

A Study on Prevalence of Risk Factors of Knee Osteoarthritis among Urban Women of Kolkata

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Abstract

Background: Osteoarthritis is the most common musculoskeletal disorder causing pain and disability in the older age group of world population especially in women. And it affects 60-70% of the population older than 60 years. The prevalence of osteoarthritis is high in India ranging from 22% to 39% in different parts of the country. Approximately 45% of woman over the age of 65 years has osteoarthritis.

Objectives: To identify the risk factors of knee osteoarthritis among women and to test the association between risk factors of knee osteoarthritis among women and selected demographic variable.

Research approach: Descriptive survey approach and convenience sampling method was utilized to collect data from the urban woman.

Research design: The design for this study was cross –sectional for prevalence of knee osteoarthritis among women from urban area of Bonhoogly area, Kolkata. The conceptual framework for the study was based on pender health promotion model.

Method: A sample of 200 women from urban area of Bonhoogly area ward number 14 and 19 from July 2014 to August 2016 were included in the study.

Instruments or tools: Data collection tools and technique: A questionnaire was used to collect study data which comprises of four parts, first part include demographic data, second part comprises of risk factors, third part comprises of physical features of knee osteoarthritis and fourth part comprises of height, weight, redness of the knee, swelling of the knee, BMI, deformity of the spine.

Results: There was statistically significant association between the occupation and risk factors in case group. From the frequency and percentage it is concluded that most of the women in the case group were overweight, higher the age higher the risk for knee osteoarthritis.

Conclusion- The majority of the findings revealed that most women who had achieved menopause were at higher risk of getting knee osteoarthritis.

Keywords: BMI, cross –sectional, demographic variable, Osteoarthritis, pender health promotion model prevalence, risk factors

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I. Introduction

Osteoarthritis(OA) is a slowly progressive inflammatory disorder of the diarthroidal (synovial) joints and is characterised by degeneration of cartilage and its underlying bone within a joint as well as bony overgrowth. The breakdown of these tissue eventually leads to pain and joint stiffness.¹ Osteoarthritis is the most common musculoskeletal disorder affecting the world population, the leading cause of pain and disability in the community. Osteoarthritis is a major cause of disability both in developing and developed countries. With the increase in the ageing population, the prevalence of osteoarthritis is increasing due to increase in the activity and its consequences are impacting significantly on society by increasing the number of clients seeking medical help for joint pain².

Osteoarthritis is a common condition in older adults, especially in women. Osteoarthritis have no cure but recently developed pharmacological agent can decrease pain and swelling and therefore increase joint motion³.

Psychological sequelae include distress, devalued self worth, loneliness. Given the high frequency of OA in the population, its economic burden is large. It is also leading cause of disability affecting 60-70% of the population older than 60 years⁴.

Although OA occurs all over the world, the prevalence and the pattern of the disease vary depending on the geographical distribution which in turn can provide valuable clues about the potential etiological factors. The prevalence of osteoarthritis is high in India ranging from 22% to 39% in different parts of the country. Approximately 45% of woman over the age of 65 years has osteoarthritis. But men are more affected than woman before age of 50 years. Knee osteoarthritis is more common in men before the age of 45 years and female affected twice after the age of 50 years⁵

II. Aim of The Study

To identify the risk factors of knee osteoarthritis among women from urban area of Bonhoogly area, Kolkata and to test the association between risk factors of knee osteoarthritis among women and selected demographic variables.

III. Materials And Methods

3.1: Design

The design for this study was cross –sectional for prevalence of knee osteoarthritis among women from urban area of Bonhoogly area, Kolkata

3.2: Sample

A sample of 200 women from urban area of Bonhoogly ward number 14 and 19 from July 2014 to August 2016 were included in the study

3.3: Study setting

Since the study was intended to collect data from the urban area, it was conducted in the municipality of Baranagar Area, Bonhoogly.

