

Physician Specialty and the Quality of Medical Care Experiences in the Context of the Taiwan National Health Insurance System

Jenna Tsai, EdD, Leiyu Shi, DrPH, MBA, MPA, Wei-Lung Yu, MHA, Li-Mei Hung, MBA, and Lydie A. Lebrun, MPH

Objectives: Based on a recent patient survey from Taiwan, where there is universal health insurance coverage and unrestricted physician choice, this study examined the relationship between physician specialty and the quality of primary medical care experiences.

Methods: We assessed ambulatory patients' experiences with medical care using the Primary Care Assessment Tool, representing 7 primary care domains: first contact (ie, accessibility and utilization); longitudinality (ie, ongoing care); coordination (ie, referrals and information systems); comprehensiveness (ie, services available and provided); family centeredness; community orientation; and cultural competence.

Results: Having a primary care physician was significantly associated with patients reporting higher quality of primary care experiences. Specifically, relative to specialty care physicians, primary care physicians enhanced accessibility, achieved better community orientation and cultural competence, and provided more comprehensive services.

Conclusions: In an area with universal health insurance and unrestricted physician choice, ambulatory patients of primary care physicians rated their medical care experiences as superior to those of patients of specialists. In addition to providing health insurance coverage, promoting primary care should be included as a health policy to improve patients' quality of ambulatory medical care experiences. (J Am Board Fam Med 2010;23:402–412.)

Keywords: Primary Health Care, Quality of Health Care, Taiwan, Comparative Health Care Financing

Given pending health care reform in the United States, a key concern is the issue of establishing med-

ical homes for patients. Currently, ambulatory care is often provided by primary care physicians, such as those practicing in family practice, general practice, general internal medicine, and general pediatrics.¹ However, a not insignificant portion of care is provided by specialists, and the US health care system is generally characterized by its relatively high use of specialty care and relatively low exposure to primary care physicians.² Almost 15% of Medicare beneficiaries have been reported to see only specialists for their care during a given year, and between 5% and 10% of ambulatory visits to specialists by both adults and children are for primary care purposes.^{3–5} The literature indicates that health care provided in a specialist-focused model is more costly than that provided in a primary care-based system and can be associated with poorer health outcomes.^{6–11}

States that have recently made advances in increasing health insurance coverage (eg, Massachu-

This article was externally peer reviewed.

Submitted 22 September 2009; revised 19 January 2010; accepted 25 January 2010.

From the Center for General Education (JT), the Department of Health-Business Administration (W-LY), and the Department of Hotel and Restaurant Management (L-MH), Hungkuang University, Shalu, Taichung County, Taiwan; and the Department of Health Policy and Management, Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD (LS, LAL).

Funding: none.

Conflict of interest: none declared.

Corresponding author: Jenna Tsai, EdD, Hungkuang University, Center for General Education, No. 34, Chung-Chie Rd., Shalu, Taichung County, Taiwan 43302 (E-mail: jennatwang@gmail.com).

See Related Commentary on Page 283.

setts) have experienced shortages in primary care physicians, and there have been urgent calls to increase the supply of primary care physicians to meet growing demands.^{12,13} In the context of primary care shortages and high utilization of specialty care, policymakers may be interested to know how the quality of primary care that patients receive from non-primary care physicians compares to that of care received from primary care physicians. In other words: Which physician specialties are better suited to serve as usual sources of care for patients? Information regarding differences in the quality of patients' medical experiences could prove useful to policymakers in their attempt to improve health care delivery.

An informative model can be found in Taiwan (Republic of China), which features a national health insurance system where ambulatory care is provided by physicians from a variety of specialties, including primary care and non-primary care specialties. The current study uses a recent patient survey from Taiwan to examine the relationship between physician specialty and the quality of medical care experiences. The results provide insight into the consequences of having a health care system that is universal but not built on a foundation of primary care.

Methods

Study Setting

Taiwan established its universal National Health Insurance (NHI) program in 1995. The program is a government-run, single-payer insurance scheme financed through a mix of premiums and taxes, which provides payments to a mixed public and private delivery system on a predominantly fee-for-service basis.¹⁴ More than 96% of Taiwan's population is now enrolled in the NHI program.¹⁵

NHI benefits are more comprehensive than those of the US Medicare program, consisting of inpatient care, ambulatory care, laboratory tests, diagnostic imaging, prescription and certain over-the-counter drugs, dental care, traditional Chinese medicine, day care for the mentally ill, limited home health care, and certain preventive medicine. And unlike managed care in the United States, the NHI program allows patients the freedom to choose their own health care providers and therapies for both primary and specialty care.

There are no program mandates regarding which physician specialties may practice ambula-

tory care, and physicians from a variety of specialties practice ambulatory care. The specialties providing most of the ambulatory care in Taiwan include both traditional primary care specialties (ie, internal medicine, family practice, pediatrics) and non-primary care specialties (ie, obstetrics and gynecology, gastroenterology, general surgery, dermatology). The absence of a referral system and the freedom of provider choice give patients the option to "shop around" for doctors and hospitals regardless of the nature or severity of their illness, access specialty care directly without first having to see a primary care physician, select either primary care or specialist providers as their usual sources of care, or elect not to have any usual source of care if they so prefer.¹⁶ An implicit assumption underlying this health care system is that specialists deliver the same quality of primary care as primary care providers.

