

ORIGINAL RESEARCH

Physician Perception of Pay Fairness and its Association with Work Satisfaction, Intent to Leave Practice, and Personal Health

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BACKGROUND: Primary care physicians generally earn less than specialists. Studies of other occupations have identified perception of pay fairness as a predictor of work- and life-related outcomes. We evaluated whether physicians' pay fairness perceptions were associated with their work satisfaction, turnover intention, and personal health.

METHODS: Three thousand five hundred eighty-nine physicians were surveyed. Agreement with "my total compensation is fair" was used to assess pay fairness perceptions. Total compensation was self-reported, and we used validated measures of work satisfaction, likelihood of leaving current practice, and health status. Hierarchical logistic regressions were used to assess the associations between pay fairness perceptions and work/life-related outcomes.

RESULTS: A total of 2263 physicians completed surveys. Fifty-seven percent believed their compensation was fair; there was no difference between physicians in internal medicine and non-primary care specialties ($P = 0.58$). Eighty-three percent were satisfied at work, 70% reported low likelihood of leaving their practice, and 77% rated their health as very good or excellent. Higher compensation levels were associated with greater work satisfaction and lower turnover intention, but most associations became statistically non-significant after adjusting for pay fairness perceptions. Perceived pay fairness was associated with greater work satisfaction (OR, 4.90; 95% CI, 3.94–6.08; $P < 0.001$), lower turnover intention (OR, 2.46; 95% CI, 2.01–3.01; $P < 0.001$), and better health (OR, 1.33; 95% CI, 1.08–1.65; $P < 0.01$).

DISCUSSION: Physicians who thought their pay was fair reported greater work satisfaction, lower likelihood of leaving their practice, and better overall health. Addressing pay fairness perceptions may be important for sustaining a satisfied and healthy physician workforce, which is necessary to deliver high-quality care.

KEY WORDS: pay fairness; physician well-being; physician workforce.

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INTRODUCTION

Career satisfaction among physicians across specialties has been found to be positively associated with self-reported income.^{1,2} However, studies examining a wide variety of non-health care occupations reveal that the perception of one's pay as fair may be a better predictor of important work- and life-related outcomes than the actual amount of compensation.^{3,4} No studies, to our knowledge, have examined physicians' perceptions of pay fairness and its relationship to relevant outcomes such as professional satisfaction and physical health.

A large body of occupational research has revealed the impact of perceived pay fairness on employees and their employers.^{5–8} Perceptions of pay fairness are grounded in objective measures (e.g., extent to which one's pay aligns with comparable rates in the external job market and among co-workers with similar skills and experience) and subjective considerations (e.g., feeling that one's pay reflects the value of one's contribution in the workplace).⁹ Individuals who perceive their pay as fair are more likely to be satisfied at work and less likely to look for alternate employment options.¹⁰ Organizations with employees who believe that their pay is fair also generally outperform their peers.^{11–13} However, it may be less apparent why individuals who feel they are inappropriately rewarded for their work effort would have worse health, which can lead to increased work absenteeism. Informed by the effort-reward imbalance model,^{14,15} the physiological impact of stressful psychosocial work environments on health is operative when individuals perceive their pay to be unfair.¹⁶ Perception of pay unfairness, for example, has been found to be associated with low heart rate variability, a stress-related indicator of functional impairment of the cardiovascular system, which increases the probability of coronary artery disease.¹⁷

For the first time, a majority of practicing physicians in the United States are employees rather than owners of their clinical practices.^{18,19} At the same time, more physicians, particularly those providing primary care, are considering or have moved into concierge practice in response to treatment time constraints and work effort-compensation concerns.^{20,21} In light of structural changes in the physician labor market, we

report on a national survey of practicing physicians that assessed their perceptions of pay fairness. Specifically, we hypothesized that physicians who think their compensation is fair will be more satisfied at work, be less inclined to leave their medical practice, and report having better overall health.

