What Factors Are Associated With Occupational Health Office Staffing, Job Stress, and Job Satisfaction?

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Objective: This study sought to identify factors associated with occupational health staffing in health care settings, provide benchmarking data, and investigate relationships between staffing and worker stress and satisfaction. **Methods:** Members of the Association of Occupational Health Professionals in Healthcare were sent an online survey. Data on facility served, staffing, job attitudes, and work stress were collected and analyzed. **Results:** Number and types of personnel served were the largest predictors of staffing, accounting for 38 and 41% of the variability seen, respectively. Number of personnel served was related to worker stress and lack of work/life balance. **Conclusion:** Offices that required a provider presence had roughly one provider, seven nurses, and three clerical staff per 8000 personnel served. Occupational health workers are generally highly satisfied, and staffing has little relation to sources of job stress and satisfaction.

Learning Objectives

- Discuss the new findings on predictors of occupational health office staffing in health care settings.
- Summarize data on perceived stressors and support in this setting, including factors affecting job and life satisfaction.
- Discuss the relationships between predictors of staffing, worker stress, and job satisfaction.

Although there is extensive literature regarding staffing among general ambulatory care clinics, the available literature pertaining to occupational health office staffing is sparse, especially in the health care setting. This has led to considerable uncertainties regarding appropriate staffing of occupational health offices and substantial inequality of employee access to occupational health services between institutions.[1] In today's climate of budget cuts in health care, there is an increasing need to justify the effectiveness and efficiency of occupational health offices.[2] Without solid information to justify staffing decisions, future positions for occupational health professionals may be at risk. In addition, given the uncertainty and variability in occupational health office staffing, the psychological well-being of occupational health professionals may also be at risk.

In 2011, the Association of Occupational Health Professionals in Healthcare (AOHP) conducted an online staffing survey of its members.[3] The cross-sectional study used descriptive statistics to describe current staffing patterns among AOHP member offices, and sought to identify variables that impact staffing levels in occupational health offices in the healthcare setting. Results of the 2011 survey demonstrated that there were many factors related to staffing levels in occupational health offices that were outside the scope of the survey. These results revealed the need for additional research into the staffing of occupational health offices. In her conclusion, Gruden[3] encouraged consideration of services offered, provision of services for personnel other than employees, additional responsibilities of the department (eg, committee membership and program management), and the need for clerical support as outlined in the AOHP publication *Getting Started in Occupational Health in the Healthcare Setting Manual*.[4]

To date, research that has examined staffing among occupational health offices in the health care setting has shown that neither high levels of occupational health needs nor the level of research conducted at the parent facility was associated with occupational health staffing.[5] In addition, universities in the United Kingdom have shown extensive variation in the level of occupational health services provided between institutions.[1]

Peer-reviewed research into occupational health office staffing in the corporate setting has provided a few expert opinions[6,7] and some information on the variation between industry types,[8] but the recommendations made are difficult to apply to occupational health in the health care setting due to the inherent differences in occupational health needs in such settings. National organizations, such as the National Association of Occupational Health Professionals (NAOHP), have published a great deal of valuable information on occupational health office staffing that is available in the proprietary literature. These publications are almost exclusively expert opinions that have not been published in peer-reviewed journals, which is an important criterion for evidence-based recommendations,[2] but they are nonetheless important contributions in the absence of empirical studies.

To add to the uncertainty, there are very few high-quality empirical studies pertaining to effectiveness and efficiency among occupational health offices.[2] There are many beneficial books, such as those by Tee Guidotti[9] and Royce Moser,[10] as well as resources from national organizations, such as American College of Occupational and Environmental Medicine and the NAOHP, that attempt to define and provide measures for efficacy, efficiency, and quality in an occupational health service. Despite these valuable resources, there is a paucity of high-quality research to quantify these recommended outcome measures. Most research regarding quality measures among occupational health services is published exclusively in the ''grey literature,'' that is primarily directed toward those with a financial interest in the findings, those who fund programs, or policy decision makers, which makes such research literature less suitable for use in establishing evidence-based recommendations.[2] This lack of high-quality, peer-reviewed studies is partially due to the lack of agreed-upon outcomes between these important contributions to clearly define effective care in the occupational health setting.

