CLINICAL ARTICLE

Retrospective claims analysis of physical therapy utilization among women with stress or mixed urinary incontinence

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Abstract

Objective: To describe the characteristics of women with stress or mixed urinary incontinence (SUI/MUI) receiving physical therapy (PT) services, including referral patterns and PT utilization.

Methods: Female patients with claims associated with an SUI or MUI diagnosis (International Classification of Disease—Clinical Modification [ICD-9-CM]: 625.6, 788.33, or ICD-10-CM: N39.3, N39.46) between July 01, 2014 and June 30, 2016 were identified in International business machines (IBM)'s MarketScan Research Database. Inclusion criteria included the absence of pregnancy claims and ≥80% medical and pharmacy enrollment pre- and postindex. First SUI/MUI diagnosis claim determined index. Patients were followed for 2 years, and associated UI-associated PT encounters were identified. Descriptive statistics were calculated for patients with at least one PT visit during the postindex period.

Results: In a cohort of 103,813 women with incident SUI or MUI diagnosis, 2.6% (2792/103,813) had at least one PT visit in the 2 years following their diagnosis. Mean age at index PT encounter was 50.55 years. A total of 52.36% (1462/2792) women had one to four PT visits; 21.2% (592/2792) had >8 PT visits. In subanalysis of the PT cohort (1345/2792), women who received PT only had the lowest average 2-year postindex total medical cost (mean: $12,671; SD: $16,346), compared with PT plus medications (mean: $27,394; SD: $64,481), and PT plus surgery (mean: $33,656; SD: $26,245), respectively. Over 40% had their first PT visit ≥3 months after their index date.

Conclusions: The percentage of women with a PT visit associated with an incident SUI or MUI diagnosis was low (2.6%), and 30% of this group completed three or more PT visits. This suggests poor adherence to clinical guidelines regarding supervised treatment of UI in women.

Impact Statement: Our study suggests underutilization of PT among insured women with SUI and MUI in the 2 years following diagnosis. Interventions to

improve this gap in first-line care may represent an opportunity for an increased role for PTs in the care of women with UI.

KEYWORDS
health economics, healthcare resource utilization, physical therapy, rehabilitation, urinary incontinence

1 | INTRODUCTION

Urinary incontinence (UI) is a highly prevalent and bothersome health condition affecting up to 50% of adult women,[1,2] with variations in prevalence according to study population and UI measurement. UI is defined as the complaint of involuntary leakage of urine and is classified into several subtypes; the most common of these are stress, urgency, and mixed UI.[3] Stress UI (SUI) is characterized by UI with sneezing, coughing, or physical exertion (e.g., sporting activities) and may also be described as "activity-related incontinence." Urgency UI (UUI) is the complaint of involuntary loss of urine associated with a "sudden, compelling desire to pass urine which is difficult to defer." Mixed UI (MUI) is the complaint of symptoms of both SUI and UUI.[3]

Adverse quality of life, economic, and health impacts have been well-documented among women with untreated UI.[4–7] It is a progressive health condition, more likely to worsen over time than to stabilize or resolve when untreated.[8–10] Despite the burden and prevalence of UI, rates of care-seeking are low, ranging from 16% to 25% of women with UI seeking care for their condition.[11,12] The size of the aging population in the United States, as well as increasing rates of overweight and obesity, which are independent risk factors for UI, result in a projected increase in prevalence of bothersome UI among adult women in the United States in the coming decades.[13,14] The healthcare system is expected to see a 35% increase in demand for care for female pelvic floor disorders (PFDs), a set of conditions that includes UI, between 2010 and 2030.[15] This figure may be expected to climb with the widespread adoption of two recent clinical guidelines on UI screening and treatment for postpartum women and as a component of well-woman care.[16,17]

