


Influence of Initial Health Care Provider on Subsequent Health Care Utilization for Patients With a New Onset of Low Back Pain: A Scoping Review

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Abstract

Objective. The aim of this research was to examine the scope of evidence for the influence of a nonmedical initial provider on health care utilization and outcomes in people with low back pain (LBP).

Methods. Using scoping review methodology, we conducted an electronic search of 4 databases from inception to June 2021. Studies investigating the management of patients with a new onset of LBP by a nonmedical initial health care provider were identified. Pairs of reviewers screened titles, abstracts, and eligible full-text studies. We extracted health care utilization and patient outcomes and assessed the methodological quality of the included studies using the Joanna Briggs Institute checklist. Two reviewers descriptively analyzed the data and categorized findings by outcome measure.

Results. A total of 26,462 citations were screened, and 11 studies were eligible. Studies were primarily retrospective cohort designs using claims-based data. Four studies had a low risk of bias. Five health care outcomes were identified: medication, imaging, care seeking, cost of care, and health care procedures. Patient outcomes included patient satisfaction and functional recovery. Compared with patients initiating care with medical providers, those initiating care with a nonmedical provider showed associations with reduced opioid prescribing and imaging ordering rates but increased rates of care seeking. Results for cost of care, health care procedures, and patient outcomes were inconsistent.

Conclusions. Prioritizing nonmedical providers at the first point of care may decrease the use of low-value care, such as opioid prescribing and imaging referral, but may lead to an increased number of health care visits in the care of people with LBP. High-quality randomized controlled trials are needed to confirm our findings.

Impact. This scoping review provides preliminary evidence that nonmedical practitioners, as initial providers, may help reduce opioid prescription and selective imaging in people with LBP. The trend observed in this scoping review has important implications for pathways of care and the role of nonmedical providers, such as physical therapists, within primary health care systems.

Lay Summary. This scoping review provides preliminary evidence that nonmedical practitioners, as initial providers, might help reduce opioid prescription and selective imaging in people with LBP. High-quality randomized controlled trials are needed to confirm these findings.

Keywords: Direct Access, Initial Provider, Low Back Pain, Primary Health Care

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Introduction

Low back pain (LBP) is the number 1 cause of years lived with disability worldwide.¹ The personal, institutional, and societal-level health impacts of LBP contribute to substantial economic burden globally.² The preponderance of low-value care, defined as care that has minimal or no evidence of benefit when considered against potential harms, costs, or health care utilization,³ is thought to be central to the problem. International guidelines advocate for a demedicalization approach to nonspecific LBP, with a focus on higher-value care, including patient education, multidisciplinary rehabilitation, and exercise prescription.^{4–6} However, compliance with clinical guidelines across primary care is highly variable for LBP.⁷

The high prevalence of low-value care for LBP may be attributed to a multitude of factors, including limited access to care, lack of funding,⁸ patient care-seeking behavior,⁹ practitioner beliefs and treatment preferences,¹⁰ and health care systems that support a medicalization model of care.¹¹ Patients' entry point into the health care system and the type of practitioner patients see at the initial point of care may also contribute to low-value care decisions. As the gatekeepers to the health care system, the initial provider shapes patients' understanding of LBP, provides management strategies and reassurance, and identifies a course for recovery.¹² The risk of patients receiving low-value care is arguably most critical at this stage because it can alter the patients' journey through the health care system. For example, patients with LBP without indicators of serious pathology (eg, cancer, cauda equine syndrome) who are referred for early imaging or prescribed opioid medication are more likely to develop prolonged work disability,¹³ incur higher medical costs, and undergo surgery.¹⁴ When low-value care is received (ie, opioid prescription, imaging, and medical subspecialty referral) within 3 weeks of initial visit, patients with acute LBP are more than twice as likely to develop chronic pain compared with those who receive none.¹⁵

Current research indicates that one-quarter of patients with LBP will be referred to imaging and 30% prescribed opioids when initiating care with primary care physicians in general practice.¹⁶ Initiating care with health care practitioners who provide musculoskeletal care (eg, chiropractors and physical therapists) or nonphysician providers who can perform triage roles for musculoskeletal conditions in the public health system (eg, nurses) offers an alternative encounter that may favorably influence health care utilization and patient outcomes. These practitioners have been collectively referred to as “nonmedical” health care providers^{17,18} in this scoping review to distinguish them from medical physicians. Recent systematic reviews comparing physician-led care to direct-access physical therapy,¹⁹ or nonmedical models of care²⁰ (triage, self-referral, and direct access), provide evidence that nonmedical initiated care may improve health care utilization and costs but not patient outcomes such as pain. These reviews focused on patients with musculoskeletal pain of any duration. By focusing on a LBP population with a new episode of care, this review seeks to highlight the impact of the initial encounter at a critical point of care.

To the authors' knowledge, no comprehensive review has been conducted on this topic. The objective of this review is to examine the scope of evidence for the influence of nonmedical initial provider on health care utilization and outcomes in

patients with LBP and identify gaps in the literature to guide future research directions.

Methods

This review follows the methodological framework set out by the Joanna Briggs Institute for scoping reviews²¹ and was conducted and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews.²² The protocol was registered with the Open Science Framework. For deviations from the protocol see [Figure 1](#).

Search Strategy

An academic librarian helped construct the search strategy following identification of relevant articles and key terminology in a preliminary database search. A combination of MeSH and search terms served to capture initial provider interactions. Terms were intentionally broad and covered provider types, health care pathways, and more direct terminology such as “initial provider” that had been highlighted during the preliminary search (see [Suppl. Material 1](#) for full search strategy). We conducted an electronic search in MEDLINE from inception to April 2020 and adapted for CINAHL, Embase, and AMED. Examination of the reference lists for pertinent studies and citation tracking was conducted to detect additional studies. The searches were updated in June 2021 using the same search strategy.

Participants

This review considered adult patients with a new onset or new episode of LBP as defined by the authors of the original studies. Studies on patients with traumatic, postsurgical injuries or chronic LBP as well as more serious pathologies requiring specific treatment (eg, malignancy/tumor, inflammatory arthritis such as ankylosing spondylitis, or cauda equina/spinal cord injuries) were excluded from the review.