3.4: Inclusion criteria

1. Women of the selected area aged 35 years and above.
2. Who are willing to participate in the study.
3. Who will be available at the time of the data collection

3.5: Research variable

Risk factors that are age, trauma, genetics, obesity, diet, lifestyle, place of living, educational status, socio economic status.

3.6: Demographic variable: Age, Education, Marital Status, Occupation, Monthly Income, Number Of Family Members

3.7: Theoretical framework:

The present study was based on the theoretical framework of Pender Health Promotion model 1987 which is an important behaviour for use in research and practice, providing opportunities for prevention and treatment.

Health promotion model has given health care a new direction, according to her, health promotion and disease prevention should be the primary focus in health care, and when health promotion and prevention fail to prevent problems and then care in illness becomes the next priority. She defined two concepts: Health Promotion and Health Prevention.

Health Promotion is defined as behaviour motivated by the desire to increase wellbeing and actualize human health potential, it is an approach to wellness. On the other hand, health protection or illness prevention is described as behaviour motivated desire to actively avoid illness, detect it early, or maintain functioning within the constraints of illness²⁵.

In this study the researcher assess the risk factors of knee osteoarthritis among urban women in Baranagar area Kolkata. In this study the perceived health behaviour referred to the respondents decision of attending the health care facility or seeking for professional help. This health behaviour leads to the initiation of treatment.

In the present study, time of treatment initiation is referred to the link between the factors associated with knee osteoarthritis in terms of demographic variables.

3.8: Evaluation :

Evaluation refers to the professional judgement about people's health status and their need for medical care. In this study the evaluation was done in terms of demographic variable.

3.9: Instruments or tools: Data collection tools and technique

A questionnaire was used to collect study data which comprises of four parts, first part include demographic data, second part comprises of risk factors, third part comprises of physical features of knee

osteoarthritis and fourth part comprises of height, weight, redness of the knee, swelling of the knee, BMI, deformity of the spine.

Table 1: showing table for data collections

Tools	Variables to be measured	Technique
Tool 1 Part 1- Semi structured interview schedule	Demographic data	Interview
Part 2- Semi Structured interview	Risk factors	Interview
Part 3- Questionnaire	Physical features of knee osteoarthritis	Questionnaire
Part 4- Physical assessment	Height, weight, redness of the knee, swelling of the knee, BMI, deformity of the spine.	Bio physiological measurement, inspection, palpation.

Part 1- It was developed for collecting the personal data of clients. It described the demographic characteristic of samples consisting of 8(eight) items such as age, religion, number of family members, family income, marital status, occupation, type of family, educational status.

Part 2- It was developed to identify the risk factors among woman. It include 20 items such as history of previous injury to knees, any osteoarthritis in the family, any disease in the family, history of surgery to the knees, physical activities, history of smoking, alcoholism, average time for standing, lifting heavy objects, climbing stairs, using high heels, type of toilet in the home, diet, use of contraceptive pills and history of menstruation.

Part 3- It was developed to identify any features for presence of knee osteoarthritis among woman, and it include 6 questions. That is history of pain in knee, history of medical advice, history of treatment modalities availed, presence of stiffness or pain, presence of crackling sound on the knee.

Part 4- It was developed for collecting the bio physiologic measurement, with 8 items. Such as height, weight, BMI, blood pressure, presence of any deformity affecting spine and lower extremity, presence of swelling on knee, resence of redness, presence of pain

3.9.1: Validation of tool

Tool is validated by 9 experts from nursing, physical medicine and rehabilitation, physiotherapy and occupational therapy. Linguistic validation was established by respective language experts. The tool was translated into Bengali and Hindi and re- translated in English with the help of experts.

3.9.2: Pretesting of the tool:

Pretesting of the tool was done on 20 clients by interviewing with structured questionnaire to identify:

1. Clarity and feasibility of the tool
2. The time taken for interview
3. Ambiguity of statement

The pre-testing indicated that the study was feasible and the items were clear and well understood by the subjects. Time taken to complete was about 30 minutes. Ambiguity was not detected.

