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Identifying Potential Predictors of a Safe Attending Physician Workload: A Survey of Hospitalists

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Attending physician workload may be compromising patient safety and quality of care. Recent studies show hospitalists, intensivists, and surgeons report that excessive attending physician workload has a negative impact on patient care.[1–3] Because physician teams and hospitals differ in composition, function, and setting, it is difficult to directly compare one service to another within or between institutions. Identifying physician, team, and hospital characteristics associated with clinicians' impressions of unsafe workload provides physician leaders, hospital administrators, and policymakers with potential risk factors and specific targets for interventions.[4] In this study, we use a national survey of hospitalists to identify the physician, team, and hospital factors associated with physician report of an "unsafe" workload.

METHODS

We electronically surveyed 890 self-identified hospitalists enrolled in QuantiaMD.com, an interactive, open-access physician community offering education, cases, and discussion. It is one of the largest mobile and online physician communities in the United States.[1] This survey queried physician and practice characteristics, hospital setting, workload, and frequency of a self-reported unsafe census. "Safe" was explicitly defined as "with minimal potential for error or harm." Hospitalists were specifically asked "how often do you feel the number of patients you care for in your typical inpatient service setting exceeds a safe number?" Response categories included: never, <3 times per year, at least 3 times a year but less than once per month, at least once per month but less than once a week, or once per week or more. In this secondary data analysis, we categorized physicians into 2 nearly equal-sized groups: those reporting unsafe patient workload less than once a month (lower reporter) versus at least monthly (higher reporter). We then applied an attending physician workload model[4] to determine which physician, team, and hospital characteristics were associated with increased report of an unsafe census using logistic regression.

RESULTS

Of the 890 physicians contacted, 506 (57%) responded. Full characteristics of respondents are reported elsewhere.[1] Forty percent of physicians (n = 202) indicated that their typical inpatient census exceeded safe levels at least monthly. A descriptive comparison of the lower and higher reporters of unsafe levels is provided (Table 1). Higher frequency of reporting an unsafe census was associated with higher percentages of clinical ($P = 0.004$) and inpatient responsibilities ($P < 0.001$) and more time seeing patients without midlevel or housestaff assistance ($P = 0.001$) (Table 1). On the other hand, lower reported unsafe census was associated with more years in practice ($P = 0.02$), greater percentage of personal time ($P = 0.02$), and the presence of any system for census control (patient caps, fixed bed capacity, staffing augmentation plans) ($P = 0.007$) (Table 1). Fixed census caps decreased the odds of reporting an unsafe census by 34% and was the only statistically significant workload control mechanism (odds ratio: 0.66; 95% confidence interval: 0.43-0.99; $P = 0.04$). There was no association between reported unsafe census and physician age ($P = 0.42$), practice area ($P = 0.63$), organization type ($P = 0.98$), or compensation (salary [$P = 0.23$], bonus [$P = 0.61$], or total [$P = 0.54$]).

DISCUSSION

This is the first study to our knowledge to describe factors associated with provider reports of unsafe workload and identifies potential targets for intervention. By identifying modifiable factors affecting workload, such as different team structures with housestaff or midlevels, it may be possible to improve workload, efficiency, and perhaps safety.[5,6] Less experience, decreased housestaff or midlevel assistance, higher percentages of inpatient and clinical responsibilities, and lack of systems for census control were strongly associated with reports of unsafe workload.

Having any system in place to address increased patient volumes reduced the odds of reporting an unsafe workload. However, only fixed patient census

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TABLE 1. Selected Physician, Team, and Hospital Characteristics and Their Association With Reporting Unsafe Workload More Than Monthly