Concept

Nonmedical health care providers were defined as any provider who is not a medical specialist (ie, not a primary care physician, general practitioner, orthopedic surgeon, sports physician, or physiatrist). Studies were included if they met the following 3 criteria: (1) assessment or treatment of patients with LBP initiated by a nonmedical health care provider delivering usual care; (2) inclusion of any comparator group (ie, usual care, preintervention or historical data, or specialty or medical care); and (3) a measure of health care utilization or patient outcome including, but not limited to, medication intake, use of imaging, care-seeking behavior, use of health care procedures, cost of care, pain, disability, and patient satisfaction measures.

Context

There was no restriction on country or health care setting.

Sources of Evidence

Published studies in peer-reviewed scientific journals were eligible for inclusion. Commentaries and editorials were excluded.

Deviations From the Protocol

As set out a priori, the original aims of this scoping review included examining the influence of nonmedical triage and clinical decision support systems on subsequent health care utilization in patients with a new onset of low back pain. After screening of titles, 11 studies investigating the initial provider and 7 studies investigating nonmedical triage were identified. No studies pertaining to clinical decision support systems met the inclusion criteria. After consultation with the research team, it was decided that studies pertaining to nonmedical triage expanded little on previous scoping review findings¹⁷ and would be removed from the review.

After assessing article eligibility, we reviewed critical appraisal tools and determined that the Joanna Briggs Institute critical appraisal checklist for cohort studies⁷² was more appropriate than the Newcastle-Ottawa Scale,⁷³ based on recently published research.⁷⁰

Figure 1. Deviations from the protocol.

Study Selection

All studies identified in the search strategy were exported into reference manager software and deduplicated. Title and abstracts were independently screened by 2 pairs of reviewers. Reconciliation of screening was performed at regular intervals throughout the screening process. Full-text articles were retrieved and assessed for eligibility by 2 pairs of reviewers. If consensus could not be reached within the review team, the senior author (P.F.) was consulted to assist with any disagreements.

Data Extraction

Data were independently extracted by 2 reviewers using a customized data extraction form developed for this review (Tab. 1). When applicable, statistical findings relating to key outcomes were included in the data extraction process.

Analyses and Data Presentation

Analyses followed 3 stages as set a priori. First, a descriptive analysis of study characteristics including primary objectives, population sample, study design, setting, type of initial health care provider, and comparator was conducted. Second, health care utilization and patient outcomes pertaining to the initial health care provider were analyzed. Two reviewers analyzed the data from included studies and categorized findings into health care utilization outcomes (subcategorized on the basis of common outcome measures) and patient-related outcome measures. Third, key findings related to gaps in the literature and future research directions were discussed with the senior author (P.F.), and the written summary was reviewed by the research team.

Quality Assessment

The Joanna Briggs Institute critical appraisal checklist for cohort studies was used to determine potential bias in the design, conduct, and analyses of individual studies. It consists

of an 11-item checklist with possible responses, including “yes,” “no,” “unclear,” or “not applicable,” for each criterion.²¹ Eligible studies were independently reviewed by 2 authors, and any discrepancies were resolved by consensus or consultation with the senior author (P.F.). Studies were not excluded based on quality appraisal findings.

Results

Search Results

The search yielded 31,883 citations, reduced to 26,462 with duplicates removed (Fig. 2). After title and abstract screening, 138 articles were eligible. A full-text review identified 11 articles pertaining to a nonmedical initial provider, and these were included in this review.

Quality Assessment

Results of the quality assessment are summarized in Tab. 2. Four of the 11 studies satisfied all criteria in the Joanna Briggs Institute checklist, indicating low risk of bias.^{24–27} The primary quality flaws of the remaining studies were lack of clarity of baseline comparisons between groups,^{28–31} not explicitly identifying confounding factors,^{29,30} and participants not being free of a measured outcome (pain medication) at the beginning of a study.³⁰ Nine of the 11 studies^{23–28,31–33} made adjustments for confounding variables.

Description of Included Studies

Key study characteristics are summarized in Tab. 3. All studies identified were observational and primarily used retrospective claims-based data. Ten studies were conducted in the United States and 1 study completed in Australia.²⁸ In all 11 studies, initial health care consultation was defined as the entry visit or first contact between patient and health care practitioner following a new episode of LBP. The most common nonmedical