3.9.3: Reliability of the tool

The reliability of the structured questionnaire was computed using inter-rater. From the data obtained during pre testing the tool. The reliability coefficient(r) was 0.7, indicating that the tool was reliable.

3.9.4: Final data collection

The final data collection procedure was conducted at Bonhoogly area ward number 14 and 19 from 1 Nov 2015 to 28th Nov 2015.

3.9.5: Ethical considerations:

An approval was obtained from National Institute for the Orthopedically Handicapped(N.I.O.H). Bonhoogly, Kolkata-90. Administrative permissions were taken from Municipality of Baranagar. The purpose of the study and the nature of co-operation and help required for the study were explained to the urban women in the Baranagar area.

3.9.6: Plan for data analysis

The following plan of data analysis was developed:

Section I: findings related to the frequency and percentage distribution of women based on their demographic characteristics.

Section II: findings related to the risk factors of knee osteoarthritis among urban women.

Section III: findings related presence of features of knee osteoarthritis.

Section IV: findings related to the association between risk factors of knee osteoarthritis and selected demographic variables.

Chi Square test is used to see the association between the two variables and is statistically insignificant if p-value < 0.05.

IV. Results

Following are the findings based on the questionnaire used in this study to collect study data which comprises of four parts, first part include demographic data, second part which comprises of risk factors, third part comprises of physical features of knee osteoarthritis and fourth part which comprises of height, weight, redness of the knee, swelling of the knee, BMI, deformity of the spine:

4.1: Findings related to the Demographic characteristics of women:

1. Majority of women in control group belongs to 35-45 years (54%) and in case group belong to 46-55 years (37%).
2. Maximum number of women in both the control group (95%) and case group (90%) belong to Hindu religion.
3. Maximum number of women in both the control group (30%) and case group (36%) had educational status of secondary.
4. Maximum number of women in both the control group (86%) and case group (70%) were married.
5. Equal number of women in both the control group (85%) and case group (85%) were housewives.
6. Maximum number of women in both the control group (79%) and case group (85%) were having nuclear family.
7. Maximum number of women in both the control group (61%) and case group (60%) were having an income of 1000-5000rs/month.
8. Maximum number of women in both the control group (31%) and case group (35%) were having family members of 4.

4.2: Findings related to risk factors of knee osteoarthritis

1. Maximum number of women in the case group was identified with an average risk (72%) and in control group maximum number of women was having a high risk (51%)
2. Women in case and control group had a low risk of 15% and 14%.
3. Mean of risk factors among women in control group was 5.41 and median was 6. Mean of risk factors in case group was 7.47, with median of 8.

4.3: Findings related to the physical features associated with knee osteoarthritis

1. Majority of the women 42% have been suffering from knee osteoarthritis for more than 5 years.
2. Maximum number of who women had visited the medical person for the treatment (35%) within 1-6 months.
3. Maximum number of the woman used drugs (35%) as a pain management for knee osteoarthritis.
4. Equal number of women had stiffness sometimes (35%) and very often (35%) in the morning when they wake up.
5. Majority of the women (87%) had stiffness in the morning but it subsides within 5 min-1 hour after moving the knee joints for a while.
6. Majority of the women sometimes (43%) hear the crackling sound/crepitus in their knee when they wake up.
7. Majority of the women in case group has a systolic pressure of <140 (81%), and diastolic pressure of <90 (84%). Women in control group had a systolic pressure of <140(88%), and diastolic pressure of <90 (91%).
8. Majority of the women doesn't have any deformity (82%) affecting the spine and lower extremity.
9. Majority of the women suffering from the knee osteoarthritis does not have any swelling (66%).
10. Maximum number of women suffering from knee osteoarthritis does not have any redness (84%).
11. Majority of the women suffering from knee osteoarthritis had a moderate pain level (52%).

