Editorial

From Dismissal to Solutions

Prioritizing Scientific Discovery and Patient-Centered Care in Chronic Pelvic Pain

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> *"I was 23 when doctors diagnosed my condition, but I had been sick my whole life. Again and again, I was told that I was suffering from nothing more than stress- that it was all in my head. This is a common experience for young women... Repeatedly finding themselves ignored can chip away at their self-confidence. Over time, fear of being seen as whiny or weak led some young women to underreport their pain, making it even harder to get treatment."*
>
> –Laurie Edwards[1]

Mrs. Laurie Edwards penned this powerful essay in *The New York Times*; it reviews the deeply disturbing evidence on how women often face dismissal and bias when seeking health care for chronic pain. Although her commentary was not focused only on the experience of those who suffer from pelvic pain, its message applies broadly to this population as well.

Chronic pelvic pain is a debilitating problem that afflicts 15–26% of women worldwide.[2] Although there is no international consensus on the definition of chronic pelvic pain, the American College of Obstetricians and Gynecologists defines it as, "pain symptoms perceived to originate from pelvic organs/structures typically lasting more than 6 months," and notes that, "It is often associated with negative cognitive, behavioral, sexual and emotional consequences as well as with symptoms of lower urinary tract, sexual, bowel, pelvic floor, myofascial, or gynecological dysfunction."[3] The significant suffering it causes often leads to multiple surgeries and long-term medical therapies. On average, women with chronic pelvic pain report using three times more medications, have four times more gynecologic surgery, and are five times more likely to undergo hysterectomy than women without chronic pelvic pain.[4] Pain and suffering often persist despite these treatments and lead to diminished emotional well-being, low work productivity, and reduced quality of life.[2,4]

Chronic pelvic pain is not a single entity; rather, it is a symptom with many potential etiologies, including some with identifiable gynecologic histopathology (eg, endometriosis, adenomyosis) as well conditions better characterized as functional pain syndromes (eg, irritable bowel syndrome, interstitial cystitis and bladder pain syndrome, pelvic floor myofascial pain).[2,3] Many conditions associated with chronic pelvic pain are part of the broader 10 chronic overlapping pain conditions recognized by the National Institute of Health Pain Consortium, which include fibromyalgia, chronic fatigue syndrome, chronic migraine, chronic tension type headache, temporomandibular joint disorder, chronic low back pain, irritable bowel syndrome, interstitial cystitis and bladder pain syndrome, vulvodynia, and endometriosis.

See related article on page 4.

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Chronic overlapping pain conditions predominantly affect women, frequently overlap in the same individual, and share common risk factors and underlying mechanisms.[5] Chronic overlapping pain conditions are thought to be driven by *nociplastic pain* (central sensitization), in which there is augmentation of central nervous system pain processing due to amplification of pain signals or impaired descending pain inhibition.[5] The hallmark symptoms of nociplastic pain include widespread pain with generalized sensory sensitivity (heightened sensitivity to both internal and external painful and nonpainful stimuli) and pain that persists out of proportion to tissue damage; fatigue, nonrestorative sleep, cognitive dysfunction, and mood disturbance are commonly reported. Nociplastic pain is not dichotomous but can occur in varying degrees among individuals with the same condition, and its severity is linked to relevant clinical outcomes. For example, in patients with chronic pelvic pain, those with higher degrees of nociplastic pain features are more likely to report greater pain intensity and functional disability and are less likely to respond to standard treatments.[6,7]

In this month's issue of *Obstetrics & Gynecology*, Green et al (see page 4)[8] analyzed administrative claims data to describe patterns of health care utilization, including diagnostic testing, physician services, prescriptions, and other treatment interventions, in patients with chronic pelvic pain, not limited to those with a presumed gynecologic etiology. They found that, compared with a control population matched on sociodemographic characteristics, health plan enrollment, year of index diagnosis, and Elixhauser comorbidities, patients with chronic pelvic pain were more likely to have chronic overlapping pain conditions and had higher rates of office visits, emergency department (ED) visits, hospitalization, diagnostic testing, procedures, and medication prescriptions in the year after the index diagnosis of chronic pelvic pain. The frequency of ED visits was particularly noteworthy, with 6.3 visits in one year after the chronic pelvic pain diagnosis, compared with 1.4 visits for patients without chronic pelvic pain. One in eight patients with chronic pelvic pain had 10 or more ED visits over the year, and more than half had at least one ED visit linked to a diagnostic code for pelvic pain. Nearly 25% received at least one opioid prescription, compared with 7.3% of patients without chronic pelvic pain.