Clinical pathways (CPWs) originated in healthcare as part of broad healthcare improvement initiatives. The intent of CPWs is to facilitate standardization and organization of care processes with a focus on patient outcomes and organizational efficiency.[18,19] CPWs have been operationally defined as structured and multidisciplinary, guideline- and evidence-based, outlining a step-wise course of care, and aiming to standardize care for a specific population, health condition, or intervention.[20] In the context of UI, CPWs and clinical practice guidelines are united in descriptions of first-line care that highlight pelvic floor muscle training (PFMT) as a cornerstone of treatment.[21,22] PFMT is described as "a programme of repeated voluntary pelvic floor muscle contractions taught and supervised by a healthcare professional."[23] Consensus exists around implementation of PFMT over a period of at least 12 weeks and under the supervision of a qualified healthcare professional (HCP), often, though not exclusively, described as a physio-therapist.[23] There is no consensus on recommended parameters of HCP supervision or of exercise program design.[24] National practice guidelines in several countries call for the implementation of PFMT as the first intervention after diagnosis with UI.[22]

The objective of this study was to describe the characteristics of women with SUI or MUI receiving physical therapy (PT) services, their referral patterns, and utilization of these services after their incident diagnosis of SUI or MUI.

2 | METHODS

2.1 | Data source

This was a secondary analysis of SUI/MUI-related PT claims in a retrospective data analysis of medical and pharmacy claims from the IBM MarketScan database from July 2013 to June 2018. Methods for the primary analysis have been described elsewhere (REF paper #2). All database records are deidentified and certified to be fully compliant with US patient confidentiality requirements set forth in the Health Insurance Portability and Accountability Act of 1996. Because this study used only deidentified patient records and did not involve the collection, use, or transmittal of individually identifiable data, Institutional Review Board approval to conduct this study was not necessary.

2.2 | Study design and subject identification

Women diagnosed with SUI or MUI were identified using the specific International Classification of Disease—Clinical Modification (ICD-9-CM) and ICD-10-CM codes (ICD-9-CM

[625.6, 788.33]; ICD-10-CM [N39.3, N39.46]) in any diagnosis field between July 1, 2014 and June 30, 2016 (identification period). Adult women (greater than 18 years of age as of July 1, 2013) were included in the study. Exclusion criteria included a record of pregnancy or continuous enrollment for less than 80% of the time during the entire study period (July 2013–June 2018). The first date of the first SUI or MUI diagnosis during the identification period for each patient was identified as the index date. Women who had a diagnosis of SUI/MUI in the 1-year preindex period (1-year period before their index date) were excluded as this analysis focused on incident UI patients. Patients were followed for 2 years postindex and their PT encounters associated with a diagnosis code for SUI/MUI on the same claim were identified from the Outpatient Services file using provider type code 850 (Physical Medicine & Rehab). Patients who had at least one PT visit during the postindex period were included in the analysis cohort (PT cohort).

2.3 | Variable measurements

Mean number of PT visits in the 2-year postindex period were calculated for the PT cohort in addition to proportion of patients having ≤ 8 or > 8 PT visits. This dichotomy was based on the assumption that >8 visits would likely correspond to 12 weeks or more of supervised care as guidelines recommend. Proportion of women who had a PT visit before a prescription for a medication (anti-cholinergics, anti-depressants, or anti-anxiety) or UI-related surgery (sling surgery, Burch colposuspension, periurethral injections of bulking agents, Kelly plication, needle suspension, or a vaginal hysterectomy) was calculated. Total medical costs (inpatient and outpatient costs) incurred by women who had fewer PT visits were calculated and compared with those having greater PT visits. Total medical costs (inpatient and outpatient costs) among women who received PT only, PT and surgery, PT and medications, and PT, surgery, and medications in the postindex period were calculated and compared. Time (in days) from index date to encounter with physical therapist was calculated. Patients who saw both a specialist (urologist or gynecologist) and a PT were identified, and the time difference (in days) between their first encounter with a specialist and a PT was calculated. T tests were used to compare continuous variables and χ^2 tests were used to compare categorical variables.

3 | RESULTS

Of 103,813 women with an incident diagnosis of SUI or MUI, 2.6% (2792/103,813) had at least one PT visit in the 2 years following their diagnosis (PT cohort). Primary results pertaining to evaluation and interventions among women with incident SUI or MUI are presented elsewhere.[25]

The demographic characteristics of the PT cohort are presented in Table 1. The mean (standard deviation) age at index PT encounter was 50.55 years (12.91). Most women (28.98%, 809) women were 45–54 years old. The greatest geographical representation was among women in the South (34.24%, 956/2792) consistent with the regional disparities in the IBM MarketScan Database.