4.4: Findings related to the bio physiological measurement of women

1. Maximum numbers of women were overweight in control group (49%), and in case group (43%).

2. Association between the risk factors of knee osteoarthritis and demographic variables
3. Statistically significant associations were found between the risk factors of knee osteoarthritis and the occupation of women in control group.
4. No statistically significance associations were found between the risk factors of knee osteoarthritis and age of the women, religion, occupation, income in the case group. And further no statistically significance associations were found between the risk factors of knee osteoarthritis and age of the women, religion and income in control group.
5. No statistically significance associations were found between the case group and control group.

V. Tables And Figures

Variable age in years	Frequency	Percentage (%)
35-45	54	54
46-55	29	29
56-65	11	11
66-75	3	3
76-85	3	3
Religion		
Hindu	95	95
Others	5	5

Variables	Frequency	Percentage (%)
Educational status		
Illiterate	11	11
Primary	12	12
Secondary	30	30
Hr. Sec	20	20
Graduate	7	7
Post Gradu	16	16
Professional	4	4
Marital status		
Unmarried	5	5
Married	86	86
Widow	8	8
Divorce	1	1

Table 2: Frequency and percentage distribution of women in control group according to their age and religion.

Table 3: Frequency and percentage distribution of women in control group according to their educational status and type of family.

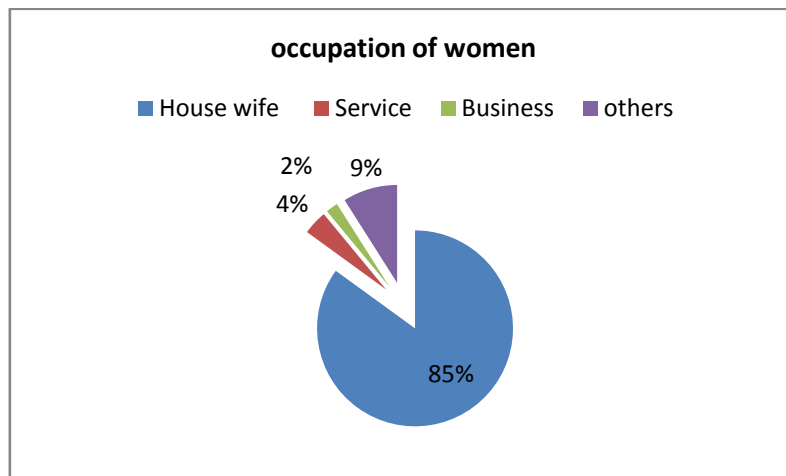


Figure 1: Pie chart showing the occupation of the women

Variables	Frequency	Percentage(%)
Types of family		
Nuclear	79	79
Joint	21	21

Table 4: Frequency and percentage distribution of the sample in control group according to their type of family

Demographic variables	Frequency	Percentage(%)
Family income (Rs/month)		
<5000	61	61
5000-15000	29	29
>15000	10	10
Number of family members		
1	2	2
2-4	60	60
5-8	35	35
>8	3	3

Table 5: Frequency and percentage distribution of the women in control group according to their family income and number of family members

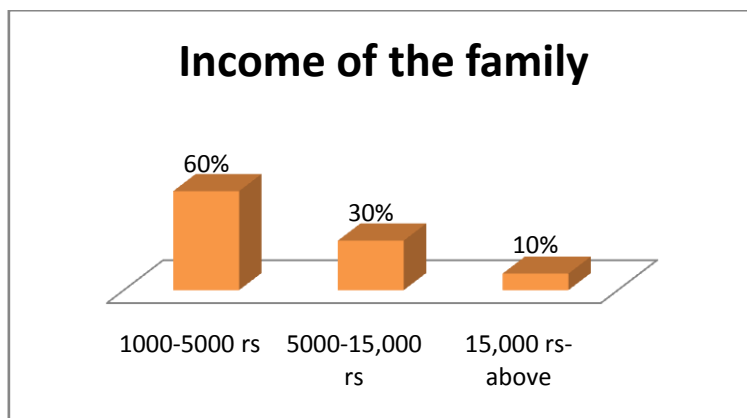


Figure 2: Bar-graph showing the family income

n=100

Variables	Frequency	Percentage(%)
Age in years		
35-45	35	35
46-55	37	37
56-65	25	25
66-75	3	3
Religion		
Hindu	90	90
Others	10	10

