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Implications of Practice Setting on Clinical Outcomes and Efficiency of Care in the Delivery of Physical Therapy Services

Most physical therapists in the United States practice in either a private practice or hospital-based setting.¹ Health care costs currently consume 17% of gross domestic product in the United States and continue to increase.²⁶ Musculoskeletal conditions represent a substantial burden to the health care system in terms of disability and direct and indirect costs, with the majority of expenditures directed toward high-cost procedures such as surgery,

imaging, and prescription medication.^{4,10} Many patients with musculoskeletal conditions benefit from care provided by physical therapists, and there is evidence to suggest that early physical therapy intervention adherent to practice guidelines may result in lower subsequent health care utilization, particularly invasive and costly procedures such as pharmaceuticals, injections, and surgery.^{8,9}

Physical therapists provide services in a variety of settings, with approximately 34% of physical therapists in the United States employed in the private practice setting and 21% in a health system or hospital outpatient setting.⁶ Health services research can inform optimal care delivery models by exploring differences in clinical outcomes and costs of care in the most common practice settings in which physical therapy services are typically delivered. According to Donabedian's⁷ structure-process-outcome model to assess quality of care, differences in the structure, such as those between hospital-based and private practice settings, would likely lead to differences in the process of physical therapy care delivered to patients, which could subsequently affect outcomes of care. The practice settings and cost structures in which physical therapists practice vary widely; hence,

● **STUDY DESIGN:** Retrospective analysis of episodes of care.

● **OBJECTIVE:** To assess the implications of practice setting (hospital outpatient settings versus private practice) on clinical outcomes and efficiency of care in the delivery of physical therapy services.

● **BACKGROUND:** Many patients with musculoskeletal conditions benefit from care provided by physical therapists. The majority of physical therapists deliver services in either a private practice setting or in a hospital outpatient setting. There have not been any recent studies comparing whether clinical outcomes or efficiency of care differ based on practice setting.

● **METHODS:** Practices that use the Focus On Therapeutic Outcomes, Inc system were surveyed to determine the specific type of setting in which outcomes were collected in patients with musculoskeletal impairments. Patient outcome data over 12 months (2011-2012) were extracted from the database and analyzed to identify differences in the functional status achieved and the efficiency of the care delivery process between private practices and hospital outpatient settings.

● **RESULTS:** The data suggest that patients experience more efficient care when receiving physical therapy in hospital outpatient settings compared to private practice settings, as demonstrated by 3.1 points of greater improvement in functional status over 2.9 fewer physical therapy visits. However, the difference in improvement between settings is less than the minimum clinically important difference of 9 points in functional status outcome score.

● **CONCLUSION:** In this cohort, our data suggest that more efficient care was delivered in the hospital outpatient setting compared to the private practice setting. However, we cannot conclude that care delivered in the hospital setting is more cost-effective, because it is possible that any difference in efficiency of care favoring the hospital outpatient setting is more than offset by higher costs of care. *J Orthop Sports Phys Ther* 2014;44(12):955-963. Epub 28 October 2014. doi:10.2519/jospt.2014.5224

● **KEY WORDS:** cost, health services research, hospital, private practice, rehabilitation

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there is widespread debate regarding which practice settings offer the most compelling case for efficient or cost-effective delivery of physical therapy services. For example, differences in payment have been observed, with costs in hospital-based settings being greater, though not statistically significant, than costs for the same set of services in private practice settings.²¹ However, it is possible to theorize that physical therapists in a hospital setting practicing within an integrated delivery system would have less of a profit motive than physical therapists in a private practice setting. This could contribute to a tendency toward more efficient delivery of care in the hospital setting, which would be evidenced by achieving similar or better outcomes in fewer visits. Alternatively, if one presumes that patients accessing physical therapy services in a hospital outpatient setting might have more comorbidities that interfere with recovery than individuals seeking care in the private practice setting, it would be reasonable to expect that hospital care might result in additional visits per episode of care.

In 1991, Jette and Davis²¹ published a study based on a systematic examination of differences between care delivered in hospital and that delivered in private outpatient physical therapy practices. These authors reported that the typical profile of patients who received care in these 2 settings was similar. However, the 2 settings differed in the number of physical therapists, with twice as many physical therapists practicing in hospital settings compared to private practice settings, yet seeing only 30% more patients. This may indicate that the cost structure for care in the hospital setting is higher than that of the private practice setting, or it may be a function of therapists in hospital settings also having to treat inpatients and to treat more complex conditions. Although charges for the same services in the hospital setting were higher, patients were seen for fewer visits, demonstrating lower utilization in the hospital versus the private practice setting. It may

be that utilization in the hospital setting was understated because these data included inpatient episodes of care, which typically require fewer visits compared to outpatient episodes of care.