METHODS

Study Participants and Data Collection

We selected a random sample of 4000 physicians, inclusive of all medical specialties, from the American Medical Association (AMA) Physician Masterfile, which includes data on all US physicians. Sampled physicians were listed as currently practicing, with resident physicians excluded. This sample was selected for a larger study evaluating physicians' work motivation and their practice environments.

Between October 2014 and May 2015, we mailed three rounds of a self-administered survey to sampled physicians. A \$10 bill was included in the second mailing to encourage participation. Subsequent to the survey mailings, 411 physicians were found to be study-ineligible (71 no longer practicing medicine, 54 no longer at the clinical practice on record, and 286 surveys returned as undeliverable), resulting in a final sample of 3589. The study protocol was reviewed and deemed exempt by the Office for the Protection of Research Subjects, University of Illinois at Chicago.

Survey Instrument

We reviewed the literature to preferentially include validated scales and questions. Cognitive interviews were conducted with 13 practicing physicians from different specialties and practice types to assess for overall survey coherence and individual item comprehension. The final instrument included an item that assessed physicians' perceptions of pay fairness, as well as measures of work- and life-related outcomes such as work satisfaction, intent to leave current medical practice, and self-reported overall health.

Measures

Perceived pay fairness was evaluated by assessing agreement with the following statement: "My total compensation is fair." The item had a five-point Likert response scale. Overall compensation was determined with a single item ("What was your approximate total compensation from the practice in the last year?") that included an open-ended response.

Validated measures of physician work- and life-related well-being included single items for work satisfaction ("Overall, I am satisfied with my current work"),²² with a five-point "agree-disagree" response scale; intention to leave their current practice ("What is the likelihood that you will leave your current practice within two years?"),²² with a five-point response scale of definitely, likely, moderate, slight, and none; and overall health ("In general, how would you rate your

health?"), with a five-point response scale of excellent, very good, good, fair, and poor.²³

Data on respondents' practice setting (solo, group, hospital, medical school, other), primary compensation (salary only, salary plus bonus, billing only, other), and employment type (employee, full or part owner, independent contractor) were also collected. Other physician characteristics including age, sex, race or ethnicity, and medical specialty were derived from the AMA Physician Masterfile.

Statistical Analyses

Responses were double-entered and imported into IBM SPSS Statistics version 21 software (IBM Corp., Armonk, NY). Differences between physician respondents and non-respondents by sex, race or ethnicity, and medical specialty were assessed using the Pearson χ^2 test; differences in age were evaluated with the *t* test.

Multivariable logistic regression was conducted to assess the association between physician characteristics (e.g., internal medicine vs. non-primary care specialties) and perceived pay fairness. As the dependent variable, pay fairness perception was dichotomized as those who "agreed" or "strongly agreed" that their compensation was fair versus all other respondents. Next, a series of hierarchical logistic regressions were conducted in two steps to evaluate perceptions regarding pay fairness and its association with work satisfaction, intent to leave current practice, and health status, respectively. We dichotomized the responses (top 2 options and the bottom 3 options) for the three dependent variables assessing work satisfaction, intent to leave current practice, and overall health. The step 1 model had overall compensation, but not pay fairness perception, as an independent variable. Self-reported overall compensation data were categorized in \$50,000 increments from \$150,000 to \$349,999, with a lower-end category of <\$150,000 and upper-end category of \geq \$350,000. Those who declined to provide data on their compensation were included in the model and categorized as "missing." The step 2 model was specified with the addition of pay fairness perception as a dichotomized independent variable. To evaluate the potential for an interaction effect between pay fairness perception and overall compensation, step 2 models were specified with interaction terms. All models included physician age, sex, race or ethnicity, medical specialty, practice setting, primary compensation, and employment type as covariates.