Table 6: Frequency and percentage distribution of women in case group according to their age and religion

n=100

Variables	Frequency	Percentage(%)
Family members		
1	5	5
2-4	70	70
5-8	24	24
>8	1	1
Marital status		
Married	70	70
Unmarried	1	1
Widowed	26	26
Divorced	4	4

Table 7: Frequency and percentage distribution of women in case group according to their family members and marital status

n=100

Variables	Frequency	Percentage(%)
Occupation		
House wives	85	85
Service	4	4
Business	2	2
Others	9	9
Type of family		
Nuclear	85	85
Joint	15	15

Table 8: Frequency and percentage distribution of women in case group according to their occupation and type of family

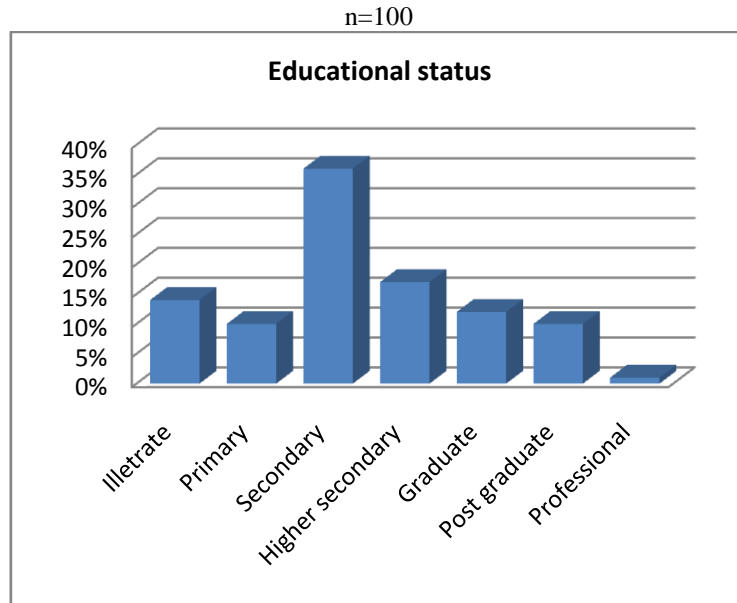


Figure 3: Bar graph showing educational status of women in case group in percentage

n=200

Variables	Mean	Median	SD
Case	7.47	8	1.79
Control	5.41	6	1.55

The data presented in the table revealed that the mean of case group (7.47) is higher than the mean of the control group (5.41), and the median of the case group (8) is higher than the median of the control group (6). The standard deviation of both the case and the control group is almost the same with 1.79 and 1.55.

Table 9: Findings related to mean, median and standard deviation of the risk factors of knee osteoarthritis of women based on data given by the women

Variables	Case		Control	
	Frequency	%	frequency	%
Low	15	15	14	14
Average	72	72	35	35
High	13	13	51	51

Table 10: Frequency and percentage distribution of risk factors in control and case group in terms of risk status.

Variables	Risk factors		Total	Chi square (X ²)
	<median	≥median		
Case	49	51	100	0.00
Control	49	51	100	0.00
Total	98	102	200	0.00

$\chi^2(1)=3.84 p>0.05$

Table 11: Chi square test of association between the case group and control group in knee osteoarthritis.

n=100

Variables	Risk factors		total	Chi Square (X ²)
	>median	≥median		
<45	18	13	31	2.07
≥45	31	38	69	
Total	49	51	100	

$\chi^2(1)=3.84 p>0.05$

Table 12: Chi square test of association between the age and risk factors of knee osteoarthritis among the case group

n=100

Variables	Risk factors		total	Chi Square (X ²)
	>median	≥media n		
Hindu	44	46	90	0.0009
Others	5	5	10	
Total	49	51	100	