More recently, Machlin and colleagues²³ examined factors associated with the resource intensity of 1377 physical therapy episodes of care, as determined by the number of visits and expenses per visit in a secondary analysis of longitudinal survey data from the Medical Expenditure Panel Survey. Approximately 75% of episodes were for musculoskeletal conditions, and most episodes were treated in nonhospital, office-based settings (ie, private practice), with only 17% being treated in hospital-based outpatient settings.²³ The mean expense per episode (based on 2007 dollars) was \$1184 (median, \$651), with an average number of visits per episode of 9.6 (median, 6.0). The average expense per visit was \$130 (median, \$95).²³ The authors found significant differences in the number of visits based on geography, gender, and having high blood pressure. However, there were no differences in the number of visits based on practice setting (hospital outpatient versus private practice).²³ On the other hand, expenditures per visit were 27% higher for episodes treated primarily in hospital outpatient departments versus private practice settings.²³

Although both of these studies were beneficial in examining utilization and costs between practice settings, differences in the quality of care, as determined by clinical outcomes, were not examined. More recently, there has been an increasing focus on the cost of care for rehabilitation services from organizations like the Centers for Medicare and Medicaid Services.^{5,6} This attention has highlighted wide variations in cost structures between different practice settings, such as hospitals, private practices, skilled nursing facilities, and others.⁵ In 2006, outpatient hospital departments accounted for 20% of expenditures for rehabilitation services, with private practices account-

ing for 27% of expenditures.⁵ The Centers for Medicare and Medicaid Services paid out more than \$800 million for claims in hospital outpatient settings, whereas \$1.1 billion was paid to private practices.⁵ Hospitals were paid at a higher rate per line claim at \$36.11, compared to \$29.52 for private practices.⁵ From 2004 to 2006, the amount paid to hospitals decreased by 3%, and the amount paid to private practitioners increased by 11%.⁵ This may likely be attributed to a decline in the number of hospitals (-7%) and an increase in private practices (25%) during this same period.⁵

It is important to examine outcome efficiency of the care delivery process across different practice settings, given the increasing costs of health care, copayments that shift more of the cost directly to the patient, and the transition toward a bundled rather than a fee-for-service payment model. Given the aging population and associated growth of Medicare beneficiaries,⁵ understanding differences in outcome and efficiency of care between different practice settings has never been more important. Currently, available evidence on the differences in clinical outcomes based on practice setting is limited, despite the increasing general evidence to support the benefits of physical therapy in the management of musculoskeletal conditions.⁸ Therefore, the purpose of this study was to determine the influence of practice setting on clinical outcomes and efficiency of care in the delivery of physical therapy services in hospital outpatient and private practice settings.

METHODS

Description of Data Source

A DEIDENTIFIED DATA SET WAS OBTAINED from Focus On Therapeutic Outcomes, Inc (FOTO; Knoxville, TN). Focus On Therapeutic Outcomes, Inc is a commercial outcomes database used by therapists across the United States. The FOTO data-collection process and sample have been described

previously.¹²⁻¹⁴ Clinics that utilize FOTO for outcome measurement tracking administer surveys to each patient using the Patient Inquiry computer software developed by FOTO. The functional status (FS) outcome measure, developed and used by FOTO, is body region specific, with demonstrated validity and reliability for common musculoskeletal conditions.^{11,15-20} Patients enter demographic information into the system and complete a baseline FS measure electronically prior to their evaluation and intervention. At subsequent visits, the therapist and/or administrative staff issue follow-up surveys, including the final discharge FS survey that includes patient satisfaction questions. That episode of care is then completed after additional information, including last date of service and number of visits, is entered by the therapists or administrative staff.

The study protocol was approved by the University of Florida Institutional Review Board.