PRISMA Flow Diagram

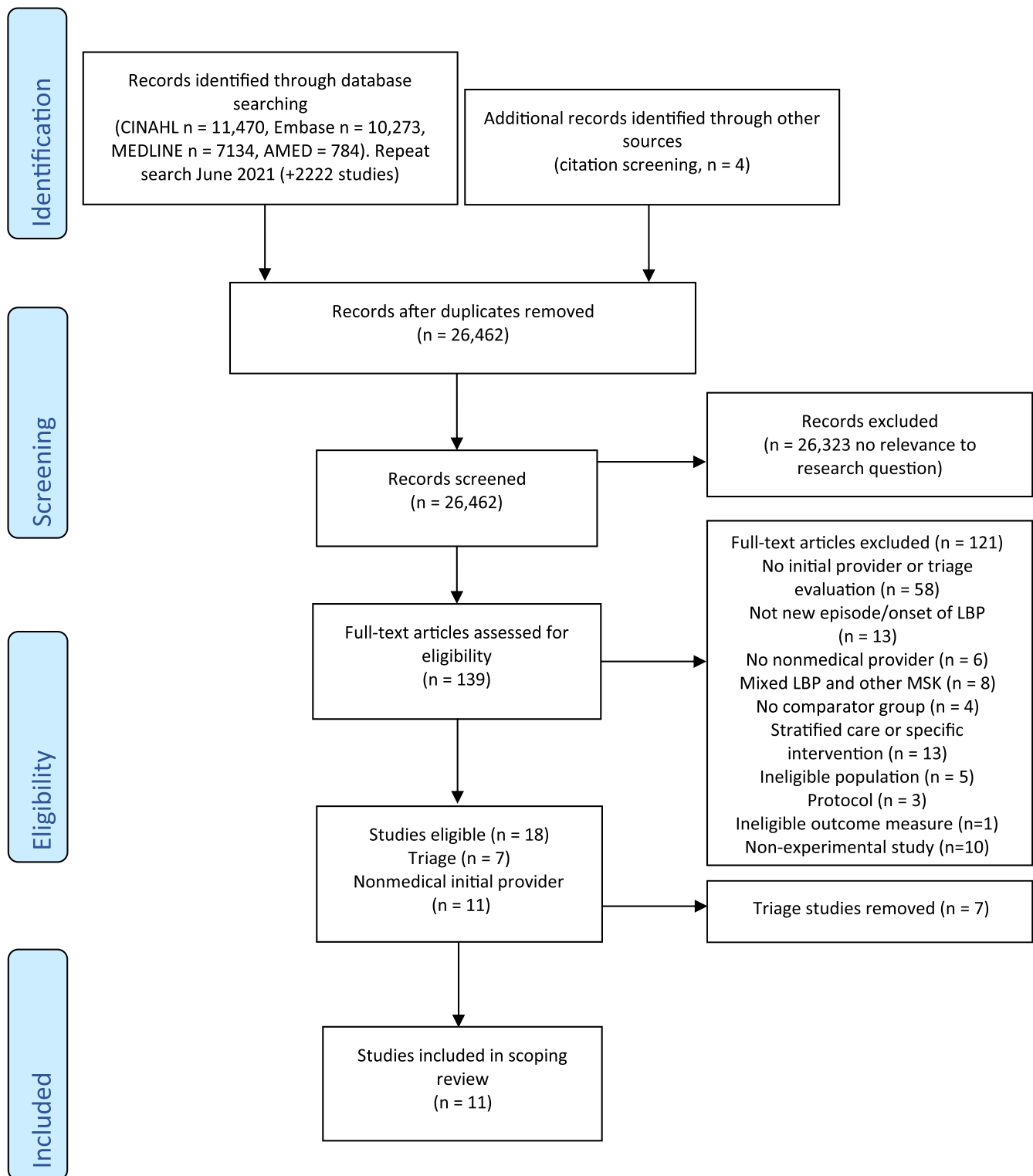


Figure 2. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) search flowchart of included studies. LBP = low back pain; MSK = musculoskeletal conditions.

Table 1. Draft Extraction Template

| Study | Country | No. and Source of Participants | Setting | Objectives | Provider Type (Nonmedical) | Comparator | Definition of Episode of Care | Duration | Outcomes Relating to Health Care Utilization | Secondary Outcomes Measured | Key Findings Relating to Primary Outcome | Key Findings Relating to Secondary Outcome |
|----------------------------------|---------------|---|--------------|---|----------------------------|--|---|-------------------------|--|--|--|--|
| Carey et al ²³ (1995) | United States | 1555 consecutively selected patients 208 randomly selected primary care providers (87 physicians, 64 chiropractors, 29 orthopedic surgeons, 28 health maintenance organization providers) | Primary care | To determine whether outcomes and charges vary according to type of provider initially seen for an episode of acute low back pain | Chiropractor | Primary care physician, orthopedic surgeon | No low back pain in 2 mo preceding current episode; people who had not previously seen a health care provider for current episode | 6 mo from initial visit | Medication prescription, radiography, advanced imaging, cost of care, hospitalization, frequency of visits | Function measured by Adapted Sickness Impact Profile; patient satisfaction with care | Average no. of prescriptions or over-the-counter medications was lower among patients initiating care with chiropractors than with medical practitioners (2.3 vs 3.5 medications; $P < .001$) | No clinically significant differences in time to functional recovery (patient reported) measured among different initial provider entry points |

Table 2. Quality Appraisal of Included Studies Using the JBI Critical Appraisal Checklist for Cohort Studies⁶

| Study | Answer to the Following Critical Appraisal Question: | | | | | | | | | |
|---|---|--|--------------------------------------|--|---|---|--|---|---|--|
| | Were the 2 Groups Similar and Recruited From Same Population? | Were the Exposures Measured Similarly to Assign People to Both Exposed and Unexposed Groups? | Were Confounding Factors Identified? | Were Strategies to Deal With Confounding Factors Stated? | Were Participants Free of Outcome at Start of Study (or at Moment of Exposure)? | Were Outcomes Measured in Valid and Reliable Way? | Were Time Reported and Long Outcomes to Occur? | Were Complete and, If Not, Were Reasons for Loss to Follow-up Described and Explored? | Were Strategies to Address Incomplete Follow-up Used? | Was Appropriate Statistical Analysis Used? |
| Carey et al ²³ (1995) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | Unclear | Yes |
| Sundararajan et al ³³ (1998) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | Unclear | Yes |
| Liliedahl et al ²⁹ (2010) | Unclear | Yes | No | Unclear | Yes | Yes | Yes | N/A | N/A | Unclear |
| Henschke et al ²⁸ (2013) | Unclear | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Unclear | Yes |
| Fritz et al ²⁴ (2015) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | Yes |
| Fritz et al ²⁵ (2016) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | Yes |
| Frogner et al ³⁰ (2018) | Unclear | Yes | No | Unclear | No | Yes | Yes | N/A | N/A | Yes |
| Azad et al ³¹ (2019) | Unclear | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | Yes |
| Kazis et al ²⁷ (2019) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | Yes |
| O'Reilly-Jacob et al ³² (2019) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | Yes |
| Garrity et al ²⁶ (2020) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A | N/A | Yes |

⁶JBI = Joanna Briggs Institute; N/A = not applicable.

providers identified were physical therapists and chiropractors, with 1 study investigating nurse practitioners.³² Primary care physician was the main comparison group in 10 of the 11 studies. Frogner et al³⁰ used a comparison group with a mixed pool of providers (chiropractors, orthopedists, and acupuncturists).

Study outcomes were categorized into 6 areas: medication (5 studies), imaging (5 studies), care seeking (3 studies), cost of care (6 studies), health care procedures and hospitalizations (3 studies), and patient outcomes (2 studies). Table 4 presents the key findings regarding the influence of initial provider on primary and secondary health care outcomes.

Review Findings

Medication

Five studies reporting data on medication showed an associated reduction in medication prescription when LBP patients initiated care with a nonmedical provider compared with a medical provider^{23,24,27,31} or a mixed group of providers.³⁰ Studies demonstrated that initiating patient care with a nonmedical provider was associated with a reduction in both short-term^{24,27,31} and long-term^{27,31} opioid prescriptions compared with initiating care with a medical provider. For example, Azad et al³¹ observed a 50% lower risk (hazard ratio = 0.5 [95% CI = 0.49–0.5]; $P < .0001$) of receiving an early opioid prescription and a 55% lower risk (hazard ratio = 0.45 [95% CI = 0.43–0.46]; $P < .0001$) of receiving a long-term opioid prescription when LBP patients initiated care with a nonmedical provider versus a primary care physician. Carey et al²³ observed that the average number of prescriptions or over-the-counter medications (ie, nonsteroidal antiinflammatories) per episode of LBP was lower for patients initiating care via a chiropractor than for those initiating care via a medical provider (2.3 vs 3.5 medications; $P < .001$). Table 4 presents the key findings regarding the influence of the initial provider on primary or secondary health care outcomes.

