Low Back Pain: Investigation of Biases in Outpatient Canadian Physical Therapy

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Background. Previous research suggested that physical therapy services can be influenced by patient characteristics (age, sex, socioeconomic status) or insurance status rather than their clinical need.

Objective. The aim of this study was to determine whether patient-related factors (age, sex, SES) and the source of reimbursement for physical therapy services (insurance status) influence wait time for, frequency of, and duration of physical therapy for low back pain.

Design. This study was an empirical cross-sectional online survey of Canadian physical therapy professionals (defined as including physical therapists and physical rehabilitation specialists).

Methods. A total of 846 physical therapy professionals received 1 of 24 different (and randomly selected) clinical vignettes (ie, patient case scenarios) and completed a 40-item questionnaire about how they would treat the fictional patient in the vignette as well as their professional clinical practice. Each vignette described a patient with low back pain but with variations in patient characteristics (age, sex, socioeconomic status) and insurance status (no insurance, private insurance, Workers' Compensation Board insurance).

Results. The age, sex, and socioeconomic status of the fictional vignette patients did not affect how participants would provide service. However, vignette patients with Workers' Compensation Board insurance would be seen more frequently than those with private insurance or no insurance. When asked explicitly, study participants stated that insurance status, age, and chronicity of the condition were not factors associated with wait time for, frequency of, or duration of treatment.

Limitations. This study used a standardized vignette patient and may not accurately represent physical therapy professionals' actual clinical practice.

Conclusions. There appears to be an implicit professional bias in relation to patients' insurance status; the resulting inequity in service provision highlights the need for further research as a basis for national guidelines to promote equity in access to and provision of quality physical therapy services.

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[Laliberté M, Mazer B, Orozco T, et al. Biases of Canadian Physical Therapists Regarding Treatment of People With Low Back Pain in Outpatient Settings. *Phys Ther.* 2017;97:985–997.]

Published Ahead of Print:
May 15, 2017
Accepted: May 12, 2017
Submitted: August 29, 2016

Health professionals' biases can influence access to and quality of health care.[1,2] A bias is a systematic neglect or discrimination of members of a social group in comparison to others that cannot be clinically justified.[1] Bias can be explicit or implicit.[1] Explicit biases are freely expressed and implemented. Implicit biases often go unnoticed as they are unintended, may be deeply embedded in cognitive processes, operate in subtle ways and are not consciously acknowledged.[2] Implicit biases can affect health care professionals' treatment recommendations,[3,4] such as recommending surgery based on patient characteristics that are not related to their health condition, or providing more or less information during the informed consent process. While some implicit biases can be directly related to the reasoning processes of individual health professionals,[5] organizational features can also shape these biases and thereby affect provision of care.[6] Patient characteristics that have been associated with unequal access to health care services include age,[7] ethnic status,[7] chronicity of pain,[7] sex,[3,8] and socioeconomic status.[9,10]

According to the US Institute of Medicine, bias has a role in the genesis of health inequities.[11] Health inequities can be defined as those inequalities in health service provision (eg, access, use, quality of care) that are avoidable, but not acted upon, and are thus deemed to be unfair.[12] The presence of health inequities is linked to the fact that health and ill-health are not distributed equally within populations and are shaped by sociodemographic determinants such as income, social support, education, or sex. Patients seeking physical therapy services have a health trajectory (being healthy or ill, life span, quality of life) shaped by this complex network of determinants of health.[13] Physical therapy professionals, as primary health care providers, can help improve health and quality of life and contribute to reducing health inequities in their community.[13,14] One way to do so is by ensuring that physical therapy services are free from bias, and that all patients receive necessary care based on their medical condition and health needs.

Several studies have addressed nonclinical factors associated with physical therapy service provision. Being younger than 65 years is associated with greater likelihood of receiving rehabilitation services.[15–22] Older patients receive treatment for a longer overall duration,[18,20,23] although Dionne et al did not find an association between age and treatment duration for patients with low back pain (LBP).[24] While women with chronic pain are less likely to be referred for physical therapy services than men,[25] women in general receive physical therapy services more often than men.[18,20,22,23,26] Factors associated with receiving physical therapy services include higher SES[16,18,22,27–30] and education level.[15–17,20,31,32] Ethnicity was negatively associated with the likelihood of receiving physical therapy services in some studies[15,28,33–36] but not in others.[20,37]

Insurance status can also influence service provision. In Canada, physical therapy services are offered both in the public and private sectors. The outpatient physical therapy services in the public sector are mainly offered to patients with acute injuries or after surgery.[38] Provincial insurance schemes cover most medical services offered to the population within the public sector. Third-party payers, such as a Workers' Compensation Board (WCB) or private insurance companies, play an increasingly important role in funding outpatient physical therapy services in both public and private sectors,[39] creating a range of financial incentives that may influence therapy practice. Workers' Compensation Board structural requirements—such as highly variable service provision guidelines (eg, total number of treatments and duration)—can limit physical therapy professional autonomy in treatment decision-making for their patients[40] or influence the patient's response to treatment.[41] Further, lower reimbursement rates for physical therapy treatments paid by a WCB compared to regular fees for physical therapy treatments may encourage discrepancies in service provision, such as a higher number of treatment sessions for patients with WCB insurance.[42] Having private insurance may also influence physical therapy services for financial reasons. For example, patients covered by private insurance in the Netherlands[23] received more physical therapy treatment sessions in comparison to patients covered by public health insurance. Similarly, in the United States, patients covered by private[15,16,18,28,35,36,43] or WCB[20,31,36,43,44] insurance received more treatment sessions than those who were not covered.