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Most currently available staffing formulas and guidelines pertain to nurses working in an inpatient setting.[11] There has been significant research into ideal inpatient hospital staffing with regard to patient safety and quality of care,[11,12] but the literature on inpatient clinic staffing cannot be adequately extrapolated to an outpatient occupational health office. Some research has investigated patient satisfaction, wait times, and average task times among personnel in general ambulatory care settings,[13] but most of these measures have yet to be reflected in the field of occupational health,[2] and they may not adequately illustrate the complex model of an effective occupational health clinic where professionals must adopt multiple roles that are unique from most ambulatory care settings.[14]

One key criterion of an effective clinic that has oft been neglected is staff job satisfaction. There are currently no available peer reviewed empirical studies that have investigated job stress and job satisfaction specifically among occupational health professionals. Research on the potential sources of stress in occupational health offices may help identify key issues for prevention or intervention that may help improve the quality of work life and well-being among occupational health professionals.

The goals of our study are to evaluate the factors that influence staffing among AOHP members' organizations, to provide preliminary data on staffing in occupational health offices to pave the way for future benchmarking studies, and to investigate the relationship between staffing and staff members' reports of job stressors, well-being, and job satisfaction.

METHODS

We conducted a cross-sectional study utilizing an anonymous, online survey sent to all members of the AOHP. The AOHP is a national professional organization founded in 1981 that advocates for occupational health and safety in the health care setting. At the time of the survey, the AOHP had 1172 members, and their membership represented 49 states, seven different countries, and roughly 750 unique institutions. Although the majority of AOHP membership is made up of occupational health nurses, their membership is open to any type of occupational health professional.

The online survey was open for four weeks in spring 2014. In order to extend prior research compared with the 2011 AOHP survey, the 2014 survey was extensively revised and included not only questions to assess staffing levels (like its predecessor) but also questions about tasks performed, facility type, and potential work stressors and satisfaction.

This study protocol was reviewed by both the Colorado Multiple Institutional Review Board and the Colorado State University Institutional Review Board, and granted exempt status as defined by their policies, current regulations, and in accordance with OHRP guidelines. No personal identifiers were collected during the survey, and the study was considered exempt on that basis.

The survey was promoted extensively by the AOHP Executive Board, such as at their national conference, in the *Journal of the Association of Occupational Health Professionals in Healthcare*, and in various electronic media. With the help of the AOHP Executive Board, we implemented methods known to increase the survey response rate, such as pre-notification of participants,[15] personalized contact,[16] appeal to a specific interest in the context of a pre-existing social network,[17] simple design of the Web survey,[18] avoidances of both complex question grids and requests for identifying information,[19] balance between the inclusion of important variables and brevity,[20] and follow-up contact.[21]

The simple unadjusted response rate was 33% (381/1172), which was significantly higher than the 26% (281/1096) response rate in 2011 ($\chi^2 = 12.93$, $P = 0.0003$). After accounting for missing and incomplete data, 303 responses were included in the final analysis. The respondents were 95% female, had a mean age of 55 years (SD = 4), and had a mean worksite tenure of 11 years (SD = 9). Sixty-two percent of the respondents' highest level of education was in the nursing profession, and 49% were the managers of their respective offices. Only 0.3% of respondents were physicians, and 37% held a terminal degree in other fields, such as public health or business.

Responses were received from 280 unique institutions, with many different facility types, most of which offered some combination of inpatient hospital beds, outpatient clinics, and long-term care. Because the data were de-identified as a condition of our IRB approval, we were unable to identify specific facilities that did respond and those that did not. However, respondent and facility characteristics were compared with the demographic and facility data of all AOHP members, and the 33% who responded were found to be generally representative of the AOHP as a whole.

The survey asked about the total number and types of personnel served by the member's occupational health office. We also gathered staffing data to include the number of occupational health office full-time equivalents (FTEs), types of staff, facility characteristics, and activities performed in the office. Participants indicated which tasks were performed at their occupational health office among 27 different activities. We grouped these tasks into four general categories: provider tasks (eg, diagnosis and treatment), nursing tasks (eg, immunizations and counseling), management tasks (eg, risk management, safety, and infection control), and administrative tasks (eg, recordkeeping). Because offices that had a provider present differed from those that did not, we examined the staffing variables separately for those offices that had any provider presence, and those that did not.

In addition to staffing questions, we asked respondents about their job satisfaction, well-being, and various work-related stressors. These items were included to provide an understanding of occupational health worker attitudes and perceptions about their jobs. These items were divided into two categories, work stressors/supports and individual/organizational outcomes. Respondents answered each item using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). We then used these responses to examine any relationships between worker stressors or satisfaction and staffing levels, number of personnel served, and staffing ratios.

