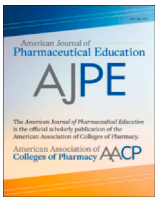
American Journal of Pharmaceutical Education xxx (xxxx) xxx

Contents lists available at ScienceDirect

AJPE

American Journal of Pharmaceutical Education

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



Research

Association of the COVID-19 Pandemic on Employment Status Change for Practicing Pharmacists

David A. Mott[a,*], Vibhuti Arya[b], Brianne K. Bakken[c], William R. Doucette[d], Caroline Gaither[e], Aaron Gilson[a], David H. Kreling[a], Jon C. Schommer[e], Matthew Witry[d]

[a] University of Wisconsin-Madison, School of Pharmacy, Madison, WI, USA
[b] St. John's University, College of Pharmacy and Health Sciences, Queens, NY, USA
[c] University of Iowa, College of Nursing, Iowa City, IA, USA
[d] University of Iowa, College of Pharmacy, Iowa City, IA, USA
[e] University of Minnesota, College of Pharmacy, Minneapolis, MN, USA

ARTICLE INFO

Keywords:
COVID-19
Workforce
Employment change
Unemployment
Work-life

ABSTRACT

Objective: The COVID-19 pandemic resulted in health care workers experiencing temporary or permanent changes in employment due to layoffs, quits, and postpandemic increased job demand. Analyzing the association of the COVID-19 pandemic with employment changes and results of changes for practicing pharmacists and understanding the associations with demographic and work-related factors could inform practice, policy, and educational programs. This study aimed to explore the frequency, characteristics, and results of employment status changes (ESCs) experienced by pharmacists practicing pharmacy in March 2020 (ie, the start of the COVID-19 pandemic).

Methods: A descriptive, cross-sectional survey research design was used to collect data from a random sample of 93,990 licensed pharmacists in the United States. The study team developed an online survey questionnaire designed to assess the impacts of the COVID-19 pandemic on pharmacists' work and work-life. The survey items used for this study related to ESCs, work-life characteristics, work characteristics in March 2020 and 2022, and demographic variables. A total of 4947 usable responses were received between November 2022 and January 2023.

Results: Overall, 36.4% of respondents reported experiencing an ESC and approximately 70% of those reporting an ESC reported experiencing just 1 ECS. Overall, 39.5% of respondents who experienced an ESC stopped working (ie, were unemployed) pursuant to an ESC. Respondents who experienced an ESC reported significantly lower levels of work exhaustion and interprofessional disengagement and significantly higher levels of professional fulfillment in their current employment than respondents that did not experience an ESC.

Conclusion: The overall increase in demand for workers in the health care sector appeared to provide opportunities for pharmacists, especially pharmacists with 1 to 10 years of experience, to change their employment situation, resulting in better work-life characteristics. Given projections of a pharmacist shortage, research, policy, and educational programs could determine the best practices to improve work settings and the work-life characteristics of practicing pharmacists to improve the health of the current pharmacist workforce.

1. Introduction

The start of the COVID-19 pandemic in March 2020 brought a considerable shock to the US economy, including the health care sector. Health services utilization dropped significantly as clinics temporarily shut down, hospitals delayed a range of surgeries to avoid the spread of the SARs-CoV-2 virus, and patients avoided health care providers in efforts to practice social distancing.[1,2] Although considered essential

* Corresponding author.
E-mail addresses: david.mott@wisc.edu (D.A. Mott), aryav@stjohns.edu (V. Arya), brianne-bakken@uiowa.edu (B.K. Bakken), william-doucette@uiowa.edu (W.R. Doucette), cgaither@umn.edu (C. Gaither), aaron.gilson@wisc.edu (A. Gilson), david.kreling@wisc.edu (D.H. Kreling), schom010@umn.edu (J.C. Schommer), matthew-witry@uiowa.edu (M. Witry).

https://doi.org/10.1016/j.ajpe.2024.100689
Received 18 December 2023; Received in revised form 14 March 2024; Accepted 18 March 2024
Available online xxxx

Please cite this article as: D.A. Mott, V. Arya, B.K. Bakken et al., Association of the COVID-19 Pandemic on Employment Status Change for Practicing Pharmacists, American Journal of Pharmaceutical Education, https://doi.org/10.1016/j.ajpe.2024.100689

workers at the start of the pandemic, estimates show that health care worker (ie, all employees working at 6 types of health care organizations [eg, offices of physicians, hospitals, skilled nursing facilities, dentists, home health care services, combine other facilities]) employment dropped 5.2% from 22.2 million in 2019 to 21.1 million in the second quarter of 2020.[3] As the COVID-19 pandemic waned into the fall of 2020, health care employment recovered. By December 2020, health care worker employment was 95% of projected levels based on pre-pandemic employment.[4]

According to the Job Openings and Labor Turnover Survey data, there was significant employment mobility (ie, layoffs, quits, job openings, and hires) in the broadly defined health care and social assistance sector of the US economy.[5] Job Openings and Labor Turnover Survey data are not available at the individual occupation level. In this sector, there was a delayed but extended increase in job openings and quits, combined with a steady growth in hires in the 36 months after the start of the COVID-19 pandemic (March 2020 to February 2023) compared with the 12 months before the pandemic (March 2019 to February 2020).[6] The data suggest that workers in the sector likely experienced situations that led to unemployment or different employment opportunities (ie, different work setting, different employer) and pursued opportunities for a potentially better (ie, better staffed, less stressful) and safer work situation or a new career path.[7–9] Research examined the trends before and after the COVID-19 pandemic in total employment and unemployment for the health care sector overall for subsectors and specific health care provider occupations.[3,4,10–12] However, there is very little detailed information about how the COVID-19 pandemic affected the employment situation (ie, changing employment, becoming unemployed, reentering the workforce) for pharmacists.[12]

Data from the Bureau of Labor Statistics' Current Population Survey revealed a negative impact on pharmacist employment initially during the COVI-19 pandemic (March 2020 to December 2020) and subsequent recovery adjustment annually thereafter. The unadjusted number of pharmacists employed dropped from 341,000 in 2019 to 327,000 in 2020 (4% decline) and increased to 352,000 in 2021 and 375,000 in 2022.[13] Coupling overall health sector employment trends before and after the pandemic with the growth in pharmacist employment after the COVID-19 pandemic raises questions about the characteristics of pharmacists' employment potentially related to the COVID-19 pandemic.

This study examined the employment status changes (ESCs) (ie, changing employer, changing job position, dropping out of the workforce temporarily or permanently) experienced by practicing pharmacists. The prevalence and number of ESCs pharmacists experienced, whether pharmacists switched work settings, the work settings that they left and the work settings they went to, and whether some pharmacist characteristics were associated with reporting an ESC are important questions related to pharmacist employment. Movement between settings is significant given past and recent concerns about working conditions in some pharmacy work settings and recent projections about pharmacist supply and demand imbalance phenomena in the future.[14–18] It also is important to examine whether employment changes resulted in better work-life characteristics (eg, reduced burnout, increased professional fulfillment) for pharmacists because one reason for making an employment change is improving work-life outcomes.[19]

1.1. Objective

The overall purpose of this study was to explore how the COVID-19 pandemic may have been associated with ESCs experienced by practicing pharmacists and whether pharmacist characteristics were related to ESCs. Specifically, this study had 3 objectives. The first objective was to examine the prevalence and number of ESCs. The second objective was to examine specific outcomes of ESCs by studying the prevalence of practicing pharmacists changing practice settings, stopping working (ie, being unemployed), being unemployed involuntarily, and reentering the workforce after being unemployed. The third objective was to examine whether ESCs were associated with pharmacist work-life characteristics, including work exhaustion.

2. Methods

2.1. Study Design Overview

For the 2022 National Pharmacist Workforce Study (NPWS), we used a descriptive survey design and sampled licensed US pharmacists.[19] On behalf of the research team, the National Association of Boards of Pharmacy Foundation (NABPF) sent an email message with an embedded link to an electronic survey to a systematic random sample of 93,990 licensed pharmacists representing about 25% of all persons with an active US pharmacist license. The sample members had to have an email listed in their record at the NABPF. The NABPF staff reviewed names and email addresses of pharmacists licensed in multiple states and removed duplication so licensed pharmacists were listed only once in the sample frame. The first email was sent November 17, 2022, and data collection stopped on January 2, 2023.

2.2. Survey Questionnaire Development

The research team started with a core set of items from the 2019 NPWS, including pharmacist work characteristics (eg, current employment status, work setting, position, hours worked), work setting (ie, system) characteristics (eg, work activities, staffing levels), work-life characteristics (eg, job stress, job satisfaction, work-home conflict), and demographic information. To help inform the content for the 2022 NPWS questionnaire, the research team conducted focus groups, 1 focus group with pharmacists practicing in each of 4 practice settings, independent community, chain community, outpatient clinic/ambulatory care, and inpatient/health system hospital. The Systems Engineering for Improving Patient Safety Model 2.0 served as a framework for examining pharmacist work systems, work activities, and work outcomes.[20]

The research team developed the 2022 NPWS questionnaire by considering content from the 2019 NPWS questionnaire and new content derived from the focus groups and the literature about the impact of COVID-19 on health professionals. The 2022 NPWS questionnaire contained 7 main sections, including current employment status; ESCs since March 2020;current work characteristics; work-life characteristics; diversity, equity, and inclusion; pharmacy technician shortage; and demographics. Branching and skipping based on participant responses to the questionnaire items about current employment status and practice setting was used to direct the respondents to specific questionnaire sections. This study was approved by the University of Wisconsin Institutional Review Board.

