

Turnover, Burnout, and Job Satisfaction of Certified Registered Nurse Anesthetists in the United States: Role of Job Characteristics and Personality

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This study, designed to identify the determinants of job satisfaction, employee burnout, and turnover intentions, was based on data derived from a survey of members of the American Association of Nurse Anesthetists (AANA) who were active Certified Registered Nurse Anesthetists (CRNAs). The relationships explored, using structural equation models, were job satisfaction as a function of job characteristics and personality factors; employee burnout as a function of job characteristics, personality factors, and demographic characteristics; and turnover as a function of job satisfaction and burnout. Job satisfaction was positively associated with the job characteristic autonomy and the personality factor agreeableness.

Employee burnout was negatively associated with the job characteristics autonomy and skill variety, and with the personality factors agreeableness, stability, and openness; it was positively associated with hours worked per week. Turnover intentions were negatively associated with job satisfaction and positively associated with burnout. The results suggest that employers should structure CRNA jobs to feature greater skill variety and greater autonomy, which should result in higher job satisfaction, less burnout, and lower turnover intentions.

Keywords: Autonomy, burnout, Certified Registered Nurse Anesthetist, job satisfaction, turnover.

Certified Registered Nurse Anesthetists (CRNAs) are essential members of a surgical team. Turnover of CRNAs is important because CRNAs, as with other highly trained healthcare professionals, are difficult and expensive to replace. This study examines the determinants of CRNA turnover to develop recommendations to reduce turnover.

Certified Registered Nurse Anesthetists who are dissatisfied with their jobs and who feel burned out may be more likely to quit their jobs. Even if dissatisfied CRNAs do not quit their jobs, dissatisfaction and burnout can negatively affect both the quality and cost of patient care because of increased sick days, lower productivity, and the expression of negative attitudes to patients and coworkers. As job demands increase for remaining employees, their reactions to higher job demands will have a negative impact on patient satisfaction.¹ Thus, it is important to understand the factors that influence CRNA job satisfaction, burnout, and turnover.

Given the importance of understanding the determinants of turnover of highly trained healthcare professionals such as CRNAs, we searched for relevant literature.

• **Literature Review Methods.** We searched for rele-

vant literature in medical sources that would be included in PubMed as well as scholarly refereed business management and psychological literature that is not indexed in PubMed. We included the business management and psychological literature because the foundational theoretical literature on the causes of employee turnover originated in those bodies of literature. These theories of employee turnover apply to employees regardless of job type or industry. Employee turnover and its causes has been extensively studied in the literature over many years. It is appropriate to cite the original works of those who developed the theory and who created the measurement instruments.

• **Turnover Costs.** Job turnover of healthcare professionals is a concern to healthcare organizations and human resource professionals as they struggle to develop and maintain sufficient employee expertise to sustain a high quality of patient care. One cannot ignore the economic consequences of healthcare professional turnover that organizations incur, both the direct and indirect costs of increased turnover. Direct costs of turnover include advertising, recruiting, selection, placing ads, costs for personnel who do the recruiting and interviewing and accompanying expenses, background checks,