Little is known regarding the extent of bias and inequities in access to physical therapy services in Canada. Is the decision-making process that shapes access to physical therapy care and service provision based on an objective evaluation of patient needs, or is it biased? If the latter is the case, then what factors contribute to bias in decisions about treatment and access to care, and how are they interrelated?

The purpose of this study was to determine whether the source of reimbursement for physical therapy services (insurance status) and patient-related factors (age, sex, socioeconomic status, chronicity of condition) influenced behavior that could affect wait time (time lapse between referral and initiation of treatment) for, frequency of, and duration of physical therapy treatment for patients with LBP in the Canadian context. The following hypotheses were tested: older patients, women, and patients with lower socioeconomic status would have a longer wait time before treatment was initiated (mainly in the public sector) and would be seen less frequently and for a shorter duration (mainly in the private sector) than other patients; and patients with WCB insurance would have a shorter wait time before the initiation of treatment (mainly in the public sector) and would be seen more frequently and for a longer duration (mainly in the private sector) than patients without WCB insurance.

Methods

Sample

A cross-sectional survey study was conducted with Canadian physical therapy professionals from each of the 10 Canadian provinces and 3 territories working with an adult musculoskeletal clientele at the time of the survey (July 2014–November 2014). Physical therapy professionals included physical therapists and physical rehabilitation

therapists (both licensed by the Ordre Professionel de la Physiothérapie du Quebec, which is the Quebec professional board of physical therapy). The former are trained at the university level (bachelor's or master's degree), whereas physical rehabilitation therapists are trained at the community college level (postsecondary diploma) and work mainly in the province of Quebec. Physical rehabilitation therapists are not the equivalent of physical therapist assistants in the United States. Physical rehabilitation therapists were included as they treat musculoskeletal problems, are licensed by the same professional board as physical therapists, and have the autonomy to make professional decisions regarding wait times treatment frequency, and treatment duration.

Procedures

Implicit biases cannot be measured effectively with self-report survey questionnaires[1] because participants are very often unable to report the reasons underlying the choices they make. However, these biases can be measured using clinical vignettes, in which participants are provided with a brief description of an event or a situation (real or hypothetical) to which they then have to respond by giving their opinion.[45,46] Clinical vignettes are a relatively simple survey tool that has been widely used in research to elicit information about clinical decision-making; they have been found to be a good methodological choice to assess physician[47,48] and physical therapist[49,50] clinical practices, as they standardize a fictional patient situation.

An online survey (in both English and French) was sent to Canadian physical therapy professionals, containing 1 of 24 different clinical vignettes (randomly assigned to participants) and a 40-item questionnaire. Each vignette described physical therapy treatment of a patient with the same musculoskeletal problem (LBP), but with variations in the circumstances of insurance coverage (no insurance, private insurance, WCB insurance) and patient characteristics (age, sex, socioeconomic status). Low back pain was chosen as it is a highly prevalent condition and accounts for a high proportion of physical therapists' clinical caseloads.[51,52] The vignettes and their variations are described in Appendix 1. To measure *implicit bias*, the accompanying questionnaire included questions about the demographic characteristics of participants, their professional clinical practices, and how they would provide care to the fictional patient in the vignette if they were seen in the participant's professional practice setting with respect to time to access services, treatment frequency, and total treatment duration. To measure *explicit bias*, self-report survey questions were used to assess the influence of insurance status, age, and chronicity of the condition on patient service provision.

Clinical Vignette Development and Validation

We designed this survey (vignettes and questionnaire) to examine whether factors such as patient characteristics (age, sex, socioeconomic status) and the source of reimbursement for physical therapy services influence physical therapy professional practices in terms of wait time for, frequency of, and duration of physical therapy treatment. A methodological framework, based on those developed by Flaskerud,[53] and Cazale et al,[54] was used to validate the vignettes. The survey construction process involved multiple validation steps. The factors chosen (age, sex, socioeconomic status, insurance status) were the focal point in all validation steps to ensure that they were evidence-based and reflected clinical realities.[46]

Survey development started with a review of the gray (nonacademic, including reports, government documents, and policy papers) and academic literatures, and was further refined through an iterative process, first within the research team, and subsequently through solicited feedback from a group of 5 experts from outside the research group to ensure representativeness of provincial clinical realities and enhance validity of the survey content. Experts were recruited for both their methodological and physical therapist clinical expertise. These experts were clinicians with experience working with patients who presented with LBP. Three experts had an academic position within a university, 1 was a knowledge broker, and 1 was an expert in advanced practice for LBP. They had between 12 and 29 years of practice; 3 were from Quebec, and 2 were from British Columbia; and 3 were English speaking, and 2 were French speaking.