Care Seeking

Three studies reported measures of care seeking, including number of visits to a health care provider per episode of care,²³ number of multiple providers used,³³ and duration of episode of care.²⁵ Results from these studies showed that care initiated by a chiropractor was associated, on average, with 5 more visits (mean number of chiropractor visits = 10; mean number of primary care physician visits = 5) ($P = .001$)²³ and increased care duration (standardized $\beta = .51$ [95% CI = 0.27–0.76]; $P < .001$)²⁵ per LBP episode than care initiated by a primary care physician. Using secondary analysis of previous study data, Sundararajan et al³³ observed that 19% (95% CI = 16%–23%) of patients initiating care with a chiropractor sought care from multiple providers compared with 14% (95% CI = 11%–17%) for private primary care physicians and 9% (95% CI = 5%–14%) for network primary care physicians. Initiating care with a physical therapist showed no differences in care duration compared with initiating care with a primary care physician.²⁵

Cost of Care

The components of the cost of care per episode of LBP were consistent across the 6 studies, including this outcome, and included a sum of direct costs relating to imaging, medication, consultations, related health care procedures, and inpatient

charges. Costs were calculated using state-wide averages²³ or recorded costs from claims databases.^{24–26,29,30} When chiropractor- and physical therapist-initiated care for LBP patients were compared with primary care physician data, the results were conflicting. Two studies indicated an increased cost^{23,26}; for example, Garrity et al²⁶ showed 14% higher (95% CI = 5%–22%) LBP-related costs for patients initiating care with a physical therapist than for those initiating care with a primary care physician. Two studies found reduced costs^{24,29}; for example, Fritz et al²⁴ showed that physical therapists incurred reduced costs (\$335 [95% CI = \$241–\$429]) compared with primary care physicians (\$533 [95% CI = \$470–\$598]). Two studies found no difference in total costs of care between nonmedical providers and primary care physicians.^{25,30}

Imaging

Five studies reported on the use of radiography and advanced imaging (computerized tomography and magnetic resonance imaging). Imaging rates differed by the type of nonmedical provider. There was an associated reduction in advanced imaging rates for patients initiating care with a chiropractor compared with a medical provider. Fritz et al²⁵ observed that patients seeing a chiropractor were 79% less likely (odds ratio = 0.21 [95% CI = 0.08–0.50]) to receive advanced imaging than patients seeing a primary care physician. Carey et al²³ observed a reduction (8% vs 17%; $P = .004$) in advanced imaging when comparing chiropractor-initiated care with orthopedist-initiated care. The same studies had conflicting results for plain-film radiography rates.

Three studies showed a reduction in radiographs when patients initiated care with physical therapists compared with primary care physicians^{24,25} or a mixed group of initial providers.³⁰ For example, Fritz et al²⁴ observed reduced odds of radiographs (odds ratio = 0.32 [95% CI = 0.15–0.65]; $P < .001$) for patients initiating care with a physical therapist than with a primary care physician. Results from these studies were inconsistent for the use of advanced imaging. One study compared rates of imaging between primary care physicians and nurse practitioners and observed similar rates of low-value imaging after an initial visit for LBP.³²

Health Care Procedures

Health care procedures described in original studies included epidural injections, emergency department visits, surgery, spine surgeon consultations, and hospitalizations. Two studies comparing patients initiating care with a nonmedical provider versus a primary care physician showed no difference in the odds of receiving an epidural injection or visiting an emergency department.^{24,25} Frogner et al³⁰ found that patients who initiated care with a physical therapist showed a 38.3% (SE = 0.052; $P < .001$) reduction in their probability of emergency department visits but a 19.3% (SE = 0.03; $P < .001$) increase in their probability of hospitalization associated with physical therapist care. Two studies investigated surgical rates and observed that no patients who had LBP and initiated care with a physical therapist underwent surgery in the 12-month follow-up period.^{24,25} By contrast, patients initiating care with a physical therapist were 4.75 (95% CI = 1.42–16.0; $P = .012$) times as likely to undergo surgery as those initiating care with a primary care physician. Fritz et al²⁵ also observed reduced odds (odds ratio = 0.18 [95% CI = 0.03–0.53]; $P = .005$) of surgical consultations for

Table 3. Initial HCP Primary Study Characteristics^a

| Study | Country | No. and Source of Participants | Setting | Research Aims | Nonmedical Provider Type | Comparator | Definition of Episode of Care | Duration | Outcomes Relating to Health Care Utilization | Secondary Outcomes Measured |
|---|---------------|--|---------------------------------|---|----------------------------------|----------------------------|---|--------------------------|--|--|
| Carey et al ^{2,3} (1995) | United States | 1555 consecutively selected patients; 208 randomly selected PCPs (87 PCPs, 64 chiropractors, 29 orthopedic surgeons, 28 health maintenance organization providers) | Primary care | To determine whether outcomes and charges vary according to the type of provider initially seen for an episode of acute LBP | Chiropractor | PCP, orthopedic surgeon | No LBP in 2 mo preceding current episode; people who had not HCP for current episode | 6 mo from initial visit | Medication prescription, radiography, advanced imaging, cost of care, hospitalization, frequency of visits | Function measured by Adapted Sickness Impact Profile; patient satisfaction with care |
| Sundararajan et al ³³ (1998) | United States | 1580; secondary analyses of data from Carey et al ²³ (1995) | Primary care | To describe patterns of provider use associated with an acute episode of nonspecific LBP and their impact on cost | Chiropractor | PCP, orthopedic surgeon | No LBP in 2 mo preceding current episode; people who had not HCP for current episode | 6 mo from initial visit | Seeking care from multiple providers and cost of care | None |
| Liliedahl et al ²⁹ (2010) | United States | 85,402; Blue Cross Blue Shield of Tennessee claims database of fully insured patients (unrestricted access to primary and specialty providers); October 1, 2004–September 30, 2006 | Primary care, ED | To determine whether there are differences in the cost of LBP care when a patient is able to choose a course of treatment with a medical doctor vs a doctor of chiropractic | Chiropractor | PCP (including osteopaths) | All reimbursed care delivered between first and last encounters with HCP for LBP; clean period of 60 d of no HCP use prior to current episode | Unspecified | Cost of care | None |
| Henschke et al ²⁸ (2013) | Australia | 1328; secondary analyses of cohort study with consecutive patient selection | Primary care | To determine predictors of satisfaction with care and symptoms in patients with acute LBP 1 y after presentation to primary care | Physical therapist, chiropractor | PCP | No experience of an episode of back pain in month prior to presentation | 12 mo after index visit | None | Satisfaction with care |
| Fritz et al ²⁴ (2015) | United States | 2289; University of Utah Healthy U Medicaid managed health plan database; January 1, 2012–December 30, 2012 | Primary care, ED | To examine physical therapy utilization by Medicaid enrollees with new LBP consultations and to evaluate associations with future health care utilization and LBP-related costs | Physical therapist | PCP and ED entry | No LBP-related claims in preceding 90 d | 12 mo from initial visit | Radiography, advanced imaging, ED visits, epidural injections, surgery, cost of care | None |
| Fritz et al ²⁵ (2016) | United States | 747; University of Utah database enrollees with private employer-based coverage; January 1, 2012–January 31, 2013 | Primary care and secondary care | To explore associations between entry settings and future LBP-related utilization and costs | Physical therapist, chiropractor | PCP | New consultation for LBP in which no charges associated with LBP received in 90 d prior to entry visit | 12 mo from initial visit | Radiography, advanced imaging, ED care, epidural injections, surgeon visit, surgery, cost of care | None |

