An Empirical Investigation of Factors Influencing Career Satisfaction of Primary Care Physicians

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Background: **The purpose of this study was to examine factors that influence career satisfaction of 3 types of primary care physicians (PCPs): internal medicine (IM) physicians, family/general medicine (FGM) physicians, and pediatricians.**

Methods: **This was a secondary analysis of the Center for Studying Health System Change's 2008 Health Tracking Physician Survey. Regression analysis was done to examine the impact of environmental-, practice quality–, compensation-, and demographic-related factors on career satisfaction of IM physicians (n = 504), FGM physicians (n = 693), and pediatricians (n = 363).**

Results: **Nineteen percent of PCPs have been practicing for ≥30 years. Pediatricians had the highest career satisfaction. Although the threat of malpractice lawsuits significantly lowered career satisfaction (β = −0.177, −0.153, and −0.146), patient interaction (β = 0.242, 0.321, and 0.346) and income (β = 0.132, 0.151, and 0.170) significantly increased career satisfaction of IM physicians, FGM physicians, and pediatricians, respectively. Ownership significantly lowered career satisfaction of IM physicians and pediatricians (β = −0.168 and −0.114, respectively). Inadequate quality care significantly lowered career satisfaction of pediatricians (β = −0.102). The 3 regression models accounted for only 16% (IM physicians), 17% (FGM physicians), and 21% (pediatricians) of the variance in career satisfaction.**

Conclusions: **Steps like giving adequate time for interaction with patients, reducing potential threats of malpractice lawsuits, and improving income may increase PCPs' career satisfaction. (J Am Board Fam Med 2010;23:762–769.)**

Keywords: **Career Satisfaction, Primary Care Physicians, Surveys, Empirical Research**

A number of studies in the recent past have examined physicians' career satisfaction.[1–8] Research indicates that physicians who are satisfied with their careers are more likely to provide better health care and have more satisfied patients.[9,10] Moreover, dissatisfaction among physicians in a particular specialization can lead to declining numbers of medical graduates of that specialty,[11,12] an increase in rates of medical errors related to job stress,[13] unionization,[14] strikes,[15] and even exodus from the medical profession.[16]

Although the overall level of satisfaction among physicians in the United States has been consistently fairly high (around 80%), there is noticeable variation of satisfaction levels among various medical specialties.[2] Primary care physicians (PCPs; including family medicine, internal medicine, pediatrics, and general practice) have consistently ranked in the bottom tier.[2,5] This is disturbing because PCPs are in a unique position to lower health care costs by having close contact with patients, listening to them, and avoiding the prescription of unnecessary and expensive medical procedures.[17,18]

Politicians and policy makers agree that one of the main reasons why the US health care system is in a state of disarray is the increased emphasis on technology and specialty care at the expense of quality primary care and prevention.[19] PCPs are expected to be the gatekeepers, care manag-

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ers, and resource allocators in an integrated health system, yet the current reimbursement policies favor specialists and discount the services provided by primary care. Longer work days, lower pay, less prestige, and increased administrative headaches are eroding PCPs' satisfaction and, in some cases, causing earlier retirements.[20]

As a result, the number of medical students electing to go into primary care has been significantly declining. According to the American Academy of Family Physicians, since 1997 the number of US medical school students going into primary care has dropped by 51.8%, and it is estimated that by 2020 there will be a shortage of more than 40,000 primary care doctors in the United States. Moreover, because universal health care is a reality and approximately 32 million currently uninsured Americans have to be absorbed into the system, the need for PCPs is bound to escalate.[21]

The role of PCPs is bound to take on a much higher level of importance if the push toward patient-centered medical homes gains steam.[19,20] These medical homes are designed to deliver better coordinated, easily accessible, continuous, comprehensive, family-centered, and culturally sensitive primary health care with a focus on prevention, safety, quality, and appropriate reimbursement via a team approach. Within such a system, much of the routine, time-consuming tasks are performed by nurse practitioners and physician assistants, leaving the PCPs more time to listen to and adequately treat patients.[19,20]

