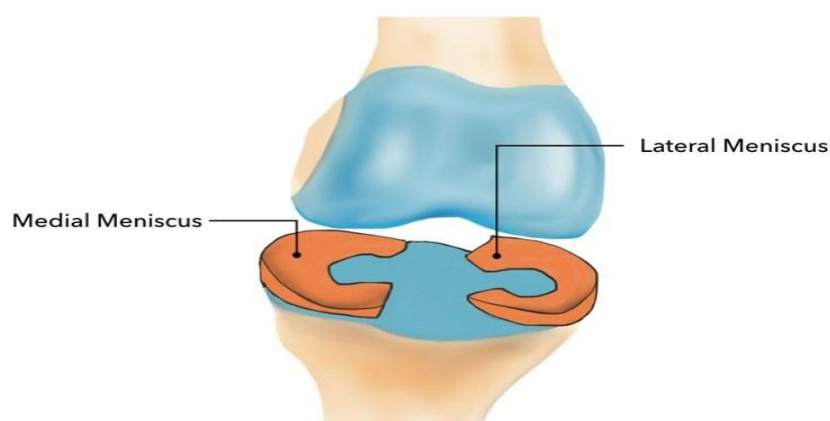
Knee has two C-shapedshockabsorberspositioned between the femur and thetibia: the **medial meniscus** (innerside of the knee) and the **lateralmeniscus** (outerside of the knee).The **menisci**(plural), comprisesofrubber-like **fibrocartilage,** protect the articular cartilageand underlying bone by shouldering over half the load during weight-bearing activity.

Fig. 8CARTILAGE
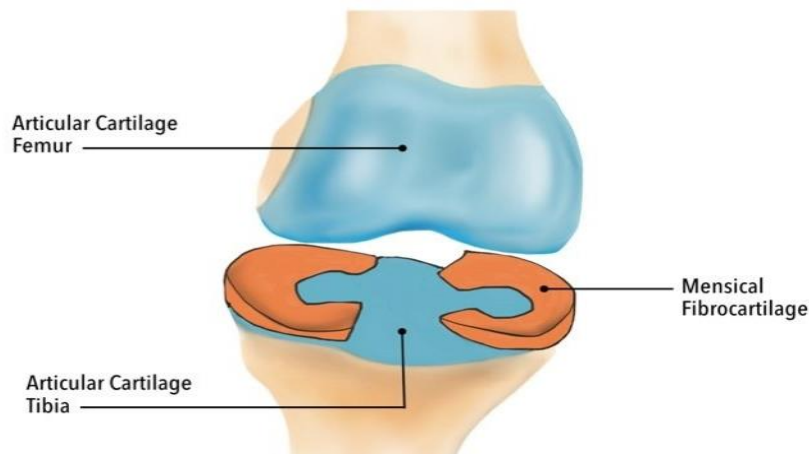
Articular cartilage vs. meniscal fibrocartilage

Thedifferencebetweenarticularcartilageandmeniscalcartilageisacommon sourceofconfusion.Whensomeonetellsyou,"Itorethecartilageinmyknee,"sheisreferringtohermedialorlateralmeniscus,not thearticularcartilage. More precisely, she should say, "I tore my meniscus."

Fig 9LIGAMENTS
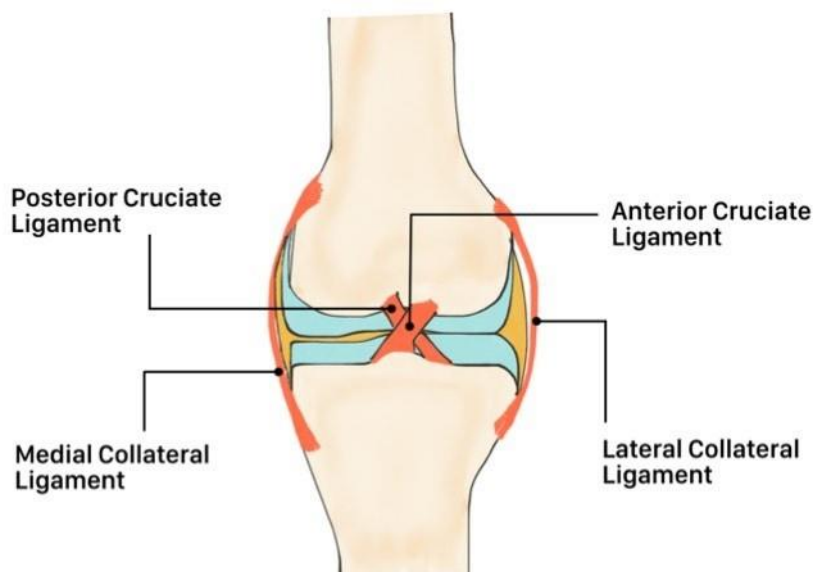
A ligament is a string-like tissue that anchors one bone to another and stabilizes the joint. The four major ligaments in the knee are the **ACL**, **PCL**, **MCL**, and **LCL**. They are not particularly relevant in the context of knee osteoarthritis and are not included in subsequent illustrations.

Fig – 10 OSTEOARTHRITIS
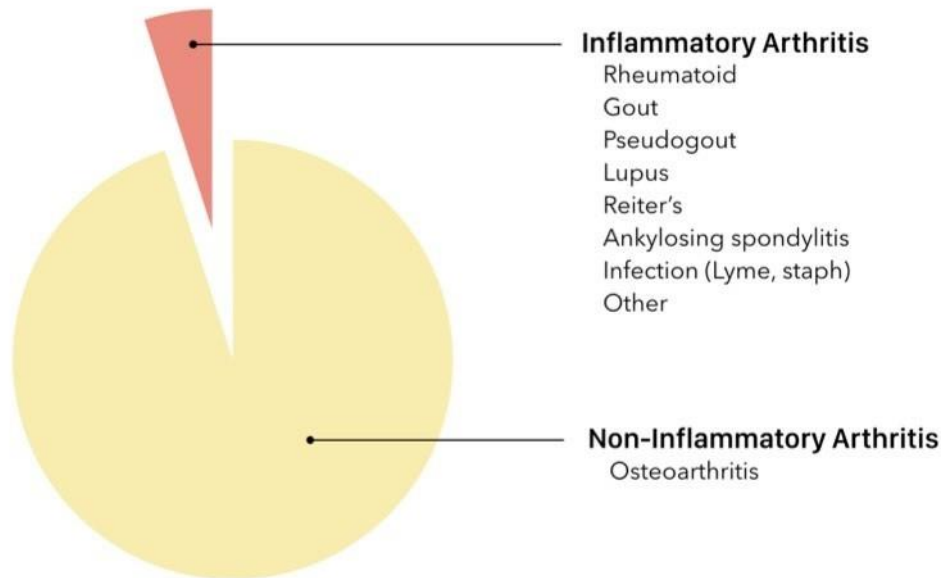
Arthritis is the common term for joint disease or degeneration, and is classified broadly into two categories: inflammatory and non-inflammatory.

The common variable in this category of arthritis is the obliteration of white blood cells to the joint resulting in an intense inflammatory response.

The majority of arthritis, however, is **non-inflammatory**. The lone condition in this category is **osteoarthritis**, also known as **wear-and-tear arthritis**. Osteoarthritis can be seen along with inflammation.[23]
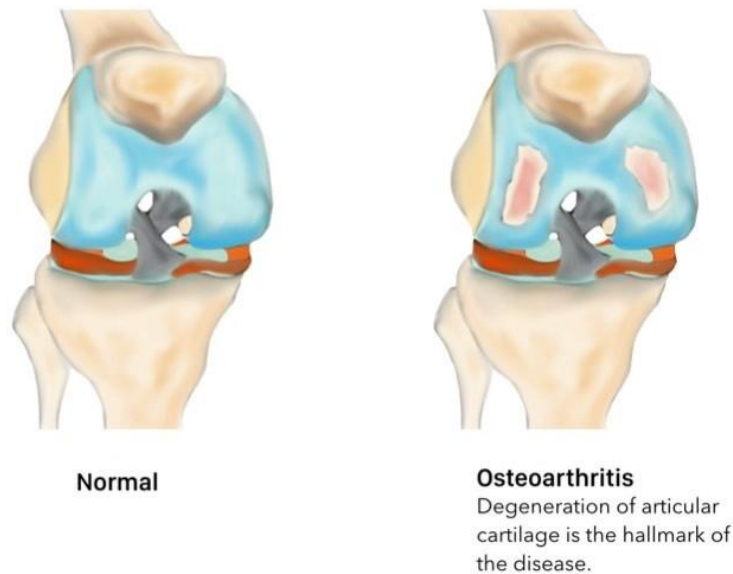
Fig - 11

The joint is seen conceptually as an organ comprised of articular cartilage, synovium, bone, muscle, nerve and even fat. The loss of cartilage remains the hallmark of osteoarthritis, but the disease is often regarded as an "organ failure."