The findings of this study highlight the deep effects of chronic pelvic pain on our health care systems and likely reflect the frustrations that many patients face when seeking medical care and meaningful improvement in their symptoms. For example, one of the primary factors driving the high rates of health care utilization in patients with chronic pelvic pain is the diagnostic challenge it poses. The nonspecific symptoms of pelvic pain, which often are stigmatized and dismissed, can lead to a protracted diagnostic and treatment journey. As shown by Green and colleagues, this is characterized by multiple physician visits and a cascade of imaging studies, laboratory tests, and invasive procedures, which collectively contribute to higher health care utilization. This is likely further compounded by insufficient training of health care professionals in the evaluation and treatment of chronic pain and the inadequacies of conventional treatment modalities. The efficacy of these interventions varies widely among individuals, often yielding suboptimal outcomes and prompting recurrent health care encounters with fragmented and incomplete care, which may explain the substantially higher frequency of ED visits found in this analysis in patients with chronic pelvic pain.

The average age of the population with chronic pelvic pain in this study was 52 years, which the authors rightly point out as reflecting a clinical population likely with, "greater chronicity and disability related to pain."[8] This age group is consistent with the case definition of chronic pelvic pain used in this analysis, which required both a claim for "female pelvic pain or perineal pain" (R10.2) and "other chronic pain" (G89.29) or "chronic pain syndrome" (G89.4) within 30 days of the pelvic pain claim, and probably represents a population with a high degree of nociplastic pain. However, it is important to note that nociplastic pain and the presence of multiple chronic overlapping pain conditions is not exclusively related to duration of symptoms or older age and can be seen in adolescents.[9] Indeed, there is a genetic risk for developing chronic overlapping pain conditions and nociplastic pain, and younger individuals appear to have a stronger genetic component to their pain.[10]

In light of these challenges, there is an urgent need to improve education and aggressively fund research regarding the etiology and treatment of chronic pelvic pain, with a greater focus on identifying novel therapies aimed at the underlying mechanism driving pain in each individual. We must also adopt a holistic approach to the management of chronic pelvic pain, encompassing interdisciplinary collaboration and patient-centered care. Such integrated care models facilitate timely diagnosis, personalized treatment plans, and ongoing support, thereby reducing low-value health care and improving patient outcomes.[11]

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Original Research

Health Care Utilization by Patients With Chronic Pelvic Pain

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OBJECTIVE: To describe the patterns of health care utilization among patients with chronic pelvic pain.

METHODS: Deidentified administrative claims data from the OptumLabs Data Warehouse were used. Adult female patients who had their first medical claim for chronic pelvic pain between January 1, 2016, and December 31, 2019, were included. Utilization was examined for 12 months after the index diagnosis. The greedy nearest neighbor matching method was used to identify a control group of individuals without chronic pelvic pain. Comparisons were made between those with and those without chronic pelvic pain using χ^2 tests for categorical data and Wilcoxon rank-sum tests for continuous data.

RESULTS: In total, 18,400 patients were analyzed in the chronic pelvic pain cohort. Patients with chronic pelvic pain had a higher rate of chronic overlapping pain conditions. Patients with chronic pelvic pain had higher rates of health care utilization across all queried indices. They had more outpatient office visits; 55.5% had 10 or more office visits. Patients with chronic pelvic pain showed higher utilization of the emergency department (ED) (6.3 visits vs 1.9 visits; $P<.001$). Urine culture and pelvic ultrasonography were the most utilized tests. One-third of patients with chronic pelvic pain utilized physical therapy (PT), and 13% utilized psychological or behavioral therapy. Patients with chronic pelvic pain had higher rates of hysterectomy (8.9% vs 0.6%). The average total health care costs per patient with chronic pelvic pain per year was $12,254.