Previous studies regarding career satisfaction of PCPs have indicated some interesting trends and raised some important questions. Buchbinder, Melick, and Powe[22] conducted a cohort study of 507 PCPs, aged younger than 45 years, who were interviewed twice (in 1987 and again in 1991) and asked overlapping questions regarding their overall career satisfaction. Fifty-five percent of all the PCPs had changed jobs during the 5-year period, with 20% of the PCPs having left 2 jobs. Thus, they concluded that there is a clear link between PCP job satisfaction and PCP turnover. They recommended that it is important for health care planners to understand the main reasons for PCPs' discontent and to develop policies designed to reduce turnover.[22] Another survey of PCPs conducted in 2006 for *Physicians Practice*,[23] a leading national medical practice management publication, found that more than 50% of PCPs considered themselves "second-class citizens" compared with surgical and diagnostic specialists. In addition, almost two thirds of PCPs reported that they would choose another field if they could do over their careers. Approximately 39% of the 508 responding PCPs said they would become surgical or diagnostic specialists, whereas approximately 22% said they would not choose medicine as a career.[23]

In an attempt to shed some light on the declining level of satisfaction,[24] decreasing sense of professional autonomy,[25] and "feelings of powerlessness"[26] in the complex health care environment within which PCPs operate,[27] Katerndahl et al[28] used Community Tracking Survey data collected during 3 consecutive periods (ie, 1996–1997, 1998–1999, and 2000–2001) to examine the relationships of both perceived autonomy and perceived complexity of care on PCPs career satisfaction. They concluded that there is considerable interaction between perceived complexity of care, perceived autonomy, and career satisfaction of PCPs. However, they point out that, because the predictors of career satisfaction in their study explained less than 15% of the variance, there must be more factors involved in satisfaction and perceived autonomy than those they measured.

Given the significant role that PCPs play in an integrated, complex health care system and the impending shortage of PCPs that has been forecasted for the next decade, it is imperative for health care policy makers and medical school directors to have a good understanding of the factors causing career dissatisfaction among PCPs. This knowledge will help health care professionals provide medical students with adequate career counseling, frame policies that will enhance the work environment, improve compensation/reimbursement methods, and increase satisfaction levels among PCPs, thereby improving the overall quality and access of primary care in the United States. The purpose of this study was to conduct an empirical investigation of the relationship between career satisfaction of various PCP specialty groups and factors associated with their work environment, practice quality, compensation, and demographics. The findings helped to establish a new baseline that can be used to track how various PCP specialty groups

like internal medicine, family/general medicine, and pediatrics organize and practice medicine.

Methods

Sample

The Center for Studying Health System Change (HSC)'s 2008 Health Tracking Physician Survey was the source of the data used in this study.[29] The HSC is a Washington D.C.–based organization that is partly funded by the Robert Wood Johnson Foundation and that is affiliated with Mathematica Policy Research. Part of its mission is to improve the health of the public. This nonpartisan organization conducts studies about the US health care system with the objective of ensuring that reliable and unbiased information is available to those making policy decisions. The 2008 HSC survey was funded by the Robert Wood Johnson Foundation and the data files and documentation are available through the Inter-University Consortium for Political and Social Research.[30] One of the objectives of this survey was to establish a new baseline to track how physicians organize and practice medicine.

The sample frame of this study was derived from a list of physicians from the American Medical Association. The American Medical Association master file had a list of 735,378 physicians as of July 2007. After deletion of inaccurate and incomplete items in the data file, the HSC was left with a sampling frame of 550,260 physicians. The HSC used stratification procedures to identify a sample of physicians to be surveyed for the study. The procedure ensured that there was an adequate sample size for various populations and that the respondents of the survey belonged to all 50 states and the District of Colombia. The HSC surveyed 10,250 physicians between February 2008 and October 2008. One thousand two hundred thirty-six physicians refused to participate in the survey, and 2683 physicians did not respond to the survey. One thousand six hundred eleven returned surveys were rejected because they were from ineligible physicians. The survey excluded residents, fellows, Federal employees, and foreign medical school graduates who were temporarily licensed to practice in the United States. It also did not include specialists whose primary focus was not direct patient care. In the end, 4720 completed surveys were received from eligible physicians. The HSC 2008 Health Tracking Physician Survey Methodology Report provides detailed information about the stratification procedure, target population, survey design, and data collection procedures.[31]

