



Contents lists available at ScienceDirect

Exploratory Research in Clinical and Social Pharmacy

journal homepage: www.elsevier.com/locate/rcsop

Predictors of job satisfaction among pharmacists: A regional workforce survey



Rotana M. Radwan^{a,b}, John P. Bentley^c, Julie A. Patterson^{a,b}, Dave L. Dixon^{a,b}, Teresa M. Salgado^{a,b,*}

^a Center for Pharmacy Practice Innovation, Virginia Commonwealth University School of Pharmacy, Richmond, VA, United States, 410 N. 12th Street, PO Box 980533, Richmond, VA 23298, United States

^b Department of Pharmacotherapy & Outcomes Science, Virginia Commonwealth University School of Pharmacy, Richmond, VA, United States, 410 N. 12th Street, PO Box 980533, Richmond, VA 23298, United States

^c Department of Pharmacy Administration, University of Mississippi School of Pharmacy, University, MS, United States, Faser Hall, University, MS 38677, United States

ARTICLE INFO

Keywords:

Job satisfaction
Pharmacists
Work attitude
Virginia
Workforce

ABSTRACT

Background: Job satisfaction affects organizational outcomes including performance and retention. The pharmacy job satisfaction literature points to several predictors of job satisfaction, but educational debt and various work settings have not been previously examined.

Objectives: To identify predictors of Virginia pharmacists' job satisfaction.

Methods: This cross-sectional study used data from the 2018 Virginia Pharmacist Workforce Survey. Of 15,424 registered pharmacists, 13,962 (90.5%) completed the survey. Pharmacists who reported being employed and working in Virginia in the previous year (2017) were included in the analysis ($n = 6042$). Data were summarized using descriptive statistics. Multiple logistic regression identified predictors of job satisfaction.

Results: Respondents were primarily female (66.3%), Pharm.D. degree holders (65.5%), with a 14.8-year average work experience. Most pharmacists (86%) reported being very/somewhat satisfied with their job. Educational debt was not significantly associated with job satisfaction. Significant predictors of job satisfaction included: being female (aOR = 1.28, 95% CI 1.08, 1.52); working <30 (aOR = 1.80, 95% CI 1.14, 2.84), 30–39 (aOR = 1.47, 95% CI 1.02, 2.11), or 40–49 (aOR = 1.42, 95% CI 1.02, 1.98) versus ≥ 50 h per week; earning an annual income of <\$50,000 (aOR = 0.60, 95% CI 0.38, 0.94) or \geq \$150,000 (aOR = 2.05, 95% CI 1.30, 3.23) versus \$100,000–\$149,999; working in an independent community pharmacy (aOR = 3.72, 95% CI 2.54, 5.44), health system (aOR = 3.81, 95% CI 2.78, 5.22), clinic-based pharmacy (aOR = 4.39, 95% CI 2.18, 8.83), academia (aOR = 5.20, 95% CI 1.97, 13.73), benefits administration (aOR = 3.64, 95% CI 1.71, 7.74), long-term home and home health/infusion (aOR = 1.71, 95% CI 1.10, 2.67), mass merchandiser community (aOR = 0.79, 95% CI 0.62, 0.99), or manufacturer and wholesale distributor (aOR = 3.46, 95% CI 1.97, 6.08) versus chain community pharmacy.

Conclusions: Overall, Virginia pharmacists reported high job satisfaction. Pharmacists working in chain community pharmacy reported lower satisfaction relative to other settings. Being female, having a high annual income, and working for less hours was associated with improved job satisfaction.

1. Introduction

Job satisfaction is a multifaceted concept that compares the reality of a work environment against employees' desires and expectations.¹ Multiple theoretical frameworks have been proposed to explain job satisfaction.^{2–5} Despite their differences, there is consensus around job satisfaction being defined as “the degree of pleasure or positive affect that an employee has toward his or her job”.⁶ While high job satisfaction is associated with improved employees' performance, productivity,

and commitment, low job satisfaction is linked to increased turnover, absenteeism, and intention to quit the profession.^{7–11} Additionally, low job satisfaction affects the psychological well-being of employees and has been strongly associated with burnout.^{12,13} In healthcare, specifically, job satisfaction is significantly associated with the quality of care delivered¹³ and is a mediator of the relationship between certain job characteristics and health outcomes.¹⁴

In pharmacy, findings regarding the association of individual characteristics such as gender, age, education, and years of experience, with

* Corresponding author at: Virginia Commonwealth University School of Pharmacy, Department of Pharmacotherapy & Outcomes Science, 410 N. 12th Street, PO Box 980533, Richmond, VA 23298, United States.

E-mail addresses: radwanr@vcu.edu (R.M. Radwan), phjpb@olemiss.edu (J.P. Bentley), japatterson2@vcu.edu (J.A. Patterson), dldixon@vcu.edu (D.L. Dixon), tmsalgado@vcu.edu (T.M. Salgado).

<http://dx.doi.org/10.1016/j.rcsop.2022.100124>

Received 23 August 2021; Received in revised form 25 February 2022; Accepted 3 March 2022

Available online xxx

2667-2766/© 2022 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

job satisfaction have been inconsistent.^{15–20} Where age and gender differences in job satisfaction have been observed, females and older pharmacists report higher levels of satisfaction.^{15–17,19} Previous research hypothesized that gender differences may reflect the greater value that female pharmacists ascribe to social relations and significance of tasks performed or a decreased value ascribed to financial earnings.^{21–23} Lower levels of observed satisfaction among younger pharmacists may reflect incongruence between their job expectations and real-world experience.^{24–27} Research on the impact of educational level (bachelors versus doctoral degree) on job satisfaction has also led to conflicting results,^{16,19,20,28–30} with some studies suggesting higher job satisfaction among pharmacists who had more management-related tasks and less time in drug distribution, irrespective of their degree.³⁰ Pharmacists with postgraduate training (residency or fellowship) also reported higher job satisfaction than those without such training.³¹ Postgraduate training affords pharmacists more autonomy and opportunities to use their skills in clinical and patient care activities.³¹ Similarly, opportunities to acquire continuing professional development have been associated with higher job satisfaction, as long as pharmacists can apply what they learn in practice.³² Being overqualified for a given position was associated with job dissatisfaction.¹⁹