Members of the research team and members of pharmacy organizations comprising the Pharmacy Workforce Center, Inc conducted questionnaire usability testing. Item wording as well as item deletion and addition resulted from the usability testing. Research team members tested the appropriateness of various questionnaire response paths. Next, the questionnaire was pilot-tested with a sample of 2000 licensed pharmacists using a one-time email from the NABPF using a format consistent with what would be used in the survey distribution to the entire sample. The research team assessed the response rate as well as the items that were skipped or appeared burdensome based on the location in the questionnaire where respondents stopped answering items. Based on the results of the pilot test, research team members modified item formats and removed items to reduce the length of the questionnaire.[19]

2.3. Data Collection

For the main survey, the NABPF sent 4 email contacts to sample members: an initial email contact and 3 reminder emails sent about 2 weeks apart. The text of the email contacts briefly described the purpose of the study and asked recipients to click on the survey link if they were willing to participate. Recipients of the email were told that the survey was voluntary, anonymous, would take about 15 to 20 min depending on their employment characteristics, and that they were free to skip items they did not want to answer. The email was not personalized and no monetary incentives were provided. Some Pharmacy Workforce Center, Inc member pharmacy organizations promoted awareness of the 2022 NPWS to their membership via organization-sponsored listservs.

The survey, hosted by the University of Wisconsin, was administered using Qualtrics. Survey items were displayed uniformly without randomization. Respondents were required to enter their current employment status. After the initial emailing of the survey link, the research team noticed that some respondents were not answering questions in the demographic section of the survey, the last section of the survey. This likely was due to the length of the survey. The questionnaire items related to a respondent's age and gender were added to the first section of the survey (ie, current employment status) to facilitate collecting data about respondent age and gender.

2.4. Measures

2.4.1. Current Employment Status

The questionnaire included items to assess current employment status, work setting, work position, and demographic variables using items from previous NPWSs. The item about current employment status included practicing as a pharmacist, working in health care but not as a pharmacist, working outside of health care, retired, and unemployed. The work setting item included 13 work setting categories using a modified version of the item used in the 2019 NPWS. Respondent work position, years of experience, gender, race, and weekly hours worked were included in the present analysis. Years of experience was defined as the difference between 2022 and the reported year of first licensure as a pharmacist.

2.4.2. ESC

The questionnaire contained a section about an ESC that respondents experienced since March 2020 up to the time of responding to the survey. The survey included a definition of ESC as any of the following: any change in your primary employer, remaining with your primary employer but changing your job position, dropping out of the workforce temporarily due to personal reasons and then reentering the workforce, and/or dropping out of the workforce permanently due to personal reasons or retirement. The items allowed respondents to report whether they experienced an ESC.

For respondents who did report experiencing an ESC, additional items assessed the number of ESCs they experienced, whether the respondent changed practice settings (eg, community pharmacy to hospital inpatient pharmacy) pursuant to the ESC, and whether they stopped working. For respondents reporting more than 1 ESC, the survey items did not assess the characteristics of each individual ESC. For respondents who did report that they stopped working, additional items assessed whether they stopped working voluntarily or involuntarily, whether they reentered the workforce, and how long (months) they were out of the workforce (ie, unemployed). The items allowed respondents to report their employment status, work setting, and work position in March 2020 before experiencing an ESC. The responses were used to examine the changes in work setting between March 2020 and the time of survey completion.

2.5. Work-life Characteristics

As in the 2019 NPWS, the questionnaire contained items from the Professional Fulfillment Index, an instrument to assess burnout and professional fulfillment over the 2 weeks preceding survey administration.[21] Six items comprising professional fulfillment (PF), 4 items comprising the work exhaustion (WE) dimension of burnout, and 3 items comprising the interpersonal disengagement (ID) dimension of burnout were included in the current study. The WE and ID dimensions are similar to the emotional exhaustion and depersonalization dimensions, respectively, in the Maslach Burnout Inventory.[22] The PF items "assess the degree of intrinsic positive rewards the individual derives from his or her work."[21] The WE items "assess symptoms of exhaustion" and included the degree to which the respondents experienced a sense of dread about work, being physically exhausted, lacking enthusiasm, and being emotionally exhausted at work during the past 2 weeks.[21] The ID items "assess empathy and connectedness with others."[21] The 3 ID items assessing respondents' relationships with their professional colleagues were included in the analysis. The 3 ID items assessing the respondents' relationships with patients were excluded because not all respondents interacted directly with patients, especially respondents in nonstaff practice positions.[23] The PF items were rated on a 5-point scale, where 1 = not at all true, 2 = somewhat true, 3 = moderately true, 4 = very true, and 5 = completely true. The WE and ID items were rated on a 5-point scale, where 1 = not at all, 2 = very little, 3 = moderately, 4 = a lot, and 5 = totally. A per-item mean score for each scale was determined across the scale items for each respondent. The respondents were categorized as having high PF if their per-item mean score was 4 or more and respondents were categorized as having low WE or low ID if their per-item mean score was 2 or less.

2.6. Study Sample

Because the goal of the study was to examine ESCs reported by respondents practicing pharmacy in March 2020, we determined the respondents' employment status in March 2020 using 2 approaches. First, for respondents who reported not experiencing an ESC, their employment status in March 2020 was assumed to be the same as the employment status that they reported on the date they responded to the survey. For respondents who reported experiencing an ESC, we used the employment status in March 2020 that they reported.

2.7. Data Analysis

Descriptive statistics and bivariate cross-tabulations of study variables were calculated, and bivariate associations were tested using χ^2 tests. Multivariate logistic regression models were estimated to test for significant associations between respondent demographic and work-related variables (ie, independent variables) and the prevalence and characteristics of ESCs and work-life outcomes (ie, dependent variables). The Wald χ^2 statistic was used to test the statistical significance of coefficients for each included variable. An a priori significance level of 0.05 was used. The significance level was not adjusted for multiple comparisons across the levels of categorical variables because the comparisons were considered hypothesis-generating rather than hypothesis-confirming.[24] All analyses were conducted using SPSS Statistics 25.

3. Results

3.1. Survey Response

A total of 5137 responses were submitted. Of those, 4947 were usable responses, defined as a response that reported current employment status. The usable response rate was 5.3% (4947 of 93,990). The assessment of nonresponse bias showed that respondents to the survey

were not significantly different in terms of gender; however, there were significantly fewer respondents with 20 or fewer years of experience compared with the population of licensed pharmacists.[19] However, there were no statistically significant differences between early and late responders to the survey in terms of respondent characteristics (ie, gender, earning a PharmD degree, employment status, employment setting, and years of experience).[19]

3.2. Employment Status in March 2020

Employment status in March 2020 could be determined for 4079 usable responses based on the responses to the questions about current work status and about experiencing an ESC. Of this total, 3266 respondents (80.1%, 3266 of 4079) were determined to be practicing pharmacy in March 2020 and comprised the sample used for the current analysis. Of the remaining 813 usable responses for whom we could determine employment status in March 2020, most (39.4%, 320 of 813) were retired in March 2020.

3.3. Prevalence and Number of ESCs

A total of 62.5% of the respondents who reported their gender reported being female (Table 1). Almost three-fourths of the respondents were practicing in community pharmacies or hospital/health system inpatient settings. Nationally, in 2022, 48% of pharmacist jobs were in community settings, 27% were in inpatient hospitals, and 6% were in ambulatory health services.[25] Overall, 36.4% of the respondents practicing pharmacy in March 2020 reported experiencing an ESC between March 2020 and the time of their survey response. The estimates from the logistic regression model showed respondents with 40 or more years of experience were significantly more likely to report an ESC than respondents with 10 or fewer years of experience. Respondents with 11 to 20, 21 to 30, and 31 to 40 years of experience were significantly less likely to report an ESC than respondents with 10 or fewer years of experience. Respondents in nonstaff positions were less likely to report an ESC than respondents in staff positions. Employment setting was not significantly associated with reporting an ESC.

Approximately 70% of the respondents reporting an ESC reported experiencing just 1 ESC, 26% reported 2 ESCs, and the remainder reported more than 2 ESCs, with up to 7 changes (Table 1). Estimates from the logistic regression model for reporting 1 ESC vs more than 1 ESC showed that respondents with 21 to 30, 31 to 40, and 40 or more years of experience were significantly more likely to report experiencing just 1 ESC than respondents with 10 or fewer years of experience.