The 5 experts reviewed and provided feedback on the clinical vignettes, the related questionnaire, and the methods. Further, they were asked to produce a written report in relation to the following criteria: the length of the survey, the realism of the clinical presentation of the case vignette, the clarity of the terminology used in the vignette and the questionnaire (both from a linguistic stance and considering provincial particularities), the neutrality of the vignette (avoiding a normative or sensationalist tone), the ease of navigating through the survey platform, and the relation between the study objective and the methods. Both English and French versions of the online survey were pretested by 1 expert, the research team, and 2 research assistants studying or practicing physical therapy.

Following these steps, changes were made to ensure clarity of the final vignettes and the questionnaire. For example, the diagnosis of the fictional patient was changed (from foraminal stenosis to disk protrusion) to improve the clarity of the vignette. To ensure neutrality, a sentence was added at the beginning of the questionnaire to remind the participants that we were interested in their current clinical practice, rather than their ideal practice: "We ask that you answer these questions according to what you really do in your current clinical practice. Please keep in mind that there is no right or wrong answer." Also, considerable discussion took place regarding the type of work to be used as a proxy to represent varying socioeconomic status for the vignette patients. The job title was selected to reduce the likelihood of a gender-related interpretation and to be more readily associated with a higher or lower socioeconomic status. Finally, the experts helped focus the questionnaire to inquire about the most relevant factors, since with each additional

factor, a higher number of participants would be required.[55]

The vignette and questionnaire package included 4 sections. The first section contained participant sociodemographic information (age, sex, education level, type of clientele, years of experience). The second section presented the vignette. The third section contained the main questions following the clinical vignettes: What is the typical wait time for this patient to be seen in your work setting? What will be the frequency of treatment for this patient (how many times per week)? What will be the total duration of treatment for this patient (how many weeks)? The fourth section explored explicit biases by questioning participants on the influence of various factors such as chronicity, age, and insurance status. For example, participants who received a vignette with a 59-year-old patient were asked: "All else remaining the same, if the patient described in the vignette was 34-years old instead of 59-years old, how would that change the waiting time prior to the first evaluation/ the frequency of treatment/ the total duration of treatment?"

Recruitment and Survey Distribution

Participants were recruited through invitations in association newsletters or via emails sent by 13 Canadian physical therapy associations (provincial and federal) and professional licensing boards (Appendix 2). Invitations contained a brief project description and a link to the presurvey webpage (first web link). Contact information for the team (email address and phone number) was also provided to participants if they wished to obtain further information. Half of the associations were able to send a second invitation for the survey while the others just sent 1 invitation to their members (6/13 = 1 invitation; 7/13 = 2 invitations).

This presurvey webpage contained information about the study procedures, inclusion criteria, informed consent information, and a question regarding the province in which they worked. The inclusion criteria were to be currently working in Canada as a physical therapy professional with adult patients with musculoskeletal problems. All study participants signed an electronic informed consent form on the survey website before beginning the study.

We used block randomization by province to ensure similar distributions with comparable proportions of vignettes containing: male and female patients; younger (34 years) and older (59 years) patients; different occupations serving as a proxy for socioeconomic status (manager or clerk); and patients with private insurance, WCB insurance, or no insurance.

We sent a second personalized link with the survey once the participant entered their email address in the presurvey. All participants who responded to the presurvey without completing the survey received 1 reminder to encourage survey completion. Participants who partially completed the survey received 1 reminder to finish the survey. There was a draw of 10 iPod Shuffles to encourage participation. Participants were unaware that biases were a primary objective of the study, to minimize the inaccurate representation of their current practices. The study had other secondary objectives, which have been published elsewhere.[56] Study data were collected and managed using REDCap electronic data capture tools.[57]

Data Analysis

The survey data were exported from the REDCap platform and then analyzed using SAS 9.3 statistical software (SAS Institute Inc, Cary, North Carolina). Descriptive statistics were used for categorical variables. Chi-square analyses with the Monte Carlo estimate for the exact test (if the cell count was <5) were conducted to determine whether independent variables related to the vignettes (age, sex, socioeconomic status, insurance status) had an influence on the 3 main service provision outcome variables: wait time, treatment frequency, and treatment duration. For all inferential analyses, the probability of a type I error was a priori fixed at an alpha of 0.05.

Role of the Funding Source

Financial support for this research was received from the Canadian Institutes of Health Research (grant EOG-120255) and the Canadian Arthritis Network.

Results

Participant Demographic Information

A total of 1,292 participants responded to the first link (presurvey) containing the consent and information to determine inclusion; of these, 430 were excluded because they did not complete the full survey, 3 because they did not meet inclusion criteria (ie, not currently working in Canada as a physical therapy professional with adult patients with musculoskeletal problems), and 13 because they were duplicates (identified by IP or email address and survey answers). The 846 physical therapy professionals who completed the cross-sectional online survey did not differ from the 430 participants who did not complete the survey with regard to language (French or English; $P = .55$), province of work ($P = .71$), profession (physical therapist or physical rehabilitation therapist; $P = .73$), role (clinician or manager; $P = .66$), or the vignette received ($P = .53$). In 2014, 20,842 physical therapists[58] and 2,473 physical rehabilitation therapists were licensed to practice in Canada,[59] 39.8% of whom worked with musculoskeletal patients,[58] giving a response rate of 9.1% for the estimated participant pool of 9,279. The confidence level and interval was 95% ± 3.0%. The survey completion rate was 65.5%. Most participants were women, and worked in private clinics. The sample is described in Table 1.