Thus, Taiwan offers an opportunity to examine the relationship between physician specialty and the quality of medical care experiences in the context of universal health insurance and freedom of provider choice by patients. The purpose of this study was to determine whether patients experience the same quality of primary care with specialists as they do with primary care providers.

Data

Data for this study came from a cross-sectional survey of randomly sampled patients in Taichung during the summer of 2008. Taichung County has a population of 1.55 million and occupies 5.74% of the total land area of Taiwan. With 37 hospitals and 1866 doctors, Taichung has physician-to-population and hospital beds-to-population ratios (12.03 per 10,000 and 28.06 per 10,000, respectively) comparable to Taiwan as a whole.

The sampling methodology was similar to that used by the US National Ambulatory Medical Care Survey (<http://www.cdc.gov/nchs/ahcd.htm>). A 2-stage probability design was utilized; this design involved a random sample of physicians practicing within Taichung County and a probability sample of patients who had recently visited their physicians. In the first stage physicians were stratified by 7 specialties that provide the most ambulatory care in Taiwan, including 3 primary care groups (ie, internal medicine, family medicine, pediatrics) and 4 specialist groups (ie, obstetrics and gynecology, gastroenterology, general surgery, dermatology).

Because doctors in Taiwan primarily practice in hospital settings, community-based doctors were not included. A systematic random sampling method was used to contact hospital-based physicians; 80% of the eligible physicians who were successfully contacted agreed to participate. Because of budgetary constraints, 10 doctors per specialty were selected and each was asked to provide a list of patients whom they saw within the past week.

In the second stage, 20 patients were randomly selected from each list and were contacted for an interview. Response rates for patients within each of the 7 physician specialty groups were comparable: internal medicine, 45% (n = 90); family medicine, 48% (n = 95); pediatrics, 48% (n = 96); obstetrics and gynecology, 44% (n = 88); gastroenterology, 47% (n = 94); general surgery, 46% (n = 91); and dermatology, 46% (n = 92). Across all physician specialties, patient medical records indicated that nonrespondents were more likely to be sick (eg, hospitalized) and older (≥ 65 years old) compared with respondents. Telephone interviews were conducted with willing participants by trained graduate research assistants from the Department of Health-Business Administration at Hungkuang University, which also reviewed and approved the study. Oral consent was obtained before the interview and no patient identifiers were recorded on the questionnaire or dataset. The survey instrument was administered in Chinese after validation by experts and field testing in the same region.

Measures

We used the Primary Care Assessment Tool (PCAT) Adult and Child Editions for data collection. The PCAT was developed by the Johns Hopkins Primary Care Policy Center to measure the extent and quality of primary care services delivered in provider settings, and it is consistent with a focus on attributes of primary care that have been demonstrated to produce better outcomes of care at lower costs.¹⁷ It focuses on patients' experiences with aspects of health care delivery rather than satisfaction with them. The questionnaire, which takes approximately 20 minutes to complete, can be administered through telephone or face-to-face interviews as well as by mail. Validation studies of the PCAT have been published elsewhere and indicate

that the hypothesized domains of primary care have substantial reliability and validity.^{18,19}

Domains of Primary Care

The validated PCAT consists of 10 scales representing 7 primary care domains: first contact (ie, accessibility and utilization); longitudinality (ie, ongoing care); coordination of services (ie, referrals and information systems); comprehensiveness (ie, services available and provided); family centeredness; community orientation; and cultural competence.

First contact care implies accessibility to and use of services for each new problem or new episode of a problem for which people seek health care. Longitudinality presupposes the existence of a regular source of care and the characteristics of the interpersonal relationship between that source and the patient. Coordination of care requires some form of continuity, either by practitioners, medical records, or both, as well as recognition of problems that are addressed elsewhere and the integration of their care into the total care of patients. Comprehensiveness implies that primary care facilities must be able to provide or arrange for all types of health care services, including referrals to secondary services for consultation, tertiary services for specific conditions, and essential support services such as home care and other community services.²⁰ Family centeredness, community orientation, and cultural competence refer to the provider's knowledge of community needs and involvement in the community. These primary care domains are consistent with the Institute of Medicine definition of primary care.^{21,22} Specific PCAT items representing the primary care domains are included in the Appendix.

For consistency in response and scoring, all items were represented by a 4-point Likert-type scale with 1 indicating "Definitely Not," 2 indicating "Probably Not," 3 indicating "Probably," and 4 indicating "Definitely." The sum score for each domain was derived by summing (after reverse-coding where appropriate) the values for all the items under each domain. The sum score for overall quality of primary care experience was derived by summing the values for all domains.