$\chi^2(1)=3.84 p>0.05$

Table 13: Chi square test of association between the religion and risk factors of knee osteoarthritis among the case group

Variables	Risk factors		total	Chi Square(X ²)
	>median	≥median		
Occupations				
House wives	41	44	85	0.04
Others	8	7	15	
Total	49	51	100	

$\chi^2(1)=3.84$ p>0.05

Variables	Risk factors		total	Chi Square(X ²)
	>median	≥median		
Income				
<5000	22	23	45	.0004
≥5000	27	28	55	
Total	49	51	100	

$\chi^2(1)=3.84$ p>0.05

Table 14: Chi square test of association between the occupation and risk factors of knee osteoarthritis among the case group

Table 15: Chi square test of association between the income and risk factors of knee osteoarthritis among the case group

Variables	Risk factors		total	Chi Square(X ²)
	>median	≥median		
Age in years				
<45	26	22	48	1.04
≥45	23	29	52	
Total	49	51	100	

$\chi^2(1)=3.84$ p>0.05

Variables	Risk factors		total	Chi Square(X ²)
	>median	≥median		
Religion				
Hindu	48	47	95	0.09
Others	1	4	5	
Total	49	51	100	

$\chi^2(1)=3.84$ p>0.05

Table 16: Chi square test of association between the age and risk factors of knee osteoarthritis among the control group

Table 17: Chi square test of association between the religion and risk factors of knee osteoarthritis among the control group

Variables	Risk factors		total	Chi Square(X ²)
	>median	≥median		
Income				
<5000	7	38	45	0.03
≥5000	8	47	55	
Total	15	85	100	

$\chi^2(1)=3.84$ p>0.05

Variables	Risk factors		total	Chi Square(X ²)
	>median	≥median		
Occupation				
House wives	43	22	65	15.61
Others	6	29	35	
Total	49	51	100	

$\chi^2(1)=3.84$ p>0.05

Table 18: Chi square test of association between the income and risk factors of knee osteoarthritis among the control group

Table 19: Chi square test of association between the occupation and risk factors of knee osteoarthritis among the case group

n=100

n=100

Variables	Frequency	Percentage (%)
Time span		
<6 month	10	10
6month-1yr	13	13
1yr-5yr	35	35
>5yrs	42	42

Variables	Frequency	percentage
Time span		
0-1month	33	33
1-6month	35	35
6month-1yr	16	16
1 yr above	16	16

Table 20: Frequency and percentage distribution of the women according to the time the women has been suffering from knee pain

Table 21: Frequency and percentage distribution of the women according to the women being last seen by a medical person

n=100

Variables	Frequency	Percentage (%)
Remedy used		
Drugs	35	35
Exercises	26	26
Heat application	14	14
By restricting movement	2	2
Two among the options	14	14
Three among the options	9	9

Table 22: Frequency and percentage distribution of the women according to the remedy used to decrease the pain for knee osteoarthritis

n=100

Variables	Frequency	Percentage
Stiffness		
Never	11	11
Sometimes	35	35
Often	19	19
Very often	35	35

Table 23: Frequency and percentage distribution of the women according to the stiffness or pain in the morning

n=100

Variables	Frequency	Percentage (%)
Time taken to subside the pain		
5min-1 hr	87	87
1hr-2hr	7	7
2hr-3hr	1	1
Pain whole day	5	5

Table 24: Frequency and percentage distribution of the women according to the time taken for pain to subside

n=100

Variables	Frequency	Percentage
Presence of crepitus		
Never	36	36
Sometimes	43	43
Often	9	9
Very often	12	12

Table 25: Frequency and percentage distribution of the women according to the presence of crackling sound/crepitus on knee while walking

n=100

Variables	Frequency	Percentage (%)
Blood pressure of case group		
Systolic <140	81	81
Systolic ≥140	19	19
Diastolic <90	84	84
Diastolic ≥90	16	16
Blood pressure of control group		
Systolic <140	88	88
Systolic ≥140		
Diastolic <90		
Diastolic ≥90		

