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Commentary

Is the duration of skin disease visits decreasing in the united states?

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Abstract

Background: Changes in the practice of medicine may be affecting how much time physicians spend with their patients. Economic pressures in some health systems may limit how much time patients spend with doctors. Inefficiencies associated with the use of EMR potentially could lengthen the duration of office visits.

Objective: To assess trends in the duration of skin disease visits over the last two decades.

Methods: Skin disease visits were selected from the 1993-2010 National Ambulatory Medical Care Survey. Changes in overall number of visits per dermatologist, variation in visit duration, and differences by specialty in visit duration were assessed.

Results: The mean duration of skin disease visits increased over time for both dermatologists ($\beta=0.24$ minutes) and non-dermatologists ($\beta=0.19$, both $P<0.0001$). For visits with a sole diagnosis of skin disease, dermatologist visits were shorter (14.7 minutes) than non-dermatologist visits (16.4 minutes, $P<0.0001$). Visits for unspecified warts, atopic dermatitis, unspecified dermatitis, and acne grew significantly longer over time. In a multivariate analysis, older age, later year, non-dermatology specialty, new patient status, procedure performed, private insurance, no physician extender involvement, and electronic medical records were associated with longer visit duration.

Limitations: The data are not informative about the quality of the time physicians spend with patients.

Conclusions: Economic pressures have, so far, not reduced the average time physicians spend in direct contact with patients.

Keywords: dermatology workforce, supply, demand, specialty care, NAMCS, electronic medical records

Introduction

Amid the changing policy landscape, dermatology patients are concerned about the amount and quality of time they get to spend with their doctor [1]. The supply of new dermatologists has struggled to keep pace with patient demand resulting from several factors that include an epidemic of skin cancer and increasing demand for cosmetic services. Although non-dermatologists treat about half of all skin disease, dermatologists are increasingly recognized by patients and other physicians as the most qualified physicians to perform many skin procedures and manage skin disease [2,3,4]. Reduced time with the physician can be associated with lower patient satisfaction.

In 2001, Mechanic demonstrated that contrary to the general perception that visits were getting shorter, actually physician visits of almost every kind in the United States were getting longer [5]. Recent analysis of the National Ambulatory Medical Care Survey (NAMCS) shows that the trends identified by Mechanic have persisted up through 2010 [6]. Increasing duration of visits may reduce the number of patients that each physician can see, exacerbating shortages. Office-based physicians are also not fully utilizing the entire workweek to see patients, seeing fewer on Fridays than other weekdays, perhaps owing to competing demands on their time [7]. How these trends will affect patient satisfaction remains to be seen. However, it is important to know what steps should be taken to avoid long wait times and dissatisfied patients.

The purpose of this study is to assess the trends in the duration of skin disease visits over the last two decades and evaluate possible consequences of related changes in supply and demand for dermatologic services.

Methods

The NAMCS, a nationally representative database of outpatient physician office visits, was used to characterize the duration of skin disease visits. This database from the National Center for Health Statistics has been previously described [8]. To calculate per capita estimates, numbers of NAMCS-eligible physicians and non-institutionalized civilian population from the NAMCS documentation were used. The NAMCS collects lists of all physicians from the American Medical Association (AMA) and American Osteopathic Association (AOA) who provide office-based, direct patient care.

For the present study, we selected visits with skin disease diagnoses, as previously defined by Fleischer [9]. We assessed the duration of visits, recorded in the NAMCS as the time spent with the physician in minutes. Time spent with other providers, such as nurses or physician assistants, is not counted as part of the visit duration in the NAMCS. We calculated the variation over time in total quantity of dermatology visits, number of dermatology visits per practicing dermatologist, and number of dermatology visits per American. Trends over time in visit duration were assessed using linear regression. We determined the top 20 skin-related diagnoses and the trend in visit duration for each of these diagnoses over time. Applying a Bonferroni correction for multiple comparisons, P-values of less than 0.05/20, or 0.0025, were considered significant. We also performed t-tests to compare dermatology visits for these 20 diagnoses to visits managed by non-dermatologists for the same diagnoses. We performed a multivariate regression to simultaneously assess the impact of patient gender, patient race, patient age, payment type, geographic region, physician extender (PE) involvement, and electronic medical records (EMR) use. Whether the visit included a procedure and whether the visit was a first or return visit were also recorded. All data analysis was performed using SAS 9.2 (SAS Institute, Cary, NC) and the study was declared exempt by the Wake Forest Baptist Hospital institutional review board.