3.4. Changing Practice Settings

Table 2 contains results only for respondents who reported an ESC and contains results for the subset of respondents who reported that they stopped working sometime between March 2020 and the time of their survey response due to an ESC. More than one-quarter (27.1%) of respondents reported that they changed practice settings (ie, moving from a community setting to an ambulatory care setting). The multivariate analyses showed respondents with 21 to 30, 31 to 40, and 40 or more years of experience were significantly less likely to change practice settings relative to respondents with 10 or fewer years of experience. Changing practice settings was significantly less likely for respondents practicing in health system/hospital inpatient settings and more likely in nursing homes/long-term care and specialty pharmacy in March 2020 than respondents practicing in community pharmacy in March 2020. Asian respondents were significantly more likely to change settings than white respondents.

3.5. Prevalence of, Reason For, and Outcomes of Stopping Working

Overall, nearly 4 in 10 respondents reporting an ESC reported that they stopped working (ie, became unemployed) sometime between March 2020 and when they responded to the survey (Table 2). The estimates from the logistic regression model showed that respondents with 11 to 20 years of experience were not significantly different from respondents with up to 10 years of experience in terms of the likelihood of becoming unemployed. In addition, respondents with 21 to 30, 31 to 40, and more than 40 years of experience were significantly more likely to become unemployed than respondents with 10 or fewer years of experience. Furthermore, respondents who reported experiencing only 1 ESC were significantly less likely to become unemployed.

Table 2 also shows that one-quarter of respondents who reported that they became unemployed reported that they did so involuntarily (ie, mandatory furlough, layoff, or practice setting closing). Multivariate analyses showed that becoming unemployed involuntarily was significantly associated only with practice setting in March 2020. Stopping working involuntarily varied considerably across practice settings in March 2020, ranging from 0% to 10.7% in other practice settings and ambulatory care settings, respectively, to 57.1% and 66.7% in health system outpatient and mail order settings, respectively.

Of the respondents who reported that they became unemployed, nearly 6 in 10 reported that they reentered the workforce sometime between March 2020 and the time of their survey response. The estimates from the multivariate model showed that respondents with 21 to 30, 31 to 40, and 40 or more years of experience were significantly less likely to reenter the workforce than respondents with 1 to 10 years of experience. Reentering the workforce was significantly more likely for respondents who reported that they became unemployed involuntarily than those who became unemployed voluntarily and for respondents who reported more than 1 ESC than respondents who reported just 1 ESC.

3.6. Movement Between Practice Settings Across Time Periods

Table 3 shows the proportion of respondents across practice settings in which they reported they worked in March 2020 and the degree to which the proportion of respondents in each practice setting changed between March 2020 and 2022. The table contains data only for respondents who reported an ESC and reported that they were working as a pharmacist in March 2020 and at the time of their survey response. Data are presented for respondents overall and by 3 years of experience categories: 1 to 10 years, 11 to 20 years, and more than 20 years. Respondents with 21 to 30, 31 to 40, and more than 40 years of experience were combined into 1 category because there were no significant differences in the practice setting distribution between March 2020 and 2022 for these categories. Overall, the practice setting distribution in 2022 was significantly different from that in March 2020. There was movement away from 4 practice settings: community pharmacy, health system/hospital inpatient, nursing home/long-term care, and academia.

Comparing the distributions of practice settings in March 2020 and 2022 for respondents with 1 to 10 and 11 to 20 years of experience showed that movement away from and into practice settings was significantly different across the 2 time points. Respondents were most likely to leave community pharmacy practice settings and moved into a wide range of practice settings. For respondents with more than 20 years of experience, the distributions of practice settings in March 2020 and 2022 were not significantly different.

3.7. Association of ESC and Respondent Work-Life Characteristics

Table 4 contains a summary of the results for PF, WE, and ID for respondents practicing pharmacy in March 2020 and at the time of their survey response. Approximately 1 in 5 (21%) respondents was categorized as having a high level of PF with their work and approximately 1 in 4 (24%) was categorized as having a low level of WE. A total of 48% were categorized as having a low level of ID. The estimates from the logistic regression models showed that experiencing an ESC was

Table 1
Sample Characteristics and Association of Respondent Demographic and Work Characteristics With Reporting an ESC and Reporting 1 or More ESCs for Respondents Practicing Pharmacy in March 2020.

				Number of ESCs	
	Overall	Reported an ESC		Reported 1 ESC only	
		n (% of row overall)		*n*[a] (% of ESC total)	
Total	3254 (3266)	1188 (36.4)		799 (69.1)	
Respondent characteristics					
		n (% of row overall total)	Odds ratio (95% CI)	*n* (% of row ESC total)	Odds ratio (95% CI)
Gender					
Male	1042	**387 (37.1)**[b]	Ref	**271 (71.7)**[b]	Ref
Female	1740	**668 (38.4)**	1.16 (0.98-1.4)	**440 (66.5)**	0.93 (0.69-1.3)
Nonbinary	7	**3 (42.9)**	1.56 (.34-7.1)	**1 (33.3)**	0.16 (0.01-1.9)
Missing	477	**130 (27.3)**	1.12 (.81-1.5)	**87 (70.2)**	1.31 (0.74-2.3)
Years of experience					
≤ 10 y	523	**244 (46.7)**[b]	**Ref**	**146 (60.6)**[b]	**Ref**
11-20 y	604	**225 (37.3)**	**0.68 (0.54-0.87)**[c]	**143 (65.0)**	**1.29 (0.87-1.9)**
21-30 y	516	**152 (29.5)**	**0.47 (0.36-0.61)**[c]	**108 (73.5)**	**1.96 (1.2-3.1)**[c]
31-40 y	465	**172 (37.0)**	**0.67 (0.52-0.87)**[c]	**124 (73.4)**	**1.92 (1.2-3.0)**[c]
> 40 y	310	**173 (55.8)**	**1.51 (1.1-2.0)**[c]	**134 (81.2)**	**2.74 (1.7-4.5)**[c]
Missing	848	**222 (26.2)**	**0.37 (0.22-0.61)**[c]	**144 (67.0)**	**2.09 (0.84-5.2)**
Race					
White	1853	**745 (40.2)**[b]	Ref	519 (70.8)	Ref
Asian	243	**94 (38.7)**	0.95 (0.72-1.3)	57 (65.5)	0.93 (0.57-1.5)
Black	96	**42 (43.8)**	1.32 (.86-2.0)	27 (67.5)	1.05 (0.52-2.2)
Other	181	**64 (35.4)**	0.81 (0.58-1.1)	40 (64.5)	0.81 (0.46-1.4)
Missing	893	**243 (27.2)**	1.02 (0.63-1.7)	156 (66.4)	0.51 (0.21-1.2)
March 2020 practice setting					
Community pharmacy	1696	622 (36.7)	Ref	419 (70.2)	Ref
Hospital/health system inpatient	851	313 (36.8)	0.87 (0.73-1.1)	206 (71.8)	1.13 (0.83-1.6)
Outpatient clinic/ambulatory care	188	67 (3.6)	0.83 (0.60-1.2)	38 (65.5)	0.93 (0.54-1.6)
Health system outpatient	141	43 (30.5)	0.72 (0.49-1.1)	25 (64.1)	0.70 (0.36-1.4)
Nursing home/long-term care	96	41 (42.7)	1.19 (0.77-1.8)	25 (62.5)	0.66 (0.34-1.3)
Managed care/pharmacy benefit manager	68	20 (29.4)	0.62 (0.36-1.1)	14 (70.0)	.99 (0.37-2.7)
Specialty pharmacy	59	20 (33.9)	0.90 (0.51-1.6)	12 (63.2)	0.79 (0.30-2.1)
Academia	49	17 (34.7)	1.08 (0.58-2.0)	12 (70.6)	1.13 (.38-3.4)
Home health/infusion	40	18 (45.0)	1.23 (0.65-2.3)	10 (55.6)	0.50 (0.19-1.3)
Other	36	12 (33.3)	0.94 (0.46-1.9)	6 (50.0)	0.45 (0.14-1.4)
Mail order pharmacy	29	9 (31.0)	0.72 (0.32-1.6)	3 (33.3)	0.23 (0.05-0.95)[c]
Industry	7	1 (14.3)	0.25 (0.03-2.2)	0	0
Professional association	1	0	–	–	–
Missing	5	5 (100)	1.02 (–)	5 (100)	> 10
March 2020 practice position					
Staff	2272	**875 (38.5)**[b]	**Ref**	586 (68.8)	Ref
Nonstaff	985	**304 (30.9)**	**0.70 (0.59-0.83)**[c]	206 (69.6)	0.99 (0.73-1.3)
Missing	9	**9 (100)**	**—**	7 (77.8)	0.51 (0.07-3.7)
Constant			214.7[c]		0.93[c]
Overall model fit (chi-square)			183.1[b]		49.3[b]
Nagelkerke R square			0.08		0.06

Other setting included government regulatory, nonprofit, research, cannabis dispensary, hospice, wholesalers, consulting firms, nuclear pharmacy, informatics, compounding, among others. Staff positions included staff pharmacists, float pharmacists, and clinical pharmacists. Nonstaff positions included owners/partners, chief pharmacist officers, directors, assistant directors, managers, assistant managers, executives, faculty, scientists, and faculty. Odds ratios estimated from a model including variables contained in the table. Ref denotes the reference category for each categorical variable. Bold type denotes statistically significant categories of variables in the bivariate comparisons and multivariate logistic regression models.
Abbreviation: ESC, employment status change.
[a]A total of 1157 respondents who experienced an ESC reported the number of ESCs they experienced.
[b]Chi-square test of association, $P < .05$.
[c]Wald statistic, $P < .05$.

significantly associated with better work-life characteristics, controlling for several demographic and work characteristics that also were significantly associated with the work-life characteristics. Respondents who reported experiencing an ESC were significantly more likely to be categorized as having a low level of WE and a low level of ID, dimensions of low burnout. In addition, respondents who reported experiencing an ESC were significantly more likely to be categorized as having a high level of PF or more likely to experience positive intrinsic rewards for their work as a practicing pharmacist.