RESULTS

Of the 3589 potential respondents, 2263 returned completed surveys, for a response rate of 63%. There was a higher proportion of white physicians in the respondent than non-respondent group (59% vs. 52%, $P < 0.001$), but no other significant differences between respondents and non-respondents were observed. Employed physicians constituted

more than half (53%) of respondents, and 40% were owners of their practice. Nearly half of respondents (47%) worked in a group practice setting, while 17% were solo practitioners.

Overall Compensation and Pay Fairness Perception

One-fifth of respondents (21%) reported earning \$350,000 or more in the previous year, while 15% earned less than \$150,000. More than half (57%) agreed that their compensation was fair, while 30% disagreed or strongly disagreed (Table 1). Among respondents, 492 declined to answer the overall compensation survey item.

Work- and Life-Related Outcomes

Nearly three-quarters of physician respondents (73%) “agreed” or “strongly agreed” that they were satisfied with their current work. The likelihood of leaving one’s practice in the next 2 years was reported as “definitely” or “likely” by 18% of respondents, while 70% said “slight” or “none.” General overall health was reported as “very good” or “excellent” by 77% of respondents (Table 1).

Associations Between Physician Characteristics and Perceived Pay Fairness

Higher income levels were consistently associated with increased odds of perceived pay fairness, but there were no

differences in pay fairness perceptions between physicians in primary care and non-primary care specialties (Table 2). Compared to physicians in a group practice setting, solo practitioners (OR, 0.61; 95% CI, 0.44–0.81; $P < 0.001$) had lower odds of agreeing that their pay was fair. Primary compensation as “salary plus bonus” was associated with higher odds (OR, 1.26; 95% CI, 1.00–1.60; $P = 0.05$) of perceiving one’s pay as fair, compared to those compensated primarily through “salary only.” No significant difference in perception of pay fairness was found between physicians who were employees and those who owned their medical practices. Neither age, sex, nor race influenced perceptions of pay fairness.

Associations Between Perceived Pay Fairness, Compensation, and Work- and Life-Related Outcomes

In step 1 logistic regression models, total compensation was found to be positively associated with work satisfaction, intention to remain in current practice, and self-reported health (Table 3). Compared to the reference group of physicians who earned less than \$150,000 per year, compensation of $\geq \$350,000$ was associated with a more than twofold increase in the odds of being satisfied with work (OR, 2.12; 95% CI, 1.49–3.01; $P < 0.001$), negligible likelihood of leaving their current practice (OR, 2.37; 95% CI, 1.67–3.35; $P < 0.001$), and more than 50% greater odds of having better self-reported health (OR, 1.60; 95% CI, 1.09–2.33; $P = 0.03$). After accounting for perceived pay fairness in the step 2 models, total compensation was not significantly associated with work satisfaction or overall health. Most of the associations between compensation and turnover intentions also became non-significant after adjusting for perceived pay fairness, with only those earning $\geq \$350,000$ (OR, 1.75; 95% CI, 1.22–2.51; $P < 0.01$) retaining statistical significance. Physicians who thought their compensation was fair had increased odds of being satisfied with their current work (OR, 4.90; 95% CI, 3.94–6.08; $P < 0.001$), a diminished likelihood of leaving their current practice (OR, 2.46; 95% CI, 2.01–3.01; $P < 0.001$), and better overall health (OR, 1.33; 95% CI, 1.08–1.65; $P < 0.01$). Finally, the Wald coefficient in the step 2 logistic regression models did not reveal any significant interaction effect between overall compensation and pay fairness perception; thus the models displayed in Table 3 did not include interaction terms as independent variables.