Following data collection and cleaning, we conducted univariate and multivariate statistical analyses such as Pearson Chi-square tests, Poisson regression analysis, and analysis of variance (ANOVA) tests, where appropriate. This design allowed us to test for associations between facility staffing and other variables, such as total number of personnel served, facility type, tasks performed, and job stressors and satisfaction.

We examined staffing as both an antecedent (exposure) and an outcome. For instance, the primary analysis attempted to identify whether facility type, number of licensed hospital beds, personnel served, and tasks performed helped to predict staffing as an outcome. However, when examining associations between facility staffing and job stressors and satisfaction, staffing was the exposure of interest, and job stressors and satisfaction were the outcome measures.

RESULTS

Roughly 82% (248/303) of the occupational health offices represented performed clinical functions, whereas the remaining 18% performed duties that were strictly administrative in nature. Of the offices surveyed, 40% (121/303) had at least some access to a clinical provider, such as a nurse practitioner, physician, or physician's assistant. However, only 32% (98/303) had a clinical provider at least half-time and only 28% (86/303) of the offices surveyed had any physician presence. All offices surveyed that had any physician presence had at least one half-time physician on staff.

TABLE 1. Predictors of Total Number of Occupational Health Office FTEs

	β	*P*	Adjusted R^2
Number of licensed beds	0.34	<0.01	0.11
Number of personnel served	0.62	<0.01	0.38
Types of personnel served			0.41
Employees	0.35	<0.01	
Students	0.45	<0.01	
Volunteers	0.02	0.77	
Medical staff (not employed)	−0.19	<0.01	
Outside employees	0.03	0.54	
Facility type			−0.01
Inpatient hospital beds	−0.04	0.58	
Outpatient clinics	−0.004	0.95	
Long-term care	0.06	0.34	
Office tasks			−0.02
Absence management	0.19	0.03	

FTEs, full-time equivalents.

Predictors of Occupational Health Office Staffing

We analyzed multiple factors using Poisson regression analysis to delineate which factors related to occupational health office staffing (see Table 1). The type of personnel served was the largest predictor of occupational health office staffing among the offices surveyed, accounting for 41% of the variability observed (adjusted $R^2 = 0.41$). Increased staffing was significantly associated with providing services to employees of their own organization ($P < 0.01$, $\beta = 0.35$), including attending physicians, interns, residents, and fellows. Serving students was also significantly associated with a greater number of occupational health staff ($P < 0.01$, $\beta = 0.45$). However, serving outside medical staff (ie, physicians that were not employees of the organization) was significantly associated with fewer occupational health staff ($P < 0.01$, $\beta = -0.19$). Offering services to volunteers and employees of outside organizations was not significantly related to the number of staff in the occupational health offices we surveyed.

The total number of personnel served was the second largest predictor of occupational health office staffing among the assessed factors, accounting for 38% of the variability observed between offices ($P < 0.01$, $\beta = 0.62$, adjusted $R^2 = 0.38$). Examining this further, the total number of personnel served was also a significant predictor of the number of providers ($P = 0.01$, $\beta = 0.17$), nurses ($P < 0.01$, $\beta = 0.32$), and administrative staff ($P < 0.01$, $\beta = 0.18$).

Although the number of licensed hospital beds was significantly associated with staffing when examined using univariate analysis ($P < 0.01$, β=0.34, adjusted $R^2 = 0.11$), it was found to be a less powerful surrogate for total number of personnel served when analyzed with the other factors.

Absence management was the only one of the 27 office tasks assessed that was significantly associated with total number of occupational health office staff when examined individually ($P = 0.03$, $\beta = 0.19$, adjusted $R^2 = -0.02$). When grouped together in general categories of provider tasks, nursing tasks, management tasks, and administrative tasks, none of the categories were significantly associated with occupational health office staffing. The type of facility surveyed was not significantly associated with the total number of occupational health office staff.

Personnel Served per Full-time Equivalent (FTE)

As one of the largest predictors of occupational health office staffing, the total number of personnel served was further analyzed using descriptive statistics to delineate the number of personnel served per full-time occupational health worker (of any type), provider, and nurse. These results are outlined in Table 2.

The mean total number of personnel served by all occupational health offices surveyed was 5728 (SEM = 461, range 95 to 50,000). When examined by the total number of FTEs in each office, the mean number of personnel served was 1236 per occupational health worker FTE (SEM = 50, range 31 to 5829), although there was substantial variability between offices. Each nurse FTE served a mean of 1862 personnel (SEM = 99, range 56 to 13,600). Among offices with any provider presence, each provider FTE served a mean of 8061 personnel (SEM = 924, range 50–58,100).