4. Discussion

To the best of our knowledge, this study is the first to explore how the COVID-19 pandemic was associated with ESCs for practicing

Table 2
Association of Respondent Demographic and Work Characteristics With Changing Practice Settings, Stopping Working, Stopping Working Involuntarily, and Reentering the Workforce After an ESC.

	Experienced an ESC (n = 1188)				Stopped working (n = 469)			
	Changed setting		Stopped working		Stopped working involuntarily		Reentered the workforce	
	n (%) of total who experienced an ESC				n (%) of total that stopped working			
Total	328 (27.1)[a]		469 (39.5)		121 (25.8)		279 (59.5)	
	% of Row	Odds ratio (95% CI)	% of Row	Odds ratio (95% CI)	% of Row	Odds ratio (95% CI)	% of Row	Odds ratio (95% CI)
Gender								
Male	25.0	ref	**40.1**[b]	Ref	23.2	Ref	**47.7**[b]	Ref
Female	27.9	0.92 (0.67-1.3)	**41.2**	1.3 (1.0-1.8)	26.2	0.95 (0.55-1.7)	**62.4**	1.3 (0.77-2.2)
Nonbinary	0	0	**66.7**	1.9 (0.15-24)	50	2.2 (0.11-45)	**100**	> 10
Missing	38.8	1.6 (0.89-3.0)	**28.5**	0.83 (0.46-1.5)	32.4	1.2 (0.37-4.2)	**86.5**	0.31 (0.03-2.9)
Years of experience								
≤ 10 y	**32.8**[b]	**Ref**	**29.1**[b]	**Ref**	22.5	Ref	**71.8**[b]	**Ref**
11-20 y	**34.8**	**1.1 (0.74-1.7)**	**32.4**	**1.1 (.72-1.6)**	30.1	1.3 (0.56-2.8)	**78.1**	**1.8 (0.74-4.1)**
21-30 y	**29.3**	**0.81 (0.50-1.3)**	**42.8**	**1.9 (1.2-3.0)**[c]	33.8	1.7 (0.76-4.0)	**53.8**	**0.43 (0.19-0.98)**[c]
31-40 y	**16.8**	**0.43 (0.26-0.71)**[c]	**51.7**	**2.9 (1.9-4.4)**[c]	21.3	0.80 (0.35-1.8)	**36.4**	**0.21 (0.10-0.46)**[c]
> 40 y	**12.7**	**0.33 (0.19-0.59)**[c]	**58.4**	**4.5 (2.9-7.0)**[c]	19.8	0.84 (0.36-2.0)	**38.6**	**0.28 (0.13-0.61)**[c]
Missing	**35.3**	**2.3 (0.72-7.1)**	**31.5**	**1.8 (0.73-4.6)**	31.4	10	**92.9**	**5.5 (0.55-54)**
Race								
White	**24.8**[a]	**Ref**	**40.8**[a]	Ref	24.7	Ref	**53.5**[a]	Ref
Asian	**41.9**	**2.0 (1.2-3.3)**[c]	**40.4**	1.4 (0.84-2.2)	21.1	0.59 (0.23-1.5)	**47.4**	0.33 (0.14-0.79)[c]
Black	**31.0**	**1.3 (0.60-2.6)**	**40.5**	1.2 (0.57-2.3)	47.1	1.94 (0.63-6.0)	**64.7**	0.61 (0.17-2.1)
Other	**22.2**	**0.83 (0.43-1.6)**	**51.6**	1.7 (0.96-2.9)	27.3	1.28 (0.53-3.1)	**57.6**	0.88 (0.37-2.1)
Missing	**33.8**	**0.38 (0.12-1.2)**	**31.7**	0.77 (0.32-1.9)	27.3	0	**89.6**	3.39 (0.47-24)
March 2020 practice setting								
Community pharmacy	**29.6**[b]	**Ref**	40.7	Ref	**21.3**[b]	**Ref**	58.1	Ref
Hospital/health system inpatient	**19.3**	**0.56 (0.39-0.80)**[c]	35.5	0.74 (0.55-1.0)	**26.1**	**1.2 (0.70-2.2)**	60.4	1.0 (0.57-1.8)
Outpatient clinic/ambulatory care	**28.4**	**0.95 (0.53-1.7)**	41.8	1.04 (0.61-1.8)	**10.7**	**0.49 (0.14-1.7)**	50.0	0.66 (0.26-1.7)
Health system outpatient	**30.2**	**1.0 (0.49-2.1)**	32.6	0.74 (0.37-1.5)	**57.1**	**4.9 (1.6-15)**[c]	78.6	2.5 (0.56-10)
Nursing home/long-term care	**48.8**	**2.7 (1.4-5.3)**[c]	46.3	1.1 (0.57-2.2)	**42.1**	**2.7 (0.44-9.1)**	77.8	2.1 (0.60-7.4)
Managed care/pharmacy benefit manager	**15.0**	**0.40 (0.11-1.4)**	40.0	1.04 (0.40-2.7)	**37.5**	**2.0 (0.44-9.1)**	37.5	0.44 (0.08-2.4)
Specialty pharmacy	**60.0**	**3.5 (1.3-9.2)**[c]	45.0	1.1 (0.41-2.9)	**55.6**	**2.9 (0.66-13)**	77.8	0.77 (0.10-6.1)
Academia	**41.2**	**1.4 (0.51-4.0)**	29.4	0.55 (0.18-1.7)	**20.0**	**0.98 (0.10-9.7)**	60.0	0.49 (0.06-4.2)
Home health/infusion	**38.9**	**0.16 (0.02-1.4)**	55.6	1.6 (0.60-4.3)	**50.0**	**3.6 (0.91-14)**	60.0	0.97 (0.19-4.9)
Other	**33.3**	**0.88 (0.26-3.0)**	33.3	0.80 (0.23-2.8)	**0**	**0**	75.0	1.4 (0.09-20)
Mail order pharmacy	**11.1**	**0.16 (0.02-1.4)**	66.7	2.6 (0.61-11)	**66.7**	**5.9 (0.92-37)**	66.7	0.50 (0.07-3.9)
Industry	**0**	**0**	0	0	**na**	**na**	na	na
Missing	**40.0**	**2.5 (0.13-46)**	40.0	1.03 (0.07-15)	**50.0**	**1.0 (0.02-54)**	0	0
March 2020 practice position								
Staff	26.9	Ref	38.5	Ref	27.3	Ref	60.4	Ref
Nonstaff	31.2	1.2 (0.90-1.7)	42.1	1.2 (0.90-1.6)	21.1	0.66 (0.38-1.1)	57.8	1.1 (0.67-2.0)
Missing	33.3	0.58 (0.06-5.9)	44.4	1.9 (0.26-14)	50.0	3.2 (0.17-57)	50.0	> 100
Number of ESCs								
1 ESC	**23.9**[b]	**0.57 (0.43-0.76)**[c]	**36.4**	**0.59 (0.45-0.77)**[c]	22.7	0.72 (0.45-1.2)	**46.2**[b]	**0.25 (0.15-0.42)**[c]
> 1 ESC	**36.9**	**Ref**	**45.5**	**Ref**	30.7	Ref	**81.0**	**Ref**

(*continued on next page*)

Table 2 (*continued*)

	Experienced an ESC (n = 1188)				Stopped working (n = 469)			
	Changed setting		Stopped working		Stopped working involuntarily		Reentered the workforce	
	n (%) of total who experienced an ESC				n (%) of total that stopped working			
Reason for stopping work								
Voluntary	na	na	na	na	na	na	**54.3**	**Ref**
Involuntary							**75.0**	**2.8 (1.6-5.1)[c]**
Constant		0.001		0.33		0.11		4441
Overall model fit (chi-square)		115.3[b]		99.7[b]		50.2[b]		174.3[b]
Nagelkerke R square		0.14		0.11		0.15		0.43

Other setting included government regulatory, nonprofit, research, cannabis dispensary, hospice, wholesalers, consulting firms, nuclear pharmacy, informatics, compounding, among others. Staff positions included staff pharmacists, float pharmacists, and clinical pharmacists. Nonstaff positions included owners/partners, chief pharmacist officers, directors, assistant directors, managers, assistant managers, executives, faculty, scientists, and faculty. Odds ratios estimated from a model including variables contained in the table. Ref denotes the reference category for each categorical variable. Bold type denotes statistically significant categories of variables in the bivariate comparisons and multivariate logistic regression models.