Chi-Square Analysis: Differences in Service Provision

With respect to vignette patient characteristics, age, sex, and socioeconomic status were not associated with difference in wait time, treatment frequency, or total duration of treatment. Insurance status did not influence wait time and treatment duration, but did influence treatment frequency ($P \leq .001$), with a higher proportion of WCB vignette patients being seen 4 to 5 time per week and a higher proportion of vignette patients with no insurance being seen 0.5 to 1 time per week (Tab. 2).

The service provision patterns differed between private and public settings for wait time ($\chi^2_4 = 347.3$, $P \leq .001$), treatment frequency ($\chi^2_4 = 53.0$, $P \leq .001$),

Table 1.
Description of Sample (N = 846)

Variable	No. (%)
Province(s)[a]	
Québec	368 (43.5)
Ontario	112 (13.2)
British Columbia	121 (14.3)
Atlantic provinces	173 (20.5)
Prairie provinces	68 (8.0)
Territories	4 (0.5)
Role at work	
Clinician	644 (76.1)
Manager	25 (3.0)
Both clinician and manager	177 (20.9)
Sector of practice	
Private	388 (45.9)
Public	353 (41.7)
Both	105 (12.4)
Training	
Physical therapist	734 (86.8)
Physical rehabilitation therapist	112 (13.2)
Sex (n = 845)	
Female	669 (79.2)
Male	176 (20.8)
Age, y (n = 845)[b]	
18–25	62 (7.3)
26–35	233 (27.6)
36–45	228 (27.0)
46–55	205 (24.3)
56–65	108 (12.8)
>66	9 (1.1)
Highest level of education (n = 845)	
College diploma	107 (12.7)
Bachelor's degree	509 (60.2)
Master's degree	223 (26.4)
PhD or equivalent	6 (0.7)
Years of experience[b]	
0–5	174 (20.6)
6–10	115 (13.6)
11–15	119 (14.1)
16–20	120 (14.2)
21–25	100 (11.8)
26–30	81 (9.6)
>30	137 (16.2)
Place of work[c]	
Rehabilitation center	84 (9.9)
Long-term care center	95 (11.2)

Continued

and treatment duration (χ^2_4 = 31.4, $P \leq .001$), with private settings having shorter wait times, higher treatment frequency, shorter treatment duration, and fewer vignette patients never being seen. Therefore, to further explore which factors could contribute to differences in professional decision-making about service provision, the analyses were stratified by type of organization (ie, public or private setting). Insurance status influenced wait times and treatment frequency in private but not in public practice settings (Tab. 3 and eFigure, available at https://academic.oup.com/ptj). Insurance status influenced wait time (Monte Carlo estimate for the exact test, P = .002), but differences between vignettes patients were not clinically significant. Vignette patients whose treatments were covered by a WCB would be seen more frequently (χ^2_8 = 31.2, $P \leq .001$) than other vignette patients in private clinics. Total treatment duration was not influenced by the vignette patient's insurance status in either private or public settings, nor did age, sex, or socioeconomic status influence service provision in either type of organization.

No Explicit Bias Influencing Service Provision

In order to analyse the explicit factors influencing service provision, participants were asked how the age of the vignette patient, the chronicity of their condition or their insurance status would influence their practices: the majority stated that these factors would not influence wait time, treatment frequency, or treatment duration. The questions were vignette-dependent, which underlines a purely descriptive approach to analysis. This allowed us to look at the data from different perspectives (Tab. 4).

Discussion

Principal Findings

We found no differences in physical therapy service provision with regard to the fictional vignette patient characteristics of age, sex, and socioeconomic status. These results contradicted the first hypothesis that age, sex, and socioeconomic status

Table 1.
Continued.

Variable	No. (%)
Hospital	255 (30.1)
Private clinic	462 (54.6)
School	26 (3.1)
Home care services	146 (17.3)
Other	50 (5.9)
Main clientele[b]	
Children and adolescents	128 (15.1)
Adults	769 (90.9)
Older adults	352 (41.6)
Type of clientele[b]	
Cardiorespiratory	107 (12.6)
Musculoskeletal	803 (94.9)
Neurological	243 (28.7)
Other	74 (8.7)
Employment status (n = 845)	
Full time	631 (74.7)
Part time	214 (25.3)
Language used at work	
French	319 (37.7)
English	415 (49.1)
Both	108 (12.8)

[a] Atlantic provinces include Prince Edward Island, Nova Scotia, New Brunswick, Newfoundland, and Labrador; prairie provinces include Alberta, Manitoba, and Saskatchewan; territories include Yukon, Northwest Territories, and Nunavut.
[b] Percentages have been rounded.
[c] Questions about clientele and place of work were not restricted to 1 choice, as many clinicians had multiple employers.

would influence wait times, treatment frequency, and treatment duration. However, the study showed that vignette patients compensated by a WCB would be seen more frequently than others (private insurance or no insurance). The source of reimbursement for physical therapy services (insurance status) did not appear to influence choices about treatment duration. These survey results partially confirmed the second hypothesis that the source of reimbursement influences service provision variables, but the direction of this influence was not expected; the hypothesis had been that a WCB would influence wait time in the public sector (shorter wait time), and frequency and duration in the private sector (more frequent and for a longer duration). Yet, while WCB vignette patients would be seen more frequently, especially in the private sector, WCB-status (ie, with or without WCB coverage) did not influence wait time in the public sector, nor did it affect treatment duration.