This study used only responses of PCPs (internal medicine, family medicine/general medicine, and pediatrics) from the Health Tracking Physician Survey. After list-wise deletion for missing values we were left with a usable sample of 504 internal medicine physicians, 693 family/general medicine physicians, and 363 pediatricians. More information about the variables used in this study is available online.[32] In addition, information about the measurement scale of each variable used in our study is provided in Table 1.

Dependent Variable

Career satisfaction was the dependent variable of this study. The overall satisfaction of a physician's career in medicine was measured on a 5-point Likert scale, ranging from a high of very satisfied to a low of very dissatisfied.

Independent Variable

The independent variables of this study were grouped into 4 categories. They are (1) environmental issues, (2) practice quality, (3) compensation, and (4) physician demographics.

Environmental Issues

Environmental issues consisted of degree of ownership, use of information technology, and if the physicians worked most of their time in private practice (yes/no). Ownership was measured (from high to low) on a 3-point scale. Use of information technology consisted of 16 items. These items examined the use of information technology in the areas of clinical practice, patient information, and prescription drugs.

Practice Quality

Practice quality factors included inadequate quality care, threat of malpractice, and patient interaction. Inadequate quality care consisted of 8 items that could limit a physician's ability to provide high-quality care to patients. These items included rejection of care decision by insurance, lack of qualified specialists in the area, patients' inability to pay for needed care, inadequate time with patients, not getting reports in time, difficulty communicating

Table 1. Operational Definitions of Study Variables

Variables	Items	Scale
Career satisfaction	1	5 = Very satisfied 1 = Very dissatisfied
Ownership	1	2 = Full owner 1 = Part owner 0 = Employee and independent contractor
Information technology use	16	3 = IT available and used 2 = IT available and not used 1 = IT not available
Private practice	1	1 = Yes 0 = No
Inadequate quality care	8	3 = Major problem 2 = Minor problem 1 = Not a problem
Threat of malpractice	5	5 = Strongly agree 1 = Strongly disagree
Patient interaction	1	5 = Strongly agree 1 = Strongly disagree
Income	1	6 = >$300,000 5= $250,001-$300,000 4 = $200,001-$250,000 3 = $150,001-$200,000 2 = $100,001-$150,000 1 = <$100,000
Benefits of drug companies	1	1 = Yes 0 = No
Sex	1	1 = Male 0 = Female
Race	1	1 = Hispanic 2 = White 3 = Black 4 = Asian or Pacific Islander 5 = Other/mix
Experience	1	8 = 2005 or later 7 = 2001–2004 6 = 1996–2000 5 = 1991–1995 4 = 1986–1990 3 = 1981–1985 2 = 1976–1980 1 = 1975 or earlier

with patients, patients not complying with treatment recommendations, and medical errors in hospitals. These items were measured on a 3-point scale.

Threat of malpractice was measured using 5 items. These items asked the respondents the extent to which they agreed that (1) they were concerned that they will be involved in a malpractice case sometime during the next 10 years, (2) they felt pressure in their day-to-day practice by threat of malpractice litigation, (3) they ordered tests or consultations to avoid any appearance of malpractice, (4) they asked for a consultation to reduce the risk of being sued, and (5) they rely less on clinical judgment than technology to make a diagnosis because of the threat of a malpractice lawsuit. Patient interaction measured the extent to which the respondents agreed that they have adequate time to spend with their patients during their office visit.

Compensation

Compensation consisted of income level of the physicians and benefits provided by drug and medically related companies. Income was measured on a 6-point categorical variable presented in Table 1. Benefits provided by drug and medically related companies consisted of 7 items that measured food and/or beverages provided at work, free drug samples, honoraria for speaking, honoraria for participating in surveys, payment for consultation services, cost of travel to meetings, and other compensation from drug companies.

