RESEARCH ARTICLE

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Relationship Between Hysterectomy and Knee Osteoarthritis in Obese Women in Rural Population

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Abstract

Objectives: The aim of this study was to examine the relationship between hysterectomy and knee osteoarthritis (OA) in obese women in rural population. **Methods:** This observational study included a total of 61 hysterectomy women (aged between 30 and 60 years). A questionnaire was performed in which age, occupation, weight, reason for the operation, hormonal changes, fatigueness, knee pain, or stiffness were obtained. **Results:** All 62 women underwent hysterectomy. We have selected three types of weight groups, in that 38% of women between the ages of 40 and 50 have undergone a hysterectomy. The average weight of women was between 67-77 kg. Fibroids were the most common reason for hysterectomy. After that, they experienced knee pain and stiffness, and most of them were diagnosed with knee OA after the operation. **Conclusion:** In this study, we found out relationship between hysterectomy and knee osteoarthritis in obese women in the rural population. Due to age and hormonal changes, knee OA in women who had hysterectomy was significantly correlated with obesity.

Keywords: Fatigue, Hysterectomy, Knee Osteoarthritis, Knee Pain, Obesity, Stiffness

1. Introduction

A hysterectomy is a surgical procedure in which the uterus is removed. This procedure can be done for various reasons, such as to treat conditions like uterine fibroids, endometriosis, uterine prolapse, or certain types of cancer. Depending on the specific reason for the hysterectomy, the surgeon may also remove the cervix, ovaries, and fallopian tubes during the procedure. Hysterectomies can be performed through various methods, including abdominal, vaginal, laparoscopic, or robotic-assisted techniques. It is important to discuss the potential risks, benefits, and alternatives with your healthcare provider before undergoing a hysterectomy.

Osteoarthritis is the most common disease in the musculoskeletal system. In this osteoarthritis of the knee is very common[1]. Knee osteoarthritis is most commonly found in the 4th decade of life[2].

The prevalence of osteoarthritis in the knee is influenced by age[3]. Osteoarthritis is a degenerative disease that can lead to the destruction of joints and articular cartilage[4]. Compared to males, women are more at risk for developing progressive and symptomatic knee osteoarthritis[5].

Knee osteoarthritis is a degenerative joint disease that affects the knee joint. It occurs when the protective cartilage that cushions the ends of the bones in the knee wears down over time, leading to pain, stiffness, swelling, and reduced mobility. Risk factors for developing knee osteoarthritis include age, obesity, previous knee injuries, genetics, and overuse of the knee joint.

It is important to note that individual factors, such as age, overall health, lifestyle habits, and genetic predisposition, also play a significant role in the development of knee osteoarthritis.

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Formerly, knee osteoarthritis was thought to be a "wear-and-tear" ailment. Obesity is a primary risk factor for knee osteoarthritis. In a similar vein, a US research of Caucasian and African-American women found that higher BMI levels were associated with a higher risk of commonly occurring knee osteoarthritis[6]. All of these investigations, however, used healthy participants with primarily normal body weights. According to research by Brouwer *et al.*[7], malalignment in people who are overweight, and especially obese people, significantly increases the risk of developing knee osteoarthritis (odds ratio (OR) 2.0 for varus alignment in people with a BMI between 25 and 30 kg/m^2, and 3.3 and 5.1 for valgus and varus alignment in people with a BMI over 30 kg/m^2)[8].

Via hormonal changes, menopause is a major life event that has a significant impact on women.

The most well-known menopausal symptoms are:

1. Vasomotor symptoms, hot flushes atrophic vaginitis,
2. Psychological symptoms, such as Depression and cardiovascular symptoms[9].