Health Care, Health Status, and Sociodemographic Measures

The primary independent variable of interest was provider specialty. For patients with a usual source

Table 1. Quality of Medical Care Experiences among Patients Seen by Primary Care Physicians Versus Specialists (Total Sample = 646)

	Primary Care					Specialty Care				Significance*
	PC (Sample Range: 261–281)	Internal Medicine (Sample Range: 82–90)	Family Medicine (Sample Range: 93–95)	Pediatrics (Sample Range: 86–96)	SC (Sample Range: 261–281)	OBGyn (Sample Range: 79–88)	Gastroenterology (Sample Range: 91–94)	General Surgery (Sample Range: 85–91)	Dermatology (Sample Range: 86–92)	
First contact (utilization)	2.94 (0.73)	2.91 (0.69)	2.85 (0.74)	3.05 (0.76)	2.69 (1.00)	2.43 (0.92)	2.95 (1.38)	2.67 (0.71)	2.69 (0.78)	3.53\$ 5.18\$
First contact (access)	2.55 (0.72)	2.61 (0.72)	2.61 (0.68)	2.44 (0.75)	2.16 (0.74)	2.11 (0.87)	2.17 (0.69)	2.19 (0.66)	2.18 (0.76)	8.73\$ 8.20\$
Ongoing care	2.66 (0.75)	2.66 (0.77)	2.62 (0.65)	2.70 (0.84)	2.48 (0.73)	2.30 (0.87)	2.55 (0.67)	2.54 (0.68)	2.54 (0.67)	2.95† 2.70†
Coordination (referral)	2.72 (0.65)	2.67 (0.64)	2.69 (0.63)	2.80 (0.69)	2.58 (0.69)	2.35 (0.83)	2.77 (0.66)	2.49 (0.57)	2.68 (0.60)	2.62† 5.17\$
Coordination information system	2.70 (1.16)	2.55 (0.74)	2.87 (1.68)	2.66 (0.76)	2.52 (0.76)	2.39 (0.83)	2.63 (0.72)	2.43 (0.74)	2.60 (0.74)	2.43† 2.62†
Comprehensiveness (services available)	2.62 (0.76)	2.54 (0.71)	2.58 (0.70)	2.73 (0.85)	2.40 (0.83)	2.48 (0.91)	2.46 (0.76)	2.19 (0.75)	2.46 (0.86)	3.47\$ 3.84\$
Comprehensiveness (Services provided)	2.78 (0.73)	2.65 (0.71)	2.81 (0.62)	2.88 (0.84)	2.57 (0.72)	2.35 (0.89)	2.55 (0.71)	2.65 (0.63)	2.72 (0.58)	3.60\$ 5.29\$
Family centeredness	2.77 (0.76)	2.67 (0.77)	2.68 (0.68)	2.97 (0.79)	2.56 (0.80)	2.41 (0.89)	2.59 (0.71)	2.51 (0.80)	2.73 (0.77)	3.38\$ 4.84\$
Community orientation	2.28 (0.64)	2.26 (0.65)	2.24 (0.66)	2.33 (0.61)	2.00 (0.73)	2.00 (0.78)	2.19 (0.73)	1.89 (0.63)	1.94 (0.74)	5.06\$ 6.08\$
Cultural competence	2.65 (0.66)	2.75 (0.69)	2.65 (0.64)	2.55 (0.66)	2.46 (0.73)	2.21 (0.79)	2.61 (0.63)	2.29 (0.78)	2.69 (0.61)	3.39\$ 7.99\$
Overall PC experience	26.60 (5.32)	26.21 (5.66)	26.57 (5.10)	27.00 (5.25)	24.41 (5.65)	23.01 (7.38)	25.49 (5.08)	23.90 (4.90)	25.07 (4.75)	4.81\$ 5.85\$

For each area of PC and SC listed, both minimum and maximum sample sizes are provided. Statistics included in the table are mean scores (SD) for the domains of health care experiences.

**t* test compares PC with SC. ANOVA compares differences across specialties.

†*P* < .05.

\$*P* < .01.

§*P* < .001.

PC, primary care; SC, specialty care; OBGyn, obstetrics/gynecology; ANOVA, analysis of variance.

Table 2. Quality of Overall Medical Care Experiences among Patients by Physician Specialty and Patient Sociodemographic Characteristics