The foremost changes to articular cartilage includes softening, peeling, and cracking. In time, the cartilage may wear away *entirely*, leaving the bony surfaces fully exposed– a condition referred to as **bone-on-bone osteoarthritis**.

Fig -12WHAT CAUSES CARTILAGE LOSS?
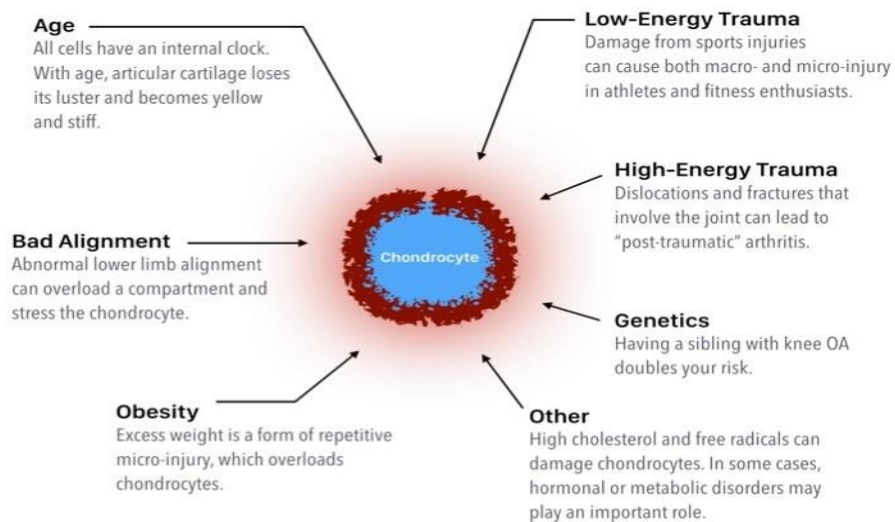
DAMAGE AT CELLULAR LEVEL

There are many factors, operating alone or together, can contribute to the on set of knee osteoarthritis.Obesity, trauma, and anumber of other factors, including then aturalaging process,can damage chondrocytes (the cells that make and maintain articularcartilage) and triggercartilageloss.[24]

Fig - 13FOCAL VS DIFFUSE

Normal

Focal Articular Cartilage Damage
Small area of cartilage loss with healthy adjacent cartilage

Diffuse Osteoarthritis
Damage over most of the joint surface

Osteoarthritis,isa**diffuse**lossofarticularcartilage.Mostmiddle-   group andolderpatientswithjointproblemshavediffusechangestothejointsurfaceratherthansmaller,focalinjury.

Focaldamagecanoccur,usuallyinyoungerpatientsasaresultofinjury.Treatmentoptions exist for these injury that are not appropriate for diffuse osteoarthritis.

Fig 14SYNOVITIS

Normal Synovium
Thin, translucent tissue lines the joint.

Synovitis
Damage to the articular cartilage triggers an inflammatory response. The synovium becomes hypervascular, thickened, and painful.

Normal   Osteoarthritis
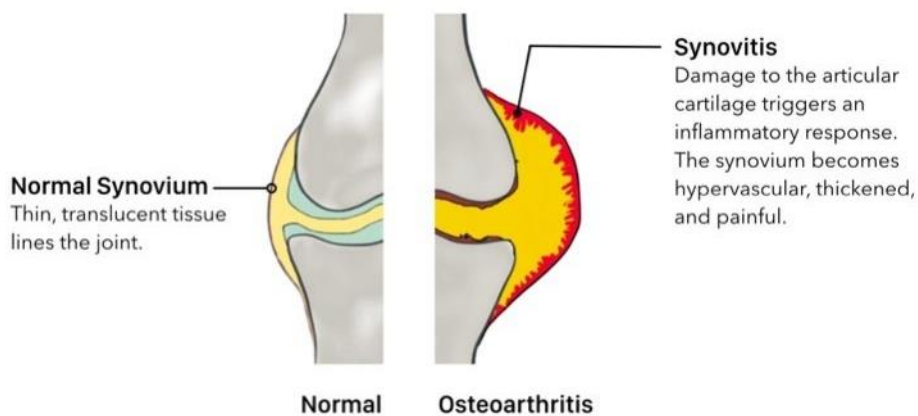
Articularcartilagecannotdirectlycausepainsinceitlacksanervesupply.Itdoes,however,shedparticlesthat startaninflammatoryreactionin the synovium called **synovitis**.

Fig –15 EFFUSION
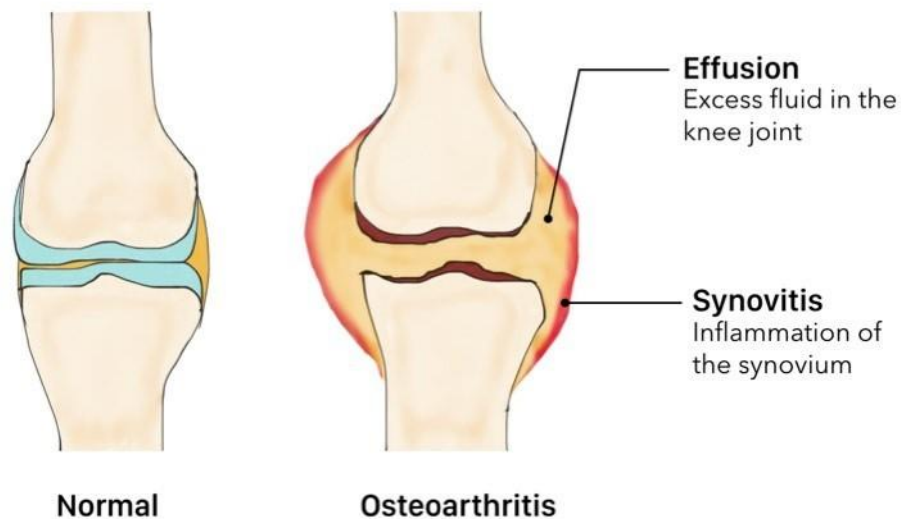
The synovium normally generates a smallamount of synovial fluid — allthatis needed to lubricatethejoint. However, an *inflamed* synovium produces an excessoffluid,knownasan**effusion**.

Rheumatoid Arthritis (RA) is a chronic incapacitating disorder that impacts the life quality.[31]

There was a recognition that osteoarthritis (OA) affects younger people who are still the workers, but the data was limited on the contribution of OA pain to work productivity and other outcomes in an employed population. .[32]

Females, particularly those who are less than 55 years, tended to have more severe OA in the knee but not other sites..[33]

The prevalence of radiographic knee OA has been investigated in 2,282 participants > or =60 years (817 men and 1,465 women) living in Japan. The prevalence of knee pain was age-dependent in women, but not in men.[35]

INCITING FACTORS

Primary osteoarthritis implies that the cause unknown Secondaryosteoarthritis arises in a joint that, by definition previously, healthy and the cartilage is altered by various conditions it is entirely possible that the incitingfactors, listed below, may increase the rate of progression of an already existent, but not clinically manifest, degenerative process.

Inflammatory process

In a process such as rheumatoid disease, the periarticülar and synovial tissues and destroy the articular cartilage.

Metabolic disorders

For example, gouty deposits of urates. and in alkaptonuricochronosisdeposits of pigments accumulate in articular cartilage. Altering its physical properties and making it susceptible to destruction. hemochromatosis acts similarly.