CONCLUSION: Patients with chronic pelvic pain have higher rates of chronic overlapping pain conditions and undergo more ED visits, imaging tests, and hysterectomies than patients without chronic pelvic pain. Improving access to multidisciplinary care, increasing utilization of interventions such as PT and psychological or behavioral therapy, and reducing ED utilization may be possible targets to help reduce overall health care costs and improve patient care.

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See related editorial on page 1.

Female chronic pelvic pain is defined as a recurrent or constant pain in the lower abdomen or pelvic area of at least 3–6 months' duration. It is a common debilitating condition that affects people born with a uterus, with an estimated prevalence ranging from 10% to 20% in the United States.[1,2] Patients with chronic pelvic pain often experience functional and psychological disability and a substantial decrease in quality of life. At the societal level, chronic pelvic pain brings damaging consequences of lost productivity, decreased ability to fulfill family roles, and significant economic burden to health care systems.[3–6]

Health care utilization by patients with chronic pelvic pain has recently been studied in Canada. There, fee-for-service physician claims data from 1999 to 2009

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showed significantly higher rates of physician visits, high-cost hospital admissions, and diagnostic imaging among patients with compared with those without chronic pain.[7] In a separate Canadian study examining inpatient hospital costs for patients with chronic pelvic pain–related admissions or surgeries over 4 years, there were 34,346 cases of surgery or inpatient admission for chronic pelvic pain, amounting to $100.5 million with an average cost of $25 million per year.[8]

Similar patterns of higher health care utilization have been seen in patients with endometriosis in the United States. A retrospective cohort study of 15,615 patients with Medicaid insurance with newly diagnosed endometriosis compared with age-matched individuals in a control group showed higher health care resource utilization during a 12-month follow-up period. This included hospital admissions, emergency department (ED) visits, office visits, and prescriptions.[9,10] However, endometriosis represents only one contributor to chronic pelvic pain. The differential diagnosis for chronic pelvic pain is extensive and includes potential visceral pain, neuromusculoskeletal disorders, and psychologic contributors.[1] Chronic pelvic pain is often multifactorial. Moreover, visceral pain may be secondary to gynecologic, gastrointestinal, or urologic causes.[1] Although endometriosis is often seen in patients with chronic pelvic pain, studies focusing solely on endometriosis risk underestimating the effect of chronic pelvic pain.

Given the detrimental effect of chronic pelvic pain on affected individuals and society, there is a need to update the current knowledge of health care services utilization in this population. Understanding the use of health care services by patients with chronic pelvic pain and the scope of health care costs can shed light on the economic burden of chronic pelvic pain in the United States while informing the health care community of opportunities to expand underutilized resources or target interventions for resources that could be overutilized. This carries future potential for improving access to appropriate chronic pelvic pain care and better patient outcomes, as well as reducing the overall burden on both the patients and the health care system.

To help fill this literature gap, a comprehensive examination of health care resource utilization was performed using nationwide medical and pharmacy claims data from the OptumLabs Data Warehouse.[11] The primary objective was to describe the utilization patterns of health care services among patients with chronic pelvic pain. Utilization of services was compared (diagnostic testing, physician services, chronic pelvic pain interventions) between patients with chronic pelvic pain and a matched control cohort to identify how the utilization pattern of patients with chronic pelvic pain differs from that of the general population and its economic effect.

METHODS

Deidentified administrative claims data from the OptumLabs Data Warehouse were used. The OptumLabs Data Warehouse contains claims-based information on patients from across the United States and represents diverse ages, ethnicities, and racial groups who have commercial insurance or Medicare Advantage insurance.[11] Because the OptumLabs Data Warehouse provides only deidentified patient data, the study was determined to be exempt by the Mayo Clinic IRB and did not require IRB approval.

Data were included on all adult (age 18 years or older) female patients who had their first medical claim for chronic pelvic pain between January 1, 2016, and December 31, 2019. Chronic pelvic pain–related medical claims were identified with the International Classification of Diseases, Tenth Edition (ICD-10) diagnosis code R10.2 (female pelvic pain or perineal pain). In addition, patients needed to have at least one of the following diagnosis codes 30 days before or after an R10.2 diagnosis: G89.29 (other chronic pain) or G89.4 (chronic pain syndrome).