Compared to men, women are more likely to experience temporomandibular joint disorder, osteoporosis, and sarcopenic obesity; this suggests that female hormones may play a role in these musculoskeletal conditions. A change in hormonal status, particularly a drop in sex hormone levels, affects body composition. Osteoporosis results from a decline in bone mass density, and sarcopenia from a decline in muscle mass. All these alterations cause postmenopausal women to live a more constrained life[10]. There is emerging evidence suggesting a potential relationship between hysterectomy and knee osteoarthritis, especially in obese women. It is hypothesized that the hormonal changes following hysterectomy might have an impact on the onset or course of knee osteoarthritis, particularly in women who are already at an increased risk due to obesity. Understanding the relationship between hysterectomy and knee osteoarthritis in obese women in rural populations is important for developing targeted interventions and treatment strategies. This study aims to investigate this relationship and explore potential mechanisms underlying the association.

By identifying the link between these two conditions, healthcare providers can better tailor treatment plans and support for women at risk. Previous studies have suggested that hormonal changes following hysterectomy, such as a decrease in estrogen levels, might have a role in the onset of osteoarthritis by affecting joint health and inflammation. Obesity is also known to be a significant risk factor for both hysterectomy and knee osteoarthritis, the connection between the two circumstances is made much more complex. In rural populations, access to healthcare services and resources may be limited, leading to delays in diagnosis and treatment for both hysterectomy and knee osteoarthritis. This can exacerbate the impact of these conditions on women's quality of life and overall health outcomes.

By conducting research specifically focused on the relationship between hysterectomy and knee osteoarthritis in obese women in rural populations, we can gain valuable insights into the potential mechanisms at play and develop targeted interventions to improve outcomes for these women.

The recovery period following a hysterectomy may lead to decreased physical activity and weight gain, which both increase the chance of developing osteoarthritis in the knee. Reduced physical activity and weight gain can place added stress on the knee joints, leading to increased wear and tear over time

This research has the potential to inform healthcare practices, policies, and programs aimed at reducing the burden of these conditions in vulnerable population. Additionally, the impact of hysterectomy on knee osteoarthritis in obese women in rural populations may be influenced by lifestyle factors such as physical activity levels, diet, and access to preventive healthcare services. Limited access to resources for managing obesity and maintaining joint health in rural areas can further complicate the relationship between these two conditions. Understanding the specific challenges faced by obese women in rural populations who have undergone hysterectomy and are at risk for knee osteoarthritis can help tailor interventions to address their unique needs. This could involve promoting weight management strategies, increasing access to physical therapy and exercise programs, and providing education on joint health and osteoarthritis prevention.

By addressing the complex interplay between hysterectomy, obesity, and knee osteoarthritis in rural populations, healthcare providers and policymakers can work towards improving the overall health and well-being of these women. Research in this area can also help with the development of targeted interventions that are

culturally sensitive and address the specific barriers faced by individuals in rural communities[11].

2. Materials and Methods

A retrospective study was conducted with the questionnaire. The sample size of 61 (n=61) was taken based on the inclusion and exclusion criteria.

2.1 Inclusion criteria

- Hysterectomy
- Obesity (Asian obesity classification)
- Knee osteoarthritis
- Age- 30 to 60 years

2.2 Exclusion criteria

- Underweight
- Cancer patient
- Thyroid patient.
- Subjects who are not willing to participate in this.

3. Results

According to Figure 1, a total of 63 subjects participated in the study out of which, 38% were participants between the 40 to 50 age group, 33% were from the 30 to 40 age group, and 29% were participants between the 50 to 60 age group.

According to Figure 2, out of 63 participants, 69% of women are housewives, 6.3% are clerks, 4.8% are lecturers, and 3.2% women are teachers by occupation.

According to Figure 3, five groups of weight were used in this study. 46% of participants were between 67 to 77 kg, 38.1% were from 78 to 88 kg, 9.5% were from 55 to 66 kg, 4.8% were from 89 to 99 kg, and 1.6% participants were between 100 to 110 kg group.

According to Figure 4, the most common reason for hysterectomy is fibroids 27%.

According to Figure 5, 63% of women are able to return to activity of daily living after surgery and 36.5% of women are not able to return to activity living after surgery.