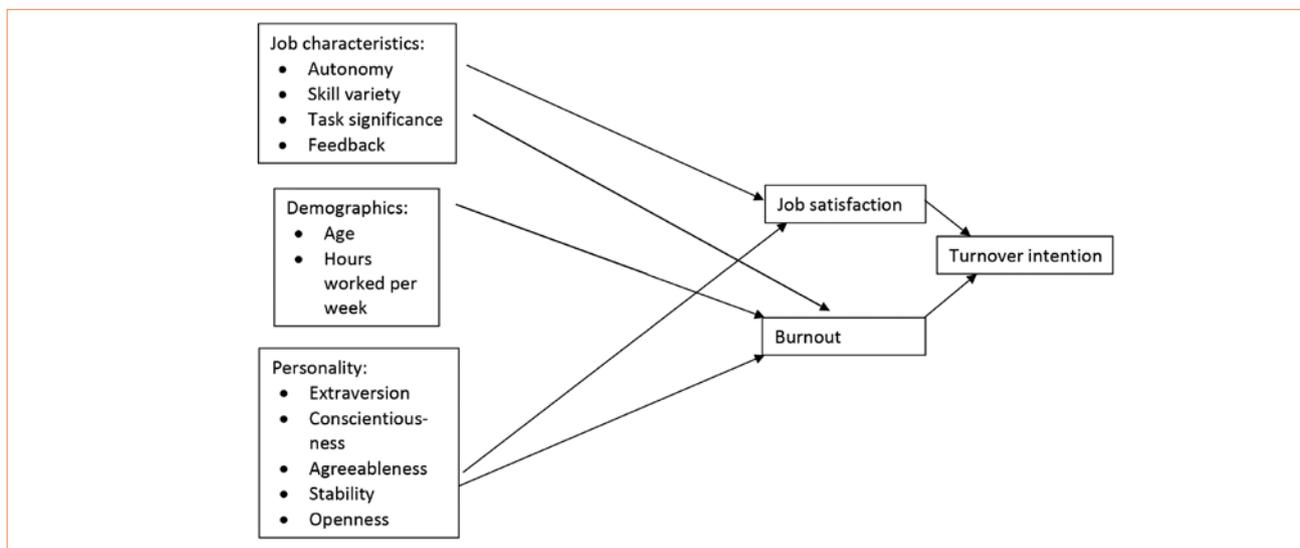


Figure. Structural Equation Model

bonuses for new hires, training and orientation costs, and all other expenses to recruit and hire. Indirect costs include the costs of paying overtime to staff CRNAs or replacement labor such as temporary or locum CRNAs (who cost more per hour than staff CRNAs), lower productivity of new hires, burnout experienced by managers whose workloads increase because of CRNA turnover, and lost revenue if operating rooms are closed or underutilized because of lack of staff, all of which result in decreased quality of patient services provided.²⁻⁴ These factors affect consumers of healthcare, payers for healthcare (both private third-party and government), and society as a whole because these organizations pass on the costs of turnover to payers and to society at large through higher taxes.

Neither the actual nor estimated costs of CRNA turnover are reported in the literature, but there are published estimates for the cost of registered nurse (RN) turnover. One of the most recent estimates for the cost of replacing an RN⁵ reported that “a Consumer Price Index cost assessment technique obtained an average cost of replacing an experienced RN at \$62,000 to \$67,000” (US dollars). That estimate is equal to 91% to 98% of the median starting salary for registered nurses, which the US Bureau of Labor Services reported was \$68,450 per year.⁶ Applying the same estimation technique to the reported median salary for CRNAs, which is \$160,270,⁷ results in an estimated cost of replacing an experienced CRNA to be approximately \$145,000 to \$157,000. Other sources provide similar or higher estimates; Jones² estimates the cost of nurse turnover is 1.3 times the salary of the nurse who leaves, and McConnell⁸ estimates turnover costs at 75% to 200% of the departing employee’s salary.

More highly educated and trained employees have more human capital, which is what makes them “worth more” in the market in terms of salary.⁹ Trevor and col-

leagues¹⁰ stated that “performance at higher job levels tends to have a larger effect on firm success and is more difficult and expensive to replace.” CRNAs have extremely high levels of general human capital—education that can be used at any employer and is not provided by their current employer. They also have midrange levels of firm-specific capital, that is, training in the healthcare organization’s specific equipment, systems, and processes.⁹ This means that all of that human capital leaves the organization when the CRNA leaves the organization. The high level of general human capital makes the CRNA qualified for more job opportunities outside the organization. The firm-specific human capital is lost when the CRNA leaves; the CRNA replacement hired must then receive training necessary to acquire the firm-specific human capital that was lost to turnover. These are all part of CRNA turnover costs. The estimates of the cost of CRNA turnover that we provide present a compelling argument to create and implement strategies that decrease turnover.

This study adds to the body of knowledge on CRNA turnover by providing evidence on the determinants of job satisfaction and burnout, and on the impact of job satisfaction and burnout on turnover. As a consequence, our study provides information for management interventions to reduce the turnover of employees who are critical to medical care and who are difficult and expensive to replace; our study findings also facilitate future research concerning how to reduce turnover.

• **Theoretical Base.** Job satisfaction has been defined as “the pleasurable emotional state resulting from the appraisal of one’s job as achieving or facilitating the achievement of one’s job values”.¹¹ Previous research has found that nurses’ job satisfaction is associated with job characteristics.^{12,13} Adams and Bond¹⁴ concluded that job characteristics are more important in predicting job satisfaction than individual nurse demographic charac-

teristics are, although Ingersoll et al¹⁵ found older nurses to be more satisfied than younger nurses.

Burnout has been defined as “a syndrome of exhaustion, depersonalization, and reduced personal accomplishment”.¹⁶ Burnout is hypothesized to be associated with 2 factors: high job demands and low job resources.¹⁶ Job demands have been found to be more important predictors of burnout than job resources.¹⁷ Employee personality factors have been found to be important predictors of burnout.¹⁷

Personality is widely used for predicting individuals’ work behaviors¹⁸ because one’s personality helps explain how one processes and responds to various situational cues and environmental features in the workplace.¹⁹⁻²¹ Personality traits have been shown to affect job satisfaction²² and intentions to quit.²³

Turnover intention has been defined as “the last in a sequence of withdrawal cognitions, a set to which thinking of quitting and intent to search for alternative employment also belongs”.²⁴ Studies of employee turnover frequently focus on turnover intentions rather than actual employee turnover because actual turnover is predicted by turnover intentions,²⁵ and studying turnover intentions allows managers to understand what they can do to influence turnover intentions before employees actually quit their jobs and turnover costs are incurred.

Based on the literature reviewed in this section, we constructed a model (Figure) in which (1) job satisfaction is a function of job characteristics and personality factors; (2) employee burnout is a function of job characteristics, personality factors, and demographic characteristics; and (3) turnover is a function of job satisfaction and burnout.

• **Research Questions.** Based on the literature and theory, we developed the following hypotheses that we tested using the structural equation model shown in the Figure.

Hypothesis 1: Job satisfaction is increased by job characteristics (skill variety, task significance, autonomy, and feedback from the job).