In addition to individual characteristics, other job-related and organizational-related characteristics have been found to influence job satisfaction, including (a) the job itself, which assesses challenge, variety, and promotion opportunities; (b) compensation/security, which measures salary, fringe benefits, and job security; and (c) the company/work environment, which assesses the sociability of coworkers, training programs, location, and reputation.³³ Low wages, limited promotion prospects, long and inflexible working hours, staff shortages, and coworker conflicts have been associated with job dissatisfaction.^{34–36} Furthermore, a discrepancy between pharmacists' actual role and their desired role leads to low job satisfaction.³⁷ For example, Lau et al. showed that hospital pharmacists who desired more clinical activities relative to their drug distribution activities displayed low job satisfaction.³⁷

The behavior of organizational members is influenced, to a large extent, by the characteristics of their work setting.³⁸ Mott et al. reported that pharmacists practicing in hospital, chain, or mass merchandiser community pharmacies encountered more job-related stress, thus exhibiting lower job satisfaction than pharmacists practicing in independent community pharmacies.¹⁵ The latter had significantly higher knowledge, support, and structural empowerment levels than pharmacists who worked in chain community pharmacies or hospitals.³⁹ Compared to their counterparts in chain community pharmacies, independent community pharmacists and hospital pharmacists reported having significantly higher levels of opportunity to advance their career, which contributed to greater job satisfaction.³⁹

Given the consequences of job satisfaction or dissatisfaction on pharmacists' performance and turnover, it is in an organization's best interest to continuously re-assess factors influencing employees' job satisfaction. National trends in the pharmacy workforce from the National Pharmacist Workforce Survey have been published for 2000, 2004, 2009, 2014, and 2019.⁴⁰ In Virginia, the Department of Health Professions Healthcare Workforce Data Center collects and analyzes the health care workforce data for multiple professions, including pharmacy.⁴¹ State-level data may offer stakeholders targeted information at levels where they can more appropriately implement change (e.g., local business practices and operations, state-level professional practice regulations). Additionally, new variables in this dataset, namely educational debt and the multitude of work settings (independent community pharmacy, chain community pharmacy, supermarket or mass merchandiser community pharmacy, health system, clinic-based pharmacy, long-term care and home health/infusion, mail pharmacy, benefits administration, manufacturer and wholesale distributor, and academia) have not been previously examined in the pharmacy job satisfaction literature. Therefore, this study aimed to identify individual and organizational predictors of job satisfaction among Virginia pharmacists.

2. Methods

2.1. Study design, data source, and sample

This cross-sectional study utilized data from the 2018 Virginia Pharmacist Workforce Survey.⁴¹ The Virginia Department of Health Professions Healthcare Workforce Data Center administers this voluntary survey every December during pharmacists' online license renewal process. Thus, the survey is not technically a census but rather a sample of pharmacists who renew their licenses online. The survey excludes pharmacists who did not renew their license that year or did not renew their license online and some newly licensed pharmacists in 2018. To account for differences in response rates by age and rurality, the dataset includes a weight for each response that can be used to adjust for nonresponse. The final analytic sample for this study included pharmacists who reported being employed due to the nature of the job satisfaction question (below) and working in Virginia in the past year (2017) because we were interested in presenting state-level data.

The Virginia Commonwealth University's Institutional Review Board determined that this study was not considered human subjects research; thus, no review was necessary.

2.2. Measurements

The 2018 Virginia Pharmacist Workforce Survey employed a previously validated single-item measure of overall job satisfaction: "Overall, and taking into account all positions you fill, how satisfied are you with your current employment or work situation?"^{42,43} Responses were provided using the following four-category format: "very satisfied," "somewhat satisfied," "somewhat dissatisfied," and "very dissatisfied." For analytic purposes, responses were dichotomized into satisfied (combining "very satisfied" and "somewhat satisfied") and dissatisfied (combining "somewhat dissatisfied" and "very dissatisfied").

Socio-demographic characteristics included: age (<30, 30–39, 40–49, 50–59, and ≥ 60 years-old); sex (male or female); total number of years in practice (calculated by subtracting survey year from year of license issue date); educational debt (<\$50,000, \$50,000–\$99,999, \$100,000–\$149,999, \$150,000–\$199,999, and ≥ \$200,000); and highest educational degree attained ("doctorate/professional degree" or "baccalaureate degree"). Advanced training characteristics included: completion of a postgraduate year (PGY) 1 or 2 residency training (yes or no); attaining a Board of Pharmacy Specialties (BPS) certification (yes or no); and reporting a self-designated specialty area in which pharmacists practice and have advanced education, training, certification or experience (yes or no).

Job and organizational variables comprised: current work status (pharmacy-related capacity or notpharmacyrelated capacity); number of currently held positions, both full-time and part-time; primary hours worked per week (<30, 30–39, 40–49, and ≥ 50); total annual income from pharmacy-related activities (<\$50,000, \$50,000–\$99,999, \$100,000–\$149,999, and ≥ \$150,000); compensation type [salary/commission, hourly wage, or other (business/practice income and by contract/per diem)]; health insurance benefits (yes or no); and percent of time (≤ 39%, 40%–79%, ≥ 80%) allocated to administrative tasks. A new binary variable to indicate the high extent of pharmacist involvement in patient care activities was created by combining responses that 50% or more of the pharmacist's time was devoted to patient care activities and affirmative responses to the question about performing either one of the following services: collaborative practice agreement (CPA), medication therapy management (MTM), consulting telepharmacy, and immunizations.

Pharmacists reported their current primary practice setting by choosing one of the following sites: independent community pharmacy, chain community pharmacy, supermarket or mass merchandiser community pharmacy, health system (inpatient and outpatient), clinic-based pharmacy, long-term care and home health/infusion combined, mail pharmacy, benefits administration (e.g., pharmaceutical benefit management, managed care), manufacturer and wholesale distributor, and academia.