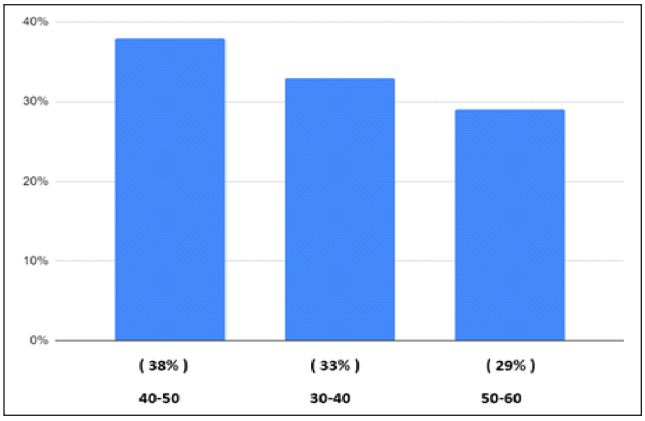


Figure 1. Age.

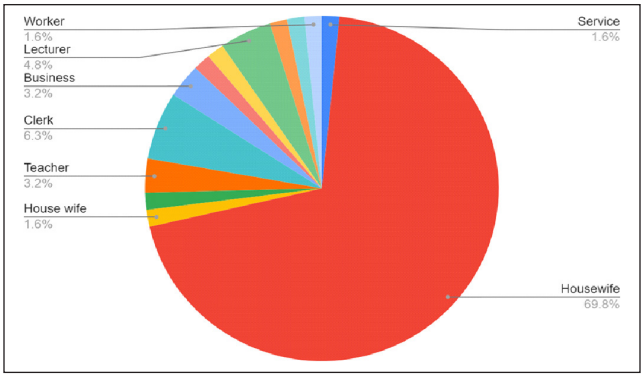


Figure 2. Occuppation.

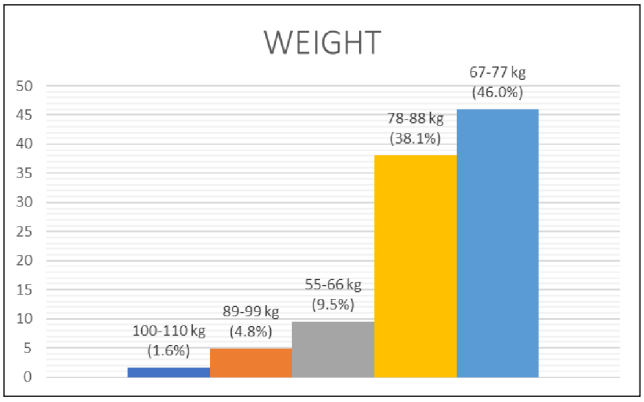


Figure 3. Weight.

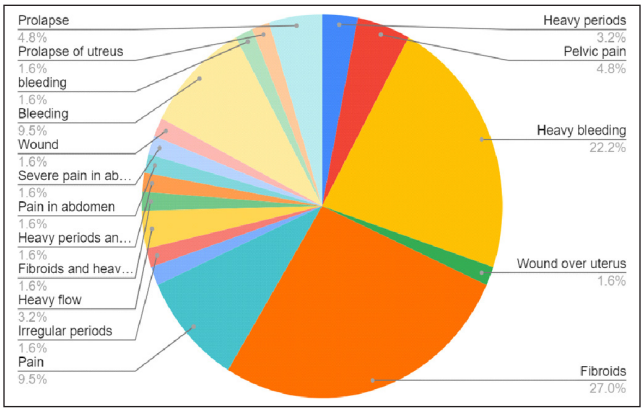


Figure 4. Common reason for hysterectomy.

