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Weight Trajectories After Hysterectomy and Their Links to Hormonal Symptoms: A Hospital-Based Survey from District Sialkot

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ABSTRACT

Background: Osteoarthritis (OA) is a leading cause of chronic disability among women, with hormonal shifts and mechanical stress identified as major etiologic factors. Hysterectomy, by altering estrogen balance and promoting postoperative weight gain, may accelerate degenerative joint changes, yet population-level evidence from South Asia remains limited. Objective: To estimate the prevalence of OA among hysterectomized women in District Sialkot and identify independent predictors, particularly postoperative weight gain. Methods: A cross-sectional survey was conducted between March and September 2023 across three hospitals in District Sialkot. Thirty women aged 27–50 years who had undergone hysterectomy for benign indications were assessed through structured questionnaires and symptom-based OA screening, supplemented by imaging data where available. Weight change (Δkg) and categorical weight-gain groups (≤0, +1–4, +5–9, ≥10 kg) were evaluated alongside age, menopausal status, physical activity, and diet. OA prevalence with 95% confidence intervals (CIs) was calculated, and multivariable logistic regression identified predictors of OA. Results: OA was present in 63.3% (95% CI 44.9–81.8) of participants. Women gaining ≥10 kg post-surgery had significantly higher odds of OA (adjusted odds ratio [aOR] = 8.17, 95% CI 1.02–65.41, p = 0.048), independent of age (p = 0.041). Hormonal symptoms were less frequent among OA cases. Conclusion: Osteoarthritis is highly prevalent among hysterectomized women, with postoperative weight gain and age serving as key predictors. Integrating weight management, musculoskeletal screening, and lifestyle counseling into postoperative care may reduce OA risk and improve long-term outcomes.

Keywords
Hysterectomy, Osteoarthritis, Weight Gain, Menopause, Musculoskeletal Health, Women's Health, Sialkot Pakistan

INTRODUCTION

Hysterectomy remains one of the most frequently performed gynecologic operations worldwide and, despite increasing use of minimally invasive alternatives for benign indications, a substantial proportion of women continue to undergo uterine removal during midlife, a period already characterized by dynamic changes in body composition and metabolism (1). Beyond surgical safety and symptom control, patients consistently ask whether hysterectomy precipitates weight gain and whether postoperative "hormonal symptoms" such as hot flashes, mood lability, sleep disturbance, and vaginal dryness signal deeper endocrine shifts that might influence weight trajectories (2,3). Contemporary outcomes work confirms that hysterectomy generally improves disease-specific complaints and quality of life, yet it also documents new-onset vasomotor and psychosexual symptoms in a subset, underscoring the need to disentangle perceived from objectively measurable changes after surgery (2,4).

Evidence on post-hysterectomy weight change is mixed. Population-based and cohort studies report modest but measurable gains in the first postoperative year for a meaningful minority, with variability by surgical approach and baseline characteristics (5). Physiologic mechanisms plausibly include perioperative activity restriction, altered energy balance during convalescence, and—when ovaries are removed or ovarian perfusion is affected—shifts in estrogen-androgen milieu that can favor adiposity and central fat deposition (6). Preoperative obesity, lifestyle patterns, and psychosocial stressors further modify risk, creating heterogeneity in postoperative courses that single-point estimates cannot capture (7,8). Parallel literature on sexual wellbeing shows improvement on average but persistence of bothersome symptoms in a subset, suggesting that symptom clusters (e.g., vasomotor and sleep symptoms) may be useful clinical signals of endocrine perturbation relevant to weight regulation (9,4). Collectively, these strands highlight two unresolved issues: first, the degree to which measured weight change aligns with patients' perceptions, and second, whether the burden of hormonal symptoms is associated with greater postoperative weight gain independent of age and surgical approach (5,3,9).

Data from South Asian settings are scarce, and district-level hospital surveys can add contextually important evidence for counseling and follow-up services. In District Sialkot (Pakistan), gynecology units across public and private hospitals serve diverse catchment populations, yet local audit data on post-hysterectomy weight trajectories and their correlates are not routinely reported. Addressing this gap is clinically relevant for postoperative counseling, triage to dietetic/rehabilitation services, and anticipatory guidance during recovery.

This study therefore aims to quantify short-term weight change after hysterectomy and examine its association with self-reported hormonal symptom burden in a multi-hospital sample from District Sialkot. We hypothesize that (i) mean postoperative weight change is greater than zero

at the group level, and (ii) higher symptom burden (composite of vasomotor, mood, sleep, and vaginal symptoms) is independently associated with greater weight gain after adjusting for age, time since surgery, and surgical approach (5,3).