Interestingly, when directly asked if a change in insurance status would influence their service provision, a large majority of participants stated that it would not affect wait times (85.8%–98.9%), treatment frequency (72.0%–93.4%), or total treatment duration (84.7%–90.5%). While these results concurred with the literature as the vast majority of health care professionals endorse egalitarian attitudes with regard to provision of and access to care,[60] they could also be explained either by the therapist's intention to be consistent with their professional regulation and code of ethics or even by a research desirability bias.

The results of the vignette study revealed a discrepancy regarding patients with different insurance statuses, signifying a possible implicit bias in this regard. It is striking to find that these differences in service provision practices with regard to insurance status were reported by all participants regardless of their professional role (manager, clinician, and clinician with managerial tasks). These findings might be related to organizational features, such as institutional arrangements that shape individual behavior. Specifically, policies or implicit expectations emerging from third-party organizations (WCB or private insurance) may create a norm of practice that favors 1 group of patients over others (eg, the expected frequency of treatments).[61] However, other data (Maude Laliberté, unpublished data, 2017) indicate that part of the inequality with regard to access for patients compensated by a WCB may be attributable to policies that are based on where the injury has occurred (ie, at work or elsewhere) rather than on need.

The prioritization of access for patients compensated by a WCB and private insurance, and the increased frequency of treatment for patients compensated by a WCB may thus threaten accessibility for other patient groups. Indeed, the overtreatment of a subgroup of the population by physical therapy professionals in an era of restricted health care resources can contribute to the undertreatment of other groups. An implicit bias was observed with respect to physical therapy service provision for the fictional patient. While the differences are clinically small, they are significant and not based directly on patient needs. It must be noted that insurance status can be indirectly linked to various determinants of health such as employment status, income, and education level.[62,63] Inequities in service provision between patients on the basis of their insurance status, even in Canada—where universal health coverage exists—could exacerbate health inequities in the community rather than reduce them. These results indicate that the allocation of physical therapy resources may be biased and distributed unfairly.

Table 2.
Association of Vignette Patient Characteristics and Service Provision Variables[a]

Characteristic or Variable	Wait Time					Treatment Frequency					Treatment Duration				
	<2 wk	2–4 wk	1–2 mo	>3 mo	Never	0.5–1×	2–3×	4–5×	Varied	Never	<4 wk	1–3 mo	>3 mo	Never	Varied
Sex															
Male	59.0	14.4	9.0	10.1	7.6	17.6	54.3	15.9	7.0	5.2	13.9	62.1	13.7	3.1	7.3
Female	64.0	13.0	9.6	6.7	6.7	20.6	50.0	17.0	6.0	6.5	17.0	60.0	13.4	3.1	6.5
Chi-square (P)	4.4 (.35)					2.9 (.58)					1.7 (.79)				
df	4					4					4				
Age (y)															
59	59.3	15.1	9.2	9.7	6.6	18.8	53.7	15.1	7.1	5.4	16.2	61.0	12.9	3.5	6.3
34	63.5	12.3	9.4	7.2	7.7	19.3	50.7	17.9	6.0	6.2	14.6	61.1	14.2	2.6	7.4
Chi-square (P)	3.6 (.47)					2.0 (.74)					1.5 (.83)				
df	4					4					4				
SES															
Manager	61.3	12.6	10.0	10.0	6.2	18.0	55.8	15.8	5.4	5.0	15.0	63.1	11.9	3.1	6.9
Clerk	61.7	14.8	8.6	6.9	8.1	20.1	48.6	17.1	7.6	6.6	15.9	59.0	15.2	3.1	6.9
Chi-square (P)	4.6 (.33)					5.3 (.25)					2.3 (.67)				
df	4					4					4				
Insurance status															
Private insurance	61.6	12.3	11.6	6.2	8.3	17.0	55.2	15.9	6.1	5.8	15.9	58.7	12.3	4.0	9.1
WCB insurance	61.3	11.2	10.4	9.7	7.4	17.1	45.0	24.9	7.1	6.0	13.1	62.9	14.6	3.4	6.0
No insurance	61.5	17.2	6.1	9.5	5.7	22.7	55.9	9.4	6.4	5.7	17.1	61.5	13.7	2.0	5.7
Chi-square (P)	13.5 (.10)					28.3* (.0004)					7.2 (.52)				
df	8					8					8				

[a] Data are reported as percentages unless otherwise indicated. Asterisk indicates significant result. SES = socioeconomic status, WCB = Workers' Compensation Board.