Identification of Study Sample

Data for this study were obtained from 1522 facilities participating in FOTO. The FOTO administrative team conducted a query of its client database to ascertain the practice setting immediately prior to the extraction of data for this analysis. The potential practice settings included private practice, hospital outpatient setting, comprehensive orthopaedic rehabilitation facility, skilled nursing facility, physician-owned practice, home health agency, and rehabilitation agency. To maximize response rates, a second query was sent to those clients who did not respond to the initial survey. A total of 46% (n = 695) of the practices responded after the 2 queries, with 405 identifying themselves as a private practice and 263 as a hospital outpatient setting. The remaining 27 facilities (n = 5636 patients) were from other settings and thus not included in the subsequent analyses. The total number of practices surveyed, number of responses per practice setting, and patients included in the analyses are listed

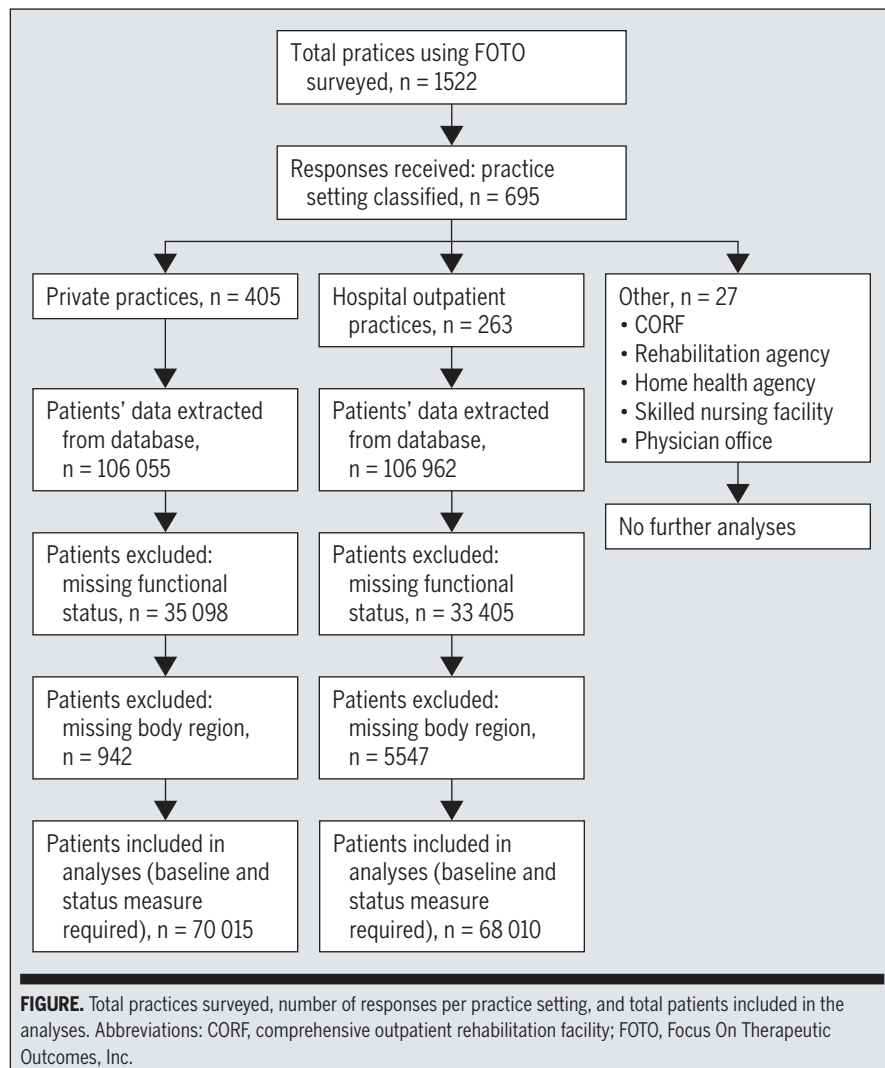


FIGURE. Total practices surveyed, number of responses per practice setting, and total patients included in the analyses. Abbreviations: CORF, comprehensive outpatient rehabilitation facility; FOTO, Focus On Therapeutic Outcomes, Inc.

in the **FIGURE**. The data extracted were for the primary purpose of investigating implications of practice setting on clinical outcomes.

Patients who had episodes of care for musculoskeletal impairments treated in private practice or outpatient settings from 2011 to 2012 were included in the sample for analysis (n = 213 017). From this sample of patients, the data were further screened to eliminate episodes of care that were missing data for FS score (n = 68 503) and the body part being treated (n = 6489). The final sample included a total of 138 025 patients (68 010 episodes in the hospital outpatient setting and 70 015 in the private practice setting) (**FIGURE**).