Hypothesis 2: Job satisfaction is increased by personality factors (extraversion, agreeableness, conscientiousness, emotional stability, and openness).

Hypothesis 3: Burnout is decreased by job characteristics (skill variety, task significance, autonomy, and feedback from the job).

Hypothesis 4: Burnout is decreased by personality characteristics (extraversion, agreeableness, conscientiousness, emotional stability, and openness).

Hypothesis 5: Turnover intention is decreased by job satisfaction.

Hypothesis 6: Turnover intention is increased by burnout.

Materials and Methods

The data used in this study were collected by one of the

authors (J.L.) as part of a master’s dissertation project. Using the variable “turnover intention” as the key variable of interest, the sample size calculation was made using these assumptions: a margin of error of 5%, a 95% confidence level, a population of 50,000 (the effect of population size on sample size does not change much once you have reached a population of 20,000), and a response distribution of 20%. According to an online sample size calculator (Raosoft),²⁶ this results in a required sample size of 245.

All CRNAs included in our sample had to be a member of the American Association of Nurse Anesthetists (AANA) and actively practicing. A randomized sample was collected via an electronic questionnaire. An electronic survey link was sent to 2,866 CRNAs; 266 responded, for a response rate of 9.3%. Of the 266 respondents, 246 had complete information for the variables used in the current study, which achieves the required sample size of at least 245 as already described.

The survey was composed of 7 sections: (1) demographic data, (2) turnover intent, (3) personality, (4) burnout, (5) work engagement, (6) work context and (7) job satisfaction. Turnover intent was measured with a single item. To measure the other variables, we abridged 4 established instruments. We measured the Big Five personality dimensions (extraversion, conscientiousness, agreeableness, stability, openness) with the Ten-Item Personality Inventory.²⁷ We measured burnout with the Oldenburg Burnout Inventory (16 items, OLBI).^{17,28,29} We measured work engagement with the Work & Well-Being Survey (9 items).³⁰ We measured the work context with the Job Diagnostic Survey (12 items).^{31,32}

To estimate our theoretical model (see Figure), we used structural equation modeling. “Structural equation modeling (SEM) is a collection of statistical techniques that allow a set of relationships between one or more independent variables (IVs), either continuous or discrete, and one or more dependent variables (DVs), either continuous or discrete, to be examined. Both IVs and DVs can be either factors or measured variables”.³³ This definition accurately describes our theoretical model.

Results

• **Descriptive Statistics.** Tables 1 to 3 show the characteristics of our sample. On average, participants were 48 years old, had 15.6 years of experience, and worked for their current employer for 7.9 years (Table 2). Of the 246 participants, 60% were female, 86% were employed full time, 45% worked in an academic hospital, 15% worked in a community hospital, 19% worked in a private practice, and 21% were self-employed. These characteristics from our sample closely reflect the national population of CRNAs; it is reflective of other larger CRNA samples such as the AANA 2016 Compensation and Benefits Survey,³⁴ which had a sample size of 3,377. The AANA 2016

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Autonomy	17.00	3.49	1													
2 Skill variety	16.16	3.78	0.437 ^a	1												
3 Task significance	18.41	2.67	0.531 ^a	0.517 ^a	1											
4 Feedback	16.07	3.28	0.534 ^a	0.471 ^a	0.533 ^a	1										
5 Extraversion	9.17	3.08	0.068	-0.029	0.106	0.125	1									
6 Conscientiousness	13.24	1.22	0.049	-0.064	0.001	0.106	0.005	1								
7 Agreeableness	11.46	2.07	0.017	-0.022	0.082	0.108	0.067	0.220 ^a	1							
8 Stability	11.88	2.04	0.144 ^b	0.050	0.044	0.176 ^a	0.070	0.308 ^a	0.308 ^a	1						
9 Openness	10.78	1.92	0.058	0.157 ^b	0.087	0.076	0.284 ^a	0.111	0.202 ^a	0.078	1					
10 Age	48.03	11.34	0.019	-0.113	-0.056	0.128 ^b	0.013	0.007	0.091	-0.032	0.071	1				
11 Hours per week	40.65	10.03	-0.061	0.167 ^a	0.068	-0.051	0.068	0.008	-0.156 ^b	-0.008	-0.006	-0.233 ^a	1			
12 Job satisfaction	3.80	0.82	0.415 ^a	0.225 ^a	0.222 ^a	0.302 ^a	0.047	0.059	0.142 ^b	0.183 ^a	0.029	0.049	-0.155 ^b	1		
13 Burnout	34.22	6.84	-0.370 ^a	-0.305 ^a	-0.288 ^a	-0.372 ^a	-0.108	-0.167 ^a	-0.250 ^a	-0.359 ^a	-0.231 ^a	-0.107	0.183 ^a	-0.639 ^a	1	
14 Turnover intention	0.24	0.43	-0.074	-0.073	-0.083	-0.011	0.067	-0.135 ^b	0.026	0.006	0.011	0.158 ^b	-0.090	-0.243 ^a	0.260 ^a	1

Table 1. Means, Standard Deviations, and Correlations Between Model Variables (N = 246)

^a $P < .01$.