The median (IQR) number of PT visits per patient in the 2-year postindex period among patients with incident SUI/MUI was 4 (IQR=2-8). A total of 52.36% (1462/2792) women had one to four PT visits and 21.20% (592/2792) women had >8 PT visits (Table 2).

Before starting medication or having surgery for UI, 59.2% (1654/2792) women had at least one PT visit. Average total medical cost in the 2-year postindex period among women in the PT cohort was $22,904 (SD: $43,914).

For 51% of women ($n = 1447$), their first PT visit was the same date as the index date for their SUI/MUI diagnosis, making it impossible to identify if the PT was the diagnosing HCP, or if there had been a previous diagnosis of SUI/MUI more than 12 months before the index diagnosis. Hence, a subanalysis for the remaining 49% (1345/2792) evaluating timing of visits and health-care resource utilization and total medical costs was conducted, excluding patients who had the first PT visit on the same day as the SUI/MUI index date. The median time from SUI/MUI index date to first PT visit was 61

TABLE 1 Demographic characteristics of the PT cohort

Characteristics	PT cohort ($n = 2792$)
Age at Index Encounter, mean (SD) [range]	50.55 (12.91) [20–95]
Age Categories, n (%)	
18–34	292 (10.46%)
35–44	647 (23.17%)
45–54	809 (28.98%)
55–64	716 (25.64%)
65+	328 (11.75%)
Region, n (%)	
Northeast	459 (16.44%)
North central	629 (22.53%)
South	956 (34.24%)
West	744 (26.65%)
Unknown	4 (0.14%)

Abbreviation: PT, physical therapy.

days. Approximately, 33% (449/1345) saw a PT within 30 days of their index SUI/MUI visit, while 16% (219/1345) saw a PT 31–60 days after their index SUI/MUI diagnosis (Table 3). Most women in this cohort (75.17%, 1011) saw a specialist (urologist or gynecologist) in the 2-year postindex period. The average number of days between the first PT encounter and the first specialist visit was 128 days (SD: 189 days, median: 49 days).

Women who received PT only had the lowest average 2-year postindex cost (mean: $12,671; SD: $16,346), followed by those who received PT and medications, and PT and surgery (Table 4). Women who received PT, surgery, and medications had the highest cost in the postindex period (mean: $46,433; SD: $52,043).

TABLE 2 Distribution of PT visits in the PT cohort

PT visits categories, n (%)	n (%)	p value
1 visit	519 (18.59%)	<0.0001
2–4 visits	943 (33.78%)	
5–8 visits	738 (26.43%)	
> 8 visits	592 (21.2%)	

Abbreviation: PT, physical therapy.

TABLE 3 Distribution of patients by days from index date to first encounter with a physical therapist

Days from index date to first encounter with physical therapist	n (%)	p value
< 31 days	449 (33.38%)	<0.0001
31–60 days	219 (16.28%)	
61–90 days	119 (8.85%)	
91–180 days	195 (14.5%)	
181–365 days	148 (11%)	
>365 days	215 (15.99%)	

4 | DISCUSSION

This analysis of claims records of a large cohort of women with incident diagnosis of SUI or MUI, found that within 2 years, very few women (2.6%) attended physical therapy to address their diagnosis. Only 1.8% initiated PT as a first treatment after diagnosis. There was variance in the distribution of PT visits, with 30% of women completing less than three PT visits and 21% completing over eight visits. The limited PT utilization is consistent with the broad deficit in utilization of conservative care identified in the primary analysis of this cohort, in which 4% of women participated in conservative care (defined as claims for continence pessary, vaginal inserts, pelvic floor muscle exercises, and bladder training) before medications or surgery.[25]

Data in the United States collected over 10 years found most ambulatory care visits for PFDs were established patients. The authors indicate it likely reflects the chronicity of the disorders.[6] It would seem reasonable then to expect the women in our cohort to continue to need care, enforcing the importance of working toward improvements in care provision and coordination. The optimal number of PT visits considered a "completed" episode of care has not been identified, and ranges from 3 to 8+ visits in the literature.[26–30] In our study, over 30% of women completed less than three PT visits, suggesting that many women do not complete PT once initiated.