(continued)

Table 3. Continued

| Study | Country | No. and Source of Participants | Setting | Research Aims | Nonmedical Provider Type | Comparator | Definition of Episode of Care | Duration | Outcomes Relating to Health Care Utilization | Secondary Outcomes Measured |
|---|---------------|--|----------------------------------|---|--|--|--|--------------------------|--|-----------------------------|
| Frogner et al ³⁰ (2018) | United States | 148,866; Healthcare Cost Institute claims database of patients with private insurance; 2009–2013 | Primary care, secondary care, ED | To compare differences in opioid prescription, health care utilization, and costs among patients who had LBP and who saw a physical therapist at the first point of care, at any time during the episode, or not at all | Physical therapist | Delayed physical therapy or no physical therapy (including a mix of chiropractors, orthopedists, and acupuncturists) | Patients with new LBP diagnosis from “index date” that followed 6-mo clean period in which no visits for LBP | 12 mo from initial visit | Opioid prescription, radiography, advanced imaging, ED care, hospitalization, costs | None |
| Azad et al ³¹ (2019) | United States | 478,981; Truven Health Marketscan Commercial claims and Encounters database (primarily comprising patients with private insurance); June 1, 2009–December 31, 2011 | Primary care, secondary care, ED | To determine whether provider specialty influences patterns of opioid use long after the initial diagnosis | Physical therapist, chiropractor, nurse practitioner, acupuncturist, physician assistant | PCP | Defined as first visit at which enrollee had claim with ICD-9 code that met criteria of LBP or lower extremity radicular pain, without any of these codes in 12 mo prior to presentation | 12 mo from initial visit | Opioid prescription | None |
| Kazis et al ²⁷ (2019) | United States | 216,504; OptumLabs Data Warehouse. Database of commercial and Medicare Advantage enrollees; 2008–2013 | Primary care, secondary care, ED | To examine the association of initial provider treatment with early and long-term opioid use in a national sample of patients with new-onset LBP | Physical therapist, chiropractor, acupuncturist | PCP | New-onset LBP defined as no diagnosis of LBP or back procedures, including spinal surgery, spinal injections, and spinal nerve stimulators, during 12-mo period prior to index event | 12 mo from initial visit | Opioid prescription | None |
| O'Reilly-Jacob et al ³² (2019) | United States | 45,295; Medicare claims database from 18 Dartmouth Atlas of Healthcare hospital referral regions; 2012–2013 | Primary care | To compare the rates of low-value back images ordered by primary care physicians and primary care nurse practitioners after primary care visits for first-time back pain | Nurse practitioner | PCP | Patients without recent history of back pain or back hospitalizations | 30 d from initial visit | Radiography, advanced imaging | None |
| Garrity et al ²⁶ (2020) | United States | 60,598; OptumLabs Data Warehouse. Database of commercial and Medicare Advantage enrollees; 2008–2013 | Primary care | To evaluate the association of level of access to physical therapist services with LBP-related health care utilization and costs | Physical therapist (in restricted- and unrestricted-access states) | PCP | New-onset LBP defined as primary LBP claim and no prior claims with diagnosis of LBP or prior back procedures, including spinal surgery, spinal injections, and spinal nerve stimulators, during 12-mo period prior to index event | 90 d from initial visit | Cost of care (physical therapist vs PCP); physician visits, radiography, advanced imaging, and back procedures analyzed between access levels only | None |

^aED = emergency department; HCP = health care provider; ICD-9 = International Classification of Diseases, Ninth Revision; LBP = low back pain; PCP = primary care physician.

Table 4. Key Findings Regarding Influence of Initial Provider on Primary and Secondary Health Care Outcomes^a