Outcome Variables

Data were examined from patients treated in the private practices and hospital outpatient settings over the course of 12 months. The dependent variables included change in FS score, efficiency, and achieving the minimal clinically important difference (MCID) for FS score over the episode of care. Efficiency was calculated by dividing the change score by the number of visits in the episode to create a continuous variable. Additionally, a separate categorical variable was calculated to represent whether patients achieved at least the MCID based on the FS change score. A cut point of equal to or greater than a 9-point change in the FS score was selected to classify patients

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as having achieved the MCID, which is a conservative estimate that can be consistently applied across body regions.^{18,27-32}

Data Analysis

Demographic and descriptive statistics were performed using *t* tests for continuous variables and chi-square tests for categorical variables when comparing practice settings. The primary independent variable of interest was practice setting (private practice versus hospital outpatient). Multivariate linear and logistic regression analyses were used to compare clinical outcomes between practice settings. Multiple specifications of the regression models were estimated based on theoretical assumptions and prior studies utilizing FOTO data.^{2,24,25} Goodness-of-fit tests were performed for final model selections. Dichotomous variables were created for body region (lumbar, shoulder, elbow/wrist/hand, hip, knee, foot/ankle, cervical, other), geographic location (Northeast, Midwest, south Atlantic, east south, mountain, west south, and Pacific), and payer type (preferred provider organization; Medicare A, B, C; health maintenance organization; Medicaid; other). During model selection, the inclusion of the interaction terms of body region by practice setting, geographic region by practice setting, and payer type by practice setting were examined and found not to significantly improve overall model fit; therefore, these interaction terms were not included in the final analyses. To account for differences in health status and behaviors of patients based on practice setting, the multivariate model was adjusted for variables such as exercise frequency, duration of pain, receiving medication for pain, number of surgeries, and number of health problems. As a result, the final models selected included separate linear regression models to examine the relationship between practice setting and efficiency and practice setting and change scores, and a logistic regression model to examine whether patients achieved the MCID on the FS. Independent variables and covariates included

TABLE 1

PATIENT DEMOGRAPHICS, BODY REGION, AND PAYER TYPE BETWEEN PRACTICE SETTINGS

Variable	Hospital Outpatient (n = 68 010)	Private Practice (n = 70 015)
Patient age, y*	54.2 ± 17.7	51.2 ± 18.4
Surgeries for condition, n*	0.5 ± 0.8	0.4 ± 0.7
Other health problems, n*	4.0 ± 3.2	3.2 ± 2.8
FABQ physical activity score (0-24)*	11.8 ± 0.03	12.3 ± 0.03
Patient sex, % male	37.3	41.4
Perform no regular exercise, %	33.8	27.8
Duration of pain 22+ d, %	75.3	75.5
Received medication for pain, %	49.0	42.4
Body region, %		
Lumbar	24.6	22.1
Thoracic	12.2	11.4
Lower extremity	37.0	40.9
Upper extremity	26.2	25.7
Payer type, %		
PPO	29.9	53.7
Medicare A, B, C	28.1	20.9
HMO	14.3	6.7
Workers' compensation	7.7	7.2
Medicaid	6.1	1.5
Other source	10.3	6.6

Abbreviations: FABQ, Fear-Avoidance Beliefs Questionnaire; HMO, health maintenance organization; PPO, preferred provider organization.

*Values are mean ± SD.

TABLE 2

FUNCTIONAL STATUS CHANGE, NUMBER OF VISITS, AND EFFICIENCY PER PRACTICE SETTING*

	Hospital Outpatient (n = 68 010)	Private Practice (n = 70 015)
Functional status (change score) [†]	17.5 ± 15.9	16.2 ± 16.1
Therapy visits, n [†]	11.1 ± 7.5	14.1 ± 9.8
Efficiency ^{†‡}	2.2 ± 3.2	1.7 ± 2.7
Achieved MCID, % [§]	67.7	63.6

Abbreviation: MCID, minimal clinically important difference.

*Values are mean ± SD unless otherwise indicated.

[†]*t* tests and chi-square test ($P \leq .001$) favoring hospital outpatient departments.

[‡]Change score divided by number of visits.

[§]Greater than 9-point change on functional status.

in the multivariate linear regression and logistic regression models included practice setting, geographic region, body region, sex, age, type of insurance, duration of symptoms, number of surgeries, number of health problems, number of visits, receiving prescription medications, exercise frequency, and the Fear-Avoidance Beliefs Questionnaire physical activity

subscale. All analyses were performed using survey procedures of Stata Version 10.0 (StataCorp LP, College Station, TX).