DISCUSSION

Perceptions create our experienced reality. Consistent with other studies examining the relationship between compensation and work-related outcomes,^{1,2} we found that physicians who earned more reported greater satisfaction at work and less inclination to leave their practice. However, these associations became largely non-significant after physicians’ perceptions of pay fairness were taken into account. Physicians who

Table 1 Self-Reported Data from Physician Survey (N = 2263)*

	No. (%)
My total compensation is fair.	
Strongly agree	277 (12.4)
Agree	1007 (45.0)
Neither agree nor disagree	281 (12.6)
Disagree	508 (22.7)
Strongly disagree	165 (7.4)
What was your approximate total compensation from [your] practice in the past year?	
<\$150,000	349 (19.7)
\$150,000–199,999	331 (18.7)
\$200,000–249,999	307 (17.3)
\$250,000–299,999	110 (6.2)
\$300,000–349,999	195 (11.0)
$\geq \$350,000$	479 (27.0)
Overall, I am satisfied with my current work.	
Strongly agree	566 (25.3)
Agree	1063 (47.6)
Neither agree nor disagree	209 (9.4)
Disagree	261 (11.7)
Strongly disagree	136 (6.1)
What is the likelihood that you will leave your current practice within 2 years?	
None	957 (42.7)
Slight	602 (26.9)
Moderate	272 (12.1)
Likely	255 (11.4)
Definitely	156 (7.0)
In general, how would you rate your health?	
Excellent	935 (41.6)
Very good	803 (35.8)
Good	406 (18.1)
Fair	89 (4.0)
Poor	12 (0.5)

*Numbers may not sum to 2263 because of missing data

Table 2 Logistic Regression Showing Odds of Physicians Agreeing that Their Compensation Is Fair Based on Their Medical Specialty after Adjusting for Total Compensation, Practice, and Personal Characteristics*

	Agree or Strongly Agree that Compensation is Fair		
	No. (%)	OR (95% CI)	P value
Medical specialty			
Internal medicine	140 (56.9)	1.00 (reference)	
Family medicine	157 (53.4)	0.93 (0.65–1.33)	0.67
Pediatrics	89 (58.2)	1.22 (0.79–1.88)	0.38
Non-primary care specialty	879 (58.3)	0.86 (0.64–1.15)	0.30
Overall total compensation			
<\$150,000	119 (34.8)	1.00 (reference)	
\$150,000–199,999	180 (54.9)	2.03 (1.47–2.80)	<0.001
\$200,000–249,999	181 (59.7)	2.56 (1.82–3.59)	<0.001
\$250,000–299,999	84 (76.4)	5.58 (3.34–9.31)	<0.001
\$300,000–349,999	123 (63.4)	3.23 (2.18–4.77)	<0.001
≥\$350,000	340 (71.9)	5.03 (3.60–7.02)	<0.001
Missing data	238 (52.8)	2.25 (1.65–3.05)	<0.001
Practice setting			
Group	629 (60.4)	1.00 (reference)	
Solo	139 (38.6)	0.61 (0.45–0.81)	0.001
Hospital	243 (63.9)	1.06 (0.80–1.40)	0.68
Medical school	106 (60.2)	1.03 (0.72–1.48)	0.88
Other	148 (60.9)	1.12 (0.82–1.54)	0.47
Primary compensation			
Salary only	308 (55.6)	1.00 (reference)	
Salary plus bonus	587 (65.1)	1.26 (1.00–1.60)	0.05
Billing only	287 (47.5)	0.80 (0.59–1.08)	0.14
Other	83 (58.5)	1.20 (0.80–1.79)	0.38
Employment type			
Employee	729 (62.1)	1.00 (reference)	
Full or part owner	463 (52.5)	0.89 (0.69–1.14)	0.35
Independent contractor	73 (50.0)	0.79 (0.54–1.16)	0.23

*Model includes all items shown in the table plus physicians' age, sex, and race or ethnicity

thought their compensation was fair experienced greater professional satisfaction and expressed less intention of turnover. In addition, pay fairness perception was positively associated with better self-reported health. Our study findings build on previous research of physician compensation,^{24–26} and point to potential consequences for physicians and their patients. Studies have found that patients are more satisfied with their care when their physicians have higher professional satisfaction,²⁷ increased physician turnover is associated with worse patient experiences of care,²⁸ patients whose physicians are compliant with health promotion practices such as screenings and vaccinations tend to undergo these preventive measures themselves,²⁹ and physicians with a normal body mass index are more likely to engage patients with obesity in weight-loss discussions.³⁰