Patients were required to have at least 6 months of continuous enrollment in their health insurance plan before their initial chronic pelvic pain–related claim and at least 1 year of follow-up after their initial chronic pelvic pain–related claim. The service date of the first observed claim for chronic pelvic pain was defined as the index event. Patients without a chronic pelvic pain–related claim were considered for the matched control cohort without chronic pelvic pain. Patients who were in the cohort without chronic pelvic pain needed to have at least one office visit between January 1, 2016, and December 31, 2019. We required 6 months of continuous enrollment before and 1 year of follow-up after their office visit.

The following patient demographics were included: age, sex, race and ethnicity, and Census region. Race and ethnicity were included to inform generalizability of results. In addition, the type of health plan was captured (ie, commercial or Medicare Advantage). Baseline comorbidities (6 months before the index date) were quantified with the Elixhauser comorbidity index using ICD-10 diagnosis codes.[12]

Study outcomes included chronic overlapping pain conditions, diagnostic tests, physician services, various interventions for treating chronic pelvic pain, and average health care costs in the year after the initial chronic pelvic pain diagnosis. Chronic overlapping pain conditions included fibromyalgia, irritable bowel syndrome, bladder pain syndrome, vulvodynia, migraine, chronic tension headache, temporomandibular disorder, chronic low back pain, chronic fatigue syndrome, and endometriosis.[13] Diagnosis codes were used to pull chronic overlapping pain conditions, which are generously outlined in previous literature.[14] Diagnostic tests included pelvic computed tomography (CT) scan, pelvic magnetic resonance imaging, pelvic ultrasonography, cystoscopy and colonoscopy, and infection screening for urinary tract infection, as well as chlamydia and gonorrhea screening. Physician services included office visits and consultative services, hospitalizations, or ED visits with and without a linked diagnosis to pelvic pain (R10.2). Interventions included prescriptions for hormones, opiates, neuromodulators, or antibiotics; physical therapy (PT); surgical procedures; and psychological interventions. Health care costs were summed for 1 year per patient, starting at chronic pelvic pain diagnosis for the chronic pelvic pain cohort. Costs were inflation adjusted to 2022 dollars with the U.S. Bureau of Labor Statistics' Consumer Price Index for hospital services. Study outcomes were analyzed for the 12-month follow-up period after the first observed claim for chronic pelvic pain, defined as the index event. Appendices 1–3, available online at http://links.lww.com/AOG/D659, detail the specific codes used to identify the outcomes of interest.

The greedy nearest neighbor matching method was used to identify a control group of individuals without chronic pelvic pain according to the independent variables.[15] They included sociodemographic characteristics (exact match), health plan enrollment (exact match), year of index diagnosis (±365 days), and Elixhauser comorbidities (exact match). Comparisons were made between those with and those without chronic pelvic pain using χ^2 tests for categorical data and Wilcoxon rank-sum tests for continuous data. Analyses were performed with SAS 9.4 software.

RESULTS

The demographic data for both the chronic pelvic pain cohort (n=18,400) and the 1:1 matched control group are outlined in Table 1. The mean age of the chronic pelvic pain cohort was 52 years; the majority were White (66%), and just more than half had commercial insurance. All geographic regions of the United States were included, with the majority residing in the South (50.4%). The mean Elixhauser comorbidity index was 2.3, with hypertension (39.5%) and depression (26.2%) being the most common comorbid conditions.

Patients with chronic pelvic pain had a higher rate of chronic overlapping pain conditions ($P<.001$) (Table 2). The three most diagnosed chronic overlapping pain conditions in patients with chronic pelvic pain were chronic low back pain (39.7%), migraine (10.7%), and fibromyalgia (9%). Compared with patients without chronic pelvic pain, patients with chronic pelvic pain had higher rates of office visits, ED visits, and hospitalizations, as well as more diagnostic testing, procedures, and medication prescriptions (Tables 3–5). The average total health care cost per chronic pelvic pain patient per year was $12,254.

Among patients with chronic pelvic pain, urine culture was the most common diagnostic test utilized (42.4%), followed by pelvic ultrasonography (32.8%) and pelvic CT (26.3%) (Table 3). Repeat imaging was noted in patients with chronic pelvic pain; 156 (0.6%) underwent five or more pelvic ultrasonograms, and 132 (0.7%) underwent five or more pelvic CTs. Magnetic resonance imaging was less frequently utilized compared with the other imaging modalities (6.3%).