Results

The sample included 29,554 records representing 588 million visits to dermatologists between 1993 and 2010. The number of visits to dermatologists rose from 29.6 million in 1993 to 39.7 million in 2010. During the same timeframe, the number of dermatologists eligible for NAMCS rose from 6,447 to 9,115. The number of visits per dermatologist declined by about 24 visits per year, dropping from around 4,300 per year to below 4,000 per year (Figure 1). The number of dermatologist visits per American increased by 0.0006 visits per person per year, or 60 visits per 100,000 annually.

The average duration of visits to dermatologists was 15.3 minutes (95% CI: 14.9 – 15.7), which was less than the average for all specialties of 18.5 minutes (95% CI: 18.3 – 18.7). For visits with a sole diagnosis of a skin disease, dermatologists spent 14.7 minutes (95% CI: 14.2 – 15.2), whereas nondermatologists spent 16.4 minutes (95% CI: 16.0 – 16.8; $P<0.0001$). Skin disease visits became longer by 0.16%/year (0.24 minutes/year) for dermatologists and 0.12%/year (0.19 minutes/year) for nondermatologists (both $P<0.0001$; Figure 2). For dermatologist visits, increased number of diagnoses was associated with visits 0.20 minutes longer per diagnosis ($P=0.04$).

For visits with the top 20 skin diseases, dermatologists showed shorter average visit durations than non-dermatologists for unspecified viral warts and unspecified disorder of skin, that were significant at the $P=0.0025$ level used with the Bonferroni

correction for multiple comparisons (Table 1). For four other diagnoses – herpes zoster, other seborrheic keratosis, acne, and sebaceous cyst – dermatologist visits appeared shorter with $P < 0.05$, but did not reach significance at $P = 0.0025$. The other fourteen diagnoses showed no significant difference in visit duration between dermatologists and non-dermatologists.

When assessing the trend over time by diagnosis, visits for unspecified warts, atopic dermatitis, dermatitis not otherwise specified (NOS), and acne became longer ($P < 0.0025$; Table 2). Visits for impetigo, psoriasis, and unspecified disorder of skin appeared to get longer with $P < 0.05$, but did not reach significance at $P = 0.0025$. The other thirteen diagnoses showed no significant trend over time.

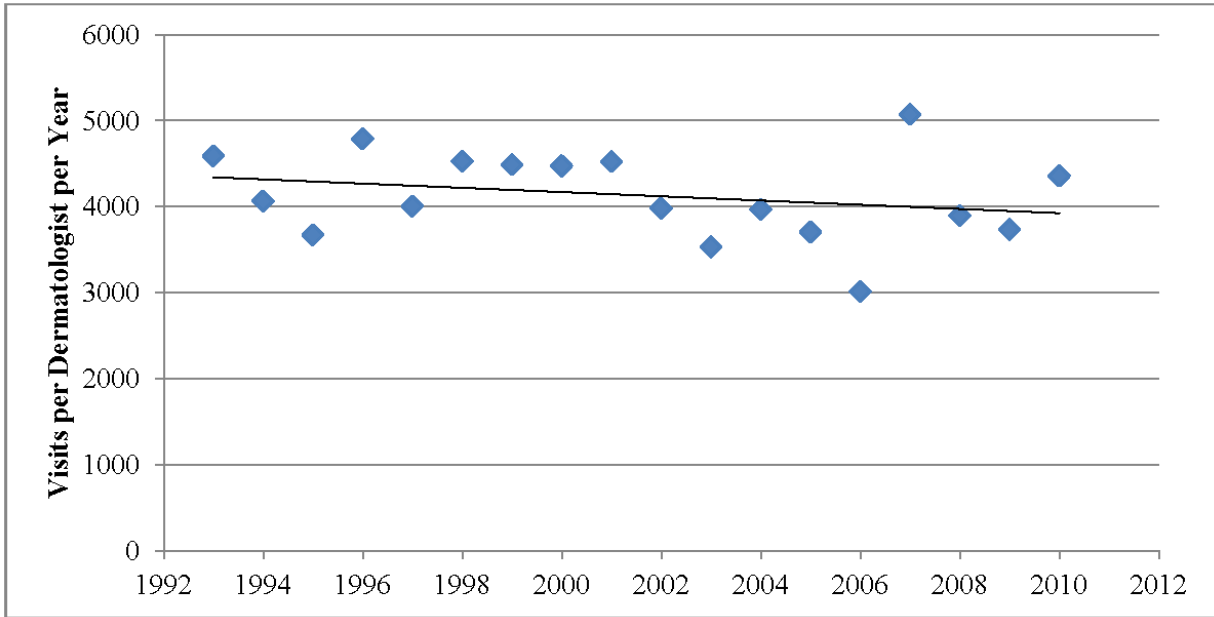


Figure 1. Visits per NAMCS-eligible dermatologist declined over the period 1993-2010 by about 24 visits per physician per year.