Due to the differences in occupational health offices that have a physician presence and those without, we analyzed the responses further to examine the total number of personnel served and the number served per FTE for offices with a provider presence

TABLE 2. Mean Numbers of Personnel Served per Occupational Health Office Staff Member

	Mean Number of Total Personnel Served			Number of Personnel Served per all staff FTEs			Number of Personnel Served per Provider FTE			Number of Personnel Served per Nurse FTE		
	Mean	SEM	Range	Mean	SEM	Range	Mean	SEM	Range	Mean	SEM	Range
All offices ($n = 303$)	5728	461	95–50,000	1,236	50	31–5829	N/A	N/A	N/A	1862	99	56–13,600
Offices with a provider ($n = 121$)	8587	889	300–50,000	1,007	59	32–3500	8061	924	50–58,100	1985	137	65–7763
Offices with no provider ($n = 182$)	3637	389	95–38,600	1,416	73	37–5829	N/A	N/A	N/A	1771	139	56–13,600

FTE, full-time equivalent.

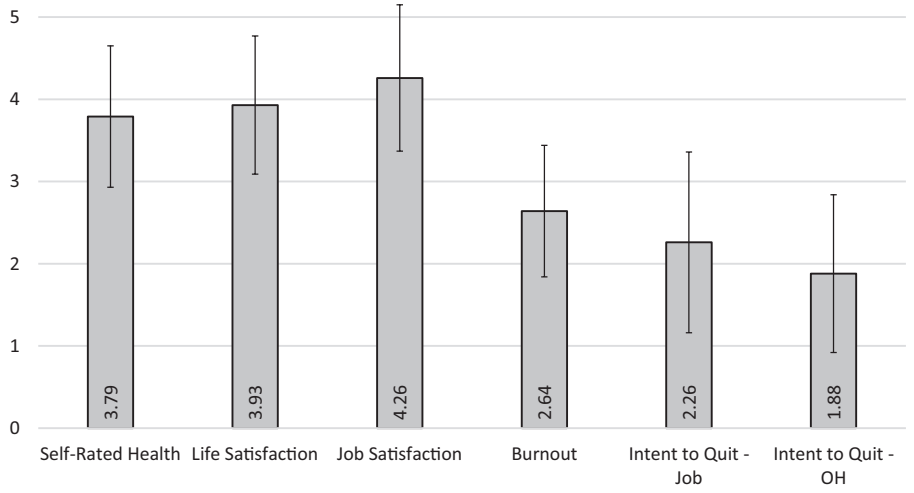

FIGURE 1. Mean staff health, well-being, and turnover intentions on a 5-point Likert scale with SEM.

and those without. Offices with a provider had substantially fewer personnel served per all occupational health office FTEs (mean 1007, SEM = 59, range 32 to 3500) than offices without a provider (mean 1416, SEM = 73, range 37 to 5829). However, personnel served per nursing FTE was slightly higher for offices with a provider (mean 1985, SEM = 137, range 65 to 7763) than those without a provider (mean 1771, SEM = 139, range 56 to 13,600).

Occupational Health Office Staffing Ratios

Another key component of occupational health staffing is the ratio of the different types of occupational health workers in the office. For the purpose of this study, we divided workers into three main categories: (1) providers, who included physicians, physician assistants, and nurse practitioners; (2) nurses, who included all other nursing fields other than nurse practitioners, and (3) administrative staff, which included all other workers. Because the offices that had no provider presence would necessarily alter the results, these categories were examined separately for offices that had any provider presence, and those that did not.

In offices that had a provider presence, there was a mean of 6.70 nurses (SEM 1.28, range 0.3 to 132) and 2.57 clerical staff (SEM 0.52, range 0 to 48) per full-time provider. When the offices that did not have any provider presence were isolated, there was a mean of 0.29 clerical staff (SEM 0.03, range 0 to 1.52) per full-time nursing staff.

Perceived Stressors and Support

Overall, job and life satisfaction levels were high among respondents, with mean scores of 4.25 (SEM = 0.05) and 3.93 (SEM = 0.05), respectively (see Fig. 1) on a 5-point rating scale. Self-rated health scores were also generally high, surveyed with a mean Likert score of 3.81 (SEM = 0.05). In addition, turnover intentions were relatively low, with higher reported intentions to quit one's job (mean 2.25, SEM = 0.61), and lower levels of intentions to leave the occupational health field (mean 1.89, SEM = 0.06).