Patients with chronic pelvic pain had higher rates of hysterectomy (8.9% vs 0.6%) during follow-up, and laparoscopic fulguration of endometriosis was coded or billed in 5.9% of patients with chronic pelvic pain (Table 3). About one-third of patients with chronic pelvic pain (35.3%) utilized at least one visit for PT, and 10.9% utilized 10 or more PT visits. Physical therapy was the most common intervention. The next most common was a peripheral nerve block (16.6%). Regarding the use of psychological or behavioral therapy by patients with chronic pelvic pain, 13% utilized therapy, 6.6% utilized 1 to 4 visits, and 3.9% utilized 10 or more visits. Overall, patients with chronic pelvic pain had higher utilization of all the queried interventions.

Most patients with chronic pelvic pain had 10 or more office visits during follow-up (55.5%). Family practice and internal medicine were the most common specialties utilized for both cohorts (Table 5). Anesthesia was the third most common specialty utilized by patients with chronic pelvic pain. Although psychiatry was the fourth most common specialty utilized by patients without chronic pelvic pain, it ranked eighth for those with chronic pelvic pain. Obstetrics and gynecology was the fourth most common specialty for patients with chronic pelvic pain. Patients with chronic pelvic pain had higher utilization of the ED; the average number of ED visits without a linked diagnosis of abdominal or pelvic pain was 6.3 compared with 1.9 ($P<.001$). Furthermore, 13.1% of

Table 1. Patient Demographics With Matching

Characteristic	Matched Control Group (n=18,400)	Patients With CPP (n=18,400)
Age (y)	52.0±17.4	51.8±17.3
18–24	942 (5.1)	942 (5.1)
25–34	2,249 (12.2)	2,249 (12.2)
35–44	3,755 (20.4)	3,755 (20.4)
45–54	3,590 (19.5)	3,590 (19.5)
55–64	2,982 (16.2)	2,982 (16.2)
65–74	2,728 (14.8)	2,728 (14.8)
75 or older	2,154 (11.7)	2,154 (11.7)
Race and ethnicity		
Asian	353 (1.9)	353 (1.9)
Black	2,997 (16.3)	2,997 (16.3)
Hispanic	1,867 (10.1)	1,867 (10.1)
White	12,195 (66.3)	12,195 (66.3)
Unknown	988 (5.4)	988 (5.4)
Health plan		
Commercial	10,528 (57.2)	10,528 (57.2)
Medicare Advantage	7,872 (42.8)	7,872 (42.8)
Census region		
South	9,276 (50.4)	9,276 (50.4)
Midwest	4,906 (26.7)	4,906 (26.7)
West	2,882 (15.7)	2,882 (15.7)
Northeast	1,336 (7.3)	1,336 (7.3)
Elixhauser comorbidity index	2 (0–3)	2 (0–3)
Elixhauser comorbidities*		
Hypertension	7,269 (39.5)	7,269 (39.5)
Depression	4,814 (26.2)	4,814 (26.2)
Chronic pulmonary disease	3,516 (19.1)	3,516 (19.1)
Diabetes	3,155 (17.1)	3,155 (17.1)

CPP chronic pelvic pain.

Data are mean±SD, n (%), or median (interquartile range) unless otherwise specified.

* Individuals in the control group were matched across Elixhauser comorbidities. Not shown are rheumatoid arthritis and collagen vascular diseases, cardiac arrhythmias, renal failure, congestive heart failure, solid tumor without metastasis, valvular disease, and pulmonary circulation disorders.

patients with chronic pelvic pain had 10 or more ED visits during follow-up (Table 4). More than half of patients with chronic pelvic pain had at least one ED visit with a linked diagnosis of pelvic pain, and 3% had five or more ED visits associated with that diagnosis (Table 4).

Opiates were utilized at a higher rate in the chronic pelvic pain cohort (24.7% vs 7.3%, $P<.001$).