2.3. Statistical analysis

The data were summarized using descriptive statistics, including means and standard deviations for continuous variables and frequencies and proportions for categorical variables. Chi-squared tests (for categorical variables) and independent *t*-tests (for continuous variables) were performed to investigate the unadjusted associations of job satisfaction with practice setting, socio-demographic, advanced training, organizational, and job-related characteristics. Approximately 2% of the responses were missing on the dependent variable, and missing values ranged from 2% to 39% for the predictor variables, meaning the use of the standard listwise deletion approach (i.e., complete-case analysis) would lead to a significant loss in sample size. To preserve sample size while attempting to arrive at unbiased estimates and appropriate standard errors, we performed multiple imputation,⁴⁴ a method widely recommended by methodologists,⁴⁵ and used in applied survey-based studies similar to ours, such as Wells and Aronson.⁴⁶ Upon comparing the patterns of missing values with the responses on other variables, the pattern of missingness was determined to be arbitrary, and the missing data mechanism was assumed to be missing at random (MAR).⁴⁷ Given this, a fully conditional specification method that specifies a series of models for each incomplete variable given the other variables was adopted.^{48–50} All of the independent variables (practice setting, socio-demographic, advanced training, organizational, and job-related characteristics) and the dependent variable (job satisfaction) were included as variables in the imputation model. The discriminant function method was used to impute missing values for categorical variables, and all variables were used as covariates. Five data sets were imputed with 20 burn-in iterations to estimate missing values.⁵⁰ Multiple logistic regression, where dichotomized job satisfaction was the dependent variable, was then performed on each of the multiple-imputed datasets, and the results were pooled to arrive at estimates of adjusted odds ratios (aORs) and 95% confidence intervals (CIs). All analyses were performed with SURVEY procedures to account for the weighting in the dataset. Prior to analysis, we assessed for multicollinearity among the predictor variables, and while some moderate correlations were observed, there did not appear to be any significant concerns. However, because some of the predictors (i.e., residency training, years in practice, and BPS certification) are often related, we conducted a sensitivity analysis to examine whether removing these variables would have any meaningful impact on the associations of the remaining variables with job satisfaction. The substantive findings did not change, so only the primary analysis with all predictors included in the multiple logistic regression is presented. All statistical tests were two-sided and conducted at an a priori significance level of 0.05. Data management and statistical analyses were performed using SAS version 9.4 (SAS Institute Inc., Cary, NC).

3. Results

3.1. Sample characteristics

Of the 15,424 pharmacists licensed in Virginia in 2018, 13,962 completed the survey, yielding a response rate of 90.5%. After excluding 7920 pharmacists who reported being unemployed, retired, or not having worked in Virginia in the past year, 6042 practicing pharmacists were included in the analyses.

Pharmacists were primarily female (66.3%), aged 30 to 39 years old (31.8%), Pharm.D. degree holders (65.5%), and with a mean (SD) of 14.8 (12.4) years of work experience. About a quarter (24.7%) completed a PGY1, less than 10% completed a PGY2, 12% were board-certified, and 58.2% had a self-designated specialty area. Educational debt was reported by 42.8% of pharmacists, one-third (34.6%) of which had over \$50,000 in debt. A majority (92%) held one work position, and 97% worked in a pharmacy-related capacity. Most pharmacists worked in a health system (31%), followed by chain community pharmacy (28.6%). Over half (53%) of the pharmacists worked between 40 and 49 h per week, 46.2% reported having high patient care involvement, and administrative tasks

comprised \leq 39% of most pharmacists' primary work hours (85.0%). A little over two-thirds (67.1%) reported an annual income between \$100,000–\$149,999, with salaries and commissions being the primary sources of compensation (50.7%), followed by hourly wage (42.9%). Almost two-thirds (64.9%) of the sample received health insurance benefits (Table 1).

Job satisfaction was prevalent, with 86% of pharmacists reporting being very or somewhat satisfied with their job.

3.2. Factors associated with pharmacist job satisfaction

In the bivariate analysis, job satisfaction was positively associated with a greater number of years in practice, having completed a PGY1 or PGY2 residency, holding a BPS certification, and working two or more positions. Significant differences were also identified among different primary work settings, hours worked per week in the primary work setting, annual income, patient care involvement, and percent time in administrative tasks (Table 1).

3.3. Predictors of pharmacist job satisfaction

In the multiple logistic regression, female pharmacists (aOR = 1.28, 95% CI 1.08, 1.52) were more likely to report being satisfied with their job. Pharmacists who worked <30 (aOR = 1.80, 95% CI 1.14, 2.84), 30–39 (aOR = 1.47, 95% CI 1.02, 2.11), or 40–49 (aOR = 1.42, 95% CI 1.02, 1.98) versus \geq 50 h per week in their primary work-setting had significantly higher odds of reporting being satisfied with their job. Pharmacists who earned an annual income of <\$50,000 (aOR = 0.60, 95% CI 0.38, 0.94) or \geq \$150,000 (aOR = 2.05, 95% CI 1.30, 3.23) versus \$100,000–\$149,999 had lower, and higher odds of reporting being satisfied with their job, respectively. Pharmacists who worked in an independent community pharmacy (aOR = 3.72, 95% CI 2.54, 5.44), health system (aOR = 3.81, 95% CI 2.78, 5.22), clinic-based pharmacy (aOR = 4.39, 95% CI 2.18, 8.83), academia (aOR = 5.20, 95% CI 1.97, 13.73), benefits administration (aOR = 3.64, 95% CI 1.71, 7.74), long-term home and home health/infusion (aOR = 1.71, 95% CI 1.10, 2.67), or manufacturer and wholesale distributor (aOR = 3.46, 95% CI 1.97, 6.08) were more likely to report being satisfied with their job relative to pharmacists working in a chain community pharmacy. Pharmacists working in a mass merchant-diser community pharmacy had lower odds of reporting being satisfied with their job relative to pharmacists working in a chain community pharmacy (aOR = 0.79, 95% CI 0.62, 0.99) (Table 2).