We did not find differences in pay fairness perceptions between physicians who were employees and practice owners. That said, more physicians are entering employment relationships in which their compensation will be determined by an employer. Compensation has always been an essential element of any employment relationship. While compensation systems provide an economic and transactional mechanism for bringing labor inside an organization, they also serve an important social and relational function.³¹ It is well established that high-performing organizations create and nurture employment relationships that are built on mutual respect and trust.^{32,33} Compensation systems and employee perceptions of whether their pay is fair have “an important role in shaping whether

people feel they are treated with dignity, trust, and respect, and whether they believe the values and culture of the organization are worthy of their fullest commitment and highest efforts.”³⁴ Therefore, health care employers' responses to physicians' negative perceptions of pay fairness may be an increasing concern as more physicians are employed by medical groups and hospital systems.

According to organizational justice research, an essential determinant of perceived pay fairness is whether an individual understands and considers the procedures for determining compensation to be fair and just.³⁵ This concept of procedural fairness is grounded in the belief that compensation determination procedures are applied consistently, are free from bias, and have mechanisms to correct inaccuracies.^{4,36,37} Procedural fairness research has also shown that compensation determination procedures that are perceived to be sound and appropriate may be as important as the specific amount of compensation.^{38,39} This notion of procedural fairness is particularly salient for health care organizations that employ physicians across various medical specialties. Given the long-standing pay differential between physicians in primary care and those in more procedure-intensive specialties,²⁶ health care employers may need to be more transparent about how physician reimbursement is determined, and be prepared to explain the rationale for pay determination across different medical specialties. While we found no significant differences in pay fairness perceptions between primary care and non-primary care physicians, mechanisms that allow physicians to

Table 3 Hierarchical Logistic Regressions Showing Odds for Physician Work Satisfaction, Intent to Leave Current Practice, and Personal Health Based on Total Self-Reported Compensation and Perceived Pay Fairness*

	More Satisfied with Current Work [†] n = 2196		Lower Likelihood of Leaving Current Practice [†] n = 2196		Better Overall Health Status [†] n = 2199	
	Step 1 Total Compensation	Step 2 Add Perception of Pay Fairness	Step 1 Total Compensation	Step 2 Add Perception of Pay Fairness	Step 1 Total Compensation	Step 2 Add Perception of Pay Fairness
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Overall total compensation						
<\$150,000	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
\$150,000–199,999	1.52	1.22 (0.85–1.75)	1.25	1.10 (0.78–1.54)	0.98	0.94 (0.65–1.35)
\$200,000–249,999	(1.08–2.14) [‡]	0.91 (0.63–1.32)	(0.89–1.75)	1.34 (0.93–1.92)	(0.68–1.41)	1.05 (0.71–1.54)
\$250,000–299,999	1.28	0.87 (0.51–1.49)	1.59	1.60 (0.94–2.73)	1.11	0.88 (0.52–1.50)
\$300,000–349,999	(0.90–1.81)	1.04 (0.67–1.62)	(1.12–2.26) [‡]	1.46 (0.95–2.23)	(0.76–1.63)	1.08 (0.69–1.68)
≥\$350,000	1.61	1.23 (0.85–1.80)	2.23	1.75 (1.22–2.51) [§]	0.99	1.44 (0.98–2.13)
Missing	(0.97–2.66)	1.27 (0.90–1.78)	(1.32–3.75) [§]	1.71 (1.23–2.38) [§]	(0.59–1.66)	1.01 (0.72–1.43)
	1.57		1.81		1.16	
	(1.04–2.38) [‡]		(1.19–2.73) [§]		(0.75–1.80)	
	2.12		2.37		1.60	
	(1.49–3.01)		(1.67–3.35)		(1.09–2.33) [‡]	
	1.62		1.96		1.07	
	(1.18–2.24) [§]		(1.42–2.70)		(0.76–1.50)	
My total compensation is fair						
Strongly disagree/ disagree/neither		1.00 (reference)		1.00 (reference)		1.00 (reference)
Strongly agree/agree		4.90 (3.94–6.08)		2.46 (2.01–3.01)		1.33 (1.08–1.65) [§]