Characteristics	Primary Care Areas						Specialty Care Areas					
	Primary Care			Internal Medicine			Family Medicine			Pediatrics		
	Mean (SD)	n		Mean (SD)	n		Mean (SD)	n		Mean (SD)	n	
Sex												
Male	26.47 (5.93)	63		27.38 (4.86)	30		25.79 (6.60)	27		25.01 (7.88)	6	
Female	26.69 (4.97)	188		26.08 (5.63)	47		26.89 (4.35)	66		26.90 (5.09)	75	
Age (years)												
<18	26.98 (5.00)	78			2		26.24 (2.83)					
18–44	25.82 (5.49)	128		25.85 (5.73)	60		25.80 (5.31)	68		23.38 (7.26)	66	
45–64	29.22 (4.16)	29		28.97 (4.06)	16		29.51 (4.41)	13		28.19 (1.61)	4	
≥65	28.54 (5.94)	5		26.01 (9.88)	2		30.23 (3.34)	3				
Education												
<High school	27.24 (5.39)	34		27.89 (8.67)	9		28.20 (3.46)	9		26.32 (3.96)	16	
High school	27.91 (4.01)	61		27.41 (3.37)	14		27.65 (4.03)	18		28.31 (4.37)	29	
Some college	25.41 (5.70)	104		25.25 (5.74)	38		25.79 (5.12)	41		25.01 (6.68)	25	
≥College	26.99 (5.42)	48		27.09 (4.82)	16		26.98 (6.18)	22		26.85 (5.08)	10	
Employment												
Full time	26.50 (5.61)	125		25.74 (6.13)	29		27.41 (5.63)	46		26.09 (5.27)	50	
Part time	27.37 (4.29)	21		28.30 (4.20)	7		26.92 (3.11)	10		26.87 (7.45)	4	
Unemployed	27.84 (5.60)	39		26.95 (6.93)	11		25.79 (5.93)	12		29.99 (3.57)	16	
Retired, in school, or other	25.91 (4.78)	63		26.40 (5.15)	30		25.60 (3.78)	24		25.08 (6.15)	9	
Household income (New Taiwan \$)												
<650,000	27.01 (4.75)	46		28.14 (5.18)	7		25.42 (4.45)	23		28.80 (4.47)	16	
650,000–849,000	28.01 (5.40)	52		27.74 (5.73)	24		29.12 (3.74)	18		26.64 (7.07)	10	
≥850,000	26.95 (5.64)	33		25.49 (5.51)	13		28.39 (6.39)	14		26.75 (3.58)	6	
Health status												
Excellent	26.57 (6.02)	21		24.96 (7.95)	9		29.01 (3.38)	6		26.55 (4.53)	6	
Very good	26.50 (4.96)	87		25.63 (6.68)	23		26.64 (4.99)	33		27.01 (5.20)	31	
Good	26.62 (5.12)	70		26.93 (5.10)	25		26.43 (5.65)	26		26.49 (4.62)	19	
Fair	26.52 (5.88)	76		26.35 (6.61)	22		25.87 (5.03)	27		27.31 (6.19)	27	
Poor	26.85 (4.07)	3		28.46 (4.18)	2					23.62 (3.38)	1	
Specialty Care												
Obstetrics/Gynecology												
	Mean (SD)	n		Mean (SD)	n		Mean (SD)	n		Mean (SD)	n	
Mean (SD)	24.44 (4.91)	127		24.44 (4.91)	127		24.44 (4.91)	127		24.44 (4.91)	127	
n	6			6			6			6		
General Surgery												
Mean (SD)	24.28 (4.69)	48		24.28 (4.69)	48		24.28 (4.69)	48		24.28 (4.69)	48	
n	38			38			38			38		
Gastroenterology												
Mean (SD)	24.58 (5.27)	38		24.58 (5.27)	38		24.58 (5.27)	38		24.58 (5.27)	38	
n	52			52			52			52		
Dermatology												
Mean (SD)	24.50 (4.93)	41		24.50 (4.93)	41		24.50 (4.93)	41		24.50 (4.93)	41	
n	36			36			36			36		
Specialty Care												
Mean (SD)	24.61 (5.91)	207		24.61 (5.91)	207		24.61 (5.91)	207		24.61 (5.91)	207	
n	6			6			6			6		
Obstetrics/Gynecology												
Mean (SD)	26.97 (2.03)	6		26.97 (2.03)	6		26.97 (2.03)	6		26.97 (2.03)	6	
n	224			224			224			224		
General Surgery												
Mean (SD)	22.83 (4.39)	49		22.83 (4.39)	49		22.83 (4.39)	49		22.83 (4.39)	49	
n	25			25			25			25		
Gastroenterology												
Mean (SD)	22.57 (0.49)	2		22.57 (0.49)	2		22.57 (0.49)	2		22.57 (0.49)	2	
n	10			10			10			10		
Dermatology												
Mean (SD)	20.86 (7.53)	3		20.86 (7.53)	3		20.86 (7.53)	3		20.86 (7.53)	3	
n	32			32			32			32		
Specialty Care												
Mean (SD)	25.19 (5.05)	17		25.19 (5.05)	17		25.19 (5.05)	17		25.19 (5.05)	17	
n	8			8			8			8		
Obstetrics/Gynecology												
Mean (SD)	23.80 (7.11)	31		23.80 (7.11)	31		23.80 (7.11)	31		23.80 (7.11)	31	
n	46			46			46			46		
General Surgery												
Mean (SD)	22.73 (4.38)	45		22.73 (4.38)	45		22.73 (4.38)	45		22.73 (4.38)	45	
n	6			6			6			6		
Gastroenterology												
Mean (SD)	22.53 (3.11)	15		22.53 (3.11)	15		22.53 (3.11)	15		22.53 (3.11)	15	
n	21			21			21			21		
Dermatology												
Mean (SD)	25.54 (6.10)	21		25.54 (6.10)	21		25.54 (6.10)	21		25.54 (6.10)	21	
n	9			9			9			9		
Specialty Care												
Mean (SD)	25.93 (3.85)	9		25.93 (3.85)	9		25.93 (3.85)	9		25.93 (3.85)	9	
n	26.12 (5.24)	12		26.12 (5.24)	12		26.12 (5.24)	12		26.12 (5.24)	12	
Obstetrics/Gynecology												
Mean (SD)	23.88 (5.68)	20		23.88 (5.68)	20		23.88 (5.68)	20		23.88 (5.68)	20	
n	4			4			4			4		
General Surgery												
Mean (SD)	25.79 (2.54)	4		25.79 (2.54)	4		25.79 (2.54)	4		25.79 (2.54)	4	
n	24			24			24			24		
Gastroenterology												
Mean (SD)	25.47 (5.82)	9		25.47 (5.82)	9		25.47 (5.82)	9		25.47 (5.82)	9	
n	13			13			13			13		
Dermatology												
Mean (SD)	24.43 (5.71)	13		24.43 (5.71)	13		24.43 (5.71)	13		24.43 (5.71)	13	
n	57			57			57			57		
Specialty Care												
Mean (SD)	23.02 (4.25)	57		23.02 (4.25)	57		23.02 (4.25)	57		23.02 (4.25)	57	
n	2			2			2			2		
Obstetrics/Gynecology												
Mean (SD)	19.85 (8.08)	8		19.85 (8.08)	8		19.85 (8.08)	8		19.85 (8.08)	8	
n	2			2			2			2		
General Surgery												
Mean (SD)	34.83 (1.94)	2		34.83 (1.94)	2		34.83 (1.94)	2		34.83 (1.94)	2	
n	1			1			1			1		