Physician Demographics

Demographic variables selected were sex, race, and experience. Scales of these variables are also presented in Table 1.

Analysis

Each of the PCP categories (internal medicine physicians, family/general medicine physicians, and pediatricians) was analyzed separately. Means and SDs were calculated for each variable. Cronbach's α was used to calculate the internal consistency or reliability of variables with multiple items (information technology use, inadequate quality care, threat of malpractice, and benefits from drug companies). Ordinary least square regression analysis was done to examine the impact of various independent variables on our dependent variable. Statistical analysis was done using SPSS Statistics version 17.0 (SPSS, Inc., Chicago, IL).

Results

Table 2 presents descriptive statistics of the data used in this study. An average internal medicine and family/general medicine physician was a white man who was "somewhat satisfied" with his career in medicine. An average pediatrician was a white woman who was "very satisfied" with her career in medicine. An average physician in all 3 specialties began his/her medical practice between 1991 and 1995. This physician had some ownership of her/his private practice and made between $100,000 and $150,000 a year. For internal medicine, family/

Table 2. Descriptive Statistics for Dependent and Independent Variables for the 3 Primary Care Specialties

Variables	Internal Medicine (n = 504)	Family/General Medicine (n = 693)	Pediatrics (n = 363)
Career satisfaction	3.857 (1.147)	3.971 (1.068)	4.320 (0.921)
Ownership	0.891 (0.873)	0.812 (0.865)	0.788 (0.784)
Information technology use	2.033 (0.573)	1.981 (0.590)	1.926 (0.554)
Private practice	0.756 (0.430)	0.799 (0.401)	0.774 (0.419)
Inadequate quality care	2.030 (0.360)	2.034 (0.337)	1.961 (0.394)
Threat of malpractice	3.607 (0.958)	3.689 (0.977)	3.233 (0.970)
Patient interaction	3.157 (1.402)	3.195 (1.380)	3.603 (1.231)
Income	2.706 (1.290)	2.622 (1.290)	2.523 (1.357)
Benefits of drug companies	0.307 (0.189)	0.320 (0.171)	0.292 (0.171)
Sex	0.706 (0.456)	0.727 (0.446)	0.482 (0.500)
Race	2.500 (0.944)	2.270 (0.789)	2.340 (0.930)
Experience	4.647 (1.936)	4.527 (1.984)	4.730 (2.077)

Values provided as mean (SD).

general medicine, and pediatrics, Cronbach's α were 0.90, 0.91, and 0.98, respectively, for information technology use; 0.53, 0.48, and 0.54, respectively, for inadequate quality care; 0.87, 0.88, and 0.87, respectively, for threat of malpractice; and 0.62, 0.57, 0.57, respectively, for benefits from drug companies.

The significance of the relationship between the independent and dependent variables is presented in Table 3. Level of ownership in a practice had a significant negative impact on career satisfaction of both internal medicine physicians and pediatricians. However, inadequate quality care had a significant negative impact only on the career satisfaction of pediatricians. Although career satisfaction of physicians in all 3 specialties was positively and significantly impacted by patient interaction and income, satisfaction was significantly and nega-

Table 3. Regression Results for Environmental Issues, Practice Quality, Compensation, and Demographics for the 3 Primary Care Specialties

Variable	Internal Medicine (n = 504)	Family/General Medicine (n = 693)	Pediatrics (n = 363)
Environmental issues			
Ownership	−0.168 (0.064)*	−0.059 (0.049)	−0.114 (0.065)†
Information technology use	0.046 (0.086)	−0.003 (0.065)	−0.026 (0.086)
Private practice	−0.011 (0.130)	−0.020 (0.106)	−0.066 (0.136)
Practice quality			
Inadequate quality care	−0.080 (0.147)	−0.044 (0.120)	−0.102 (0.117)†
Threat of malpractice	−0.177 (0.053)*	−0.153 (0.039)*	−0.146 (0.047)*
Patient interaction	0.242 (0.038)*	0.321 (0.029)*	0.346 (0.038)*
Compensation			
Income	0.132 (0.038)*	0.151 (0.031)*	0.170 (0.035)*
Benefits of drug companies	0.051 (0.266)	0.067 (0.229)	0.096 (0.284)
Demographics			
Sex	−0.064 (0.110)	0.011 (0.091)	0.025 (0.095)
Race	−0.007 (0.052)	−0.007 (0.048)	−0.030 (0.049)
Experience	0.019 (0.027)	0.012 (0.021)	−0.026 (0.022)
F	9.881*	13.475*	9.713
Adjusted R^2	0.16	0.17	0.21

