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Prevalence of knee pain due to osteoarthritic change in relation to different occupations: A community-based study in Bangladesh

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Abstract

Background: Osteoarthritis (OA) is a chronic degenerative joint disease that involves progressive softening and loss of articular cartilage, subchondral bone sclerosis, cyst formation and the development of osteophyte. OA knee causes the cartilage of the knee joint to thin and the joint surface to become rougher, causing the knee to move less smoothly and feel painful and stiff. Among multiple predisposing factors, occupation is one of the important factors that has been linked to OA. So, the knee joint load due to different occupations was studied.

Objective: The study's objective was to evaluate the prevalence of knee pain caused by osteoarthritis in relation to various occupations.

Methods: The study was conducted at the Bangladesh Korea Friendship Hospital's Pain Clinic in Dhaka, Bangladesh, to determine the occupational predisposing factors of knee osteoarthritis. A total of 201 cases were chosen by random sampling, with knee pain due to osteoarthritis changes of different occupations from July 2019 to June 2020. The results were statistically analyzed with Statistical Packages for Social Sciences (SPSS-24).

Results: The age distribution of the patients shows that the majority of the patients 48(23.88 %) are between the ages of 45 and 49 years. The overall prevalence of knee pain in women is higher than in men. Women had high rates of prevalence for 49(24.38%) garments worker (tailoring) while high rates of prevalence in men were apparent for 32(15.92%) construction workers. Prevalence of knee pain in women 49(24.38%) were Garments worker (Tailoring), 20(9.96%) were Nurse, 15(7.46%) were Cleaner, 9(4.48%) were teachers, 5(2.48% were Construction workers, 3(1.49%) were Sales Assistant and 1(0.49%) were the driver. Prevalence of knee pain in men 26(12.93%) were Garment's worker, 3(1.49%) were teacher, 35(15.92%) were Construction worker, 7(3.48%) were Sales Assistant, 15(7.46%) were driver, 10(4.98%) were carpenters and 6(2.99%) were Police/Security. The recent prevalence of knee symptoms was 157(78.11%) had pain, 18(8.96%) had stiffness, 16(7.95%) had swelling, 4(1.99%) had locked, and 6(2.99%) had any symptom.

Conclusion: The result suggested that occupation might affect the development of chronic knee pain. In garments workers (tailoring), construction workers and carpenters are at increased risk of development of the knee OA because they are more vulnerable to develop joint trauma by bending of the knee and heavy lifting. So proper measures should be taken to reduce joint load.

Keywords: occupation, knee pain, knee osteoarthritis, epidemiology

Introduction

Osteoarthritis (OA) is the most prevalent arthritis in the world [1]. With the progressive ageing and increasing obesity of the population, it becomes a major problem of public health and financial burden for the global economy. [2]. Knee OA is the most common form of joint disease and among the top 10 causes of disability worldwide. Knee OA has been many established risk factors include age, sex, obesity, heredity, trauma occupational and recreational usage. Low socioeconomic status (SES) also is a risk factor of knee OA, due to the nature of work and joint loading [3]. However, there is not enough data in Bangladesh about the prevalence of this common and disabling disease in the working-age group of different occupations. In garments workers [3], construction workers [4] and carpenters [5] development of the knee OA has been more prevalent. The farmers are particularly vulnerable to hip osteoarthritis [5] and textiles workers can be linked to specific hand OA [6]. This tendency to develop structural osteoarthritis is associated with specific occupational activities, such as squatting, prolonged standing, walking, lifting, climbing and kneeling [7]. Obesity and increasing age have a cumulative effect on before mentioned factors [8]. If certain work causes or aggravates knee OA, prolonging its duration can further increase morbidity, which will cause a significant impact on productivity and the economy. So, further studies are required to identify occupational factors associated with the development of osteoarthritis and elimination of those factors is essential.