| Category | Study | Health Care Outcomes per Episode of Care |
|-----------------------------|---|--|
| Care seeking | Carey et al ²³ (1995) | Mean no. of visits associated with initiation of care significantly higher with DCs than with medical providers (mean visits in rural/urban areas = 10.1/15 for DCs vs 4.6/4.4 for PCPs; $P = .001$) |
| | Sundararajan et al ³³ (1998) | Patients who saw HMO providers least likely to see multiple providers during an episode of care for LBP (9% [95% CI = 5% to 14%]), whereas patients who initiated care with orthopedic surgeons most likely to do so (30% [95% CI = 23% to 37%]); of those who initiated care with DCs and PCPs, 19% (95% CI = 16% to 23%) and 14% (95% CI = 11% to 17%), respectively, sought care from other health care providers |
| | Fritz et al ²⁵ (2016) | Duration of episode of care with initial visit in DC setting longer than that with initial visit in primary care setting (standardized $\beta = 0.51$ [95% CI = 0.27 to 0.76]; $P < .001$) |
| Medication use/prescription | Carey et al ²³ (1995) | Average no. of prescriptions or over-the-counter medications lower among patients initiating care with DCs than among those initiating care with medical practitioners (2.3 vs 3.5 medications, respectively; $P < .001$) |
| | Fritz et al ²⁴ (2015) | Odds of receiving opioid medication early significantly lower for patients entering via physical therapy (OR = 0.5 [95% CI = 0.28 to 0.89]; $P = .02$) than for those entering via primary care (combined PCP, ED, and psychiatry) |
| | Frogner et al ³⁰ (2018) | Patients who had physical therapy first had an 89.4% (SE = 0.053; $P < .001$) reduced probability of receiving an opioid prescription than those who had no physical therapy or physical therapy later |
| | Azad et al ³¹ (2019) | Compared with patients who initiated care with PCP, those who initiated care with nonmedical provider less likely to receive an early opioid prescription (HR = 0.5 [95% CI = 0.49 to 0.5]; $P < .0001$) and less likely to receive a third opioid prescription (HR = 0.45 [95% CI = 0.43 to 0.46]; $P < .0001$) |
| | Kazis et al ²⁷ (2019) | Compared with patients who initiated care with PCP, patients who initiated care with DC (OR = 0.1 [95% CI = 0.09 to 0.1]; $P < .01$), acupuncturist (OR = 0.09 [95% CI = 0.07 to 0.12]; $P < .01$), or physical therapist (OR = 0.15 [95% CI = 0.13 to 0.17]; $P < .01$) had significantly lower odds of early opioid use; this result also seen with long-term opioid use (for DC: OR = 0.22 [95% CI = 0.15 to 0.48] [$P < .01$]; for acupuncturist: OR = 0.07 [95% CI = 0.01 to 0.48] [$P < .01$]; for physical therapist: OR = 0.27 [95% CI = 0.15 to 0.48] [$P < .01$]) |
| | Carey et al ²³ (1995) | No. of radiographs higher per episode of care for patients initiating care with DCs and orthopedic surgeons (67%–72% of patients) than for those initiating care with PCPs (26%–32% of patients) ($P = .001$); use of advanced imaging lower for patients seeing DCs (7%–8%) and going to HMO (6%) than for patients seeing an orthopedist (17%) ($P = .004$) |
| Imaging | Fritz et al ²⁴ (2015) | Relative to primary care, physical therapy as entry setting associated with lower odds of radiography (OR = 0.32 [95% CI = 0.15 to 0.65]; $P < .001$); no statistical difference seen in advanced imaging rates |
| | Fritz et al ²⁵ (2016) | Relative to primary care, physical therapy as entry setting associated with decreased risk of radiography (OR = 0.39 [95% CI = 0.18–0.84]), but no statistical difference in advanced imaging rates; chiropractic as entry setting associated with decreased risk of advanced imaging rates (OR = 0.21 [95% CI = 0.08 to 0.50]), but no statistical difference in radiography |
| | Frogner et al ³⁰ (2018) | Patients who had physical therapy as first point of care had 29.7% (SE = 0.045; $P < .001$) reduced probability of having advanced imaging and 16.6% (SE = 0.056; $P < .001$) reduced probability of having radiography than those who had no physical therapy or physical therapy later |
| | O'Reilly-Jacob et al ³² (2019) | No significant difference in rates of low-value back images between primary care medical doctors (24.5% [IQR = 11%–38%]) and primary care nurse practitioners (26.5% [IQR = 7%–40%]) after initial consultation |
| | Carey et al ²³ (1995) | Care initiated by urban chiropractors (adjusted mean = \$783 [95% CI = \$698 to \$868]) and orthopedists (adjusted mean = \$746 [95% CI = \$633 to \$858]) had highest costs per episode of LBP compared with care initiated via urban primary care providers (adjusted mean = \$508 [95% CI = \$418 to \$598]) |
| Cost of care | Liliedahl et al ²⁹ (2010) | Mean cost per episode significantly lower for care initiated with chiropractor (\$532.54 [SE = \$9.56]) than initiated with medical doctor (\$661.10 [SE = \$29.16]) |
| | Fritz et al ²⁴ (2015) | Physical therapy as entry point of care associated with significantly lower health care costs over 12 mo (\$335 [95% CI = \$241 to \$429]) than primary care (\$533 [95% CI = \$470 to \$598]) |
| | Fritz et al ²⁵ (2016) | Care initiated via physical therapy (standardized $\beta = -0.21$ [95% CI = -0.63 to 0.2]; $P = .34$) and chiropractic (standardized $\beta = -0.28$ [95% CI = -0.058 to 0.021]; $P = .07$) not associated with statistically significant differences in cost compared with care initiated via primary care |
| | Frogner et al ³⁰ (2018) | Care initiated via physical therapy associated with higher provider costs but lower pharmacy, outpatient, and out-of-pocket costs than care not initiated via physical therapy; total costs did not differ between patients who did and patients who did not initiate care via physical therapy |
| | Garrity et al ²⁶ (2020) | The 90-d cost ratio higher for care initiated via physical therapy in both provisional access states (1.28 [95% CI = 1.20 to 1.36]) and unrestricted states (1.14 [95% CI = 1.05 to 1.23]) than for care initiated via primary care |

(continued)

Table 4. Continued

| Category | Study | Health Care Outcomes per Episode of Care |
|---|-------------------------------------|--|
| Health care procedures and hospitalizations | Frogner et al ³⁰ (2018) | Patients who had physical therapy first had 38.3% (SE = 5.2%; $P < .001$) reduced probability of ED visits but 19.3% (SE = 3.0%; $P < .001$) increased probability of hospitalization |
| | Fritz et al ²⁴ (2015) | Physical therapy as initial management not associated with statistically significant difference in odds of receiving an injection (OR = 0.36 [95% CI = 0.04 to 2.99]; $P = .35$) or having ED visit (OR = 0.46 [95% CI = 0.18 to 1.18]; $P = .11$) compared with primary care; no patients who initiated care via physical therapy had surgery |
| | Fritz et al ²⁵ (2016) | Care initiated via physical therapy (OR = 0.36 [95% CI = 0.05 to 2.82]) and chiropractic (OR = 0.42 [95% CI = 0.10 to 1.80]) had no significant effect on ED care or odds of injection compared with care initiated via primary care; care initiated via chiropractor had reduced odds (OR = 0.13 [95% CI = 0.03 to 0.53]) of spinal surgeon consultation; no patients who initiated care via physical therapy had surgery |
| Patient outcomes | Carey et al ²³ (1995) | No clinically significant differences in time to functional recovery (patient reported) measured among different initial provider entry points; patient satisfaction levels for initiation of care with chiropractor vs PCP or orthopedic or HMO provider were: information given (47.1% vs 30.2%; $P < .001$), treatment of back problem (52.1% vs 31.5%; $P < .001$), outcomes (42.1% vs 26.5%; $P < .001$), detailed history of back pain (88.4% vs 68.4%; $P < .001$), careful examination of back (96.1% vs 79.9%; $P < .001$), and cause of problem clearly explained (93.6% vs 74.6%; $P < .001$) |
| | Henschke et al ²⁸ (2013) | No statistically significant differences in satisfaction with care (OR = 0.81 [95% CI = 0.58 to 1.12]; $P = .2$) or satisfaction with symptoms (OR = 0.98 [95% CI = 0.73 to 1.33]; $P = .916$) between care initiated via PCP and that initiated via physical therapist |