All data provided as β (SE).
*$P \leq .01$.
†$P \leq .05$.

tively impacted by the threat of malpractice lawsuits. In fact, among all factors examined in this study, patient interaction had the greatest impact on career satisfaction of all specialties.

Discussion

This is not the first nationwide study to examine the career satisfaction of PCPs. However, most of the nationwide studies in the past used the Community Tracking Survey, a predecessor to the 2008 Health Tracking Physician Survey used in our study. The Community Tracking Survey, a longitudinal survey, was first conducted in 1996 and has various limitations, which have been well documented.[28,29] Besides being more current, the 2008 Health Tracking Physician Survey addresses many policy issues related to physician care that are important today and were not covered in the Community Tracking Survey. The 2008 Health Tracking Physician Survey was created to set up a new baseline for research about physicians and included questions about many new issues such as malpractice and physician ownership.

Our data indicates that 19% of PCPs have been practicing since at least 1980. These physicians who have been practicing for 30 years or more may be contemplating retirement at a time when there is a dire need in the United States for more PCPs. This further emphasizes the need to create opportunities and systems to encourage medical students, especially women and minorities, to specialize in primary care. Mentorship programs and formal social support groups may help with recruiting more women and minorities. Previous research about career satisfaction of female physicians has indicated that some female physicians report that they have fewer opportunities for advancement and are paid less than their male counterparts. Female medical students are less likely to pursue those specialties where these practices are prevalent.[33,34] The attrition and "burn out" rate of PCPs also needs to be addressed via better remuneration and reimbursement methods so that their overall level of career satisfaction can be significantly increased. Most experts believe that a real transformation of US health care will only occur when quality, access, coordination, and accountability are enhanced, all of which require excellent and motivated PCPs.

Our analysis found that those internal medicine physicians and pediatricians who had some degree of ownership in their practice were less satisfied with their careers. This suggests that those PCPs who worked as independent contractors or as employees were more satisfied with their careers. Use of information technology in the areas of clinical practice, patient information, and prescription drugs and working in a private practice had no impact on career satisfaction. In addition, various benefits provided by drug companies and working in private practice had no significant positive or negative impact on the career satisfaction of PCPs.

Practice quality factors were the most important predictors of career satisfaction for PCPs in the 3 specialties. Inadequate quality of care had a significant negative impact on the career satisfaction of pediatricians. Thus, career satisfaction of pediatricians was negatively influenced by their inability to refer a patient to a quality specialist, arrange nonhospital admissions, provide high-quality outpatient mental health services, and the absence of interpreter services for non–English-speaking patients. In our study, patient interaction had the biggest impact on career satisfaction of PCPs, followed by the threat of malpractice. The income level of physicians significantly impacted career satisfaction of all types of PCPs. None of the demographic variables had a significant impact on career satisfaction. It is possible that some of these nonsignificant variables had an indirect impact on career satisfaction. Future research needs to examine the indirect impact of these factors using path analysis.

Because physician pay was associated with lower satisfaction, this study suggests that increasing pay could help attract more physicians to primary care fields. For example, changes in reimbursement have been recommended by many experts in health care.[20,21,35] However, more research needs to be done to clarify the true relationship between income and career satisfaction. For example, future research could examine if a PCP's career satisfaction is impacted by actual pay, pay relative to that of other specialties, or both. The number of medical students opting into a primary care specialty may be able to be increased through the provision of tuition waivers or loan forgiveness programs.[20,35] Given the negative view of liability by the physicians in this study, states may also increase the PCP workforce by improving the professional liability climate. Further, because satisfaction is dependent on patient interaction, payment mechanisms that

encourage time for patient interaction over volume—such as salary rather than fee per individual service—could also increase the attractiveness of the fields.