Biomechanical factors

Cartilage is fatigue prone (i.e.. it will tail when a stress of sufficientmagnitude is cyclically applied). Thus, cyclical loading will not only producefractures of collagen fibers but also produce proteoglycan (PG) depletionsurface.
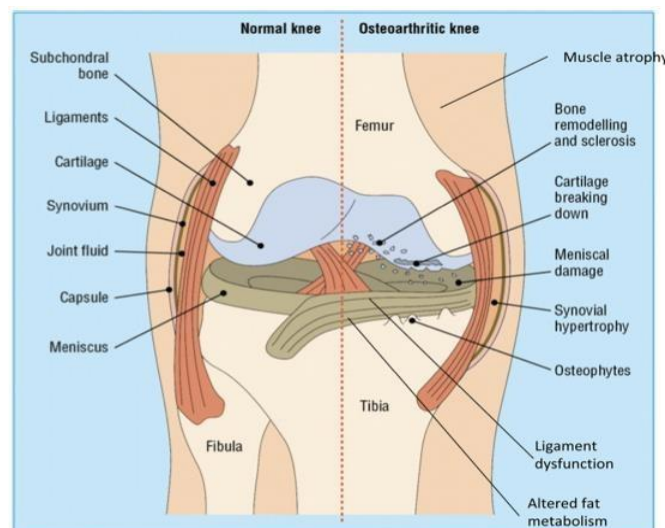
Pathology ofOA

Figure16 Cross-sectional pictureof healthykneejoint
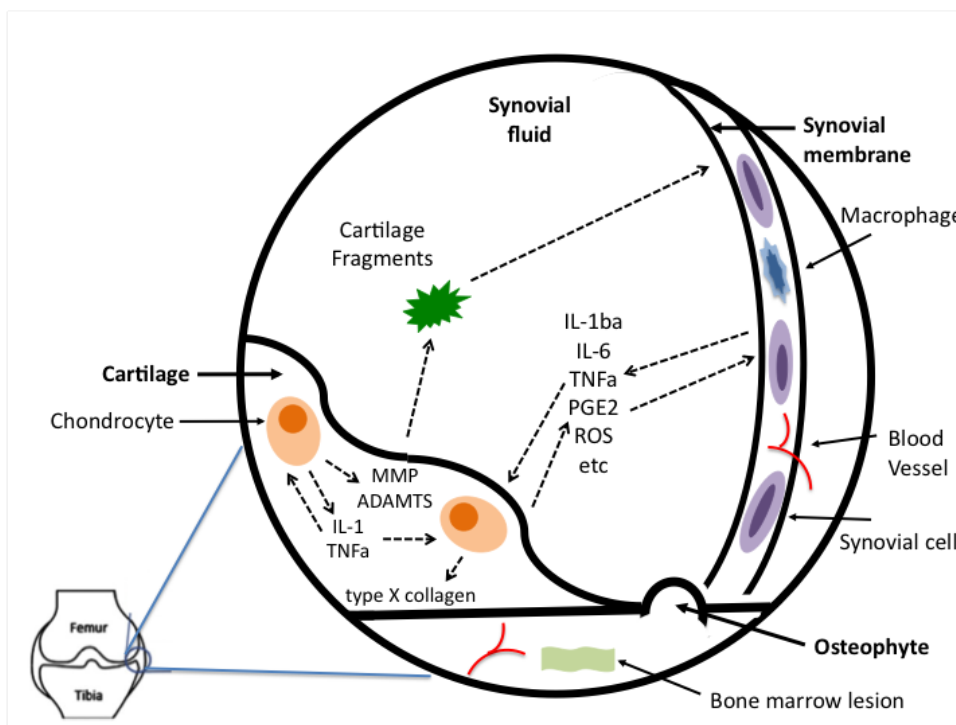
FIG.17

AMERICAN COLLEGE OF RHEUMATOLOGY CRITERIA

American College of Rheumatology (ACR) criteria: ACR criteria for diagnosing osteoarthritis of knee joint is presence of pain in knee joint plus any three of six factors listed below . The sensitivity and specificity of the ACR criteria are 91% and 86% respectively [90]

☐ 1.Age more than 50 y

☐ 2.Presence of crepitus on active motion

☐ 3.Less than 30 min of morning stiffness

☐ 4.Bony tenderness

☐ 5.Bony overgrowth

☐ 6.No palpable warmth of synovium.

"The clinical classification criteria developed by the American College of Rheumatology (ACR) remain a popular method of classifying knee osteoarthritis, recommended for clinical and epidemiological studies and the practice of primary care.[91]The ACR clinical and clinical plus radiographic criteria for OA of the knee accurately predict cartilage damage as assessed by arthroscopy. Furthermore, the ACR clinical classification criteria identify OA patients with cartilage damage before any radiographic change, while the ACR clinical plus radiographic classification criteria identify OA patients with more severe cartilage damage.[91]

Western Ontario and McMaster Universities Osteoarthritis Index

In 1988, Bellamy and coworkers[3] first published the WOMAC, a 24-item, condition-specific questionnaire to be used for hip and knee osteoarthritis. Since its conception, the WOMAC has undergone several revisions and modifications, with the latest version (WOMAC 3.1) available in over 90 languages.[92]

The WOMAC consists of three subscales: pain (five questions), stiffness (two questions), and physical function (17 questions). The subscale scores can vary, with pain ranging from 0 to 20 points; stiffness, 0 to 8 points; and physical function, 0 to 68 points. Higher scores represent worse pain, stiffness, and functional limitations. These investigators reported adequate face, content, and construct validity as well as responsiveness in patients with hip or knee osteoarthritis.[92]The Western Ontario and McMaster Universities Arthritis Index (WOMAC) is widely used in the assessing severity of Knee Osteoarthritis. It is a self-administered questionnaire consisting of 24 items divided into 3 subscales.
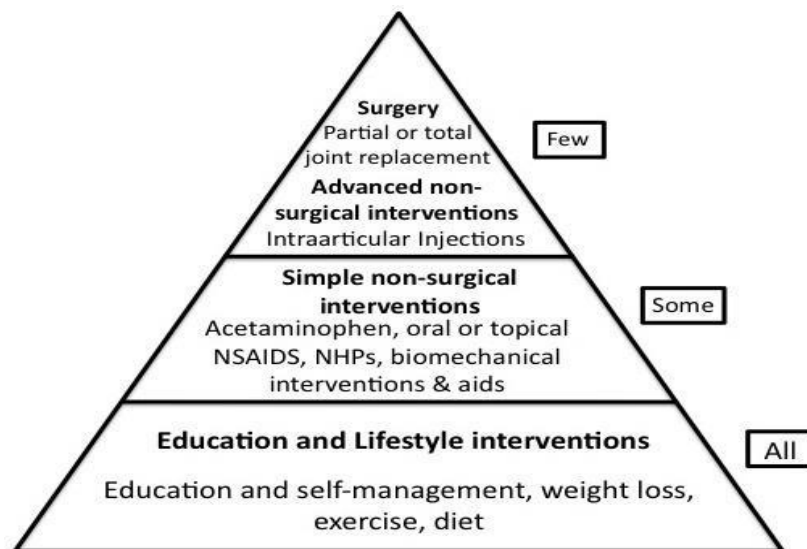
FIGURE 19

Management Recommendations forAll Individualswith KneeOA

EducationandSelf-Management

Patient-education programs aresome methodsfor achievingself-management.This describes an individual's abilityto managethe symptoms, treatment, physical,and psychological consequences of achronic condition (Du et al 2011).

Weight Loss/Weight Maintenance

Although weight loss is includedin all theguidelines, weight loss as atreatment forkneeOAhas not been extensivelyexamined in theliterature. Ameta-analysisexamined4 weight-lossRCTsin kneeOApatients andfoundthat 5%weight reduction was associatedwith insignificant improvements pain (ES = 0.20, 95%CI=0 to 0.39), but significant improvements in physical function (ES=0.23, 95%CI=0.04 to 0.42) (Christensen et al 2007).

Exercise

Although weight loss is often an outcomeof exerciseinterventions trials, thereare also benefits of exercise without weight loss. A numberofsystematic reviews and meta-analyses havebeen publishedin this area examiningaerobic and strengtheningexercises forth treatment of knee OA.

Materials and methods

Study design –Community based cross sectional study

Study setting-NELLANAD PANCHAYAT,It comes under Trivandrum district,under block Vamanapuram,area -18.46 km^2 .Nellanad panchayat contains 16 wards.

Study period was from November 2017 to November 2019

Study population-Elderly in Nellanad panchayat with age over 60 years

Inclusion criteria -Residents with age more than 60 years

Exclusion criteria-Infections of knee joint, rheumatoid arthritis, residents with amputated lower limb

SAMPLE SIZE –

P was taken from the study done in elderly population.

Reference-https://www.ncbi.nlm.nih.gov/pubmed/25386465[15]

Prevalence in the study done in urban slum in Delhi was 41.1 percent.

Sample size was calculated using formulae

$\underline{(Z\alpha)^2\,pq} = \underline{(1.96)^2 x\ 41.1\ x\ (100\text{-}41.1)} = 9315/67.24 = 138.53$ design effect =multiply by
$L^2 (20\%\ ofp)^2$

2=276

Zα= 1.96

P=41.1 % was taken from a previous study conducted by singhak et al [15]

L= 20% of p

Final sample size = 276 plus 10% non respondents =303

Final sample size ~ 303

SAMPLING TECHNIQUE – Cluster sampling was done.There were 16 wards,Each ward was divided into 2 clusters.16 wards were divided into 32 clusters. Each day of data collection one cluster was completed .one cluster had 10 households . from each ward. Data was collected using interviewer administered semi structured Proforma by face to face interview was conducted by the investigator with the participant after informed consent.Variables such asAge,gender, occupation, previous knee injury, occupation, physical activity were collected using the proforma.NellanadPanchayat has 16 wards,each ward was divided into 2 cluster and from 32 clusters 10 elderly was interviewed from each cluster .Thus total sample size was 320.First house from the cluster was selected using lottery method and consecutive houses with elderly was included in the study selected till 10 elderly was selected from each cluster.