4. Discussion

Consistent with previous research in the United States,^{15,18,31,51,52} the overwhelming majority of Virginia pharmacists (86%) were satisfied with their job. This information is encouraging for current members of the profession and an incentive for students to consider pharmacy as a career choice. Despite the high overall job satisfaction, our findings, along with others,^{18,19} suggest that levels of job satisfaction vary across work settings. This is to be expected as work environment characteristics (e.g., learning opportunities, reward and recognition, supervisory style, staffing, and physical environment) differ across work settings and may therefore lead to different levels of job satisfaction.^{15,51} Similarly to our findings, a pattern among other studies indicated that job satisfaction tended to be higher for pharmacists practicing in independent community pharmacies,^{15,51,53} and lower for those working in chain community pharmacies.^{15,18,30,51} Job dissatisfaction among pharmacists working in chain community pharmacy was reported to be due to increased workload, work stress, work home-conflict, and less time for breaks and engagement with coworkers due to shortage of staff.^{19,51}

Type of work and the proportion of time spent in each activity could also explain varying satisfaction levels across pharmacy settings. Lapane et al. found that long-term care pharmacists who were more engaged in dispensing activities reported higher stress due to more work-related interruptions and felt less satisfied than those who were more involved in

Table 1
Descriptive statistics of respondents and bivariate relationships with job satisfaction.

Variable	Overall sample (n = 6042)	Satisfied* (n = 5171)	Dissatisfied* (n = 728)	P value ^a
Years in practice, mean (SD)	14.8 (12.4)	14.8 (12.4)	13.9 (11.8)	0.038
Age, n (%)				
< 30	515 (9.3)	431 (86.0)	70 (14.0)	
30–t39	1751 (31.8)	1486 (86.7)	228 (13.3)	
40–49	1374 (24.9)	1175 (87.4)	169 (12.6)	
50–59	1083 (19.6)	937 (88.9)	117 (11.10)	0.132
≥ 60	792 (14.4)	690 (89.7)	79 (10.3)	
Missing	527	452	65	
Gender, n (%)				
Female	3623 (66.3)	3108 (88.2)	415 (11.8)	
Male	1838 (33.7)	1566 (86.7)	241 (13.3)	0.112
Missing	581	497	72	
Highest degree in profession, n (%)				
Doctorate/professional degree	3849 (65.5)	3320 (88.0)	455 (12.1)	
Baccalaureate degree	2030 (34.5)	1723 (87.2)	254 (12.9)	0.380
Missing	163	128	19	
Post-graduate year 1, n (%)				
No	4548 (75.3)	3840 (86.6)	595 (13.4)	
Yes	1494 (24.7)	1331 (90.9)	133 (9.1)	<0.0001
Post-graduate year 2, n (%)				
No	5522 (91.4)	4705 (87.3)	682 (12.7)	
Yes	520 (8.6)	466 (91.0)	46 (9.0)	0.017
Board of Pharmacy Specialties certification, n (%)				
No	5312 (87.9)	4505 (86.9)	678 (13.1)	
Yes	730 (12.1)	666 (93.0)	50 (7.0)	<0.0001
Designated specialty area, n (%)				
No	3518 (58.2)	3010 (87.9)	415 (12.1)	
Yes	2524 (41.8)	2161 (87.4)	313 (12.7)	0.521
Work setting, n (%)				
Health system	1660 (31.1)	1545 (94.3)	94 (5.7)	
Chain community pharmacy	1525 (28.6)	1207 (80.5)	292 (19.5)	
Mass merchandiser community pharmacy	608 (11.4)	456 (76.3)	142 (23.8)	
Independent community pharmacy	505 (9.5)	456 (91.9)	40 (8.1)	
Manufacturer and wholesale distributor	357 (6.7)	324 (92.1)	28 (8.0)	
Long-term home and home health/infusion	229 (4.3)	196 (87.1)	29 (13.0)	
Clinic-based pharmacy	171 (3.2)	160 (95.2)	8 (4.8)	<0.0001
Benefits administration	136 (2.6)	128 (94.1)	8 (5.9)	
Academia	102 (1.9)	94 (95.0)	5 (5.0)	
Mail pharmacy	37 (0.7)	34 (91.9)	3 (8.1)	
Missing	712	571	79	
Number of positions, n (%)				
One position	5325 (91.6)	4650 (87.3)	675 (12.7)	
Two or more positions	486 (8.4)	445 (91.6)	41 (8.4)	0.006
Missing	43	76	12	
Primary hours worked per week, n (%)				
< 30	893 (16.0)	759 (86.7)	116 (13.3)	
30–39	1189 (21.3)	994 (85.0)	175 (15.0)	
40–49	2948 (52.7)	2573 (88.8)	326 (11.3)	0.008
≥ 50	562 (10.1)	494 (88.7)	63 (11.3)	
Missing	450	351	48	
Annual income, n (%)				
< \$50,000	322 (7.6)	271 (85.8)	45 (14.2)	
\$50,000–\$99,999	578 (13.6)	494 (87.1)	73 (12.9)	
\$100,000–\$149,999	2847 (67.1)	2446 (87.3)	357 (12.7)	<0.0001
≥ \$150,000	494 (11.7)	462 (94.5)	27 (5.5)	
Missing	1801	1498	226	
Compensation type, n (%)				
Salary/commission	2689 (50.7)	2313 (87.3)	338 (12.8)	
Hourly wage	2273 (42.9)	1962 (88.0)	268 (12.0)	
Other	339 (6.4)	291 (87.7)	41 (12.4)	0.741
Missing	741	605	81	
Educational debt, n (%)				
0	2715 (57.2)	2361 (88.5)	306 (11.5)	
< \$50,000	394 (8.3)	345 (89.6)	40 (10.4)	
\$50,000–\$99,999	483 (10.2)	413 (86.2)	66 (13.8)	0.134
\$100,000–\$149,999	389 (8.2)	323 (84.1)	61 (15.9)	

Table 1 (continued)