*All models included covariates of physician age, sex, race or ethnicity, medical specialty, practice setting, primary compensation, and employment type

[†]More satisfied with current work based on responses of “strongly agree” or “agree”; lower likelihood of leaving current practice based on responses of “none” or “slight”; better overall health status based on responses of “excellent” or “very good”

[‡]P < 0.05

[§]P < 0.01

^{||}P < 0.001

raise concerns about pay decisions and to have those concerns addressed could help minimize negative consequences related to perceived pay unfairness.

With respect to procedural fairness, physicians are probably more inclined to see their pay determination procedure as fair if they had input in the development of compensation methods. With implementation of the Medicare Access and CHIP Reauthorization Act of 2015, physician compensation methods are expected to be increasingly tied to explicit performance targets.^{40,41} If physicians think that pay-for-performance (P4P) measures used to determine their pay are appropriate (which is more likely if they help to identify such measures), there is a higher likelihood that they will perceive their pay as fair. On the other hand, if physicians believe that P4P does not promote high-quality patient care, they may be less inclined to think performance measures used in determining their pay are appropriate.⁴² One major concern among physicians is the determination of pay using performance measures that are beyond the control of individual physicians.^{43,44} Given this concern, adjusting quality measures for potentially health-related factors such as patient sociodemographic characteristics has garnered more attention, especially as P4P moves toward measuring outcomes, rather than processes, of care.⁴⁵ As opposed to processes of care, which are largely under physician control, outcomes of care such as blood pressure and glycemic control are influenced by more than medical care. In July 2014, the National Quality

Forum amended its blanket policy against the use of sociodemographic risk adjustment and has since been assessing the appropriateness of using such P4P risk adjustment.⁴⁶

Several limitations of this study should be considered. First, a cross-sectional survey cannot assess causality between key study variables. Second, the respondent group had a higher proportion of white physicians than the non-respondent group, which may limit the generalizability of our results. Third, like other studies on physician compensation, we relied on self-reported income data, because it is neither feasible nor practical to acquire these data through other means. Given the sensitivity of this information, it was not surprising that one-fifth of our physician sample did not answer the total compensation survey item. While there were differences for physicians with missing income data in our hierarchical regression models, perceived pay fairness remained a significant independent variable in every specified model.

In our study, physicians who thought their overall compensation was fair had greater work satisfaction, lower likelihood of leaving their current practice, and better self-reported health. To promote a high-performing physician workforce in a rapidly changing health care system, medical practices and hospital systems may need to pay more attention to perceptions of pay fairness, which have implications for the well-being of physicians and their patients.

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Compliance with Ethical Standards:

Conflict of Interest: The authors declare that they do not have a conflict of interest.