^b $P < .05$.

survey reported the average age of CRNAs as 47.1 years (ours was 48), percentage of male CRNAs as 52% (ours was 40%), and CRNAs with 10 years of practice or less as 37% (ours was 44%).³⁴ Furthermore, our sample showed that the 6 states with the highest employment levels were Texas, California, Florida, Michigan, Pennsylvania, and North Carolina. This geographic distribution was very similar to that of the US Bureau of Labor Statistics,⁷ which reported the 5 states with the highest employment levels as Texas, Ohio, North Carolina, Pennsylvania, and Florida.

Respondents were asked about their perceptions of jobs available in the market for which they were qualified; 33.7% of respondents believed they could easily find a similar job, whereas 15.9% believed that they could easily find a better job than their current one.

Table 2 shows gender differences in the sample characteristics. We found significant differences for the following characteristics between men and women, respectively: hours worked per week (42.6 vs 39.3), percentage employed full time (88.8% vs 83.8%), total years of experience (17.9 vs 14.1), and percentage in private practice (14.3% vs 21.6%). There were no significant differences between men and women in average age, number of operating rooms where employed, years of experience with current employer, number of different employers in career, number of continuing education days per year, percentage who worked at community hospitals or academic centers, and percentage self-employed.

Table 3 shows results for 2 different levels of experience in the sample characteristics. We found significant differences for the following characteristics between those with 10 years' experience or less and those with more than 10 years of experience, respectively: average age (38.0 vs 56.0 years), percentage employed full time (92.7% vs 80.3%), number of operating rooms where employed (15.5 vs 11.4), total years of experience (4.0 vs 24.8), years of experience with current employer (3.3 vs 11.5), number of different employers in career (1.9 vs 4.9), and number of continuing education days per year (3.8 vs 3.0). We also found significant differences in workplace by experience level (≤ 10 years vs > 10 years, respectively): the percentage who worked at community hospitals (7.3% vs 20.4%) or academic centers (56.9% vs 35.8%), percentage with a private practice (22.0% vs 16.1%), and percentage self-employed (13.8% vs 27.7%). There were no significant differences between those with 10 or fewer years of experience and

Characteristic	All (N = 246)	Male (n = 98)	Female (n = 148)	P value
Age, y	48.0 (11.3)	49.4 (11.9)	47.1 (10.9)	.141
Hours per week	40.6 (10.0)	42.6 (11.2)	39.3 (9.0)	< .001
Employed full time	85.8 (35.0)	88.8 (31.7)	83.8 (37.0)	.001
Number of operating rooms	13.2 (12.3)	12.5 (12.2)	13.6 (12.4)	.727
Experience, total, y	15.6 (12.5)	17.9 (13.2)	14.1 (11.8)	.028
Experience with current employer, y	7.9 (8.2)	8.9 (9.4)	7.2 (7.3)	.138
Total different employers	3.6 (4.3)	3.9 (4.7)	3.4 (3.9)	.184
Continuing education, d/y	3.4 (4.1)	2.8 (3.6)	3.7 (4.4)	.103
Workplace, %				
Community hospital	14.6	14.3	14.9	.802
Academic center	45.1	46.9	43.9	.405
Private practice	18.7	14.3	21.6	.003
Self-employed	21.5	24.5	19.6	.073

Table 2. Demographics and Gender Differences^a

^aValues are mean (SD) except for workplace, which is percentage.

Characteristic	0-10 years (n = 109)	More than 10 years (n = 137)	P value
Age, y	38.0 (7.0)	56.0 (11.5)	< .001
Hours per week	41.6 (7.7)	39.9 (11.5)	.095
Employed full time	92.7 (26.2)	80.3 (39.9)	< .001
Number of operating rooms	15.5 (14.1)	11.4 (10.4)	.032
Experience, total, y	4.0 (3.0)	24.8 (9.0)	< .001
Experience with current employer, y	3.3 (3.4)	11.5 (9.1)	< .001
Total different employers	1.9 (2.7)	4.9 (4.0)	< .001
Continuing education, d/y	3.8 (4.9)	3.0 (3.3)	.041
Workplace, %			
Community hospital	7.3	20.4	< .001
Academic center	56.9	35.8	.032
Private practice	22.0	16.1	.019
Self-employed	13.8	27.7	< .001

Table 3. Demographics and Work Experience Differences^a

^aValues are mean (SD) except for workplace, which is percentage.

those with more than 10 years of experience for hours worked per week.

Table 4 shows that, overall, 24.7% intended to either quit their current job within the next 2 years (15.4%) or retire (9.3%). The reasons CRNAs intended to leave their current place of work vary. The most prevalent reason they intended to quit is better working conditions (43%), followed by retirement (38%) and for better pay (37%). The smallest amount reported leaving to advance their position (7%), and 17% reported they intend to leave to relocate to another geographic area.