This study has several limitations. First, this study is based on self-reported secondary data. Second, our independent variables accounted for only16% of the variance in career satisfaction for internal medicine physicians, only 17% of the variance in career satisfaction for family/general practice physicians, and only 21% of the variance in career satisfaction for pediatricians. Although many researchers would consider them low, these values are higher than what has been found in previous research examining the career satisfaction of PCPs.[28] Because we used a secondary data set, our analysis is limited to the variables studied by the primary researchers. Clearly there are other significant variables that were not included in our study. Previous health care research has shown that, besides financial rewards, factors like ethical climate, recognition, respect, empathy, and appreciation can significantly impact job satisfaction and commitment of employees. Future research needs to investigate the impact of these factors on career satisfaction. Research also needs to be done about the impact on mentorship programs and formal social support groups on the recruitment of women and minorities. Third, the Cronbach's α for some of our variables were low. Cronbach's α is impacted by the number of items in the scale and the magnitude of the correlation among the items. Fourth, our regression model only accounts for direct effects. A path model with indirect effects may give us a better understanding of the true impact of these factors on career satisfaction.

Conclusion

To our knowledge, this is the first study that has examined the factors that impact the career satisfaction of different types of PCPs using the 2008 Health Tracking Physician Survey. Our study found that patient interaction, followed by the threat of malpractice and income, had the most significant impact on the career satisfaction of PCPs. Use of information technology, the kind of practice, drug company benefits, sex, race, and experience had no direct impact on PCPs' career satisfaction. Although pediatricians reported the highest level of satisfaction with their careers, factors indentified in our study can guide future doctors in their decisions regarding whether or not to pursue a career in primary care. Given the need for more PCPs, the result of this study can help health care managers come up with strategies to not only ensure that physicians don't quit but also to persuade physicians to delay early retirement.

References

1. Ahmadiyeh N, Cho NL, Kellogg KC, et al. Career satisfaction of women in surgery: perceptions, factors, and strategies. J Am Coll Surg 2010;210: 23–8.
2. Leigh JP, Tancredi DJ, Kravitz RL. Physician career satisfaction within specialties. BMC Health Serv Res 2009;9:166–77.
3. Cydulka RK, Korte R. Career satisfaction in emergency medicine: the ABEM Longitudinal Study of Emergency Physicians. Ann Emerg Med 2008;51: 714–722.e1.
4. Clem KJ, Shah A, Glickman SW, et al. Indentification of factors that enhance career satisfaction among female emergency physicians. Ann Emerg Med 2007;50(3 Suppl 1):S19.
5. Duffy RD, Richard GV. Physician job satisfaction across six major specialties. J Vocat Behav 2006;68: 548–59.
6. Gendreau M. Career satisfaction in emergency medicine and burnout: all is not well. Ann Emerg Med 2008;52:577.
7. German RH. Career and lifestyle satisfaction among surgeons. J Am Coll Surg 2009;209:795.
8. Kuhn G, Goldberg R, Compton S. Tolerance for uncertainty, burnout, and satisfaction with the career of emergency medicine. Ann Emerg Med 2009;54: 106–13.e6.
9. DeVoe J, Fryer GE, Hargraves JL, Phillips RL, Green LA. Does career dissatisfaction affect the ability of family physicians to deliver high-quality patient care? J Fam Pract 2002;51:223–8.
10. Hass JS, Cook EF, Puopolo RL, Burstin HR, Cleary PD, Brennan TA. Is the professional satisfaction of general internists associated with patient satisfaction? J Gen Intern Med 2000;15:122–8.
11. Pugno PA, Schmittling GT, McGaha AL, Kahn NB. Entry of US medical school graduates into family medicine residencies: 2005–06 and 3-year summary. Fam Med 2006;38:626–36.
12. Lambert TW, Davidson JM, Evans J, Goldacre MJ. Doctors' reasons for rejecting initial choices of specialties as long-term careers. Med Educ 2003;37:312–8.
13. Fahrenkopf AM, Sectish TL, Burger LK, et al. Rates of medication errors among depressed and burnt out residents: prospective cohort study. Br Med J 2008; 336:488–91.
14. Burke RJ. Stress, satisfaction and militancy among