In countries where conservative care that includes PFMT as a first-line intervention for UI is codified in national guidelines, adherence to guidelines is also nonoptimal. A national audit of NHS data identified the records of 7846 women with SUI and found that initiation of conservative care (defined by the authors as education, biofeedback, bladder retraining, and lifestyle management) occurred for 54%–68% of women. Lowest rates were among older women (≥65 years old) in primary care settings and highest among younger women

TABLE 4 Average total costs associated with PT visits, surgery, and medications

Average total cost 2-years postindex	n (%)	p value
Patients who received PT only, n (%)	406 (30.19%)	<0.0001
Average total 2-year cost postindex, mean (SD)	$12,671 ($16,346)	
Patients who received PT and surgery, n (%)	49 (3.64%)	
Average total 2-year cost postindex, mean (SD)	$33,656 ($26,245)	
Patients who received PT and medications, n (%)	752 (55.91%)	
Average total 2-year cost postindex, mean (SD)	$27,394 ($64,481)	
Patients who received PT, surgery, and medications, n (%)	138 (10.26%)	
Average total 2-year cost postindex, mean (SD)	$46,433 ($52,043)	

Abbreviation: PT, physical therapy.

(<65 years old) receiving care in hospital settings. A postal survey conducted among Dutch general practitioners (GPs) sought to identify the degree to which they were adherent to the Guideline on Urinary Incontinence of the Dutch College of GPs. Based on 264 responses, they concluded that adherence to diagnostic recommendations was high, but adherence to treatment recommendations was low. Treatment recommendations were strongest for women with mild-moderate SUI, with 82.6% of GPs reporting they provided instruction in bladder training and PFMT. In both examples, the authors conclude that current practice is not satisfactory. They call for future work to reduce barriers among women and HCPs and capacity building within the healthcare system to care for women with UI more efficiently.[31,32] In contrast, rates of guideline adherence in these studies are over 13 times higher than the 4% observed in our cohort. This represents a massive opportunity for improvement in the US health system and is consistent with other authors' descriptions of underutilization of PFMT in the United States.[33]

Tibaek et al. highlight limitations in health resource capacity in Denmark, reporting that only women with the most severe PFD symptoms including UI are referred to specialized PT.[30] Of those referred to PT, 78% initiated treatment, but only 48% completed (completion = ≥8 visits). The authors cite waitlist as a factor (mean 93 days; SD: 58). By comparison, the time from index date to first PT encounter in our cohort was greater (mean: 151.89 days; SD: 188.07). Just over 33% of women had their first PT encounter within 30 days following index date; however, this timeframe was ≥3 months for 42% of our cohort. Anticipating such an interval from index date to first PT encounter may present an opportunity to provide educational, group-based, and/or digitally enabled interventions in advance of individualized PT care.

While training of specialist PTs to care for women with PFDs is important and much-needed, PTs in general practice or other subspecialties can assume a meaningful role in education and treatment of women with UI that is consistent with their practice focus and commitment to evidence-based care. The PT workforce is limited in number and reach, and even more so with regard to women's health specialization.[34,35] It may be reasonable to train both entry-level and experienced PTs to screen and initiate treatment for uncomplicated UI, referring complicated cases to specialty providers.[36] Evidence is emerging that women are interested in and achieving positive outcomes through technology-enabled solutions for PFMT,[37–40] as well as group treatments.[41] These interventions and changes in practice may help increase access to and participation in first-line care for women with UI.

Insurance coverage and time constraints have been cited as barriers to care among US women referred to PT for high-tone PFD and pelvic pain.[42] Health literacy is also a barrier, as low condition-specific health literacy has been documented among US women with PFDs even among women with high general health literacy.[43,44] Low health literacy may indicate that women lack an understanding of their condition, and in turn are limited in understanding the plan of care presented at the time of diagnosis, hindering their capacity to be fully engaged and to follow treatment recommendations. It may be worthwhile to account for this in public awareness efforts, community-based education events, and at the first PT encounter.