Table 2. (Continued)

	Primary Care Areas						Specialty Care Areas											
	Primary Care		Internal Medicine		Family Medicine		Pediatrics		Specialty Care		Obstetrics/ Gynecology		Gastroenterology		General Surgery		Dermatology	
	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n
Characteristics																		
Physical/mental problems																		
Yes	28.23 (5.23)	26	26.05 (1.15)	3	28.22 (6.26)	16	29.19 (3.82)	7	26.79 (3.94)	33	28.53 (3.98)	6	26.61 (2.91)	13	27.74 (4.90)	8	24.17 (4.03)	6
No	26.70 (5.24)	192	26.22 (6.08)	68	26.55 (4.81)	63	27.40 (4.60)	61	25.33 (5.01)	227	25.28 (5.36)	51	26.83 (4.55)	51	24.10 (4.82)	52	25.21 (5.02)	73
Additional private insurance																		
Yes	28.61 (4.27)	80	28.43 (4.15)	30	28.58 (3.69)	31	28.93 (5.41)	19	26.11 (4.95)	97	28.29 (5.57)	14	28.32 (2.79)	27	24.99 (5.32)	35	23.69 (4.58)	21
No	25.33 (5.97)	75	23.45 (7.74)	20	25.26 (4.45)	24	26.61 (5.55)	31	25.07 (3.99)	129	25.91 (3.33)	30	25.92 (4.92)	28	23.65 (4.18)	36	25.13 (3.15)	35
				F = 15.55*			F = 9.17†						F = 4.91*					

Mean (SD) statistics are for the overall quality of primary care experiences. Analysis of variance compares differences across categories of patient characteristics.

 $^{*}P < .05.$ $^{\dagger}p < .01.$ $^{\dagger}P < .001.$

of care, this was recorded as the specialty of the usual source of care; for patients without a usual source of care, this was recorded as the specialty of last health care provider seen. The survey also included questions about various sociodemographic characteristics (ie, sex, age, education, employment, household income); health status (ie, self-perceived general health status, whether respondent had any physical or mental concerns lasting for ≥ 1 year); and whether respondents had private insurance coverage in addition to national health insurance.

Analysis

The purpose of the analysis was to compare the quality of primary medical care that patients received from primary care providers versus that received from specialty care providers and to determine whether specialists provide the same quality of primary care delivery compared with primary care providers.

First, we used paired t tests to compare quality of primary care indicators during ambulatory visits for patients with primary care providers versus specialty providers. Analysis of variance was used to examine differences in primary care quality across physician specialties. Next, we used χ^2 analyses to compare sociodemographic and health characteristics of patients seen by primary care versus specialist physicians and to highlight any differences across populations. Finally, we used ordinary least squares regression models to assess the association between physician specialty (primary care vs specialty care) and quality of primary care attributes after controlling for patients' sociodemographic, health, and health care characteristics. Patient characteristics were included as control variables to account for differences that may lead some patients to choose primary care providers and others to choose specialty care providers. Separate models were created for each primary care domain as well as for overall quality of care.

Results

Table 1 presents the quality of primary care experiences among ambulatory patients seen by primary care physicians versus specialists. Patients seeing primary care physicians were most pleased with utilization (mean score, 2.94), followed by comprehensiveness of services provided (mean score, 2.78) and family centeredness (mean score, 2.77); they

Table 3. Effect of Primary Care Versus Specialty Care on Quality of Medical Care Experiences: Results of Multiple Regressions