[a]A total of 1169 respondents who reported an ESC answered the question about changing work settings.

Abbreviations: ESC, employment status change; na, not applicable.

[b]Chi-square test of association, $P < .05$.

[c]Wald statistic, $P < .05$.

pharmacists. Overall, in the health care sector of the US economy, there were significant numbers of involuntary layoffs immediately after the start of the pandemic. Subsequently, there were significant voluntary job quits and growth in job demand and monthly job openings (reaching a high in March 2022), providing significant opportunity to change jobs and/or leave the workforce.[6] Given this backdrop, our results showed that over one-third of respondents practicing pharmacy in March 2020 reported an ESC sometime in the 34 months between March 2020 and December 2022. Our results are consistent with employment decisions made by physicians and nurses after March 2020. Reports suggest that 55% of physicians experienced an employment change sometime between March 2020 and April 2022 and 43% reported changing jobs.[26] In addition, 15.6%, 6.1%, and 5.4% of nurses reported changing their practice setting, switching their practice to telehealth, or switching to be a travel nurse, respectively, after March 2020. In addition, 6.0% and 2.7% of nurses reported retiring or leaving nursing, respectively.[27] Since March 2020, the health services sector provided health professionals opportunities, voluntary and involuntary, to change their employment and/or career situation.[5,6,26,27]

According to data about pharmacist job openings from 2020 to 2022, employers increasingly were trying to hire pharmacists after the pandemic, especially in community pharmacy settings.[28] The extended period for which there was high demand for pharmacists provided ample opportunity for pharmacists to search for different employment and change their employment status. The job turnover rate is a measure of how often employees change their employment situation during a defined period and was defined in a previous study of pharmacists as the number of job changes (ie, left an employer, retired) divided by the number of employed pharmacists.[29] Unfortunately, there is very little information about actual pharmacist turnover rates. Between 1983 and 1997, the average annual pharmacist turnover rate was 11.1%. In the present study, the turnover rate between March 2020 and December 2022 was 48.9% or 16.3% per 12 months, confirming increased employment changes recently compared with the past. Future research could determine how the job turnover rate fluctuated each year after the start of the pandemic by collecting more detailed information from pharmacists about the timing of job turnover events.

The balance between the supply of and demand for pharmacists after COVID-19 is important when considering the implications of the study results. Projections by the National Center for Health Workforce Analysis of the supply of and demand for pharmacists in the United States show that there is a current shortage of roughly 5000 full-time equivalent pharmacists, which is expected to increase to 2036.[17] Evidence suggesting a shortage is the 2.9% growth from May 2021 to May 2022 in the mean hourly wage for pharmacists, overall, after no wage growth from May 2019 to May 2021.[30–33] The wage rate increased between May 2021 and May 2022 for pharmacists in community settings and hospital settings.[30–33] Research could continue to monitor evidence of a pharmacist shortage across all practice settings. An important issue likely contributing to the projected shortage is the reduction in the number of students enrolled in schools and colleges of pharmacy in the US, primarily due to the reduction in numbers of applicants to schools and colleges of pharmacy.[34] Increased demand for pharmacists, coupled with rising wage rates, could increase the number of applicants to schools and colleges of pharmacy in the future.

The results suggest that approximately 14.5% of respondents or 5.1% per 12 months who were practicing pharmacy in March 2020 became unemployed (ie, reported stopping work) at some point between March 2020 to December 2022. On average, the respondents who reported that they stopped working and reentered the workforce returned to the workforce in 5 months. Research shows that 1.6% and 1.7% of physicians and 3.6% and 2.7% of nurses were unemployed at some point between April to December 2020 and January to October 2021, respectively.[12,35] Employment levels for physicians and nurses returned to prepandemic levels approximately 8 to 12 months after March 2020.[12,35] The impact of the pandemic on pharmacists becoming unemployed appears to have been larger than the impact on physicians

Table 3
Change in Practice Setting Among Respondents Reporting an ESC and Practicing Pharmacy in March 2020 and 2022: Overall and by Years of Experience Categories.

Practice setting	Overall (N = 865)		1-10 Years of experience (n = 211)		11-20 Years of experience (n = 185)		> 20 Years of experience (n = 260)	
	% by setting March 2020	Percentage point change 2020-2022	% by setting March 2020	Percentage point change 2020-2022	% by setting March 2020	Percentage point change 2020-2022	% by setting March 2020	Percentage point change 2020-2022
Movement away from setting								
Community pharmacy	52.5[a]	−7.5	52.6[a]	−12.3	49.2[a]	−10.8	50.4	−1.9
Health system/hospital inpatient	26.4	−0.9	29.4	−1.0	26.5	−2.7	26.2	−0.4
Nursing home/long-term care	3.5	−0.7	0.9	0	4.3	0	5.4	−0.8
Academia	1.4	−0.5	1.9	−1.4	2.2	−0.6	1.5	−0.3
Missing	0.5	0	0	0	0	0	0	0
Total		−9.6		−14.7		−14.0		−3.4
Movement into setting								
Ambulatory care	5.0	+2.3	4.7	+3.8	4.9	+0.5	4.6	0
Health system outpatient	3.9	+1.6	3.8	+1.4	5.4	+3.2	3.8	0
Specialty pharmacy	2.0	+0.4	1.4	−0.5	0	+3.2	2.7	−0.4
Managed care/pharmacy benefit manager	1.6	+1.3	2.4	+3.3	3.2	+1.7	1.2	+0.3
Home health/infusion	1.4	+0.8	0.9	+1.9	1.6	0	2.3	+0.4
Other	1.2	+1.2	0.5	+0.4	1.1	+1.7	1.5	+2.3
Mail order pharmacy	0.7	+1.4	0.9	+2.4	1.6	+2.2	0.4	0
Industry	0.1	+0.6	0.5	+0.9	0	+1.1	0	+0.4
Professional/trade association	0	+0.2	0	0	0	+0.5	0	0

Abbreviation: ESC, employment status change.
The table contains data only for respondents who reported an ESC and reported they were working as a pharmacist in March 2020 and at the time of their survey response in 2022.
[a]Chi-square goodness-of-fit test between practice setting distribution in March 2020 and 2022 overall and for each years of experience category, $P < .05$.

Table 4
Association of Respondent Demographic and Work Characteristics With Work-Life Outcomes for Respondents Practicing Pharmacy in March 2020 and 2022.