Table 4 also shows differences in turnover intentions between men and women who intended to quit. Although there were no significant differences between

men's and women's intent to quit their current job (13.3% vs 16.9%), there was a significant difference for intention to retire (13.3% vs 6.8%). Focusing on those who reported intention to leave their current job (15.4% of total sample), there were significant differences in leave to retire (40.0% vs 37.1%), leave for better working conditions (72.0% vs 22.9%), leave for better pay (64.0% vs 17.1%), and leave to relocate geographically (16.0% vs 17.1%). There was no significant difference between men and women in the percentage who reported leaving to advance their position (8.0% vs 5.7%).

Table 5 shows differences in turnover intentions between those with 10 years of experience or less and those with more than 10 years of experience. There were

Reason	All (N = 246)	Male (n = 98)	Female (n = 148)	P value
Intend to quit current job in ≤ 2 y (not to retire), No. (%)	38 (15.4)	13 (13.3)	25 (16.9)	.120
Quit to retire, No. (%)	23 (9.3)	13 (13.3)	10 (6.8)	.001
Reason to leave current job (those who intend to leave), ^a No. (%)	60 (100)	24 (40)	36 (60)	
Advance position	4 (6.7)	2 (8.0)	2 (5.7)	.417
Retire	23 (38.3)	10 (40.0)	13 (37.1)	.001
Better working conditions	26 (43.3)	17 (72.0)	8 (22.9)	.044
Better pay	22 (36.7)	15 (64.0)	6 (17.1)	.010
Relocate geographically	10 (16.7)	4 (16.0)	6 (17.1)	.008
Could easily obtain a similar job (1-5), mean	2.77	2.81	2.74	
Could easily obtain a better job (1-5), mean	2.44	2.49	2.41	

Table 4. Turnover Intention Differences by Gender

^a "Reasons to leave" sum equals more than 100% since respondents could provide more than 1 reason.

Variable	0-10 years (n = 109)	More than 10 years (n = 137)	P value
Intend to quit current job in ≤ 2 years (not to retire)	19.3	12.4	.003
Quit to retire	2.8	14.6	< .001
Reason to leave current job for those who intend to leave ^a			
Advance position	10.0	3.0	.013
Retire	10.0	60.6	< .001
Better working conditions	56.7	27.3	< .001
Better pay	50.0	21.2	< .001
Relocate geographically	16.7	15.2	.462

Table 5. Turnover Intention Differences by Years of Experience (percent)

^a "Reasons to leave" sum equals more than 100% since respondents could provide more than 1 reason.

significant differences in intention to leave to advance their position (10.0% less experience vs 3.0% more experienced), leave to retire (10.0% vs 60.6%), leave for better working conditions (56.7% vs 27.3%), and leave for better pay (50.0% vs 21.2%). We found no significant difference for intention to leave to relocate geographically (16.7% vs 15.2%).

• **Structural Equation Model Statistics.** Data analyses were done with structural equation modeling using maximum likelihood estimation in the Amos software.³⁵ The Figure shows our structural equation model. The model shows that burnout was determined by job characteristics (autonomy, skill variety, task significance, and feedback), personality characteristics (extraversion, conscientiousness, agreeableness, stability, and openness), age, and hours worked per week. Job satisfaction was determined by job characteristics and personality characteristics. Turnover intention was determined by job satisfaction and burnout.

We next examined the overall fit of the structural equation model (Tables 6 and 7). The traditional χ^2 goodness-of-fit statistic and the goodness of fit index are seldom used to judge effectiveness of models in structural equation modeling because they are sensitive to

sample size, so we present 3 widely accepted alternative goodness-of-fit indexes here.³⁶ Bentler³⁶ fails to adjust for sample size; models with larger sample sizes have smaller values, whereas the Tucker-Lewis Index (TLI) and comparative fit index (CFI) vary only slightly with sample size. It is generally suggested that the TLI and CFI should exceed 0.90 or even 0.95 for the model to be considered a good fit.³⁶ The TLI for our model was 0.901 ($P < .01$); while the CFI for our model was 0.940 ($P < .01$). Similarly, a value of 0.60 or less for the root mean squared error of approximation reflects a good fit.³⁶ The root mean squared error of approximation for our model was 0.058 ($P < .01$).

We used the joint significance test recommended by MacKinnon et al^{37,38} to investigate whether a mediator effect exists. The 2 conditions that must be met to conclude that a mediator effect exists are as follows: (1) The independent variable is significantly related to the mediating variable. (2) The mediating variable is significantly related to the dependent variable. The significance of the mediated effect of the independent variable on the dependent variable was calculated using the Sobel³⁹ test for mediation. Our analysis indicates that the 2 conditions of the joint significance test have been met for all the pre-

Predictor	Dependent variables		
	Burnout	Job satisfaction	Turnover intention
Autonomy	-0.34 ^a	0.08 ^b	
Skill variety	-0.30 ^a	0.01	
Task significance	-0.10	-0.02	
Feedback	-0.20	0.02	
Extraversion	-0.07	0.00	
Conscientiousness	-0.26	-0.01	
Agreeableness	-0.33 ^c	0.05 ^c	
Stability	-0.85 ^b	0.03	
Openness	-0.45 ^c	-0.02	
Age	-0.04		
Hours per week	0.73 ^a		
Job satisfaction			-0.07 ^c
Burnout			0.01 ^c
R^2	0.31	0.20	0.07
Overall model fit statistics:			
Tucker-Lewis Index (TLI) = 0.901 ^a			
Comparative fit index (CFI) = 0.940 ^a			
Root mean squared error of approximation (RMSEA) = 0.058 ^a			

Table 6. Estimated Regression Coefficients From Structural Model

^a $P \leq .01$.