	Model 1* (Unadjusted)		Model 2† (Adjusted)	
	Standardized Coefficients (SE)	<i>t</i> Score	Standardized Coefficients (SE)	<i>t</i> Score
Overall primary care experience	0.23 (1.61)	5.82 [‡]	0.14 (1.75)	3.19 [§]
First contact (utilization)	0.14 (0.21)	3.53 [‡]	0.08 (0.25)	1.64
First contact (access)	0.26 (0.23)	6.73 [‡]	0.25 (0.26)	5.85 [‡]
Ongoing care	0.12 (0.24)	2.95 [§]	0.05 (0.27)	1.21
Coordination (referrals)	0.07 (0.23)	1.87	0.00 (0.27)	−0.09
Coordination (information systems)	0.10 (0.23)	2.43	0.09 (0.28)	1.85
Comprehensiveness (services available)	0.14 (0.19)	3.43 [‡]	0.08 (0.22)	1.77
Comprehensiveness (services provided)	0.32 (0.36)	8.37 [‡]	0.09 (0.37)	2.33
Family centeredness	0.13 (0.19)	3.38 [‡]	0.04 (0.22)	0.97
Community orientation	0.19 (0.17)	4.98 [‡]	0.15 (0.19)	3.34 [‡]
Cultural competence	0.13 (0.17)	3.39 [‡]	0.16 (0.20)	3.45 [‡]

In this table, the reference group is specialty care.

*The independent variable in model 1 is physician specialty (primary care vs specialty care).

†In model 2, independent variables included patients' sex, age, education, employment, household income, health status, physical/mental health problem, and additional private health insurance in addition to physician specialty.

[‡] $P < .001$.

[§] $P < .01$.

^{||} $P < .05$.

were least satisfied with community orientation (mean score, 2.28), access (mean score, 2.55), and comprehensiveness of services available (mean score, 2.62). Patients who were seeing specialists were most pleased with utilization (mean score, 2.69), followed by coordination of referrals (mean score, 2.58) and comprehensiveness of services provided (mean score, 2.57); they were also least satisfied with community orientation (mean score, 2.00), access (mean score, 2.16), and comprehensiveness of services available (mean score, 2.40). Patients seeing primary care physicians consistently rated their quality of medical experiences for specific quality domains as well as overall quality of care significantly higher than did those seeing specialists ($P < .01$). The total score for quality of primary care experiences was 26.60 for ambulatory patients seeing primary care physicians versus 24.41 for patients seeing specialists, a difference of 2.19 ($P < .001$).

Table 2 shows the total score for overall quality of primary care experiences among patients with different sociodemographic characteristics seen by primary care and specialty care physicians. For patients seeing primary care physicians, significant age-, education-, and insurance-related differences in the quality of medical care experiences were

noted. Specifically, older patients, those with lower education levels, and those with additional private insurance tended to rate their quality of medical care experiences higher than younger patients, those with higher education levels, and those without additional private insurance, respectively. For patients seeing specialists, significant health status differences were noted: patients in better health tended to rate their quality of medical care experiences higher than those in fair or poor health.

Table 3 displays the standardized regression coefficients for the association between physician specialty (primary care vs specialists) and the 10 medical care quality scales as well as the summary score representing overall quality of care. Model 1 (in which only the physician specialty variable was included) shows that patients seeing primary care physicians rated their medical care experiences higher than did those seeing specialists for overall quality of care delivered as well as for 9 out of 10 quality scales (the one exception was coordination of referrals). After controlling for various sociodemographic, health, and health care characteristics (model 2), patients seeing primary care physicians still rated their overall experience higher than did those seeing specialists; 4 individual quality domains (ie, access, comprehensiveness of services

provided, community orientation, cultural competence) were also rated higher by patients seeing primary care physicians.

In addition to physician specialty, other covariates were found to be significantly associated with quality of medical care experiences, including patients' age, employment status, family income, perceived health status, presence of a physical/mental health problem, and possession of additional health insurance (results not shown but are available on request). Specifically, patients younger than 18 years of age reported more comprehensive services than did patients in other age groups. Employed patients reported fewer services available or family centeredness than did unemployed patients. Patients with higher incomes reported better access than did those with lower incomes. Those with better perceived health status reported better coordination of care, services available, family centeredness, community orientation, and cultural competence compared with patients with worse health status. Patients with additional health insurance coverage reported higher overall quality of medical care experiences, first contact care, ongoing care, and community orientation than did patients without additional coverage.

Discussion

Using patient-provided survey information collected in Taichung, Taiwan, this study assessed the association between physician specialty (particularly primary care v non-primary care) and the quality of medical care experiences. Our study is unique because it was conducted in a region that provides universal health insurance coverage and that imposes no restrictions on provider selection. Although research has been conducted comparing the effect of primary versus specialist care on health outcomes,^{8–11,20,23} there has been limited research exploring the intermediary link between physicians' specialties and the quality of primary care delivery. Our study addresses this gap in the literature and suggests that primary care physicians may provide better primary care experiences for patients in ambulatory settings than specialists.