Variable	Overall sample (n = 6042)	Satisfied* (n = 5171)	Dissatisfied* (n = 728)	P value ^a
\$150,000–\$199,999	299 (6.3)	260 (87.8)	36 (12.2)	
≥ \$200,000	471 (9.9)	407 (87.5)	58 (12.5)	
Missing	1291	1062	161	
Health insurance benefit, n (%)				
No	2122 (35.1)	1762 (86.9)	266 (13.1)	0.220
Yes	3920 (64.9)	3409 (88.1)	462 (11.9)	
Patient care involvement ^b , n (%)				
No	2922 (53.8)	2657 (90.9)	265 (9.1)	<0.0001
Yes	2508 (46.2)	2107 (84.0)	403 (16.0)	
Missing	481	407	12.89	
Percent time in administrative tasks, n (%)				
≤ 39%	3127 (85.0)	2635 (85.4)	450 (14.6)	0.0004
40%–79%	327 (8.9)	285 (88.0)	39 (12.0)	
≥ 80%	226 (6.1)	211 (94.6)	12 (5.4)	
Missing	2362	2040	227	
Current work status, n (%)				
Pharmacy-related capacity	5843 (96.7)	5003 (87.7)	705 (12.4)	0.900
Not pharmacy-related	199 (3.3)	168 (88.0)	23 (12.0)	

Bold values indicate significance at alpha = 0.05.

* Job satisfaction variable had 143 missing values.

^a To account for weighted frequencies, the *p*-values for the t-tests and Chi-square tests were produced by employing PROC SURVEYREG and PROC SURVEYFREQ in SAS, respectively.

^b Patient care involvement was created by combining responses where 50% or more of the pharmacist's time was devoted to patient care activities and affirmative responses to the question about performing either one of the following services: collaborative practice agreement, medication therapy management, consulting telepharmacy, and immunizations.

consulting activities.⁵² Similarly, both Lau et al. and Olsen et al. found that hospital pharmacists who were more engaged with clinical and patient-oriented roles reported higher satisfaction than hospital pharmacists who performed dispensing tasks.^{37,54} Other studies found higher job satisfaction among pharmacists with more managerial activities than their peers who were more involved in dispensing.^{53,55}

The desire for more clinical or administrative activities reflects the desire for more autonomy, skill utilization, and creativity.^{19,30,31,53–56} Contrary to our expectations, factors such as attaining postgraduate residency training, high patient care involvement, and more time allocated conducting administrative activity were not significant predictors of job satisfaction in our sample. Rausch et al. investigated job satisfaction among pharmacists in United States Army Medical Treatment Facilities relative to intrinsic (e.g., achievement, recognition, responsibility, and advancement) and extrinsic (e.g., pay, work conditions, and interpersonal relations) sources of job satisfaction. In their study, pharmacists providing direct patient care services were significantly more satisfied based on intrinsic job satisfaction measures than pharmacists not providing patient care. No significant differences in extrinsic job satisfaction measures were found between those involved and those not involved in direct patient care.⁵⁶ Because the 2018 Virginia Pharmacist Workforce survey employs a single-item measure of overall job satisfaction, which asks participants to consider all aspects of their job that contribute to their satisfaction, it is possible that Virginia pharmacists were primarily extrinsically motivated.

In our study, job characteristics (e.g., annual income, working hours) were significant predictors of job satisfaction. Likewise, satisfaction with compensation was one of the factors that had the greatest impact on general job satisfaction among Californian pharmacists.²⁰ Further, our results are consistent with others suggesting that working fewer hours or part-time is associated with higher job satisfaction.^{15,16,27,57} Mott et al. identified significant differences in work attitude measures between pharmacists working full-time (>30 h/week) and part-time (<30 h/week), with the former reporting higher role ambiguity, role conflict, role overload, job stress, work-home conflict, and lower job satisfaction.¹⁵ Managerial implications that could improve job satisfaction include incentivizing pharmacists with financial benefits, and focusing on promoting an improved work-life balance by offering voluntary decreased working hours, part-time shifts, or

required time off.⁵⁷ Future research using an interventional prospective study design may be beneficial to assess the effect of modifying job characteristics in a pharmacy setting.

The relationship between socio-demographic characteristics and pharmacists' job satisfaction is inconsistent across studies.^{15–20} In our sample, female pharmacists were more likely to be satisfied with their job. Likewise, Carvajal et al.²¹ found that women were consistently more satisfied with their job despite their perceived heavy workload and lower salaries. In addition, these authors found that women were significantly more satisfied with 11 of 12 job facets, including job security, autonomy, advancement opportunities, adequacy of salaries and benefits, amount of workload, level of stress, scheduling flexibility, job atmosphere, job importance to patients, supervisor support, and good relations with coworkers relative to their male coworkers.²¹ However, these results were from bivariate analysis. Future research should investigate whether sex moderates the relationship between various job or organizational facets and job satisfaction when adjusting for possible confounders. In addition, the relationship between sex and job satisfaction may be mediated by job or organizational facets, another potential topic for future research. In our study, age, years of practice, education, and educational debt were not significantly associated with job satisfaction, suggesting that job-related, rather than employee-related, characteristics may largely drive job satisfaction among Virginia pharmacists.

While analyses of pharmacist job satisfaction by age, sex, and education level have been previously reported, the association between educational debt and job satisfaction has not been extensively studied in this population. Amin et al. recently reported the impact of student loans on perceptions of life choices among new pharmacy practitioners in Ohio. Their results suggest that student loan debt may negatively impact new practitioner decisions to pursue additional degrees, education, training, and certifications while limiting pharmacists' ability to switch to a new job and feel fulfilled by the work they do.⁵⁸ Similarly, Yusuf et al. investigated the relationship between educational debt and choice of practice setting, while controlling for demographics, among a national sample of pharmacists. Their findings suggest that pharmacists with higher educational indebtedness were more likely to choose higher-paying chain pharmacies relative to independent pharmacies.⁵⁹ These findings, coupled with other literature suggesting job dissatisfaction among pharmacists working in chain

Table 2
Multiple logistic regression predicting pharmacist job satisfaction.