^b $P \leq .001$.

^c $P \leq .05$.

dictors used in our model. The Sobel³⁹ test for mediation showed that the mediation effects were significant.

Discussion

A look at the simple descriptive statistics in Tables 4 and 5 of the reasons CRNAs leave their positions provides some useful insights. Those CRNAs who intend to quit but *not* retire make up 15.4% of the entire sample—they intend to quit to pursue another job. A greater percentage of women than men intend to quit to pursue another job (16.9% vs 13.3%; see Table 4).

A significantly higher percentage of those with less than 10 years' experience, compared with more experienced CRNAs, intend to quit to pursue another job. A possible explanation for this finding is that those with less experience, who have more years left in their working careers, have the opportunity to benefit for a longer time from a job change resulting in higher pay (the reason that half of CRNAs with ≤ 10 years' experience reported leaving).

An examination of the factors reported as to why CRNAs are leaving their jobs provides understanding of the most important reasons: better working conditions and better pay. A small fraction intend to leave to advance their position—about 7% of the total who plan to leave. By far the greatest reason CRNAs intend to leave, regardless of gender or years of experience, is to find better working conditions—43.3%. The second

most common reason CRNAs plan to leave their current job (other than retire) is for better pay—36.7%. The factor of better pay appears to be much more important to men in the decision to leave, 64.0% vs 17.1% for women; and to those with 10 years or less of experience, 50.0% vs 21.2% for those with more experience. As in most other professions, pay increases early in one's career are more valuable because they increase lifetime earnings more than a pay increase late in one's career. The reasons CRNAs reported to intend to leave their jobs in our survey are similar to the results of the Employee Engagement Series conducted by Kronos,⁴⁰ which found that “[u]nfair compensation (41%), unreasonable workload (32%), and too much overtime/after-hours work (32%)” are the top 3 contributors to burnout across all occupations in the United States.

The large percentage of CRNAs who plan to leave their jobs within 2 years but are not retiring (15.4% of our sample) is troublesome, particularly when one notes that almost 20% of those with 10 or fewer years of experience intend to leave for another job. This presents a challenge to employers of CRNAs: losing new and younger workers results in a situation where constant recruitment, hiring, and training is necessary—creating a revolving door of replacements, which both drives up costs and threatens the quality of patient care.

The results of our structural equation model are consistent with the comparisons of descriptive statistics

Predictor	Dependent variables		
	Burnout	Job satisfaction	Turnover intention
Autonomy	-0.17 ^a	0.36 ^b	
Skill variety	-0.17 ^a	0.06	
Task significance	-0.04	-0.06	
Feedback	-0.10	0.09	
Extraversion	-0.03	0.02	
Conscientiousness	-0.05	-0.01	
Agreeableness	-0.10 ^c	0.12 ^c	
Stability	-0.26 ^b	0.09	
Openness	-0.13 ^c	-0.04	
Age	-0.06		
Hours per week	0.11 ^a		
Job satisfaction			-0.13 ^c
Burnout			0.17 ^c
R^2	0.31	0.20	0.07
Overall model fit statistics:			
Tucker-Lewis Index (TLI) = 0.901 ^a			
Comparative fit index (CFI) = 0.940 ^a			
Root mean squared error of approximation (RMSEA) = 0.058 ^a			

Table 7. Standardized Regression Coefficients From Structural Model

^a $P \leq .01$.

^b $P \leq .001$.

^c $P \leq .05$.

that we noted in the previous paragraphs (see Tables 6 and 7). Looking at the results for *burnout*, we can see that if the working conditions provide more skill variety and greater autonomy, burnout decreases significantly. Excess hours per week (eg, overtime, longer shifts) also increase burnout significantly. These results provide employers with opportunities for management interventions that decrease burnout and subsequent turnover by increasing skill variety and autonomy, and by decreasing work hours.

Several of the Big Five personality characteristics have a significant impact on decreasing burnout: agreeableness, stability, and openness. There are, of course, few management interventions available to have an effect on personality characteristics.

The results for *job satisfaction* show that if the working conditions provide greater autonomy, job satisfaction increases significantly. These findings are consistent with those of Mileto and Penprase,⁴¹ who found lack of autonomy was significantly related to lower job satisfaction, and Jones and Fitzpatrick,⁴² who found that limited scope of practice increases job dissatisfaction. Thus, the same management intervention of increasing autonomy that would reduce burnout would also result in increasing job satisfaction.

The results for *turnover intentions* indicate that higher levels of burnout are associated with higher turnover intentions and that higher levels of job satisfaction are as-

sociated with lower turnover intentions. Taken together, these results suggest that employers can reduce burnout, increase job satisfaction, and reduce turnover intentions by increasing skill variety and autonomy, and by decreasing hours worked per week (eg, shorter shifts and less overtime).