RESULTS

PATIENTS HAD A MEAN ± SD AGE OF 52.6 ± 18.1 years, and 39.1% were male. Additional demographics

TABLE 3

LINEAR REGRESSION MODEL FOR EFFICIENCY
(CHANGE SCORE DIVIDED BY NUMBER OF VISITS)

Variables	Coefficient (Adjusted)*	P Value
Constant	4.28 (3.88, 4.68)	<.001
Treatment setting		
Hospital clinic (reference)	...	...
Private practice	-0.74 (-0.88, -0.59)	<.001
Body region		
Lumbar (reference)	...	...
Thoracic	-0.22 (-0.29, -0.15)	<.001
Lower extremity	-0.01 (-0.07, 0.06)	.857
Upper extremity	-0.38 (-0.47, -0.28)	<.001
Patient sex		
Female (reference)	...	...
Male	0.13 (0.10, 0.17)	<.001
Patient age	-0.02 (-0.02, -0.01)	<.001
Payment source		
Indemnity insurance (reference)	...	...
Medicaid	-0.20 (-0.49, 0.08)	.17
Medicare A, B, C	0.00 (-0.27, 0.26)	.98
Self-pay, free care	0.05 (-0.29, 0.41)	.74
Litigation, no fault, auto insurance	-0.20 (-0.49, 0.08)	.17
HMO	0.01 (-0.26, 0.30)	.89
PPO	0.09 (-0.17, 0.36)	.50
Workers' compensation	-0.33 (-0.61, -0.04)	.02
Other source	0.03 (-0.25, 0.33)	.80
Exercise frequency		
No exercise (reference)	...	...
Exercise 1-2 times/wk	-0.02 (-0.07, 0.03)	.37
Exercise 3+ times/wk	0.02 (-0.03, 0.07)	.45
Duration of pain 22+ d	-1.23 (-1.37, -1.10)	<.001
Received medication for pain	0.04 (0.00, 0.08)	.02
Number of surgeries for condition	-0.22 (-0.26, -0.19)	<.001
Number of other health problems	-0.04 (-0.05, -0.03)	<.001
FABQ score-physical activity	0.01 (0.00, 0.01)	.001
Geographic region		
Northeast (reference)	...	...
Midwest	-0.16 (-0.39, 0.05)	.14
South Atlantic	0.06 (-0.38, 0.51)	.77
East South	0.41 (0.03, 0.77)	.02
Mountain	0.25 (0.00, 0.51)	.05
West South	0.14 (-0.18, 0.46)	.40
Pacific	0.41 (-0.25, 1.08)	.22

Abbreviations: FABQ, Fear-Avoidance Beliefs Questionnaire; HMO, health maintenance organization; PPO, preferred provider organization.

*Values in parentheses are 95% confidence interval.

patients seen in the hospital outpatient setting demonstrated greater changes in FS and greater efficiency of care, as demonstrated by better outcomes over fewer visits (TABLE 2). A higher proportion of patients in the hospital outpatient setting achieved the MCID on the FS change score (TABLE 2).

Change Score

Patients in the hospital outpatient setting achieved greater FS changes compared to those treated in the private practice setting, with a difference in mean change score of 1.3 points (95% confidence interval [CI]: 1.2, 1.5). After adjusting for variables in the regression model, those patients receiving physical therapy services in the hospital outpatient setting achieved, on average, 3.1 points greater FS change compared to those in the private practice setting ($\beta = -3.1$; 95% CI: $-3.9, -0.9$; $P < .001$).

Efficiency

Hospital outpatient settings reported 2.9 fewer visits per episode of care than private practice settings (TABLE 2). The difference in number of visits and change in FS score between settings combine to indicate that more efficient care was delivered in the hospital outpatient setting. Every 10 visits in a hospital outpatient setting resulted in an average of 7 more points of improvement in FS compared to patients treated in the private practice setting ($\beta = -0.7$; 95% CI: $-0.9, -0.6$; $P < .001$). See TABLE 3 for the model.