When compared with the primary analysis, a higher proportion of women with SUI or MUI in the West attended PT and a lower proportion of women in the South attended PT; representation was relatively unchanged in the Northeast and North Central regions. The claims database used is known to over-sample in the South, and so it is possible that this shift reflects regional differences in awareness of CPWs and the role of PTs in multidisciplinary care, in willingness of women to see a PT for their UI, and/or density of the PT workforce.

Women who saw a specialist (urologist; Ob/Gyn) were more likely to have attended PT than those who were diagnosed by a PCP, and a low percentage of our sample overall were originally diagnosed by a PCP. Newly published guidance on remote urogynecologic care in response to the coronavirus disease 2019 (COVID-19) pandemic indicates that it is reasonable to make a provisional UI diagnosis via virtual consult and to initiate first-line care without leaving the home.[45] This should encourage PTs to communicate with HCPs in their region about ways they are poised to support alternative care delivery through decreased in-person visits, utilization of virtual visits, home visits, and/or other technology-enabled solutions. The pattern of referral observed in our analysis also highlights the opportunity for PTs to facilitate relationships around UI screening and treatment with primary care providers, an endeavor that is supported by practice guidelines from the American College of Physicians.[46]

5 | LIMITATIONS

Our study has several limitations. First, diagnostic codes (ICD-9-CM, ICD-10-CM) from medical claims data were used to identify women with SUI/MUI, rather than individual medical records. Low rates of care-seeking for women with UI have been documented elsewhere, thus it is possible that the number of women with SUI/MUI was underestimated. Second, given deidentified nature of

the claims database, we were also unable to gather information on many other factors that could be material to the interpretation of findings, including, but not limited to race, socioeconomic status, number of women referred to PT who never initiated care, and outcomes. Third, incident SUI/MUI patients were defined as those who did not have a diagnosis for SUI or MUI in the 1 year before the identification period. However, it is possible that these patients had a diagnosis of SUI/MUI before this 1-year period and are incorrectly being classified as incident. This might explain the 1447 patients with a PT visit on their index SUI/MUI diagnosis, whom we excluded from the secondary referral analysis. Lastly, other HCPs (nurse practitioners, continence nurses, and physicians) may be involved in primary supervision of PFMT or a diagnosing HCP may have provided instructions for an unsupervised home PFM exercise program. Neither scenario is captured in our analysis of PT claims, however, the finding of only 4% of our primary cohort being referred to nonpharmacologic/nonsurgical care as a first step gives us confidence that overall utilization of PFMT as a treatment strategy is extremely low, regardless of HCP involvement.

6 | CONCLUSION

Despite Level I evidence to support PT-supervised care to treat women with SUI and MUI, as well as multiple clinical practice guidelines recommending this as first-line treatment, our findings indicate that <3% of women participate in supervised PFMT with a PT. Future research and community-based efforts should work to identify barriers to evidence-based care, which are likely multifaceted.

Women with bothersome UI are a population of 20+ million US women, sizeable enough to be described as a public health issue.[1] It is in their interest that the healthcare community, including the PT community, look to the collective optimization of therapeutic interventions through facilitating referrals to PT, increasing the capacity of the PT workforce to provide evidence-based care for UI and the leveraging of technology, digital health, and public health campaigns to maximize awareness of, access to, and participation in evidence-based treatment for UI.

ETHICS STATEMENT
All database records are statistically deidentified and certified by IBM/Marketscan to be fully compliant with US patient confidentiality requirements set forth in the Health Insurance Portability and Accountability Act of 1996. Because this study used only deidentified patient records and did not involve the collection, use, or transmittal of individually identifiable data, Institutional Review Board approval to conduct this study was not necessary.

DATA AVAILABILITY STATEMENT
Data supporting the findings of this study are not publicly available because they are under license from IBM. Aggregate datasets generated and analyzed during the current study are available from the corresponding author on reasonable request, upon consultation with the sponsor.

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