Respondents' perceptions of work-related stressors and supports were examined, including role conflict, role overload, autonomy, work/life balance, perceived organizational support, and meaningfulness of work (see Fig. 2). Role overload (receiving too many demands from a professional role) was the highest reported stressor among those surveyed with a mean score of 3.54 (SEM = 0.06) on a 5-point scale. Respondents reported mean scores of 4.03 (SEM = 0.05) for autonomy, 3.95 (SEM = 0.05) for perceived organizational support, and 4.31 (SEM = 0.03) for meaningful work.

Table 3 outlines the significant relationships discovered between work stressors and the measured supports and outcomes.

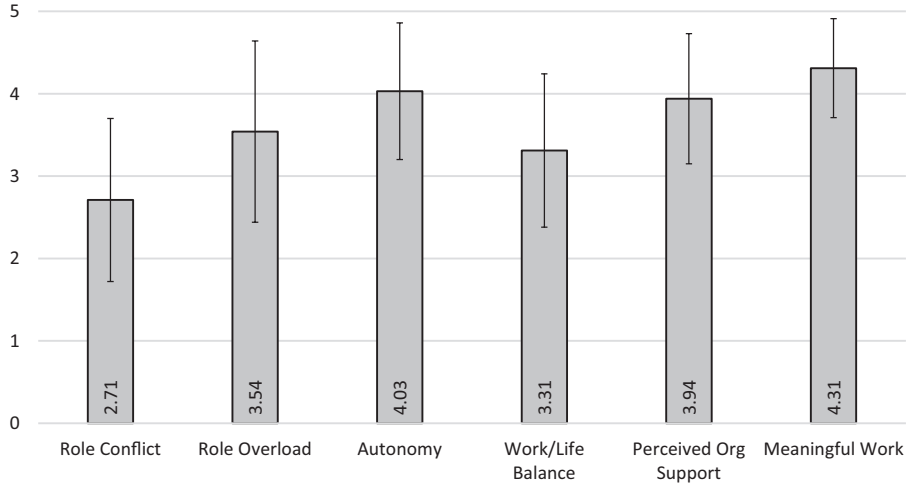

FIGURE 2. Mean level of perceived stressors and supports on a 5-point Likert scale with SEM.

TABLE 3. Psychological Outcomes Associated With Work Stressors and Supports

	β	*P*	R^2
Job satisfaction			0.44
Work burnout	−0.19	<0.01	
Role conflict	−0.18	<0.01	
Job autonomy	0.109	0.05	
Perceived organizational support	0.248	<0.01	
Meaningfulness of work	0.21	<0.01	
Intent to quit job			0.54
Job satisfaction	−0.54	<0.01	
Role conflict	0.22	<0.01	
Meaningfulness of work	−0.12	<0.01	
Intent to leave field of occupational health			0.30
Job satisfaction	−0.25	<0.01	
Role conflict	0.15	0.01	
Meaningfulness of work	−0.22	<0.01	
Burnout	0.13	0.02	

Job satisfaction was significantly related to all measured work stressors and supports, except for work/life balance, and when combined these factors explained 44% of the variability ($R^2 = 0.44$) reported in job satisfaction. Similarly, certain work stressors and absence of supports were also significantly related to the intent to quit one's job, and when combined explained 54% of the variance ($R^2 = 0.54$) in an intent to quit one's job. Of the factors assessed, only role conflict and lack of meaningful work were significantly associated with an intent to leave the field of occupational health, explaining 30% of the variance ($R^2 = 0.30$) reported.

Staffing and Stress

We investigated the relationships between the predictors of staffing and worker stress and satisfaction; results are displayed in Table 4. Neither the total number of full-time occupational health office staff nor the total number of licensed beds was significantly related to perceptions of work stressors or satisfaction. However, increasing the total number of personnel served was significantly related to increased stressors ($P = 0.01$, $\beta = 0.16$, $R^2 = 0.020$) and decreased work/life balance ($P = 0.02$, $\beta = -0.14$, $R^2 = 0.016$).

We then examined the number of personnel served per each type of occupational health professional for relationships with job stressors and satisfaction. Results can be found in Table 5. The number of personnel served per occupational health staff was related to small increases in self-rated health scores ($P = 0.04$, $\beta = 0.13$, $R^2 = 0.01$). Similarly, the number of personnel served per nurse was also related to small increases in self-rated health scores ($P < 0.01$, $\beta = 0.17$, $R^2 = 0.02$). No other significant associations were discovered, and the number of personnel served per provider did not significantly relate to the perceptions of occupational health office workers.