Anthropometric examination was conducted during each house visit a weighing machine was used in each house to measure weight and a measuring scale was used to assess the height of the study participants.

Severity of pain, stiffness & physical function was assessed by 5 point Likert scale using WOMAC index.

Study instrument-ACR CLINICAL CRITERIA questionnaire,Structuredproforma,WOMAC osteoarthritis index.

METHODOLOGY OF DATA COLLECTION

A cross sectional survey was done and after obtaining informed consent from the study participants.particpiants were interviewed based on structured proforma which contains study variables such as age,genderoccupation,previous knee injury,occupation,physicalactivity,ACR criteria(pain,presence of crepitus on active motion,less than 30 minutes of morning stiffness,bonytenderness,bonyovergrowth,no palpable warmth of synovium).

Severity (Pain,stiffness and difficulty in performing daily activities)wasgraded in 5 point Likert scale by using WOMAC INDEX for osteoarthritis. **Anthropometric examination and clinical examination of knee was conductedby the investigator.**Clinical examination of the study population with ACR clinical criteria was done.

Data of each elderly was collected ,which includes age, sex,, family income, diet, educational status ,smoking status , mode of treatment preferred .physical activity,previous history of knee surgery ,previous history of hand osteoarthritis.

Clinical examination was done using ACR criteria for knee osteoarthritis.

AMERICAN COLLEGE OF RHEUMATOLOGY CRITERIA

American College of Rheumatology (ACR) criteria: ACR criteria for diagnosing osteoarthritis of knee joint is presence of pain in knee joint plus any three of six factors listed below . The sensitivity and specificity of the ACR criteria are 91% and 86% respectively [90]

☐ 1.Age more than 50 y

☐ 2.Presence of crepitus on active motion

☐ 3.Less than 30 min of morning stiffness

☐ 4.Bony tenderness

☐ 5.Bony overgrowth

☐ 6.No palpable warmth of synovium.

Every elderly was asked about the pain in the knee and also clinically assessment of the 6 factors mentioned above were done. According to the ACR criteria participants with pain and 6 different clinical features were marked in the proforma.

Weight was collected using a portable digital weighing machine and a measuring tape was used to measure the height.

To assess the socioeconomic status ,3 Important variables were collected which were occupation, education and total per capita income.

Physical activity was assessed using the tool below

TABLE 1

	Score	Activity
Intensity		
	5	Sustained heavy breathing and perspiration
	4	Intermittent heavy breathing and perspiration,
	3	Moderately heavy, as in cycling and other
	2	Moderate, as in volleyball, softball
	1	Light, as in fishing
Duration		
	4	Over 30 minutes
	3	20 to 30 minutes
	2	10 to 20 minutes
	1	Less than 10 minutes

Frequency		
	5	6 to 7 times per week
	4	3 to 5 times per week
	3	1 to 2 times per week
	2	A few times per month
	1	Less than once a month

Total score was calculated using the formulae

Intensity X Duration X Frequency = Score Total

Evaluation of activity was done by the score.

TABLE 2

Evaluation of Activity Score		
Score	Evaluation	Activity Category
81 to 100	Very active lifestyle	High
60 to 80	Active and healthy	Very good
40 to 59	Acceptable but could be better	Fair
20 to 39	Not good enough	Poor
Under 20	Sedentary	

Severity was assessed using Western Ontario and Mcmaster universities osteoarthritis index.

The WOMAC consists of three subscales: pain (five questions), stiffness (two questions), and physical function (17 questions). The subscale scores can vary, with pain ranging from 0 to 20 points; stiffness, 0 to 8 points; and physical function, 0 to 68 points. Higher scores represent worse pain, stiffness, and functional limitations.

STATISTICAL ANALYSIS

Data was done in spss20.Using IBM SPSS Version 20.Results was expressed in proportions with 95% confidence interval. Chi square test was used as a test of significance. $p < 0.05$ will be considered as statistically significant.

ETHICAL CONSIDERATION

Written informed consent was elicited from each participant and participant information sheet in Malayalam was provided. All the participants requiring any preliminary treatment was referred to nearest hospital for treatment.

STUDY VARIABLES

1.   Osteoarthritis as per ACR CRITERIA.

2.   Gender

3.   BMI

4.   socio economic status

5.   physical activity

6.   previous history of knee injury

7.   occupation

8.   AGE

9.   Diabetes mellitus

10.   type of diet

11.   education

12.   history of hand osteoarthritis

13. Womac severity index for knee osteoarthritis

RESULTS

SOCIO DEMOGRAPHIC PROFILESTUDY PARTICIPANTS -

A cross sectional study was conducted among 320 elderly >60 yearsof Nellanad Panchayat in Trivandrum district

Distribution of Study subjects based on age group
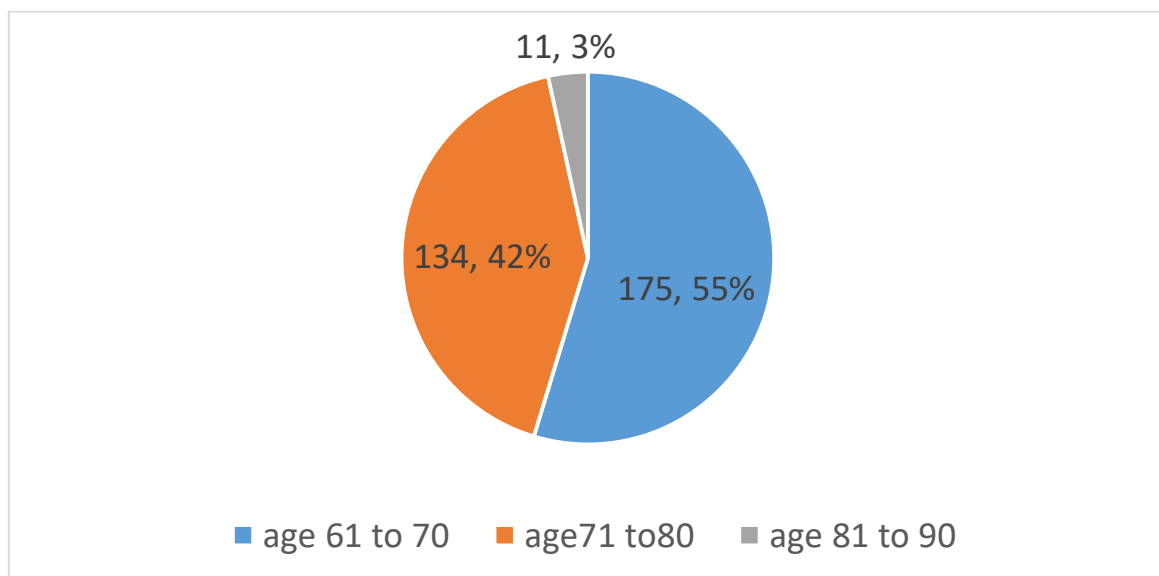
FIG 20

Among the study population 55 % were of the age group 61-70,42 % were of the age group 71-80,3% were of the age group 81 to 90.Mean age of study participant was 69.9 years

GENDER DISTRIBUTION AMONG STUDY PARTICPANTS
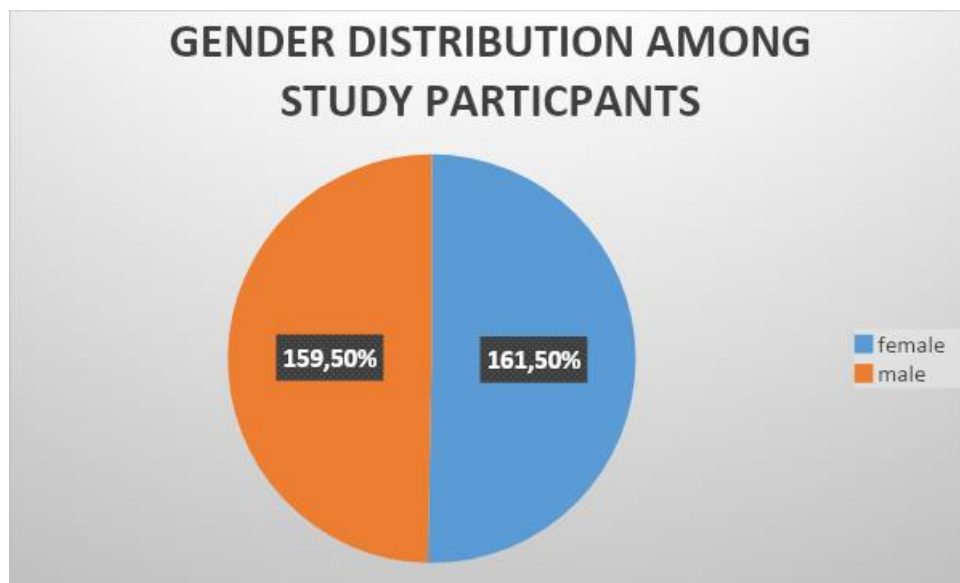
Among study participants 159 were males and 161 females.