According to Figure 6, 77.8% of women have experienced hormonal changes and 22.2% of women are

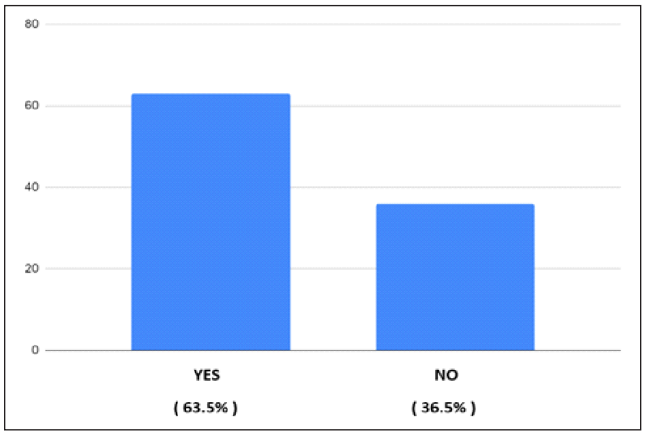


Figure 5. Women's who return to activity of daily living after surgery.

unable to experience hormonal changes.

According to Figure 7, 87.3% of women have experienced fatigue while doing daily activity and 12.7%

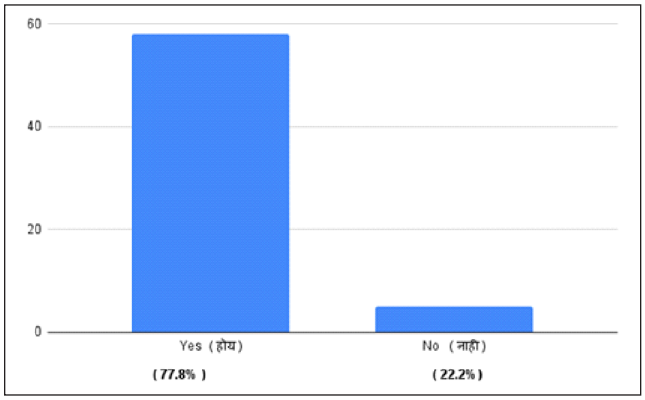


Figure 6. Women's who experienced hormonal changes.

of women are unable to experience fatigue.

According to Figure 8, 76.2% of women have experienced knee pain & stiffness 'after the operation' and 23.8% of women have experienced knee pain and stiffness 'before the operation'.

According to Figure 9, 73% of women were diagnosed with knee osteoarthritis 'after operation' and 27% 'before operation'.

According to Table 1, women who have experienced any knee pain or stiffness 'after an operation or before operation', by 'Chi-square' statistic is 2.032. 'P – value

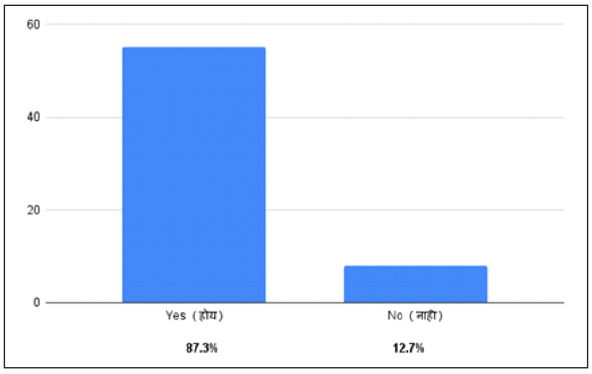


Figure 7. Women's who experienced fatigue while doing daily activity.

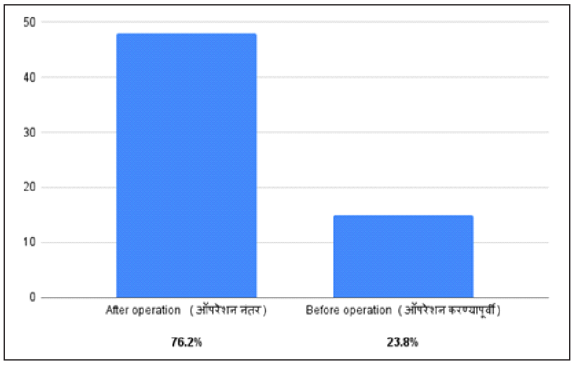


Figure 8. Women's who experienced knee pain and stiffness.

