

RISK FACTORS ASSOCIATED WITH KNEE OSTEOARTHRITIS AMONG ADULTS: A CASE CONTROL STUDY AT BAGALKOT

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Abstract

Background: Osteoarthritis (OA) is the most common form of arthritis. Some people call it degenerative joint disease or “wear and tear” arthritis. It occurs most frequently in the hands, hips, and knees. The common risk factors include excessive use; strain or injury lack of exercise, tobacco smoking, alcohol consumption, dietary practices etc. compared to Rheumatoid arthritis Osteoarthritis is a result of many modifiable risk factors. Whereas most of the rheumatoid arthritis cases are attributed to genetic factors. If the risk factors are understood and avoidance of negative factors and promotion off positive factors can prevent occurrence of osteoarthritis even with advancing age. Methods: In case-control study patients with and without symptomatic knee osteoarthritis (OA) were questioned by means of a standardized questionnaire complemented by a semi-standardized interview. Controls were matched and assigned to the cases by gender and age. A sample of 300 young adults was selected by convenient sampling.

Results: The mean age of the sample was 35 -45 years. Among 150 ,56% were female suffering from knee osteoarthritis, 42% were educated up to 10t 44%were household, 58% joint family , 50 % were vegetarian, 32.1% were pregnant twice, 76% having non hypertensive, 20%were diabetic, 66% were not doing daily exercise 90% were not were high heeled shoes, 54% used Indian style toilet, 86% were absence of chronic disease, 72%were no habit of consuming tobacco, 55%were suffering from knee pain , 94% were not took infertility treatment, 62% having no history of low limb fracture , 84% were not living in hilly area , 92% were not consuming alcohol, 46%were normal body mass index.

Conclusion: The result of the study will be a platform for future researcher to test the intervention that can control the determinants explored by present study. The most important implication of the study is to prevent the future physical as well as psychological health issues of adults.

Keyword: Case Control, Knee, Osteoarthritis, adults

INTRODUCTION

Osteoarthritis (OA) is an irreparable joint condition cause pain, joint stiffness, movement restrictions, and disability. It is associated with ageing and likely to happen in the joints that have been frequently stressed all over the years. Joints are most frequently affect by it are, namely, cervical and lumbo sacral spine, hip, knee, and first metatarsal phalangeal joint. OA is the most common type of arthritis.¹

Osteoarthritis is the second most widespread rheumatologic problem and it is the most frequent joint disease with a occurrence of 22% to 39% in India.OA.² Can contribute to immobility with ageing, secondary to pain and reduced function, thus finally impair quality of life. It is well familiar that OA pain, swelling or rigidity can make it not easy for individuals to make simple actions of daily living (ADL) such as opening boxes of

food, tucking in bed sheets, writing, using a computer mouse, driving a car, walking, climbing stairs and lifting objects ³

A new knowledge project almost 1 billion people will be living with osteoarthritis, the most common form of arthritis, by 2050. at present, 15% of individuals aged 30 and older experience osteoarthritis. The study found that cases greater than before quickly over the past three decades because of three main factors: aging, population growth, and obesity. In 1990, 256 million public had osteoarthritis. By 2020, this number rose to 595 million people, which was a 132% raise_from 1990. By 2050, this number is projected to approach the 1 billion mark.⁴ According to World Health Organization (WHO) data, nearly 9.6 percent of men and 18 percent of women aged over 60 years suffer from Osteoarthritis worldwide. In India, Osteoarthritis is the second a large amount of common rheumatologic crisis and

it is the most recurrent joint disease in the country with a prevalence of 22 per cent to 39 per cent.⁵ Arthritis means inflammation or swelling of one or more joints. It describes more than 100 situation that affect the joints, tissues around the joint, and other connective tissues.⁶ The global prevalence of knee osteoarthritis was 16% in individuals aged 15 years and above and 22.9% in individuals aged 40 years and above. It correspond to around 654.1 million individuals (40 years and above) with knee osteoarthritis in 2020 worldwide.⁷ Osteoarthritis is the second most universal rheumatologic problem and it is the most common joint disease with a prevalence of 22% to 39% in India. OA is more common in women than men, but the incidence increases significantly with age.⁸

METHODS

In case-control study patients with and without symptomatic knee osteoarthritis (OA) were questioned by means of a standardized questionnaire complemented by a semi-standardized interview. Controls were matched and assigned to the cases by gender and age. A sample of 300 young adults was selected by convenient sampling.