Minimal Clinically Important Difference

Approximately 67.7% of patients seen in the hospital outpatient setting achieved the MCID of at least 9 points or greater on FS, compared to 63.6% in the private practice outpatient setting, in unadjusted analyses. After adjusting for variables in the logistic regression model, those patients receiving care in the private practice setting were 32% less likely to achieve an MCID in FS than those in the hospital setting (odds ratio = 0.68; 95% CI: 0.62, 0.76; $P < .001$). See TABLE 4 for the model.

of the sample that were controlled for are presented in TABLE 1. When examining private practice setting, there was a nearly

even distribution of patients receiving care in the hospital (49.3%) and private practice (50.7%) settings. Overall,

DISCUSSION

OUR STUDY EVALUATED A LARGE SAMPLE of patients with musculoskeletal impairments who received physical therapy services in either a private physical therapy practice or hospital outpatient setting (FIGURE). Our results suggest that physical therapy care delivered in hospital outpatient settings was more efficient, estimated by the magnitude of clinical change relative to the number of visits. Specifically, patients seen in the hospital outpatient setting achieved 3.1 additional points of improvement in FS change in 2.9 fewer visits compared to the private practice setting, and 67.7% achieved the MCID in FS compared to 63.6% in the private practice setting (TABLE 2). Our analysis tested for differences based on 2 different practice settings, thus readers should be careful not to interpret the results as suggesting that there are underlying differences between the physical therapists in each practice setting. Specific information about providers is not available in the FOTO database. However, with the large sample of practices included, we would expect an even distribution of provider characteristics, such as subspecialty training. In addition, we did not have information on cost for episodes, so we were not able to compare cost-effectiveness across the 2 practice settings.

Determining reasons for this finding is beyond the primary purpose of this article. However, although speculative, it may be that hospital physical therapy departments have more personnel and other resources dedicated to the care delivery process, whereas private practice owners/managers have more overlapping patient care and administrative responsibilities. It could be that hospitals have a more coordinated and integrated delivery system that supports a more efficient care process. Perhaps hospitals that commit to measuring clinical outcomes have inherently strong physical therapy leaders who are actively managing the care delivery process and prepositioning

TABLE 4		LOGISTIC REGRESSION FOR CLINICALLY MEANINGFUL CHANGE OF 9 POINTS IN FUNCTIONAL STATUS SCORE	
Variable	Odds Ratio (Adjusted)*	P Value	
Treatment setting			
Hospital clinic (reference)	...	...
Private practice	0.68 (0.62, 0.76)	<.001	
Body region			
Lumbar (reference)	...	...
Thoracic	0.78 (0.75, 0.82)	<.001	
Lower extremity	1.30 (1.24, 1.35)	<.001	
Upper extremity	0.99 (0.93, 1.05)	.83	
Patient sex			
Female (reference)	...	...
Male	1.07 (1.04, 1.10)	<.001	
Patient age	0.98 (0.98, 0.99)	<.001	
Number of visits	1.02 (1.01, 1.02)	<.001	
Payment source			
Indemnity insurance (reference)	...	...
Medicaid	0.61 (0.49, 0.78)	<.001	
Medicare A, B, C	0.85 (0.68, 1.06)	.15	
Self-pay, free care	0.79 (0.60, 1.03)	.08	
Litigation, no fault, auto insurance	0.95 (0.75, 1.21)	.69	
HMO	0.85 (0.67, 1.08)	.20	
PPO	0.92 (0.73, 1.14)	.46	
Workers' compensation	0.66 (0.53, 0.83)	<.001	
Other source	0.82 (0.64, 1.04)	.11	
Exercise frequency			
No exercise (reference)	...	...
Exercise 1-2 times/wk	0.97 (0.92, 1.02)	.31	
Exercise 3+ times/wk	1.04 (0.99, 1.09)	.06	
Duration of pain 22+ d	0.92 (0.88, 0.95)	<.001	
Received medication for pain	1.19 (1.16, 1.23)	<.001	
Number of surgeries for condition	1.05 (1.04, 1.08)	<.001	
Number of other health problems	0.95 (0.94, 0.96)	<.001	
FABQ score-physical activity	1.00 (1.00, 1.01)	.01	
Geographic region			
Northeast (reference)	...	...
Midwest	0.85 (0.75, 0.98)	.02	
South Atlantic	0.93 (0.76, 1.13)	.47	
East South	1.35 (1.10, 1.66)	.003	
Mountain	1.14 (0.94, 1.37)	.15	
West South	1.13 (0.90, 1.41)	.26	
Pacific	1.34 (0.90, 1.99)	.14	

Abbreviations: FABQ, Fear-Avoidance Beliefs Questionnaire; HMO, health maintenance organization; PPO, preferred provider organization.
*Values in parentheses are 95% confidence interval.

themselves to be organized within the accountable care organization model. On the other hand, these same arguments

about dedicated leadership and commitment to the outcomes monitoring process can be made for the private practice cli-

ents who utilize FOTO, thus these explanations don't seem wholly adequate for explaining the differences we observed. Although beyond the purposes of this article, it would also be interesting to understand whether patient expectations and goals differ based on practice setting, and whether differing utilization of care extenders (physical therapist assistants, technicians, aides, etc) could have implications on the findings. Although the FOTO database does not permit these types of questions to be answered, they would be interesting considerations for future research.