Table 2. Chronic Overlapping Pain Conditions

Condition	Matched Control Group (n=18,400)	Patients With CPP (n=18,400)	P
Chronic low back pain	2,534 (13.8)	7,297 (39.7)	<.001
Migraine	877 (4.8)	1,965 (10.7)	<.001
Fibromyalgia	633 (3.4)	1,656 (9.0)	<.001
Irritable bowel syndrome	334 (1.8)	1,053 (5.7)	<.001
Endometriosis	47 (0.3)	1,167 (6.3)	<.001
Chronic fatigue syndrome	221 (1.2)	417 (2.3)	<.001
Bladder pain syndrome	39 (0.2)	552 (3.0)	<.001
Chronic tension headache	164 (0.9)	338 (1.8)	<.001
Vulvodynia	<11 (<1)*	176 (1.0)	<.001
Temporomandibular disorder	22 (0.1)	56 (0.3)	<.001

CPP, chronic pelvic pain.

Data are n (%) unless otherwise specified.

* Blinded because of the small cell size (less than 11) in the grouping.

Table 3. Diagnostic Tests and Interventions

	Matched Control Group (n=18,400)	Patients With CPP (n=18,400)	*P*
Pelvic CT			<.001
0	16,762 (91.1)	13,554 (73.7)	
1–4	1,615 (8.8)	4,714 (25.6)	
5 or more	23 (0.1)	132 (0.7)	
Pelvic MRI	261 (1.4)	1,158 (6.3)	<.001
Pelvic ultrasonogram			<.001
0	16,915 (91.9)	12,364 (67.2)	
1–4	1,450 (7.9)	5,917 (32.2)	
5 or more	35 (0.2)	119 (0.6)	
Urine culture			<.001
0	14,139 (76.7)	10,692 (57.6)	
1–4	4,100 (22.3)	6,931 (37.7)	
5 or more	161 (0.9)	777 (4.2)	
Hysterectomy	115 (0.6)	1,644 (8.9)	<.001
Laparoscopic fulguration of endometriosis	33 (0.2)	1,081 (5.9)	<.001
Peripheral nerve block			<.001
0	17,391 (94.5)	15,343 (83.4)	
1–4	947 (5.1)	2,730 (14.8)	
5 or more	62 (0.3)	327 (1.8)	
Physical therapy			<.001
0	15,136 (82.3)	11,900 (64.7)	
1–4	1,540 (8.4)	2,940 (16.0)	
5–9	769 (4.2)	1,546 (7.1)	
10 or more	955 (5.2)	2,014 (10.9)	
Psychological or behavioral therapy			<.001
0	16,515 (89.8)	16,014 (87.0)	
1–4	911 (5.0)	1,220 (6.6)	
5–9	354 (1.9)	450 (2.4)	
10 or more	620 (3.4)	716 (3.9)	

CPP, chronic pelvic pain; CT, computed tomography; MRI, magnetic resonance imaging.
Data are n (%) unless otherwise specified.

Antibiotics were the second most common pharmacologic therapy, followed by neuromodulators (Table 6). The use of hormones was not statistically different between cohorts except for medroxyprogesterone acetate (Depo-Provera), which was more commonly used in patients with chronic pelvic pain (Table 6). Intrauterine device utilization was low in both groups and did not meet thresholds for individual reporting (10 or fewer patients).

DISCUSSION

Using claims-based data for a large cohort of patients with a diagnosis of chronic pelvic pain (n=18,400), we were able to demonstrate higher rates of health care utilization compared with a matched patient cohort across all indices. These data provide an up-to-date representation of health care utilization and aid us in identifying potential gaps in services and areas of high utilization.

From this large cohort, we were able to estimate the average total health care cost per chronic pelvic pain patient per year at $12,254. This represents a significant economic burden for patients and the health care system. According to data from 1990 to 2005, chronic pelvic pain had been estimated to cost U.S. health care systems $2.8 billion per year.[7] Our estimate likely reflects only a portion of the financial cost of living with chronic pelvic pain because we were not able to account for the additional costs of lost productivity, including missed work, reduced ability to perform while at work, or job losses.[5,6]

Patients in the chronic pelvic pain cohort had higher rates of overlapping chronic pain conditions, which aligns with our understanding of chronic pelvic pain. Health care utilization for this cohort reflects the care for the evaluation and management of chronic pelvic pain, which may have multiple causes, but it also reflects care for unrelated conditions such as chronic overlapping pain conditions. In this cohort, low back pain, migraine, and fibromyalgia were the most common chronic overlapping pain conditions. Other studies have estimated that more than half of patients with chronic pelvic pain have a coexisting