STUDY PARTICIPANTS

The population for the study will be adults who are above 35 years of age, visiting to OPD OF HSK hospital Bagalkot. The cases will be the adults diagnosed with knee osteoarthritis and controls will be the adults not diagnosed with knee osteoarthritis

SAMPLE SIZE CALCULATION

The sample size was estimated considering the following parameters $P=0.20$, $Q=0.80$, Level of confidence = 95% with $Z=1.96$, margin of error = 0.05. The calculated sample size was 270 (135 case and 135 controls). Considering possibility of 10% attritions in data the researcher 10% extra sample. Hence the final sample size was 150 adults with osteo arthritis as cases and 150 adults who are not diagnosed with osteoarthritis as controls. The total sample was 300 (cases: 150 and controls: 150)

SETTING OF THE STUDY

the cases will be selected by Orthopedic OPD of HSK hospital and research center Bagalkot. The researcher will enroll the patients with knee osteoarthritis as cases from OPD by convenient sampling technique, I's they are enrolled as they visit the OPD. The researcher will check their case sheet and if they are diagnosed as knee osteoarthritis they will be included in the study as cases. The enrollment will be continued until 150 adults with knee osteoarthritis are enrolled.

DATA COLLECTION INSTRUMENTS

the data collection instrument Check list on presence or absence of osteoarthritis. Structured questionnaire/interview schedule, to assess data regarding socio demographic factors. Structured questionnaire/interview schedule with items to assess the data regarding risk factors of Knee osteoarthritis.

Validity of data collection tools: The data collection instruments were validated by seven experts. 5 of them were orthopedics and 2 were from the department of community health nursing.

Reliability if data collection tools: The rituality was determined by test retest method. The tools were administered

twice with a difference of 5 days to 20 adults; 10 with osteoarthritis and 10 without knee osteoarthritis. Pearson's correlation coefficient was calculated and the calculated r value ($r=1$) suggested that the tools were highly reliable

ETHICAL CONSIDERATIONS

Ethical clearance certificate was obtained from institutional ethical clearance committee, B.V.V.S Sajjalashree institute of Nursing Sciences Bagalkot. Written consent of participation was obtained from participants and their parents before data collection

STATISTICAL ANALYSIS

The categorical data will be coded and the missing data or outliers will be omitted. Univariate analysis will be done using descriptive statistical measures like frequency distribution, percentage distribution, arithmetic mean, standard deviation and median. Reliability of the tool will be calculated by Cronbach 's alpha. Chi square test for nominal data and 't' test for numerical data will be used compare cases and controls for homogeneity with reference to extraneous factors. Linear or bivariate or multinomial regression analysis will be done according to data to determine the risk factors associated with Knee osteoarthritis. Odd's ratio and Adjusted Odd's ratio will be used to determine the extent to which the risk factors are contributing to the occurrence Knee Osteoarthritis.

PROCEDURE FOR DATA COLLECTION

The data was collected January 2024 prior permission were taken from the medical superintendent of HSK hospital and research center Bagalkot, and also permission from HOD department of orthopedic HSK hospital and research center Bagalkot. Adults like case and control subject who are participating in this study should feel free to express their experience.

- Principal B.V.V. Sangha's SOINS Bagalkot
- Medical superintendent of HSK Hospital and research center Bagalkot
- Permission will be obtained from HOD, Department of orthopedics, HSK hospital and research center, Bagalkot.
- Written consent will be obtained from cases and controls.
- The data regarding, presence of Osteoarthritis was collected from case sheets of patient.
- The data regarding risk factors will be collected from the cases and controls.

RESULTS

The mean age of the sample was 35 -45 years. Among 150 ,56% were female suffering from knee osteoarthritis, 42% were educated up to 10⁴44%were household, 58% joint family , 50 % were vegetarian, 32.1% were pregnant twice, 76% having non hypertensive, 20%were diabetic, 66% were not doing daily exercise 90% were not were high heeled shoes, , 54% used Indian style toilet, 86% were absence of chronic disease , 72%were no habit of consuming tobacco , 55%were suffering from knee pain , 94% were not took infertility treatment , 62% having no history of low limb fracture , 84% were not living in hilly area , 92% were not consuming alcohol , 46%were normal body mass index.

Table 1: Estimation of risk of occurrence of Knee Osteoarthritis with selected socio-demographic variables of adults.