Predictor	Estimate	SE	95% CI	P value	aOR	aOR 95% CI
Years in practice	0.00	0.01	-0.02, 0.01	0.496	1.00	0.98, 1.01
Age (ref = <30)						
30–39	-0.04	0.17	-0.36, 0.29	0.832	0.97	0.70, 1.34
40–49	0.03	0.20	-0.35, 0.42	0.872	1.03	0.70, 1.52
50–59	0.20	0.25	-0.29, 0.69	0.422	1.22	0.75, 1.99
≥ 60	0.37	0.33	-0.27, 1.02	0.255	1.45	0.76, 2.78
Sex (ref = male)						
Female	0.25	0.09	0.07, 0.42	0.005	1.28	1.08, 1.52
Highest degree in profession (ref = doctorate/professional degree)						
Baccalaureate degree	-0.17	0.14	-0.45, 0.11	0.236	0.84	0.64, 1.12
Post-graduate year 1 (ref = yes)						
No	-0.22	0.13	-0.48, 0.04	0.095	0.80	0.62, 1.04
Post-graduate year 2 (ref = yes)						
No	0.06	0.20	-0.33, 0.45	0.767	1.06	0.72, 1.57
Board of Pharmacy Specialties certification (ref = yes)						
No	0.00	0.17	-0.34, 0.35	0.979	1.00	0.71, 1.41
Designated specialty area (ref = yes)						
No	0.01	0.09	-0.16, 0.18	0.896	1.01	0.85, 1.20
Work setting (ref = chain community pharmacy)						
Mass merchandiser community pharmacy	-0.24	0.12	-0.47, -0.01	0.040	0.79	0.62, 0.99
Independent community pharmacy	1.31	0.19	0.93, 1.69	<0.0001	3.72	2.54, 5.44
Health system	1.34	0.16	1.02, 1.65	<0.0001	3.81	2.78, 5.22
Clinic-based pharmacy	1.48	0.35	0.78, 2.18	<0.0001	4.39	2.18, 8.83
Mail pharmacy	1.09	0.60	-0.08, 2.26	0.068	2.98	0.92, 9.63
Academia	1.65	0.49	0.68, 2.62	0.001	5.20	1.97, 13.73
Benefits administration	1.29	0.38	0.54, 2.05	0.001	3.64	1.71, 7.74
Long-term home and home health/infusion	0.54	0.23	0.09, 0.98	0.019	1.71	1.10, 2.67
Manufacturer and wholesale distributor	1.24	0.29	0.68, 1.81	<0.0001	3.46	1.97, 6.08
Number of positions (ref = one position)						
Two or more positions	0.14	0.18	-0.22, 0.49	0.451	1.15	0.80, 1.63
Primary hours worked per week (ref = ≥50)						
< 30	0.59	0.23	0.13, 1.04	0.012	1.80	1.14, 2.84
30–39	0.38	0.19	0.02, 0.75	0.040	1.47	1.02, 2.11
40–49	0.35	0.17	0.02, 0.68	0.039	1.42	1.02, 1.98
Annual income (ref = \$100,000–\$149,999)						
< \$50,000	-0.52	0.23	-0.97, -0.06	0.026	0.60	0.38, 0.94
\$50,000–\$99,999	-0.26	0.16	-0.57, 0.06	0.106	0.77	0.57, 1.06
> \$150,000	0.72	0.23	0.26, 1.17	0.002	2.05	1.30, 3.23
Compensation type (ref = salary/commission)						
Hourly wage	-0.14	0.11	-0.37, 0.09	0.220	0.87	0.69, 1.09
Other	-0.21	0.19	-0.58, 0.17	0.277	0.81	0.56, 1.18
Educational debt (ref = ≥\$200,000)						
0	-0.09	0.18	-0.45, 0.28	0.640	0.92	0.64, 1.32
< \$50,000	-0.09	0.23	-0.54, 0.37	0.707	0.92	0.58, 1.44
\$50,000–\$99,999	-0.24	0.21	-0.66, 0.18	0.261	0.79	0.51, 1.20
\$100,000–\$149,999	-0.34	0.26	-0.88, 0.21	0.204	0.71	0.41, 1.23
\$150,000–\$199,999	0.05	0.25	-0.44, 0.54	0.843	1.05	0.64, 1.72
Health insurance benefit (ref = no)						
Yes	0.13	0.10	-0.07, 0.33	0.194	1.14	0.94, 1.39
Percent time in administrative tasks (ref = ≤39%)						
40%–79%	-0.25	0.22	-0.71, 0.21	0.263	0.78	0.49, 1.23
≥ 80%	0.27	0.28	-0.29, 0.83	0.338	1.31	0.75, 2.30
Patient care involvement (ref = no)						
Yes	0.02	0.11	-0.20, 0.24	0.838	1.02	0.82, 1.27
Current work status (ref = not pharmacy-related capacity)						
Pharmacy-related	0.50	0.34	-0.18, 1.18	0.148	1.65	0.84, 3.24

CI, confidence interval

aOR, adjusted odds ratio

SE, standard error

Bold values indicate significance at alpha = 0.05

community pharmacies, may suggest a need for future research to understand how educational debt may indirectly affect job satisfaction through pharmacists' career choices.

This study has some limitations. First, the survey employed a single-item measure of overall job satisfaction. While the single-item measure has advantages over a multiple-item measure, such as comparable validity estimates to a multi-item measure of job satisfaction, higher response rates, and shorter survey length,⁴² the results could have been different with a multiple-item measure of job satisfaction. Second, logistic regression with a binary dependent variable was selected over ordinal logistic regression primarily because the proportional odds assumption associated with the ordinal logistic regression model was not met for all variables. Further, due to the relatively small number of observations on some of the levels of the job satisfaction measure, collapsing the ordinal measure to a binary outcome increased the number of observations per level but may have led to some loss of information. Third, despite the high response rate (90.5%), the analysis only included pharmacists who were employed and working in Virginia in the past year, and who renewed their license online. Therefore, the results are not generalizable to all pharmacists in Virginia. Finally, job satisfaction was measured at a single time point, thus not allowing investigation of the impact that changes in professional roles and work-life issues over the last two years of the COVID-19 pandemic may have had on job satisfaction. Therefore, continued tracking of job satisfaction and the factors that influence it will be important.

