

The Relationship Between Healthcare Provider Availability and Conservative Versus Non-conservative Treatment for Back Pain Among Older Americans



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INTRODUCTION

Back pain among older Americans is among the most common causes of disability in the USA and is associated with significant cost.¹ Established treatment guidelines recommend conservative care that includes education, non-steroidal anti-inflammatory medications, and spinal manipulation.² However, trends spanning the past two decades indicate increasing utilization of non-conservative care, including advanced imaging, opioid medications, and surgery.³ While back pain is often managed by primary care physicians,⁴ medical specialists and non-medical providers such as chiropractors and physical therapists provide much of the care in the USA. We performed a quasi-experimental study to examine the relationship between availability of healthcare providers and the utilization of conservative vs non-conservative care for back pain episodes.

METHODS

From an initial dataset of over 16 million Medicare Part B enrollees, we identified a cohort of 402,372 individuals who had at least one low back pain episode and relocated once between 2010 and 2014.⁵ Low back pain was identified using ICD-9 diagnostic codes 721.2-3, 721.5, 721.8-9, 722.1-2, 722.5-6, 722.8-9, 724, 738.4-5, 739.2-4, 846, and 847.1-4. After removing those with any evidence of cancer, significant infection, motor vehicle accidents, and/or inflammatory arthropathy, we identified a subset of 44,322 older adults. All episodes (i.e., claims occurring 60 days or older apart) were identified before and after relocation. Conservative care was defined as utilization of prescription non-steroidal anti-inflammatory medications, physical therapy (provider specialty code: 65), occupational therapy (67), or chiropractic care (35). Evidence of diagnostic imaging,

prescription opioid medications, or spine surgery (20, 14) classified an episode as non-conservative care. Procedure codes used to identify imaging studies and spine surgery are available upon request. Using national data on active providers, we determined the provider-to-population ratio of primary care physicians, spine surgeons, and chiropractors across US Hospital Referral Regions. Generalized linear models were used to examine the relationship between the change in provider availability and the number of conservative versus non-conservative care episodes per 1000 older adults. Models were adjusted for age, sex, race, co-morbidity, move year, and baseline provider availability.

RESULTS

The 44,322 older adults in our study were predominately female, were white, and most had one or fewer comorbidities (Table 1). A total of 8071 conservative care episodes were identified; chiropractic care was present in 71.2%, NSAIDs in 17.8%, and physical therapy in 16.9%. Of 11,372 non-conservative care episodes, opioids were used in 44.3%, spine surgery in 26.7%, and imaging studies in 63%.

At the population level, an increase of one spine surgeon was associated with 31.3 (95% CI: 0.4, 62.30) more non-conservative care episodes per 1000 older adults; no association was found with the number of conservative episodes. An additional one chiropractor was associated with an increase of 18.7 conservative care episodes (95% CI: 16.1, 21.3) and a decrease of 3.6 non-conservative care episodes per 1000 older adults (95% CI: -6.1, -1.0). An increase of one primary care physician was associated with a modest decrease of 2.5 (95% CI: -3.3, -1.6) conservative care episodes per 1000 older adults (Table 2).

DISCUSSION

Our study is among the first to empirically demonstrate how the makeup of the healthcare workforce can affect treatment of a condition such as low back pain — a condition for which treatment is often discretionary. Among the providers we examined, medical providers were more likely to increase the number of non-conservative care episodes (e.g., surgeons

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Table 1 Characteristics of Older Adults with Back Pain Prior to Relocation

| Characteristic | No. (%) or mean (SD) |
|---|----------------------|
| Sample size ^a , No. | 44,322 |
| Sociodemographic characteristics | |
| Mean age in years (SD) | 77.4 (7.7) |
| Sex, No. (%) | |
| Male | 13,233 (29.9) |
| Female | 31,089 (70.1) |
| Race, No. (%) | |
| White | 37,799 (85.3) |
| Black | 3542 (8.0) |
| Other | 2981 (6.8) |
| Health status | |
| No. of comorbidities (%) | |
| 0 or 1 | 36,354 (82.0) |
| 2 | 4525 (10.2) |
| 3 or more | 3443 (7.8) |
| No. of non-specific back pain episodes (%) | |
| 1 | 23,379 (52.8) |
| 2 | 9823 (22.2) |
| 3 or more | 11,120 (25.1) |
| Healthcare provider availability, mean (SD) | |
| No. of chiropractors per 10,000 | 17.9 (8.9) |
| No. of primary care physicians per 10,000 | 99.0 (36.8) |
| No. of spine surgeons per 10,000 | 1.8 (0.7) |

Abbreviations: SD, standard deviation

^aRestricted to older fee-for-service beneficiaries who had at least one episode prior to relocation

were associated with an increase in non-conservative care episodes). However, chiropractors (as an example of a non-medical provider) were associated with a higher number of conservative care episodes. Our findings may not be surprising given the association between practitioner characteristics (e.g., education and scope of practice) and the treatment administered.

There are several limitations that must be acknowledged.

Table 2 Association Between an Increase of One Healthcare Provider and Number of Conservative Versus Non-conservative Low Back Pain Episodes per 1000 Older Adults

| Additional 1 per 10,000 | No. of Episodes per 1000 Older Adults (95% CI) | |
|-------------------------|--|-------------------------------|
| | Conservative ^a | Non-conservative ^b |
| Primary care physicians | | |
| Unadjusted | -4.2 (-5.0, -3.3)*** | 0.4 (-0.3, 1.0) |
| Adjusted ^c | -2.5 (-3.3, -1.6)*** | 0.4 (-0.3, 1.0) |
| Spine surgeons | | |
| Unadjusted | -12.6 (-46.9, 27.4) | 30.8 (-0.2, 61.7) |
| Adjusted ^c | -22.6 (-60.0, 14.7) | 31.3 (0.4, 62.3)* |
| Chiropractors | | |
| Unadjusted | 20.6 (18.0, 23.2)*** | -3.7 (-6.2, -1.2)* |
| Adjusted ^c | 18.7 (16.1, 21.3)*** | -3.6 (-6.1, -1.0)* |

Abbreviations: CI, confidence interval. *P-value ≤ 0.05; **P-value < 0.01; ***P-value < 0.001

^aConservative care defined as evidence of non-steroidal anti-inflammatory medications, physical/occupational therapy, chiropractic care

^bNon-conservative care defined as evidence of diagnostic imaging, opioid prescriptions, spine surgery

^cAdjusted for age (continuous), sex, race, baseline provider access, and No. of episodes (baseline and post-relocation)

First, the population of older adults who relocated may not be broadly generalizable. Second, despite adjustment for differences, we were not able to control for clinical factors such as level of disability. Third, even after removing older adults with serious conditions that may warrant more aggressive diagnostic practices, our study is not able to fully evaluate the appropriateness of each service. Despite these inherent limitations, we believe these results further highlight the need for healthcare policymakers to consider how the composition of the workforce affects care.

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