FIG 21

RELIGION
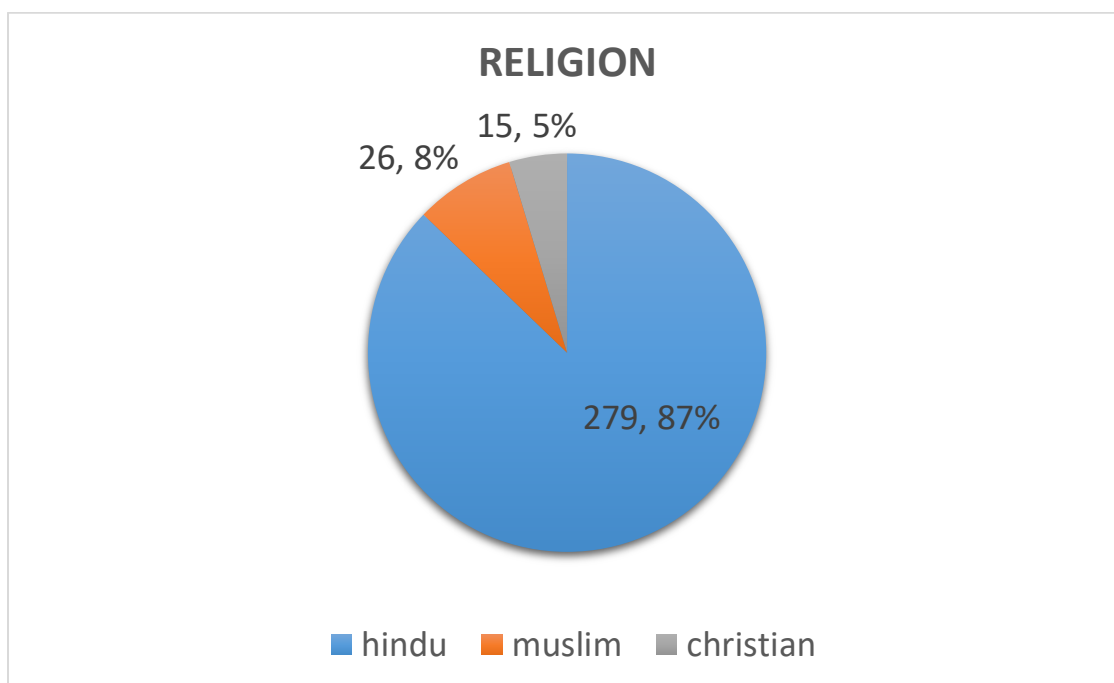
FIG 22

Distribution of study participants based on religion

Religion in Kerala are a mixture of different faiths, most significantly Hinduism, Islam,and Christianity.Kerala has a reputation of being,communally,one of the most tolerant states in India.

In this study 87 % Hindus,8% Muslim,5 % Christians

EDUCATION

Table -3

Distribution of study participants based on educational qualification(N=320)

EDUCATION	Frequency	Percent
Illiterate	20	6.2
Primary school	132	41.3
Middle school	55	17.2
High school	97	30.3
Post high school diploma	16	5.0
Total	320	100.0

Among the study participants 6.3% were illiterate,41.3% were primary school, 17.2% were middle school,30.3% were high school and 5%had more than post high school diploma education.

Table -4Socioeconomic category

Socioeconomic status	Frequency	Percent
lower class	34	10.6
upper lower class	247	77.2
lower middle class	31	9.7
upper middle class	8	2.5
Total	320	100.0

Distribution of study participants based on socioeconomic category.

In this study 10.6 % were lower class,77.2% upper lower class,9.7% were lower middle class,2.5% were upper middle class.(based on modified kuppuswamy socioeconomic status scale)

Table - 5

Distribution of study participants based on occupation.

Occupation	Frequency	Percentage
unemployed	126	39.4
unskilled worker	164	51.3
semi skilled	9	2.8
skilled	11	3.4
clerical	7	2.2
semi professional	3	.9
Total	320	100.0

In this study 39.4% were unemployed,51.3 % were unskilled worker,2.8% were semiskilled worker, 3.4% were skilled,2.2% were clerical,0.9% were semiprofessional.

PREVALENCE OF OBESITY AMONG STUDY POPULATION

WHO CLASSIFICATION OF BMI AMONG STUDY PARTICIPANTS

According to WHO CLASSIFICATION,THE PREVALENCE OF OBESITY were 11% overweight were 31.25% and 6.25% were found to be undernourished among study population
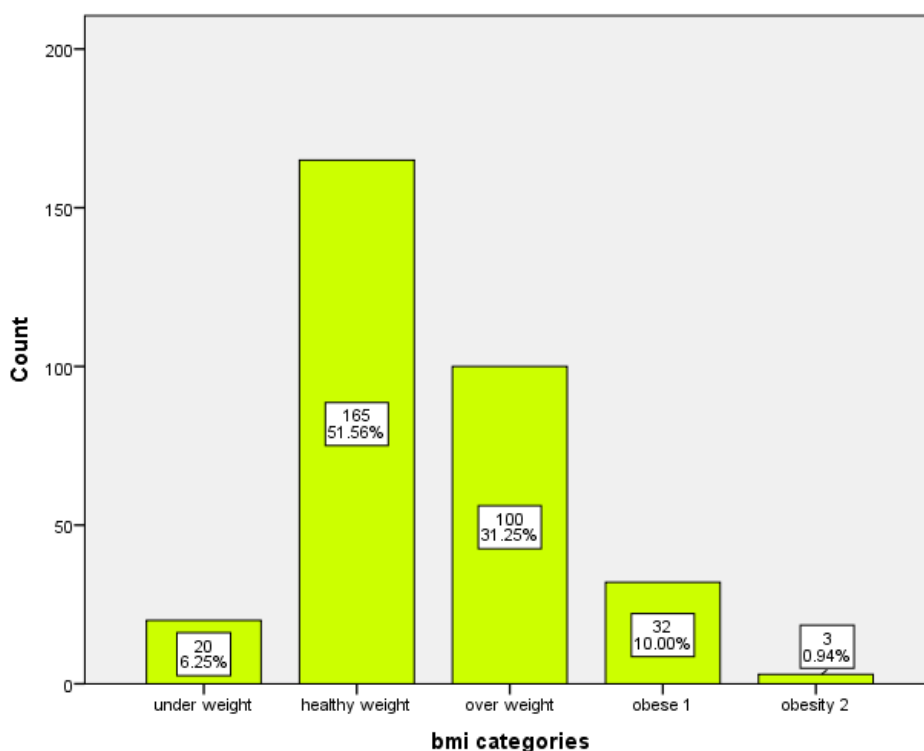
FIG 23

Nutritional status based on WHO CLASSIFICATION of BMI

Distribution of participants based on BMI (WHO Classification.)

Table - 6Mode of transport

Mode of transport	Frequency	Percentage
walking	200	62.5
motor	113	35.3
cycle	7	2.2
Total	320	100.0

Among the study participants 62.5% uses walking as mode of transport,35.3% uses motor vehicles as mode of transport,2.2% uses cycle as mode of transport

System of medicine preferred by study participants.
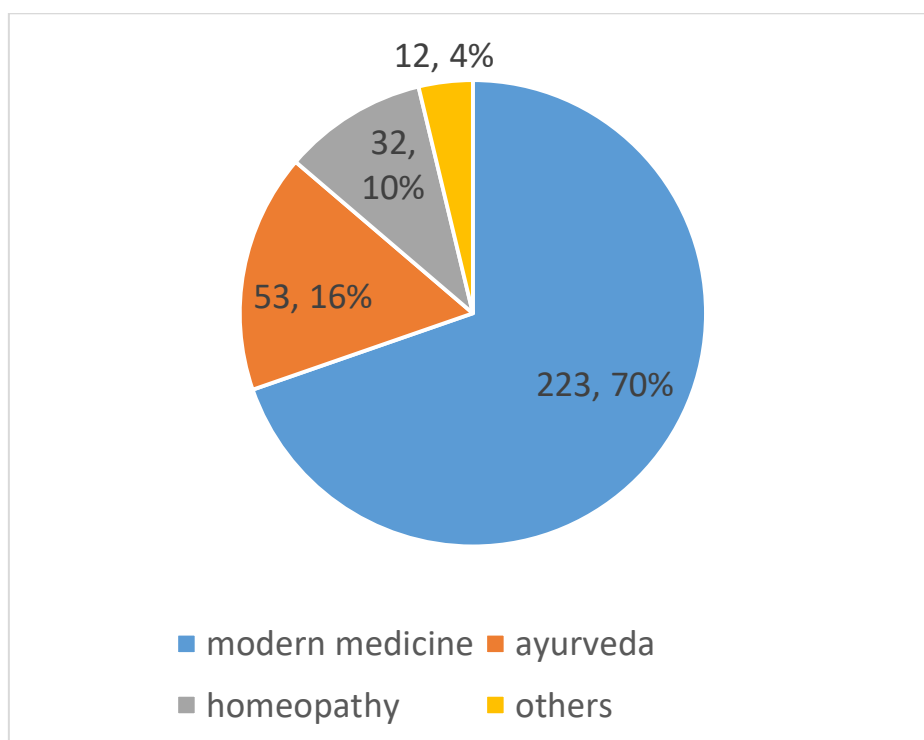
FIG 24

System of medicine preferred by study participants

Among the study participants 70 % preferred by modern medicine.16 % preferred by Ayurveda 10%,4 % preferred other system of medicine.