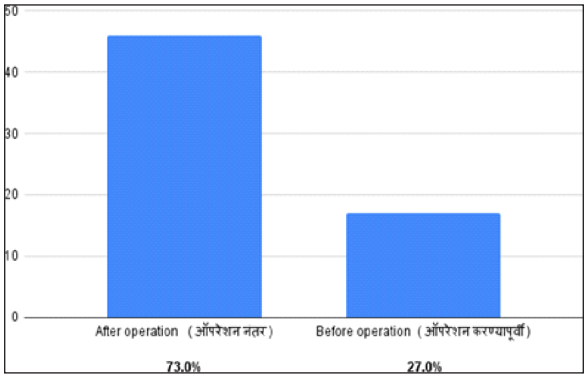


Figure 9. Women's who diagnosed with knee osteoarthritis.

is 0.1540, considered not significant, And 'degree of freedom' is 1.

According to Table 2, women who have been diagnosed with osteoarthritis 'after an operation or before operation', by 'Chi-square' statistic is 24.889. 'P-value' is <0.0001, considered extremely significant, and 'degree of freedom' is 1.

Table 1. Women who have experienced any knee pain or stiffness

	BEFORE OPERATION	AFTER OPERATION	TOTAL
YES	27 (50%)	36(29%)	63(50%)
NO	36(29%)	27(50%)	63(50%)
TOTAL	63(50%)	63(50%)	126(100%)

Women's who have experienced any knee pain or stiffness.

Table 2. Women who have been diagnosed with osteoarthritis

	BEFORE OPERATION	AFTER OPERATION	TOTAL
YES	17(13%)	46(37%)	63(50%)
NO	46(37%)	17(13%)	63(50%)
TOTAL	63(50%)	63(50%)	126(100%)

Women's who have been diagnosed with osteoarthritis.

4. Discussion

In this study, we find out the relationship between hysterectomy and knee osteoarthritis in obese women in rural populations. The relationship between hysterectomy and knee osteoarthritis in obese women in rural populations is an important area of study that warrants further investigation. We conducted the study for the same in that we see that 76.2% of women have experienced knee pain and stiffness after the operation and 73.0% of women were diagnosed with knee osteoarthritis after the operation. This number Suggests after the operation obese women suffer from osteoarthritis of the knee.

Hysterectomy, the surgical removal of the uterus, is a common procedure among women and obesity is a known risk factor for both knee osteoarthritis and hysterectomy.

Understanding how these factors may interact to impact the onset and course of knee osteoarthritis in rural populations is crucial for improving healthcare outcomes in this demographic.

One potential explanation for the relationship between hysterectomy and knee osteoarthritis in obese women could be related to changes in hormone levels following the removal of the uterus. Estrogen, for example, plays a role in maintaining joint health and may have a protective effect against osteoarthritis. Therefore, the sudden decrease in estrogen levels that occurs after hysterectomy could potentially increase the risk of developing knee osteoarthritis, especially in obese women who are already at higher risk due to their weight.

Additionally, the physical effects of obesity, such as increased mechanical stress on the joints and inflammation, may exacerbate the development of knee osteoarthritis following a hysterectomy. Obesity is known to be a major risk factor for osteoarthritis due to the increased load placed on the joints, leading to accelerated wear and tear over time. Therefore, obese women who undergo hysterectomy may be at a higher risk of developing knee osteoarthritis due to these combined factors.

The impact of living in a rural setting should also be considered when studying this relationship. Rural populations often face unique challenges in accessing healthcare services, including limited availability of specialized care and resources for managing chronic conditions like osteoarthritis. This may result in delays in diagnosis and treatment, leading to more severe disease progression and poorer outcomes for individuals with knee osteoarthritis following hysterectomy.