Variable	Category	Odds Ratio	AOR	95.0% C.I. for AOR		P value
				Lower	Upper	
Age	Age	1.21	1.013	.961	1.07	1.07626
Gender	Male	1	1	-	-	
	Female	1.21	1.073	.285	4.04	.917
Education	No formal education (ref)	1	1	-	-	-
	Up to SSLC	0.64	.486	.183	1.288	.147
	Above SSLC	0.84	.778	.299	2.026	.607
Occupation	House makers/ unemployed	1.64	1.54	.000	-.	.000**
	Government employee	1.58	1.4	.000	-.	0.99
	Farmer	1.89	1.61	.000	-.	0.99
	Self employed (ref)	1	1	1	1	
Family monthly income	Family monthly income	1	1.0	1.0	1.0	.288

Reference category: First, ** Significant $\alpha = 0.01$, Abbreviation S.E-Standard error, C.I: Confidence interval

A significant association was found between occupational status and occurrence of Knee osteoarthritis ($P < 0.000$) among adults.

The odds of suffering with knee osteoarthritis were 1.5 times high among adults who were unemployed or house makers.

Table 2: Estimation of risk of occurrence of Knee Osteoarthritis with selected personal variables of adults.

Variable	Category	Oddr Ratio	Adjusted odds ratio	95.0% C.I. for AOR		P Value
				Lower	Upper	
Diet	Vegetarian		2.082	.012	8.08	.009*
	Mixed (ref)	1	1			-
Type of family	Nuclear (ref)	1	1	1	1	-
	Joint	0.34	2.93	1.296	6.647	0.010*
Hypertension	Yes		.291	.016	5.293	.404
	No (ref)	1	1	1	1	-
Diabetes mellitus	Yes		2.308	.059	9.504	.654
	No (ref)	1	1	1	1	
Exercise	Yes		1	1	1	-
	No (ref)	1.32	1.610	.192	13.520	.661
Using high heeled shoes	Yes		.090	.003	2.520	.157
	No (ref)	1	1	1	1	

Reference category: First, * Significant $\alpha = 0.05$, Abbreviation S.E-Standard error, C.I: Confidence interval, EXP (B): Adjusted Odds ratio

A significant association was found between Type of Diet and Type of family and occurrence of Knee osteoarthritis ($P < 0.009$) among adults. The odds of suffering with knee osteoarthritis were (AOR: 1.72, 95% CI: 0.012 – 8.08) higher among adults who were consuming vegetarian diet and from joint family (AOR: 2.93, 95% CI: 1.29 – 6.647). The odds Knee Osteoarthritis were higher (AOR: 2.308, 95% CI: 0.59 – 9.504) among people diagnosed with Diabetes Mellitus. The odds of suffering with knee Osteoarthritis were 32% higher among adults not doing exercise (AOR: 1.61, 95% CI: 0.192 – 13.52).

DISCUSSION

This case and control study to know the cause of knee osteoarthritis among young adults at Hanagalshri Kumareshwar hospital, Navanagar, Bagalkot. The sample was selected by convenient sampling technique. Behzad Heidari(2011) conducted a similar study to find the factors associated with osteoarthritis⁹ Yawei Dong et al (2023) conducted a similar study to explore the risk factors associated with knee osteoarthritis.¹⁰ Nasrin Moghimi et al (2019) conducted similar case control study to determine the risk factors associated with knee osteoarthritis¹¹ André Klusmann et al(2010) conducted a case control study in Germany, to explore the occupational factors associated with knee osteoarthritis¹² Vispute S(2011) and associated published a reviewed article on finding the evidence of risks of knee Osteoarthritis¹¹. Naovarat (2022) and associates

did a research to determine the factors Associated with Knee Osteoarthritis in an Outpatient HIV-1 Clinic Setting⁽¹³⁾

The demographic profile in case group of 72 (48%) were males and 96(64%) were females. 48(32%) were illiterate and 26 (26%) were educated up to 7th ,63(42%) were educated upto 10th. 66(44%) were household,15 (10%) were government employe,60(40%) were permanent employee and 9(6%) were former. 63(42%) belonged to nuclear family,87(58%) belonged to joint family. 6(7.1%) had pregnancy once,27(32.1%) had pregnancy twice,27(32.1%) had pregnancy thrice,15 (17.9%) had pregnancy four times, 3(3.6%) had pregnancy 5 times and 6(7.1%) had 6 pregnancies. 36(24%) had Hypertension and 30(20%) were diabetic. 51(34%) were doing daily exercise and 15(10%) were wearing high heeled shoes, 135(90%) were wearing high heeled shoes. 57(38%) used to practice open air defecation,81(54%) used Indian style toilet and 12(8%) were use commode. 21(14%) were suffering from chronic disease. 42(28%) were consuming tobacco and 108(72%) were habit of consuming tobacco. 81 (55%) were suffering from knee pain.9 (6%) were took infertility treatment. 57(38%) having history of low limb fracture. 24(16%) were living in hilly area. (8%) were consuming alcohol. (14) Ruch N. acharya Hemal. M. patel (2023) conducted prevalence of the knee osteoarthritis risk factors among young adults population an observational study 15. Ashok R. Jadhao Punum M. dambhare (2021) conducted study of magnitude of knee osteoarthritis among adult