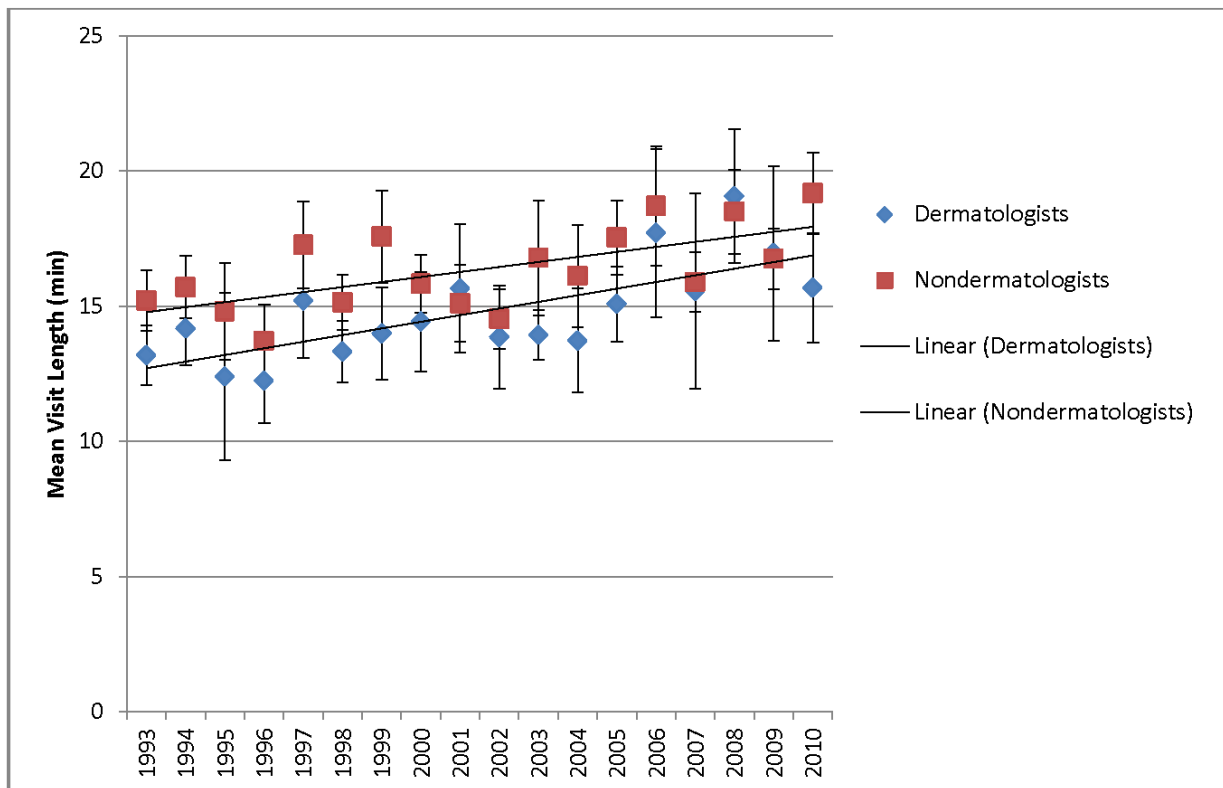


Figure 2. Duration of visits for a sole diagnosis of a skin disease. Mean visit duration increased over time for dermatologists by 0.24 minutes per year ($R^2 = 0.52$), and for nondermatologists by 0.19 minutes per year ($R^2 = 0.45$).

Table 1. Visits to dermatologists were shorter than visits to non-dermatologists for several skin conditions, whereas the remaining conditions showed no significant difference.