After adjusting for potential confounders, the results indicated that ambulatory patients seeing primary care physicians reported higher average scores for perceived quality of primary care delivery compared with those seeing specialists. We found a

2.2-point difference in overall mean PCAT scores, approximately 9% higher for patients with primary care providers versus those with specialist providers. This difference is considered to be substantially significant and is similar in magnitude to an earlier study of racial/ethnic disparities in primary care in the United States, which found that parents of Asian-American children reported lower quality of care compared with the parents of white children.^{18,24}

The reader should exercise caution in interpreting the results from this study because of several limitations. First, this study was conducted in one region, included a limited sample size, achieved somewhat low response rates among patients, and revealed health- and age-related differences between respondents and nonrespondents. Therefore, the generalizability of the findings to other settings is limited. Secondly, this study examined patients' perceived quality of care experiences rather than actual outcomes of medical care. In addition to concerns with recall and response-set biases, patient-reported responses limit the inclusion of survey questions regarding the technical quality of medical care. However, self-reports are the only means of assessing patients' perceptions with health care experiences. Finally, the cross-sectional nature of the analysis limited our ability to draw causal inferences from the findings.

Despite these limitations, our study has implications for health care policy in Taiwan. The sizable sample of surveyed patients who were seeing specialists for ambulatory care suggests that this may contribute to significant increases in medical utilization and expenditures. There are significant cost implications of relying on specialists to provide primary care: certain physician specialties are more expensive to train for than others, care provided in a specialist-focused model drives costs higher than does a primary care-based system, and health outcomes may be poorer among patients treated by specialists.^{3,6,7,25,26} A more integrated referral system featuring primary care physicians who provide medical homes for patients might help curb utilization and expenditures as well as enhance the quality of medical care experiences.

There are also policy implications for the United States. Given pending health care reform in this country, the patient experience in Taiwan provides useful information about the consequences of having a health care system that is universal but not

built on a solid primary care foundation. Although primary care providers seem better equipped to serve as patients' usual sources of care than do specialists, health care reform may exacerbate current primary care shortages and negatively impact patients' health care experiences. When designing legislation, policymakers should be mindful of the critical need for primary care to improve the quality of patients' medical experiences and, ultimately, their health outcomes.

This study demonstrates that, even in an area that has universal health insurance and unrestricted access to physicians of all specialties, ambulatory patients seeing primary care physicians report higher quality of primary care experiences compared with patients seeing specialists. In addition to the provision of health insurance coverage, efforts to improve the quality of patients' medical care experiences should include policies promoting primary care providers as usual sources of care.

References

- Cherry DK, Hing E, Woodwell DA, Rechtsteiner EA. National ambulatory medical care survey: 2006 summary. National Health Statistics Reports, no. 3. Hyattsville, MD: National Center for Health Statistics; 2008.
- Forrest CB. A typology of specialists' clinical roles. *Arch Intern Med* 2009;169:1062–8.
- Rosenblatt RA, Hart LG, Baldwin L, Chan L, Schneeweiss R. The generalist role of specialty physicians: is there a hidden system of primary care? *JAMA* 1998;279:1364–70.
- Valderas JM, Starfield B, Forrest CB, Sibbald B, Roland M. Ambulatory care provided by office-based specialists in the United States. *Ann Fam Med* 2009;7:104–11.
- Valderas JM, Starfield B, Forrest CB, Rajmil L, Roland M, Sibbald B. Routine care provided by specialists to children and adolescents in the United States (2002–2006). *BMC Health Serv Res* 2009;9:221.
- Donohoe MT. Comparing generalist and specialty care: discrepancies, deficiencies, and excesses. *Arch Intern Med* 1998;158:1596–608.
- Weingarten SR, Lloyd L, Chiou CF, Braunstein GD. Do subspecialists working outside of their specialty provide less efficient and lower-quality care to hospitalized patients than do primary care physicians? *Arch Intern Med* 2002;162:527–32.
- Starfield B, Shi L, Grover A, Macinko J. The effects of specialist supply on populations' health: assessing the evidence. *Health Aff (Millwood)* 2005;Suppl Web Exclusivea:W5–97–W5–107.
- Starfield B, Shi L, Macinko J. Contributions of primary care to health systems and health. *Millbank Q* 2005;83:457–502.
- Shi L. Primary care, specialty care, and life chances. *Int J Health Serv* 1994;24:431–58.
- Shi L. The relationship between primary care and life chances. *J Health Care Poor Underserved* 1992;3:321–35.
- Massachusetts Medical Society. Physician workforce study. 2009. Available at http://www.massmed.org/AM/Template.cfm?Section=Research_Reports_and_Studies2&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=31514. Accessed 5 April 2010.
- Steinbrook R. Easing the shortage in adult primary care—is it all about money? *N Engl J Med* 2009;360:2696–9.
- Chiang TL. Taiwan's 1995 health care reform. *Health Policy* 1997;39:225–39.
- Cheng TM. Taiwan's new national health insurance program: genesis and experience so far. *Health Aff (Millwood)* 2003;22:61–76.
- Chang HJ. NHI policy priorities and future directions. Taipei: Bureau of National Health Insurance; 2001.
- Green LA. Science and the future of primary care. *J Fam Pract* 1996;42:119–22.
- Shi L, Starfield B, Xu J. Validating the adult primary care assessment tool. *J Fam Pract* 2001;50:161W–75W.
- Cassady C, Starfield B, Hurtado MP, Berk RA, Nanda JP, Friedenberg LA. Measuring consumer experiences with primary care. *Pediatrics* 2000;105(4 pt 2):998–1003.
- Greenfield S, Rogers W, Mangotich M, Carney MF, Tarlov AR. Outcomes of patients with hypertension and non-insulin-dependent diabetes mellitus treated by different systems and specialties: results from the Medical Outcomes Study. *JAMA* 1995;274:1436–44.
- Politzer R, Yoon J, Shi L, Hughes RG, Regan J, Gaston MH. Inequality in America: the contribution of health centers in reducing and eliminating disparities in access to care. *Med Care Res Rev* 2001;58:234–48.
- Regan J, Lefkowitz B, Gaston M. Cancer screening among community health center women: eliminating the gaps. *J Ambul Care Manage* 1999;22:45–52.
- Starfield B. Primary care: is it essential? *Lancet* 1994;344:1129–33.
- Stevens GD, Shi L. Racial and ethnic disparities in the quality of primary care for children. *J Fam Pract* 2002;51:573.
- Damiano PC, Momany ET, Tyler MC, Penziner AJ, Lobas JG. Cost of outpatient medical care for children and youth with special health care needs: investigating the impact of the medical home. *Pediatrics* 2006;118:e1187–94.
- Gillespie KN, Campbell CR. Cost and productivity