Methods

The study was conducted at the Bangladesh Korea Friendship Hospital's Pain Clinic in Dhaka, Bangladesh, to determine the most common symptoms of knee pain caused

by osteoarthritis. A total of 201 cases were chosen at random for the study, with the common indication of knee pain due to osteoarthritis changing with different occupations. From July 2019 to June 2020, a clinical examination and evaluation were conducted. The following question defined the presence of relation to the different occupations of knee pain in this study: 'Have you ever had knee pain for at least a month on most days? If so, during the past year have you been involved in the profession?' Any yes answer to both portions of the question was necessary to be classified as knee-pain positive. Another part of the information has been published on this issue's relative sensitivity. Crude data on hip and back pain and other medical conditions were obtained, in addition to knee pain. Using the Standard Occupational Classification system, each subject was assigned a code. When the last and longest job titles differed, the longest job title was employed in the analysis that followed. The same methodology was used to determine social class. The social class of female subjects was determined by the husband's work code. Weight (kg)/ [height (m) 2] was used to compute the body mass index (BMI). The results were statistically analyzed using window-based computer software created with Statistical Packages for Social Sciences (SPSS-22).

Results

The total study population was 201 Patients aged 40 years to 70 years, 34(16.92%) were 40 years to 44 years, 48(23.88%) were 45 years to 49 years, 40(19.90%) were 50 years to 54 years, 30(14.93%) were 55 years to 59 years, 25(12.43%) were 60 years to 64 years and 24(11.94%) were 65 years to 70 years [Table I]. The overall prevalence of knee pain in women is higher than in men. 102(50.75%) were female and 99(49.25%) were male in the study. Variation in prevalence with the occupational group for men and women are shown in Figure I. Women had high rates of prevalence for 49(24.38%) garments workers (tailoring), 20(9.96%) nurse and 6(2.99%) cleaners while high rates of prevalence in men were apparent for construction worker. Prevalence of knee pain in women 49(24.38%) were Garments worker (tailoring), 20(9.96%) were Nurse, 15(7.46%) were Cleaner, 9(4.48%) were teachers, 5(2.48%) were Construction worker, 3(1.49%) were Sales Assistant and 1(0.49%) were the driver. Prevalence of knee pain in men 26(12.93%) were Garments workers, 3(1.49%) were teachers, 35(15.92%) were Construction workers, 7(3.48%) were Sales Assistant, 15(7.46%) were drivers, 10(4.98%) were carpenters and 6(2.99%) were Police/Security [Figure II]. The recent prevalence of knee symptoms was 157(78.11%) had pain, 18(8.96%) had stiffness, 16(7.95%) had swelling, 4(1.99%) had locked, and 6(2.99%) had any symptom [Table II].

Table 1: Age distribution of study population in comparison to the total population aged 40–70 years.

Age Distribution (years)	n=201	%
40-44	34	16.92
45-49	48	23.88
50-54	40	19.90
55-59	30	14.93
60-64	25	12.43
65-70	24	11.94
Total	201	100.0

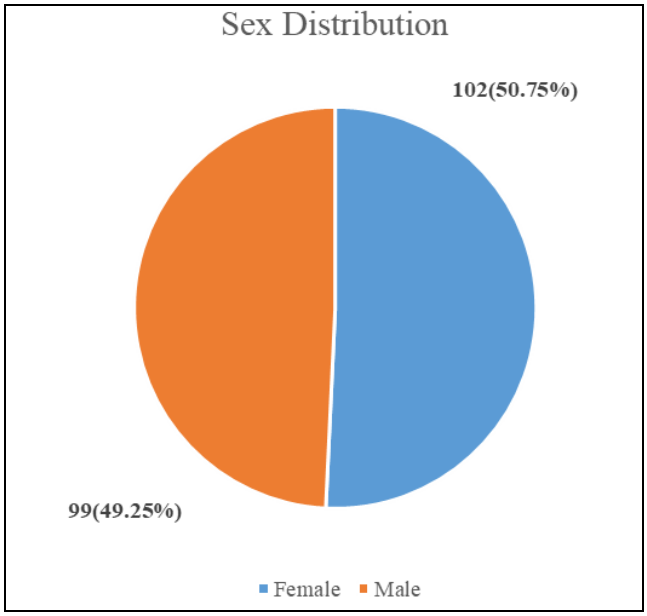

Fig 1: Sex distribution of study population in comparison to the total population n=201.