Diagnosis (ICD-9-CM code)	Total weighted (unweighted) visits	Mean visit length to dermatologists (95% CI)	Mean visit length to nondermatologists (95% CI)	P-value for t-test*
Dermatitis NOS (692.9)	70,910,000 (2335)	13.4 (12.7, 14.0)	13.3 (12.7, 13.9)	0.79
Acne (706.1)	68,970,000 (3165)	13.0 (12.6, 13.5)	14.7 (13.5, 15.9)	0.01
Actinic keratosis (702.0)	35,330,000 (1703)	13.1 (12.5, 13.7)	14.8 (12.8, 16.8)	0.13
Viral warts NOS (078.10)	34,440,000 (1377)	12.4 (11.7, 13.0)	14.7 (13.8, 15.5)	<0.0001
Epidermoid cyst (706.2)	28,220,000 (1335)	16.4 (15.2, 17.7)	18.8 (17.8, 19.7)	0.01
Nonmelanoma skin cancer of unspecified site (173.9)	22,880,000 (1133)	24.8 (21.3, 28.4)	26.6 (20.4, 32.7)	0.63
Benign neoplasm of skin (216.9)	22,550,000 (1039)	17.3 (15.9, 18.7)	20.1 (17.7, 22.5)	0.06
Psoriasis (696.1)	17,130,000 (821)	12.1 (11.3, 12.9)	16.4 (12.1, 20.8)	0.07
Unspecified disorder of skin (709.9)	14,830,000 (590)	15.1 (13.6, 16.5)	21.0 (19.2, 22.8)	<0.0001
Cellulitis and abscess of unspecified site (682.9)	14,790,000 (384)	15.1 (11.9, 18.2)	15.8 (14.1, 17.4)	0.70
Skin rash (782.1)	14,470,000 (351)	13.9 (11.7, 16.0)	15.5 (13.1, 17.9)	0.32
Other seborrheic keratosis (702.19)	10,560,000 (470)	12.8 (11.9, 13.7)	16.5 (14.0, 19.1)	0.01
Contact dermatitis due to plants (692.6)	10,350,000 (244)	11.6 (9.8, 13.3)	13.1 (11.6, 14.7)	0.18
Herpes zoster without complication (053.9)	10,310,000 (264)	13.0 (11.2, 14.8)	17.1 (14.2, 19.9)	0.02
Rosacea (695.3)	10,020,000 (463)	12.8 (12.1, 13.6)	14.5 (12.0, 17.0)	0.24
Atopic dermatitis (691.8)	8,670,000 (392)	14.2 (12.8, 15.7)	14.5 (12.8, 16.2)	0.81
Urticaria, unspecified (708.9)	8,360,000 (239)	16.3 (13.4, 19.1)	15.8 (13.9, 17.6)	0.77
Insect bite NOS (919.4)	8,220,000 (238)	11.2 (9.3, 13.0)	12.2 (11.1, 13.3)	0.35
Other specified viral warts (078.19)	7,820,000 (270)	13.5 (10.5, 16.5)	14.9 (13.6, 16.3)	0.39
Impetigo (684.00)	6,850,000 (178)	13.4 (11.0, 15.8)	12.3 (10.9, 13.6)	0.40

Table 2. Trends in the duration of visits with a sole diagnosis of skin disease over the period 1993-2010. Four diagnoses showed visits getting significantly longer over time, although none showed a significant decrease in duration.

Diagnosis (ICD-9-CM code)	Beta (min/y)	P-value*
Dermatitis NOS (692.9)	0.19	<0.0001
Acne (706.1)	0.23	<0.0001
Actinic keratosis (702.0)	0.09	0.05
Viral warts NOS (078.10)	0.21	<0.0001
Epidermoid cyst (706.2)	0.13	0.18
Nonmelanoma skin cancer of unspecified site (173.9)	0.52	0.07
Benign neoplasm of skin (216.9)	0.11	0.26
Psoriasis (696.1)	0.18	0.03
Unspecified disorder of skin (709.9)	0.32	0.03
Cellulitis and abscess of unspecified site (682.9)	-0.05	0.74
Skin rash (782.1)	-0.16	0.43
Other seborrheic keratosis (702.19)	0.16	0.11
Contact dermatitis due to plants (692.6)	0.17	0.19
Herpes zoster without complication (053.9)	0.54	0.07
Rosacea (695.3)	0.14	0.07
Atopic dermatitis (691.8)	0.33	0.002
Urticaria, unspecified (708.9)	0.14	0.49
Insect bite NOS (919.4)	0.11	0.36
Other specified viral warts (078.19)	0.13	0.34
Impetigo (684.00)	0.30	0.003

Multivariate Regression

In the multivariate analysis of skin disease visits from 1993-2010 (Table 3), excluding visits that included a PE, older age continued to be associated with longer visits after controlling for all other variables ($\beta=0.21$ minutes/year, $P<0.0001$). Greater age was associated with visits 0.29 minutes longer per 10 years of age. Seeing a dermatologist, being an established patient, and not having a procedure done were associated with shorter visits. Patient gender and race did not affect visit duration ($P>0.05$).

A separate multivariate analysis was performed for the years 2003-2010 with PE visits included. This analysis included the variables payment type, PE, and EMR, which did not have data available for the earlier years. The results for the other variables remained the same in this analysis, whereas having private insurance, no PE involvement, and EMR access were associated with longer visits.

Table 3. Multivariate regression assessing the effect of patient demographics, physician specialty, insurance, and selected characteristics of the visit on visit duration.