REFERENCES

- Stoddard JJ, Hargraves JL, Reed M, Vratil A. Managed care, professional autonomy, and income: effects on physician career satisfaction. *J Gen Intern Med.* 2001;16(10):675–84.
- Leigh JP, Kravitz RL, Schembri M, Samuels SJ, Mobley S. Physician career satisfaction across specialties. *Arch Intern Med.* 2002;162(14):1577–84.
- Jawahar IM, Stone TH. Fairness perceptions and satisfaction with components of pay satisfaction. *J Manag Psychol.* 2011;26(4):297–312.
- Shaw JD, Gupta N. Pay fairness and employee outcomes: exacerbation effects of financial need. *J Occup Organ Psychol.* 2001;74:299–320.
- Jones FF, Scarpello V, Bergmann T. Pay procedures: what makes them fair? *J Occup Organ Psychol.* 1999;72:129–45.
- Shaw JD, Gupta N, Delery JE. Pay dispersion and workforce performance: moderating effects of incentives and interdependence. *Strateg Manag J.* 2002;23:491–512.
- Abeler J, Altmann S, Kube S, Wibral M. Gift exchange and workers' fairness concerns: when equality is unfair. *J Eur Econ Assoc.* 2010;8(6):1299–1324.
- Cohn A, Fehr E, Goette L. Fair wages and effort provision: combining evidence from a choice experiment and a field experiment. *Manag Sci.* 2015;61(8):1777–94.
- Fehr E, Schmidt KM. A theory of fairness, competition, and cooperation. *Q J Econ.* 1999;114(3):817–68.
- Erdogan B, Bauer TN, Truxillo DM, Mansfield LR. Whistle while you work: a review of the life satisfaction literature. *J Manag.* 2012;38(4):1038–83.
- Anitha J. Determinants of employee engagement and their impact on employee performance. *Int J Product Perform Manag.* 2014;63(3):308–23.
- Christian MS, Garza AS, Slaughter JE. Work engagement: a quantitative review and test of its relations with task and contextual performance. *Pers Psychol.* 2011;64(1):89–136.
- de Boer EM, Bakker AB, Syroit JE, Schaufeli WB. Unfairness at work as a predictor of absenteeism. *J Organ Behav.* 2002;23(2):181–97.
- van Vegchel N, de Jonge J, Bosma H, Schaufeli W. Reviewing the effort-reward imbalance model: drawing up the balance of 45 empirical studies. *Soc Sci Med.* 2005;60(5):1117–31.
- Rasmussen V, Turnell A, Butow P, et al. Burnout among psychosocial oncologists: an application and extension of the effort-reward imbalance model. *Psychooncology.* 2016;25(2):194–202.
- Heikkilä K, Nyberg ST, Theorell T, et al. Work stress and risk of cancer: meta-analysis of 5700 incident cancer events in 116,000 European men and women. *BMJ.* 2013;346:f165.
- Falk A, Kosse F, Menrath I, Verde PE, Siegrist J. Unfair pay and health [published online ahead of print February 16 2017]. *Manag Sci.* doi: <https://doi.org/10.1287/mnsc.2016.2630>.
- The Physicians Foundation. 2016 survey of America's physicians: practice patterns and perspectives. http://www.physiciansfoundation.org/uploads/default/Biennial_Physician_Survey_2016.pdf. Accessed December 1, 2017.
- Kacik A. For the first time ever, less than half of physicians are independent. *Modern Healthcare.* <http://www.modernhealthcare.com/article/20170531/NEWS/170539971/for-the-first-time-ever-less-than-half-of-physicians-are-independent>. Accessed 1 Dec 2017.
- Dalen JE, Alpert JS. Concierge medicine is here and growing. *Am J Med.* 2017;130(8):880–1.
- Huff C. Direct primary care: concierge care for the masses. *Health Aff (Millwood).* 2015;34(12):2016–9.
- Friedberg MW, Chen PG, Van Busum KR, et al. Factors Affecting Physician Professional Satisfaction and Their Implications for Patient Care, Health Systems, and Health Policy. Santa Monica, CA: RAND Corporation; 2013. http://www.rand.org/content/dam/rand/pubs/research_reports/RR400/RR439/RAND_RR439.pdf. Accessed 1 Dec 2017.
- Brazier JE, Harper R, Jones NM, et al. Validating the SF-36 health survey questionnaire: new outcome measure for primary care. *BMJ.* 1992;305(6846):160–4.