Table 4. Office Visits and Hospital Services

	Matched Control Group (n=18,400)	Patients With CPP (n=18,400)	*P*
ED visits	0 (0–1)	1 (0–3)	<.001
ED visits			<.001
0	12,426 (67.5)	8,420 (45.8)	
1–4	4,507 (24.5)	6,389 (34.7)	
5–9	587 (3.2)	1,179 (6.4)	
10 or more	880 (4.8)	2,412 (13.1)	
ED visits related to R10.2			<.001
0	17,850 (97)	8,424 (46)	
1–4	543 (3)	9,139 (51)	
5–9	<11 (<1)*	602 (3)	
10 or more	<11 (<1)*	235 (1)	
Hospitalizations			<.001
0	15,822 (86.0)	14,639 (79.6)	
1	1,829 (9.9)	2,545 (13.8)	
2 or more	749 (4.1)	1,216 (6.6)	
Office visits	5 (3–10)	11 (6–18)	<.001
Office visits			<.001
1–4	7,719 (42.0)	3,539 (19.2)	
5–9	5,634 (30.6)	4,650 (25.3)	
10 or more	5,047 (27.4)	10,211 (55.5)	

CPP, chronic pelvic pain; ED, emergency department.
Data are median (interquartile range) or n (%) unless otherwise specified.
* Blinded because of small cell size (less than 11) in the grouping.

diagnosis of migraine; overlap with fibromyalgia has been estimated to be between 4% and 31% in patients with chronic pelvic pain.[16,17] Depression was the second most common medical comorbidity among the patients with chronic pelvic pain. However, psychiatry visits were utilized less in this cohort than in the cohort without chronic pelvic pain, the eighth compared with the fourth most utilized specialty. Management of psychological conditions appears to be an area of undertreatment according to our data. The prevalence of mood disorders, including anxiety and depression, is known to be higher in patients with chronic pelvic pain. Moreover, patients with concurrent mood disorders experience more severe pain and worse quality of life compared with those with pain alone.[18] Targeted interventions to address this potential gap would require partnering health care professionals across disciplines for concurrent management, addressing physical and psychological components of a patient's pain experience.

The differential for chronic pelvic pain is broad, posing diagnostic challenges in the evaluation of both chronic pain and acute on chronic pain episodes. Patients in this chronic pelvic pain cohort demonstrated higher rates of diagnostic testing, including repeat imaging. Patients with chronic pelvic pain also went to the ED more than those without chronic pelvic pain (average 6 visits per follow-up period), and half of patients with chronic pelvic pain had at least one ED visit for the diagnoses of pelvic pain. Data on the predictive value of CT scan in the evaluation of nontraumatic abdominal pain in the ED have demonstrated a decrease in predictive value with serial testing. The positivity rate of CT declines with an increasing number of prior negative CT scans: 22.5% for the first scan compared with 8.4% for the second scan and 5.9% for four or more scans.[19] Emergency department visits and repeat imaging are potential areas of high utilization to further study related outcomes and potential

Table 5. Percentage of Patients Seeking Care With a Specialist

Matched Control Group		Patients With CPP	
Specialist	%	Specialist	%
Family practice	24.4	Family practice	20.9
Internist	14.1	Internist	11.9
Orthopedist	4.4	Anesthesiologist	9.9
Psychiatrist	4.0	Ob-gyn	7.7
Anesthesiologist	3.9	Orthopedist	5.1
Ob-gyn	3.8	Rehabilitation medicine	3.9
Cardiologist	3.5	RN, special service	3.6
Dermatologist	3.5	Psychiatrist	3.5
RN, special service	3.4	Gastroenterologist	2.8
Neurologist	2.6	Neurologist	2.7

CPP, chronic pelvic pain; ob-gyn, obstetrician–gynecologist; RN, registered nurse.