In light of the fact that patients seeking care in the hospital outpatient setting received an average of 3 fewer visits compared to the private practice setting, it is important to consider whether financial incentives might explain the additional visits that occurred in the private practice setting. Conventional wisdom suggests that physical therapists in a hospital setting practicing within an integrated delivery system have less of a profit motive compared to those in the private practice setting. However, many physical therapists employed in a private practice setting are not owners, nor do they necessarily have compensation arrangements dependent on achieving specific productivity thresholds (eg, units per visit or visits per day). Moreover, similar to the potential fee-for-service profit motive in private practice, it is not uncommon for administrators in hospital outpatient settings to implement productivity standards and other practice management systems to optimize utilization. Future research should explore the implications of financial incentives on differences in utilization and efficiency of care in the delivery of physical therapy services.

Our results are similar to those of Jette and Davis,²¹ who found that care delivered in the hospital setting resulted in fewer visits per episode of care compared to the private practice setting. However, one important difference is that our study only included outpatient settings, whereas the study by Jette and

Davis²¹ also included the inpatient setting for the hospital estimates. However, our data differ from those of Machlin and colleagues,²³ who found no difference in the number of visits per episode of care based on the hospital outpatient versus private practice setting. Whether there is a tendency toward additional visits per episode of care in the private practice setting versus the hospital-based setting should continue to be an important area for future research.

Given our large sample size and corresponding high level of statistical power, even small magnitudes of difference in FS and visits between practice settings would likely achieve statistical significance. For example, the mean improvement in FS after adjusting for confounding factors was only 3.1 points higher in the hospital outpatient setting compared to the private practice setting, which is less than the MCID of approximately 9 points for the FS score (TABLE 2).^{18,27-32} Therefore, this is likely a trivial difference despite the statistical significance of the finding. However, to address this possibility further, we also considered the extent to which patients in each practice setting achieved a clinically meaningful change in FS, as determined by the MCID on the FS score. Approximately 4% more patients in the hospital outpatient setting achieved at least 9 points on the FS score compared to those treated in the private practice setting (TABLE 2). Although not a dramatic difference, the finding may not be trivial, and so the implications may be worth further exploration.

Limitations

This study did not account for the actual costs of care or whether the increased FS among patients seen in the hospital outpatient setting may have favorable implications on subsequent health care utilization and costs. For example, hospital settings have typically benefited from group provider reimbursement compared to private practice, which has resulted in insurance payments to hospitals that are typically 30% to 40%

higher for the same set of services delivered in the private practice setting.^{5,21-23} Machlin and colleagues²³ also found that expenses per physical therapy visit were about 27% higher in hospital outpatient departments. The authors noted this was not surprising, as overhead costs are considerably larger than those of private practice offices.^{21,23} Therefore, it is possible that any difference in efficiency of care favoring the hospital outpatient setting is more than offset by higher costs of care. Additionally, current knowledge does not provide information on whether fewer visits result in decreased chronicity or recurrence, lower downstream health care costs (medication use, utilization of imaging, laboratory tests, surgery, etc), less work absenteeism, increased work productivity, etc. Therefore, we cannot conclude from these data that care delivered in the hospital outpatient setting was necessarily more cost-effective than that delivered in the private practice setting. Future research would be helpful to better inform our understanding of the optimal number of visits for a given diagnosis and the value of physical therapy services in the context of the overall health care delivery process.

Some of the observed differences may be attributable to other confounding factors not accounted for in the present analysis. For example, research has demonstrated that patients who are able to access physical therapy services within the first 2 weeks after physician referral have better outcomes and lower costs compared to patients for whom access to physical therapy is delayed after referral.⁸ Perhaps physical therapists in hospital outpatient practice settings are able to see patients faster after physician referral compared to private practice settings, due to the majority of referrals coming from physicians who are employed by or contracted with the hospital. The FOTO database does not capture the number of days between the physician referral and the initial physical therapy evaluation, thus we are unable to determine the extent to which timing of physical therapy

care might explain some of the differences observed.