Canadian physicians: a longitudinal investigation. Soc Sci Med 1996;43:517–24.
15. Kravitz RL, Shapiro MF, Linn LS, Froelicher ESS. Risk factors associated with participation in the Ontario. Canada doctors' strike. Am J Public Health 1989;79:1227–33.
16. Landon BE, Reschovsky JD, Pham HH, Blumenthal D. Leaving medicine–the consequences of physician dissatisfaction. Med Care 2006;44:234–42.
17. Ferrer RL, Hambidge SJ, Maly RC. Essential role of generalists in health care systems. Ann Intern Med 2005;142:691–9.
18. Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. Milbank Q 2005;83:457–502.
19. Rushton FE. US health-care crisis. Pediatr Int 2009; 51:603–5.
20. Lloyd J. Doctor shortage: primary care losing its prestige. USA Today 18 August 2009; A1.
21. Halsey A. Primary-care doctor shortage may undermine reform efforts. Washington Post 20 June 2009; A1.
22. Buchbinder SB, Melick CF, Powe NR. Managed care and primary physicians' overall career satisfaction. J Health Care Finance 2001;28:35–42.
23. Physicians Practice. Survey: 60% of primary care physicians would choose another field. Available at: http://www.medicalnewstoday.com/articles/81499.php. Accessed 15 September 2010.
24. Kushnir T, Cohen AH, Kitai E. Continuing medical education and primary care physicians' job stress, burnout and dissatisfaction. Med Educ 2000;34:430–6.
25. Burdi MD, Baker LC. Physicians' perceptions of autonomy and satisfaction in California. Health Aff (Millwood) 1999;18:134–45.
26. Lewis JM, Marjoribanks T. Impact of financial constraints and incentives on professional autonomy. Int J Health Plann Manage 2003;18:49–61.
27. Plsek PE, Greenhalgh T. Complexity science: the challenge of complexity in health care. BMJ 2001; 323:625–8.
28. Katerndahl D, Parchman M, Wood R. Perceived complexity of care, perceived autonomy, and career satisfaction among primary care physicians. J Am Board Fam Med 2009;22:24–33.
29. Center for Studying Health System Change. 2008 HSC health tracking physician survey public use file: user's guide. Technical publication no. 78. Washington, DC: Center for Studying Health System Change, January 2010.
30. Inter-University Consortium for Political and Social Research, Robert Wood Johnson Foundation. Health and medical care archive: Health Tracking Physician Survey, 2008, United States. Available at: http://www.icpsr.umich.edu/icpsrweb/HMCA/studies/27202. Accessed 15 September 2010.
31. Strouse R, Potter F, Davis T, et al. HSC 2008 Health Tracking Physician Survey methodology report. Available at: http://www.hschange.com/CONTENT/1085/1085.pdf. Accessed 15 September 2010.
32. Inter-University Consortium for Political and Social Research, Robert Wood Johnson Foundation. Health and medical care archive: Health Tracking Physician Survey, 2008 variable search results. Available at: http://www.icpsr.umich.edu/icpsrweb/HMCA/ssvd/variables?study=Health+Tracking+Physician+Survey%2C+2008+%5BUnited+States%5D. Accessed 15 September 2010.
33. Keyes LE. Underpaid women, stressed out men, satisfied emergency physicians. Ann Emerg Med 2008;51:729–31.
34. Clem KJ, Promes SB, Glickman SW, et al. Factors enhancing career satisfaction among female emergency physicians. Ann Emerg Med 2008;51:723–8.
35. Starfield B. The primary solution. Put doctors where they count. Boston Review. 2005. Available at: http://bostonreview.net/BR30.6/starfield.php. Accessed 27 May 2010.