Respondent characteristic	High professional fulfillment		Low work exhaustion		Low interpersonal disengagement	
	n/N (% of total)					
Total	458/2171 (21.1)		512/2167 (23.6)		1024/2154 (47.5)	
	% of Row	Odds ratio (95% CI)	% of Row	Odds ratio (95% CI)	% of Row	Odds ratio (95% CI)
Gender						
Male	**25.6**[a]	**Ref**	**27.8**[a]	**Ref**	**50.8**[a]	Ref
Female	**18.6**	**0.72 (0.57-0.90)**^	**20.9**	**0.68 (0.54-0.85)**^	**45.2**	0.84 (0.70-1.0)
Nonbinary	**40.0**	**1.4 (0.17-11.5)**	**40.0**	**1.3 (0.17-9.4)**	**40.0**	0.44 (0.06-3.1)
Missing	**16.7**	**0.43 (0.16-1.1)**	**31.1**	**1.3 (0.52-3.3)**	**63.2**	1.9 (.80-4.3)
Years of experience						
≤ 10 years	**16.8**[a]	**Ref**	**17.4**[a]	**Ref**	**37.6**[a]	**Ref**
11-20 years	**20.4**	**1.2 (0.89-1.7)**	**19.3**	**1.1 (0.81-1.6)**	**42.5**	**1.2 (0.94-1.6)**
21-30 years	**17.7**	**1.1 (0.77-1.6)**	**22.9**	**1.6 (1.1-2.3)**[b]	**50.4**	**1.8(1.4-2.4)**[b]
31-40 years	**22.5**	**1.4 (0.96-2.0)**	**29.6**	**2.2 (1.5-3.2)**[b]	**51.7**	**1.9 (1.4-2.5)**[b]
> 40 years	**38.1**	**2.7 (1.8-4.1)**[b]	**42.6**	**3.1 (2.1-4.7)**[b]	**68.5**	**3.3 (2.3-4.9)**[b]
Missing	**22.5**	**1.8 (0.82-4.0)**	**18.8**	**1.2 (0.51-2.7)**	**56.6**	**2.6 (1.3-5.1)**[b]
Race						
White	21.2	Ref	24.0	Ref	46.6	**Ref**
Asian	18.5	1.0 (0.70-1.5)	19.6	0.96 (0.65-1.4)	49.3	**1.4 (1.0-1.8)**[b]
Black	24.7	1.4 (0.81-2.3)	33.0	1.9 (1.2-3.2)^	59.6	**1.9 (1.2-2.9)**[b]
Other	22.4	1.3 (0.82-1.9)	20.4	.95 (0.61-1.5)	46.8	**1.1 (0.82-1.6)**
Missing	20.2	1.2 (0.57-2.4)	23.5	1.0 (0.49-2.1)	49.4	**.076 (0.41-1.4)**
2022 Practice setting						
Community pharmacy	**15.3**[a]	**ref**	**13.9**[a]	**Ref**	**42.5**[a]	**Ref**
Hospital/health system inpatient	**21.1**	**1.8 (1.4-2.4)**[b]	**30.1**	**2.8 (2.1-3.6)**[b]	**47.5**	**1.4 (1.1-1.7)**[b]
Outpatient clinic/ambulatory care	**34.1**	**3.81 (2.5-5.9)**[b]	**29.4**	**3.4 (2.2-5.4)**[b]	**54.0**	**2.0 (1.4-3.0)**[b]
Health system outpatient	**32.7**	**3.2 (2.0-5.1)**[b]	**30.1**	**2.9 (1.8-4.8)**[b]	**49.0**	**1.3 (0.88-2.0)**
Nursing home/long-term care	**23.5**	**1.7 (0.90-3.1)**	**46.3**	**5.3 (3.1-9.1)**[b]	**61.2**	**2.0 (1.2-3.4)**[b]
Managed care/pharmacy benefit manager	**35.7**	**4.1 (2.4-7.0)**[b]	**54.3**	**10.6 (6.3-17.9)**[b]	**70.0**	**4.0 (2.4-6.9)**[b]
Specialty pharmacy	**29.3**	**2.8 (1.4-5.8)**[b]	**31.7**	**3.2 (1.6-6.6)**[b]	**64.7**	**2.1 (1.1-4.0)**[b]
Academia	**25.7**	**1.8 (0.81-4.0)**	**28.6**	**3.5 (1.6-7.7)**[b]	**50.0**	**1.6 (0.81-3.3)**
Home health/infusion	**30.6**	**2.7 (1.3-5.7)**[b]	**30.6**	**2.9 (1.3-6.2)**[b]	**44.4**	**1.1 (0.54-2.2)**
Other	**40.0**	**2.9 (1.4-2.5)**[b]	**55.9**	**7.1 (3.4-15.0)**[b]	**64.7**	**2.1 (0.97-4.3)**
Mail order pharmacy	**34.5**	**3.5 (1.6-8.0)**[b]	**58.6**	**11.7 (5.3-25.9)**[b]	**75.9**	**5.1 (2.1-12.1)**[b]
Industry	**30.0**	**2.1 (0.51-8.9)**	**50.0**	**6.1 (1.6-22.4)**[b]	**50.0**	**1.3 (0.35-4.6)**
Professional association	**33.3**	**2.6 (0.23-29.5)**	**33.3**	**4.1 (0.35-48.2)**	**33.3**	**0.77 (0.07-8.9)**
2022 Practice position						
Staff	**18.7**[a]	**Ref**	23.5	**Ref**	47.1	**Ref**
Nonstaff	**26.5**	**2.1 (1.6-2.7)**[b]	23.9	**1.3 (1.0-1.7)**[b]	48.5	**1.3 (1.0-1.6)**[b]
2022 Weekly hours worked						
More than 30 h	**19.8**[a]	**Ref**	**21.4**[a]	**Ref**	**44.8**[a]	**Ref**
30 h or less	**28.4**	**1.8 (1.4-2.5)**[b]	**37.1**	**2.3 (1.7-3.1)**[b]	**62.9**	**1.9 (1.5-2.5)**[b]
Missing	**19.4**	**0.82 (0.47-1.4)**	**18.5**	**0.74 (0.42-1.3)**	**44.0**	**0.89 (0.57-1.4)**
Experienced an ESC						
Yes	**23.9***	**1.3 (1.1-1.7)**[b]	**29.2***	**1.6 (1.2-2.0)**[b]	**52.7***	**1.4 (1.2-1.7)**[b]
No	**20.0**	Ref	**21.2**	**Ref**	**45.2**	**Ref**
Constant		0.12		0.17		0.34
Overall model fit (chi-square)		130.5[a]		227.3[a]		163.7[a]
Nagelkerke R square		0.09		0.15		0.10

A total of 2943 respondents reported practicing as a pharmacist in March 2020 and at the time of their survey response in 2022. Total N in each work-life variable column does not equal 2943 due to respondents that did not report work-life variables. Respondents were categorized as having a high level of professional fulfillment if their mean item score was 4 or more on a 5-point scale (1 = not at all true, 2 = somewhat true, 3 = moderately true, 4 = very true, and 5 = completely true). Respondents were categorized as having a low level of work exhaustion or interprofessional disengagement if their mean item score was 2 or less on a 5-point scale (1 = not at all, 2 = very little, 3 = moderately, 4 = a lot, and 5 = totally). Odds ratios estimated from a model including variables contained in the table. Odds ratios estimated from a model including variables contained in the table. Ref denotes the reference category for each categorical variable. Bold type denotes statistically significant categories of variables in bivariate comparisons and multivariate logistic regression models.
Abbreviation: ESC, employment status change.
[a]Chi-square test of association, $P < .05$.
[b]Wald statistic, $P < .05$.

and nurses. One explanation for the differences could be that most pharmacists (62.2%) (Table 1) were working in community or ambulatory care settings in March 2020. Research shows that health care workers in ambulatory care settings were impacted more in terms of losing employment than those in hospital settings.[2,12] Reasons to voluntarily stop working, circumstances that influenced the amount of time pharmacists were out of the workforce, and the influence of practice settings on being unemployed are topics for future research.

One concern about the COVID-19 pandemic was that health care providers would permanently leave the provider workforce due to work

experiences during the COVID-19 pandemic.[2] Based on results from the 2022 NPWS, we estimate that 9.9% of pharmacists practicing pharmacy in March 2020 permanently dropped out of the workforce sometime between March 2020 and December 2022 (36.4% of practicing pharmacists reported an ESC × 27.2% of practicing pharmacists dropping out of practice after an ESC). This is an average of 3.5% of practicing pharmacists per 12 months. Using 2020 Bureau of Labor Statistics estimates of the employed pharmacist workforce, approximately 11,041 pharmacists left the workforce annually between March 2020 and December 2022 pursuant to an ESC.[32] National estimates suggest that the pharmacist workforce loses about 13,400 pharmacists annually due to retirement and other reasons.[25] Based on 2022 NPWS data, it appears that the pandemic did not result in an increase in pharmacists permanently leaving the workforce beyond was what normally expected.

The result that pharmacists who reported an ESC, especially pharmacists with 20 or fewer years of experience, shifted away from community pharmacy practice settings is concerning. The estimates suggest that the number of pharmacists employed in community settings in 2022 rebounded to 2020 levels but was 3.7% less than the peak employment in 2017.[36] The share of total pharmacist employment that is in community settings decreased by 8% points since 2013.[36] A significant issue for the academy and the profession, in general, is ensuring that community pharmacy settings have adequate numbers of pharmacists to meet patient medication and public health needs, especially the needs of vulnerable patient populations.[37–39] Job openings data suggest that the demand for pharmacists in community settings after COVID-19 was high.[28] However, the persistence of community pharmacy job openings may point to an unmet demand.[28] Understanding the perceptions about community pharmacy and pharmacy in general, among pharmacists, the broader public, and prospective pharmacy students could be an area for future research.[18,40–45] Recruiting young people into pharmacy and focusing efforts on improving working conditions in community pharmacy work systems is critical.[18,45]

Regarding efforts to improve pharmacy work environments, research could document successful strategies to improve pharmacist work experiences. Although research has examined turnover intention and actual turnover behavior of pharmacists, a gap in this research is knowledge about what specific characteristics or processes within pharmacy work systems (ie, people, organizations, physical work environment, tasks, tools, and technology) facilitate positive work environments, reduce stress and burnout, and promote retention.[18,20,26,41,44,46–49] The Academy, pharmacy professional organizations, employers, and pharmacists could collaborate to learn about characteristics of employers and work systems that are promoting positive work experiences and how work systems could be modified at the individual pharmacist level and the organizational or system level to improve working conditions for pharmacists.[18,41,44,50–52] Then, teams can design ways to implement new improvements in work systems and evaluate the impact of the changes on work processes and patient (eg, adverse drug events) and pharmacist outcomes (eg, burnout and job satisfaction). Meaningfully and purposefully improving the environments in which pharmacists work will be vital to the health of the pharmacist workforce.[48,50,52]