In conclusion, further research is needed to better understand the relationship between hysterectomy and knee osteoarthritis in obese women in rural populations. Through the identification of the variables that lead to the onset and advancement of knee osteoarthritis within this population, healthcare providers can develop targeted interventions to improve outcomes and quality of life for these individuals. Additionally, addressing the specific needs of rural populations in terms of access to care and resources will be essential for effectively managing knee osteoarthritis in obese women following hysterectomy.

5. Conclusion

In the presented study, we find out relationship between hysterectomy and knee osteoarthritis in obese women in the rural population. Due to age and hormonal

changes, knee OA in women who had hysterectomy was significantly correlated with obesity.

6. Acknowledgment

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7. References

1. Szoeke C, Dennerstein L, Guthrie J, Clark M, Cicuttini F. The relationship between prospectively assessed body weight and physical activity and prevalence of radiological knee osteoarthritis in postmenopausal women. J Rheumatol. 2006; 33(9):1835-40. Epub 2006 Aug 1. PMID: 16881096.
2. Nur H, Tuncer T. The relationship between body composition and knee osteoarthritis in postmenopausal women. Turk J Phys Med Rehabil. 2018; 64(2):121-125. https://doi.org/10.5606/tftrd.2018.1496. PMID: 31453501; PMCID: PMC6657760.
3. Heidari B. Knee osteoarthritis prevalence, risk factors, pathogenesis and features: Part I. Caspian J Intern Med. 2011; 2(2):205-212.
4. Hame SL, Alexander RA. Knee osteoarthritis in women. Curr Rev Musculoskeletal Med. 2013; 6:182-187. https://doi.org/10.1007/s12178-013-9164-0. PMid:23471773 PMCid:PMC3702776.
5. Chong BKC, Kyun T, Yeon GK, Seong SC, Kang SB. Prevalence of osteoporosis in female patients with advanced knee osteoarthritis undergoing total knee arthroplasty. J Korean Med Sci. 2014; 29(10):1425-1431https://doi.org/10.3346/jkms.2014.29.10.1425 PMid:25368498 PMCid:PMC4214945
6. Sowers MR, Karvonen-Gutierrez CA. The evolving role of obesity in knee osteoarthritis. Curr Opin Rheumatol. 2010; 22(5):533-7. https://doi.org/10.1097/BOR.0b013e32833b4682 PMid:20485173 PMCid:PMC3291123.
7. Brouwer GM, van Tol AW, Bergink AP, *et al.* Association between valgus and varus alignment and the development and progression of radiographic osteoarthritis of the knee. Arthritis Rheum. 2007; 56:1204-11. https://doi.org/10.1002/art.22515 PMid:17393449.
8. Runhaar J, van Middelkoop M, Reijman M, Vroegindeweij D, Oei EHG, Bierma-Zeinstra SMA. Malalignment: A possible target for prevention of incident knee osteoarthritis in overweight and obese women. Rheumatology. https://academic.oup.com/rheumatology/article-pdf/53/9/1618/5299332/keu141.pdf PMid:24706992
9. Kim HI, Ahn SH, Kim Y, *et al.* Effects of sarcopenia and sarcopenic obesity on joint pain and degenerative osteoarthritis postmenopausal women. Sci Rep. 2022; 12:13543. https://doi.org/10.1038/s41598-022-17451-1 PMid:35945253 PMCid: PMC9363497.
10. Kim HI, Ahn SH, Kim Y, *et al.* Effects of sarcopenia and sarcopenic obesity on joint pain and degenerative osteoarthritis in postmenopausal women. Sci Rep. 2022; 12:13543. https://doi.org/10.1038/s41598-022-17451-1 PMid:35945253 PMCid: PMC9363497.
11. Althomali OW, Amin J, Acar T, Shahanawaz S, Abdulrahman AT, Alnagar DK, *et al.* Prevalence of symptomatic knee osteoarthritis in Saudi Arabia and associated modifiable and non-modifiable risk factors: a population-based cross-sectional study. Healthcare. 2023; 11(5):728. https://doi.org/10.3390/healthcare11050728 PMid:36900733 PMCid: PMC10001239.

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