Implicit biases are common in health care[1] and can be enacted in many ways, such as negative behavior,[1,4,64] poor communication,[1,64] or body language,[1,65] but also through values and approaches promoted by institutional policies or structures.[6] Further, biases can be enhanced in cognitively charged environments (time pressure, organizational constraints, distraction, stress) where there is less time for reflexive thinking.[5,66,67] In this survey, we asked participants to state their current practices, so it is not possible to determine whether the inequalities illustrate individual or organizational bias. Distinguishing the source of bias would require a more comprehensive study on the organization of the health care system (eg, health policy analysis and qualitative analysis with the managers and the physical therapy professionals).

The study findings showed no differences in service provision with regard to patient characteristics such as age, sex, and socioeconomic status, which differs from the current medical literature on bias.[1–4,7–11,27,32] It should be mentioned that this study surveyed participants who might have minimal control over these decisions. It is possible that bias could exist at an intermediate level (organizational policies) through rationing or a prioritization system. For example, participants did not express explicit bias toward older patients or those with chronic conditions. However, several studies have shown that chronic conditions receive lower priority or are categorically refused in public physical therapy departments.[38]

Based on participant responses, socioeconomic status was not associated with decreased access in the current study, although it has been found to be associated with decreased access to physical therapy professionals in some research.[27,32] It is important to note that the study vignettes did not explicitly address socioeconomic status, as we used occupation as a proxy in order to minimize social desirability bias and this may have attenuated the effect of socioeconomic status in the study findings.

While we cannot exclude the possibility that some physical therapy professionals might have individual biases, the survey findings demonstrate a collective professional bias for service provision with regard to

Table 3.
Association of Vignette Insurance Status and Service Provision Variables by Type of Organization (Private or Public Setting)[a]

Variable	Wait Time					Treatment Frequency					Treatment Duration				
	<2 wk	2–4 wk	1–2 mo	>3 mo	Never	0.5–1×	2–3×	4–5×	Varied	Never	<4 wk	1–3 mo	>3 mo	Never	Varied
Private setting															
Private insurance	96.7	3.3	0.0	0.0	0.0	17.4	58.7	19.0	5.0	0.0	16.7	65.0	10.0	0.0	8.3
WCB insurance	89.1	3.9	3.9	2.3	1.0	14.1	42.2	35.2	7.8	0.8	10.2	67.7	16.5	0.8	4.7
No insurance	90.5	9.5	0.0	0.0	0.0	26.8	57.3	10.9	4.4	0.7	16.7	69.6	10.1	0.0	3.6
Chi-square (*P*)	24.0* (.0019) (Monte Carlo)					31.2* (.0001)					10.4 (.24)				
df	8					8					8				
Public setting															
Private insurance	28.2	20.2	23.4	12.9	15.3	15.2	55.2	10.4	8.0	11.2	17.6	48.8	16.0	7.2	10.4
WCB insurance	24.5	20.8	17.0	19.8	17.9	18.9	50.9	13.2	3.8	13.2	13.3	60.0	15.2	7.6	3.8
No insurance	23.3	28.3	14.2	22.5	11.7	20.5	54.9	7.4	7.4	9.8	14.8	53.3	19.7	4.1	8.2
Chi-square (*P*)	10.5 (.23)					5.5 (.70)					7.5 (.48)				
df	8					8					8				

[a] Data are reported as percentages unless otherwise indicated. Asterisk indicates significant result. WCB = Workers' Compensation Board.

Table 4.
Explicit Factors Influencing Service Provision Variables[a]

Factor	Wait Time (%)			Treatment Frequency (%)			Treatment Duration (%)		
	No Change	Longer Wait	Shorter Wait	No Change	Higher Frequency	Lower Frequency	No Change	Longer Duration	Shorter Duration
Age									
If patient was 59 instead of 34-y-old	97.9	1.0	1.2	97.1	1.2	1.7	85.4	13.1	1.4
If patient was 34 instead of 59-y-old	96.5	0.2	3.3	96.5	2.6	1.0	87.5	1.4	11.1
Insurance status									
If patient was not covered by WCB (instead of being covered by WCB)	85.8	10.1	4.1	72.0	3.4	24.6	84.7	4.9	10.5
If patient had better insurance coverage (limit of $1,000/y instead of $750/y)	98.9	0.4	0.7	93.4	5.8	0.7	90.5	9.5	0
If patient had insurance coverage (instead of no insurance coverage)	95.6	2.4	2.0	87.2	5.7	7.1	88.2	4.0	7.7
Chronicity of condition									
If patient had a chronic condition and had been off work for 6 mo (instead of subacute condition and off work for 4 wk)	74.0	18.1	7.9	68.4	11.8	19.8	66.0	28.6	5.5

[a] WCB = Workers' Compensation Board.

insurance status: external rules set by third-party insurers, namely, WCB and private insurers, appear to influence physical therapy services offered to the Canadian population. This practice norm, with service provision based on insurance status rather than need, runs counter to the public interest and has led physical therapy professionals away from their main professional values.[62,63] Indeed, professional codes of ethics increasingly include social responsibility rather than solely focussing on the individual relationship between the professional and patients/colleagues.[14] For example, the Canadian Physiotherapy Association's code of ethics and rules of conduct state, "Physiotherapists

shall recognize their responsibility to improve standard of health care."