The results suggest that ESCs resulted in better work-life outcomes, such as WE, PF, and ID. One explanation for the results is that respondents actively searched for a better work situation and changed jobs. Future research could examine why respondents left or remained at work situations after the pandemic, examine how extensive (ie, length of time, number of jobs considered) was their search, determine resources that they needed to make a job or career change, and associate reasons for leaving and staying with work-life characteristics. Of particular interest would be research examining the job search experience for pharmacists with 20 or fewer years of experience. The results showed that they were significantly more likely to report multiple ESCs and to return to work than respondents with more years of experience, implying that their job search likely was purposeful to improve their work situation. Pharmacists with 20 or fewer years of experience will be the core of the pharmacist workforce in the future due to the increases in the number of pharmacy graduates between 2001 and 2018.[34] Ensuring they remain healthy and in the pharmacist workforce through positive work experiences is significant, especially given the projected pharmacist supply and demand imbalance.[17]

4.1. Limitations

The response rate to the survey was low. Based on the comparisons of characteristics of respondents to the survey and the population of licensed pharmacists, the respondents underrepresented pharmacists with fewer years of experience.[19] However, there were no significant differences in the prevalence of experiencing an ESC when comparing early responders with late responders to the survey within each years of experience category. The results provide some evidence against the possibility that respondents across each of the categories of years of experience who did not experience an ESC systematically did not respond to the survey. Therefore, the data may accurately reflect the ESC experiences of respondents across the categories of years of experience. Our results may bias downward the proportion of all respondents who experienced an ESC and bias upward the proportion that stopped working since March 2020 because pharmacists with fewer years of experience were more likely to report an ESC and were less likely to stop working.

There was no association between a respondent reporting an ESC and their practice setting in March 2020. The questionnaire did not contain an item about the type of community setting (eg, independent, large chain, mass merchandiser, etc.) in which a respondent was working in March 2020. The variability in the likelihood of experiencing an ESC across types of community pharmacy practice settings should be considered when discussing the implications of the current results.

The estimates of pharmacist unemployment since March 2020 calculated in this study were not determined in the same manner as the estimates calculated for other health professionals (eg, nurses and physicians).[12,35] Our estimates did not include responding licensed pharmacists who were not practicing pharmacy (ie, working but not as a pharmacist, retired, or unemployed) in March 2020, which was about 20% of the respondents. The extent of bias likely is small because a significant proportion of respondents working but not practicing pharmacy remained working after March 2020 and a significant proportion of those unemployed in March 2020 were practicing pharmacy in December 2022.

The survey did not contain questions for respondents to report details of each ESC if a respondent experienced more than 1 ESC. The questions about details of ESCs experienced by respondents used a format that allowed the respondents to check boxes to describe all their ESCs. It is unknown whether respondents considered all, some, or just 1 of their ESCs when reporting. However, it was most common for respondents included in the analysis to report experiencing 1 ESC. If respondents did not consider all their ESCs when reporting the details of their ESCs, the characteristics of ESCs likely are biased downward. For example, details that are cumulative, such as the length of time out of the workforce, would be biased downward if only 1 of 3 ESCs was considered when answering the question. Other details that are discrete details, such as leaving an employer, could have been the same or different across all ESCs for a respondent. Because the details of ESCs were analyzed at the respondent level, bias could result for such variables if the respondent did not consider all their ESCs and there were differences in the details (eg, left an employer for 1 ESC and remained with employer for another ESC). The degree of the bias is unknown.

5. Conclusion

Over one-third of the respondents reported an ESC after the start of the COVID-19 pandemic and reporting an ESC was significantly more

likely among respondents with 10 or fewer years of experience than respondents with 11 to 40 years of experience. A significant majority of respondents who experienced an ESC returned to practice. The respondents appeared to benefit from stopping work and/or leaving one work environment for another. Future research and educational opportunities could focus on ways to ensure pharmacists remain healthy and engaged in the professional workforce by improving work environments and helping pharmacists effectively search for and act on employment changes. Such efforts could help improve the attractiveness of pharmacy to pharmacists, student pharmacists, and young people.

Author Contributions

Conceptualization: All authors. *Methodology*: All authors. *Programming*: D.M. *Validation*: D.M. *Formal analysis* : D.M. *Resources*: D.M., C.G., D.K., M.W. *Data curation*: D.M. *Writing – original draft*: D.M. *Writing – review & editing*: W.D., C.G., D.K., J.S., M.W. *Project administration*: D.M. *Funding acquisition*: D.M., V.A., B.B., W.D., C.G., D.K., J.S., M.W.

Funding/Support

This work was funded by a grant from the Pharmacy Workforce Center, Inc

Declaration of Competing Interest

None declared.