Table 6. Pharmacologic Therapies

	Matched Control Group (n=18,400)	Patients With CPP (n=18,400)	*P*
Opiates	1,344 (7.3)	4,549 (24.7)	<.001
Antibiotics	1,898 (10.3)	3,349 (18.2)	<.001
Neuromodulators	700 (3.8)	2,253 (12.2)	<.001
Hormones	1,130 (6.1)	1,169 (6.4)	.40
Depo-Provera	192 (1.0)	343 (1.9)	<.001
Aromatase inhibitors	71 (0.4)	116 (0.6)	.001

CPP, chronic pelvic pain.
Data are n (%) unless otherwise specified.

interventions to prioritize high-yield testing and to maximize health care utilization and costs. A systematic review evaluating the effectiveness of interventions targeting frequent ED users demonstrated that the following interventions can decrease visits and could apply to chronic pelvic pain: use of care plans, ED decision support program, internet-based case management, cognitive behavioral therapy, primary care referrals, and case management.[20]

Patients within this chronic pelvic pain cohort exhibited higher rates of hysterectomy in the study period compared with the control group (8.9% vs 0.6%). Recent studies evaluating the utility of hysterectomy in the treatment of chronic pelvic pain have noted that as many as 11% of patients experience persistent pelvic pain 6 months after surgery.[21] In addition, patients with central sensitization are less likely to experience improved pain outcomes.[22] The higher utilization of opiates among this chronic pelvic pain cohort raises concerns about overreliance and potential risks. Opioids are not recommended for the treatment of chronic pelvic pain.[1] Nonopioid and multidisciplinary pain management approaches that extend beyond surgical management should be used by health care professionals, and this is a current area of focus in education on the management of pelvic pain. The low utilization of intrauterine devices was surprising and represents a possible area of further study.

Musculoskeletal dysfunction with myofascial pain is a common condition contributing to pelvic pain but is often overlooked.[22] The first-line treatment for myofascial pain is PT.[1] Although PT was the most common intervention seen in this chronic pelvic pain cohort (35.7%), only 17% utilized 10 or more PT visits. Physical therapy is typically prescribed as a multisession intervention, usually 12 sessions. The rates of utilization in our cohort are similar to those seen in a recent study of patients referred to PT with either pelvic floor support disorders or pelvic pain. Compared with rates of initiation of PT, lower rates of completion were noted in patients with pelvic pain: 45% rate of initiation and 16% rate of completion.[23] Interventions to address barriers to PT utilization and to improve rates of PT completion should be studied further.

There are notable limitations to our study. First, administrative billing codes have previously been used to identify chronic pelvic pain; however, it has been noted that such methodology risks misidentification of chronic pelvic pain or underidentification of chronic pelvic pain because of undercoding or coding errors (ie, coding pain rather than pelvic pain).[14,24] The ICD-10 code for pelvic pain (R10.2) does not reflect chronicity, and “pelvic and perineal pain” and “chronic pelvic pain female” are coded R10.2. The addition of the G89.29 (other chronic pain) or G89.4 (chronic pain syndrome) narrowed the study cohort to one specifically coded to have chronic pain. This can result in patients with more chronic pain conditions such as fibromyalgia. This narrow focus was chosen to attempt to focus the study on those patients with chronic rather than acute pain. This focus may be reflected in the older average age of 52 years for the patients with chronic pelvic pain in this cohort. The outcomes may reflect a subset of patients with chronic pelvic pain with greater chronicity and disability related to pain. Health care utilization studied in this cohort reflects care that could extend beyond care specifically for chronic pelvic pain. Although ED visits were linked to diagnosis codes for pelvic pain, other visits and testing were not specifically linked to chronic pelvic pain, therefore representing general health care utilization for this patient cohort. Another limitation is that our patient population was identified from a cohort of patients with Medicare Advantage or private insurance with pharmaceutical benefits. These could limit generalizability to patients with different or no health care coverage. Finally, the study period also may underestimate the effect of chronic pelvic pain and comorbid conditions because 1 year is a narrow window in the context of a chronic condition.

Despite these limitations, this study includes a large cohort of patients for analysis. An additional strength is the application of the greedy method for propensity matching for sociodemographic characteristics, comorbidities, and health plan enrollment, which allow comparisons with a control cohort.

Patients with chronic pelvic pain have higher rates of chronic overlapping pain conditions, utilize more opiates, and undergo more ED visits, imaging tests, and hysterectomies than patients without chronic pelvic pain. Improving access to multidisciplinary care, increasing the utilization of interventions such as PT and psychological or behavioral therapy, and reducing ED utilization may be possible targets to help reduce overall health care costs and to improve patient care.

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