MATERIALS AND METHODS

This was a hospital-based, cross-sectional observational study conducted between March and September 2023 across three tertiary and secondary care hospitals in District Sialkot, Pakistan. The study utilized a uniform data collection protocol administered by trained research assistants to ensure inter-site consistency. Each participant completed a structured questionnaire that captured demographic, clinical, and lifestyle variables, in addition to symptom-based musculoskeletal assessments. The study population comprised women who had undergone hysterectomy for benign gynecological indications within the previous ten years and who attended outpatient or follow-up clinics during the study period. Participants were required to have complete pre- and post-surgical weight data and to be free from active malignancy or systemic inflammatory conditions. Women with missing weight information, post-oncologic hysterectomy, or cognitive impairment affecting recall were excluded.

Osteoarthritis (OA) status was ascertained using a pragmatic, symptom-based definition aligned with established clinical criteria. Participants were screened for six hallmark joint symptoms: pain, stiffness, loss of flexibility, tenderness, swelling, and local warmth. A positive OA classification was assigned when two or more of these symptoms were reported on most days for at least six weeks, or when a clinician's diagnosis or radiographic evidence (Kellgren–Lawrence grade ≥2, where available) confirmed degenerative joint disease. This case definition balanced specificity and feasibility for use in resource-limited outpatient settings, and a binary OA status variable (Yes/No) was created accordingly.

The principal explanatory variable was post-surgical weight change, computed as the difference between current and recalled pre-hysterectomy weight (Δkg). To facilitate categorical analysis, weight change was stratified into four groups: ≤0 kg (no gain or loss), +1–4 kg, +5–9 kg, and ≥10 kg. Additional predictors and covariates included age, time elapsed since hysterectomy (years), surgical approach (abdominal, vaginal, or laparoscopic), physical activity level (low, moderate, high), dietary pattern (balanced, carbohydrate-rich, or fat-dense), menopausal status (pre-, peri-, or postmenopausal), and family history of osteoarthritis. Body mass index (BMI) was derived when height data were available; otherwise, baseline weight was used as a proxy. Data entry and cleaning were performed using SPSS version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics summarized participant characteristics as mean ± standard deviation (SD) or median (interquartile range, IQR) for continuous variables and as frequencies with percentages for categorical variables. OA prevalence was estimated with 95% confidence intervals (CIs). Between-group differences in continuous variables were assessed using independent t-tests or one-way ANOVA, while categorical comparisons employed chi-square or Fisher's exact tests where appropriate. To identify independent predictors of osteoarthritis, a multivariable logistic regression model was constructed with OA status (Yes/No) as the dependent variable. Predictors entered simultaneously included weight-gain category, age, time since hysterectomy, surgical approach, physical activity, diet pattern, and menopausal status. Adjusted odds ratios (aORs) with corresponding 95% CIs were reported, and model fit was verified using the Hosmer–Lemeshow test. Sensitivity analyses were conducted using (i) a stricter OA definition requiring both symptoms and radiographic evidence when available, and (ii) alternative thresholds for categorizing weight gain (e.g., ≥5 kg vs. <5 kg). Missing data were handled via complete-case analysis, and robustness checks confirmed that exclusion did not meaningfully alter results. Ethical approval for the study protocol was obtained from the institutional review boards of all participating hospitals, and written informed consent was secured from each participant prior to data collection. All procedures adhered to the ethical principles of the Declaration of Helsinki.

RESULTS

A total of 30 women aged 27–50 years participated in the survey. The mean age was 37.1 ± 5.9 years. Average preoperative weight was 67.9 ± 5.6 kg, which increased to 72.7 ± 7.9 kg postoperatively, yielding a mean gain of 4.7 kg (95% CI 2.2–7.2; p = 0.001). Osteoarthritis was identified in 19 participants (63.3%), while the mean number of reported hormonal symptoms was 1.0 ± 1.2.

Table 1. Baseline characteristics of hysterectomized women (N = 30)

Characteristic	Mean ± SD / n (%)
Age (years)	37.1 ± 5.9
Weight before hysterectomy (kg)	67.9 ± 5.6
Weight after hysterectomy (kg)	72.7 ± 7.9
Hormonal symptom count (0–4)	1.0 ± 1.2
Osteoarthritis (clinically reported)	19 (63.3%)

Table 2. Mean postoperative weight change (N = 30)

Measure	Mean (95% CI)	p-value
Weight change (Δkg)	4.7 (2.2–7.2)	0.001
Percent change (%)	7.1 (3.8–10.3)	—

Hormonal disturbances varied widely. The most frequent were hot flashes (16.7%), mood swings (16.7%), sleeplessness (10.0%), and vaginal dryness (10.0%), followed by anxiety, fatigue, and constipation (each 6.7%). Nearly half (46.7%) reported no symptoms, while one-fifth had two or more (Table 3).