5. Conclusions

Most Virginia pharmacists were satisfied with their job. Sex, annual income, primary work hours, and work setting significantly impacted job satisfaction. Chain pharmacists reported lower job satisfaction relative to pharmacists practicing in other settings. A more in-depth exploration of both intrinsic and extrinsic facets of job satisfaction at various work settings would be beneficial for employers to adopt targeted interventions to improve their employees' satisfaction and, consequently, retention. One way to achieve this could be by employing mixed methods approaches, including qualitative and quantitative analyses, to identify the unique contributing factors that influence job satisfaction in the pharmacy profession. A higher level of satisfaction within the pharmacy workforce is likely to improve efforts to recruit new individuals to the field.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

CRediT authorship contribution statement

Rotana M. Radwan: Conceptualization, Data curation, Formal analysis, Writing – original draft. **John P. Bentley:** Methodology, Writing – review & editing, Supervision. **Julie A. Patterson:** Conceptualization, Writing – review & editing. **Dave L. Dixon:** Conceptualization, Writing – review & editing. **Teresa M. Salgado:** Conceptualization, Data curation, Supervision, Project administration, Writing – review & editing.

Declaration of Competing Interest

None.

Acknowledgments

The authors would like to thank the Healthcare Workforce Data Center for providing the Virginia Pharmacy Workforce Survey data, the Board of Pharmacy who facilitated the survey, and the Virginia pharmacists who responded to the survey.

References

- Newstrom JW, Davis K. *Human Behavior at Work: Organizational Behavior (7th Ed.)*. New York: McGraw-Hill Companies. 1997:109.
- Maslow AH. A theory of human motivation. *Psychol Rev* 1943;50:370–396.
- Herzberg F, Mausner B, Snyderman BB. *The Motivation to Work*. 2nd ed. New York: John Wiley & Sons. 1959:141–147.
- Ali SAM, Said NA, Yunus NM, Kader SFA, Latif DSA, Munap R. Hackman and Oldham's job characteristics model to job satisfaction. *Procedia Soc Behav Sci* 2014;129:46–52.
- Staw BM, Cohen-Charash Y. The dispositional approach to job satisfaction: more than a mirage, but not yet an oasis. *J Organ Behav* 2005;26:59–78.
- Locke EA. The nature and causes of job satisfaction. In: *Dunnette MD, ed. Handbook of Industrial Organizational Psychology*. Chicago, IL: Rand McNally; 1976. p. 1297–1349.
- Pathman DE, Konrad TR, Williams ES, et al. Physician job satisfaction, dissatisfaction, and turnover. *J Fam Pract* 2002;51:593.
- Clegg CW. Psychology of employee lateness, absence, and turnover: a methodological critique and an empirical study. *J Appl Psychol* 1983;68:88–101.
- Freeman RB. Job satisfaction as an economic variable. *Am Econ Rev* 1978;68:135–141.
- Saari LM, Judge TA. Employee attitudes and job satisfaction. *Hum Resour Manage* 2004;43:395–407.
- Halkos G, Bousinakis D. The effect of stress and satisfaction on productivity. *Int J Product Perform Manag* 2010;59:415–431.
- Wright TA, Cropanzano R. Psychological well-being and job satisfaction as predictors of job performance. *J Occup Health Psychol* 2000;5:84–94.
- Visser MR, Smets EM, Oort FJ, De Haes HC. Stress, satisfaction and burnout among Dutch medical specialists. *CMAJ* 2003;168:271–275.
- Charkhabi M, Alimohammadi S, Charkhabi S. The full mediator role of job satisfaction in relationship between job characteristics and health outcomes in hospital nurses: a new conceptual model. *Procedia Soc Behav Sci* 2014;159:365–369.
- Mott DA, Doucette WR, Gaither CA, Pedersen CA, Schommer JC. Pharmacists' attitudes toward worklife: results from a national survey of pharmacists. *J Am Pharm Assoc* 2003;2004(44):326–336.
- Liu CS, White L. Key determinants of hospital pharmacy staff's job satisfaction. *Res Social Adm Pharm* 2011;7:51–63.
- Seston E, Hassell K, Ferguson J, Hann M. Exploring the relationship between pharmacists' job satisfaction, intention to quit the profession, and actual quitting. *Res Social Adm Pharm* 2009;5:121–132.
- Maio V, Goldfarb NI, Hartmann CW. Pharmacists' job satisfaction: variation by practice setting. *P&T* 2004;29:184–190.
- Cox ER, Fitzpatrick V. Pharmacists' job satisfaction and perceived utilization of skills. *Am J Health Syst Pharm* 1999;56:1733–1737.
- Ried LD, McGhan WF. An equity model of staff pharmacists' job satisfaction. *J Pharm Mark Manage* 1987;1:3–24.
- Carvajal MJ, Popovici I, Hardigan PC. Gender differences in the measurement of pharmacists' job satisfaction. *Hum Resour Health* 2018;16:33.
- Kim S. Gender differences in the job satisfaction of public employees: a study of Seoul Metropolitan Government, Korea. *Sex Roles* 2005;52:667–681.
- Bender KA, Donohue SM, Heywood JS. Job satisfaction and gender segregation. *Oxf Econ Pap* 2005;57:479–496.
- Stewart JE, Smith SN. Work expectations and organizational attachment of hospital pharmacists. *Am J Hosp Pharm* 1987;44:1105–1110.
- Hardigan PC, Carvajal MJ. Application of Rasch rating scale model to analysis of job satisfaction among practicing pharmacists. *J Am Pharm Assoc* 2003;2008(48):522–529.
- Gustafsson M, Mattsson S, Wallman A, Gallego G. Pharmacists' satisfaction with their work: analysis of an alumni survey. *Res Social Adm Pharm* 2018;14:700–704.
- Ayele Y, Hawulte B, Feto T, Basker YV, Bacha YD. Job satisfaction among pharmacy professionals working in public hospitals and its associated factors, eastern Ethiopia. *J Pharm Policy Pract* 2020;13:11.
- Ried LD, McGhan WF. PharmD or BS: does the degree really make a difference in pharmacists' job satisfaction? *Am J Pharm Educ* 1986;50:1–5.
- Carvajal MJ, Popovici I. Gender, age, and pharmacists' job satisfaction. *Pharm Pract (Granada)* 2018;16:1396.
- Cox FM, Carroll NV. Comparison of practice patterns and job satisfaction of entry level PharmD and BS level graduates in hospital and community practice. *Am J Pharm Educ* 1988;52:47–50.
- Padiyara RS, Komperda KE. Effect of postgraduate training on job and career satisfaction among health-system pharmacists. *Am J Health Syst Pharm* 2010;67:1093–1100.
- Murawski MM, Payakachat N, Koh-Knox C. Factors affecting job and career satisfaction among community pharmacists: a structural equation modeling approach. *J Am Pharm Assoc* 2003;2008(48):610–620.
- Carless SA, Imber A. Job and organizational characteristics: a construct evaluation of applicant perceptions. *Educ Psychol Meas* 2007;67:328–341.
- Gaither CA, Kahaleh AA, Doucette WR, Mott DA, Pederson CA, Schommer JC. A modified model of pharmacists' job stress: the role of organizational, extra-role, and individual factors on work-related outcomes. *Res Social Adm Pharm* 2008;4:231–243.
- Mott DA. Pharmacist job turnover, length of service, and reasons for leaving, 1983–1997. *Am J Health Syst Pharm* 2000;57:975–984.
- Gaither CA, Nadkarni A, Mott DA, et al. Should I stay or should I go? The influence of individual and organizational factors on pharmacists' future work plans. *J Am Pharm Assoc* 2003;2007(47):165–173.
- Lau WM, Pang J, Chui W. Job satisfaction and the association with involvement in clinical activities among hospital pharmacists in Hong Kong. *Int J Pharm Pract* 2011;19:253–263.
- Robertson PJ. The relationship between work setting and employee behaviour. *J Organ Chang Manag* 1994;7:22–43.