The study also confirmed that most physical therapy professionals are unaware that insurance status leads to discrepancies in access and service provision. If physical therapy professionals wish to advocate for greater equity in service provision to improve standards of health care, then they must be aware of these implicit biases. This shows that there is a need to emphasize the development of reflexive capacity within physical therapy training curricula. The ability to take time to reflect and think critically are part of the competencies addressed by Canadian physical therapy ethics courses.[68] However, the time devoted to ethics is highly variable across training programs,[69,70] and more studies are needed to see if the actual physical therapy training curricula is effective in contributing to the reduction of bias within professional practice.

Our findings highlight the need for additional health services and policy research to further investigate the reimbursement rates and protocols of third-party payers, providers, and the system issues at play, as they might contribute to important inequities. There is also a lack of clinical guidelines on resource allocation. Such guidelines should provide evidence-based benchmarks for service provision to ensure that all people receive services according to their clinical needs, moving professionals beyond the implicitly biased practices identified in the survey.[56] The creation of national guidelines would obviously require consensus among key stakeholders, such as third-party payers, professional associations, and government Health Ministry delegates. National guidelines would also need to be enacted within provincial contexts by professional boards and associations, and tangible incentives would likely need to be offered to clinics to ensure participation. In the meantime, physical therapy professionals need to be educated and made aware of their individual and collective biases with regard to inequitable service provision.

Finally, there is increasing appreciation of the role of psychosocial and socioeconomic factors in the management of LBP. For example, job dissatisfaction,[71] strenuous[71] and stressful[72] work, distress,[72] anxiety,[72] or low education[71] are related to increased risk for LBP and its related disability. So while this study used LBP only as a representative example of physical therapy practice (as it is highly prevalent[73–75] and 1 of the most common complaints treated by physical therapists[51,52,76–79]), it could also contribute to our understanding of the treatment of patients with LBP.

Strengths and Weaknesses of the Study

The vignette methodology was a strength of the study as it permitted participants to react to a standardized patient case (same clinical portrait), but with varying characteristics. However, there are also some weaknesses. For wait time, it was not indicated whether it was the first encounter with the patient (such as for a preliminary evaluation in order to prioritize the patient) or the first clinical evaluation, and this may have influenced the results.[80]

The clinical vignette was carefully designed to reflect Canadian clinical realities, but it is possible that this patient case scenario in another national context might have produced different findings, and that real practices differ from the survey answers. Further, this methodology cannot test the embodied and relational aspect of the real-world clinical encounter,[81] something that might also influence service provision. It would be interesting to repeat this experiment with an actual standardized patient. Social desirability can also be a bias,[82] even if this was minimized in the survey by various strategies, such as avoiding normative or sensationalist tones[82] and stating explicitly in the instructions that there were no right or wrong answers.[83]

An additional limitation is that, even though we used the same recruitment method, there was an underrepresentation of some provinces and regions (ie, Ontario and the Prairie provinces) and an overrepresentation of others (ie, Quebec and the Atlantic provinces)[58] that could be due to outside factors (eg, the research team is well known in Quebec, competing studies were advertised in the same association newsletters, greater interest in the topic from participants in certain provinces, not all associations sent the information twice). That being said, the intent of this study was not to compare the provinces but to identify biases in professional practice. Also, there was a low response rate (9.1%) compared to other online surveys (~10%–25%),[84] that does present a generalizability challenge for the results.

We were not permitted to contact individual physical therapy professionals – recruitment was only done via professional associations and licensing boards. So we cannot be sure that all physical therapy professionals actually read the invitation; associations sent these invitations via their newsletter as opposed to individual personalized emails. Furthermore, the registration to receive online association newsletters is optional and some physical therapy professionals may have opted not to receive it and therefore never saw the invitation to participate in the study. Thus, the actual denominator (ie, those professionals who read the invitation) is unknown and likely considerably smaller than the total number of physical therapy professionals practicing in Canada. As the response rate was higher for 3 provinces (70% of the sample), the results probably reflect more accurately the views of professionals practicing in those provinces, rather than nationally. Also, physical rehabilitation therapists were included even though they have a different educational level and are mainly working in Quebec. However, their responses did not differ significantly from the other participants for wait time ($\chi^2_4 = 7.3$, $P = .12$) and treatment frequency ($\chi^2_4 = 4.4$, $P = .36$). The total treatment duration did differ statistically ($\chi^2_4 = 10.5$, $P = .03$) but not clinically (Tab. 5). Also, in Quebec, the proportion of physical therapists to physical rehabilitation therapists is the same as among study participants.[59]

Finally, it was not specified whether the vignette patient was in an acute or a chronic phase, which could lead to differing interpretations among participants, even though the number

Table 5.
Association of Service Provision Variables by Type of Profession[a]

Variable	Wait Time					Treatment Frequency					Treatment Duration				
	<2 wk	2–4 wk	1–2 mo	>3 mo	Never	0.5–1×	2–3×	4–5×	Varied	Never	<4 wk	1–3 mo	>3 mo	Never	Varied
Physical therapist	63.0	13.4	9.0	8.1	6.4	18.8	52.7	16.6	6.7	5.2	14.8	62.6	12.6	2.7	7.3
Physical rehabilitation therapist	51.4	15.3	10.8	10.8	11.7	20.5	49.1	15.2	5.4	9.8	19.6	50.9	19.6	5.4	4.5
Chi-square (P)	7.3 (.12)					4.4 (.36)					10.5* (.03)				
df	4					4					4				

[a] Data are reported as percentages unless otherwise indicated. Asterisk indicates significant result.

of weeks since the injury was clearly stated.