Table 26: Frequency and percentage distribution of the women according to the blood pressure among the case group and control group

n=100

Variables	Frequency	Percentage
Presence of deformity		
Absent	82	82
Present	18	18
Presence of swelling		
Absent	66	66
Present	34	34

Table 27: Frequency and percentage distribution of the women according to the presence of deformity and swelling

n=100

Variables	Frequency	Percentage (%)
Presence of redness		
Absent	84	84
Present	16	16
Pain level		
No pain	Nil	Nil
Pain	100	100

Table 28: Frequency and percentage distribution of the women according to the presence of redness and pain

n=100

Variables	Frequency	percentage
BMI of case group		
Under weight	1	1
Normal	36	36
Over weight	43	43
Obese	20	20
BMI of control group		
Under weight	1	1
Normal	38	38
Over weight	49	49
Obese	9	9

Table 29: Frequency and percentage distribution of the women according to their BMI in case and control group

VI. Discussion

The study was conducted with the core purpose of assessing the risk factors of knee osteoarthritis in association with selected demographic variable. A descriptive survey design was used. The sample included 200 women, 100 women were suffering from knee osteoarthritis and 100 women were not having knee osteoarthritis. On the basis of the objectives of the present study and its findings, a discussion was held in relation to other studies.

In this present study it was shown that the majority of the women who were suffering from knee osteoarthritis were above 45 years of age, and higher the age higher the risk. Andrianakos AA et al, (2006) conducted a cross sectional study on the Prevalence of symptomatic knee, hand, and hip osteoarthritis in Greece and found a significant association of female sex and age ≥ 50 years with all sites of OA.

The present study found that family history of knee osteoarthritis has an influence on developing knee osteoarthritis. A similar study was conducted by Spector TD, MacGregor AJ (2004) on the relationship of osteoarthritis with genetics. Evidence of a genetic influence of OA comes from a number of sources, including epidemiological studies of family history and family clustering, twin studies, and exploration of rare genetic disorders. The study have shown that the influence of genetic factors is between 39% and 65% in radiographic OA of the hand and knee in women, about 60% in OA of the hip, and about 70% in OA of the spine. Taken together, these estimates suggest a heritability of OA of 50% or more, indicating that half the variation in susceptibility to disease in the population is explained by genetic factors.

In this study revealed that maximum women did strenuous work, squatting and heavy lifting. A systematic literature search on factors associated with physical activity in patients with osteoarthritis of the hip or knee by Veenhof C, Huisman PA, Barten JA, Takken T, Pisters MF (2011) found that a high level of physical activity with high BMI were evidence hip and knee osteoarthritis. Zhang Y, et al. conducted a study on the association of squatting with increased prevalence of radiographic tibiofemoral knee osteoarthritis. The study concluded that the prevalence of tibiofemoral OA increased as the time spent squatting at age 25 increased in both the men and the women. Compared with subjects who squatted <30 minutes per day at age 25, the multivariable-adjusted prevalence odds ratios of tibiofemoral OA were 1.1 for time spent squatting of 30-59 minutes/day, 1.0 for 60-119 minutes/day, 1.7 for 120-179 minutes/day, and 2.0 for ≥ 120 minutes/day among the men (P for trend = 0.074), and the respective odds ratios among the women were 1.4, 1.3, 1.2, and 2.4 (P for trend = 0.077). After adjusting for the impact of squatting, the age-adjusted difference in prevalence of tibiofemoral OA was reduced from an excess of 14.4% to 9.5% in the Chinese women, but the difference in prevalence of tibiofemoral OA in the Chinese men increased after adjustment for age and squatting, from 2.9% lower to 7.0% lower as compared with their white counterparts.