PREVALENCE OF OSTEOARTHRITIS KNEE AMONG STUDY PARTICIPANTS.
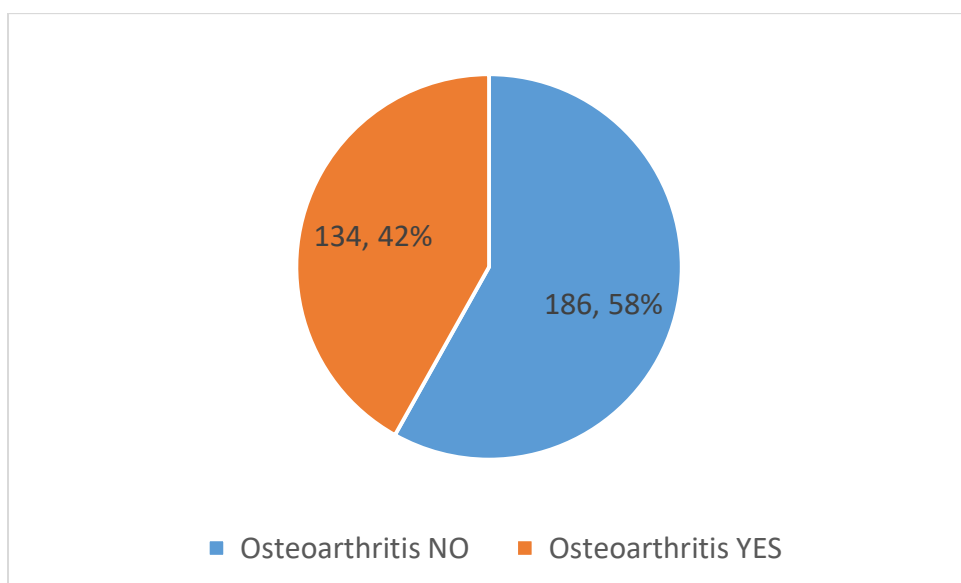
FIG 25

In this study prevalence of osteoarthritis knee were 41.9 % according to ACR criteria for knee osteoarthritis.

Table -7

Severity of Osteoarthritis Knee Assessed Using

WESTERN ONTARIO AND MCMASTER SEVERITY SCALE.

Severity	Osteoarthritis yes
low severity	0 0.0%
moderate severity	23 17.2%
high severity	104 77.6%
Very high severity	7 5.2%
Total	134 100.0%

Among 134 who has osteoarthritis knee, 5.2% has very high severity,77.6% has high severity,17.2% has moderate severity and no one with low severity.CI -95%

Table 8

PHYSICAL ACTIVITY AMONG STUDY PARTICIPANTS

PHYSICAL ACTIVITY	Frequency	Percent
sedentary	167	52.2
poor	117	36.6
fair	33	10.3
very good	3	.9
Total	320	100.0

Among the study participants 52.2% were sedentary,36.6% were having poor physical activity,10.3% were having fair physical activity,0.9% had very good physical activity.

Table -9

Association between age group and osteoarthritis knee among study population

Age group	Osteoarthritis no		Osteoarthritis yes		Total
	Number	Percentage	Number	Percentage	Number
Age 60 -70	116	66.4%	59	33.6%	175
Age 70-80	66	49.3%	68	50.7%	134
Age 80-90	4	36.4%	7	63.6%	11
Total	186	58.1%	134	41.9%	320

Among 175 people who are in the age group 60-70,33.7% had osteoarthritis. In the age group age 70-80, 50.7% had osteoarthritis knee.In the age group 80-90, 63.6% had osteoarthritis. The difference between age groups was found to be statistically significant with chi square-11.261 and p value-0.004.There was a linear trend the increase in prevalence of osteoarthritis in higher age groups.

Chi square for trend-11.170 p value-0.001

Table - 10 Association between gender and knee osteoarthritis

GENDER	Total		Total
	No Osteoarthritis	Osteoarthritis Yes	
female	80	81	161
	49.7%	50.3%	100.0%
male	106	53	159
	66.7%	33.3%	100.0%
Total	186	134	320
	58.1%	41.9%	100.0%

In this study among 161 females 50.3% had osteoarthritis knee and among 159 males 33.3% had osteoarthritis knee. There was a statistically significant association between female gender and knee osteoarthritis.

chi square-9.473 p value-.002

The odds of having knee osteoarthritis is 2.025 times higher in females than in males.

odd's ratio-2.025 confidence interval-(1.288-3.18)

Table - 11

Association between BMI and knee osteoarthritis

BMI categories	No osteoarthritis	Osteoarthritis positive	Total
under weight	14	6	20
	70.0%	30.0%	100.0%
healthy weight	116	49	165
	70.3%	29.7%	100.0%
over weight	47	53	100
	47.0%	53.0%	100.0%
obese 1	8	24	32
	25.0%	75.0%	100.0%
obesity 2	1	2	3
	33.3%	66.7%	100.0%
Total	186	134	320
	58.1%	41.9%	100.0%

In this study among 20 who were underweight,30% had osteoarthritis knee. In the healthy weight group 29.7% had osteoarthritis knee,among overweight 53.0%,and in obese 1 and 2.75% and 66.7% respectively.The BMI and knee osteoarthritis was found to be associated, with a chisquarevalue- 31.481 and p value- 0.001

TABLE 12

Association between obesity and knee osteoarthritis

BMI		total		Total
		Osteoarthritis yes	osteoarthritis No	
bmi	Non obese	76	154	230
		33%	67	100.0%
	obese	58	32	90
		64.4%	35.6%	100.0%
Total		134	186	320
		41.9%	58.1%	100.0%

The odds of having osteoarthritis knee is 3.63 times higher in obese than in non obese.

Odd's ratio-3.63 95% confidence interval(2.202-6.126)

Table -13

Association between Education and Knee osteoarthritis

Education	Total		Total
	No osteoarthritis	Osteoarthritis yes	
illiterate	5	15	20
	25.0%	75.0%	100.0%
primary school	76	56	132
	57.6%	42.4%	100.0%
middle school	40	15	55
	72.7%	27.3%	100.0%
high school	54	43	97

	55.7%	44.3%	100.0%
post high school diploma	11	5	16
	68.8%	31.2%	100.0%
Total	186	134	
	58.1%	41.9%	100

Chi-Square value-14.833 and p value-0.005

In this study among 20 people who were illiterate 75 % had osteoarthritis knee,in 132 who had primary education 42.4% had history of osteoarthritis knee. In 55 study participants who had middle school education 27.3% had osteoarthritis knee,In 97 who had high school education 44.3% had osteoarthritis knee and in 16 study participants who had post high school diploma 31.25% had osteoarthritis knee. There was statistically significant association between educational status and knee osteoarthritis.

Table 14

Association between occupation and knee osteoarthritis among study participants

Occupation	Total		Total
	No osteoarthritis	Osteoarthritis yes	
unemployed	76	50	126
	60.3%	39.7%	100.0%
unskilled worker	93	71	164
	56.7%	43.3%	100.0%
semi skilled	7	2	9
	77.8%	22.2%	100.0%
skilled	5	6	11
	45.5%	54.5%	100.0%
clerical	3	4	7
	42.9%	57.1%	100.0%
semi professional	2	1	3
	66.7%	33.3%	100.0%
Total	186	134	320
	58.1%	41.9%	100.0%

Chi squarevalue-3.298   p value-0 .654

In this study among 126 study participants who are unemployed 39.7% had osteoarthritis knee.In the study among 164 unskilled workers 43.4% had osteoarthritis knee,in the 9 semiskilled workers 22.2% had osteoarthritis knee.In the 11 skilled study participants 54.5% had osteoarthritis knee,among 7 who had clerical jobs 57.1% had history of osteoarthritis knee and in 3 participant who does semi professional work 33.3% had osteoarthritis knee. The difference was not found to be statistically significant.