References

1. Paavola A. 266 hospitals furloughing workers in response to COVID-19. Becker's Hospital CFO Report. ⟨https://www.beckershospitalreview.com/finance/49-hospitals-furloughing-workers-in-response-to-covid-19.html⟩. Accessed November 13, 2023.
2. Impact of the COVID-19 pandemic on the hospital and outpatient clinician workforce: challenges and policy responses (Issue Brief No. HP-2022–13). Office of the Assistant Secretary for Planning and Evaluation, United States Department of Health and Human Services; 2022. https://aspe.hhs.gov/reports/covid-19-health-care-workforce. Accessed October 15, 2023.
3. Cantor J, Whaley C, Simon K, Nguyen T. US health care workforce changes during the first and second years of the COVID-19 pandemic. 2 *JAMA Health Forum.* 2022;3(2):e215217. https://doi.org/10.1001/jamahealthforum.2021.5217
4. Nguyen T, Whaley C, Simon KI, Cantor J. Changes in employment in the US health care workforce, 2016-2022. *JAMA.* 2023;330(20):2018–2019. https://doi.org/10.1001/jama.2023.18932
5. Akinyooye L, Nezamis E. As the COVID-19 pandemic affects the nation, hires and turnover reach record highs in 2020. U.S. Bureau of Labor Statistics. Available at: ⟨https://www.bls.gov/opub/mlr/2021/article/as-the-covid-19-pandemic-affects-the-nation-hires-and-turnover-reach-record-highs-in-2020.htm⟩. Accessed November 13, 2023.
6. Author analysis of Job openings and labor turnover survey data. U.S. Bureau of Labor Statistics. ⟨https://www.bls.gov/jlt/data.htm⟩. Accessed December 1, 2023.
7. Wilensky GR. The COVID-19 pandemic and the US health care workforce. *JAMA Health Forum.* 2022;3(1):e220001. https://doi.org/10.1001/jamahealthforum.2022.0001
8. Cutler DM. Challenges for the beleaguered health care workforce during COVID-19. *JAMA Health Forum.* 2022;3(1):e220143. https://doi.org/10.1001/jamahealthforum.2022.0143
9. Jain U. Risk of COVID-19 due to shortage of personal protective equipment. *Cureus.* 2020;12(6):e8837. https://doi.org/10.7759/cureus.8837
10. Eisenberg MD, Eddelbuettel JCP, McGinty EE. Employment in office-based and intensive behavioral health settings in the US, 2016-2021. *JAMA.* 2022;328(16):1642–1643. https://doi.org/10.1001/jama.2022.17613
11. Strasser J, Schenk E, Dewhurst E, Chen C. Changes in the clinical workforce providing contraception and abortion care in the US, 2019-2021. *JAMA Netw Open.* 2022;5(11):e2239657. https://doi.org/10.1001/jamanetworkopen.2022.39657
12. Frogner BK, Dill JS. Tracking turnover among health care workers during the COVID-19 pandemic: a cross-sectional study. *JAMA Health Forum.* 2022;3(4):e220371. https://doi.org/10.1001/jamahealthforum.2022.0371
13. Labor force statistics from the current population survey pharmacists. U.S. Bureau of Labor Statistics. ⟨https://beta.bls.gov/dataQuery/find?st=0&r=20&s=popularity%3AD&fq=survey:[ln]&more=0&fq=cg:[Occupation]&q=pharmacists⟩. Accessed November 13, 2023.
14. LeCoz E "Pharmageddon" hits US with walkouts at multiple pharmacies including CVS and Walgreens. USA Today. ⟨https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiKurOr0JiFAxWwcfUHHShwBXkQFnoECBgQAQ&url=https%3A%2F%2Fwww.usatoday.com%2Fstory%2Fnews%2Finvestigations%2F2023%2F10%2F30%2Fphamageddon-walkout-hits-us-pharmacies%2F71386906007%2F&usg=AOvVaw0uNHOF3rP5EU-Ib9_RER2J&opi=89978449⟩. Accessed December 1, 2023.
15. Goodkind E, Rothenberg E. CVS and Walgreens pharmacy staff begin 3-day walkout. CNN. ⟨https://www.cnn.com/2023/10/30/business/cvs-walgreen-pharmacy-walkout/index.html⟩. Accessed November 13, 2023.
16. Levenson M. Why pharmacy workers at CVS and Walgreens are protesting. The New York Times. ⟨https://www.nytimes.com/2023/11/01/business/cvs-walgreens-pharmacy-workers-protest.html⟩. Accessed November 13, 2023.
17. Workforce projections for pharmacists. Health Resources and Services Administration. ⟨https://data.hrsa.gov/topics/health-workforce/workforce-projections⟩. Accessed November 13, 2023.
18. Schommer JC, Lee S, Gaither CA, Alvarez NA, Shaughnessy AM. Improving the experience of providing care in community-based pharmacies. *Pharmacy.* 2022;10(4):67. https://doi.org/10.3390/pharmacy10040067
19. 2022 National pharmacist workforce study final report. American Association of Colleges of Pharmacy. ⟨https://www.aacp.org/sites/default/files/2023-08/2022-npws-final-report.pdf⟩. Accessed November 13, 2023.
20. Holden RJ, Carayon P, Gurses AP, et al. SEIPS 2.0: a human factors framework for studying and improving the work of healthcare professionals and patients. *Ergonomics.* 2013;56(11):1669–1686. https://doi.org/10.1080/00140139.2013.838643
21. Trockel M, Bohman B, Lesure E, et al. A Brief instrument to assess both burnout and professional fulfillment in physicians: reliability and validity, including correlation with self-reported medical errors, in a sample of resident and practicing physicians. *Acad Psychiatry.* 2018;42(1):11–24. https://doi.org/10.1007/s40596-017-0849-3
22. Maslach C, Jackson SE. The measurement of experienced burnout. *J Organ Behavior.* 1981;2(2):99–113. https://doi.org/10.1002/job.4030020205
23. Fadare OO, Doucette WR, Gaither CA, et al. Use of the professional fulfillment index in pharmacists: a confirmatory factor analysis. *Pharmacy.* 2021;9(4):158. https://doi.org/10.3390/pharmacy9040158
24. Saville DJ. Multiple comparison procedures: the practical solution. *Am Stat.* 1990;44(2):174–180. https://doi.org/10.1080/00031305.1990.10475712
25. Occupational outlook handbook, pharmacists. Bureau of Labor Statistics, United States Department of Labor. ⟨https://www.bls.gov/ooh/healthcare/pharmacists.htm⟩. Accessed December 3, 2023.
26. Saley C. Survey: nearly half of physicians changed jobs during the pandemic. CHG Healthcare. ⟨https://chghealthcare.com/blog/physicians-changed-jobs-survey#:~:text=A%202022%20CHG%20Healthcare%20survey,physicians%20is%206%2D7%25⟩. Accessed November 5, 2023.
27. The 2022 national nursing workforce survey. J Nurs Regul 14(1); 2023:S1-S90.
28. Pharmacy demand report (PDR). ⟨https://www.aacp.org/article/pharmacy-demand-report-pdr⟩. Accessed November 5, 2023.
29. Mott DA. Pharmacist job turnover, length of service, and reasons for leaving, 1983-1997. *Am J Health Syst Pharm.* 2000;57(10):975–984. https://doi.org/10.1093/ajhp/57.10.975
30. Occupational employment and wages, May 2022. 29–1051 pharmacists. US Bureau of Labor Statistics. ⟨https://www.bls.gov/oes/current/may/oes291051.htm⟩. Accessed February 8, 2024.
31. Occupational employment and wages, May 2021. 29–1051 pharmacists. US Bureau of Labor Statistics. ⟨https://www.bls.gov/oes/2021/may/oes291051.htm⟩. Accessed February 8, 2024.
32. Occupational employment and wages, May 2020. 29–1051 pharmacists. US Bureau of Labor Statistics. ⟨https://www.bls.gov/oes/2020/may/oes291051.htm⟩. Accessed February 8, 2024.
33. Occupational employment and wages, May 2019. 29–1051 pharmacists. US Bureau of Labor Statistics. ⟨https://www.bls.gov/oes/2019/may/oes291051.htm⟩. Accessed February 8, 2024.
34. Lopez EJ, Li CX, Nguyen NT. *Profile of pharmacy students fall 2022.* Alexandria, VA: American Association of Colleges of Pharmacy; 2023. https://www.aacp.org/research/institutional-research/student-applications-enrollments-and-degrees-conferred. Accessed December 1 2023.
35. Buerhaus PI, Staiger DO, Auerbach DI, Yates MC, Donelan K. Nurse employment during the first fifteen months of the COVID-19 pandemic. *Health Aff.* 2022;41(1):79–85. https://doi.org/10.1377/hlthaff.2021.01289
36. Fein A. Pharmacist salaries and employment in 2022: the good times roll for retail pharmacists. Drug Channels. ⟨https://www.drugchannels.net/2023/06/pharmacist-salaries-and-employment-in.html⟩. Accessed December 1, 2023.
37. Qato DM, Daviglus ML, Wilder J, Lee T, Qato D, Lambert B. Pharmacy deserts' are prevalent in Chicago's predominantly minority communities, raising medication access concerns. *Health Aff.* 2014;33(11):1958–1965. https://doi.org/10.1377/hlthaff.2013.1397
38. Pednekar P, Peterson A. Mapping pharmacy deserts and determining accessibility to community pharmacy services for elderly enrolled in a State Pharmaceutical Assistance Program. *PLoS One.* 2018;13(6):e0198173. https://doi.org/10.1371/journal.pone.0198173
39. Guadamuz JS, Alexander GC, Zenk SN, Kanter GP, Wilder JR, Qato DM. Access to pharmacies and pharmacy services in New York City, Los Angeles, Chicago, and Houston, 2015-2020. *J Am Pharm Assoc.* 2021;61(6):e32–e41. https://doi.org/10.1016/j.japh.2021.07.009
40. Clabaugh M, Newlon JL, Illingworth Plake KS. Perceptions of working conditions and safety concerns in community pharmacy. *J Am Pharm Assoc.* 2021;61(6):761–771. https://doi.org/10.1016/j.japh.2021.06.011

41. APhA and NASPA national state-based pharmacy workplace survey. American Pharmacists Association. ⟨https://www.pharmacist.com/APhA-Press-Releases/apha-and-naspa-release-2021-national-state-based-pharmacy-workplace-survey-report⟩. Accessed December 1, 2023.
42. Haugtvedt C, Lewis NJW, Gaither CA, et al. Final report of the pharmacy section task force on system-mediated medication safety issues. American Public Health Association. ⟨https://www.cshp.org/resource/resmgr/files/news/Task_Force_on_System-mediate.pdf⟩. Accessed December 1, 2023.
43. Nau DP, Kier KL. The decline in graduating student pharmacist positivity for the profession of pharmacy. *J Am Pharm Assoc.* 2022;62(2):537–540. https://doi.org/10.1016/j.japh.2021.10.013
44. Pharmacy workplace and well-being reporting (PWWR). American Pharmacists Association. ⟨https://www.pharmacist.com/Advocacy/Well-Being-and-Resiliency/pwwr⟩. Accessed December 3, 2023.
45. Newlon JL, Clabaugh M, Illingworth Plake KS. Policy solutions to address community pharmacy working conditions. *J Am Pharm Assoc.* 2021;61(4):450–461. https://doi.org/10.1016/j.japh.2021.02.011
46. Thin SM, Chongmelaxme B, Watcharadamrongkun S, Kanjanarach T, Sorofman BA, Kittisopee T. A systematic review on pharmacists' turnover and turnover intention. *Res Social Adm Pharm.* 2022;18(11):3884–3894. https://doi.org/10.1016/j.sapharm.2022.05.014
47. Carayon P, Perry S. Human factors and ergonomics systems approach to the COVID-19 healthcare crisis. *Int J Qual Health Care.* 2021;33(suppl 1):1–3. https://doi.org/10.1093/intqhc/mzaa109
48. Carayon P, Schoofs Hundt AS, Karsh BT, et al. Work system design for patient safety: the SEIPS model. *Qual Saf Health Care.* 2006;15(suppl 1):i50–i58. https://doi.org/10.1136/qshc.2005.015842
49. Chui MA, Mott DA, Maxwell L. A qualitative assessment of a community pharmacy cognitive pharmaceutical services program, using a work system approach. *Res Social Adm Pharm.* 2012;8(3):206–216. https://doi.org/10.1016/j.sapharm.2011.06.001
50. Abuzied Y, Al-Amer R, Abuzaid M, Somduth S. The magnet recognition program and quality improvement in nursing. *Glob J Qual Saf Healthc.* 2022;5(4):106–108. https://doi.org/10.36401/JQSH-22-12
51. Goldsmith T. Developing an effective employee value proposition. Gist Healthcare. ⟨https://gisthealthcare.com/developing-effective-employee-value-proposition/⟩. Accessed December 3, 2023.
52. Implementing solutions. Building a sustainable, healthy pharmacy workforce and workplace. American Society of Health-System Pharmacists. ⟨https://wellbeing.ashp.org/-/media/wellbeing/docs/Implementing-Solutions-Report-2023.pdf⟩. Accessed December 3, 2023.