- Khullar D, Chokshi DA, Kocher R, et al. Behavioral economics and physician compensation—promise and challenges. *N Engl J Med.* 2015;372(24):2281–3.
- Trowbridge E, Bartels CM, Koslov S, Kamnetz S, Pandhi N. Development and Impact of a Novel Academic Primary Care Compensation Model. *J Gen Intern Med.* 2015;30(12):1865–70.
- Medscape, LLC. Medscape physician compensation report 2017. <http://www.medscape.com/slideshow/compensation-2017-overview-6008547>. Accessed 1 Dec 2017.
- Haas JS, Cook EF, Puopolo AL, et al. Is the professional satisfaction of general internists associated with patient satisfaction? *J Gen Intern Med.* 2000;15:122–8.
- Reddy A, Pollack CE, Asch DA, Canamucio A, Werner RM. The effect of primary care provider turnover on patient experience of care and ambulatory quality of care. *JAMA Intern Med.* 2015;175(7):1157–62.
- Frank E, Dresner Y, Shani M, Vinker S. The association between physicians' and patients' preventive health practices. *CMAJ.* 2013;185(8):649–53.
- Bleich SN, Bennett WL, Gudzone KA, Cooper LA. Impact of physician BMI on obesity care and beliefs. *Obesity (Silver Spring).* 2012;20(5):999–1005.
- Gerhart B, Milkovich GT. Employee compensation: research and practice. CAHRS Working Paper #92-26. Ithaca, NY: Cornell University, School of Industrial and Labor Relations, Center for Advanced Human Resource Studies; 1992. <http://digitalcommons.ilr.cornell.edu/cahrswp/311/>. Accessed 1 Dec 2017.
- Folger R, Konovsky MA. Effects of procedural and distributive justice on reactions to pay decisions. *Acad Manag J.* 1989;32(1):115–30.
- Carter MZ, Armenakis AA, Field HS, Mossholder KW. Transformational leadership, relationship quality, and employee performance during continuous incremental organizational change. *J Organ Behav.* 2013;34(7):942–58.
- Bloom M. The ethics of compensation systems. *J Bus Ethics.* 2004;52(2):149–52.
- Morrison EW, Robinson SL. When employees feel betrayed: a model of how psychological contract violation develops. *Acad Manag Rev.* 1997;22(1):226–56.
- Leventhal GS, Karuza J, Fry WR. Beyond fairness: a theory of allocation preferences. In: Mikula G, ed. *Justice and Social Interaction*. New York: Springer-Verlag; 1980:167–218.
- Gupta N, Jenkins GD. The politics of pay. *Compens Benefit Rev.* 1996;28(2):23–30.
- Brockner J, Siegel PA, Daly JP, Tyler T, Martin C. When trust matters: the moderating effect of outcome favorability. *Adm Sci Q.* 1997;42(3):558–83.
- Scarpello V, Jones FF. When justice matters in compensation decision making. *J Organ Behav.* 1996;17(3):285–99.
- Burwell SM. Setting value-based payment goals: HHS efforts to improve U.S. health care. *N Engl J Med.* 2015;372(10):897–9.
- Centers for Medicare & Medicaid Services (CMS), HHS. Merit-Based Incentive Payment System (MIPS) and Alternative Payment Model (APM) incentive under the Physician Fee Schedule, and criteria for physician-focused payment models; final rule. *Fed Regist.* 2016;81(214):77008–831.
- Christianson JB, Knutson DJ, Mazze RS. Physician pay-for-performance. Implementation and research issues. *J Gen Intern Med.* 2006;21(Suppl 2):S9–13.
- Kao AC. Driven to care: aligning external motivators with intrinsic motivation. *Health Serv Res.* 2015;50 Suppl 2:2216–22.
- Woolhandler S, Himmelstein DU. Collateral damage: pay-for-performance initiatives and safety-net hospitals. *Ann Intern Med.* 2015;163(6):473–4.
- Clough JD, McClellan M. Implementing MACRA: implications for physicians and for physician leadership. *JAMA.* 2016;315(22):2397–8.
- Fiscella K, Burstin HR, Nerenz DR. Quality measures and sociodemographic risk factors: to adjust or not to adjust. *JAMA.* 2014;312(24):2615–6.