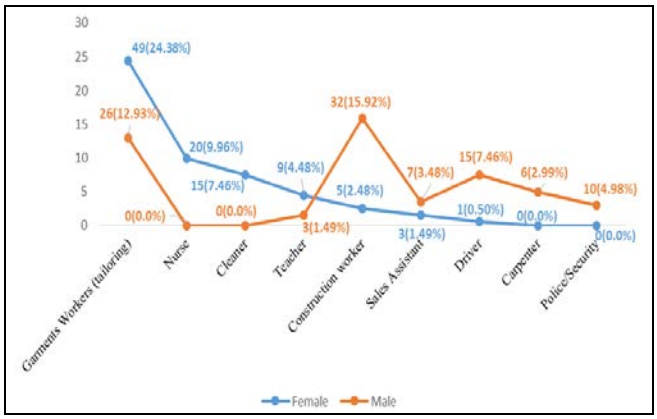

Fig 2: Prevalence of knee pain in men and women in different occupational groups n=201.

Table 2: Recent Prevalence of knee symptoms

Symptoms	n=201	%
Pain	157	78.11
Stiffness	18	8.96
Swelling	16	7.95
Locking	4	1.99
Any symptom	6	2.99
Total	201	100.0

Discussion

This study found clear links between occupational and knee pain in this community. Garments workers, construction workers and carpenters are more likely to suffer from knee pain. Women garments workers (tailoring) were the most vulnerable to develop knee OA. On the other hand, high rates of prevalence in men were for construction workers, this is because more men are engaged in construction work and women in readymade garments. In our study, the overall prevalence of knee OA in females is higher than in males.

Tang *et al*. reported that occupational hazards (physical overloads) work history in one speciality for over 5 years, functional and static-dynamic loads on the bones and joints, and elevated temperature and humidity in the industrial premises were the main industrial risk factors for OA [9].

Several studies showed there is an increased risk of OA among construction workers, floor layers and farmers and health care assistants [10]. Our study also found that low income and long-term walking increase the prevalence of knee OA. This may be because the low-income population usually engages in heavy physical labour, which increases the load on the knee joints. Similarly, long-term walking also increases loading on the knee joint, thus aggravating any damage to the cartilage.

Holmberg *et al*. found that men working long term in the building and construction industry had 3.7 times (95% CI: 1.2, 11.3) increased risk of knee OA and women, but not men, who had worked long term in farming also tended to have an increased risk of knee OA (OR: 2.1; 95% CI: 1.0, 4.5) [11]. Sandmark *et al*. found high levels of exposure to lifting heavy items at work was associated with a three-fold increase in men (OR:3.0; 95% CI: 1.6, 5.5) and a nearly two-fold increase in women (OR: 1.7; 95% CI: 1.0, 2.9) in the risk of knee OA leading to joint replacement compared to individuals with no or low exposer [12]. Likewise, Klussman *et al*. found occupational kneeling/squatting was related to an increased OR for knee OA (women, OR: 2.52 (78934h/life); men OR: 2.16 (574-12, 244n/life) [13]. Similarly, a study by Allen *et al*. showed several occupational tasks including lifting >10 pounds, crawling, doing heavy work while standing, walking and less sitting were associated with increased odds of symptomatic knee OA (OR: 1.4-2.1) [14]. A number of recent systematic reviews have identified that frequent performance of physically demanding occupation-related tasks such as kneeling, squatting and heavy lifting were associated with both the development and progression of knee OA [15].

Our study has some limitations. First radiological examination and symptomatic examination are the common diagnostic methods for the epidemiological investigation of knee OA. In our study the symptomatic diagnostic method was used as the main inclusion criteria for knee OA, so a questionnaire was the primary screening tools. The survey data were epidemiological data from only one small area. More epidemiological data from different areas need to be collected and analyzed in future.

Limitations of the study

This was an observational study with a small-sized sample. So, the findings of this study may not reflect the exact scenario of the whole country.

Conclusion

The study suggested that the risk for knee OA is higher in occupations requiring heavy work loading or demanding movements that put a burden on the knee, such as kneeling or squatting. A strong risk factor for knee cartilage injury has been identified in garments workers (tailoring), construction workers and carpenters.

Recommendation

This study can serve as a pilot to much larger research involving multiple centres that can provide a nationwide picture, validate regression models proposed in this study for future use and emphasize points to ensure better management and adherence.

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Ethical approval: The study was approved by the informed consent of the participant patients.

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