	1993-2010, No PE's (Unweighted)	2003-2010, with PE's (Unweighted)
	N=28,050; Weighted	N=10,564; Weighted

Variable	N=713,730,000		N=317,090,000	
	Beta (95% CI)	P-value	Beta (95% CI)	P-value
Age	0.029 (0.017, 0.041)	<0.0001	0.029 (0.004, 0.054)	0.02
Visit year	0.23 (0.17, 0.29)	<0.0001	0.31 (0.12, 0.49)	0.001
Internist	0.67 (-0.38, 1.73)	0.21	0.09 (-1.85, 2.02)	0.93
Pediatrician	-0.94 (-1.66, -0.22)	0.01	-1.60 (-2.72, -0.49)	0.005
Dermatologist	-1.80 (-2.53, -1.07)	<0.0001	-1.61 (-2.71, -0.50)	0.004
General/family practitioner	(Referent)		(Referent)	
Procedure performed	4.75 (4.08, 5.43)	<0.0001	3.72 (2.54, 4.91)	<0.0001
New patient	2.07 (1.52, 2.61)	<0.0001	1.20 (0.34, 2.05)	0.006
Gender, female	-0.04 (-0.41, 0.32)	0.82	-0.20 (-0.88, 0.48)	0.56
Black race	-0.16 (-0.74, 0.43)	0.60	-0.69 (-1.72, 0.35)	0.19
Other race	-0.42 (-1.23, 0.39)	0.31	-0.70 (-1.78, 0.39)	0.21
White race	(Referent)		(Referent)	
Private insurance	(No data)		1.45 (0.19, 2.71)	0.02
Medicare	(No data)		1.40 (-0.59, 3.39)	0.17
Medicaid	(No data)		0.87 (-0.57, 2.31)	0.23
Other or no insurance	(No data)		(Referent)	
Physician extender present	(Excluded)		3.30 (0.52, 6.07)	0.02
EMR	(No data)		1.40 (0.22, 2.59)	0.02

Discussion

Dermatology visits follow the general pattern of office visits not getting shorter. However, dermatologists compensated for the increasing duration of visits by seeing fewer patients per physician, whereas physicians in general saw a constant number of patients per physician despite increasing visit duration [6]. Although it is encouraging that visit durations are not being reduced by economic pressures, patients may not be able to see dermatologists as often as they want.

An increase of 0.24 minutes per year, averaged over 4,000 visits, equates to about 960 minutes per year. At the same time, dermatologists spend about 367 minutes per year less due to seeing about 24 fewer patients at 15.3 minutes per visit. Although the net increase of about 593 minutes, or about one work day, may not seem like a large amount, over an 18-year period, it results in a cumulative increase of roughly 18 added work days, which is a substantial added burden. If dermatologists work 35 patient care hours per week, 48 weeks per year, this increase would necessitate 965 additional full-time equivalent dermatologists to absorb the extra burden, about 11% of the current total.

EMR access was associated with longer visits. Although incentives for adopting EMR were intended to increase efficiency, so far they seem to be reducing dermatologists' efficiency. Many health systems have asked dermatologists to adopt EMR's that are not dermatology-specific and lack features that dermatologists find essential. Thus incentives for EMR adoption need to be carefully constructed so that dermatologists do not feel forced to adopt EMR's that impede their workflow [10,11].

Our study confirmed the results of Feldman (1999) that dermatologists are generally more time-efficient in managing skin disease than non-dermatologists [12]. Therefore, it is especially crucial to have enough dermatologists available to manage these conditions in the most time-efficient manner possible. Although the impact of physician extenders on quality of care is still debated, training more extenders may also be helpful to treat simple diagnoses and alleviate patients' concerns about lack of access to care.

Limitations include the fact that for some analyses, only visits with a sole diagnosis of a skin disease were included. The quality of the time physicians spent with patients could not be directly assessed. The possible impact of changing case-mix of dermatologists was not assessed. However, the increase in duration of both medical and surgical dermatology visits suggests that increases in cancer and surgery were not the main cause of longer visits. With its large sample size, this study achieved statistical significance on many measures, but statistical significance does not always equate to clinical significance. Measurement error is also a potential problem. NAMCS estimates have been compared to directly observed visit times [13,14] finding that physicians tended to over-report visit length by counting some time not spent directly with the patient. We believe that measurement error would probably be consistent over the entire time period and not affect the validity of trends identified over time. More studies that quantified the precision of the survey visit duration estimates would improve the robustness of our results.

The effect of visit duration on dermatologic quality of care will need to be closely monitored over the coming decades and more dermatologists may need to be trained to fully meet the robust demand for services.

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