population with age 40 years and above in rural area a cross sectional study¹⁶. Jaimie steinmetz (2023) global regional and national burden of osteoarthritis 1990-2020 and projections to 2050 (17). Asingh.s. Das A Chopra e.tal (2022) conducted on burden of osteoarthritis in india and its state's 1990-2019 findings from the global burden of disease study (18). Yadhav rohit, verma, Ajay kumar e.tal,(2022) conducted prevalence of primary knee osteoarthritis in the urban and rural population in India, Indian journal of rheumatology (19). Haresh A. Desai, Rima. B shah, Heeya shah, Keval thakkar (2022) conducted prevalence and medical practices for osteoarthritis in wstern india rima_1223@yahoo.co.in.

In control group 96(64%) were males and 54(36%) were females. 30(20%) had no formal education, 39(26%) were educated upto 7th. And 81(54%) were educated upto 10th. 6(4%) were Household, 84(56%) were government employee 60(40%) were farmer, 102(68%) belongs to nuclear family, 48(32%) belonged to joint family. 15(10%) were vegetarian, 15(10%) were non vegetarian, and 120(80%) were mixed. 18(35.3%) had pregnancy twice, 18(35.3%) had pregnancy thrice, 6(11.8%) had pregnancy four times, 9 (17.6%) had pregnancy 5. 24(16%) had hypertension. 21(14%) were diabetic and 129 (86%) were non diabetic 42(28%) were doing daily exercise, 6(4%) were wearing high heeled shoes, 54(36%) used to practice open air defecation, 81(54%) used Indian style toilet and 15(10%) were use commode. 9 (6%) were suffering from chronic disease, 18(12%) were consuming tobacco 3(2%) had history of knee joint pain, 3(2%) took infertility treatment. 6(4%) had history of low limb fracture. 6(4%) were living in hilly area. 24(16%) were consuming alcohol.

A significant association was found between Type of Diet and Type of family and occurrence of Knee osteoarthritis ($P < 0.009$) among adults. A significant association was found between Type of Diet and Type of family and occurrence of Knee osteoarthritis and history of low limb fracture. The odds of knee osteoarthritis were high among adults living in hilly area (AOR: 1.198, 95% CI: 0.037 – 5.057)., consuming alcohol (AOR: 2.963, 95% CI: 0.685 – 12.812). Similar results were found in a study in which history of using high-heeled shoes (>3 cm) ($P = 0.005$), history of knee Injury ($P = 0.04$), history of lower limb fracture ($P = 0.02$) were found significantly associated with knee osteoarthritis pain in the knee already in childhood was found associated with knee osteoarthritis.

LIMITATION OF THE STUDY

the present study to assess the factors associated with knee osteoarthritis among young adults and other socio-demographic variables are included to find out the life style factors associated with knee osteoarthritis among young adults.

CONCLUSION AND RECOMMENDATION:

A significant association was found between occupational status and occurrence of Knee osteoarthritis ($P < 0.000$) among adults. The odds of suffering with knee osteoarthritis were 1.5 times high among adults who were unemployed or house makers. A significant association was found between Type of Diet and Type of family and occurrence of Knee osteoarthritis ($P < 0.009$) among adults. The odds of suffering with knee osteoarthritis were (AOR: 1.72, 95% CI: 0.012 – 8.08) higher among adults who were consuming vegetarian diet and from joint family (AOR: 2.93, 95% CI: 1.29 – 6.647). The odds Knee Osteoarthritis were higher (AOR: 2.308, 95% CI: 0.59 – 9.504) among people diagnosed with Diabetes Mellitus. The odds of

suffering with knee Osteoarthritis were 32% higher among adults not doing exercise (AOR: 1.61, 95% CI: 0.192 – 13.52).

SUMMARY

The chapter deals with the summary of study and its major findings. The aim of the present study was to know the lifestyle factors associated with knee osteoarthritis among young adults visiting Ortho OPD of HSK hospital of Bagalkot.

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