^aDC = chiropractor; ED = emergency department; HCP = health care practitioner; HMO = health maintenance organization; HR = hazard ratio; IQR = interquartile range; LBP = low back pain; OR = odds ratio; PCP = primary care physician.

patients who initiated care via a chiropractor compared with those who initiated care via a primary care physician.

Patient Outcomes

Two studies assessed patient outcomes including satisfaction with care^{23,28} and functional recovery.²³ When patients initiated care with a physical therapist compared with a primary care physician,²⁸ no difference in satisfaction with care was observed. In contrast, another study²³ reported that patients who initiated care via chiropractors were more satisfied with all aspects of care than patients who initiated care via medical providers (satisfaction with care provided by chiropractors was 42.1%, and that with care provided by physicians was 26.5%; $P < .001$). In a study of functional recovery in LBP,²³ no statistical difference in time to functional recovery among the 6 different entry providers (urban and rural chiropractors, urban and rural primary care physicians, orthopedists, and network primary care physicians) was observed for patients with LBP.

Discussion

This scoping review identified 11 observational studies that investigated the influence of initial management of LBP patients by nonmedical health care providers, primarily compared with physicians, on the outcomes of medication prescription, care seeking, cost of care, health care procedures, imaging, and patient outcomes.

The absence of any randomized controlled trial identified in this scoping review prevents strong conclusions on the efficacy of nonmedical initiated care. However, consistent associations for reduced rates of short-term^{24,27,31} and long-term^{27,30,31} opioid prescriptions as well as selective imaging (radiography for physical therapists^{24,25,30} and advanced imaging for chiropractors^{23,25}) identified in this review suggest that there

may be benefits associated with initiating care with a nonmedical provider compared with a medical provider for patients with a new episode of LBP. Potential disadvantages could include the increased rate of care seeking^{23,25,33}; however, the strength of this finding is limited by the inclusion of 2 studies using the same data set.^{23,33} There were inconsistent results for cost of care, health care procedures, or patient outcomes.

The results in this review should be interpreted within the setting that the observational studies were primarily conducted, which was the United States (10/11 studies). For example, the reduction in opioid prescriptions and imaging referrals may reflect the lack of prescribing rights ascribed to nonmedical practitioners as well as barriers to referrals for imaging compared with medical providers, with various states, provider settings, and insurance companies dictating the ability to request images directly.²⁵ Additionally, payment for nonpharmacological treatments for LBP among included studies is likely to be impacted by variable public and private insurance coverage unique to this setting.³⁴ Examining alternate pathways that patients access health care, such as referral to nonmedical care^{35,36} and nonmedical models of care,^{19,20} provides some context to the findings from this review.

A previous systematic review investigating the timing of nonmedical care for patients with LBP compared early physical therapy (within 30 days of the index visit to a medical provider) with both delayed physical therapy (>30 days of the index visit) and usual care.³⁷ Early physical therapy resulted in reduced imaging, opioid prescription, and downstream costs compared with delayed physical therapy. However, compared with usual care, early physical therapy did not demonstrate consistent associations with health care utilization outcomes, including imaging and opioid prescription. Two randomized controlled trials included in the review showed higher costs for patients in the early physical therapy arm.^{38,39} The contrasting findings with this scoping review may be explained by both timing and access to care. It is possible that

nonpharmacological pain management and education strategies delivered by nonmedical practitioners are effective in reducing opioid prescribing and imaging referrals when offered at the entry point of care compared with the same strategies offered after consultation with a medical practitioner. However, the characteristics of patients who seek out nonmedical care for LBP, such as higher education and income levels,^{40,41} may differ from those of patients who are referred by medical practitioners and may favorably influence the likelihood that these patients will be prescribed opioids or referred for imaging. Supporting this argument, results from a recent systematic review investigating nonmedical models of care (triage, self-referral, and direct access) in patients with musculoskeletal pain suggest that patients who “self-referred” to physical therapy care were slightly younger, were more educated, and had a better socioeconomic status than those who initiated care via the usual medical team–led care model.²⁰

Gaps in the Research

Potential influences on access to nonmedical care such as government policy,⁴² funding,³⁴ health care systems,¹¹ remoteness, and public awareness⁴³ are important elements to consider when interpreting the pragmatic impact of the initial provider on outcomes for LBP patients. Within this review, only 1 study investigated the impact of access on medical compared with nonmedical care.²⁶ Results from this study indicated that patients living in states with provisional access to physical therapy consulted physicians at a 41% higher rate (95% CI=1.00–1.99; $P=.05$) and had increased odds of plain imaging in the first 30 days after consultation (odds ratio = 1.58 [95% CI=1.03–2.42]; $P=.03$) compared with patients with unrestricted access to physical therapy. With only 20 states in the United States classified as having unrestricted direct access to physical therapy care,⁴⁴ this issue may be an important consideration when interpreting results for care initiated via nonmedical personnel in different settings.

This review did not identify any studies investigating the impact of nonmedical initiated care for LBP patients outside of primary care. Nonmedical practitioners are afforded advanced scope of practice roles in countries such as Australia and the United Kingdom.^{45–47} However, systematic evidence on the impact of nonmedical providers in these settings has largely grouped all musculoskeletal complaints together,^{48,49} and evidence in the LBP population specifically did not control for the initial encounter.⁴⁵

The measure of influence of a nonmedical provider at the initial point of care in patients with LBP may not be limited to changes in health care utilization or patient outcomes identified in this review. Systematic reviews of direct-access physical therapy¹⁹ and nonmedical triage models in musculoskeletal patients²⁰ have reported other important outcomes, such as reduced physician visits,¹⁹ improved quality of life,^{19,20} and reduced work-related absence²⁰ associated with nonmedical care, that either were not measured in the included observational studies in this review or were limited to a few studies.^{25,33} Additionally, only 1 study in this review attempted to measure low-value care³² in the form of unnecessary imaging on the basis of the recommendations provided by Choose Wisely.⁸ Short-term opioid prescribing, imaging requests, and surgical referrals may be appropriate recommendations for specific LBP patients, and distinguishing these from low-value care choices is important to provide

evidence of a practitioner’s ability to guide patients’ early care decisions through the health care system.