Only one of the Big Five personality characteristics had a significant impact on increasing job satisfaction: agreeableness. As noted earlier, few management interventions are available that affect personality characteristics.

Referring to the standardized regression coefficients in Table 7, we can see that a change in autonomy and skill variety has an identical impact on decreasing burnout, -0.17. However, autonomy has more than twice the impact on job satisfaction, increasing it by 0.36. The implication for a management intervention that may be most likely to decrease turnover of CRNAs is to increase autonomy since it both decreases burnout and increases job satisfaction, resulting in the largest reduction in turnover intentions.

The economic costs of CRNA turnover affect health-care organizations, consumers of healthcare, payers for healthcare (both private third party and government), and society as a whole because organizations pass these costs of turnover on to payers and to society, which ultimately pays for the costs of turnover in the form of taxes. Future research that examines actual reported costs

of CRNA turnover would be very useful and could be instrumental in convincing managers in healthcare organizations to put more effort and resources into reducing their CRNA turnover.

There are some strengths and limitations to our study. The similarities in demographic characteristics between our sample of CRNAs and national data^{7,34} strengthen the use of our results and their generalizability.

Taken together with the economic costs of CRNA turnover, our results suggest that employers should structure CRNA jobs to feature greater skill variety, greater autonomy, and fewer work hours per week (eg, shorter shifts and less overtime), which will result in higher job satisfaction, less burnout, and lower turnover intentions. The literature suggests that as a result of these changes, CRNAs will have better health and better job performance in addition to lower turnover rates, resulting in increases in the quality of patient care and decreases in cost.¹⁷