Table - 15

Association between socioeconomic class and osteoarthritis knee among study participants

Socioeconomic status		Total		Total
		No osteoarthritis	Osteoarthritis yes	
socioeconomic	Lower class	13	21	34
		38.2%	61.8%	100.0%
	Upper lower class	145	102	247
		58.7%	41.3%	100.0%
	Lower middle class	21	10	31
		67.7%	32.3%	100.0%
	Upper middle class	7	1	8
		87.5%	12.5%	100.0%
	Total	186	134	320
		58.1%	41.9%	100.0%

While looking for association between socioeconomic class and osteoarthritis knee, amongLower class 61.8% had osteoarthritis knee, upper lower class 41.3 % had osteoarthritis knee, lower middle class 32.3% had osteoarthritis knee , in upper middle class 12.5% had osteoarthritis knee. There was association between socioeconomic status and knee osteoarthritis.

Chisquare value-9.574

p value-0.023

Table – 16Association between Diet and knee osteoarthritis

DIET		Total		Total
		Osteoarthritis yes	Osteoarthritis no	
Diet	Vegetarian	14	24	38
		36.8%	63.2%	100.0%
	Non vegetetarian	120	162	282
		42.6%	57.4%	100.0%
Total		134	186	320
		41.9 %	58.1%	100.0%

Chi square value-0.449 p value-0.503

In this study 38 study participants were vegetarians among them 36.8% were having knee osteoarthritis and among 282 non vegetarians 42.6% had osteoarthritis knee. The difference was not statistically significant.

Table – 17 Association between diabetes mellitus and knee osteoarthritis.

History of Diabetes mellitus		Total		TOTAL
		Osteoarthritis yes	Osteoarthritis no	
Diabetesmellitus	yes	65	50	115
		56.5.0%	43.5.%	100%
	no	69	136	205
		33.7%	66.3%	100%
Total		134	186	320
		49.1 %	58.1%	100%

P value-0.001 ,chi square value-33.001 odds ratio-2.562,95 % confidence interval-(1.603-4.095)

In this study,there was statistically significant association between osteoarthritis knee and diabetes mellitus. This association was found to be significant.In115 participants who had diabetes mellitus 56.5% had osteoarthritis knee and in 205 who did not have diabetes mellitus only 33.7% had osteoarthritis knee.

Table –18Knee surgery and knee osteoarthritis knee

Previous history of knee surgery		Total		Total
		Osteoarthritis YES	Osteoarthritis NO	
	YES	22	13	35
		62.9%	37.1%	100.0%
	NO	112	172	285
		39.4%	60.6 %	100.0%
Total		134	186	320
		41.9 %	52.1.%	100.0%

In this study among 35 participants who had history of knee surgery, 62.9% had osteoarthritis knee. Among 284 who had no history of knee surgery 39.4% had osteoarthritis knee. There was significant association between history of previous knee surgery and knee osteoarthritis

chi square value-7.016, p value-0.008,Odds ratio -2.599 ,95% CI (1.258-5.370)

Table – 19Association between Mode of transport and osteoarthritis knee

Preferred Mode of transport	Total		Total
	No Osteoarthritis	Osteoarthritis Yes	
walking	104 52.0%	96 48.0%	200 100.0%
motor	78 69.0%	35 31.0%	113 100.0%
cycle	4 57.1%	3 42.9%	7 100.0%
Total	186 58.1%	134 41.9%	320 100.0%

In the study among study participants 200 preferred walking among them 48% had osteoarthritis knee, Among 113 who preferred motor vehicles 31% had osteoarthritis knee and among 7 participants who preferred cycle 42.9% had osteoarthritis knee.the difference was found to be statistically significant with chi square-8.603 ,p value-.014

Table –20

Association between Hand Osteoarthritis and knee osteoarthritis

Hand osteoarthritis	Total		Total
	Osteoarthritis YES	Osteoarthritis NO	
hand osteoarthritis YES	50 60.2%	33 39.8%	83 100.0%
Hand osteoarthritis NO	84 35.4 %	153 64.6 %	237 100.0%
Total	134 41.9 %	186 58.1%	320 100.0%

P value-0.003 chi square value-8.581 Odds ratio-2.760 ,95% Confidence interval(1.65-4.61)

In this study among 70 who had hand osteoarthritis 57.1% had knee osteoarthritis and among 250 who did not have hand osteoarthritis 37.6% had knee osteoarthritis.the difference was found to statistically significant

DISCUSSION

Prevalence

In my study, the overall prevalence of osteoarthritis knee among years was found to be 41.9% .

The study done in Bangalore urban district had a prevalence in elderly of about 54.1%[94]   which was higher than the prevalence from this study. The study done in Delhi in urban slum had the prevalence of knee osteoarthritis of 42 %[15] .This finding was consistent with this study result.National health registry has reported prevalence of 22 to 39 % prevalence of osteoarthritis knee in elderly.[95] Prevalence of osteoarthritis of knee joint among adult population in a rural area of Kanchipuram District, Tamil Nadu had found 27.1 % of knee osteoarthritis in adult population.[94]

In the study done in UK by peat et al, it was found that 25% of people over 55 years have a persistent episode of knee pain, of whom about one in six in the UK and the Netherlands consult their general practitioner about it in the same time period. The prevalence of painful disabling knee osteoarthritis in people over 55 years is 10%, of whom one quarter are severely disabled[104] .In the study done by lant et al in Vietnam it was found that prevalence in elderly to be 61%,which is high when compared to my study.[105]

SEVERITY OF OSTEOARTHRITIS KNEE

In this study among the study participants , 2.185% had very high severity,32.5 % had high severity, has 7.187 % moderate severity and no one with low severity. Severity assessed will help in the management of the disability . Patients with high severity would need surgical treatment at the earliest. the patients with low severity would need life style modifications and pharmacotherapy. In a study done by AbolfazlBagherifard et al in Iran it was found that a strong correlation was observed between WOMAC scores and OA grade in male patients.There were no studies assessing severity of symptoms of knee osteoarthritis in literature.

Determinants of osteoarthritis knee

Age and osteoarthritis

In our study ,increase in age group was found to have an association with prevalence of knee osteoarthritis .The prevalence of osteoarthritis increased in older age group . In a study done in United Kingdom by Peat et al it was found that the prevalence of painful disabling knee osteoarthritis increases in people over 55 years .[14] In a study done in Vietnam by Ho Pham et al, it was found that   age was

significantly associated with knee cartilage defect scores.[96] in my study chi square for trend was also significant it implies that the trend of increasing prevalence of osteoarthritis is significant higher age groups.

Although older age is the greatest risk factor for OA, OA is not an inevitable consequence of growing old. Radiographic changes of OA, particularly osteophytes, are common in the aged population but symptoms of joint pain may be independent of radiographic severity in many older adults. Aging changes in the musculoskeletal system increase the propensity to OA but the joints affected and the severity of disease are most closely related to other OA risk factors such as joint injury, obesity, genetics, and anatomical factors that affect joint mechanics. The aging changes in joint tissues that contribute to the development of OA include cell senescence that results in development of the senescent secretory phenotype and aging changes in the matrix, including formation of advanced glycation end-products that affect the mechanical properties of joint tissues. An improved mechanistic understanding of joint aging will likely reveal new therapeutic targets to slow or halt disease progression. In a study done by Shane Anderson et al in US it was found that, the ability to slow progression of OA in older adults will have enormous public health implications given the aging of our population and the increase in other OA risk factors such as obesity.[80]

Gender and knee osteoarthritis

In this study I got a significant association between knee osteoarthritis and gender. The proportion of knee osteoarthritis in elderly female was more than elderly male.In the study done by Maleki fish back et al in US it was found that there are sex differences in the incidence and severity of knee OA. Sex differences have been noted in the prevalence, incidence, and severity of osteoarthritis (OA) and this finding was well correlated with my study result.[102] . The incidence of knee, hip, and hand OA is higher in women than men and in women increases dramatically around the time of menopause, prompting many investigations into the roles of estrogen and other hormones as possible explanatory factors. Results of clinical and epidemiologic studies have been conflicting, with some showing a protective effect for estrogen or hormone replacement therapy (HRT) on radiographic knee and hip OA or progression to joint replacement but no effect on joint symptoms.