Several of the studies included in this review reported on the influence of nonmedical initiated care on rare health care outcomes such as injections, hospitalizations, and spine surgery.^{24,25,30} These outcomes arguably incur some of the greatest costs in an episode of LBP care and often represent low-value care choices given clear lack of evidence for effectiveness in the majority of LBP patients.^{50–52} Despite their importance, the low incidence rates of these outcomes in LBP populations⁵³ create some uncertainty around the results within included studies. For example, elective lumbar fusion rates in the United States have been estimated at 80/100,000 adults.⁵⁴ The sample size required to determine a moderate effect size between nonmedical initiated care and physician-led care in a rare outcome such as this would be extremely large and unlikely to be accurately represented by the relatively small sample sizes of some of the included studies.^{24,25}

Implications for Clinical Practice and Future Research

The relationship between initiation of care by nonmedical providers and decreased short- and long-term opioid prescription as well as reduced imaging in patients with LBP warrants further investigation. Opioid prescription has not been shown to be superior to nonopioid medications in LBP, has no evidence to support early return to work, is not associated with improved patient outcomes, and is associated with significant harms, including overdose and death.^{55–57} Similarly, radiographs or advanced imaging (eg, magnetic resonance imaging) have been associated with potential harm, including increased health care costs,⁵⁸ radiation exposure (radiographs and computerized tomography),⁵⁹ and negative psychological consequences such as increased patient anxiety or movement-related fear.⁶⁰ Both types of imaging may be considered low-value care in the absence of signs and symptoms suggesting serious pathology.⁶¹ Efforts to reduce unnecessary early prescription of opioid medication and imaging referral may have important long-term health implications for patients and the health care system.

Future research examining the effect of the entry point for LBP care must balance the need to determine the true effect of the initial provider under ideal experimental circumstances (efficacy) alongside the need to examine the impact of the initial provider in real-world scenarios (effectiveness). For example, using a randomized controlled trial design and randomly assigning LBP patients to nonmedical or medical providers in primary care settings would help address issues of selection bias. However, by removing the patient’s choice of initial provider, those factors known to influence a patient’s entry point of care, such as cost, access, health care funding, insurance type, a patient’s beliefs, and social recommendations, are no longer accounted for.^{62–64} A potential solution would be to use a cluster design approach as demonstrated by a pilot trial in the United Kingdom, where randomization occurred at the clinic rather than patient level.⁶⁵ Practices were randomized to offer 2 models of care: the option of direct-access physical therapy alongside physician-led care in the intervention arm or usual physician-led care. The advantage of this design is that it still allows patients to choose their care while minimizing potential issues with selection bias as well as contamination between arms of the trial.

Considering the potential benefits to reducing low-value care (opioid prescription and imaging) alongside the uncertainty of improved clinical outcomes, a cost-effectiveness analysis would be an important addition to future research to help inform policy makers and patients of the efficiency of nonmedical compared with traditional physician-led care in the treatment of LBP. This would need to include direct costs attributed to patients and health care systems as well as indirect costs associated with loss of productivity (ie, work absenteeism).⁶⁶

Strengths and Limitations

To the best of our knowledge, this is the first review to analyze the influence of the initial health care provider on subsequent outcomes in patients with a new episode of LBP. This review identified the relationship between the nonmedical initial provider, opioid prescription, and imaging use as areas for future research and a potential pathway to reduce low-value care.

The results of this study must also be considered alongside its limitations. By using the term “nonmedical provider,” we sought to obtain a scoping perspective of care approaches for LBP but acknowledge that within this mixed group, practitioners such as nurses and physical therapists have different roles and levels of training in LBP care, which may influence outcomes. Nurse practitioners commonly substitute physician roles in triage, and the majority have limited training in treating musculoskeletal conditions.⁶⁷ It is possible that their lack of confidence delivering a nonmedical management approach for LBP would lead to a similar number of investigations, prescriptions, and procedures as physicians. This has been demonstrated within a broader patient population in primary care in a recent Cochrane review⁶⁸ but not specifically for patients with LBP. Although the trends reported in this scoping review would not change, future studies and systematic reviews should define providers by the type of training they receive and the type of care offered.

Most included studies used a retrospective design, with this method of examining the influence of the initial provider being limited by the information contained in the respective databases. First, all databases contained information on patients in the US health care system, limiting generalizability given the different funding arrangements and structure of health care systems that are likely to influence access to care. Second, there is a risk of bias due to unmeasured confounding variables not being accounted for within the databases. Specifically, pain severity and disability, which are known characteristics associated with health care use⁶⁹ in LBP patients, were measured in only 2 of the included studies.^{23,33} It is possible that patients with greater severity of pain and disability presented to medical providers and that the lack of adjustment for these variables is a limitation of the original studies. The Joanna Briggs Institute critical appraisal tool for cohort studies was chosen given its appropriateness for assessing included study designs.⁷⁰ However, a limitation of the tool is the lack of definitive guidance provided in responding with “yes/no/unclear” to some criterion, such as item 4 (“Were confounding factors identified?”), which does not require a decision on the inclusion of “sufficient” confounders. It is likely that future trials will provide more clarity around potential confounding domains as the evidence base develops.

This could be addressed in future reviews by including pre-specified confounders in the review protocol alongside the use of more detailed critical appraisal tools.^{70,71}

Although this is a scoping review and no pooling of data was performed, the consistent finding within included studies suggests initiating care with a nonmedical provider may be protective of opioid prescription in patients with LBP. The impact of providers on other measures such as use of imaging and care seeking is less clear. Future research should incorporate more comprehensive patient variables, cost-effectiveness analysis, and a carefully considered trial design to examine the pragmatic impact of nonmedical initiated care on opioid use and other health care outcomes in patients with acute LBP, with important implications for health care policy to reduce low-value care.

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Disclosures and Presentations

The authors completed the ICMJE Form for Disclosure of Potential Conflicts of Interest and reported no conflicts of interest.

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