Conclusion

Equity and accessibility for all patients, based on need rather than the ability to pay, is a central value in the Canadian health care system.[85] The study findings provide insight into wait list management and the duration and frequency of physical therapy treatment. Notably, the study shows that patient characteristics such as age, sex and socioeconomic status are not associated with physical therapy service provision. However, there are some inequities with respect to access to services and in service provision, and these depend on the insurance status of patients: third-party payers, such as private insurers and a WCB, have an influence, albeit implicit, on the provision of health care services by physical therapy professionals. These biases may contribute to unequal service provision based on factors other than clinical need, exacerbating health inequities within the community. The study findings highlight the need for further research in order to establish new national guidelines and raise awareness among physical therapy professionals to mitigate implicit bias and promote equity in access to and provision of physical therapy services.

Author Contributions and Acknowledgments

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This study was completed in partial fulfillment of the requirements for M. Laliberté's PhD.

The authors thank the Canadian physical therapy professionals who participated in the survey. The authors also thank Anne Hudon for her assistance in preparing the vignettes and the 5 experts who reviewed the vignettes in the preliminary validation phase (Max Folkersma, Alison Hoens, Jean-Louis Larochelle, and 2 others who wished to remain anonymous). The authors gratefully acknowledge the support of the physical therapy associations who distributed the vignettes: Yukon Council, Nova Scotia College of Physiotherapists, Nova Scotia Physiotherapy Association, Atlantic Physiotherapy Association, College of Physiotherapists of New Brunswick, Ontario Physiotherapy Association, Physiotherapy Alberta (College and Association), Ordre Professionnel de la Physiothérapie du Québec, Fédération des Cliniques Privées de Physiothérapie du Québec, Physiotherapy Association of British Columbia, College of Physiotherapists of British Columbia, Canadian Physiotherapy Association, and Private Practice Division of the Canadian Physiotherapy Association. Finally, the authors thank Nelly Huynh and Eve Desplats for their help with using the REDCap platform for data collection.

Ethics Approval

The Centre for Research in Rehabilitation of Greater Montreal Research Ethics Board approved the project (CRIR-753-0712).

Funding

M. Laliberté holds a doctoral fellowship from the Fonds de Recherche du Québec-Santé (FRQ-S). T. Orozco was supported by the Quebec Research Rehabilitation Network (REPAR). M. Hunt was supported by a Research Scholar award from the FRQ-S. Financial support for this research was received from the Canadian Institutes of Health Research (grant EOG-120255) and the Canadian Arthritis Network.

Disclosures/Presentations

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

M. Laliberté, B. Mazer, T. Orozco, G. Chilingaryan, B. Williams-Jones, M. Hunt, and D.E. Feldman presented some of the information in this article in a presentation titled, "Factors Influencing Prioritization, Frequency and Duration of Physiotherapy Services," at the World Confederation for Physical Therapy in Singapore in May 2015.

DOI: 10.1093/ptj/pzx055

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Appendix 1.
Clinical Vignettes

Diagnosis: disk protrusion at the level of L4–L5, with hypoesthesia to pain and to touch in the L5 dermatome.

History: low back pain that started 6 years earlier; condition worsened in the last few months, after a fall.

Symptoms: pain radiating down the left buttock, left thigh, and left leg; complaints of pain were 3 of 10 in the lumbar region and 5 of 10 in the leg (on a visual/verbal analog scale, where 0 of 10 indicates no pain and 10 of 10 indicates intolerable pain); flexion of the spine was very painful, and the patient could not endure long hours sitting at work.

Function: off work for the last 4 weeks.

Variations in vignette characteristics included insurance status, age, sex, and occupation.

Insurance status: private insurance ($50 per treatment; limit of $750 per year), Workers' Compensation Board insurance, or no insurance (payment out of pocket)

Age: 34-or 59-y-old

Sex: male or female

Occupation: senior manager or office clerk.

Appendix 2.
Canadian Physical Therapy Associations (Provincial and Federal) and Professional Licensing Boards Through Which Study Participants Were Recruited

Canadian Physiotherapy Association

Yukon Council

Nova Scotia College of Physiotherapists

Nova Scotia Physiotherapy Association

Atlantic Physiotherapy Association

College of Physiotherapists of New Brunswick

Ontario Physiotherapy Association

Physiotherapy Alberta (College and Association)

Ordre Professionel de la Physiothérapie du Quebec

Fédération des Cliniques Privées de Physiothérapie du Québec

Physiotherapy Association of British Columbia

College of Physiotherapists of British Columbia

Canadian Physiotherapy Association

Private Practice Division of the Canadian Physiotherapy Association.