BMI and knee osteoarthritis

In my study it was found that high BMI was having an association with knee osteoarthritis. Participants with healthy weight had relatively lesser prevalence when compared to obese and overweight.As the BMI

increased the prevalence of osteoarthritis also increased.In the study done by Holmberg et al in southern Sweden it was found thata moderate increase in BMI, within the normal weight range, was significantly related to knee osteoarthritis among men and overweight at any time was related to knee osteoarthritis.[95] in our study we got significant association between BMI and knee osteoarthritis. Obesity was a robust risk factor for knee OA. Obesity is seen as the primary modifiable trait to prevent or reduce the effects of knee OA. In the study done by Weiss in UK it was found that "Even after controlling for a variety of confounding factors, including sex, socio-economic status, smoking, diet, education and alcohol consumption, increased weight increases the risk of knee OA"[97] and this was in correlation with my study.In the same study in UK it was reported more than half of all knee replacements in middle-aged females can be attributed to obesity [97]. In my study obese people were at 3.63 times risk than healthy weight for getting osteoarthritis knee.Odd's ratio-3.63 with 95% confidence interval(2.202-6.126)

System of medicine and knee osteoarthritis

In this study we got no association between system of medicine and knee osteoarthritis. There were no studies assessing the association between system of medicine and knee osteoarthritis.

Education and knee osteoarthritis

In this study, there was an association between education and knee osteoarthritis .the prevalence of osteoarthritis knee was lesser in participants with better education than with those who had primary education or illiterate.Education can influence the knowledge about having a better life style to avoid diseases such as knee osteoarthritis.Better educated community can always equip themselves from various life style diseases .there were no studies assessing the association between education and knee osteoarthritis.

Occupation and knee osteoarthritis

In this study there was no association between education and knee osteoarthritis.In the study done by Andre Klussman et al in Germany it was found that , a number of occupational risk factors lead to the development and progress of knee joint diseases, e.g. working in kneeling or squatting posture, lifting and carrying of heavy weights.In my study there was no association as the important occupational risk factor was absent in the study area. The occupational risk factor becomes important in the areas where there are jobs which requires squatting, kneeling or lifting. The importance of the single risk factors and the

possibility of prevention are currently under discussion. Besides the occupational factors, a number of individual risk factors are important, too. The distinction between work-related factors and individual factors is crucial in assessing the risk and in deriving preventive measures in occupational health. In existing studies, the occupational stress is determined mainly by surveys in employees and/or by making assumptions about individual occupations. Direct evaluation of occupational exposure has been performed only exceptionally.[98] Workplace interventions and policies to prevent knee OA have seldom been evaluated. Moreover, their implementation can be problematic. However, the need for research to optimise the design of work in relation to knee OA is pressing, given population trends towards extended working life. It may be seen that the evidence for an association between work activity and knee OA is reasonably good, being strongest for squatting/kneeling, lifting, and physical workload[99]

Socioeconomic class and knee osteoarthritis

In this study we got a significant association between socio economic class and knee osteoarthritis. In the study done by Reyes c et al in Spain it was found that deprived areas having low socioeconomic status had higher rates OA (hand, hip, knee) and this was consistent with my study. In the same study increased prevalence of obesity accounts for a 50% of the excess risk of knee OA observed.The prevalence of obesity was high in the areas with deprivation. Public health interventions to reduce the prevalence of obesity in this population could reduce health inequalities.

Diet and knee osteoarthritis knee

In this study there was no association between osteoarthritis knee and type of diet(veg/non veg).in the study done by Sally Thomas in UK it was found that there are protective role of antioxidants and omega 3 fatty acids for knee osteoarthritis but this study couldn't find any association between type of diet or knee osteoarthritis[101]

Diabetes and mellitus and knee osteoarthritis knee

In this study there was an association between diabetes mellitus and knee osteoarthritis..In the study done by Mariely nieves plaza in the hispanics of puertorico it was found that DM patients were more likely to have OA of hands or knees than non-diabetic subjects. This association was retained in multivariable models accounting for established risk factors for OA. Among DM patients, females were at greater risk for OA, whereas the use of insulin was negatively associated.[106]

Knee surgery and knee osteoarthritis knee

In this study we got significant association between knee osteoarthritis and knee surgery.Previous knee surgeries are known risk factor for osteoarthritis knee.Previous ligament repairs or similar knee surgeries are risk factor for development of knee osteoarthritis .

In the study done by Washington by smith mv et al it was found that Previous knee surgery, particularly ACL reconstruction and partial Meniscectomy, and elevated BMI are associated with knee OA. This finding was consistent with my study result.In the study done by Rocco Pappalia in UK it was found that 53.5% prevalence in the patients who had undergone previous Meniscectomy surgery.[107] This finding was consistent with my study result.

Hand Osteoarthritis knee and knee osteoarthritis

In this study there was significant association between hand osteoarthritis and knee osteoarthritis.In the study done by Dahagin s et al in Rotterdam it was found that hand osteoarthritis is a risk factor for knee osteoarthritis.[103] This finding was in consistent with my study finding.

SUMMARY AND CONCLUSION

A cross sectional study was conducted among 320 elderly aged more than 60 years in Nellanad panchayat to find prevalence and factors associated with osteoarthritis knee and severity of osteoarthritis knee.

The mean age of study subject was 69.92, standard deviation -5.161.

Prevalence of osteoarthritis knee as per ACR criteria was found to be 41.9 %

The factors found to be statistically significant were age group(p value-0.005),female gender (p value-0.001),BMI (p value-0.049),education (p value-.035),socioeconomic class(p value-0.037),hand osteoarthritis(p value-.001),knee surgery(0.013) and diabetes mellitus(P value-.001)

Whereasthere was no significant association between diet, occupation and knee osteoarthritis.

Among the participant who were having knee osteoarthritis.5.2% were having very high severity,77.6% high severity,17.2% were having moderate severity.

RECOMMENDATIONS

The increased prevalence of osteoarthritis knee in old age in a developing country like India is very alarming.The elderly population are mostly economically dependent population. Knee osteoarthritis can seriously disable the person from being economically productive.In such a scenario dependent population will have a very miserable old age life.The increased burden of knee osteoarthritis has to be reduced with multi prongedapproach.The first being health education .The most important step being informing the persons the risk factors of knee osteoarthritis. second step being providing free of cost surgeries and treatment for knee osteoarthritis.Third being increasing the physical activity to reduce BMI in the population.

The elderly with knee osteoarthritis cannot afford high cost surgeries , so they have to remain disabled . This will make them economically non productive and more dependent. The comorbidities associated with sedentary lifestyle may coincide with knee OA.This will make the situation more miserable .

Excess weight is one of the biggest risk factors of OA, as it puts extra stress on your joints, which can speed up the deterioration of joint cartilage. Overweight and obese individuals are at high risk of developing OA. Losing weight can help reduce pain and improve symptoms.Exercise can help people develop healthy joints and muscles, but overuse of joints can increase the risk of developing OA. The key is balance. If your joints are swollen or achy, give them a break. Try to avoid using a swollen joint for at least 12 to 24 hours. Letting an injured joint heal helps reduce the risk of developing OA there in the future.Although there is no cure for osteoarthritis, there are many ways to prevent it and relieve and manage its symptoms. Maintaining a healthy lifestyle with low-impact exercise, getting plenty of rest and enough sleep, and maintaining a healthy diet and weight are simple ways you can reduce and manage OA symptoms so that you can live a healthy and fulfilling life. Professionals should take a possible weight reduction into account for the treatment of knee OA whenever a patient is significantly overweight.

Osteoarthritis is one of the leading causes for absence of the elderly individuals from workplaces, social gatherings, and festivities. Often, these patients neglect and remain unsatisfied due to ignorance, delayed presentation, long duration of therapy, financial constraints, rampant quack practices, ineffective motivation, and counselling with ineffective exercise regimens. One of the challenges of managing OA is the prevailing perception among people that OA is a general aging procedure and that little can be done to slow down the progress of joint damage or improve joint function.

The public health system and the government has to bring in new programmes exclusively for tackling the menace of increasing prevalence of knee osteoarthritis in elderly. The programme should focus on preventive and curative part the primary health sector should be properly equipped for the preventive

strategies the tertiary care should given strengthened in terms of manpower and equipment ,so that they can provide free surgical services (including implants) in the future.

Limitations

Cross sectional study design limits conclusion about causality.

Bed ridden and very old patients could not be included in the study. It is a limitation to the study.

LIST OF ABBREVIATIONS

ACR- AMERICAN COLLEGE OF RHUEMATOLOGY

OA-OSTEOARTHRITIS

WOMAC-WESTERN ONTARIO AND MACMASTER OSTEOARTHRITIS INDEX.

RA -RHUEMATOID ARTHRITIS

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Variables	Knee osteoarthritis(n)		Chi-square	P value
	Yes	no		
Age group			11.170	0.001
Age 60 -70	59	116		
Age 70-80	68	66		
Age 80-90	7	4		
Gender			9.473	0.002
Male	53	106		
female	81	80		
Bmi categories				
Under weight	6			
Healthy weight	49			
Over weight				
Obese `1				
Obese 2				