39. Kahaleh A, Gaither C. The effects of work setting on pharmacists' empowerment and organizational behaviors. *Res Social Adm Pharm* 2007;3:199–222.
40. American Association of Colleges of Pharmacy. National Pharmacist Workforce Studies. Available from: <https://www.aacp.org/article/national-pharmacist-workforce-studies> 2021.(accessed June 17, 2021).
41. Virginia Department of Health Professions. Virginia's Pharmacist Workforce. Available from: <https://www.dhp.virginia.gov/media/dhpweb/docs/hwdc/pharm/0202Pharm2019.pdf> 2019.(accessed June 17, 2021).
42. Nagy MS. Using a single-item approach to measure facet job satisfaction. *J Occup Organ Psychol* 2002;75:77–86.
43. Dolbier CL, Webster JA, McCalister KT, Mallon MW, Steinhardt MA. Reliability and validity of a single-item measure of job satisfaction. *Am J Health Promot* 2005;19:194–198.
44. McCleary L. Using multiple imputation for analysis of incomplete data in clinical research. *Nurs Res* 2002;51:339–343.
45. Baraldi AN, Enders CK. An introduction to modern missing data analyses. *J Sch Psychol* 2010;48:5–37.
46. Wells MB, Aronson O. Paternal postnatal depression and received midwife, child health nurse, and maternal support: a cross-sectional analysis of primiparous and multiparous fathers. *J Affect Disord* 2021;280:127–135.
47. McNeish D. Missing data methods for arbitrary missingness with small samples. *J Appl Stat* 2017;44:24–39.
48. Van Buuren S. Multiple imputation of discrete and continuous data by fully conditional specification. *Stat Methods Med Res* 2007;16:219–242.
49. Liu Y, De A. Multiple imputation by fully conditional specification for dealing with missing data in a large epidemiologic study. *Int J Stat Med Res* 2015;4:287–295.
50. Bartlett JW, Seaman SR, White IR, Carpenter JR. Alzheimer's disease neuroimaging initiative. Multiple imputation of covariates by fully conditional specification: accommodating the substantive model. *Stat Methods Med Res* 2015;24:462–487.
51. McHugh PP. Pharmacists' attitudes regarding quality of worklife. *J Am Pharm Assoc (Wash)* 1999;39:667–676.
52. Lapane KL, Hughes CM. Job satisfaction and stress among pharmacists in the long-term care sector. *Consult Pharm* 2006;21:287–292.
53. Rickert DR. The relationship between pharmacy practice setting and job design. *J Pharm Mark Manage* 1988;2:149–163.
54. Olson DS, Lawson KA. Relationship between hospital pharmacists' job satisfaction and involvement in clinical activities. *Am J Health Syst Pharm* 1996;53:281–284.
55. Lin BY, Yeh YC, Lin WH. The influence of job characteristics on job outcomes of pharmacists in hospital, clinic, and community pharmacies. *J Med Syst* 2007;31:224–229.
56. Rauch TM. Job satisfaction in the practice of clinical pharmacy. *Am J Public Health* 1981;71:527–529.
57. Lindfelt TA, Ip EJ, Barnett MJ. Survey of career satisfaction, lifestyle, and stress levels among pharmacy school faculty. *Am J Health Syst Pharm* 2015;72:1573–1578.
58. Amin KA, Ulbrich TR, Kirk LM, Gothard MD. Investigating the impact of student loan debt on new practitioners. *J Am Pharm Assoc* 2003;2021(61):191–197.
59. Yusuf AA, Schommer JC, Mott DA, Doucette WR, Gaither CA, Kreling DH. Association between student loan debt on graduation, demographic characteristics and initial choice of practice setting of pharmacists. *Inov Pharm* 2011;2:(Article 51).