effects of residency programs in medicine, psychiatry, and surgery. AHSR FHSR Annu Meet Abstr Book 1995;12:26.

Appendix. Primary Care Assessment Tool: Indicators and Items of Quality Medical Care Experiences

Item responses consisted of a 4-point scale, with 1 being "Definitely not," 2 being "Probably not," 3 being "Probably," and 4 being "Definitely."

First Contact—Utilization

- B1. When you need a regular general checkup, do you go to your PCP before going somewhere else?
- B2. When you have a new health problem, do you go to your PCP before going somewhere else?
- B3. When you have to see a specialist, does your PCP have to approve or give you a referral?

First Contact—Access

- C3. When your PCP is open and you get sick, would someone from there see you the same day?
- C4. When your PCP is open, can you get advice quickly over the phone if you need it?
- C5. When your PCP is closed, is there a phone number you can call when you get sick?
- C7. When your PCP is closed and you get sick during the night, would someone from there see you that night?

Ongoing Care

- D1. When you go to your PCP, are you taken care of by the same doctor or nurse each time?
- D4. If you have a question, can you call and talk to the doctor or nurse who knows you best?
- D7. Does your PCP know you very well as a person, rather than as someone with a medical problem?
- D9. Does your PCP know what problems are most important to you?

Coordination (Referrals)

- E8. Did your PCP discuss with you different places you could have gone to get help with that problem?
- E9. Did your PCP or someone working with your PCP help you make the appointment for that visit?
- E10. Did your PCP write down any information for the specialist about the reason for the visit?
- E12. After you went to the specialist or special service, did your PCP talk with you about what happened at the visit?

Coordination (Information Systems)

- F1. When you go to your PCP, do you bring any of your own medical records, such as shot records or reports of medical care you had in the past?
- F2. Could you look at your medical record if you wanted to?
- F3. When you go to your PCP, is your medical record always available?

Comprehensiveness (Services Available)

Following is a list of services that [you/your child] or your family might need at some time. For each one, please indicate whether it is available at your PCP's office.

- G2. Immunizations (shots)
- G6. Family planning or birth control methods
- G8. Counseling for mental health problems
- G10. Sewing up a cut that needs stitches

Comprehensiveness (Services Provided for Adults)

During visits to your PCP, are any of the following subjects discussed with you?

- H1. Advice about healthy foods and unhealthy foods or getting enough sleep
- H2. Home safety, like getting and checking smoke detectors and storing medicines safely
- H4. Ways to handle family conflicts that may arise from time to time
- H5. Advice about appropriate exercise for you
- H7. Checking on and discussing the medications you are taking

Comprehensiveness (Services Provided for Children)

During visits to your child's PCP, are any of the following subjects discussed with you and your child?

- H1. Ways to keep your children healthy, such as nutritional foods or getting enough sleep
- H2. Home safety, like using smoke detectors and storing medicines safely
- H14. Ways to handle problems with your child's behavior
- H15. Changes in growth and behavior that you can expect at certain ages
- H16. Safety issues for children younger than 6, eg, teaching them to cross the street safely and using child safety seats in cars
- H17. Safety issues for children between 6 and 12, eg, teaching them to stay away from guns and to use seatbelts and bicycle helmets
- H18. Safety issues for children older than 12, eg, teaching them about safe sex, saying no to drugs, and not drinking and driving

Family Centeredness

- I1. Does your PCP ask you about your ideas and opinions when planning treatment and care for you or a family member?

- I2. Has your PCP asked about illnesses or problems that might run in your family?
- I3. Would your PCP meet with members of your family if you thought it would be helpful?

Community Orientation

- J1. Does anyone at your PCP's office ever make home visits?
- J2. Does your PCP know about the important health problems of your neighborhood?
- J3. Does your PCP get opinions and ideas from people that will help to provide better health care?

Cultural Competence

- K1. Would you recommend your PCP to a friend or relative?
- K2. Would you recommend your PCP to someone who does not speak English well?
- K3. Would you recommend your PCP to someone who uses folk medicine, such as herbs or homemade medicines, or has special beliefs about health care?