Upon examining the potential relationships between staffing ratios and job stress/satisfaction in offices with a provider presence, there were no significant relationships between worker stressors or satisfaction variables and the number of clerical staff per provider or number of nurses per provider. Among offices without a provider, increasing numbers of clerical staff per nurse had a small relation with decreases in role conflict ($\beta = -0.26$, $P < 0.01$, $R^2 = 0.06$) and increases with overall self-rated health ($\beta = 0.29$, $P < 0.01$, $R^2 = 0.08$), but no other significant associations were found.

DISCUSSION

Occupational health professionals are not just clinicians but also educators, case managers, expert consultants, safety professionals, and risk managers.[14] Therefore, data on staffing, job stressors, and job satisfaction in other settings cannot be easily generalized to occupational health offices, especially in the health care setting. The paucity of available literature on these unique offices indicates that the factors that influence staffing among occupational health offices must be adequately assessed and analyzed.

Although occupational stress in the health care industry has been a long-standing concern and the subject of much research,[22] our study is the first to examine job stress and satisfaction specifically among occupational health professionals in the health care setting. Our study is also the first to employ a robust statistical analysis to offer evidence explaining the extreme variability observed in occupational health office staffing.

The literature available to offer insights into occupational health office staffing is limited. Prior research examining staffing among occupational health offices in the health care setting has shown that occupational health office staffing was not associated with either high levels of occupational health needs or the level of research conducted at the parent facility.[5] A survey of academic institutions in the United Kingdom showed extensive variation in access to occupational health services, but this analysis did not offer information on the cause of this variability.[1] In the industrial setting, Fine[6] developed a complex model for company-based occupational health office staffing in 1982 based on the ''judgment and opinions'' of 10 safety professionals. The author freely acknowledged the absence of scientific research on the matter and made the recommendations with several significant assumptions regarding the ''quantification factors'' and their weighted values that should be included in the calculation. Rieth[7] attempted to offer an updated expert opinion in 2000 indicating that staffing of an occupational health service in industry is largely dependent upon the services provided and the type of staff hired. However, the author reiterated the caveat that no clear rules exist about staffing in the occupational health setting. Aside from expert opinions, one study published in 1991 examined the occupational medicine physician-to-employee ratios of the 25 largest U.S. corporations and found substantial variations between industry types.[8] These analyses do provide some insight, but the practice of occupational health in the health care setting remains wholly unique, and the applicability of the recommendations may have changed dramatically in the intervening years.

With regard to the average staffing levels among occupational health offices in the health care setting, our data can provide some insight. For offices with a provider presence, the data suggest that roughly every 8000 individuals are served by one provider, seven nursing staff (RN/MA/CNA/LPN/LVN), and three clerical staff. For offices without a provider presence, the data

TABLE 4. Staffing Factors Related to Measures of Job Stress and Satisfaction

	β	*P*	R^2
Total number of occupational health staff			
Overall self-rated health	0.09	0.16	0.004
Stress	0.05	0.44	−0.002
Job satisfaction	0.02	0.80	−0.003
Role overload	−0.05	0.43	−0.001
Role conflict	0.02	0.80	−0.004
Perceived organizational support	0.07	0.24	0.002
Work/Life balance	−0.03	0.58	−0.003
Meaningfulness of work	0.06	0.31	< 0.001
Job autonomy	0.02	0.80	−0.003
Personal burnout	0.02	0.80	−0.004
Work burnout	−0.04	0.57	−0.003
Total number of personnel served			
Overall self-rated health	0.12	0.05	0.010
Stress	0.16	0.01	0.020
Job satisfaction	−0.04	0.55	−0.002
Role overload	0.05	0.40	−0.001
Role conflict	0.1	0.90	0.007
Perceived organizational support	0.00	0.99	−0.004
Work/Life balance	−0.14	0.02	0.016
Meaningfulness of work	0.01	0.85	−0.003
Job autonomy	0.00	1.00	−0.004
Personal burnout	0.11	0.07	0.008
Work burnout	0.04	0.54	−0.002
Total number of licensed beds			
Overall self-rated health	0.08	0.20	0.002
Stress	0.09	0.14	0.004
Job satisfaction	−0.02	0.73	−0.003
Role overload	0.04	0.54	−0.002
Role conflict	0.08	0.17	0.003
Perceived organizational support	0.03	0.60	−0.003
Work/Life balance	−0.08	0.21	0.002
Meaningfulness of work	0.09	0.13	0.005
Job autonomy	−0.03	0.60	−0.003
Personal burnout	0.04	0.51	−0.002
Work burnout	0.01	0.89	−0.004

suggest that roughly every 1800 individuals are served by one nurse and 0.3 clerical staff.