REFERENCES

1. Reilly G, Nyberg AJ, Maltarich M, Weller I. Human capital flows: using context-emergent turnover (CET) theory to explore the process by which turnover, hiring, and job demands affect patient satisfaction. *Acad Manag J*. 2014;57(3):766-790. doi:10.5465/amj.2012.0132
2. Jones CB. The costs of nurse turnover: part 1: an economic perspective. *J Nurs Adm*. 2004;34(12):562-570. doi:10.1097/00005110-200412000-00006
3. Jones CB. The costs of nurse turnover, part 2: application of the Nursing Turnover Cost Calculation Methodology. *J Nurs Adm*. 2005;35(1):41-49. doi:10.1097/00005110-200501000-00014
4. O'Brien-Pallas L, Griffin P, Shamian J, et al. The impact of nurse turnover on patient, nurse, and system outcomes: a pilot study and focus for a multicenter international study. *Policy Polit Nurs Pract*. 2006;7(3):169-179. doi:10.1177/1527154406291936
5. Kurnat-Thoma E, Ganger M, Peterson K, Channell L. Reducing annual hospital and registered nurse staff turnover—a 10-element onboarding program intervention. *SAGE Open Nurs*. 2017;3:1-13. doi:10.1177/2377960817697712
6. US Bureau of Labor Statistics. Healthcare practitioners and technical occupations. In: National occupational employment and wage estimates United States. May 2016.
7. US Bureau of Labor Statistics. *Occupational Outlook Handbook*. Washington, DC: Bureau of Labor Statistics; 2016.
8. McConnell CR. Staff turnover: occasional friend, frequent foe, and continuing frustration. *Health Care Manag*. 1999;8(1):1-13.
9. Ehrenberg RG, Smith RS. *Modern Labor Economics: Theory and Public Policy*. 13th ed. London, UK: Routledge, Taylor & Francis Group; 2017.
10. Trevor CO, Gerhart B, Boudreau JW. Voluntary turnover and job performance: curvilinearity and the moderating influences of salary growth and promotions. *J Appl Psychol*. 1997;82(1):44.
11. Locke EA. What is job satisfaction? *Organ Behav Hum Perform*. 1969;4(4):309-336. doi:10.1016/0030-5073(69)90013-0
12. Aiken LH, Cimiotti JP, Sloane DM, Smith H, Flynn L, Neff DF. The effects of nurse staffing and nurse education on patient deaths in hospitals with different nurse work environments. *Med Care*. 2011;49(12):1047-1053. doi:10.1097/MLR.0b013e3182330b6e
13. Nantsupawat A, Srisuphan W, Kunaviktikul W, Wichaikhum OA, Aunguroch Y, Aiken LH. Impact of nurse work environment and staffing on hospital nurse and quality of care in Thailand. *J Nurs Schol*. 2011;43(4):426-432. doi:10.1111/j.1547-5069.2011.01419.x
14. Adams A, Bond S. Hospital nurses job satisfaction, individual and organizational characteristics. *J Adv Nurs*. 2000;32(3):536-543. doi:10.1046/j.1365-2648.2000.01513.x
15. Ingersoll GL, McIntosh E, Williams M. Nurse-sensitive outcomes of advanced practice. *J Adv Nurs*. 2000;32(5):1272-1281. doi:10.1046/j.1365-2648.2000.01598.x
16. Demerouti E, Bakker AB, Nachreiner F, Schaufeli WB. The job demands-resources model of burnout. *J Appl Psychol*. 2001;86(3):499-512.
17. Bakker AB, Demerouti E, Sanz-Vergel AI. Burnout and work engagement: the JD-R approach. *Annu Rev Organ Psychol Organ Behav*. 2014;1:389-411. doi:10.1146/annurev-orgpsych-031413-091235
18. Tett RP, Jackson DN, Rothstein M. Personality measures as predictors of job performance: a meta-analytic review. *Pers Psychol*. 1991;44(4):703-742.
19. Meyer RD, Dalal RS, Hermida R. A review and synthesis of situational strength in the organizational sciences. *J Manag*. 2010;36(1):121-140. doi:10.1177/0149206309349309
20. Mischel W, Shoda Y. A cognitive-affective system theory of personality: reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. *Psychol Rev*. 1995;102(2):246-268. doi:10.1037/0033-295x.102.2.246
21. Tett RP, Burnett DD. A personality trait-based interactionist model of job performance. *J Appl Psychol*. 2003;88(3):500. doi:10.1037/0021-9010.88.3.500
22. Judge TA, Heller D, Mount MK. Five-factor model of personality and job satisfaction: a meta-analysis. *J Appl Psychol*. 2002;87(3):530-541. doi:10.1037/0021-9010.87.3.530
23. Jenkins JM. Self-monitoring and turnover: the impact of personality on intent to leave. *J Organ Behav*. 1993;14(1):83-91.
24. Tett RP, Meyer JP. Job satisfaction, organizational commitment, turnover intention, and turnover: path analyses based on meta-analytic findings. *Pers Psychol*. 1993;46(2):259-293. doi:10.1111/j.1744-6570.1993.tb00874.x
25. Mobley WH, Horner SO, Hollingsworth AT. An evaluation of precursors of hospital employee turnover. *J Appl Psychol*. 1978;63(4):408-414.
26. Raosoft Sample Size Calculator. Seattle, WA: Raosoft Inc. <http://www.raosoft.com/samplesize.html>. Accessed November 18, 2018.
27. Gosling SD, Rentfrow PJ, Swann WB Jr. A very brief measure of the Big-Five personality domains. *J Res Pers*. 2003;37(6):504-528. doi:10.1016/S0092-6566(03)00046-1
28. Demerouti E, Bakker AB, Vardakou I, Kantas A. The convergent validity of two burnout instruments: a multitrait-multimethod analysis. *Eur J Psychol Assess*. 2003;19(1):12-23. doi:10.1027//1015-5759.19.1.12
29. Demerouti E, Mostert K, Bakker AB. Burnout and work engagement: a thorough investigation of the independency of both constructs. *J Occup Health Psychol*. 2010;15(3):209-222. doi:10.1037/a0019408
30. Schaufeli WB, Bakker AB, Salanova M. The measurement of work engagement with a short questionnaire: a cross-national study. *Educ Psychol Measure*. 2006;66(4):701-716. doi:10.1177/0013164405282471
31. Hackman JR, Oldham GR. *The Job Diagnostic Survey: An Instrument for the Diagnosis of Jobs and the Evaluation of Job Redesign Projects*. Technical Report No. 4. New Haven, CT: Yale University Department of Administrative Sciences; 1974.
32. Hackman JR, Oldham GR. *Work Redesign*. Reading, MA: Addison-Wesley; 1980.
33. Ullman JB, Bentler PM. Structural equation modeling. In: Weiner IB, ed. *Handbook of Psychology*. 2nd ed. New York, NY: John Wiley & Sons; 2013. *Research Methods in Psychology*, vol 2. doi:10.1002/9781118133880.hop202023
34. American Association of Nurse Anesthetists. *2016 Compensation and Benefits Survey*. Park Ridge, IL: American Association of Nurse Anesthetists; 2016.
35. Amos [computer program]. Version 23.0. Chicago, IL: IBM SPSS; 2014.
36. Bentler PM. Comparative fit indexes in structural models. *Psychol Bull*. 1990;107(2):238-246. doi:10.1037/0033-2909.107.2.238
37. MacKinnon DP, Lockwood CM, Hoffman JM, West SG, Sheets V. A comparison of methods to test mediation and other intervening variable effects. *Psychol Methods*. 2002;7(1):83-104. doi:10.1037/1082-989x.7.1.83

38. MacKinnon DP, Fairchild AJ, Fritz MS. *Mediation analysis*. *Annu Rev Psychol*. 2007;58:593-614. doi:10.1146/annurev.psych.58.110405.085542
39. Sobel ME. Asymptotic confidence intervals for indirect effects in structural equation models. *Sociol Methodol*. 1982;13:290-312. doi:10.2307/270723
40. The employee burnout crisis: study reveals big workplace challenge in 2017 [press release]. Kronos website. <https://www.kronos.com/about-us/newsroom/employee-burnout-crisis-study-reveals-big-workplace-challenge-2017>. Published January 9, 2017. Accessed August 10, 2017.
41. Mileto L, Penprase B. Job satisfaction among Certified Registered Nurse Anesthetists: a multigenerational analysis. *Anesth ej*. 2014;2(1).
42. Jones TS, Fitzpatrick JJ. CRNA-physician collaboration in anesthesia. *AANA J*. 2009;77(6):431-436.

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