Moreover, depending on the specific third-party payer and the patient's individual benefit level, patients receiving physical therapy services in both practice settings have a copayment for each visit, which is designed to deter the continuation of care. Copayments are especially effective if patients do not perceive a benefit from the services being delivered, in which case they would tend to discontinue services prematurely. Therefore, the greater number of visits in the private practice may be attributable to a greater patient-perceived value of physical therapy services delivered in the private practice setting, hence patients' willingness to pay more for care in this practice setting. It may also be that copayments differ based on practice setting. For example, if copayments are generally higher in outpatient hospital settings than the private practice setting, this might explain the tendency toward fewer visits compared to the private practice setting. As patient copayment obligations are not available in the FOTO database, we are unable to analyze the extent to which copayment might have confounded the findings. It is possible that the greater number of visits observed in the private practice setting might be attributable to greater patient satisfaction/loyalty or better compliance with treatment recommendations, hence the tendency to seek additional visits.

Another limitation is the extent to which our findings are generalizable to all patients receiving physical therapy services. Clearly, the results cannot be generalized to physical therapy care delivered outside the hospital outpatient or private practice setting (ie, physician's office, skilled nursing facility, etc). It is also important to consider the generalizability of the results in light of loss to follow-up (defined by the lack of a discharge FS score). The analysis revealed a significant difference between practice settings on missing scores for discharge FS score—31% versus 33% for hospital and private practice settings, respec-

tively—but the practical implication of the magnitude of this difference is likely negligible (FIGURE). Although a higher follow-up rate would be ideal, our follow-up rate was generally similar to that of other studies reporting FOTO data.³⁰ Furthermore, because we do not have access to demographic data for the practices that did not respond to the initial survey regarding practice setting, we cannot be certain that the characteristics of responding practices are similar to those that did not respond, hence the potential for selection bias to exist. Nevertheless, there was no difference in response rate based on practice setting. The present study's response rate of 46% still exceeds the average response rate typically observed in organizational surveys.³

Finally, we do not know the precise number of physical therapists in each of the practice settings in our study. However, we can speculate that the hospital outpatient settings had more staff, because it required 405 private practices to generate roughly the same number of patients as 263 hospital outpatient settings during the study period. This raises a question about the extent to which FOTO clients enter all patients into the database. For example, we eliminated approximately 75 000 visits between both practice settings from the analysis because of missing data. Although the level of underreporting appears to be similar for each setting, we cannot be certain that the results are generalizable to patients in either setting whose outcomes were never entered into the FOTO database or who had incomplete data. We do not have access to demographic data for the nonresponding facilities to compare against those practices that responded. As a result, we cannot be certain that the characteristics of practices that responded are necessarily similar to those that did not respond, hence there is a potential for selection bias. The authors acknowledge that loss to follow-up, which was established by a missing discharge FS score (FIGURE), could potentially bias the results. Although we are not able to ascertain the specific rea-

sons for loss to follow-up, the difference in loss-to-follow-up rates based on practice setting was small (33% versus 31% for private practice and the hospital outpatient setting, respectively).

CONCLUSION

THE FINDINGS OF THIS STUDY SUGGEST that more efficient care was delivered among patients who received physical therapy in the hospital outpatient setting compared to the private practice setting, based on clinics that use FOTO. However, no conclusions about the cost-effectiveness of the services provided can be made, because it is possible that any difference in efficiency of care favoring the hospital outpatient setting may be more than offset by higher costs of care. Therefore, the study design and limitations warrant caution with interpretation and generalization. Future health-services research is needed to confirm the relevance of these differences, identify potential reasons for these findings, and determine implications for policy decision making. Future research should be undertaken to determine how delivery setting impacts the cost-effectiveness of physical therapy services and subsequent health care utilization. ●

KEY POINTS

FINDINGS: Few studies have examined whether clinical outcomes or efficiency of care differ based on practice setting. The data suggest that patients receiving physical therapy in hospital outpatient settings experience more efficient care compared to those who received care in private practice settings, as demonstrated by fewer visits to achieve a similar outcome.

IMPLICATIONS: It is important to examine outcome efficiency of the care delivery process across different practice settings given the increasing costs of health care, copayments that shift more of the cost directly to the patient, and the transition toward a bundled rather than a fee-for-service payment model.

CAUTION: We cannot conclude that care delivered in the hospital setting is more cost-effective, because it is possible that any difference in efficiency of care favoring the hospital outpatient setting is more than offset by higher costs of care. Future research is needed to establish how delivery setting impacts the cost-effectiveness of physical therapy services and subsequent health care utilization.

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