The numbers and high variability of personnel served per nurse in our data were remarkably similar to results obtained by Hughes et al[1] in the 1999 survey of the UK's National Health Service, which showed 1838 personnel served (SEM = NR, range 436 to 5806) per nurse FTE. However, the 8061 personnel served per provider FTE among AOHP membership was roughly 45% less than the 1,467 (SEM = NR, range 43 to 8198) personnel served per physician half-day session in the survey by Hughes et al,[1] which would roughly correlate to 14,670 personnel served per physician FTE. Of note, only 28% of the offices we surveyed had any physician presence at all. In comparison, 38% of the UK National Health Service occupational health offices surveyed in 1999 had at least a half-time physician appointed, but 100% of departments had at least one medically qualified staff member.[1]

In our study, we found that types of personnel served, number of personnel served, and number of licensed beds were all significantly associated with staffing of occupational health offices. Types of personnel served were the most substantial predictor of staffing, accounting for 41% of the variability observed between offices surveyed. Total number of personnel served was also significantly associated with occupational health office staffing, explaining approximately 38% of the variability observed. Based upon multivariate analysis, it appears that number of licensed beds is colinear with number of personnel served and is simply a less powerful surrogate for this measure.

The factor that was most strongly related to types of personnel served and staffing was the number of students served by the occupational health office. This may indicate that academic institutions are more aware of the need for occupational health services, that the need for medical clearance of students (who generally turnover more quickly than employees) places an increased demand on the occupational health office, or that employees may be engaged in activities that require greater occupational health support, such as experimental research or medical surveillance for hazardous drugs. However, previous research has concluded that neither high levels of occupational health needs, nor the level of research conducted at the parent facility, were associated with occupational health staffing.[5] Thus, future research should investigate which factors are related to the finding that academic institutions have higher levels of occupational health office staffing.

Although offices with a provider presence had more total staff per personnel served, they also had fewer nurses. This may indicate that providers not only require greater nonclinical, administrative support than nurses but also that providers may take on additional roles typically accomplished by nurses in offices without a provider presence.

Absence management was found to be a significant predictor of occupational health office staffing, but the presence of a negative adjusted R^2 indicated that our model did not follow the trend of the data. In addition, this was the only task that was significantly related to office staffing among the 27 separately assessed office tasks, which could be the result of a Type I (alpha) error. The term

TABLE 5. Staffing Ratios Related to Measures of Job Stress and Satisfaction

	β	*P*	R^2
Personnel served per all OH staff			
Overall self-rated health	0.13	0.04	0.012
Stress	−0.001	0.98	−0.004
Job satisfaction	0.03	0.67	−0.003
Role overload	−0.02	0.76	−0.003
Role conflict	0.05	0.42	−0.001
Perceived organizational support	−0.08	0.22	0.002
Work/Life balance	−0.01	0.88	−0.004
Meaningfulness of work	0.04	0.49	−0.002
Job autonomy	−0.03	0.64	−0.003
Personal burnout	0.06	0.38	−0.001
Work burnout	0.04	0.51	−0.002
Personnel served per nurse			
Overall self-rated health	0.17	<0.01	0.024
Stress	0.08	0.18	0.003
Job satisfaction	−0.01	0.93	−0.004
Role overload	−0.01	0.98	−0.004
Role conflict	0.03	0.70	−0.003
Perceived organizational support	−0.06	0.33	<0.001
Work/Life balance	−0.02	0.71	−0.003
Meaningfulness of work	0.05	0.44	−0.002
Job autonomy	0.03	0.64	−0.003
Personal burnout	0.04	0.48	−0.002
Work burnout	0.09	0.17	0.003
Personnel served per provider			
Overall self-rated health	−0.01	0.88	−0.009
Stress	0.02	0.88	−0.009
Job satisfaction	0.1	0.27	0.002
Role overload	−0.02	0.85	−0.009
Role conflict	−0.04	0.69	−0.007
Perceived organizational support	0.16	1.00	0.016
Work/Life balance	−0.02	0.83	−0.008
Meaningfulness of work	0.03	0.78	−0.008
Job autonomy	0.02	0.81	−0.008
Personal burnout	−0.03	0.76	−0.008
Work burnout	−0.06	0.54	−0.006

''absence management'' was not specifically defined in the survey and was left open for the respondent to infer the term's meaning, which makes the interpretation and generalizability of this finding difficult despite its statistical significance.