In this present study researcher observe that most of the clients were pre obese and obese group. Lohmander LS, Gerhardsson M, Roloff J, Nilsson PM, Engstrom G, (2004) conducted a population based prospective cohort study. Body mass index (BMI), waist circumference, waist-hip ratio (WHR), weight and percentage of body fat (BF%) were measured at baseline in 11026 men and 16934 women from the general population. The incidence of osteoarthritis over 11 years was monitored by linkage with the Swedish hospital discharge register. 471 individuals had knee osteoarthritis and 551 had hip osteoarthritis. All measures of overweight were associated with the incidence of knee osteoarthritis, with the strongest relative risk gradient observed for BMI. The results support a major link between overweight and biomechanics in increasing the risk of knee and hip osteoarthritis in men and women. A J Teichtahlet all (2008), conducted a study on Obesity and adiposity association with the rate of patella cartilage volume loss over 2 years in adults without knee osteoarthritis. 297 community-based adults aged 50-79 years with no clinical knee osteoarthritis were recruited at baseline (2003-4). 271 (62% female) subjects were re-examined at follow-up (2006-7). Measures of obesity (body mass index (BMI) and weight) and adiposity (fat mass and percentage fat mass), as well as patella cartilage volume, were determined by established protocols. Patella cartilage volume was lost at an annual rate of 1.8% (95% CI 1.4% to 2.1%). Increased baseline BMI, weight, fat mass and percentage fat mass were all associated with an increased rate of patella cartilage volume loss after adjustment for confounders (all $p \leq 0.04$). The direction and magnitude of the effects were similar for both sexes but the number of men examined was considerably smaller and the associations were not statistically significant. This study demonstrated that increased levels of obesity and adiposity are associated with an increased annual rate of patella cartilage volume loss in healthy adults.

In this present study researcher observe that most of the clients with knee osteoarthritis have metabolic disease. A cross sectional study among 202 subjects, 100 adult DM patients and 102 nondiabetic subjects, conducted by Nieves-Plaza M, Castro-Santana LE, Font YM, Mayor AM, Vilá LM (2013). They found that the prevalence of OA in patients with DM and nondiabetic subjects was 49.0% and 26.5%, respectively (P < 0.01). In the multivariable analysis, patients with DM had 2.18 the odds of having OA when compared with nondiabetic subjects (95% confidence interval [CI], 1.12-4.24). In a subanalysis among DM patients, female patients were more likely to have hand or knee OA (odds ratio [95% CI], 5.06 [1.66-15.66]), whereas patients

who did not use insulin alone for DM therapy were more likely to have OA (odds ratio [95% CI], 4.44 [1.22-16.12]). Moreover the study of Eymard F et al. (2015) found that metabolic factors (obesity, diabetes, hypertension and dyslipidemia) and their clustering in metabolic syndrome (MetS) might be involved in the pathophysiology of knee osteoarthritis (OA). 559 patients older than 50 years with symptomatic knee OA were recruited for the placebo arm of the SEKOIA trial. Body mass index (BMI) was calculated, obesity was considered >30 kg/m². A total of 43.8% was obese, 6.6% had type 2 diabetes, 45.1% hypertension, 27.6% dyslipidemia and 13.6% MetS. Mean annualised JSN was greater for patients with type 2 diabetes than without diabetes (0.26 [-0.35 to -0.17] vs 0.14 [-0.16 to -0.12] mm; P = 0.001). This association remained significant after adjustment for sex, age, BMI, hypertension and dyslipidemia (P = 0.018). Courties A and Sellam J (2016) also conducted a systematic literature review and meta-analysis. They included cohort, case-control and cross-sectional studies assessing the number of patients with DM and/or OA. And found the association between the OA and DM.

VII. Conclusion

The current study concluded that the development of osteoarthritis has strong association with increasing age, family history of osteoarthritis, physical activities like squatting, heavy weight lifting, strenuous activities etc. And also found that obesity and metabolic disorder plays a significant risk factors for development of osteoarthritis.

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