Characteristic	Report of Unsafe Workload*		Univariate Odds Ratio (95% CI)	Reported Effect on Unsafe Workload Frequency
	Lower	Higher		
Percentage of total work hours devoted to patient care, median [IQR]	95 [80–100]	100 [90–100]	1.13† (1.04–1.23)‡	Increased
Percentage of clinical care that is inpatient, median [IQR]	75 [50–85]	80 [70–90]	1.21† (1.13–1.34)§	
Percentage of clinical work performed with no assistance from housestaff or midlevels, median [IQR]	80 [25–100]	90 [50–100]	1.08† (1.03–1.14)‡	
Years in practice, median [IQR]	6 [3–11]	5 [3–10]	0.85‖ (0.75–0.98)¶	Decreased
Percentage of workday allotted for personal time, median [IQR]	5 [0–7]	3 [0–5]	0.50† (0.38–0.92)¶	
Systems for increased patient volume, No. (%)				
Fixed census cap	87 (30)	45 (22)	0.66 (0.43–0.99)¶	
Fixed bed capacity	36 (13)	24 (12)	0.94 (0.54–1.63)	
Staffing augmentation	88 (31)	58 (29)	0.91 (0.61–1.35)	
Any system	217 (76)	130 (64)	0.58 (0.39–0.86)#	
Primary practice area of hospital medicine, No. (%)				
Adult	211 (73)	173 (86)	1	Equivocal
Pediatric	7 (2)	1 (0.5)	0.24 (0.03–2.10)	
Combined, adult and pediatric	5 (2)	3 (1)	0.73 (0.17–3.10)	
Primary role, No. (%)				
Clinical	242 (83)	186 (92)	1	
Research	5 (2)	4 (2)	1.04 (0.28–3.93)	
Administrative	14 (5)	6 (3)	0.56 (0.21–1.48)	
Physician age, median [IQR], y	36 [32–42]	37 [33–42]	0.96‖ (0.86–1.07)	
Compensation, median [IQR], thousands of dollars				
Salary only	180 [130–200]	180 [150–200]	0.97** (0.98–1.05)	
Incentive pay only	10 [0–25]	10 [0–20]	0.99** (0.94–1.04)	
Total	190 [140–220]	196 [165–220]	0.99** (0.98–1.03)	
Practice area, No. (%)				
Urban	128 (45)	98 (49)	1	
Suburban	126 (44)	81 (41)	0.84 (0.57–1.23)	
Rural	33 (11)	21 (10)	0.83 (0.45–1.53)	
Practice location, No. (%)				
Academic	82 (29)	54 (27)	1	
Community	153 (53)	110 (55)	1.09 (0.72–1.66)	
Veterans hospital	7 (2)	4 (2)	0.87 (0.24–3.10)	
Group	32 (11)	25 (13)	1.19 (0.63–2.21)	
Physician group size, median [IQR]	12 [6–20]	12 [8–22]	0.99†† (0.98–1.03)	
Localization of patients, No. (%)				
Multiple units	179 (61)	124 (61)	1	
Single or adjacent unit(s)	87 (30)	58 (29)	0.96 (0.64–1.44)	
Multiple hospitals	25 (9)	20 (10)	1.15 (0.61–2.17)	

NOTE: **Abbreviations:** CI, confidence interval; IQR, interquartile range.

*Not all response options shown. Columns may not add up to 100%.

†Expressed per 10% increase in activity.

‡$P < 0.005$

§$P < 0.001$

‖Expressed per 5 additional years.

¶$P < 0.05$

#$P < 0.01$

**Expressed per $10,000.

††Expressed per 5 additional physicians.

caps were statistically significant. A system that incorporates fixed service or admitting caps may provide greater control on workload but may also result in back-ups and delays in the emergency room. Similarly, fixed caps may require "overflow" of patients to less experienced or willing services or increase the number of handoffs, which may adversely affect the quality of patient care. Use of separate admitting teams has the potential to increase efficiency, but is also subject to fluctuations in patient volume and increases the number of handoffs. Each institution should use a multidisciplinary systems approach to address patient throughput and enforce manageable workload such as through the creation of patient flow teams.[7]

Limitations of the study include the relatively small sample of hospitalists and self-reporting of safety.

Because of the diverse characteristics and structures of the individual programs, even if a predictor variable was not missing, if a particular value for that predictor occurred very infrequently, it generated very wide effect estimates. This limited our ability to effectively explore potential confounders and interactions. To our knowledge, this study is the first to explore potential predictors of unsafe attending physician workload. Large national surveys of physicians with greater statistical power can expand upon this initial work and further explore the association between, and interaction of, workload factors and varying perceptions of providers.[4] The most important limitation of this work is that we relied on self-reporting to define a safe census. We do not have any measured clinical outcomes that can serve to validate the self-reported impressions. We recognize, however, that adverse events in healthcare require multiple weaknesses to align, and typically, multiple barriers exist to prevent such events. This often makes it difficult to show direct causal links. Additionally, self-reporting of safety may also be subject to recall bias, because adverse patient outcomes are often particularly memorable. However, high-reliability organizations recognize the importance of front-line provider input, such as on the sensitivity of operations (working conditions) and by deferring to expertise (insights and recommendations from providers most knowledgeable of conditions, regardless of seniority).[8]

We acknowledge that several workload factors, such as hospital setting, may not be readily modifiable. However, we also report factors that can be intervened upon, such as assistance[5,6] or geographic localization of patients.[9,10] An understanding of both modifiable and fixed factors in healthcare delivery is essential for improving patient care.

This study has significant research implications. It suggests that team structure and physician experience may be used to improve workload safety. Also, particularly if these self-reported findings are verified using clinical outcomes, providing hospitalists with greater staffing assistance and systems responsive to census fluctuations may improve the safety, quality, and flow of patient care. Future research may identify the association of physician, team, and hospital factors with outcomes and objectively assess targeted interventions to improve both the efficiency and quality of care.

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