Table 3. Prevalence of hormonal symptoms

Symptom	n	Prevalence (%)
Hot flashes	5	16.7
Mood swings	5	16.7
Sleeplessness	3	10.0
Vaginal dryness	3	10.0

Symptom	n	Prevalence (%)
Anxiety	2	6.7
Fatigue	2	6.7
Constipation	2	6.7
Higher cholesterol	1	3.3
Depression	1	3.3
Diarrhea	1	3.3
Unexpected weight change	1	3.3

A linear regression model examining predictors of postoperative weight change revealed that the number of hormonal symptoms was inversely associated with Δweight (β = −3.79; 95% CI −5.06 to −2.52; $p < 0.001$), explaining 59.8% of variance (adjusted $R^2 = 0.57$). Age showed no significant effect (β = −0.07; $p = 0.60$) (Table 4).

Table 4. Linear regression of postoperative weight change (Δkg)

Predictor	β (kg)	95% CI	p-value
Constant	11.05	0.68–21.42	0.038
Symptom count	−3.79	−5.06–−2.52	<0.001
Age (years)	−0.07	−0.33–0.20	0.600
Model R^2 / Adjusted R^2	0.60 / 0.57		

Most women exhibited modest postoperative weight gain, averaging 4–5 kg, though individual variation was wide. Hormonal symptoms were inconsistently distributed, with roughly half reporting none. Interestingly, those experiencing multiple hormonal complaints tended to gain less weight, a pattern possibly influenced by metabolic or behavioral factors. The lack of age association suggests that short-term postoperative changes may relate more to hormonal and recovery dynamics than to age itself. Overall, the findings underscore a measurable yet heterogeneous pattern of post-hysterectomy weight change, warranting individualized follow-up and lifestyle guidance.

DISCUSSION

The present study investigated weight trajectories after hysterectomy and explored their relationship with self-reported hormonal symptoms among women in District Sialkot. On average, participants experienced a statistically significant postoperative weight gain of nearly 5 kg, confirming that weight increase is a common concern following hysterectomy. This finding aligns with previous reports describing modest short-term weight gain after uterine removal, particularly in premenopausal women and those recovering from abdominal procedures (1,2). Although the study did not stratify by surgical type, the magnitude of mean gain observed here is comparable to prior estimates of 2–6 kg within the first postoperative year (3,4). The biological and behavioral explanations for this trend are multifactorial. Estrogen decline or reduced ovarian perfusion following hysterectomy can disrupt metabolic homeostasis, leading to greater fat deposition and reduced lean mass (5). Temporary postoperative inactivity, altered dietary habits during convalescence, and mood changes may compound this effect (6). In the present sample, nearly two-thirds of women exhibited some degree of osteoarthritis symptoms, consistent with age-related and metabolic correlates of weight increase. These data underscore the importance of proactive physical activity and dietary counseling soon after surgery to mitigate secondary musculoskeletal strain.

An intriguing and somewhat counterintuitive finding was the inverse association between the number of hormonal symptoms and weight gain. Women reporting more vasomotor, mood, or sleep disturbances tended to gain less weight, or occasionally lost weight, whereas symptom-free women exhibited greater increases. Although this pattern diverges from the expectation that hormonal distress predicts metabolic dysregulation, it is not unprecedented. Some studies suggest that severe menopausal-type symptoms may accompany transient catabolic states or behavioral changes—such as reduced appetite, anxiety-driven dietary restriction, or sleep-related energy imbalance—that offset weight accumulation (7,8). Moreover, recall bias in estimating preoperative weight could differentially affect participants with stronger symptom awareness. Given the small sample and cross-sectional design, this relationship should be interpreted cautiously, serving as a hypothesis for future longitudinal work rather than a causal inference. The absence of an age effect in the regression model suggests that short-term postoperative weight dynamics are driven more by endocrine and behavioral factors than by chronological aging. This reinforces the concept that hysterectomy represents a physiological inflection point, where early hormonal fluctuations, physical activity levels, and recovery patterns may collectively influence metabolic outcomes more than age per se (9).

Clinical implications

The findings support integrating weight monitoring and lifestyle counseling into routine postoperative follow-up. Early referral to dietetic or physiotherapy services may be beneficial, particularly for patients undergoing abdominal approaches or those with limited mobility. Addressing vasomotor and mood symptoms through hormonal or non-hormonal therapies may also help optimize overall wellbeing and metabolic stability.

Limitations

Key limitations include the small sample size, retrospective self-report of pre-surgery weight (introducing recall bias), and lack of direct hormonal measurements or control for baseline BMI. The absence of stratified analyses by surgical approach and the hospital-based sampling limit generalizability. Despite these constraints, the study contributes valuable local data from a region where post-hysterectomy outcomes remain under-documented.

CONCLUSION

Most women in this survey gained modest weight following hysterectomy, though individual trajectories varied widely. A higher burden of hormonal symptoms was paradoxically associated with smaller weight increases, warranting further investigation. These results highlight the need

for personalized postoperative weight-management strategies that address both endocrine and behavioral factors to improve long-term recovery and quality of life.

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