Occupational health professionals are generally a highly satisfied workforce. Some aspects of occupational health office staffing do have small associations with work stress and job satisfaction. Increasing numbers of personnel served have a small, but significant, relationship to increased work stress and lack of work/life balance. This may indicate that the areas of responsibility of the occupational health office in a larger health care facility may be different from those at a smaller facility. However, given the current regulatory requirements mandated by the Occupational Safety and Health Administration, the Joint Commission, and the Accreditation Association for Ambulatory Health Care, it is more likely that common areas of responsibility simply have a different level of complexity in larger facilities that contributes to work stress and lack of work/life balance. This is supported by the absence of any clinically significant relationships discovered between tasks performed by the occupational health office and the number of staff employed. Without further data, no strong conclusions can be made regarding what factors would lead to increased job satisfaction for occupational health professionals. Further research into worker stress and satisfaction and how it influences the quality of jobs for occupational health professions is warranted.

In an attempt to include all potential responses regarding job stress and job satisfaction, we permitted multiple respondents from a single facility, which may have biased our results toward the null. Based upon survey responses, no more than 8% (23/303) of included respondents offered duplicate information about staffing and personnel served. However, to control for this possible bias, we conducted the analyses again, excluding respondents from the same facility, and the results remained the same.

Given that 18% of the occupational health offices surveyed were strictly administrative in nature, it is likely that the differences between clinical and nonclinical sites contributed to the sizeable variations that we observed. Future research should focus on describing the differences between clinical and nonclinical sites in greater detail, which would likely mandate separate surveys to assess workload.

Although our study does offer evidence to explain the extreme variability observed in occupational health office staffing, a conclusive study examining appropriate staffing levels would necessitate a more nuanced analysis, which would require a much longer survey to account for potential confounders and effect modifiers. Thus, our approach was justified on three grounds. First, due to the limited research on staffing ratios in occupational health settings, this economical and efficient exploratory study is appropriate in order to provide groundwork for larger studies examining staffing in the future. Second, the univariate analyses conducted have generated hypotheses and preliminary findings that can be tested and replicated in additional research. Finally, due to the profound variability in clinical practices, services offered, and populations served by AOHP members' organizations, the sample size would have been insufficient

to adjust statistically for all of the relevant covariates in a more nuanced analysis. As a result, there are factors that are unassessed by our study and require further investigation. Number of patient encounters, average time spent on specific activities, and perhaps separate surveys of clinical versus nonclinical sites should be considered. In addition, because 87% of occupational health offices surveyed deal with workers' compensation management, it is likely that the variation between state requirements in recordkeeping and reporting plays some role in occupational health office staffing. These variables should be considered and investigated in future research.

Our study has some limitations that warrant discussion. The greatest limitation was that the study was restricted to one national professional society, which may put external validity at risk. This may be especially true given that the overwhelming majority of the respondents were female and members of the nursing profession. Given the lack of current data on occupational health offices in the U.S., we are unable to verify whether these statistics are descriptive of all occupational health professionals nationwide, or if they are unique to the health care setting. However, with 280 unique facilities represented, this survey likely represents roughly 5% of all 5723 hospitals in the U.S.[23] With a membership body that spans 49 of the 50 states, it is reasonable to assume that the sample obtained from the AOHP bears at least some similarity to other occupational health offices in the health care setting in the U.S. These data may also be useful to inform offices outside the health care setting; however, it is not readily generalizable to all occupational health offices without placing external validity at further risk.

Our aim is to provide information that will lay the foundation for future, large-scale studies to examine staffing among occupational health offices nationwide, thereby positively influencing the effectiveness of occupational health professionals.

CONCLUSION

Our study is the first to examine job stress and satisfaction among staff members in occupational health offices, and it is also the first to employ a robust statistical analysis to offer evidence explaining the extreme variability observed in occupational health office staffing. The primary predictors of staffing among occupational health offices are the types of personnel served and the total number of personnel served. In our sample, offices that required a provider presence typically had one provider, seven nursing staff, and three clerical staff for every 8000 individuals served. Offices that did not require a provider presence typically had one nurse and 0.3 clerical staff for every 1800 individuals served. However, our results suggest that occupational health professionals are generally a highly satisfied workforce, and staffing levels have little relation to their levels of job stress and satisfaction.

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